6 Return on equity: Sharpe–Lintner CAPM parameters

In chapter 5, we outline our proposed approach to determining the return on equity. This approach includes adopting the Sharpe–Lintner capital asset pricing model (CAPM) as our 'foundation model'.

The Sharpe–Lintner CAPM requires the estimation of three parameters:

- The risk free rate—this compensates investors for the time value of money. This is compensation for an investor having committed funds to an investment for a period of time and therefore forgoing the opportunity to immediately spend money or consume goods.[193]

- The equity beta— the equity beta measures the correlation between the returns on an individual asset or firm with that of the overall market.[194] Beta multiplied by the MRP provides for the return above the risk free rate required to compensate the investor for the risk that cannot be diversified away.

The market risk premium (MRP)—this compensates an investor for the systematic risk of investing in the market portfolio or the 'average firm' in the market.[195] Systematic risk is risk that affects all firms in the market (such as macroeconomic conditions and interest rate risk) and cannot be eliminated or diversified away through investing in a wide pool of firms.[196]In this chapter, we set out our approach and high level reasons for our estimation of the three Sharpe–Lintner CAPM parameters. We also set out our estimate of the equity beta. We set out our estimate for the MRP and risk free rate in December 2013. In three appendices to this explanatory statement (appendices C, D and E), we expand on the reasons for our approach to estimating the equity beta and MRP, respectively. In these appendices, we also address issues associated with the equity beta and MRP that were raised in submissions on our draft guideline.

6.1 Risk free rate

In the Sharpe–Lintner CAPM, the risk free rate measures the return an investor would expect from an asset with no default risk.[197]

6.1.1 Issue

In the draft guideline, we proposed to estimate the risk free rate using 10 year Commonwealth government securities (CGS) averaged over a short period of time as close as possible to the commencement of the regulatory period.[198] We maintain that position for the final guideline. Briefly, we consider this position appropriate because the CGS yield is an appropriate proxy for the risk free rate in Australia and a short averaging period is consistent with the CAPM and promotes regulatory certainty and consistency. These considerations are discussed in more detail in the application section below.

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[193] M. McKenzie, and G. Partington, *Report to the AER: Supplementary report on the equity market risk premium*, 22 February 2012, pp. 11–12.

[194] R. Brealey, S. Myers, G. Partington and D. Robinson, *Principles of corporate finance*, McGraw–Hill: First Australian edition, 2000, pp. 186–188 (Brealey et al, *Principles of corporate finance*, 2000).

[195] VAA, *Review of debt risk premium and market risk premium*, February 2013, p. 7.

[196] M. McKenzie, and G. Partington, *Report to the AER: Supplementary report on the equity market risk premium*, 22 February 2012, p. 10.

[197] Gregory also identified the absence of re-investment risk and inflation risk and characteristics of a risk free rate. Gregory, *The risk free rate and the present value principle*, November 2012, p.5. Lally discussed these risks in his report: Lally, *The present value principle*, March 2013, p. 10–12.

[198] AER, *Explanatory statement: Draft rate of return guideline*, August 2013, pp. 209–211

In their submissions on the draft guideline, service providers supported adopting a 10 year term and CGS yields as the proxy for the risk free rate.[199] APA Group supported a prevailing rate over a short averaging period as close as practicable to the final decision.[200] However, on the averaging period, the NSW distribution network service providers (NSW DNSPs) proposed we adopt a historical average risk free rate, instead of a prevailing rate.[201] We address the NSW DNSPs' submission below. We did not receive any submissions from consumer groups that commented specifically on the risk free rate.

6.1.2 Approach

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

On the risk free rate proxy, we propose to adopt:

- the yield on CGS

- a 10 year term.

On the risk free rate averaging period, we propose to adopt a period that:

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

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

6.1.3 Reasons for approach

Conceptually, the adoption of a 10 year forward looking risk free rate, based on prevailing conditions in the market for funds at the commencement of the regulatory control period is:

- reflective of prevailing market conditions

- consistent with the Sharpe–Lintner CAPM

- internally consistent with our estimate of the MRP.

Practically, in estimating a 10 year forward looking risk free rate, we propose to adopt the prevailing yield on 10 year CGS averaged over a period which is short and as close as practicably possible to the commencement of the regulatory period. We adopt his method because:

- An observable market proxy for the risk free rate is available.

- The yield on CGS is the best proxy for the risk free rate in Australia, as supported by the RBA advice.[202]

- The RBA, Commonwealth Treasury and AOFM advised that the CGS market is liquid and functioning well.[203]

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199   ENA, *Response to the draft guideline*, October 2013, p. 30; APA Group, *Submission on the draft guideline*, October 2013, p. 23-24; NSW DNSPs, Submission *on the draft guideline*, October 2013, p. 18. Spark Infrastructure, *Response to the draft guideline*, October 2013, p. 4.

200   APA Group, *Submission on the draft guideline*, October 2013, p. 23–24.

201   NSW DNSPs, Submission *on the draft guideline*, October 2013, pp. 18–24.

202   RBA, *Letter regarding the CGS market*, July 2012, p. 1.

- CGS yields are an observable market determined parameter.

- The prevailing risk free rate at any point in time is the benchmark that returns on risky investments must outperform.[204]

- Prevailing 10 year CGS yields reflect expectations of the risk free rate over the appropriate forward looking investment horizon (which is 10 years).

- A short averaging period is a pragmatic alternative to the prevailing rate.

- Selecting an averaging period in advance ensures the method is unbiased.

- There is no clear evidence that CGS yields are abnormally low. McKenzie and Partington suggest that the current rates may be consistent with a longer term trend.[205]

CGS are an appropriate proxy for the risk free rate in Australia

The risk free rate measures the return an investor would expect from an asset with no default risk. CGS are low default risk securities issued by the Australian Government, and are therefore an appropriate proxy for the risk free rate.[206] Each of the three major credit rating agencies issued its highest possible rating to the Australian Government.[207]

Experts generally acknowledge that an observable proxy for the risk free rate is available in Australia.[208] We received advice from the RBA, Australian Treasury and AOFM in July 2012 that supported the use of CGS yields as a proxy for the risk free rate in Australia.[209] In the RBA letter, Assistant Governor Guy Debelle stated:[210]

> I therefore remain of the view that CGS yields are the most appropriate measure of a risk free rate in Australia.

Similarly, the Treasury and AOFM stated:[211]

> The nominal CGS market is liquid and continues to display the attributes of a well-functioning market.

For the above reasons, we consider CGS yields credible and verifiable, comparable and timely, and clearly sourced. These reasons also illustrate why we consider the CGS yield is fit for the purpose of estimating the risk free rate and will reflect changes in market conditions.

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[203] Reserve Bank of Australia, *Letter to the ACCC: The Commonwealth Government Securities Market*, 16 July 2012, (RBA, *Letter regarding the CGS market*, July 2012); Australian Treasury and Australian Office of Financial Management, *Letter to the ACCC: The Commonwealth Government Securities Market*, 18 July 2012, p. 2 (Treasury and AOFM, *Letter regarding the CGS Market*, July 2012).

[204] By definition all investments other than the risk free rate are 'risky'.

[205] McKenzie and Partington, *Review of the AER's overall approach*, February 2013, p. 5.

[206] Gregory also identifies the absence of re-investment risk and inflation risk and characteristics of a risk free rate. Gregory, *The risk free rate and the present value principle*, November 2012, p.5. Lally discusses these risks in his report. Lally, *The present value principle*, March 2013, p. 10–12.

[207] Standard and Poor's, viewed 18 November 2013, http://www.standardandpoors.com/prot/ratings/entity-ratings/en/au/?entityID=268976&sectorCode=SOV ; Moody's, viewed 18 November 2013, https://www.moodys.com/credit-ratings/Australia-Government-of-credit-rating-75300?cy=aus&lang=en; Fitch Ratings, viewed 18 November 2013 http://www.fitchratings.com/gws/en/esp/issr/80442187

[208] See, for example, Lally, *The present value principle*, March 2013, p. 13, and Wright, *Review of risk free rate and Cost of equity estimates: A comparison of UK approaches with the AER*, October 2012, p. 3.

[209] RBA, *Letter regarding the CGS market*, July 2012; Treasury and AOFM, *Letter regarding the CGS Market*, July 2012.

[210] RBA, *Letter regarding the CGS market*, July 2012, p. 1.

[211] Treasury and AOFM, *Letter regarding the CGS Market*, July 2012, p. 2.

Risk free rate averaging period

Our method for the risk free rate averaging period is to use a short and recent averaging period as close as practicably possible to the commencement of the regulatory control period. We explain our reasons for this position in the following sections.

In the Victorian gas review, we allowed service providers to nominate their preferred averaging period so long as it was consistent with certain criteria.[212] The return on debt approach informed the rationale for allowing service providers to nominate an averaging period.[213] 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.[214]

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.[215] Allowing service providers to nominate an averaging period inevitably meant concurrent determinations could have different return on equity allowances, even though there is no particular economic reason why service providers with the same regulatory control period should have different returns on equity.[216]

In the draft guideline we proposed a move away from providing service providers with the flexibility to determine the exact dates of the risk free rate averaging period.[217] In the final guideline, we propose the nominated averaging period for the risk free rate will be:

- 20 consecutive business days in length[218]

- ending as close as practicably possible to the commencement of the regulatory period

We note the ENA and NSW DNSPs support a long term average estimate (for example, 10 year average) of the risk free rate in combination with a long term average MRP.[219] In the Victorian gas draft and final determinations we considered the use of a long term average risk free rate.[220] We did not find the arguments in support of a long term average compelling.[221] 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.[222] Accordingly, we do not consider a long term average risk free rate appropriate.

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[212] AER, *Final decision: APA GasNet*, March 2013, Part 3, pp. 44–46.

[213] AER, *Final decision: APA GasNet*, March 2013, Part 3, p. 45.

[214] 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).

[215] AER, *Final decision: APA GasNet*, March 2013, Part 3, p. 45.

[216] 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.

[217] See chapter 8 for discussion of the averaging period for the return on debt. AER, *Explanatory statement: Draft rate of return guideline*, August 2013.

[218] 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.

[219] 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.

[220] 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.

[221] 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.

[222] See, for example, Lally, The present value principle: risk, inflation, and interpretation, March 2013, p. 9.

In the draft guideline we use the Wright approach as a source of additional information at the return on equity level.[223] 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.

Prevailing CGS yields are consistent with the CAPM

For the following reasons, using a CGS yield estimated as close as practical to the commencement of the regulatory control period is consistent with the CAPM. Inputs to a model should be appropriate for use in that model, so individual equity parameters in this decision should be consistent with the CAPM framework.

The CAPM uses the most current information to derive the rate of return. In theory, it would use the risk free rate on the day (in this case, the commencement of the access arrangement period), as recognised by the Federal Court in ActewAGL Distribution v The Australian Energy Regulator [2011] FCA 639 (the ActewAGL matter).[224]

During the ActewAGL matter, Associate Professor Lally for the AER and Greg Houston for ActewAGL agreed theory requires the risk free rate be an 'on the day' rate.[225] The Federal Court acknowledged this agreement:[226]

> There was no dispute between the experts that the CAPM theory suggests that, ideally, the nominal risk-free rate input will be calculated on the day of the final determination.

Associate Professor Lally advised:[227]

> In relation to the Sharpe–Lintner model, this model always requires a risk free rate prevailing at a point in time for some subsequent period rather than a historical average and application of the model to a regulatory situation would require the risk free rate prevailing at the beginning of a regulatory period.

A short averaging period is a pragmatic alternative to the prevailing rate

A short averaging period provides a reasonable estimate of the prevailing rate while not exposing service providers to unnecessary volatility. It is a pragmatic alternative to using a risk free rate that is precisely consistent with the CAPM.

As noted above, the CAPM theoretically requires the risk free rate be an 'on the day' rate—literally, the first market price on the first day of the access arrangement period.[228] However, as Lally explained:[229]

> ... the use of this transaction would expose the regulatory process to reporting errors, an aberration arising from an unusually large or small transaction, and a rate arising from a transaction undertaken by a regulated firm for the purpose of influencing the regulatory decision.

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[223]   See appendix B for further discussion of the Wright approach.
[224]   Federal Court of Australia, *ActewAGL Distribution v The Australian Energy Regulator [2011] FCA 639*, 8 June, 2011, paragraph 119.
[225]   In advice provided to SP AusNet by NERA, Greg Houston raised concerns with the AER's presentation of his advice to the Federal Court. NERA, *Estimating the cost of equity under the CAPM: Expert report of Gregory Houston*, November 2012, pp. 36-37. In response, we amended our discussion of Mr Houston's advice to the Federal Court.
[226]   Federal Court of Australia, *ActewAGL Distribution v The Australian Energy Regulator [2011] FCA 639*, 8 June, 2011, paragraph 119.
[227]   Lally, *Risk free rate and present value*, August 2012, p. 3.
[228]   Lally, *Risk free rate and present value*, August 2012, p. 7
[229]   Lally, *Risk free rate and present value*, August 2012, p. 7

A short averaging period (for example, 20 business days) as close as practically possible to the commencement of the access arrangement period provides a pragmatic alternative—violating the theoretical requirements of the model only to a small extent. Lally states:[230]

> The use of the CAPM in a regulatory situation requires that the risk free rate and the MRP must be the rates prevailing at the beginning of the regulatory period. However pragmatic considerations suggest that the risk free rate be averaged over a short period close to the beginning of the regulatory period.

On the other hand, Lally noted a long term average would more significantly violate the requirements of the CAPM without providing any pragmatic gain:[231]

> Rates averaged over a much longer historical period would be inconsistent with the present value principle, i.e., they would violate it without offering any incremental pragmatic justification.

Subsequent advice provided by Lally did not change this conclusion.[232] Therefore, we do not consider a long-term averaging period is an appropriate and reasonable departure from the requirements of the CAPM.

APA Group also seems to support this view. It submitted:[233]

> The use of an averaging period of 20 trading days, as proposed in section 5.3.3 of the Draft Guideline, effects noise reduction without giving undue weight to superseded prior expectations.

This statement is supportive of our proposed approach for reasons in accordance with those outlined in this appendix.

In the past, we have identified the present value principle as supporting the use of a prevailing risk free rate.[234]

CGS are an observable market determined parameter

CGS yields are observable in a market. As that market is liquid and functioning well, we have confidence the market rate reflects the prevailing risk free rate and prevailing conditions in the market for funds.[235]

Changes in yields for securities traded in a liquid market are likely to reflect the actions of many market participants at each point in time. Therefore, market determined CGS yields are likely to reflect prevailing conditions in the market for funds. On its own, a yield that is low (or high) relative to historical averages is not a sign that the yield prevailing at any point in time is no longer a good proxy for the risk free rate. The current CGS yields are likely to reflect strong demand from foreign investors and a general re-assessment of the value of a risk free asset. Lower yields (higher prices) are an expected outcome from increased demand for those assets.

The Treasury and the AOFM noted this point:[236]

> The weak and fragile global economy has put downward pressure on benchmark global long-term bond yields, and is driving investors into high quality government debt.

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230 Lally, *The present value principle*, March 2013, p. 5
231 Lally, *Risk free rate and present value*, August 2012, p. 7
232 Lally, *The present value principle*, March 2013, p. 6
233 APA Group, *Submission on the draft guideline*, October 2013
234 AER, *Final decision: APA GasNet*, March 2013, Part 2, pp. 90–91.
235 Treasury and AOFM, *Letter regarding the CGS Market*, July 2012, p. 2.
236 Treasury and AOFM, *Letter regarding the CGS Market*, July 2012, p. 1

The prevailing yield is the benchmark that risky investments must out-perform

In previous advice, Professor McKenzie and Associate Professor Partington explained the relationship between the prevailing risk free rate and investment decisions:[237]

> The fundamental point to be made is that the government bond rate sets the current benchmark that a risky project has to beat. Clearly there is little point in taking on a risky project if you can get the same or higher return by investing in a government bond. The government bond thus sets a benchmark; the time value of money.

They also advised:[238]

> At the time of writing investors can invest in a 10 year government bond at yield of 3.84%. So a ten year project that offers say 4.5% is worth considering if the risk is low enough. The fact that government bond yields were higher in the past does not make 4.5% a bad deal, or 3.84% too low a benchmark. We see no reason to switch from using the current 10 year government bond yield as the proxy for the risk free rate.

The logic in Professor McKenzie and Associate Professor Partington's advice continues to apply. In prevailing market conditions as of December 2013, 4.11 per cent is the benchmark that a risky project must exceed. Similarly, at future points in time, specifically at the commencement of the regulatory control period for each determination, the prevailing risk free rate will be the benchmark that investments at that point in time must better. This supports our adoption of a prevailing risk free rate at the commencement of the regulatory control period.

Prevailing 10 year CGS yield is a forward looking 10 year rate

The prevailing 10 year CGS yield is a forward looking rate. The prevailing 10 year CGS yield varies over time. But, this variation does not mean the yield is a 'short term' rate. The prevailing 10 year CGS yield is a market determined yield investors expect on an investment with cash flows over the forthcoming ten year period.

Indeed, according to the expectations theory, at any point in time the yield on 10 year CGS incorporates the market's expectation of the yield on shorter dated bonds over that period.[239] The expectations theory is generally regarded as a partial but not complete explanation of the term structure of interest rates. Other factors are also likely to be relevant.[240]

The method is unbiased

Determining the averaging period in advance helps achieve an unbiased risk free rate.

Regulated businesses have an incentive to seek a WACC that is as high as possible, because it will increase their revenue allowance. If a regulated business can select an averaging period by looking at historical yields, it may introduce an upward bias.[241] It can select a period with the highest yield available. But, when an averaging period is agreed or specified in advance, opportunistic behaviour is less likely because the risk free rate is unknown for that future period. This same possibility of upward

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237   McKenzie and Partington, *Supplementary report on the MRP*, February 2012, pp. 11–12.
238   McKenzie and Partington, *Supplementary report on the MRP*, February 2012, p. 12.
239   The expectations theory suggests then that current yields on long-dated bonds incorporate current market yields on short dated bonds and expectations of future market yields on short dated bonds: T. Brailsford, R. Heaney, and C. Bilson, *Investments: concepts and applications*, Nelson Australia Pty Ltd: Third edition, 2007, p. 710. We discussed the expectations theory in more detail in the Victorian gas draft decision: AER, *Draft decision: APA GasNet access arrangement*, March 2013, Part 3, pp. 24–25.
240   The 'liquidity premium' theory and the 'preferred habitat' theory identify other important determinants of the term structure of debt. Elton et. al., *Modern Portfolio Theory and Investment Analysis 8th ed.* (2010), pp. 516–521.
241   Lally, M., *Expert Report of Martin Thomas Lally*, 13 February 2011, pp. 9-10. Lally's comments in this report were made about a specific approach proposed in the relevant determination but are consistent with the approach taken by the AER in this decision.

bias also applies to a long term average. No particular long term averaging period is clearly superior to any other. Different averaging periods will produce different average yields. A regulated business would have an incentive to select the period with the highest yield.

We therefore maintain our position that a short averaging period, determined in advance, minimises the likelihood of bias.

There is no clear evidence that CGS yields are abnormally low

In the Victorian gas review, we considered whether CGS yields are 'abnormally' low.

The analysis above demonstrates that the CGS market is liquid and functioning well. We did not accept submissions that conditions in the CGS market are abnormal. Conversely, there is no clear understanding of what 'normal' market conditions mean. Prices (and yields) in markets move up and down all the time depending on the circumstances, demand and supply conditions, and investor expectations. We do not accept that the evidence before us suggests that there is mispricing in the CGS market.

McKenzie and Partington also considered the question of whether CGS yields are abnormally low. They did not find that there was reason to describe current CGS yields as abnormally low. They state:[242]

> The evidence provided by the data suggests that the history of interest rates over the last few decades is not truly representative of the long run in this market. For both the U.S., UK and Australian markets, evidence exists which suggests that bond yields were stable (and possibly even falling) in the long run. The history of data over the last few decades is anomalous and the high interest rates observed during this period are clearly not representative of the longer time series. As such, one conclusion may be that the current environment is nothing more than a return to the 'normal' long run interest rate regime. On the other hand, it could be argued that there is a new normal and the GFC represents a true regime shirt for global financial markets. It is difficult to determine whether this is the case or not - only in the fullness of time will we be able to comment on this with any certainty.

Their report also presents the following figure from Brailsford et al (2012).

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[242]   McKenzie and Partington, *Review of the AER's overall approach*, February 2013, p. 5.

Figure 6.1   Bond yields, bill yields and inflation rates over time
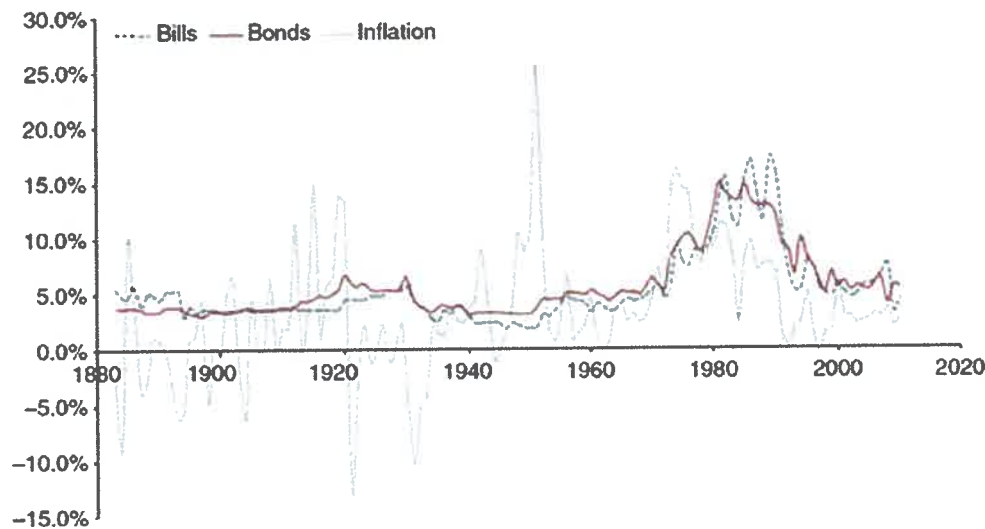
Source: McKenzie and Partington, *Review of the AER's overall approach*, February 2013, p. 13.

The figure shows:

- yields in the 1970s and 1980s were high by comparison with historical rates

- yields have remained elevated (depressed) for long periods before falling (increasing).

The available evidence does not support a conclusion that yields on CGS are 'abnormally low'. Indeed, it may be more appropriate to conclude interest rates during the 1970s and 80s were abnormally high.

Internal consistency

We consider our approach to estimating the risk free rate internally consistent with our approach to estimating the MRP. Appendix D contains more detailed discussion supporting our position.

On the other hand, the NSW businesses submitted:[243]

> When estimating the cost of equity using the Capital Asset Pricing Model (CAPM) using an estimate of the market risk premium (MRP) that primarily relies on long term historical data and an equity beta that relies on historical data, the risk free rate should also be estimated using historical data. This is an internally consistent approach, particularly when combined with a trailing average approach to the cost of debt, and should provide stability in the regulated return on equity over time...

Similarly, in its submission in response to our consultation paper, the ENA proposed the use of a long term average risk free rate.[244] The NSW DNSPs identified a report by Professor Bruce Grundy and Dr Tom Hird for CEG in support of their proposal.[245]

We do not agree that internal consistency requires we use a long term average risk free rate in combination with our estimate of the MRP. We considered this issue at length in the Victorian gas

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[243]   NSW DNSPs, *Submission on the draft guideline*, October 2013.
[244]   ENA, *Response to the consultation paper*, June 2013, p. 57.
[245]   CEG, *Estimating E[Rm] in the context of recent regulatory debate*, June 2013.

final decision.[246] The Tribunal did not find error in that decision.[247] Our reasoning on this issue can be briefly summarised as follows:

- As well as being consistent with the CAPM, we apply an approach that employs consistent definitions and logic throughout.

- A misunderstanding of our MRP estimate appears to underlie the suggestion that we should use a long term historical average of the risk free rate. We estimate a 10 year forward looking return on equity using an estimate of the 10 year forward looking MRP. We do not rely on historical data alone.

Our proposed approach in the draft and final guidelines is consistent with our proposed approach in the Victorian gas final decision. That decision contains further discussion of internal consistency.[248]

6.1.4 Application of approach

As set out above, our approach is to estimate the risk free rate based on market conditions that prevail as close as possible to the commencement of the regulatory control period. Accordingly, we propose to update the risk free rate, based on our approach, as close as possible to each individual reset determination.

6.1.5 Reasons for the application of approach

As we do not exercise discretion when estimating the risk free rate, there are no additional reasons for the application of the risk free rate approach.

6.2 Equity beta

Under our return on equity approach, we need to determine a point estimate and range for the equity beta of a benchmark efficient entity. The equity beta is a key input parameter in our foundation model, the Sharpe–Lintner capital asset pricing model (CAPM). It measures the sensitivity of an asset or business to the overall movements in the market (systematic or market risk).[249]

In this chapter, we will discuss our approach to estimating the equity beta and the reasons for our approach. In appendix C, we address issues relating to equity beta in more detail, and respond to matters raised in submissions.

6.2.1 Issue

In our consultation paper, we raised several key issues we considered relevant to the estimation of equity beta. Subsequently, on 11 October 2013, we released an issues paper on the equity beta as part of our consultation for developing the rate of return guideline. Further, we have also held a number of meetings with service providers, investors and consumer groups in relation to this issue.

In the issues paper, we proposed and set out our reasons for a 0.7 point estimate of equity beta, chosen from within a range of 0.4–0.7. On 28 October, we received submissions from interested

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[246] AER, *Final decision: Access arrangement final decision: SPI Networks (Gas) Pty Ltd 2013-17*, March 2013, Part 3, pp. 25-30.
[247] Australian Competition Tribunal, *Application by APA GasNet Australia (Operations) Pty Limited (No 2) [2013] ACompT 8*, 18 September 2013, paragraphs 227–311.
[248] AER, *Final decision: Access arrangement final decision: SPI Networks (Gas) Pty Ltd 2013-17*, March 2013, Part 3, pp. 25–30.
[249] R. Brealey, S. Myers, G. Partington, and D. Robinson, *Principles of Corporate Finance*, McGraw-Hill Australia: First Australian Edition, 2007, p. 187.

parties on our equity beta issues paper. We have considered the issues raised and have reassessed our analysis and reasons in light of submissions. Generally speaking, consumer groups supported our range but considered we should chose a point estimate closer to the mid-point of that range.[250] Service providers generally considered we should adopt a higher range and point estimate. For example, the Energy Networks Association (ENA) submitted we should adopt a point estimate of 0.94.[251]

6.2.2 Approach

We estimate a range for the equity beta and select a point estimate from within that range. We propose to adopt the same point estimate and range for equity beta across each of the energy sectors we regulate (electricity transmission, electricity distribution, gas transmission and gas distribution). This is because our conceptual analysis suggests systematic risks are similar between the different sectors of the energy market. Further, the results of our empirical analysis are not sufficiently precise to distinguish a measurable difference between the gas and electricity sectors.

Under our approach, we estimate the range for the equity beta based on empirical analysis using a set of Australian energy utility firms we consider reasonably comparable to the benchmark efficient entity. This empirical range is consistent with our conceptual analysis, which we use to cross check our range for the equity beta. This is because our conceptual analysis suggests the systematic risks of a benchmark efficient entity would be less than the systematic risks of a market average entity (that is, less than 1.0). Our approach to estimating the range for the equity beta gives primary consideration to Australian empirical estimates.

We then use other information sources to inform a point estimate from within the empirical range of equity beta estimates. This additional information includes:[252]

- Empirical estimates of overseas energy networks. We use this information to inform our point estimate from within the range. We consider empirical estimates for a number of international energy networks across the US, UK and Europe, prepared by a number of different entities.

- The theoretical principles underpinning the Black CAPM.

6.2.3 Reasons for approach

Our approach to estimating the range for equity beta gives primary consideration to Australian empirical estimates. We consider these empirical estimates align with our rate of return criteria (see chapter 2). That is, these estimates are:

- Based on available market data and derived with sound, econometric techniques.

- Fit for purpose as they are based on businesses that most closely, albeit imperfectly, meet our definition of the benchmark efficient entity.

- Implemented in accordance with good practice as they are derived from robust, transparent and replicable regression analysis. We note that consistent results are derived from different studies using different econometric techniques and sampling periods.

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[250] COSBOA, *Comments: Return on equity issues paper*, November 2013, p. 1; MEU, *Submission to beta issues paper*, October 2013, p. 7; PIAC, *Submission to beta issues paper*, October 2013, p. 5.
[251] ENA, *Submission to beta issues paper*, October 2013, p. 5.
[252] AER, *Equity beta issues paper*, October 2013, pp. 54–56.

- Based on quantitative modelling in that they are derived using robust regression techniques with no arbitrary adjustment to the data.

- Based on market data that is credible, verifiable, comparable, timely and clearly sourced.

Further, we have confidence in our Australian empirical estimates because these present a consistent pattern that is robust to the use of different econometric techniques, comparator sets and time periods. For instance, consistent results have been produced under the following studies:

- Professor Henry's 2009 analysis (for the 2009 WACC review) examined data sampled at monthly and weekly frequencies over the period 1 January 2002 to 1 September 2008 for the nine comparable Australian-listed energy firms.[253] Henry implemented two types of regression calculations, ordinary least squares (OLS) and least absolute deviations (LAD). Further, he examined equity beta estimates for individual firms, portfolios of firms with constant weights, and portfolios of firms with time varying weights. He also analysed different estimation periods- including a long estimation period from after the technology bubble to before the global financial crisis (GFC), and the last five years.[254]

- The Economic Regulation Authority's (ERA's) 2011 study largely replicated Henry's approach and updated the analysis to October 2011. The ERA introduced two further regression techniques to the analysis in its 2013 study—MM and Theil–Sen.[255] Adding two new regression techniques did not change the results. Later, the ERA also further updated the analysis to April 2013. The ERA's 2013 analysis continued to show a similar pattern.[256]

- The ENA's consultant, SFG presented equity beta estimates in its June 2013 report. Its analysis of Australian data was based on the same nine comparable energy firms adopted by Henry and sampled over an 11 year period from 2 January 2002 to 19 February 2013. It computed total returns over a four–weekly period for each firm and repeated the analysis 20 times using different start points within this four-weekly period. SFG applied OLS regression to the data and incorporated the Vasicek adjustment.[257]

Notably, compared to our 2009 WACC review, we now have greater confidence in the empirical estimates for the following reasons:

- We now have greater confidence in the reliability of the empirical estimates. At one level, this reflects the substantial increase in the length of the time series of the data set. The core regressions in the 2009 WACC review were based on the periods from January 2002 to September 2008 (six years and eight months) and September 2003 to September 2008 (five years).[258] Extending the data set to 2013 allows up to an additional five years of data.[259] The more recent studies examining longer time periods provided results in line with Henry's 2009 study.

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[253] Henry, *Estimating β*, April 2009, p. 8.
[254] Henry, *Estimating β*, April 2009, p. 8.
[255] See ERA, *Explanatory statement for the draft rate of return guideline*, August 2013, pp. 168-180. The ERA state the MM regression is a form of robust regression that has the highest breakdown point and statistical efficiency of robust regression estimators currently available. The ERA states Fabozzi proposed using the Theil-Sen estimator for the equity beta in response to the OLS estimator being acutely sensitive to outliers. See Fabozzi, F.J(2013) *Encyclopaedia of Financial Models*, Wiley Publications, p442.
[256] See section 12.3.4 'estimating equity beta: Authority's enhanced study in 2013' in ERA, *Explanatory statement for the draft rate of return guideline*, August 2013, pp. 168-180
[257] SFG, *Regression-based estimates of risk parameters for the benchmark firm*, June 2013, pp. 5-6.
[258] For clarity, the 2009 WACC review also considered other periods, including longer periods submitted by ACG for the Joint Industry Association.
[259] The Henry report we have commissioned will use data up to the end of June 2013, an increase of four years and nine months.

- In 2009, there was uncertainty due to the global financial crisis (GFC). Four years on, we now have empirical estimates generated from a broader set of different market conditions. The consistency of these results from markedly different environments also gives us increased confidence that the observed empirical range is reasonable. That is, the empirical estimates from the relatively stable period after the tech boom but before the GFC (2002–2008) are consistent with recent analysis using the period encompassing the GFC and its aftermath (2008–2013).[260] This appears to suggest that the equity beta for the benchmark efficient entity is relatively stable across time, even when there are major fluctuations in the business cycle. This increases our confidence in the observed range of equity betas.

Our approach to selecting a point estimate for equity beta from within our range considers international equity beta estimates and the theory behind the Black CAPM. We do not consider this evidence can be used to justify adjusting our range for the following reasons:

- International comparators are less aligned with the benchmark efficient entity, compared to Australian comparators. It is difficult to use this information in accordance with good practice because it is difficult to adjust for these differences. These differences include, but are not limited to; differences in regulatory regimes, economic conditions and market structures (see appendix B).

- There are major problems deriving a reasonable empirical estimate using the Black CAPM. There is also no generally accepted method to generate a reliable estimate of the zero beta return. Further, the Black CAPM is sensitive to errors in estimating the zero beta portfolio. Also, theoretical analysis does not lead to a clear indication of the magnitude of the difference between the Black CAPM and the standard Sharpe–Lintner CAPM. Further, while the Black CAPM removes one of the assumptions underlying the standard CAPM, it replaces it with another assumption (see appendix A).[261]

However, we use this evidence to inform the selection of a point estimate for equity beta from within our range. This is for the following reasons:

- We account for the Black CAPM because we recognise there is merit to its theoretical basis, particularly when viewed alongside the standard Sharpe–Lintner CAPM.[262] However, we propose to use the Black CAPM informatively, rather than mechanistically, because it is difficult to implement it in accordance with good practice.

- We recognise the limitations of having nine comparators in our Australian comparator set. Therefore, we consider empirical estimates of overseas energy networks. These are more statistically robust than our domestic estimates as they are generated from larger datasets. However, the firms in the international comparator set are less aligned with the benchmark efficient entity.

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[260] This does not mean that we consider a short data period centred on the GFC would be a reasonable basis for equity beta estimation. We consider a period of (at least) five years is appropriate for equity beta estimation and see no conceptual problem with incorporating GFC data within such a data period.

[261] 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. However, in its place the Black CAPM assumes that unlimited short selling of stocks is possible with the proceeds available for investment. 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. See AER, *Explanatory statement: Draft rate of return guideline*, August 2013, p. 190.

[262] For clarity, this statement does not imply that we consider the theoretical basis for the Black CAPM to be completely accurate (or more reliable than the standard CAPM).

One element of our approach has changed since our equity beta issues paper. That is, we now give limited value to equity betas from regulated Australian water networks, rather than using this information as a cross check. We consider Australian water networks face reasonably comparable systematic risks to Australian energy networks. Further, adopting comparable rates of returns between energy and water decisions avoids potential investment distortions caused by different rates of return between the sectors. However, this data provides an immaterial amount of new information. Australian water regulators often base their beta estimates on equity betas from Australian energy networks.[263] Notwithstanding, this information supports an equity beta estimate within our proposed range.

6.2.4 Application of approach

Applying our approach, we propose a range for the equity beta of 0.4–0.7. We consider the equity beta of a benchmark efficient entity is in this proposed range as:

- Conceptual analysis supports that the equity beta of a benchmark efficient entity would be low and below 1.0.

- The empirical evidence for Australian electricity and gas networks supports an equity beta of between 0.4 and 0.7 for the benchmark efficient entity.

Applying our approach, we propose a point estimate for beta of 0.7. This point estimate is for a benchmark efficient entity with a similar degree of risk as that which applies to the service providers we regulate, in respect of the provision of regulated services.

Our proposed point estimate is at the upper end of our 0.4–0.7 range. We have chosen this point estimate because:

- Theoretical principles underpinning the Black CAPM suggest the standard Sharpe–Lintner CAPM may underestimate the return on equity for firms with equity betas below 1.0. Although it is difficult to ascertain the magnitude (or materiality) of this effect, selecting a point estimate at the higher end of the range is an appropriate approach to allow for the theoretical differences between the Sharpe–Lintner CAPM and the Black CAPM.

- We have used overseas energy networks to inform our point estimate (see appendix C.3, international comparators). The pattern of overseas results is not consistent and there are inherent uncertainties when relating foreign estimates to Australian conditions. However, these results support choosing a point estimate in the upper end of our range.

6.2.5 Reasons for application of approach

We note our proposed range is consistent with the range proposed in our equity beta issues paper. Consumer groups agreed that the identified range is reasonable.[264]

A range of 0.4–0.7 is consistent with our conceptual analysis. Our conceptual analysis, including evidence from Professor McKenzie and Associate Professor Partington, suggests the equity beta of a benchmark efficient entity would be 'among the lowest possible' and below 1.0.[265]

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[263] See QCA, *Final report: Seqwater irrigation price review 2013-17, vol. 1*, April 2013, p. 273; ERA, *Inquiry into the efficient costs and tariffs of the Water Corporation, Aqwest and the Busselton Water Board: Revised final report*, March 2013, pp. 57–58; QCA, *Final report: SunWater, Irrigation price review: 2012-17, vol. 1*; May 2012, p. 492.

[264] COSBOA, *Comments: Return on equity issues paper*, November 2013, p. 1; MEU, *Submission to beta issues paper*, October 2013, p. 1; PIAC, *Submission to beta issues paper*, October 2013, p. 5.

Our approach to estimating the range for equity beta gives primary consideration to Australian empirical estimates. Table 6.1 illustrates that these empirical evidence supports an equity beta within the range of 0.4–0.7 for the benchmark efficient entity. Further, table 6.1 demonstrates empirical studies based on Australian energy utility firms present a consistent pattern that is robust to the use of different econometric techniques, comparator sets and time periods.

Table 6.1   **Average equity beta point estimates for Australian energy networks**

Source	Estimation period	Individual firm averages	Fixed portfolios	Varying portfolios	Summary of analysis permutations
Henry 2009	2002–2008	0.45–0.71	0.49–0.66	0.43–0.78	Monthly/weekly intervals, 2002/2003 start, OLS/LAD regressions, value/equal Weighted fixed portfolios, average/median varying portfolios
ERA 2011	2002–2011	0.44–0.60	–	–	Monthly/weekly intervals, OLS/LAD regressions
ERA 2013	2002–2012	0.49–0.52	0.47–0.53	–	OLS/LAD/MM/TS regressions, value/equal weighted portfolios
SFG 2013	2002–2012	0.60	–	0.55	Four weekly repeat sampling

Source: Henry, *Estimating β*, 23 April 2009; ERA, *Draft decision: Western Power access arrangement*, March 2012, pp. 195–205; ERA, *Explanatory statement for the draft rate of return guidelines*, 6 August 2013, pp. 168–181; and SFG, *Regression-based estimates of risk parameters for the benchmark firm*, 24 June 2013, pp. 12–15. Note some averages are calculated by the AER.

We have transparently derived our range for equity beta using a single type of evidence—empirical estimates using our comparator set of Australian energy service providers traded on the Australian Stock Exchange. As demonstrated in table 6.1, most beta estimates fall within the 0.4–0.7 range. We have based our range on the range of point estimates derived from different samples and sampling periods. We have chosen not to base our range for equity beta on confidence intervals. This is consistent with our 2009 decision where we outlined our reasons for not basing the range for equity beta on confidence intervals.[266] These reasons include:

- The presence of outliers can affect point estimates and their associated confidence intervals.

- The presence of autocorrelation and heteroskedasticity creates difficulties in discerning whether confidence intervals overstate or understate the upper bound estimate.[267]

- Confidence intervals are less likely to represent the 'true' equity beta point estimate, compared to the range of point estimates derived from different samples and sampling periods.

We recognise the values in our range are lower than the previous equity betas we have applied to the energy sector. We applied an equity beta of 1.0 before our 2009 WACC review. This was because the NER deemed the initial equity beta value for all transmission network service providers and the NSW/ACT distribution network service providers should be a default value of 1.0.[268] Under the rules, there was a need for persuasive evidence before adopting a value or method that differed from those

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[265]   McKenzie and Partington, *Estimation of equity beta*, April 2012, p. 15.
[266]   AER, *Final decision: WACC review*, May 2009, pp. 286-290.
[267]   Autocorrelation is present when the errors in the regression have a relationship or trend with errors in the past. Heteroskedasticity is where the variance in the errors is not constant (over time or as the values of the independent variables change).
[268]   See NER, cl. 6A.6.2(b) and 6.5.2(b) of chapter 11, appendix 1 (in pre- 2009 versions of the NER).

previously adopted.[269] We lowered the equity premium to 0.8 in 2009 because there was persuasive evidence to depart from the previously adopted equity beta values.[270] The point estimate of 0.8 was slightly above our range of empirical estimates. This took into account the likely precision of our empirical estimates, along with other relevant considerations.[271] However, relative to 2009, we now have greater confidence that the equity beta for the benchmark efficient entity is in the range of 0.4–0.7.

Several industry stakeholders disagreed with using an equity beta from within our range and submitted an equity beta point estimate from the top of this range would be too low.[272] We disagree with these submissions. As stated in our equity beta issues paper, we consider we have sufficient evidence to determine an equity beta from our range of empirical estimates reflects the systematic risks of a benchmark efficient entity. This range is robust to different econometric techniques and sampling periods. We address the issues raised by these stakeholders in appendix C.

Under our approach, we adopt a point estimate for equity beta from the top of the empirical range. This is consistent with the point estimate proposed in our equity beta issues paper. We consider a point estimate from the top of the range to be consistent with alternative evidence international equity beta estimates and the theory behind the Black CAPM for the following reasons:

- Theoretically, under the Black CAPM, firms with an equity beta below 1.0 should have higher returns on equity than what the standard Sharpe–Lintner CAPM predicts.[273] This is because, as a result of different starting assumptions, the Black CAPM predicts the slope of estimated returns will be flatter than for the standard Sharpe–Lintner CAPM.[274] This information informs our proposal to select a point estimate at the top end of the 0.4–0.7 range of empirical estimates.

- We consider empirical estimates from a number of international energy networks across the US, UK and Europe, support a point estimate closer to the upper end of our range.

We also consider an equity beta point estimate from any point of our 0.4–0.7 empirical range is not inconsistent with McKenzie and Partington's advice that, 'one would expect the beta to be among the lowest possible'. In their submissions to our equity beta issues paper, consumer groups submitted that we should not select an equity beta at the top of the 0.4–0.7 range.[275] Each of these consumer groups submitted that a point estimate from the top of the range was inconsistent with our evidence from McKenzie and Partington. Further, MEU and PIAC both specified it would be more appropriate to adopt a point estimate around the mid-point of the range.[276] We disagree with these submissions. We consider other relevant information suggests it is reasonable for us to select a point estimate from the upper end of the range of empirical equity beta estimates. This information includes the theoretical principles underpinning the Black CAPM and empirical evidence from international comparators. We address these submissions in detail in appendix C.

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[269] NER, cls. 6.5.4(e) and 6A.6.2(j).
[270] AER, *Final decision: WACC review*, May 2009, p. 244.
[271] AER, *Final decision: WACC review*, May 2009, p. 307.
[272] CitiPower, Powercor, SAPN, *Submission to beta issues paper*, October 2013, pp. 3-4; Spark, *Response to beta paper*, October 2013, p. 3.
[273] Conversely, for firms with an equity beta above 1.0, the Black CAPM predicts a lower return on equity than the standard CAPM.
[274] This statement assumes that the representative investor can lend (but not borrow) at the risk free rate. The base form of the Black CAPM does not constrain the zero beta return to be above the risk free rate (which does not exist, by definition). In this case, the Black CAPM predicts a return on low beta equity that is below that of the standard CAPM.
[275] COSBOA, *Comments: Return on equity issues paper*, November 2013; MEU, *Submission to beta issues paper*, October 2013; PIAC, *Submission to beta issues paper*, October 2013.
[276] MEU, *Submission to beta issues paper*, October 2013; PIAC, *Submission to beta issues paper*, October 2013.

6.3 Market risk premium

Under the Sharpe–Lintner CAPM, the market risk premium (MRP) is the difference in returns between the risk free asset and the return on an average risky equity investment.

The MRP compensates an investor for the systematic risk of investing in the market portfolio or the 'average firm' in the market. Systematic risk is that which affects all firms in the market (such as macroeconomic conditions and interest rate risk) and cannot be eliminated or diversified away through investing in a wide pool of firms.

6.3.1 Issue

In the draft guideline we proposed to estimate a range and point estimate for the MRP. In doing so we proposed to consider a range of theoretical and empirical evidence—including historical excess returns, survey evidence, financial market indicators and dividend growth model (DGM) estimates. We maintain that position in the final guideline. We did not include a range and point estimate with the explanatory statement accompanying the draft guideline. In this explanatory statement we do.

In determining the MRP, we propose to consider each source of evidence identified above. This is consistent with our practice over the past five years where we have determined values for the MRP of 6.0 or 6.5 per cent. In response to our draft guideline, many stakeholders requested that we provide additional guidance and examples on the approach we are intending to apply. Therefore, in this explanatory statement to our final guideline we have included a worked example to show how we would apply the material available to inform the MRP in December 2013. The worked example settles on an MRP of 6.5 per cent based on the evidence before us.

We released the Victorian gas final decision earlier this year.[277] That decision contained a detailed consideration of the theory and evidence underlying the MRP.[278] This chapter and appendix D draw on that material. The Tribunal recently reviewed that decision and did not find error in our MRP estimate of 6.0 per cent.[279] Since the Victorian gas final decision, the most significant development in this area is our proposal of a preferred construction of the DGM.

The inclusion of a range and point estimate for the MRP in this explanatory statement responds to submissions from various stakeholders requesting estimates be included with the final decision.[280] In other submissions on this topic, the ENA supports the consideration of DGMs when estimating the MRP, with preference for estimates produced by the SFG model.[281] The APIA and APA Group appear to support the use of the Wright approach to allow for deficiencies they see in our proposed approach to estimating the MRP.[282] The EUAA appears to suggest a wider consideration of risk and return throughout the regulatory regime is required to determine an appropriate return on equity.[283]

This example is provided as a guide only. We intend to consider and review a range of material on the MRP, as it becomes available. We will draw on this material and will consider more up to date information when determining the MRP at each determination.

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[277] AER, *Final decision: APA GasNet*, March 2013.
[278] AER, *Final decision: APA GasNet*, March 2013, Part 2, pp. 46–56, Part 3, pp. 46–56.
[279] Australian Competition Tribunal, *Application by APA GasNet Australia (Operations) Pty Limited (No 2) [2013] ACompT 8*, 18 September 2013, paragraphs 227–308.
[280] See, for example, ENA, *Response to the draft guideline*, October 2013, p. 5; Envestra, *Response to the draft guideline*, October 2013, p. 4; NSW DNSPs, *Submission on the draft guideline*, October 2013, p. 3; SP AusNet, *Submission on the*
[281] ENA, *Response to the draft guideline*, October 2013, pp. 30-32.
[282] APIA, *Submission to the draft guideline*, October 2013, pp. 25-27; APA Group, *Submission on the draft guideline*, October 2013, pp. 27–29.
[283] EUAA, *Submission to the draft guideline*, October 2013, p. 2.

6.3.2   Approach

We propose to estimate a range for the MRP, and then select a point estimate from within that range.

We propose to estimate the MRP range with regard to theoretical and empirical evidence—including historical excess returns, DGM estimates, survey evidence and conditioning variables. We will also have regard to recent decisions by Australian regulators. Each of these sources of evidence has strengths and limitations.[284]

We propose to estimate the MRP point estimate based on our regulatory judgement, taking into account estimates from each of those sources of evidence and considering their strengths and limitations.

The sources of evidence we propose to consider, and a summary of their strengths and weaknesses, are as follows:

- Historical excess returns:

    - Strengths include the estimation method and results are transparent, the estimation methods have been extensively studied and the results are well understood. Historical estimates are also widely used and have support as the benchmark method for estimating the MRP in Australia.

    - Also, over the past decade, there is an increased scepticism about the ability for particular variables to predict returns. New empirical evidence has cast doubt on previous empirical evidence that suggested particular variables were good predictors of returns. Some studies indicate there is no better forecast of excess returns than the historical average.

    - Limitations include concerns with the quality of the historical data (particularly the older data), the 'equity premium puzzle' which suggests historical excess returns may overstate expected returns, the proxy for the market return is not perfect, and there are challenges when selecting a measure of central tendency (arithmetic or geometric averages) and an appropriate averaging period.

- Dividend growth model estimates:

    - Strengths include the theoretical underpinnings of this estimation method and there is some support for the ability of valuation models (DGMs) to predict returns.

    - Limitations include the practical difficulties with estimating the DGM. These models are highly sensitive to assumptions made when estimating them and there is no clear answer about what those assumptions should be.

- Survey evidence

    - Strengths include the direct theoretical link between expected excess returns and stated expectations, and the triangulation of results across surveys and across time.

    - Limitations include timeliness, survey design and the representativeness of the respondents.

- Conditioning variables—these include dividend yields, credit spreads and implied volatility:

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[284]   We discuss these estimation methods in more detail in appendix D.

- Strengths include these estimation methods are responsive to prevailing market conditions.

- Limitations include difficulties defining a robust estimation method and, as noted above, that there is greater scepticism than previously in the academic literature about the ability of these sources of evidence to predict returns.

- Recent decisions by Australian regulators:

  - Strengths include these estimates provide an indication of regulatory practice in Australia, and that consistency in approach between regulators can avoid distortions in investment between different regulated industries.

  - Limitations include the evidence will not necessarily be timely and there may be different frameworks used by different regulators (e.g. different benchmark entity assumptions). Further, other regulators may consider similar evidence to us. Accordingly, decisions of other regulators are not direct evidence on the MRP but reflect other assessments of some or all of the information available to us.

We explore these strengths and limitations in more detail below and in appendix D.

6.3.3 Reasons for approach

In this section we outline the reasons for our approach. Our reasons fall under three headings:

- consideration given to different estimation methods

- determination of the point estimate

- considerations informing our exercise of judgment.

Consideration given to different estimation methods

Under the new rules framework we are required to estimate a return on equity that contributes to the achievement of the allowed rate of return objective. The objective requires that the rate of return is commensurate with efficient financing costs of a benchmark efficient entity. In this context we contribute to the objective by estimating the expected return on equity, and as an input, the expected MRP.

Evidence suggests the MRP may vary over time.[285] In their advice to the AER, Professor Lally and Professor Mackenzie and Associate Professor Partington have expressed the view that the MRP likely varies over time.[286] They also suggest it would be better to use a wide range of models and information to estimate the MRP.[287]

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[285] For example, Dimson, Marsh and Staunton suggest there are 'good reasons to expect the equity premium to vary over time'. Dimson, Marsh and Staunton, *Sourcebook*, 2012, p. 37. Similarly, McKenzie and Partington suggest the fundamental determinants of the risk premium may change over time and, therefore, the market risk premium changes. M. McKenzie, and G. Partington, *Report to Corrs Chambers Westgarth: Equity market risk premium*, 21 December 2011, pp. 5–6.

[286] M. McKenzie, and G. Partington, *Review of the AER's overall approach to the risk free rate and market risk premium*, February 2013, p. 20; M. Lally, *Review of the AER's methodology for the risk free rate and the market risk premium*, March 2013, pp. 14–15.

[287] M. McKenzie, and G. Partington, *Review of the AER's overall approach to the risk free rate and market risk premium*, February 2013, p. 20; M. Lally, *Review of the AER's methodology for the risk free rate and the market risk premium*, March 2013, pp. 27–34.

However, it is well recognised that the MRP cannot be directly observed. Unlike the risk free rate, the evidence on the MRP is comparatively imprecise and subject to varied interpretation. In addition, different methods can produce widely different results at the same point in time.[288] There is also debate in the finance literature on the predictability of returns.[289] Ultimately, there is no consensus among experts on which method produces the best estimate. These differences reflect their consideration of the relative strengths and limitations of the various estimation methods, as well as their consideration of the best means of bringing these estimation methods together.

Determination of the point estimate

Given the range of estimates of the MRP and the variability of estimates over time, judgment is required when determining a point estimate for the return on equity. Just as there is no consensus among experts on the strengths and limitations of the various sources of evidence, there is no consensus among experts on the determination of a point estimate.

We propose to assess a range of evidence to inform our estimate of the MRP. In this assessment we must apply judgment to interpret the information before us. Our judgment is guided by the approaches we consider will satisfy the allowed rate of return objective and have regard to prevailing conditions in the market for funds.

Considerations informing our exercise of judgment

It is important to avoid bias in regulatory outcomes over time. Therefore, it is important we apply different sources of evidence symmetrically through time to avoid bias. Since the WACC Review in 2009, various sources of evidence on this topic have arguably been presented asymmetrically. An example is implied volatility. In periods where the implied volatility suggested the MRP should be significantly above the long term average, regulated businesses relied upon this evidence. Recently, when implied volatility estimates have fallen, regulated businesses have not relied upon, or even considered, this evidence. Asymmetric application of evidence may lead to biased outcomes. In contrast, we propose to consider each source of evidence symmetrically through time. Application of our proposed approach may result in an MRP below the long term average where the evidence supports this.

Good regulatory outcomes will be achieved by an approach that provides certainty and predictability to stakeholders. This certainty and predictability promotes the rate of return objective and comes in two forms:

- certainty of process

- certainty of value.

The process we have used to consider the relevant information and form a judgement on the MRP provides greater certainty that the rate of return objective will be achieved. Hence, it provides a better basis for future decisions and should increase certainty that we will promote the rate of return objective in future. It does not provide the same certainty of the future value of the MRP as an approach that gives greater consideration to long term averages. However, it is not clear that a relatively stable MRP provides greater certainty on the cost of equity at future decisions. The proposed approach should, however, provide greater certainty that the return on equity will be

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[288] 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."

[289] See appendix D for more detail on this debate.

consistent with the requirement to determine the return on equity having regard to prevailing conditions in the market for funds.

Under our foundation model approach, we propose to use our foundation model estimate of the return on equity informatively. At the return on equity level we propose to compare our foundation model estimate of the return on equity with other information. Some of that other information typically provides a relatively stable return on equity estimate. Because we have adopted a prevailing risk free rate with a MRP that may vary through time, our final return on equity estimate may be relatively less likely to depart from the foundation model estimate. This is because our foundation model estimate may be relatively closer to the other information.

6.3.4   Application of approach (at December 2013)

In the previous section, we outlined and summarised our approach to determining the MRP and the reasons for the approach. In this section, we apply that approach and set out our estimate of the MRP (point estimate and range) for December 2013.

We consider a range for the MRP of 5.0 to 7.5 per cent is reasonable based on the evidence before us. The range we determine in this decision reflects the span of the evidence before us. This is because:

- The geometric mean historical excess return currently provides the lowest estimate of the MRP with a range of 3.6 to 4.8 per cent. However, as we discuss in more detail in appendix D, there are concerns with using the geometric mean as a forward looking estimate. Therefore, we consider a reasonable estimate of the lower bound will be above the geometric average. However, we give some weight to geometric mean estimates. Therefore, we consider a lower bound estimate of 5.0 per cent appropriate. The arithmetic average provides a range of 5.7 to 6.4 per cent.

- On the other hand, using our proposed models, the DGM currently provides the highest estimate of the MRP at about 7.5 per cent.[290] We consider this an appropriate upper bound for the range. The upper and lower bound estimates reflect the evidence before us. These estimates may change over time and likewise the upper and lower bounds may change.

Given the available information we consider 6.5 per cent an appropriate estimate of the MRP having regard to prevailing market conditions. After assessing the information, we consider this estimate contributes to the achievement of the allowed rate of return objective.

In reaching the conclusion that 6.5 per cent is an appropriate estimate, we had regard to the following sources of evidence:

- Historical excess returns—these estimates provide a range of 5.7–6.4 per cent if calculated using an arithmetic mean and a range of 3.6–4.8 per cent if calculated using a geometric mean. We consider 6.0 per cent a reasonable estimate based on this source of evidence.

- Dividend growth models—these estimates, from two applications of the DGM and a range of inputs, suggest a range of 6.1–7.5 per cent is reasonable for the two months to November 2013.

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[290]   This is the average of the estimate of the MRP derived from our DGM models for the two months ending November 2013.

These estimates are broadly 60 to 80 basis points above the average for the period from March 2006 for which estimates are available.[291]

- Survey evidence—surveys of market practitioners consistently support 6.0 per cent as the most commonly adopted value for the MRP. These surveys also indicate that the average MRP adopted by market practitioners was approximately 6.0 per cent. Like the conditioning variables, surveys are subject to various limitations.

- Conditioning variables—these give mixed results, and are each subject to various limitations. On the one hand, the dividend yield is approximately equal to its long term average with no discernible trend. On the other hand, credit spreads are above their pre–2007 levels and decreasing for lower quality instruments (for example, BBB) while being equal to their pre–2007 levels and decreasing for higher quality instruments (for example, swaps). Finally, implied volatility based MRP estimates suggest the MRP is currently below its historical average level at 5.6 per cent.

We have also considered:

- Recent decisions among Australian regulators—the AER notes both the ERA and the QCA consistently adopted an MRP estimate of 6.0 per cent under the same CAPM framework. However, IPART proposes to use DGMs to estimate a range for the current market risk premium. Decisions of other regulators are not direct evidence on the MRP but reflect other assessments of some or all of the information available to the AER.

- Recent Tribunal decisions—the Tribunal held the view that it was open on the evidence for regulators to adopt a 6.0 per cent MRP in all of the recent decisions where regulated businesses sought Tribunal review.

- Consultant advice—Associate Professor Lally, Professor McKenzie and Associate Professor Partington all recently advised us that a 6.0 per cent MRP was reasonable around the time of the Victorian gas final decision.[292]

Appendix D contains more detailed discussion of the available evidence. Figure 6.2 below presents the empirical estimates.

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[291] It should be noted that the average for this period has been affected by the GFC and this has been taken into account in considering the current MRP relative to the historical average.

[292] M. Lally, *Review of the AER's methodology for the risk free rate and the market risk premium*, March 2013, p. 34; M. McKenzie, and G. Partington, *Review of the AER's overall approach to the risk free rate and market risk premium*, February 2013, p. 32.

Figure 6.2   Empirical estimates of the MRP (per cent)
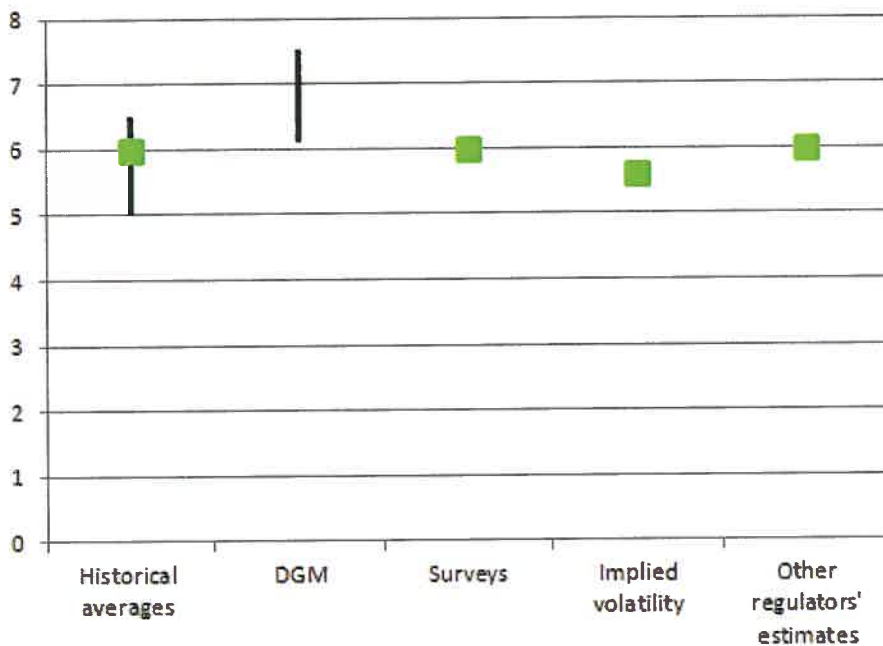
Source: AER analysis

In determining an MRP of 6.5 per cent, we had regard to each source of evidence. Reflecting our assessment of the various sources of evidence, we give greatest consideration to historical averages followed by estimates of the MRP from DGMs and then surveys. We also give some consideration to conditioning variables and other regulators' estimates of the MRP. In the next section we discuss our consideration of these sources of evidence.

6.3.5   Reasons for the application of approach (at December 2013)

We consider our estimate in this decision contributes to the achievement of the rate of return objective by taking into account all the available evidence while recognising the strengths and limitations of that evidence. We have also had regard to prevailing conditions in the market for funds. In reaching this decision we have assessed a range of estimates from various sources and models.

We note our estimate of 6.5 per cent is a departure from our most recent decisions. In the most recent decisions we have consistently adopted 6.0 per cent.[293] In the past we have generally adopted MRP estimates of 6.0 or 6.5 per cent.

Consideration given to different estimates

Historical averages of the MRP are widely used by financial practitioners and regulators in Australia.[294] While a point estimate of 6.0 per cent is common, the choice of the averaging period and judgements in the compilation of the data result in a range for plausible estimates of the MRP of about 5.0–6.5 per cent.[295] We consider historical averages the best source of evidence available to estimate the MRP.

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[293]   See, for example, AER, *Final decision: APA GasNet*, March 2013, p. 80.
[294]   M. McKenzie, and G. *Partington, Report to Corrs Chambers Westgarth: Equity market risk premium*, 21 December 2011.
[295]   See appendix D for more detail on the sources of evidence. The lower bound of this range reflects our judgment as outlined above in the discussion of the lower bound of the MRP range.

We consider DGM estimates of the MRP a useful source of evidence. While the estimates are not as robust as historical averages they may reflect current market conditions more closely. In the past we have raised concerns about the sensitivity of this source of evidence to the assumptions used.[296]

DGMs are recognised financial models that are commonly used in practice.[297] They rest upon the fundamental proposition that the value of an asset is a function of expected future income and the discount rate, which in this case is the required return on equity.[298] DGMs are suited to the estimation of the rate of return from current market information, as demonstrated by US regulators using them for this purpose.[299] However, the outcomes are sensitive to the model assumptions, especially the assumed long term growth in dividends and the transition from current dividends to the long term growth path. There are a range of plausible assumptions that one could make on these parameters. We note, however, consistent applications of the various models appear to show similar trends over time.[300] There are also issues in applying the models in Australian conditions with more limited data.

In the past our starting point for DGM estimates of the MRP has been the specifications presented to us by the regulated businesses.[301] Of which, there have been various specifications over time.[302] These specifications have differed from decision to decision. In conducting our analysis, our approach has been to adjust these estimates to reflect our consideration of the evidence.

In this guideline process we have taken a different, bottom-up approach. We have considered the available evidence on the DGM and proposed our preferred construction of the model.[303] We have consulted with stakeholders on our preferred construction and engaged consultants to review our proposal.[304] As a result, in this explanatory statement we propose our preferred DGM estimates. Consequently, we have greater confidence in the symmetry of this information through time and give these estimates greater consideration than we have in the past.

However, we nevertheless consider any DGM, including our preferred construction, sensitive to the assumptions employed. This sensitivity might be moderated to some extent by:

- having regard to the outcomes of a range of models and assumptions on the future growth in dividends; and/or

- having regard to the current estimate of the MRP compared to the long term average for each of the models to assess the extent to which the MRP is above or below its long term average.

We have regard to a range of plausible assumptions and estimate a range for DGM estimates of the MRP of about 140 basis points.[305] We discuss our DGM estimates in more detail in appendices D and E.

We also give consideration to survey estimates of the MRP but consider this evidence less informative than historical averages and DGM estimates. This is because on the one hand survey estimates are a theoretically sound source of evidence and triangulation across various surveys and

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[296] See, for example, AER, *Final decision: APA GasNet*, March 2013, p. 101.
[297] ENA, *Response to AER rate of return guideline consultation paper*, 28 June 2013, p. 32.
[298] NERA Economic Consulting, *The market risk premium, analysis in response to the AER's draft rate of return guideline: A report for the Energy Networks Association*, 11 October 2013, p. 30.
[299] SFG, *Dividend discount model estimates of the cost of equity*, June 2013, p. 9.
[300] See, for example, IPART, *Draft report: WACC methodology*, September 2013, p. 23.
[301] AER, *Final decision: Access arrangement final decision: SPI Networks (Gas) Pty Ltd 2013-17*, March 2013, pp. 102-103.
[302] See, for example, discussion in appendix D.
[303] See appendix E for more detail.
[304] M. McKenzie and G. Partington, *Report to the AER: The Dividend Growth Model (DGM)*.
[305] See appendices D and E for more detail.

different time periods provide support for this evidence. On the other hand, as outlined by the Tribunal and others there are various practical limitations with this evidence.[306] The results may be affected by the sampling procedures and wording of the questionnaire. Furthermore practitioners may make adjustments to other parameters (for example, the risk free-rate) or to the return on equity or overall returns to reflect prevailing market conditions and this may not be picked up in the survey.

We also give some consideration to conditioning variables and other regulators' MRP estimates. These sources of evidence are subject to various limitations and should be used with caution. At the same time, we consider them relevant and worthy of limited consideration.

In summary, in this decision, we give DGM estimates greater consideration than other forward looking estimates of the MRP, such as dividend yields, implied volatility and credit spreads. This reflects our assessment of the relative strengths and limitations of these sources of evidence. However, we have continued to give greater consideration to long term average historical excess returns, consistent with common regulatory and market practice. We consider the strengths and limitations of the various estimation methods in more detail above and in appendix D.

Determination of the point estimate

Our considerations when determining the point estimate are as follows:

- Consistent with the discussion in the previous section, we give greatest consideration to historical averages. We consider 6.0 per cent an appropriate estimate of this source of evidence.[307] This represents the starting point for our determination of a point estimate. We note that while a point estimate of 6.0 per cent is common, the choice of the averaging period and judgments in the compilation of the data result in a range for plausible estimates of about 5.0–6.5 per cent.

- We also give significant consideration to DGM estimates of the MRP. Using our preferred application of these models, we estimate a range of 6.1–7.5 per cent.

- We give some consideration to survey estimates which generally support an MRP estimate of about 6.0 per cent.

- We also give limited consideration to conditioning variables which give mixed results at the time of this decision. Credit spreads and dividend yields are stable, while implied volatility suggests the MRP may be below the historical average at 5.6 per cent.

- Lastly, we give limited consideration to other regulators' estimates of the MRP. These generally suggest an estimate of 6.0 per cent is appropriate. The Tribunal has also affirmed several of these decisions.[308]

We consider an MRP estimate of 6.5 per cent provides an appropriate balance between the various sources of evidence. This point estimate lies between the historical average range and the range of estimates produced by the DGM. This reflects our consideration of the strengths and limitations of each source of evidence as summarised above and expanded upon in appendix D.

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[306] See appendix D for more discussion.
[307] See appendix D for more detail.
[308] See appendix D for more detail.

7 Return on debt: approach

This chapter deals with the conceptual 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 covers the reasons for the approach.

7.1 Issue

We must set out in the 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. This is to apply to electricity and gas, and transmission and distribution businesses, taking into account the definition of the benchmark efficient entity (see chapter 3).

7.2 Approach

To estimate the return on debt we propose:

- to use a trailing average portfolio approach, that is, to estimate:[309]

  - 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 (that is, 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 ten years.

7.3 Reasons for approach

In the draft guideline we proposed our conceptual approach to return on debt estimation. Specifically, we proposed to estimate the return on debt using a trailing average portfolio approach with equal weights applied to all the elements of the trailing average, and to update the return on debt estimate annually. We also proposed to implement transitional arrangements consistent with the 'QTC method' and our proposed benchmark debt term. We sought views of stakeholders on our proposed approach. Below we outline the reasoning for our approach in the final guideline and address stakeholder submissions.

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

- Subsection 7.3.1 provides the relevant background.

- Subsection 7.3.2 discusses our decision to propose a single approach for the benchmark efficient entity.

- Subsection 7.3.3 reviews efficient debt financing practices and provides reasons for our preferred approach.

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[309]   NER, cls. 6.5.2(j) and 6A.6.2(j); NGR, r. 87(10).

- Subsections 7.3.4 and 7.3.5 consider specification of the trailing average portfolio approach with respect to annual updating and weighting schemes.

- Subsection 7.3.6 concludes with our considerations on the need for a transition and our proposed method of transition.

7.3.1 Background

Prior to the November 2012 rule change final determination, we used the return on debt definitions in the previous rules. As a result, the expected return on debt was the nominal risk free rate plus the debt risk premium (DRP).[310] We estimated the DRP in our recent decisions using an appropriate benchmark and a method that conforms to the benchmark parameters.[311] The risk free rate was the same as for the return on equity.[312]

We and the Energy Users Committee 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.[313] 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 allowed rate of return objective.

The AEMC set out the characteristics of three approaches to estimating the return on debt that a regulator could reasonably contemplate, which should reflect one of the following:[314]

- 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; or

- some combination of the above.

For simplicity, we refer to these as the 'on the day', trailing average portfolio and hybrid portfolio approaches, respectively.

The AEMC also provided considerations with respect of the regulatory discretion we are to exercise in arriving at our proposed approach:[315]

> This discretion for the regulator includes the detail of any approach, such as the period over which a prevailing cost of debt is observed, the length of any historical averaging period, and the form of

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

[311] 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;

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

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

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

[315] AEMC, *Final rule change determination*, November 2012, p. 90.

measurement of the observed financing costs. In all cases the regulator's judgement is to be exercised in such a way as to be consistent with the overall allowed rate of return objective.

7.3.2 Menu of approaches

As detailed in chapter 3, 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 consider that factors such as difference in size or ownership structure of service providers do not 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'.

A 'menu approach' would involve us providing details in the guideline on how we would estimate the return on debt under each of the three approaches. 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 a benchmark efficient entity in the circumstances.[316]

We propose to maintain our proposal in the draft guideline to use a single approach to estimating the return on debt for the benchmark efficient entity, rather than a menu of approaches.

Our reasoning for this position is as follows:

1. We acknowledge there may be a number of approaches to the return on debt estimation that could be consistent with the rules, the RPP, and the objectives. 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.[317] In addition, we consider that, as long as the adopted approach satisfies the rules, the RPP, and the objectives, there is no need for it to be further tailored to the individual circumstances of service providers.

2. Further, we consider that one of the objectives of the guideline and the Better Regulation program is to provide regulatory certainty and transparency. Regulatory certainty and transparency are important factors for both energy consumers and service providers and their investors.[318]

3. We consider that the 'menu approach' would not be consistent with the principles of incentive-based regulation. Specifically, it would not encourage efficient debt financing. A service provider would have an incentive to propose the option that maximises its total allowed revenue, but not necessarily use the proposed approach in managing its actual debt portfolio. 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 incentives to behave strategically 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 date, the regulator would potentially face the complex task of working out a transitional

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[316] See, for example: ENA, *Response to the AER's rate of return guidelines issues paper*, February 2013. pp. 27–29.
[317] NER, cls. 6.5.2(n) and 6A.6.2(n); NGR, r. 87(14).
[318] PIAC, *Submission to the consultation paper*, June 2013, p. 6; Paul Johnston, *Investor perspectives on energy market reform*, Presentation to ENA forum, 24 July 2013, p. 2.

arrangement to apply within another transitional arrangement. We do not consider this to be a desirable outcome, particularly given it may not promote the long term interests of consumers.

4. We consider that the proposed adoption of the trailing average 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 consider that the use of a 'menu approach' would be consistent with the commitment required for this regulatory change.

We also received submissions on specific issues in relation to a menu approach. We consider these submissions below.

Thus, for the above reasons, we consider that it is preferable to set out one approach consistent with the rules, the RPP, and the objectives in the guideline rather than providing a menu of possible approaches. The above reasoning is consistent with the reasoning we presented in the draft guideline.

Response to key issues raised in stakeholder submissions

In their submission to the draft guideline consumer groups generally supported our proposal to use a single approach to estimating the return on debt for the benchmark efficient entity. They submitted that a menu of approaches would not be consistent with incentive based regulation and would provide service providers with incentives to behave strategically.[319]

The submissions on this issue we received from industry stakeholders fall into two categories: comments on the reasoning we used to arrive to our conclusion and comments related to the preferred choice of approach.

In the first category, APA and APIA emphasised the need for the proposed approach to satisfy the requirements of the rules and, especially, the allowed rate of return objective.[320] In particular, APIA submitted:[321]

> We do not have a particular problem with the [trailing average approach], and believe the availability of a trailing average approach will enhance efficiency within the energy industry. Where we have issue is with the preclusion of other approaches to the cost of debt, which the NGR has deemed to be acceptable; an on-the-day and a hybrid approach. ... Additionally, while we take the AER's point that, so long as its approach satisfies the rules, the NEO and the NGO, it does not need to take individual circumstances into account in this particular context, we would remind the AER that the rules also require it to provide support for or against methodologies that makes direct reference to the ARORO. The AER has not done this; neither its support for its trailing average approach nor the reasons it gives for not supporting for other models makes reference to the ARORO.

In the second category, consistent with its submission to the consultation paper, Jemena submitted that it 'favours the hybrid cost of debt approach because it leads to lower financing costs for smaller networks like JEN and JGN, which benefits both the firms and their customers'.[322]

The ENA expressed the following view:[323]

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[319] Public Interest Advocacy Centre, *Reasonably rated: Submission to the AER's draft rate of return guideline*, 11 October 2013, pp. 10, 40–41; Council of Small Business Australia, *Australian Energy Regulator – Better Regulation program draft rate of return guideline – Comments*, 10 October 2013, p. 4.

[320] APA Group, *Submission on the Australian Energy Regulator's draft rate of return guideline*, 11 October 2013, p. 33; Australian Pipeline Industry Association Ltd, *Meeting the ARORO? A submission on the Australian Energy Regulator's draft rate of return guideline*, 11 October 2013, pp. 4, 8–9, 35–36.

[321] APIA, *Submission to the draft guideline*, October 2013, pp. 35–36.

[322] Jemena Ltd., *Rate of return guideline: Jemena submission on the draft guideline*, 11 October 2013, p. 1.

The ENA agrees that the trailing average approach to estimating the cost of debt should be set out in the guideline. ...The ENA also recognizes the AER's preference that the guideline should specify a single approach to estimating the return on debt. However, as the ENA has previously submitted, some businesses consider that the hybrid or current approaches better reflect efficient debt management practices in some cases. While the AER has chosen to include only the trailing average approach in the draft guideline, as the guideline is not binding, businesses have the opportunity to present alternative approaches as part of their revenue determinations.

We address the above submissions in more detail in section 7.3.3. In particular, we have provided more detailed discussion of how our proposed approach addresses the allowed rate of return objective in response to the submissions from the ENA, Jemena, APIA and APA Group.

Overall, we consider that no new evidence was presented that would justify our departure from the preferred approach. Therefore, we propose to use a single approach to estimating the return on debt for the benchmark efficient entity. Section 7.3.3 of this chapter sets out how such an approach contributes to achievement of the allowed rate of return objective.

7.3.3 Efficient debt financing practices and conceptual approach to return on debt estimation

We propose to use a trailing average portfolio approach to estimating the return on debt of the benchmark efficient entity.

In this section we discuss our considerations of efficient debt financing practices of the benchmark efficient entity and provide reasons for our preferred approach.

In summary:

- We propose to use a single definition of a benchmark efficient entity and specify a single approach to estimating the return on debt.

- We consider that holding a portfolio of debt with staggered maturity dates is likely an efficient debt financing practice of the benchmark efficient entity operating under the trailing average portfolio approach.

- We consider that the regulatory return on debt allowance under the trailing average portfolio approach is, therefore, commensurate with the efficient debt financing costs of the benchmark efficient entity.

- We further consider that the trailing average portfolio approach is consistent with other requirements of the rules, RPP, and the objectives.

Efficient debt financing of the benchmark efficient entity

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 risk as that which applies to the [service provider] in respect of the provision of [regulated services]'.[324] Therefore, it is important to be clear about how we identify efficiency and what would represent efficient debt financing costs.

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[323]   Energy Networks Association, *Response to the draft rate of return guideline of the Australian Energy Regulator*, 11 October 2013, p. 56.
[324]   NER, cls. 6.5.2(c) and cl. 6A.6.2(c); NGR, r. 87(3).

As we discussed in the draft guideline, we consider that satisfying the requirements of the rules, the objectives, and RPP is aligned with promoting economically efficient outcomes.[325] The AEMC's rule change determination recognised these considerations. It noted that the rate of return on debt framework should reflect the allowed rate of return objective and:[326]

> ...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.

We propose that the benchmark efficient entity should be a regulated energy business (see chapter 3). It then follows that efficiency of different debt financing practices of the benchmark efficient entity needs to be considered in the context of the adopted regulatory regime and, specifically, the adopted approach to return on debt estimation.

We acknowledge the QTC's view on the relevance of financial risk management principles in assessing the efficiency of different return on debt approaches:[327]

> 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.

Therefore, we interpret 'the efficient financing costs of a benchmark efficient entity' as financing costs resulting from the benchmark efficient entity minimising the expected present value of its financing costs over the life of its assets. In doing so, the benchmark efficient entity would take into account the regulatory framework and the associated financial risks it faces and expects to face in the future. That is, *all other things being equal*, each regulatory approach to estimating return on debt corresponds to:

- the efficient financing costs of the benchmark efficient entity under this approach; and

- a range of efficient financing practices—including a range of efficient debt financing practices—that result in those efficient financing costs.

These considerations provide a basis for assessing how different approaches to estimating the return on debt satisfy the requirements of the rules and promote overall efficiency in a manner consistent with the objectives and RPP.

Current 'on the day' approach

In this section we analyse our current methodology that is an 'on the day' approach. The purpose of the following analysis is not to establish whether the 'on the day' approach is consistent with the requirements of the rules. Rather, the aim is to provide a starting point for our consideration of the trailing average portfolio approach in later sections. As we stated in section 7.3.2, we consider that our task is to establish consistency with the rule requirements only for the methodologies we propose to use.[328]

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[325] AER, *Explanatory statement: Draft rate of return guideline*, August 2013, pp. 76–78.
[326] AEMC, *Rule Determination*, 29 November 2012, p. 73.
[327] Queensland Treasury Corporation, *Rate of return guidelines consultation paper: Submission to the Australian Energy Regulator*, 21 June 2013, p. 21.
[328] NER, cls. 6.5.2(n) and 6A.6.2(n); NGR, r. 87(14).

Our current methodology 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.[329] 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 for every regulatory control period (that is, just ahead of the start of each regulatory control period).

The efficient debt financing practices of the benchmark efficient entity under the 'on the day' approach would depend on a number of factors. These include debt financing costs, the associated financial risks and the risks the benchmark efficient entity expects to face in the future.

In the 2009 WACC review we recognized that 'the central task of the Treasury function at [regulated energy network] businesses is to manage risks (that is, refinancing, interest rate and currency risks) at the lowest possible costs' and the 'complex trade-off between refinancing risk and the cost of debt'.[330] We observed that 'according to the Treasurers, having a debt portfolio with staggered maturity dates is critical to mitigating refinancing risk'.[331] We also observed that '[t]he Treasurers explain that interest rate risk is managed separately by hedging against movements in base rates away from the risk-free rate assumed by the regulator at the reset'.[332] These risks are discussed below.

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.[333] Refinancing risk is often due to systematic factors, such as macroeconomic 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 need to manage refinancing risk is balanced against the overall cost of the benchmark efficient entity's debt portfolio. For example, 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.[334] Hence, the efficient debt financing practices would address this trade–off.

Further, regulated businesses face **interest rate risk**, resulting from a potential mismatch between the regulatory return on debt allowance and their actual return on debt:[335]

> Consider a firm that operates a single regulated network. For such a business, any difference between the costs of servicing its debt and the allowed return on debt will flow through to (or from) equity holders. This is because the firm must pay its debt holders exactly what it has promised them, irrespective of whether the regulatory allowance is more or less than what is to be paid. Any surplus or deficit will then flow to (or from) the equity holders as the residual claimants. Consequently, if a regulated firm is able to match its debt servicing costs to the regulatory revenue allowance, it will remove this source of cash flow volatility to equity holders. It is for this reason that many regulated businesses seek to create the best possible match between their borrowing costs and the regulatory revenue allowance in relation to those borrowing costs.

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[329]   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.
[330]   AER, *Final decision: WACC review,* May 2009, pp. 150, 152.
[331]   AER, *Final decision: WACC review,* May 2009, p. 151.
[332]   AER, *Final decision: WACC review,* May 2009, p. 144.
[333]   AER, *Explanatory statement: Draft rate of return guideline,* August 2013, p. 169.
[334]   Assuming a positively sloping yield curve.
[335]   SFG Consulting, *Rule change proposals relating to the debt component of the regulated rate of return, Report for AEMC,* 21 August 2012, p. 22.

Under the 'on the day' approach, the benchmark efficient entity can manage its interest rate risk in a number of ways. For example, it can raise all debt required to satisfy its financing needs once (i.e., just ahead of the start of each regulatory control period). Alternatively, it can engage in some other debt financing practice, but enter into hedging arrangements. Entering hedging arrangements aims to replicate a borrowing cost structure that would arise if the benchmark efficient entity did refinance the entirety of its debt at the beginning of the regulatory control period.

Under the former scenario, the benchmark efficient entity may be able to alleviate the potential mismatch between the regulatory return on debt allowance and its expected return on debt. However, raising the entirety of its debt once for every regulatory control period would expose the benchmark efficient entity to substantial refinancing risk.

Under the latter scenario, the benchmark efficient entity would be able to address both its interest rate risk and refinancing risk. For example, the benchmark efficient entity could hold a floating-rate debt portfolio with staggered maturity dates. It could then overlay this with 'pay fixed' interest rate swaps to hedge the base rate to the regulatory allowance for the duration of the regulatory control period. This strategy would address its refinancing risk and limit the potential mismatch between the regulatory return on debt allowance and its expected return on debt to their DRP components. As Chairmont Consulting pointed out:[336]

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

Therefore the benchmark efficient entity would not able to alleviate all potential 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. To this extent, under the 'on the day' approach the benchmark efficient entity faces a potential trade–off between the need to manage its refinancing and interest rate risk.

Further, the need to manage interest rate risk is also balanced against the overall cost of the benchmark efficient entity's debt portfolio.

The efficient debt financing practices of the benchmark efficient entity would address all of the above considerations and trade–offs. Thus, determining which debt financing practices of the benchmark efficient entity are efficient under the 'on the day' approach is a complex and, to a large extent, theoretical exercise. However, we can inform our analysis by observing market outcomes in the regulated energy sector.

Many debt financing strategies may have been available to service providers under the current 'on the day' approach. However, we observe that most service providers hold a diversified portfolio of debt with staggered maturity dates.[337] This means that a service provider will only have to refinance a proportion of its debt at any point in time. Holding a portfolio of debt with different terms to maturity allows a service provider to manage its refinancing risk.[338] This view, for example, is supported by the submission from CitiPower, Powercor, and SAPN:[339]

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[336] Chairmont Consulting, *Comparative Hedging Analysis*, 12 June 2013, p. 17.
[337] 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.
[338] NSW DNSP, *Submission to AER's rate of return guidelines consultation paper*, 21 June 2013, p. 3; PIAC, *Submission on the consultation paper*, June 2013, p. 20.
[339] CitiPower, Powercor and SA Power Networks, *Response to the AER's rate of return guidelines consultation paper*, 28 June 2013, p. 6.

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

Further, in its report for AEMC, SFG analysed common debt management strategies used by service providers under the current 'on the day' approach to address interest rate risk. It noted that:[340]

> One debt management approach that is commonly used by small to medium sized regulated businesses is to "lock in" the base interest rate at the time of the determination using the interest rate swaps market...

This strategy would involve the following steps:

- A service provider would issue floating rate debt prior to the regulatory determination (or issue fixed rate debt and immediately swap it into floating rate debt with the same maturity).

- The service provider would then enter 'pay fixed – receive floating' interest rate swap contracts during the averaging period prior to the regulatory determination:[341]

  > Under these contracts, the business receives the relevant risk-free rate of interest from the counterparty and pays to the counterparty a fixed rate of interest that is set at the time the contract is entered into. The term of the swap will be set to match the length of the regulatory period (usually five years).

- On balance, such strategy 'leaves the business paying only the fixed rate under the swap contract'.[342]

SFG also observed that businesses that might be 'too large to lock in interest rates using swap contracts' during the averaging period use 'different techniques to match their debt service cash flows with the regulatory revenue allowance, including':[343]

> a) Locking in base interest rates in the swaps market over a much longer time period (e.g., 6 to 12 months) rather than seeking to do this during the 20- to 40-day averaging period, and simply accepting the inevitable mis-match between interest payments and the regulatory allowance; and
>
> b) Issuing fixed rate bonds well before the determination and "parking" the proceeds until the determination – for government-owned businesses who raise their finance through treasury corporations.
>
> ...The issue-early-and-park approach is not feasible for private sector businesses.

Finally, SFG noted that businesses that own a portfolio of multiple assets, with regulatory determinations occurring at different points in time 'are able to use a portfolio debt management approach':[344]

> This involves accessing debt markets from time to time when conditions are considered to be favourable, and not seeking to actively hedge interest rate risk at the time of each determination.

Overall, SFG suggested that:[345]

> ...for a single-asset firm, it is highly unlikely that the firm would elect not to attempt to match its debt service costs with the allowed return on debt.

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[340] SFG Consulting, *Rule change proposals relating to the debt component of the regulated rate of return*, Report for AEMC, 21 August 2012, p. 24.
[341] SFG Consulting, *Rule change proposals relating to the debt component of the regulated rate of return*, Report for AEMC, 21 August 2012, p. 24.
[342] SFG Consulting, *Rule change proposals relating to the debt component of the regulated rate of return*, Report for AEMC, 21 August 2012, p. 24.
[343] SFG Consulting, *Rule change proposals relating to the debt component of the regulated rate of return*, Report for AEMC, 21 August 2012, pp. 25–26.
[344] SFG Consulting, *Rule change proposals relating to the debt component of the regulated rate of return*, Report for AEMC, 21 August 2012, p. 27.
[345] SFG Consulting, *Rule change proposals relating to the debt component of the regulated rate of return*, Report for AEMC, 21 August 2012, p. 23.

Consistent with this view, NSW TCorp submitted:[346]

> ...privately- and government-owned utilities will seek to minimise uncompensated financial risk by closely matching debt costs to the debt allowance benchmark.

In practice, we observe that most privately–owned businesses typically manage their interest rate risk by entering into interest rate swap contracts in order to 'lock in' the base rate at the time of the determination. This is consistent with Jemena's submission: [347]

> 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.

This observation is also consistent with our consultant's report for the 2009 WACC review:[348]

> Typically private companies borrow on the longest tenor available, and then convert the fixed rate debt into synthetic floating rate debt. This would then be hedged during the reset period via an interest rate swap for the duration of the regulatory period.

> In the absence of the long term bond market, corporates will typically borrow bank debt on the longest tenor available on a floating basis and then again hedge their interest rate risk to match the regulatory period.

Given the observed practices of regulated network businesses and the definition of the benchmark efficient entity, we consider that the following practice is likely to constitute an efficient debt financing practice of the benchmark efficient entity under current 'on the day' approach:

- holding a debt portfolio with staggered maturity dates and using swap transactions to hedge interest rate exposure for the duration of a regulatory control period.

Outline of alternative approaches

Below we outline other alternative approaches.

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'.[349] This reflects the forward–looking return on debt that would be incurred by the benchmark efficient entity for debt raised incrementally.

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 (that is, reflecting market conditions around the time of the determination). The DRP estimate roughly corresponds to the one derived under the trailing average portfolio approach (that is, a long–term estimate). 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.

Finally, we note that 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

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[346] NSW Treasury Corporation, *AER's proposal for a 7-year debt allowance benchmark*, 9 October 2013, p. 1.
[347] Jemena, *Submission to the consultation paper*, June 2013, p. 19.
[348] Deloitte, *Refinancing, debt markets and liquidity*, 12 November 2008, p. 13.
[349] NER, cls. 6.5.2(j)(2) and cl. 6A.6.2(j)(2); NGR, r. 87(10)(b).

the return on debt allowance with the length of the regulatory control period and its credit margin component with the benchmark debt maturity.[350]

Our preferred approach: overall considerations

We propose to use a trailing average portfolio approach to estimating the return on debt of the benchmark efficient entity. As we state in section 7.3.2, we consider that the guideline should specify a single approach to estimating the return on debt for the benchmark efficient entity.

In this section we set out our considerations of how our proposed approach to estimating return on debt would result in the determination of a return on debt in a way that contributes to the achievement of the allowed rate of return objective.

Under the trailing average portfolio approach the return on debt estimate is computed as a weighted average of the total return on debt over a period spanning up to the start of the regulatory control period (or regulatory year). The length of this period would be informed by the benchmark debt maturity. We discuss the choice of the weighting scheme in section 7.3.5 and the choice of the benchmark term to maturity in section 8.3.3.

To assess this approach against the requirements of the rules, we need to consider what would represent efficient debt financing practices of the benchmark efficient entity under the trailing average portfolio approach. We cannot directly observe the efficient debt financing practices of the benchmark efficient entity under the trailing average portfolio approach. Therefore, we need to rely on theoretical reasoning and indirect evidence. This indirect evidence includes observed debt financing practices of service providers under the current 'on the day' regulatory approach and, to the extent they are relevant, observed debt financing practices of unregulated businesses.

As we observed above, under current 'on the day' approach most service providers hold a diversified portfolio of debt with staggered maturity dates. Most privately–owned service providers also manage their interest rate risk via 'locking in' base interest rates in the swap market for the duration of a regulatory control period. We agree with SFG that this interest rate risk management strategy is likely a product of the 'on the day' approach, and if the trailing average portfolio approach is implemented:[351]

> ...it would make no sense for businesses to seek to lock in interest rates at the time of the determination. To manage interest rate risk, the business would need to match, as best it can, its debt service costs with the average cost of debt estimated by the regulator. This would require the business to actually issue debt throughout the period over which the average was taken. That is, no business would have any incentive to adopt the approach of using swaps to lock in the rate at the time of the determination or the raise-early-and-park approach, because those approaches are designed to match market rates at the time of the determination. Both of these approaches would be abandoned in favour of an approach whereby debt was issued approximately uniformly over the historical averaging period.

In other words, the trailing average portfolio approach allows a service provider—and therefore also the benchmark efficient entity—to manage interest rate risk arising from a potential mismatch between the regulatory return on debt allowance and the expected return on debt of a service provider without exposing itself to substantial refinancing risk.

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[350] M.Lally, *Estimating the cost of debt of the benchmark efficient regulated energy network businesses*, 16 August 2013, p. 8.

[351] SFG Consulting, *Rule change proposals relating to the debt component of the regulated rate of return*, Report for AEMC, 21 August 2012, p. 32.

Thus, we consider that holding a (fixed rate) debt portfolio with staggered maturity dates to align its return on debt with the regulatory return on debt allowance is likely to be an efficient debt financing practice of the benchmark efficient entity under the trailing average portfolio approach.

If a benchmark efficient entity holds a debt portfolio with staggered maturity dates, the expected 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 annual updating of the return on debt estimate and the choice of a weighting scheme in more detail in sections 7.3.4 and 7.3.5, 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 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 return on debt, as it allows the incorporation of newly revealed market information into the estimate more frequently.

To summarise, we are satisfied that the trailing average portfolio approach is likely to contribute to the achievement of 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'.[352]

If the expected return on debt (and equity) raised in a period is different from the return on debt (and equity) allowance for the period, this difference may distort intertemporal investment and consumption decisions. That is, it may result in dynamic inefficiency. In particular, if the return on debt allowance is below the expected return on debt this might result in under–investment. On the other hand, if the return on debt allowance is above the expected return on debt this would lead to over–compensation for the regulated business and customers paying prices that are above efficient levels.

Under the trailing average portfolio approach, movements in the market return on debt from year to year are reflected in the allowed return on debt. Reflecting market changes during the regulatory control period reduces the scope for sub-optimal investment and consumption levels. We discuss annual updating in section 7.3.4 and different weighting schemes in section 7.3.5. Overall, we are satisfied that the trailing average portfolio approach provides service providers with incentives to engage in efficient debt financing practices. We consider this 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 objectives.

Finally, we consider 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.

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. We consider this would result in lower price volatility (from one regulatory control period to the next) for energy consumers and more stable returns for investors than the "on the day" approach. Consideration of consumer

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[352] NER, cls. 6.5.2(k)(1) and cl. 6A.6.2(k)(1); NGR, r. 87(11)(a).

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.

- It minimises the consequences of a single measurement error.[353]

- It may be more reflective of the actual debt management approaches of non-regulated businesses.[354] It might, therefore, be more likely to represent efficient financing practice.

The above reasoning is consistent with the draft explanatory statement. It also takes into account stakeholder submissions to the draft guideline. We have provided more detailed discussion of how our proposed approach addresses the allowed rate of return objective in response to the submissions from ENA, Jemena, APIA, and APA Group.[355] Below we respond to other key issues raised in stakeholder submissions.

Response to key issues raised in stakeholder submissions

The majority of stakeholders supported our proposal to use the trailing average portfolio approach in their submissions to the draft guideline.[356] For example, the ENA submitted:[357]

> The trailing average approach performs well in terms of minimizing the potential difference between the return on debt allowance and the expected required return on debt, as required under the National Electricity Rules. It also better reflects the actual and efficient financing practices of the majority of businesses and will result in lower volatility in both revenue and prices, compared with the current approach.

At the same time, the stakeholders expressed preferences regarding certain aspects related to the implementation of the approach. These included annual updating, particular weighting schemes, benchmark term, and the presence of transitional arrangements. We discuss these aspects in the relevant sections of the explanatory statement.

On the other hand, NSW Irrigators' Council submitted that:[358]

> ...the seven year trailing average portfolio approach will provide less clarity and transparency for the overall determination of the allowed WACC parameter. As such, NSWIC submits that the allowed WACC should be set for the entirety of the regulatory period instead of being re-evaluated every time period.

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[353] 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.

[354] See, for example, CEG, *Efficiency of staggered debt issuance*, February 2013, pp. 30–32.

[355] APA Group, *Submission on the Australian Energy Regulator's draft rate of return guideline*, 11 October 2013, p. 33; Australian Pipeline Industry Association Ltd, *Meeting the ARORO? A submission on the Australian Energy Regulator's draft rate of return guideline*, 11 October 2013, pp. 4, 8–9, 35–36; Jemena Ltd., *Rate of return guideline: Jemena submission on the draft guideline*, 11 October 2013, pp. 1–2; ENA, *Response to the draft guideline*, October 2013, p. 56.

[356] ActewAGL, *Response to draft rate of return guideline*, 11 October 2013, p. 3; APA Group, *Submission on the draft guideline*, October 2013, p. 33; Council of Small Business Australia, *Australian Energy Regulator – Better Regulation program draft rate of return guideline – Comments*, 10 October 2013, p. 4; Ethnic Communities' Council of NSW, *Submission to Better Regulation: Draft rate of return guidelines*, 10 October 2013, p. 2; ENA, *Response to the draft guideline*, October 2013, p. 4; Energex Ltd., *Response to the AER's draft rate of return guideline*, 11 October 2013, p. 3; Envestra, *Response to AER draft rate of return guideline*, 11 October 2013, p. 8; Ergon Energy, *Submission on the draft AER rate of return guidelines and explanatory statement: Australian Energy Regulator*, 11 October 2013, p. 4; Energy Users Association of Australia, *Submission to the draft AER rate of return guideline*, 11 October 2013, p. 2; NSW distribution network service providers, *Submission on the rate of return draft guideline*, 11 October 2013, pp. 1, 4; Public Interest Advocacy Centre, *Reasonably rated: Submission to the AER's draft rate of return guideline*, 11 October 2013, pp. 10, 41–43; Queensland Treasury Corporation, *Submission to the draft rate of return guideline*, 11 October 2013, p. 1; SP AusNet, *Submission on the draft rate of return guideline*, 11 October 2013, pp. 1–3; Spark Infrastructure, *Response to the AER's draft rate of return guideline*, 11 October 2013, p. 3; TransGrid, *Submission on the rate of return draft guideline*, 11 October 2013, p. 3.

[357] ENA, *Response to the draft guideline*, October 2013, p. 56.

[358] NSW Irrigators' Council, Draft submission: Australian Energy Regulator, *Better Regulation – Draft rate of return guideline*, 14 October 2013, p. 5.

We disagree. As long as the parameters and the formula for the trailing average are specified at the time of regulatory determination, the approach is transparent. The regulatory return on debt estimate can be reproduced by applying the formula. In addition, as we propose to update the estimate for each regulatory year, we must apply annual updating through the automatic application of a formula.[359] Therefore, annual updating would also be transparent and reproducible.

Finally, in their submissions to the consultation paper the ENA and Jemena submitted that some businesses might consider that 'a hybrid approach will better reflect their own efficient debt management practices'. They also submitted that the trailing average portfolio approach 'has some material negative consequences for smaller network service providers'.[360] In the draft guideline we provided the following considerations in regard to these submissions:

- As detailed in chapter 3, we propose not to use size as a part of the benchmark efficient entity definition. 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.

- Further, 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. A service provider is free to choose whatever debt financing practices it sees fit, given the incentives provided by the regulatory framework.

The remaining question is whether and to what extent would the trailing average portfolio approach distort investment decisions of smaller service providers like Jemena and thus, result in an inefficient outcome.

In its submission to the draft guideline, Jemena expressed its preference for the hybrid portfolio approach 'because it leads to lower financing costs for smaller networks like JEN and JGN' and submitted:[361]

> Finally, we recognise the AER's preference for the guideline to set out only one cost of debt approach (i.e. the trailing average approach). We also note that the guideline is not binding and the National Electricity Rules and National Gas Rules allow for alternative cost of debt approaches. We therefore look forward to further consulting with the AER on alternative approaches during the JEN and JGN price reviews.

The ENA also suggested that some businesses might have a preference for the hybrid or 'on the day' approaches.[362] We acknowledge the position expressed by the ENA and Jemena. We were not, however, persuaded that Jemena provided enough supporting evidence that our use of the trailing average portfolio approach would result in significant distortion of its investment decisions.

7.3.4 Annual updating

We propose to update the allowed return on debt estimate in each regulatory year of a regulatory control period.

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[359] 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).
[360] ENA, *Response to the consultation paper*, June 2013, pp. 6-7; Jemena, *Submission to the consultation paper*, June 2013, p. 1.
[361] Jemena Ltd., *Rate of return guideline: Jemena submission on the draft guideline*, 11 October 2013, pp. 1–2.
[362] ENA, *Response to the draft guideline*, October 2013, p. 56.

The rules allow for two options in designing the return on debt estimation methodology:[363]

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.

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. As we observed in the consultation paper, 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 propose to update the allowed return on debt estimate annually for the following reasons:

1. Annual updating minimises the potential mismatches between the benchmark efficient entity's return on debt and allowed return on debt during the regulatory control period. This, in turn, reduces the scope for dynamic inefficiency.

2. Annual updating is feasible and its costs are relatively small. We propose to use a third–party data provider to estimate the allowed return on debt. 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.

Each of the two options allowed by the rules has advantages and disadvantages. In particular, option one (no annual updating) may lead to mismatches between the benchmark efficient entity's return on debt during the regulatory control period and the regulatory return on debt allowance. This could create investment distortions for the benchmark efficient entity and result in dynamic inefficiency.[364] This problem would be exacerbated where there is a prolonged period of increasing or decreasing rates of return on debt and when the return on debt displays significant autocorrelation.[365] The paper by the ACCC's Regulatory Development Branch (RDB) on the return on debt suggested 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.[366] However, such self–correction does not take into account the time value of money. Further, it may take more than one regulatory control period in the circumstances described above.

On the other hand, option two (estimate updated annually) minimises the potential mismatches between the benchmark efficient entity's return on debt and allowed return on debt during the regulatory control period. However, it introduces additional complexity to the tariff computation (that is, the CPI-X profile would need to be recalculated annually). Option two may also be more resource intensive on both us 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.

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[363] NER, cls. 6.5.2(i) and 6A.6.2(i); NGR, r. 87(9).
[364] See section 7.3.3 for more detail.
[365] See, for example, QTC, *Submission to the consultation paper*, June 2013, pp. 29-38. We provided further analysis of this quantitative study in the draft explanatory statement: AER, *Explanatory statement: Draft rate of return guideline*, August 2013, pp. 88–89.
[366] RDB, *Estimating the return on debt*, April 2013, pp. 30–35.

Further, the rules require that we must apply annual adjustments in an automatic way.[367] Therefore, our decision on whether to use annual adjustments or not cannot be made without also considering implementation issues. These include whether the return on debt is estimated using a third–party dataset (such as the ones produced by Bloomberg or expected to be produced by the RBA) or a dataset we create.[368] In particular, if a third–party dataset is used, annual updating would likely be less resource intensive than if an in–house dataset is used.

Finally, on the issue of annual updating that is implemented via a retrospective true up, industry stakeholders submitted in their response to the consultation paper that:

- 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[369]

- 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.[370]

CEG also expressed this view.[371] We consider that the results presented by CEG should be interpreted with caution. It is not clear that the historical US data sample used in the study is of direct relevance to the current domestic capital market that functions under inflation targeting. Nevertheless, we consider that the study suggests that updating annually may be in some circumstances preferable to a retrospective true up.[372]

In the draft explanatory statement we proposed to use a third–party data provider to estimate the allowed return on debt. We then considered 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.[373] Therefore, we proposed to update the return on debt estimate in each regulatory year of a regulatory control period. Taking into consideration stakeholder submissions to the draft guideline, we propose to maintain this approach in the final guideline. The final guideline outlines the annual updating process. We provide an overview of stakeholder submissions in relation to annual updating below.

Response to key issues raised in stakeholder submissions

The majority of submissions supported our proposal to update the return on debt estimate annually.[374] For example, SP AusNet submitted:[375]

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367 NER, cls. 6.5.2(i), 6.5.2(l), 6A.6.2(i) and 6A.6.2(l); NGR, rr. 87(9) and 87(12).
368 The RBA expects to start publishing monthly credit spreads of Australian non-financial corporations from December 2013.
369 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, *Submission on the consultation paper*, June 2013, p. 37; QTC, *Submission on the consultation paper*, June 2013, p. 2.
370 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.
371 CEG, *Impact of annual updating on revenue smoothing, Memorandum*, 17 June 2013, p. 6.
372 We provided further analysis of this quantitative study in the draft explanatory statement: AER, *Explanatory statement: Draft rate of return guideline*, August 2013, pp. 88–89.
373 AER, *Better Regulation: Explanatory statement, Draft rate of return guideline*, 30 August 2013, pp. 86–89.
374 APA Group, *Submission on the draft guideline*, October 2013, p. 37; COSBOA, *Comments– draft guideline*, October 2013, p. 4; ENA, *Response to the draft guideline*, October 2013, pp. 4, 56; Energex, *Response to the draft guideline*, October 2013, p. 3; Envestra, Response *to the draft guideline*, October 2013, p. 8; Ergon Energy, *Submission on the draft guideline*, October 2013, p. 4; EUAA, *Submission to the draft guideline*, October 2013, p. 6; MEU, *Comments on the draft guideline*, October 2013, p. 42; NSW DNSPs, *Submission on the draft guideline*, October 2013, pp. 1, 5; QTC, *Submission to the draft guideline*, October 2013, p. 1; SP AusNet, *Submission on the draft guideline*, October 2013, pp. 1–2.
375 SP AusNet, *Submission on the draft guideline*, October 2013, pp. 1–2.

The inclusion of annual updating is necessary to allow NSPs to minimise the mismatch between the return on debt allowance and the actual return on debt. This will also result in smoother prices for consumers, as changes to the cost of debt are gradually reflected in the allowance rather than aggregated and passed through at the beginning of the next regulatory control period.

The ENA and APA Group expressed similar concerns related to the implementation of the formula for annual updating. In particular, APA Group submitted:[376]

APA understands the reasons for, and is generally supportive of, the AER's proposal to update the allowed rate of return in each year of a regulatory period by updating the estimate of the rate of return on debt used in determining that allowed rate.

If the allowed rate of return is updated annually as proposed, then rules 6.5.2(l) and 6A.6.2(l) of the NER, and rule 87(12) of the NGR, require that a change to the service provider's total revenue be effected through the automatic application of a formula. This formula is to be established for each service provider individually, and is to be set out in a regulatory decision pertaining to the service provider. We expect that the form of this formula and its use will involve some complexity. The way in which the AER intends to flow the annually updated rate of return through to regulated revenue should, therefore, be the subject of consultation, and (at minimum) key principles should be set out in the rate of return guidelines.

The ENA submitted:[377]

The ENA strongly supports that annual updating of the cost of debt will be carried out as part of the trailing average approach set out in the draft guideline. ...The ENA would welcome further details on how annual updating would be carried out to be provided by the AER. An opportunity to comment on the implementation of this process, for example, changes to be made to the PTRM, would also be welcome.

We acknowledge the above considerations. As discussed in chapter 1, we recognise that the post–tax revenue model (PTRM) will need to be amended to reflect our adoption of a trailing average portfolio approach. This includes annually updating the trailing average. We will consult on proposed amendments to the PTRM in accordance with the consultation procedures outlined in the rules.

Further, PIAC submitted that it 'does not have a strong preference with respect to annual updating' and that:[378]

PIAC recommends that the AER undertake further assessment on the length of interest rate cycles in order to inform the final decision on annual updating of the return on debt and the trade-off between the cost of this and the long-term benefit to consumers.

PIAC also submitted:[379]

If automatic annual updating were to proceed PIAC would recommend the following:

- the AER confirms that the process of updating will not be so complex for either the AER or the NSP that it will add to overall costs and/or reduce transparency in the process;

- the AER note the significant increase in the burden on consumers to engage effectively in the process and investigate ways this might be addressed;

- the AER ensure that the reduction in interest rate risk for the NSP is appropriately captured in the cost of equity, for instance, by a further reduction in equity beta.

- At a minimum, the benefits of annual updating should outweigh any additional costs that NSPs may claim for implementing annual updating; and

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[376] APA Group, *Submission on the draft guideline*, October 2013, p. 37.
[377] ENA, *Response to the draft guideline*, October 2013, p. 56.
[378] PIAC, *Submission to the draft guideline*, October 2013, pp. 9, 43.
[379] PIAC, *Submission to the draft guideline*, October 2013, p. 44.

- the AER closely monitor the outcomes of annual updating so that a more robust statistical assessment of its value and costs can be conducted in the future.

We acknowledge PIAC's position. We consider that, on balance, the benefits of annual updating outweigh the relevant costs and that annual updating is consistent with the requirements of the rules. We would expect that annual updating would be likely to minimise the potential mismatch between the allowed return on debt and the expected return on debt for the benchmark efficient entity.

As discussed above, the rules require that the return on debt calculation must be capable of automatically updating.[380] We intend to set out the process for automatic updating that will be transparent in service providers' relevant determinations. Consumer groups will have an opportunity to comment on the proposed process for updating the return on debt estimate during a relevant determination process. We also acknowledge that the PTRM (revenue/price control model) will need to be amended to reflect our approach to estimating the return on debt (including the need to annually update the return on debt). We will consult with stakeholders on any proposed amendments (refer to 1.5.2).

Finally, we have addressed the submission of NSWIC in section 7.3.3.

7.3.5 Weighting

We propose to maintain our proposed approach in the draft guideline and to adopt a simple (equally weighted) trailing average to estimate the return on debt allowance.

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 time in tranches of equal size (that is, the debt balance remains constant over time), it is reasonable to apply equal weights. That is, for a benchmark term of 10 years, a weight of 1/10 would be given to each year in the trailing average.[381] We refer to such a weighting scheme as a 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 potentially distort investment decisions and lead to a dynamically inefficient outcome.

Alternatives to simple trailing average suggested by stakeholders include:[382]

- 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 PTRM.

We propose to adopt a simple trailing average rather than the alternative weighting scheme for the following reasons:

1. All three of the alternative approaches imply that the weights used in a trailing average would be different for each individual service provider. We do not consider that differences in investment

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[380] NER, cls. 6.5.2(l) and 6A.6.2(l); NGR, r. 87(12).
[381] See section 8.3.3 for further detail on the proposed benchmark term of debt.
[382] AER, *Rate of return consultation paper*, May 2013, pp. 111–113.

profiles of individual service providers justify adoption of different benchmark definitions. Since we propose to use a single definition of the benchmark efficient entity, there should be a single weighting scheme.

2. Weighting schemes based on actual data (the first two approaches) may not provide a service provider with incentives to review the efficient timing of investment in response to the cost and availability of finance (as we further discuss below). In addition, these approaches would need to be implemented via a retrospective true up, since such weights can only be computed after the parameters they are based on have been observed.

3. Service providers may not (and indeed, often do not) follow their forecast PTRM profile. We consider the relative complexity of the PRTM–based weighting scheme, and forecast imprecision outweigh potential benefits of the approach.

Below we detail our reasoning.

All three approaches imply that the weights would be different for each individual service provider. We previously considered that this would represent a departure from the benchmarking approach and the allowed rate of return objective.[383]

In response to this position, the QTC submitted:[384]

> The use of different weights for each service provider is not a departure from benchmark regulation, as the efficient cost of debt for the benchmark efficient firm will depend on its investment and funding profile during a period.

We recognise that the debt financing requirements of the benchmark efficient entity are informed by its investment profile. To that extent, the efficient debt financing practices of the benchmark efficient entity would be affected by its efficient investment profile and debt financing needs. The benchmark efficient entity is a conceptual notion rather than a real entity. So, therefore, are its investment profile and debt financing needs, as no entity with that profile or those needs actually exists. Individual service providers' expected funding profiles are therefore only of limited use. They may inform our view about the efficient financing practices of the benchmark efficient entity with a similar degree of risk. However they are not a substitute for the investment profile and debt financing of the benchmark efficient entity. Further, since we propose to use a single definition of the benchmark efficient entity, we propose that there should be a single weighting scheme.

In addition to the above considerations, the three alternative approaches suggested by stakeholders also have other limitations.

We consider that the return on debt allowance which relies on the actual value of a parameter that the service provider can influence (such as debt balances and capex) is not consistent with incentive-based regulation. In particular, such weighting schemes may not provide a service provider with incentives to minimise its return on debt and, therefore, to engage in efficient financing practices. The QTC submitted that:[385]

> A weighting scheme based on the actual increase in the RAB would provide incentives for efficient financing practices, because the service provider is incentivised to fund at a lower cost relative to prevailing rates at the time of the investment. ...The advantage of weighting using the actual increase in RAB is that

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383 AER, *Consultation paper, Rate of return guidelines*, 10 May 2013, pp. 111–113; AER, *Explanatory statement: Draft rate of return guideline*, August 2013, pp. 89–92.
384 QTC, *Submission to the draft guideline*, October 2013, p. 20.
385 QTC, *Submission to the draft guideline*, October 2013, p. 20.

the service provider is not influenced by the absolute level of interest rates in regards to the timing of its investment.

We acknowledge that the benchmark entity would still have an incentive to reduce interest costs relative to prevailing rates. However, we do not consider that removing the link between the absolute level of interest rates and timing of investment would necessarily lead to an efficient outcome. For an investment decision to be efficient, it needs to take into account a number of factors. One of the factors, arguably, is the prevailing rates at which a service provider can obtain funding.

In addition, 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, since such weights can only be computed after the parameters they are based on have been observed. This would increase the complexity of the estimation process. This also could potentially result in higher price volatility for consumers and cash flow volatility for investors.[386]

Further, we consider weights based on the PTRM (forecast) debt balances.

During the regulatory control period, a service provider might choose not to follow the debt issuance profile assumed in the PTRM forecast. We agree that the 'PTRM debt balances ...are ultimately approved by the AER' and 'reflect the new funding required to maintain and expand a service provider's network'.[387] However, the PTRM is approved at the time of regulatory determination and relies on forecasts incorporating all the available relevant information at that time. It is conceivable that future capital expenditure which is considered efficient at the time of the determination might no longer be considered to be efficient at a later date, as new information becomes available. For example, a significant change in the prevailing conditions in capital markets might influence the efficiency of such investment.

We acknowledge the QTC's view that it might not be possible to forecast future interest rates with any certainty.[388] At the same time, it might be possible to observe whether the prevailing rate is relatively low or relatively high. This appears to be consistent with the QTC's statement referring to 'a time when interest rates are relatively low (for example, due to continued quantitative easing)'.[389] To clarify, it might be possible to tell that the rates are relatively high without it being possible to tell whether or not they continue being relatively high next year. In that case, it might be efficient for a service provider to postpone investment if it considers the prevailing rate of return on debt is relatively high.

To summarise:

- Service providers may not (and indeed, often do not) follow their forecast PTRM profile. Moreover, there are circumstances when it might be efficient for a service provider to do so.

- PTRM forecast debt balances of individual service providers are not a substitute for debt financing profile of the benchmark efficient entity.

- Given the above, PTRM–based weighting scheme might not minimise the mismatch between the expected return on debt of the benchmark efficient entity and the allowed return on debt.

- Implementation of the PTRM–based weighting scheme is relatively complex.

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[386] See, section 7.3.4 for a discussion of retrospective true ups.
[387] QTC, *Submission to the draft guideline*, October 2013, p. 21.
[388] QTC, *Submission to the draft guideline*, October 2013, p. 20.
[389] QTC, *Submission to the draft guideline*, October 2013, p. 20.

For the above reasons, we are not convinced that trailing average with PTRM–based weights will perform better than the approach with simple weights in terms of addressing the allowed rate of return objective and other requirements of the rules. We consider the relative complexity of the PRTM–based weighting scheme, and forecast imprecision outweigh potential benefits of the approach. We propose not to use the PTRM–based weighting scheme.

Other considerations

The above analysis acknowledges that the potential mismatch between the regulatory return on debt allowance based on a trailing average with uniform weights and the efficient debt financing costs can potentially cause investment distortions. However, alternative weighting approaches also have disadvantages.

Below we provide additional considerations that inform our proposed approach.

The QTC submitted that:[390]

> It is possible that an unweighted average may perform adequately if normal circumstances are assumed to occur in the future, with interest rates relatively near to their longer-term average and a relatively low rate of growth in regulated asset bases (RAB). ... An unweighted average is likely to prove problematic in circumstances where interest rates are volatile, and where interest rates are persistently higher or lower than the trailing average value. These are the conditions which currently exist...

We note that an unweighted average would be 'problematic' when interest rates are volatile only to the extent that the efficient investment profile of the benchmark efficient entity leads to increasing debt balances/increasing RAB over time.[391] If it is efficient for the benchmark efficient entity to maintain a constant RAB which would be funded by issuing debt in equal tranches over time then the equally weighted trailing average would be reflective of its efficient debt financing costs.

Further, in the case of an increasing or decreasing RAB, the potential mismatch between the benchmark efficient entity's efficient debt financing costs and the equally–weighted return on debt allowance would be smaller:

- the longer is the benchmark term of debt

- the smaller is the growth rate of RAB/debt balances.

Response to key issues raised in stakeholder submissions

In their submissions to the draft guideline stakeholders expressed different views on our proposed approach. Several consumer groups expressed their preference for simple weights.[392] For example, PIAC submitted:[393]

> With respect to the various options for weighting years within the trailing average portfolio, PIAC agrees with the AER's conclusions that there should be no weighting applied. Any weighting complicates the analysis but provides no better guarantee that it will replicate the prudent practices of an efficient benchmark entity. The fact that NSPs will have a different profile than the 'equal weight' profile is not a relevant consideration unless it is found that there is some consistent cycle of debt issuances that would be adopted by a benchmark efficient NSP over time.

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[390] QTC, *Submission to the draft guideline*, October 2013, p. 18.
[391] Assuming that the benchmark gearing ratio is constant.
[392] EUAA, *Submission to the draft guideline*, October 2013, p. 6; PIAC, *Submission to the draft guideline*, October 2013, p. 44; COSBOA, *Comments– draft guideline*, October 2013, p. 4.
[393] PIAC, *Submission to the draft guideline*, October 2013, p. 44.

NSWIC, however, stated:[394]

> Should a trailing average approach be adopted however, NSWIC submits that the weights should reflect the approximation to the present regulatory period, instead of having equal weights for each year of the seven year period.

At the same time, NSWIC provided no further recommendation on a specific design of such a weighting scheme.

Many industry stakeholders did not explicitly address the issue of weighting in their submissions. At the same time, several stakeholders supported QTC's proposal to adopt 'a weighted average based on the PTRM debt balances'.[395] We have addressed the QTC's position above. Consistent with the QTC's view, Ergon Energy submitted that 'use of unweighted average may lead to investment distortions especially for service providers with large capital expenditure programs'.[396] Further, CitiPower and Powercor submitted that 'under the simple average approach it will be impossible for a distribution business to effectively hedge its costs when its RAB is growing'.[397]

Energex submitted that:[398]

> Given that capital expenditure in network businesses invariably follows a 'lumpy' profile characterised by large, less frequent investments, the consequences of a mismatch between the regulated cost of debt and the actual cost of debt can be significant and difficult to hedge in advance (**as the exact amount and timing of future expenditures is rarely certain**).[Emphasis added]
>
> ...Energex therefore supports QTC's proposed weighted average approach as it will properly take account of the cost of new borrowings expected to be undertaken at the start of each regulatory period based on the approved capex forecasts.

We acknowledge that Energex views the timing and amount of future expenditures as uncertain. However, we consider that this view emphasises difficulties in forecasting future debt financing needs and, therefore, is not consistent with Energex's recommendation.

Finally, United Energy and Multinet did not recommend a specific approach. They submitted that:[399]

> The Companies consider that the use of fixed weights over time (or an equally weighted average) may be inappropriate in certain circumstances, such as in those cases in which a business is experiencing marked growth in its regulatory asset base. ...Regulated businesses should be presented with an opportunity to prepare arguments for the use of time-varying weighting schemes. Businesses may be able to devise weighting methods that make use of information pertinent to a benchmark efficient entity, and thereby overcome potential problems associated with the use of firm specific data.

We consider that in future regulatory determinations (given the non-binding nature of the guideline) stakeholders have an opportunity to propose alternative approaches to estimating return on debt.

Taking into account all of the considerations above as well as computational and conceptual simplicity of an equally–weighted trailing average, we maintain our proposal in the draft guideline to adopt an equally–weighted (simple) trailing average.

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[394] NSWIC, *Submission to the draft guideline*, October 2013, p. 5.
[395] QTC, *Submission to the draft guideline*, October 2013, pp. 1–2, 18–21; Ergon Energy, *Submission on the draft guideline*, October 2013, pp. 5–6; Energex, *Response to the draft guideline*, October 2013, pp. 2–3; CitiPower, Powercor, SA Power Networks, *Submission to the draft guideline*, October 2013, p. 7.
[396] Ergon Energy, *Submission on the draft guideline*, October 2013, p. 5.
[397] CitiPower, Powercor, SA Power Networks, *Submission to the draft guideline*, October 2013, p. 7.
[398] Energex, *Response to the draft guideline*, October 2013, pp. 2–3.
[399] United Energy and Multinet, *Submission to the AER's draft rate of return guideline*, 15 October 2013, p. 5.

7.3.6 Transitional arrangements

We propose to maintain our approach in the draft guideline to apply uniform transition to all service providers in moving to the trailing average return on debt. That is, we propose to use a single transitional arrangement consistent with the 'QTC method', based on the proposed benchmark debt term of 10 years. This is based on the following considerations:

- consideration that the benchmark efficient firm is likely to need a transition in moving from the current 'on the day' approach to the trailing average approach

- proposing an approach that is likely to contribute to the achievement of the allowed rate of return objective and other requirements of the rules

- 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 incentives for potential strategic behaviour of service providers.

In this section we consider the reasons above in more detail as well as review the relevant stakeholder submissions.

Background

Our intention to adopt the trailing average approach to estimate the allowed return on debt within this guideline raises a question of whether we need a transition to move away from the current 'on the day' approach. An alternative would be to apply the trailing average approach to service providers immediately at the start of their next 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:[400]

> ...**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:[401]

> 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:[402]

> 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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[400] NER, cls. 6.5.2(k)(4) and 6A.6.2(k)(4); NGR, r. 87(11)(d).
[401] AEMC, *Final rule change determination*, 29 November 2012, p. 85.
[402] AEMC, *Final rule change determination*, 29 November 2012, p. 85.

As we discussed in the consultation paper, we do not support the notion that transitional arrangements should be specific to individual service providers' debt financing practices.[403] The return on debt for each regulatory year needs to be determined so that it contributes to the achievement of the allowed rate of return objective. That is, debt financing practices of individual service providers inform the return on debt estimate to the extent that they inform our view of what represents the efficient debt financing costs of the benchmark efficient entity.

We propose to use a single definition of a benchmark efficient entity and we do not consider that factors such as difference in size or ownership structure of service providers justify the adoption of different benchmark definitions. Further, given our definition of the benchmark efficient entity, we propose to adopt a single approach to return on debt estimation. Therefore, if a transition is needed for the benchmark efficient entity, we consider it should be implemented via a single transitional method. As we pointed out in our consultation paper, we also would not expect a transition to occur more than once, unless we changed the approach to estimating the return on debt in future guidelines.

Overall considerations

Considering 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:

- significant costs and practical difficulties for the benchmark efficient entity in moving to another approach for estimating the return on debt

- significant and unexpected change in costs/prices that may have negative effects on confidence in the predictability of the regulatory arrangements.

We consider that the AEMC's reasoning provides us with some guidance regarding important considerations for determining whether a transitional arrangement is required.

Overall, we consider that there should be a transition from the 'on the day' approach to the trailing average portfolio approach for the benchmark efficient entity.

In section 7.3.3 we considered what would constitute the efficient debt financing practices of the benchmark efficient entity under the current 'on the day' approach. We considered it likely that holding a debt portfolio with staggered maturity dates and using swaps to hedge interest rate exposure for the duration of a regulatory control period would constitute such an efficient debt financing practice. Further, we consider that holding a (fixed rate) debt portfolio with staggered maturity dates to align its return on debt with the regulatory return on debt allowance is likely to be an efficient debt financing practice of the benchmark efficient entity under the trailing average portfolio approach. That is, it is likely that the benchmark efficient entity would need to unwind its hedging contracts in moving from the current 'on the day' approach to the trailing average portfolio approach. Therefore, if transition is immediate (that is, if there is no transitional arrangement), the benchmark efficient entity is likely then to face costs or practical difficulties, as:

- It would have likely entered hedging contracts to manage its interest rate risk in the past.[404]

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[403] AER, *Rate of return consultation paper*, May 2013, p. 115.
[404] For example, the benchmark efficient entity could have entered into 'pay floating' interest rate swap contracts matching its term of the debt immediately after issuing fixed rate debt. This would effectively convert the issued fixed rate debt into floating rate debt. Therefore, at the time of the next regulatory determination, it would have floating rate exposure on its historical debt.

- It would be impossible for it 'to go back and lock in rates that applied some time ago'.[405]

- Without transition there would be, therefore, a mismatch between the expected return on debt of the benchmark efficient entity and the regulatory return on debt allowance set according to the trailing average portfolio approach.[406] This mismatch could potentially be significant.

A gradual transition, on the other hand, can take into account the efficient financing practices under the current 'on the day' approach. It can also address the need for the benchmark efficient entity to unwind its historical hedging contracts. As SFG suggested:[407]

> The type of "rolling in" arrangement that has been proposed by QTC would be an effective means of transitioning from the current Rules to the use of an historical average cost of debt approach.

Further, we consider that a gradual adjustment is also consistent with the need to account for the effect of the change in the return on debt approach on confidence in the predictability of the regulatory regime. This would accommodate any potential discrepancy between the proposed approach to 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 regulatory allowances for the return on debt can be disruptive to both businesses and consumers (to the extent that they may result in significant and unexpected changes in energy prices and cash flows compared to the expected levels under the continuation of the previous policy). Gradual changes to the regulatory framework may be more desirable. For instance, under the 'on the day' approach energy consumers may have reasonably expected energy prices to be based on the 'on the day' rate at the next determination. 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 consumers may not be met if a switch to the trailing average portfolio approach were implemented without a transition. A transition would allow for a more gradual adjustment to the change in regulatory approach. The same logic, of course, also applies to the reasonable expectations formed by service providers. In particular, the benchmark efficient entity may have reasonably expected that the current 'on the day' regulatory approach would continue into the future. As we observed in section 7.3.3, it is likely that it would then be holding a debt portfolio with staggered maturity dates and using swap transactions to hedge interest rate exposure for the duration of the current regulatory control period. As we discussed above, in this case, an immediate transition to the trailing average portfolio approach could potentially result in significant costs and practical difficulties for the benchmark efficient entity.

We have also had regard to the issues, related to the implementation of the return on debt approach. 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, particularly, to the extent that we are proposing to use a third–party data set. We would also need to reach an

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[405]   SFG Consulting, *Rule change proposals relating to the debt component of the regulated rate of return, Report for AEMC,* 21 August 2012, p. 45.

[406]   This is because the expected return on debt of the benchmark efficient entity would reflect the hedging contracts it entered into. For example, if it entered into 'pay floating' interest rate swap contracts immediately after issuing fixed rate debt, the respective portion of its debt servicing costs would be linked to the prevailing base rate, rather than historical base rate at the time of debt issuance.

[407]   SFG Consulting, *Rule change proposals relating to the debt component of the regulated rate of return, Report for AEMC,* 21 August 2012, p. 46.

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 in section 7.3.2, there is a concern that, given the guideline is not binding, service providers would seek to switch from proposing one return on debt approach to proposing another and back at the time of their determinations. Service providers could propose to adopt whichever approach provided them with the highest allowed revenue. 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 of the new approach. In turn, this would delay any 'windfall gains' received by the service provider from changing approaches.

We consider that the 'QTC method' of transition, consistent with simple weighting, addresses all of the reasons for a transition specified above. In addition, the 'QTC method' received the most support from stakeholders throughout the guideline process. We provide details on the 'QTC method' in appendix G.

Below we provide an overview of stakeholder submissions to the draft guideline on the issue of a transition and explain how our proposed approach addresses the stakeholders' comments.

Response to key issues raised in stakeholder submissions

In their submissions to the draft guideline consumer groups expressed the following range of views:

- Whether or not a transition is needed depends on other factors, such as the benchmark debt term and the length of the averaging period.[408]

- The benchmark debt term should be five, rather than seven, years. If a five-year tenor is adopted, there is lesser or no need for a transition.[409]

- Our proposed transition is too long. A transition is needed to accommodate prior expectations of consumers, but:[410]

  - it should be no longer than five years

  - it should start on July 1 2013 for all service providers, except the Victorian distributors (for them it should start on January 2014 to match their regulatory year).

- If a transition is adopted, it should be uniform, based on consideration of the benchmark efficient entity and allowed rate of return objective, and should not 'be driven by the particular preferences of NSPs with particular ownership characteristics'.[411]

PIAC also submitted:[412]

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[408] PIAC, *Submission to the draft guideline*, October 2013, p. 51; EUAA, *Submission to the draft guideline*, October 2013, p. 6.
[409] MEU, *Comments on the draft guideline*, October 2013, p. 42; PIAC, *Submission to the draft guideline*, October 2013, p. 7; COSBOA, *Comments– draft guideline*, October 2013, p. 5; ECC, *Submission to the draft guidelines*, October 2013, p. 2.
[410] EUAA, *Submission to the draft guideline*, October 2013, p. 6.
[411] PIAC, *Submission to the draft guideline*, October 2013, p. 52; COSBOA, *Comments– draft guideline*, October 2013, p. 5.
[412] PIAC, *Submission to the draft guideline*, October 2013, p. 51.

> This is perhaps one of the more difficult decisions the AER will have to make. There are arguments for providing a period of adjustment for the NSPs from one regulatory approach to another. However, there are very good arguments for not having a transition period, not least of which is the precedence it sets, the complexity and time lag to achieve the final objective and the risks on the way to that goal.

With respect to the above submissions, we consider:

- The length of transition is determined by considerations of the efficient debt financing practices of the benchmark efficient entity and, as such, is related to the benchmark debt term. We propose to adopt the benchmark debt term of 10 years. Therefore, the corresponding transition period would also be 10 years. This takes into account the period of time that is likely to be needed for the benchmark efficient entity to unwind its hedging contracts.[413] Accordingly, we do not consider that adopting a shorter benchmark debt term reduces the need for transition.

- We consider that the beginning of the transition period for each service provider should match the beginning of the regulatory control period in which new rules apply to that service provider.

- We consider that the key objective of the transitional arrangements is to estimate the return on debt so that it contributes to the achievement of the allowed rate of return objective. As such, we do not consider that the proposed transitional method creates a 'time lag to achieve the final objective'.

Many service providers generally supported our proposed approach to transition, provided the approach is based on a 10 year benchmark term of debt.[414] For example, QTC submitted:[415]

> QTC supports the proposed transitional arrangements (but based on the original 10-year benchmark debt tenor and transition period), **which are appropriate for service providers that have attempted to align their funding with the 'on the day' method,** although we note that different transitional arrangements may be appropriate for other service providers. [emphasis added]

On the other hand, ActewAGL expressed a view that 'a transition may not be necessary for businesses that already follow [the portfolio approach]'.[416]

Further, the NSW DNSPs and TransGrid supported an immediate transition (that is, no transitional period) to trailing average for their businesses, as these businesses 'already [use] a benchmark efficient portfolio approach to manage [their] debt'.[417] The NSW DNSPs submitted:[418]

- Throughout previous regulatory frameworks and the Global Financial Crisis (GFC), the NSW DNSPs have managed their debt on a staggered portfolio basis. We agree with the AER that a staggered portfolio approach is an efficient approach to debt management. The cost of debt under this approach is reflected in a trailing average cost of debt. As such we have serious concerns over the AER's proposed approach of adopting a transition to the trailing average, which would under-compensate a "benchmark efficient firm" with a debt portfolio size of the NSW DNSPs by more than $700 million over a seven year transition period based on current forward rate projections;

- In our view, if the AER was to apply a transition to the trailing average for the NSW DNSPs, this would provide an allowed cost of debt lower than the efficient cost of debt, which would not satisfy the Revenue and Pricing Principles in Section 7A of the National Electricity Law (NEL) to provide a

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413   For example, if the benchmark efficient entity entered into a 10 year swap contract (the duration of the swap contract would then match the benchmark debt term) a year before the regulatory determination, such a swap contract would take 10 years to unwind.
414   APA Group, *Submission on the draft guideline*, October 2013, p. 33; Ergon Energy, *Submission on the draft guideline*, October 2013, p. 6; Jemena, *Submission on the draft guideline*, October 2013, p. 1; QTC, *Submission to the draft guideline*, October 2013, p. 2; SP AusNet, *Submission on the draft guideline*, October 2013, p. 3.
415   QTC, *Submission to the draft guideline*, October 2013, p. 2.
416   ActewAGL, *Response to the draft guideline*, October 2013, p. 3.
417   TransGrid, *Submission on the draft guideline*, October 2013, p. 3.
418   NSW DNSPs, *Submission on the draft guideline*, October 2013, pp. 1–2.

network service provider with a **reasonable opportunity to recover at least its efficient costs**. We also consider that any such decision by the AER to adopt a debt transition to the NSW DNSPs would be inconsistent with the National Electricity Objective and the Rate of Return Objective...

TransGrid expressed a similar view.[419] The NSW DNSPs' submission also included supporting reports by CEG and UBS.[420]

The ENA summarised the views expressed by the member service providers as follows:[421]

> In some circumstances, it may be that no transition is required if the business already uses a debt financing approach consistent with an efficient benchmark or this is the best way of facilitating a business to hedge its efficient interest costs to the regulatory allowance.

> The ENA considers that the transition path set out by the AER in its draft guideline is **appropriate, where a business is in transition from a debt raising practice that is consistent with the AER's current approach** to establishing the cost of debt. [emphasis added]

We detailed our reasons for a single transition method for the benchmark efficient entity above, taking into account the stakeholders submissions we received. Further, we consider that the trailing average portfolio approach and the proposed transition method is capable of providing the benchmark efficient entity 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.

Overall, we propose to maintain our approach in the draft guideline to use a single transitional arrangement consistent with the 'QTC method' (based on the proposed benchmark debt term of 10 years) in moving to the trailing average return on debt to apply to all service providers.

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[419] TransGrid, *Submission on the draft guideline*, October 2013, pp. 3–4.
[420] Competition Economists Group, *Transition to a trailing average approach: A report for the NSW distribution network service providers*, 11 October 2013; UBS [commercial in confidence].
[421] ENA, *Response to the draft guideline*, October 2013, p. 77.

8   Return on debt: implementation

This chapter deals with the implementation issues for estimating the return on debt. Section 8.1 and 8.2 presents the issue and the approach we propose in the guideline. Section 8.3 elaborates on the reasoning for the proposed approach.

8.1   Issue

We must set out in the 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 the implementation of those methodologies is proposed to result in the determination of a return on debt in a way that it contributes to the achievement of the allowed rate of return objective.[422] In the draft guideline, 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.

- The averaging periods used to estimate the prevailing return on debt.

- The inputs to estimate the return on debt, including the benchmark term of maturity of debt and credit rating.

8.2   Approach

After further consideration of the issues and submissions to the draft guideline, we propose to use:

- an independent third party data service provider to estimate the return on debt

- an averaging period of 10 or more consecutive business days to estimate the prevailing return on debt, where the averaging period should be as close as practical to the commencement of the each regulatory year in a regulatory control period

- a benchmark credit rating of BBB+ or its equivalent.

We also propose to use a benchmark term of debt of 10 years, whereas in the draft guideline we proposed a term of seven years.

8.3   Reasons for approach

In the draft guideline, we sought stakeholder views on our proposed use of a third party data service provider. We also sought views on the proposed benchmark credit rating, average term of debt and an averaging period to calculate the return on debt of 10 or more consecutive business days.

Each of these issues is discussed below.

8.3.1   Third party data service provider

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 consider that this method has the following advantages:

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

- It is independent expert advice.

- It can be implemented in the context of automatically updating a trailing average of the return on debt as required by the NER/NGL.

We have previously expressed a preference for using an independent third party data service provider, where the method for estimating the return on debt is transparent. However, other factors—such as differences in debt selection criteria—would also need to be considered in assessing which of the competing data providers to adopt in a determination. We consider that an assessment of the relative merits of a data service provider 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'.[423]

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 further reasoning for adopting an independent third party data provider and our response to submissions is summarised below.

As previously discussed in the explanatory statement, 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).

For the draft guideline, we proposed to estimate the return on debt using a third party data service provider. We considered 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.

- Third party data sources are constructed by finance 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. As we have previously highlighted, if we used an in-house method, we would need to develop and apply:[424]

  - detailed criteria for selecting debt instruments with appropriate specification of contingencies to allow automatic updating.

  - a detailed description of the estimation method (that is, a curve fitting technique or some form of averaging observed yields—for example, Nelson–Siegel, Svensson or spline-based approaches).

- A third party data source can be more readily implemented in the context of automatically updating a trailing average of the return on debt as required by the rules.

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[423]   NER, cls. 6.5.2(k)(1), 6A.6.2(k)(1); NGR, r.87(11)(a).
[424]   AER, *Explanatory statement: Draft rate of return guideline*, August 2013, pp. 98–99.

At the time the draft guideline was published, Bloomberg was the only independent third party data service provider that published an independent estimate of the return on debt.[425] At the same time while we proposed to rely on a third party data service provider such as Bloomberg for the estimation of return on debt, we acknowledged the known issues with this dataset or potential issues with using a third party dataset. In particular:[426]

- The third party data service provider may stop publishing data.

- 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.

- 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.

It is now expected that the Reserve Bank of Australia (RBA) will publish an estimate for return on debt, on both broad band BBB (includes BBB-, BBB and BBB+) and an A credit rating band (includes A-, A and A+), with a range of maturities (for example, three, five, seven and 10 year average debt terms). Importantly we also understand that the RBA's method will be transparent.

ENA supported the use of the Bloomberg BBB FVC as the mechanism to implement a curve fitting process to determine the benchmark return on debt. ENA also considered the curve fitting process proposed by CEG as a useful cross-check on the proprietary methods employed by Bloomberg.[427] APA also supported the continued reliance on Bloomberg to estimate the return on debt but provided no basis for this support.[428] Similarly, COSBOA did not oppose the use of third party data, but encouraged the AER to develop an in-house dataset.[429] As indicated in the draft guideline, for the reasons outlined above, we prefer to use an independent third party data service provider to estimate the return on debt.

PIAC submitted that the AER needs to undertake an assessment of the consistency of the third party provider's yield curves from year to year, to maintain the integrity of the annual updating process.[430] PIAC also submitted that:[431]

> The AER should continue to develop its own database of information on relevant corporate bonds in the Australian market place and relevant overseas markets, in order that it can critically evaluate commercial third-party providers of bond yields.

We acknowledge PIAC's views. However, 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, given that this method has advantages as discussed above.

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[425] Bloomberg generates fair market sector curves for many bond sectors, grouped by currency, sovereign, agency, corporate, industry, issuer, and credit ratings. A yield curve is built daily for each sector based on the population of bonds directed to that sector or curve. A zero coupon yield curve is modelled and all other curves (par, coupon curve and forward curve) are derived from the zero coupon yield curve.

[426] AER, Explanatory statement: Draft rate of return guideline, August 2013, p. 100.

[427] ENA, Response to the draft guideline, October 2013, p. 56.

[428] APA, Submission to the draft guideline, October 2013, p. 35.

[429] COSBOA, Comments– draft guideline, October 2013, p. 4.

[430] PIAC, Submission to the draft guideline, October 2013, p. 46.

[431] PIAC, Submission to the draft guideline, October 2013, pp. 45–46.

EUAA submitted that the analysis by Smyczynski and Popovic in figure 8.1 shows that for most of the time since the global financial crisis the five year annual Bloomberg FVC has been above the five year average bond yield. It also suggested the use of weighted average yield of bonds with three to seven years to mature.[432] However, this analysis also indicates that prior to 2008 the five year annual Bloomberg FVC has typically been below the five year average bond yield. Importantly, based on the longer-term historical experience, this evidence does not support the view that the Bloomberg FVC will have a systematic bias towards the overestimation of the relevant average bond yield.

Figure 8.1   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
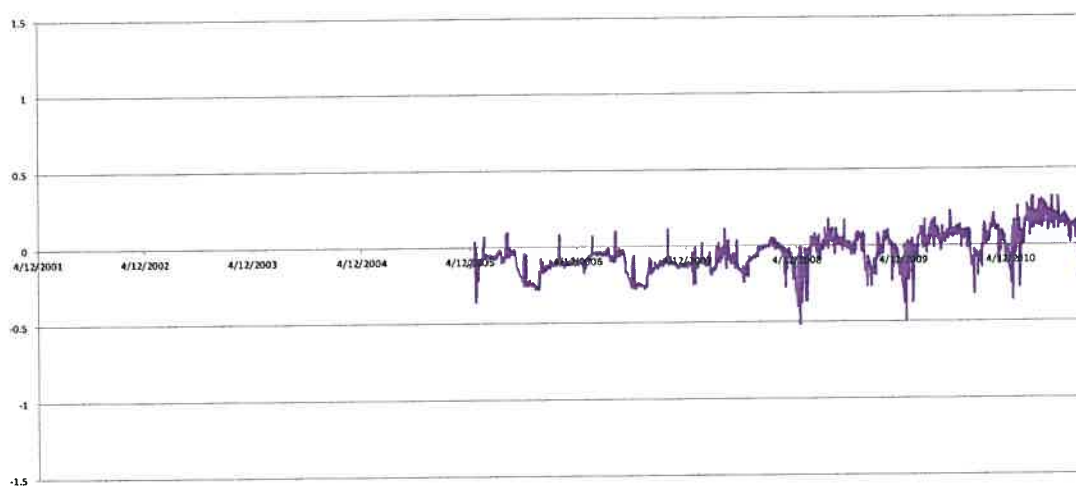
Source: Smyczynski and Popovic, *Estimating the Cost of Debt: A Possible Way Forward*, Regulatory Development Branch, *Australian Competition and Consumer Commission*, April 2013, p. 44.

MEU supported an AER developed dataset and estimation technique, and stated that:[433]

- The industry the firm operates in is the critical determining factor in setting the cost of the bond, and not the credit rating (and noted the analysis by Oakvale and Chairmont Consulting to support this view).

- Bloomberg FVCs have consistently provided an overstatement of the observed costs for bonds that are incurred by regulated energy networks.

- The AER, by using the Bloomberg FVCs, effectively persists in assuming all bonds rated to the same credit rating are equivalent and all should be used to provide the benchmark.

- The AER should use a cohort of bonds that are comparable to those sourced by firms similar to the firms that are to be regulated as this will provide a more accurate benchmark for the cost of debt sourced by service providers.

- The AER should consider all investment-rated bonds when calculating the benchmark return on debt.

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432   EUAA, *Submission to the draft guideline*, October 2013, pp. 2–3.
433   MEU, *Comments on the draft guideline*, October 2013, pp. 29–33; EUAA, *Submission to the draft guideline*, October 2013, p. 6.

We agree the industry a business operates in is an important factor but the credit rating is still a relevant and an important factor to take into account when considering proxy selections for a benchmarking process. Both Oakvale and Chairmont Consulting agreed with our view.[434] However, in practice we are using a range of credit ratings to estimate the return on debt for a benchmark efficient entity. This is because we understand that the available independent third party data providers use a range of ratings (for example, the Bloomberg FVC uses a BBB credit rating band.[435]

We agree that, ideally, we should use a cohort of bonds that are comparable to those sourced by businesses similar to the benchmark efficient entity. However, we consider that the number of close comparators in the BBB band is too small to be reliable for the estimate of return on debt. Lally has also recognised this issue and proposed a 'four tiered approach' where the first tier would include those businesses to be the closest comparators (that is, regulated energy network businesses).[436] The fourth tier would include unregulated businesses whose principal activities would be monopolistic (for example, airfield operations). However, we note that even with this approach to bond selection, the sample size is limited.[437] Further, the ERA has indicated that it would ideally select bonds from the regulated sector. But, due to the lack of bonds, the ERA has considered it is necessary to widen the criteria to all Australian entities.[438]

Finally, in response to the inclusion of all investment grade bonds to estimate the return on debt for a benchmark efficient entity, we consider it may be too broad to include all investment rated bonds. For example, this would include government-owned businesses, which we have excluded from the definition of the efficient benchmark entity. However, as acknowledged above in practice we are using broad BBB band credit ratings for the estimate of return on debt.

8.3.2 Approach to calculating the averaging period to estimate the allowed return on debt

The averaging period is used to smooth out short term volatility in the annually updated return on debt allowance. This smoothing can be achieved by averaging the daily estimates published by an independent third party data service provider over a number of days.

At this time we propose to estimate the prevailing return on debt using a simple average of the prevailing rates observed over a period of 10 or more consecutive business days up to a maximum of 12 months. The proposed averaging period will be subject to the following principles to be included in the guideline:

- The period must be specified prior to the commencement of the regulatory control period.

- At the time the period is nominated, all dates in the averaging period must take place in the future.

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

- A period needs to be specified for each regulatory year within a regulatory control period.

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[434] Chairmont Consulting, *Debt risk premium expert report*, 9 February 2012, p. 8; Oakvale Capital, *Report on the cost of debt during the averaging period: The impact of callable bonds*, February 2011, pp. 1–2.
[435] While the benchmark credit rating is BBB+, Bloomberg's BBB rated FVC is based on a composite of BBB–, BBB, and BBB+ rated bonds.
[436] M. Lally, *Estimating the cost of debt of the benchmark efficient regulated energy network business*, August 2013, p. 23.
[437] A review of bond data on Bloomberg on 28 June 2013 indicates that there were only 12 outstanding bonds on issue for a 10 year BBB rated entity. This sample size increases to only 14 bonds, if a five to seven year term to maturity is adopted.
[438] ERA, *Final decision on WA Gas Networks Pty Ltd proposed revised access arrangement for the Mid-West and South-West Gas Distribution Systems*, 28 February 2011, pp. 79–85.

- The specified periods for different regulatory years are not required to be identical, but should not overlap.

- Each agreed averaging period is to be confidential.

The allowed return on debt averaging periods can be either:

- proposed by the service provider during the Framework and Approach process or 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 are not agreed by the AER.

We consider this approach has advantages, in terms of:

- providing clear principles and guidance to be applied in considering a service provider's proposed averaging period

- providing flexibility to accommodate different averaging period windows for different service providers for the first regulatory year, as a result of different transitional arrangements.

In the draft guideline we specified averaging periods for different groups of service providers, depending on their transitional arrangements as outlined in the rules. Meanwhile, we also recognised that the averaging period window would vary widely between service providers for the first regulatory year of the regulatory control period as a result of the transitional rules.[439] Consequently, for the final guideline we do not consider that it is appropriate to specify the averaging periods for service providers (or groups of service providers). This is also consistent with the AEMC view that implementation issues are better dealt with through the Framework and Approach paper rather than through the guidelines, which are not intended to apply in a service provider specific manner.[440]

In the draft guideline, we proposed that the service provider's averaging period for the subsequent regulatory year should end six months before the commencement of the relevant regulatory year to:

- provide service providers with sufficient time to calculate the return on debt

- obtain our approval before they submit their annual pricing proposals for the upcoming regulatory year.

In response, some submissions considered that specifying an averaging period which ends six months before the commencement of the relevant regulatory year is too far from the start of the regulatory year.[441] QTC considered that it would be appropriate to allow service providers to nominate averaging periods that end no later than three months prior to the start of the next regulatory year, rather than the proposed six months.[442] CitiPower, Powercor and SA Power Networks also noted that investors require a premium to be paid for committing to the provision of funds between date of pricing and provision of funds, unless the time period is very short.[443]

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[439]   AER, *Explanatory statement: Draft rate of return guideline*, August 2013, pp. 102–105.
[440]   AEMC, *Final rule change determination*, November 2012, pp. 248–249.
[441]   CitiPower, Powercor and SA Power Networks, *Submission to the draft guideline*, October 2013, pp. 7–8; Ergon Energy, *Submission on the draft guideline*, October 2013, pp. 6–7; QTC, *Submission to the draft guideline*, October 2013, p. 22.
[442]   QTC, *Submission to the draft rate of return guideline*, October 2013, p. 22.
[443]   CitiPower, Powercor and SA Power Networks, *Submission to the draft guideline*, October 2013, pp. 7–8.

Submissions from service providers that are subject to a 'preliminary determination with mandatory re-opener' in the rules expressed concern that they will be disadvantaged. They submitted that they are only be able to nominate an averaging period within the window of five months for the estimating the allowed return on debt in the first regulatory year. These service providers suggested the start date for the first agreed averaging period should be brought forward in advance of their initial regulatory proposal.[444]

We recognise it is desirable for the averaging period to be as close as practical to the start of the relevant regulatory year. At the same time, the annual updating process requires service providers to submit their pricing proposals for approval in advance of the upcoming regulatory year. Therefore, we propose that the service provider's averaging period be as close as practical to the commencement of the relevant regulatory year (rather than no closer than six months as proposed in the draft guideline). In addition, we propose that a service provider can nominate the averaging periods during the Framework Approach (F&A) process (rather than limiting the nomination in their regulatory proposal). However, we consider that any averaging periods nominated by a service provider should be as close as practical to the commencement of the relevant regulatory year within a regulatory control period.

The MEU and PIAC submitted that our proposed averaging period window of 12 months is too long and too open-ended. MEU and PIAC consider that service providers can 'cherry pick' if there are consistent cycles of interest rates within the year. To minimise this concern, they recommended that we should assess whether there is an intra-year cycle for bond yields, and that we should consider taking an average of all business days across a year or selecting a period of 40 consecutive business days close to the final determination.[445] The MEU presented figure 8.2 that tracks the long term average monthly changes of 10 year CGS yields since 1970. It noted that interest rates are likely to fall in the third and fourth quarters of a year and likely to rise in the first and second quarters of the year. MEU concluded that this 'unequivocal bias' would be used by the service providers to maximise their benefit.[446] Further, EUAA noted the proposed averaging period calculation effectively reduces service providers' interest rate risk and users do not benefit from it.[447]

[444] Ergon Energy, *Submission on the draft guideline*, October 2013, pp. 6–7; Energex, *Response to the draft guideline*, October 2013, p. 3.
[445] EUAA, *Submission to the draft guideline*, October 2013, p. 3; MEU, *Comments on the draft guideline*, October 2013, pp. 38–40; PIAC, *Submission to the draft guideline*, October 2013, pp. 47–48.
[446] MEU, *Comments on the draft guideline*, October 2013, pp. 39–40.
[447] EUAA, *Submission to the draft guideline*, October 2013, p. 3.

**Figure 8.2   MEU averaging period analysis**
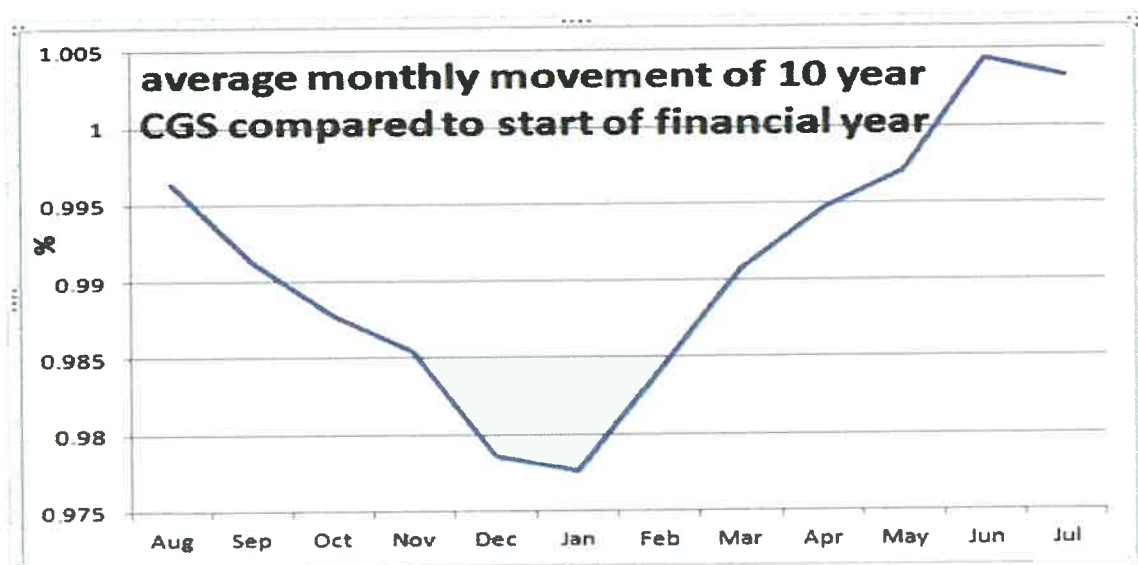
Source: MEU, *Submission to the draft guideline*, October 2013, p. 39.

We propose that the averaging period window should be 10 or more consecutive business days up to a maximum of 12 months. We consider that regulatory gaming is less likely when the averaging periods are specified and agreed upon in advance. This is because the return on debt will be unknown for future periods. That said, we have reviewed historical CGS yields and Bloomberg FVCs to assess whether the intra-year pattern as suggested by the MEU exists.[448] In particular, we have analysed both the CGS yields and the Bloomberg BBB FVC yields from the time that data is first available on Bloomberg. As presented in figure 8.3 to figure 8.5, this evidence does not support the view that there is a consistent intra-year pattern for interest rate movements in the 10-year CGS yields and the seven year Bloomberg BBB FVC. In addition to the graphical analysis, regression analysis can be used to test for seasonality effects. However, as the seven year Bloomberg BBB FVC yields are only available from January 2002, we do not have a sufficiently large sample for the regression analysis. The regression analysis will not be robust given this sample is small. However, if any robust analysis becomes available in the future that suggests the existence of such an intra-year pattern, we will reconsider our position. In addition, we will use our discretion to reject the averaging periods proposed by the service provider if the service provider is found to choose the averaging periods opportunistically according to an intra-year pattern.

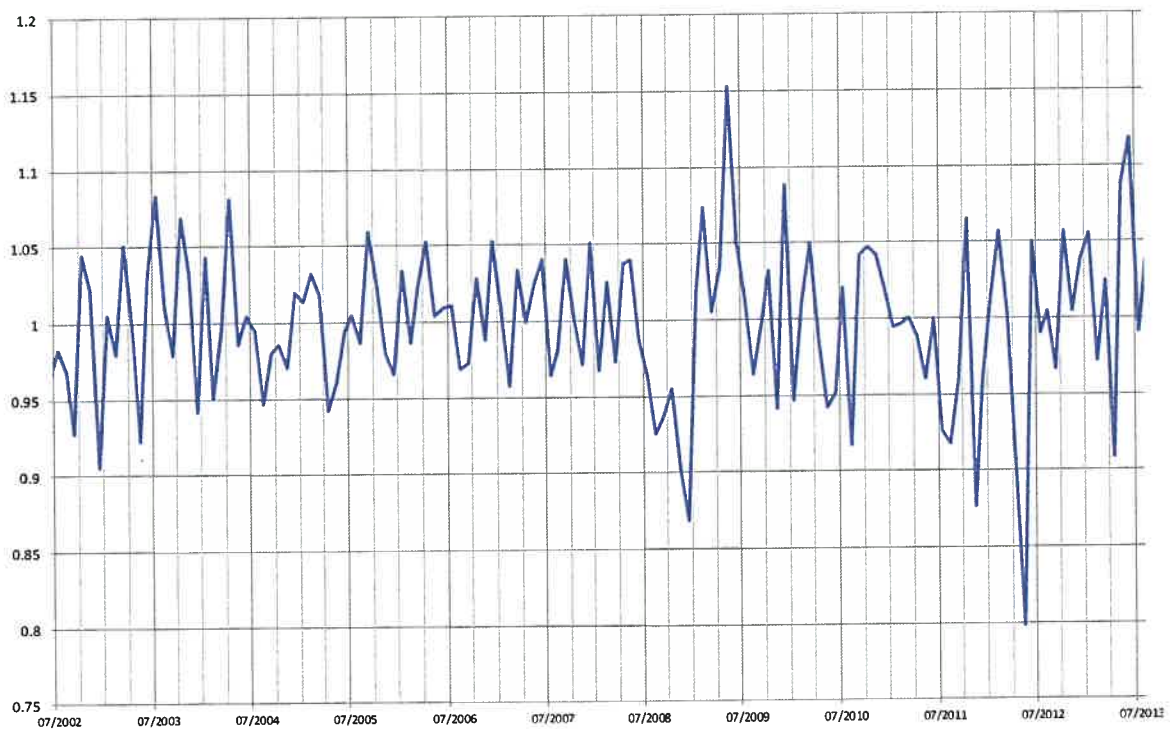[448]   We consider the Bloomberg BBB FVC data is more relevant than the CGS yield when analysing the intra-year pattern of return on debt over time.

Figure 8.3   Average monthly movement of 10-year CGS yields (July 1991 – July 2002)
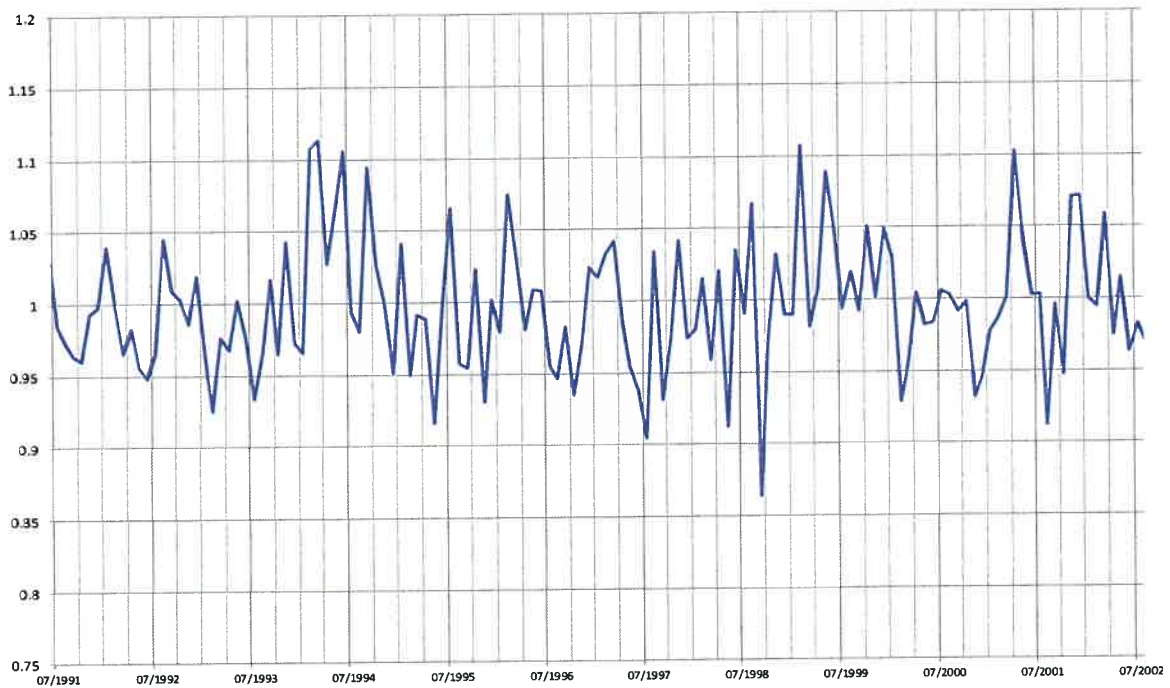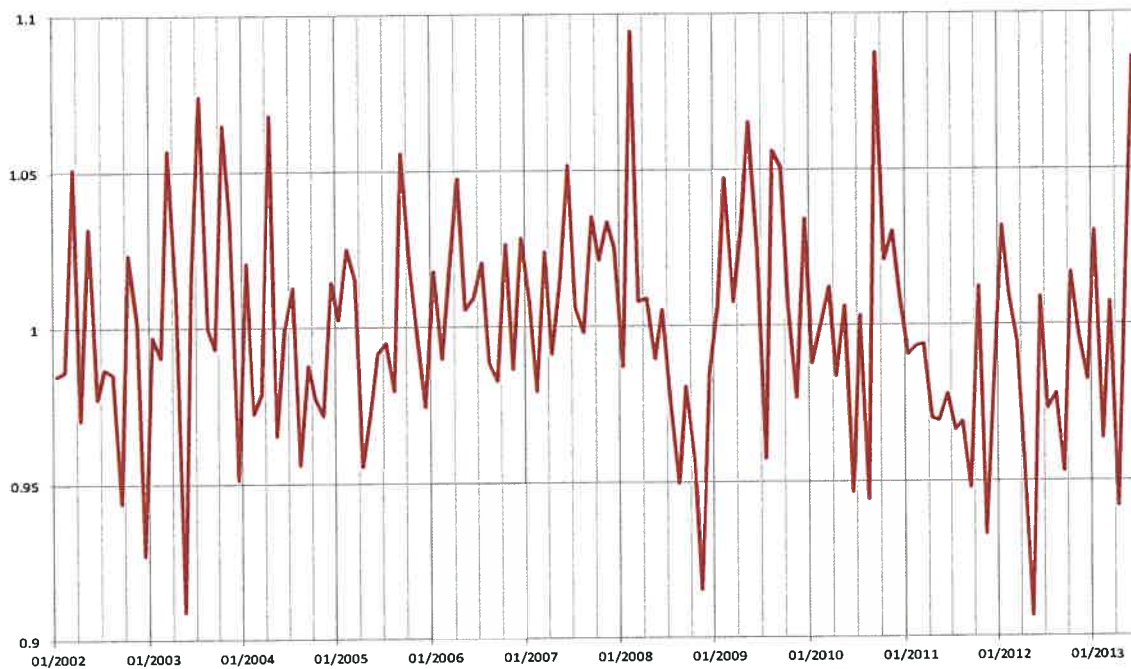

Source: Bloomberg and AER analysis.

Figure 8.4   Average monthly movement of 10-year CGS yields (July 2002 – July 2013)

Source: Bloomberg and AER analysis.

Figure 8.5   Average monthly movement of 7-year Bloomberg BBB FVC (January 2002 – January 2012)

Source: Bloomberg and AER analysis.

Additionally, Ergon Energy commented that service providers cannot issue debt twice. Therefore, our example in the draft guideline for overlapping averaging periods for the first and second agreed averaging periods cannot be replicated in practice.[449] As outlined above, we propose that the averaging period should be as close as practical to the commencement of the relevant regulatory year. Further, we have included a condition that the specified averaging periods for different regulatory years should not overlap.

8.3.3   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:

- establishes the period over which the trailing average is calculated

- determines the period of the transition to the trailing average

- is an input to obtaining yields to estimate the return on debt.

In the explanatory statement accompanying the draft guideline, we proposed a seven year debt term at issuance. PwC and CEG estimated a debt term of approximately 10 years from debt portfolio data derived from Bloomberg and annual reports. We considered that there were methodological issues with the term inferred and did not rely upon it. In the absence of actual debt portfolio information we noted the 2009 WACC Review finding of a term of 7.4 years after making adjustments to convert floating rate notes into a fixed rate equivalent term and for hedging. We considered that the debt term was likely to be less than 10 years. Adding weight to the decision to move to a shorter debt term, we

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[449]   Ergon Energy, *Submission on the draft guideline*, October 2013, pp. 6–7.

noted the difficulty in finding a mechanistic extrapolation method for annual updating. In using Bloomberg FVCs to estimate the yield on debt, extrapolation is required from the 7-year BBB Bloomberg FVC yield to a 10-year yield estimate. We considered that our current paired bond extrapolation approach could not be specified in a way that would reliably result in either the derivation of a bond sample (if specifications were too tight) or an acceptable error level (if specifications were too loose). We considered two other approaches which we discounted due to a lack of robustness and applicability.[450]

In the final guideline we are proposing an average term of debt for the benchmark debt portfolio of 10 years. We have reached this view for the following reasons.

Conceptually we consider that businesses will seek to issue longer-term debt. As the assets are long-lived the fewer times that the debt which funds them is required to be refinanced, the lesser is the risk. The risk consists of firstly, securing funding and secondly, with securing this funding at rates which do not vary considerably from the prevailing rates associated with financing that debt. Generally the cost of longer term debt is higher than shorter term debt as debt holders require compensation for the risks associated with holding debt over a longer time period.

A business will consider the trade-off of the higher cost of issuing long term debt against the reduction in costs associated with lowering refinancing risk.[451] Lally suggests that one way of lowering the cost of debt is to swap the risk-free component to a shorter term.[452] However, businesses state that under a trailing average approach hedging is either not required, not relevant or not possible.[453]

The determination of the benchmark debt term is a complex theoretical exercise. While we consider businesses will seek to issue longer-term debt, conceptually it is not clear what that term should be. Accordingly, we have considered the current debt financing practices of businesses considered to be close comparators to the benchmark efficient entity to inform us in arriving at a proposed debt term.

Based on observed practice we have assessed that the businesses' debt portfolio weighted average term at issuance is 8.7 years (ranging between 6.7 years to 16.3 years). We observe that businesses are securing bank debt with an average term at issuance of 4.3 years, issuing Australian bonds with an average term of 9.7 years and offshore bonds of 9.7 years. We understand that the current domestic bond market is not liquid in Australia beyond an issuance of seven years. However, businesses appear to be issuing offshore to cover any lack of liquidity in the domestic market. Further, when they issue offshore they appear to issue at multiple maturities (for example, seven, 10 and 15 years). We note that issuances beyond 15 years are currently not common.

Given that the empirical evidence lies between a seven and 10-year term we have considered that:

- The move to a trailing average approach effectively builds in a term for a longer period than the current approach.

- There is variability in the weighted average term at issuance over time.[454]

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[450]   AER, *Explanatory statement: Draft rate of return guideline*, August 2013, pp. 105-109.
[451]   AER, *Final decision: WACC review*, May 2009, p. 152.
[452]   M. Lally, *Estimating the cost of debt of the benchmark efficient regulated energy network business*, August 2013, pp. 11–12.
[453]   ENA, *Response to the draft guideline*, October 2013, p. 67; QTC, *Submission to the draft guideline*, October 2013, pp. 8-9; APIA, *Submission to the draft guideline*, October 2013, p. 33; SP AusNet, *Submission on the draft guideline*, October 2013, p.2.
[454]   In the 2009 WACC Review the weighted average debt term at issuance was 9.14 years. For the same businesses, the weighted average in August/September 2013 was 8.70 years.

- We regulate under objectives of promoting efficient investment and allowing businesses to recover their efficient costs.[455]

Accordingly, in moving to a trailing average approach we consider that we are committing to a debt term for the period nominated. To change the benchmark debt term in response to updated debt portfolio information would not be conducive to regulatory stability. In light of this, in order to ensure that the benchmark efficient entity is able to recover its efficient financing costs consistent with the allowed rate of return objective, we propose to use a 10 year debt term for the purposes of estimating the return on debt and for setting the period of the trailing average. It also means that a 10-year transition will apply.

We will, however, continue to monitor the average debt term at issuance of the regulated network service providers against the benchmark term. We will consider this information when we are assessing future transactions costs and any proposed adjustment of the return on equity.

With respect to the issue of extrapolation, we acknowledge businesses submissions that stated that at times the difference between 10-year and 7-year yields may be material.

We consider that, at a minimum, the difference between the 10-year and 7-year risk-free rates should be added to the estimated yield on a BBB+ 7-year debt term (if extrapolation is required). We propose to calculate the risk-free 10-year/7-year yield differential as the average difference between the annualised yield on 10-year and 7-year CGS bonds. The nominated averaging period (see 8.3.2) that we propose to use is the period over which the average risk-free yield differential is calculated.

We do not consider it prudent to commit to a particular method in the guideline for extrapolating the 10-year/7-year debt risk premium (DRP) differential. We consider that it is more appropriate to examine the possible methods at the time of the reset, in the context of the prevailing conditions. We consider that the 10-year/7-year DRP differential estimated via extrapolation should be capped to minimise any significant unexpected error associated with the extrapolation technique.

These issues are discussed in more detail below.

Conceptual issues in managing a debt portfolio for regulated energy businesses

We consider that in managing a debt portfolio for regulated energy businesses the following issues will be contemplated:

- Matching debt funding to the asset lives to manage refinancing risk

- Using interest rate swaps to reduce the cost of debt.

These issues are considered in turn below.

Long-term debt funding to match long-lived assets to manage refinancing risk

We consider that a business will, within the constraints of the market for corporate bonds, aim to match the length of the debt term to the asset life in order to minimise refinancing risk. We note, however, that this is subject to consideration of the increased cost of debt associated with a longer term.

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

A significant proportion of regulated energy assets are long-lived. We observe that electricity transmission lines and gas pipelines are depreciated for regulatory purposes over as long as 60 years.[456] Accordingly, we consider that the entity will seek to fund the long-lived energy assets with longer debt tenors in order to manage refinancing and interest rate risk. By issuing longer term debt the entity reduces the frequency with which it must approach the market, thereby reducing the risk associated with not being able to secure funding at the time when it is required, or at rates that are higher or lower than those it currently pays. In approaching the market less frequently there is less risk associated with changing interest rates, which reduces the volatility in debt servicing costs and the likelihood of mismatch between the business' cash flows and its debt servicing obligations.

However, longer-term debt costs more than shorter-term debt in normally functioning markets, as debt holders require compensation for the risks associated with committing capital over a longer period of time. This will lead the entity to trade-off the increase in refinancing risk and the increase in transactions costs due to more frequent issuance associated with shorter-term debt against the increased cost of longer-term debt. The AOFM stated, 'a debt portfolio that reprices less frequently gives rise to less volatile debt servicing cost outcomes... Experience suggests that this risk reduction usually comes at appreciable cost.'[457]

CEG submitted that besides the cost trade-off described by the movement down an upwards sloping issuer yield curve, lenders will seek a higher risk premium (that is, interest costs will increase) for the effect of the increased refinancing risk on the overall risk of the entity if it shortens its maturity period. That is, the yield curve for the business will shift up. CEG stated that it is unclear conceptually whether the two opposing effects will result in a lowering of the cost of debt.[458] However, CEG did not provide evidence of its practical significance.

AOFM stated that the term premium associated with issuing longer-term debt 'has been significantly reduced in recent years, both because of low historical outright levels of borrowing and because the yield curve has tended to be 'flatter' than history would suggest be the case. In view of this the AOFM has been strategically lengthening its issuance activities since mid-2011'.[459]

We note that despite what AOFM describe as current favourable conditions, the actual business' debt portfolios we accessed did not indicate an increase in the tenor of bonds being issued recently (see figure 2). We observe that for the same businesses, the average term at issuance at the 2009 WACC Review was 9.1 years and is now estimated to be 8.7 years. This suggests that the optimal term and refinancing risk/debt cost trade-off does not appear to have changed materially.

A number of submissions stated that it is desirable to issue longer-term debt in order to match the asset life and so minimise interest rate and refinancing risk.[460] Further, some submissions submitted that the shortening of the debt term from 10 years, which is stated to be current financing practice, to seven years will increase their refinancing risk.[461] QTC, NSW DNSPs and NSW TCorp stated that compared with a 10-year term, a seven year term will increase the proportion of the total debt portfolio which is required to be annually refinanced from 10.0 per cent to 14.3 per cent.[462] QTC also stated

[456] As indicated by PTRM models from the following determinations: AER, *Final decision: Envestra access arrangement Vic, Part 2: Attachments*, March 2013; AER, *Final decision: Aurora distribution determination*, April 2012; AER, *Final decision: SPI Networks (Gas) access arrangement*, March 2013
[457] AOFM, *Email to the AER "Rate of Return Guideline - Review"*, received 23 October 2013.
[458] CEG, *Review of Lally and Chairmont for the ENA*, October 2013, p. 4.
[459] AOFM, *Email to the AER "Rate of Return Guideline - Review"*, received 23 October 2013.
[460] AFMA, *Submission to the draft guideline – Benchmark term of debt*, October 2013, p. 2; Ergon Energy, *Submission on the draft guideline*, October 2013, p. 4; NSW DNSPs, *Submission on the draft guideline*, October 2013, pp. 4,12.
[461] Ergon Energy, *Submission on the draft guideline*, October 2013, p. 4; NSW DNSPs, *Submission on the draft guideline*, October 2013, p. 4
[462] NSW DNSPs, *Submission on the draft guideline*, October 2013, p. 14.

that assuming a five per cent annual growth rate in the debt balance, a seven year benchmark will increase the annual funding requirement to approximately 20 per cent. QTC stated that this will create a mismatch between the return on debt and the cost of debt for firms that continue to issue 10-year debt to keep refinancing risk at an acceptable level. NSW DNSPs and NSW TCorp stated that the increased annual refinancing will increase the liquidity requirements accordingly.[463] Finally, NSW DNSPs stated that the increase in short-term debt would cause credit metrics to deteriorate, requiring review of the benchmark credit rating, in turn increasing the cost of debt and equity.[464]

We understand that the credit metrics which the ratings agencies are interested in are as specified in table 8.1.

Table 8.1   Credit metrics considered by rating agencies

Moody's	S&P's
Adjusted interest cover ratio or FFO interest cover (sub-weighting 15%)	FFO/Debt
Net debt/regulatory asset value (15%)	Debt/EBITDA
FFO/net debt (15%)	Debt/Capital
RCF/capex (5%)	

Source: Moody's, *Rating Methodology: Moody's Global Infrastructure Finance – Regulated Electric and Gas Networks*, August 2009, p. 28; Standard & Poor's Rating Services, *Ratings Direct: Methodology: Business Risk/Financial Risk Matrix Expanded*, September 2012, p. 3.

We recognise that the amount to be annually refinanced will increase under a seven year term relative to a 10-year term. However, the annual interest and the net debt, all else equal, should be no higher under a 10-year term than a seven year term. It is therefore unclear to us how the credit metrics could deteriorate.

We note that the businesses have in place policies regarding annual refinancing amounts in order to manage refinancing risk. For example, Envestra and APA Group have a policy of not refinancing more than 15 and 20 per cent of their debt portfolio respectively in one year. This implies a minimum average term at issuance of seven and five years respectively.[465] For the 2009 WACC Review, statements outlining treasury practices were received from Jemena, Envestra, Citipower and Powercor, SP AusNet and QTC. The policies on the maximum percentage of the debt portfolio to be refinanced in a year ranged between 15 and 25 per cent, implying a minimum term at issuance of between seven and four years.[466] We note that a seven year debt term is within the guidelines set in treasury policies.

McKenzie and Partington consider that given the low default risk of regulated utilities, refinancing and interest rate risk are unlikely to be substantive in normal market conditions.[467]

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[463]   NSW DNSPs, *Submission on the draft guideline*, October 2013, p. 14.
[464]   NSW DNSPs, Submission *on the draft guideline*, October 2013, p. 14.
[465]   Envestra, 2013 Annual Report, p. 56.
[466]   AER, *Final decision: WACC review*, May 2009, p. 151.
[467]   McKenzie and Partington, *Risk, asset pricing models and WACC*, June 2013, p. 12.

We also note CEG's remarks that any increase in refinancing risk associated with adopting a seven year term, if businesses do in fact have a longer debt term at issuance currently, will be reflected as a shift in risk from debt to equity.[468]

Use of interest rate swaps to reduce the cost of debt

We consider that an efficient financing practice will be to minimise financing costs subject to managing refinancing and interest rate risk. We consider that, post transition, the benchmark efficient entity is not likely to engage in an active debt management strategy using swaps.

In the explanatory statement accompanying the draft guideline, we referred to the likely use of hedging, drawing on advice from Lally. Lally advised that firms will minimise refinancing risk by issuing longer-term debt. However, in order to decrease the cost of debt, firms will swap the base rate into a shorter-term fixed rate. The term of the swap will be determined by the firm optimally trading-off the increase in interest rate risk and the transactions costs associated with the swap against the interest rate differential between the longer-term fixed rate and the shorter-term swap base rate.[469]

AFMA submitted that due to recent international regulatory developments it considers that interest rate swaps are likely to increase the cost of debt rather than reduce the cost of debt.[470] NSW DNSPs stated that issuing shorter term debt will proportionately shift premiums away from longer term debt to shorter term debt. It also stated that the transaction costs associated with engaging in interest rate swap contracts would be 'prohibitively high for businesses with notional debt portfolios the size of NSW DNSPs'.[471]

A number of industry submissions submitted that the current use of interest rate swaps is to hedge to the five year regulatory period under the current 'on the day' approach, thereby minimising the interest rate risk associated with the resetting of the risk free rate at each regulatory determination. The submissions stated that hedging is not required, not relevant, or not possible under a trailing average approach.[472] ENA stated '[t]he trailing average cost of debt allowance is explicitly calculated on the basis that there is no swap overlay to a business's debt portfolio. It is illogical to base the term of debt under the trailing average approach on an assumption that businesses will enter swap contracts'.[473] ENA and QTC suggested that the use of floating rate debt and interest rate swaps, as suggested by Lally, is more akin to a hybrid approach than a portfolio approach.[474] QTC also suggested that as Lally has stated that the term of the base rate under the trailing average approach is indeterminable, Lally's arguments cannot be used to support a seven year term.[475]

ENA and QTC also argued that in the presence of relatively stable revenues, a shorter-term base interest rate exposure will increase the potential for a mismatch between the firm's revenues and its debt servicing costs.[476] QTC submitted that this will increase the probability of financial distress, especially if the firm is highly geared. QTC questions whether the lower interest rate would offset this increase in risk.[477]

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[468] CEG, *Review of Lally and Chairmont for the ENA*, October 2013, p. 5.
[469] AER, *Explanatory statement: Draft rate of return guideline*, August 2013, pp. 105-106.
[470] AFMA, *Submission to the draft guideline – Benchmark term of debt*, October 2013, p. 3.
[471] NSW DNSPs, *Submission on the draft guideline*, October 2013, p. 16.
[472] ENA, *Response to the draft guideline*, October 2013, p. 67; QTC, *Submission to the draft guideline*, October 2013, pp. 8-9; APIA; Energex; SP AusNet;
[473] ENA, *Response to the draft guideline*, October 2013, p. 69.
[474] ENA, *Response to the draft guideline*, October 2013, p. 67; QTC, *Submission to the draft guideline*, October 2013, p. 9.
[475] QTC, *Submission to the draft guideline*, October 2013, p. 10.
[476] ENA, *Response to the draft guideline*, October 2013, p. 67; QTC, *Submission to the draft guideline*, October 2013, p. 9.
[477] QTC, *Submission to the draft guideline*, October 2013, p. 9.

We note that when businesses issue debt, for example into the US Private Placement market, they often issue at the same time, multiple bonds with staggered maturities. From the observed debt portfolios we note that there have been simultaneous issues of five, seven and 10 year bonds, and 10, 12 and 15 year bonds. We also note that approximately one third of the total value of all the portfolios has been issued as floating rate notes.

As discussed in chapter seven, we consider that an efficient financing practice of the benchmark efficient entity would be to minimise the expected present value of its financing costs over the life of its assets subject to managing the associated financial risks (and subject to the regulatory regime). On this basis we have concluded that the benchmark efficient entity would have likely entered into hedging contracts to manage its interest rate risk in the current regulatory control period (that is, under the 'on the day' approach). Further, we consider that holding a (fixed rate) debt portfolio with staggered maturity dates to align its return on debt with the regulatory allowance is likely to be an efficient financing practice of the benchmark efficient entity under the trailing average portfolio approach. To achieve this the benchmark efficient entity would need to unwind its existing hedging contracts and issue new (fixed rate) debt over a transition period to gradually accumulate a portfolio that matches the trailing average regulatory return on debt allowance. Consistent with this, we consider that post transition the benchmark efficient entity is not likely to engage in an active debt management strategy using swaps.

Current regulated energy business evidence of term at issuance

Evidence provided by the businesses indicates that the current average term at issuance is 8.7 years.

We consider that the choice of term at issuance is informed by market practice given the trade-offs identified above. However, the reliance on observed practice is complicated by a change in approach to estimating the return on debt. In particular, observed practice relates to the current 'on the day' approach and this may differ under the trailing average approach.

In the explanatory statement accompanying the draft guideline, we stated that we had concerns about PwC's and CEG's analysis of debt term at issue. In the absence of actual debt portfolio information we referred to the 2009 WACC Review conclusion of an effective term of 7.4 years (consisting of 7.1 years after adjusting floating rate notes into a fixed-term equivalent and 7.4 years after adjusting floating rate notes into a fixed-term equivalent and after accounting for hedging).

ENA provided actual debt portfolio information to the AER in its response to the draft guideline. In particular, actual debt portfolio information for Envestra, ElectraNet, Multinet and United Energy, Powercor, SA Power Networks and SP AusNet was provided. Inferred debt portfolio information[478] was also provided for APA Group. ENA also collected debt portfolio information from SPIAA (parent of Jemena) and Dampier Bunbury Pipeline but excluded this information on the basis that SPIAA (parent of Jemena) is government-owned and that Dampier Bunbury Pipeline is not regulated by the AER. We sought this information from the ENA and also requested actual data for the APA Group. We also sought formal assurances, via statutory declaration, from the businesses that the information provided represented the business' full debt portfolio and accorded with its financial records. During this process we were provided with CitiPower's debt portfolio and minor amendments to maturity dates or amounts and correction of omitted instruments.

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[478] This information was drawn from APA Group's annual report, a slide presentation (dated 21 August 2013) and Bloomberg.

In reviewing the updated information we observe that the average term at issuance, calculated using each business' drawn debt share of the total sum of all entities drawn debt as weights, varied from 6.7 years to 16.3 years, but on average was 8.7 years (see Figure 8.6 and Table 8.2).

While this is a point in time estimate, we note that it has not changed considerably since the 2009 WACC Review, where the average term at issuance was 9.1 years. There are indications that the current market environment is favourable for issuing longer-term debt due to the low prevailing interest rates and increased appetite for corporate debt domestically. This would lead us to expect that the current environment is supportive of businesses issuing longer tenors. However, from 2011 (post the GFC credit tightening) we are observing tranches of offshore issues (mainly in the US private placement market) at a range of relatively short tenors. Eighty per cent of the bonds issued from 2011 had an average tenor of 10 years or less. We therefore consider that an average term of issuance around nine years is reasonably stable over time.

Figure 8.6 **Histogram of businesses' weighted average term of issuance of total debt portfolio**

Table 8.2   Energy business' debt value and term at issuance

Business	Total debt ($m)	Drawn debt ($m)	Term at issuance - drawn debt (yrs)	Term at issuance - bank debt (yrs)	Term at issuance - AUD bonds (yrs)	Term at issuance - offshore bonds (yrs)
Envestra	2,453.9	2,053.9	16.3	4.4	19.7	15.3
ElectraNet	1,520.5	1,367.8	9.0	2.7	14.8	7.8
Multinet and United Energy	3,355.8	3,062.7	7.1	4.8	8.3	8.1
CitiPower, Powercor and SA Power Networks	7,293.0	6,833.8	8.8	3.4	10.0	8.6
SP AusNet	6,289.5	5,364.5	8.6	3.6	8.4	8.8
APA Group (a)	5,307.9	4,416.3	9.2	3.0	7.5	10.7
SPIAA (parent of Jemena)	4,703.0	4,239.9	6.7	4.6	5.3	10.8
Dampier Bunbury Pipeline	2,745.0	2,540.0	6.7	4.7	8.2	N/A
Average term at issuance (all debt)	33,668.5	29,879.7	8.7	4.3	9.7	9.7

Source: AER analysis of ENA, *Submission to the draft guideline*, October 2013.
Note: (a) AER has adjusted the maturity of APA Group subordinated notes from 2072 to 2018.

The NSW DNSPs submitted that 'the corporate bond market is not sufficiently liquid to provide Australian energy network businesses with the option to issue the majority of their debt beyond 10 years' which necessitates that entities issue offshore.[479] This is supported by the business debt portfolios provided to the AER which currently have on issue:

- bank debt and commercial paper which have issuance tenors of between 1 month and 7.0 years

- Australian bonds which have issuance tenors of between 2.7 and 21.3 years

- offshore bonds which have tenors of between 4 and 30 years (see figure 8.7).

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[479]   NSW DNSPs, *Submission on the draft guideline*, October 2013, p. 12.

Figure 8.7   Businesses' term at issuance of bonds (as at 30 June-20 September 2013[a], years)

Source: ENA provided eleven business debt portfolios, AER analysis.
Note: Two businesses provided portfolio information as at 30 June 2013, eight as at 30 August 2013 and one as at 20 September 2013.

For the purposes of estimating debt yield compensation we consider that it is appropriate to consider:

- Drawn debt rather than total debt (equal to drawn and undrawn debt) as it is the cost of drawn debt that the WACC is compensating. The cost of undrawn debt is a transaction cost which is compensated through the opex building block cash flows.

- Term at issuance rather than term to maturity. Term at issuance reflects the premium associated with the original term length. An issuer must pay this premium irrespective of the premium at a subsequent point in time, as reflected by the term to maturity.

- All senior/secure debt instruments (including bank and other non-bond based debt).

In the 2009 WACC Review we adjusted the term of debt to take account of floating rate notes. At that time we observed from the sample of actual debt portfolios that floating rate debt had a lower yield than the fixed rate equivalent.[480] We consider that floating rate notes could have a different yield to fixed rate debt. This is because the risk being compensated for floating rate notes may be different to that of fixed debt due to the influence of interest rate reset risk on yields. We intend to revisit this issue at the next review of the rate of return guideline.[481]

In section 3.3.4 we stated that we considered that there should not be a separate benchmark for government-owned energy network service providers because the risk for which investors require

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[480]   AER, *Final decision: WACC review*, May 2009, pp. 158-159.
[481]   NER s.6.5.2(p), NGR r.87(16).

compensation is the same. Under competitive neutrality requirements, governments in Australia are required to charge their departments and statutory bodies a fee such that the interest rates they are exposed to are equivalent to those they would face in accessing capital without the benefit of the effective underwriting by the taxpayer. To estimate the fee, treasuries reference the debt issuances of privately-owned business at the same credit rating as the stand alone credit rating of the government energy network service provider. Given the reference to privately-owned businesses, we do not consider that any further information is provided by using government-owned energy business debt portfolio information relative to using privately-owned energy debt portfolio information.

CEG undertook analysis of the revised portfolio on behalf of ENA. It did not include Jemena or Dampier Bunbury Pipeline in its revised analysis. CEG reported a simple/weighted average term at issuance of 10.9/10.5 years.[482] This calculation of term at issuance differs from the AER's calculation of an average term at issuance of 8.7 years because we have:

- Included SPIAA (parent of Jemena) and Dampier Bunbury Pipeline debt portfolio into the calculation. These businesses both had average terms at issuance of 6.7 years.

- Adjusted APA Group's maturity date for its subordinated notes from 30 September 2072 to 30 September 2018 on the basis that this is how APA Group is representing the maturity of the bond[483] and investment commentary indicates that the expected maturity is 2018[484]. This is because at this time credit ratings agencies will no longer treat 50 per cent of this debt as equity, as is currently the case, thereby negatively impacting APA Group's credit rating.

CEG submitted that a weighted average of the entire drawn debt portfolio is likely to understate the debt used to fund the regulatory asset base. It states that an amount of short-term debt should be excluded as short-term debt is used to provide the cash balance or to fund the repayment of soon-to-mature debt.[485] After excluding an amount equal to the value of the cash and cash equivalents balance or other liquid funds it calculates a simple/weighted average term at issuance of 11.0/10.7 years.

We do not agree with CEG's submission that a portion of short-term debt (bank debt and commercial paper) may be excluded as negative cash. We consider that a cash balance will reflect a number of items, including receivables and the proceeds of asset sales, which are not debt transfers. We understand that short-term debt is primarily used by the businesses to fund new capital expenditure, until such time as a marketable parcel (approximately $500 million) is accumulated that may be refinanced by issuing longer-term (bond) debt. We also understand that businesses try to have enough residual bank debt drawn to maintain competition between a pool of banks in order to provide competitively priced capex facilities. We therefore do not consider that it is appropriate to discount short-term debt by an amount equal to cash and cash equivalents.

CEG submitted that SP AusNet should be excluded from the analysis on the basis that its debt management policy to date is likely to be affected by its majority government ownership. If it is excluded, CEG calculates a simple/weighted average term at issuance of 11.5/11.3 years. As stated above, our basis for excluding government-owned network service providers from our sample is that

[482] CEG, *Response to AER criticisms of estimates of average term of debt for the ENA*, October 2013, p. 2.
[483] See slide 23 of the Full Year Results Presentation, 21 August 2013, <www.apa.com.au/media/214600/apa fy13 presentation.pdf> accessed 25 October 2013.
[484] See Wealth Focus, *APA Group Subordinated Notes Analysis & Research*, 10 August 2012, <www.fundsfocus.com.au/managed-funds/pdfs/ipo/apa-analysis.pdf> accessed 25 October 2013; Morning Star, *APA Group Subordinated Notes (AQHHA): Piping hot margin but be comfortable with the risk!*, 13 August 2012, <www.morningstar.com.au/s/documents/20120813-APA-Group-New.pdf> accessed 25 October 2013;
[485] CEG, *Response to AER criticisms of estimates of average term of debt for the ENA*, October 2013, p. 2.

we cannot observe their cost of debt. We consider that this is not the case with SP AusNet and Jemena. SP AusNet and SPIAA have their own treasuries which raise funds in the private capital market. We can and do observe their cost of debt. Singapore Power (SP) currently holds 51 per cent of SP AusNet and 100 per cent of SPIAA (parent of Jemena[486]). These Australian assets constitute approximately 70 per cent of SP's assets. While the ratings agencies consider that SP supports SP AusNet and SPIAA, we consider that SP is likely to have similar risk to SP AusNet and SPIAA given the high weighting of the Australian regulated network service providers in the SP portfolio and that the other subsidiaries are Singapore's monopoly electricity and gas distribution and transmission network service providers. We consider SP is run as an independent company to Temasek Holdings, its holding company, who as a policy does not guarantee the financial obligations of its portfolio companies.[487] We also note that Temasek Holdings is a corporation run on a commercial basis.[488] We therefore consider that SP AusNet and SPIAA are suitable comparators and should be included in the sample used to inform the debt term at issuance.

QTC presented the debt maturity profiles of non-regulated infrastructure businesses and businesses operating in capital intensive industries. It argued that while these firms' business risk profile may differ from that of a regulated service provider, they are presented with the same requirement to refinance maturing debt or fund new investment when credit markets are unfavourable. On the assumption that a seven year term at issuance results in a 3.5 year term to maturity, QTC states that this is shorter than these firms, which have gearing less than 60 per cent.[489] However, we do not consider a term at issuance can be inferred from the series of business graphs' term to maturity data presented by QTC. We consider that more robust analysis of the data is required in order to substantiate this assertion.

Support for a 5-year debt term

The MEU, COSBOA and the Ethnic Communities' Council of NSW stated that we should consider the extensive evidence provided by the ERA that suggests that the average term of debt is closer to five years than seven years.[490]

PIAC's preference is for a five year term to match the regulatory period and, on the basis of Davis and Lally's recommendation to IPART, to achieve net present value neutrality of regulated cash flows under the building block model.[491]

PIAC and the Ethnic Communities Council of NSW state that a five year term is also more practically advantageous, leading to more accurate and consistent estimation of yields via the Bloomberg FVCs.[492]

COSBOA and the Ethnic Communities Council of NSW stated that a five year term would also lessen the need for a transition.[493]

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[486] SPIAA also holds interests in ActewAGL, United Energy Distribution and other Australian gas pipelines.
[487] Temasek Holdings (Private) Limited, 'Investor FAQs', <http://www.temasek.com.sg/investorrelations/investorlibrary/investorfaqs> accessed 3 December 2013.
[488] Temasek Holdings (Private) Limited, 'About Temasek', <http://www.temasek.com.sg/abouttemasek/faqs> accessed 3 December 2013.
[489] QTC, Submission to the draft guideline, October 2013, p. 10.
[490] MEU, Submission to the draft guideline, October 2013, pp. 33-37; COSBOA, Submission to the draft guideline, October 2013, p. 5; ECC, Submission to the draft guidelines, October 2013, p. 2.
[490] PIAC, Submission to the draft guideline, October 2013, pp. 48-51.
[491] PIAC, Submission to the draft guideline, October 2013, p. 49.
[492] ECC, Submission to the draft guidelines, October 2013, p. 2.
[493] COSBOA, Submission to the draft guideline, October 2013, p. 5; ECC, Submission to the draft guidelines, October 2013, p. 2; PIAC, Submission to the draft guideline, October 2013, p. 50.

We consider that the evidence of the term at issuance presented by the ERA is consistent with that found by us. However, the ERA has a different approach to us. It states that:[494]

> The Authority considers that it is the average remaining term to maturity that determines the debt profile of a firm at a given time. That is, the yield required to service a firm's cost of debt is a function of the remaining term to maturity, and not the term to maturity at issuance. Investors will price bonds based on the coupons they are eligible to receive, the face value of the bond and the credit risk of the bond issuer. The prior history of the bond does not determine the current market value of a bond, and therefore does not determine the current market value of a bond, and therefore does not determine the current market value of a firm's debt. Therefore, the term to maturity at issuance is irrelevant for the pricing of a firm's debt, and consequently irrelevant for determining the relevant term to maturity for estimating the risk-free rate of return.

Our preference is to use the opportunity cost of capital, rather than the new entrant cost of capital, for calculating the return on debt. This is for two reasons. Under this approach as the regulatory framework does not revalue the RAB to current market value, we do not consider that the new entrant cost is consistent with this regulatory framework. Also businesses incur a term premium on the issuance of new debt. This term premium may not be priced when the debt is sold on the secondary market. However, the business which initially issued the debt must pay the term premium for the life of the debt..

Under a trailing average approach we do not consider that the NPV neutrality objective is appropriate. We expect that a business will recover its return on debt on average over the term of the trailing average rather than over the regulatory period. An assumption of NPV neutrality over a five year regulatory period may, on average, be unlikely to equal the firms' debt financing costs.

Conclusion on the debt term

We consider that a business will, within the constraints of the market for corporate bonds, aim to match the length of the debt term to the asset life in order to minimise refinancing risk. We note, however, that this objective is subject to consideration of the increased cost of debt associated with a longer term. Businesses in their submissions indicated that the use of interest rate swaps will no longer be required under a trailing average approach. Current debt portfolio information indicates that firms are choosing weighted average debt terms of between 6.7 years to 16.3 years, but on average 8.7 years. We note that of the 11 businesses, 10 have an average term at issuance of less than ten years.

In moving to a trailing average approach we consider that we are committing to a debt term for the period nominated. To change the benchmark debt term in response to updated debt portfolio information would not be conducive to regulatory stability. In light of this, in order to ensure that the benchmark efficient entity is able to recover its efficient financing costs consistent with the allowed rate of return objective, we propose to use a 10 year debt term for the purposes of estimating the return on debt and for setting the period of the trailing average. It also means that a 10-year transition will apply.

We will, however, continue to monitor the average debt term at issuance of the regulated network service providers against the benchmark term. We will consider this information when we are assessing future transactions costs and any proposed adjustment of the return on equity.

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[494] ERA, *Explanatory Statement for the Draft Rate of Return Guidelines - Meeting the requirements of the National Gas Rules*, August 2013, p. 75.

Extrapolation—technical assessment

In the explanatory statement accompanying the draft guideline, we raised concerns over the ability to find a reliable extrapolation method for mechanistically calculating the 10-year DRP for annual updating purposes. The need for extrapolation has arisen due to the absence of a Bloomberg FVC BBB+ at the benchmark term of 10 years.

As discussed in the explanatory statement accompanying the draft guideline, in attempting to automate the AER's current paired bonds extrapolation method, we 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. We outlined that 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. We also raised that it is difficult to specify factors which would lead to the exclusion of bonds on the basis of unusual trading activity (for example, such as if the company was subject to merger and acquisition activity).

In the explanatory statement accompanying the draft guideline, we considered two alternative extrapolation methods:

- The 7-year/5-year Bloomberg Australian BBB FVC spread.

- The 10-year/7-year Bloomberg US BBB FVC spread (post swapping back to Australian dollars).

In relation to the first method, PwC noted that the extrapolation method may be inaccurate during periods of increased market uncertainty.[495] We also found that this method resulted in much larger error than other methods.[496] We commented that this method would require an overall constraint to be specified in the automation process to address the likelihood of unacceptable error. We considered that it would be difficult to specify such a constraint.

With respect to the second alternative method, we considered that there are likely to be different risk exposures for a business operating in the US compared with one operating in Australia. We therefore considered that using the US Bloomberg curves to proxy for Australia would be likely to result in unacceptable estimation error.

A number of submissions commented that they did not consider that the limitations associated with extrapolation methods should influence the choice of debt term.[497]

The ENA, based on the advice of CEG, proposed two alternative extrapolation methods:[498]

- CGS spread plus a fixed DRP spread, calculated using the AER's current paired bond approach, to be set at the determination and carried over for five years

- CGS spread plus the specification of a formula for calculating the DRP spread. The ENA points to the use of QTC's proposed formula based on the historical relationship between the 10-year DRP

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[495] PwC, *Powerlink Methodology to estimate the debt risk premium: Report to Powerlink Queensland*, April 2011, p. 11.

[496] AER, *Final decision – Public: Jemena Gas Networks, Access arrangement proposal for the NSW gas networks 2010-15*, June 2010, p. 188.

[497] APIA, *Submission to the draft guideline*, October 2013, p.33; APA Group, *Submission on the draft guideline*, October 2013, p. 34.

[498] ENA, *Response to the draft guideline*, October 2013, p. 62.

and the interest rate swap curve. The ENA stated that the formula 'need not be based on purely contemporaneous data during each annual averaging period'[499].

Box 8.1   Discussion of QTC's proposed extrapolation method

QTC's proposed method of extrapolation involves:[500]

Establishing a simple linear relationship between 7- and 10-year BBB+ credit margins from the QTC quarterly credit margin survey[501]. QTC estimated the relationship for data between March 2006 and June 2013 using linear regression. The relationship is specified as:

10 yr/7 yr BBB$^+$ SRP[502] term premium = 0.0015 + 0.0778 x 7yr BBB$^+$ SRP[503]   (1)

AFMA 7- and 10-year fixed swap mid rates (which are published daily) are used in the formula from the first step above in order to estimate the 10-year BBB$^+$ yield.

10 yr BBB$^+$ yield = 10 yr swap rate + 7 yr BBB$^+$ SRP + 10 yr/7 yr BBB$^+$ SRP term premium

10 yr BBB$^+$ yield = 10 yr swap rate + 7 yr BBB$^+$ SRP + (0.0015 + 0.0778 x 7 yr BBB$^+$ SRP)   (2)

where:

10 yr swap rate = 10 yr AFMA fixed swap mid rate

7 yr BBB$^+$ SRP = 7 yr Bloomberg BBB+ FVC debt yield - 7 yr AFMA fixed swap mid rate.

The AER has a number of concerns regarding this method:

We consider that the particular estimated relationship, specified in (1) above, may not always perform well. Importantly, we have no reality check for the QTC survey data, apart from a short period between March 2006 and September 2007 when the Bloomberg 10-year BBB FVC was available. During this short period the difference between the Bloomberg 10-year BBB FVC debt yield and the 10-year BBB debt yield estimated using QTC's method was relatively small. On average, the difference between the QTC method and the Bloomberg FVC between March 2006 and October 2007 was 1 basis point. The maximum difference was 22 basis points and the minimum difference was -11 basis points. However, we have reason to expect that this may not be the case recently. We consider there are likely to be two sources of differences. We note that over the same period the 10-year/7-year Bloomberg SRP ranged between -0.17 and 0.18 while the QTC 10-year/7-year SRP ranged between 0.16 and 0.24. In addition to significantly different levels, the shape of the curves were also quite different (see figure 8.8).

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499   ENA, *Response to the draft guideline*, October 2013, p. 64.
500   QTC, *Submission to the draft guideline*, Attachment A, October 2013, pp. 1-8.
501   QTC undertakes a quarterly credit margin survey as part of the administration of the competitive neutrality fee on behalf of Queensland Treasury and Trade, to determine credit margins on corporate debt issuance for various tenors and credit ratings. The QTC quarterly survey requests data on indicative A$ issue margins to swap for new debt issuance based on a minimum total annual borrowing program of A$1 billion, with a credit rating of AAA to BBB-, for between a 3 month and 10 year tenor and excluding margins for facility, underwriting or Commonwealth guarantees. Six debt capital market specialists are surveyed.
502   SRP is the swap risk premium. It is the margin between the annualised fixed corporate yield and the annualised fixed swap rate for the same term to maturity.
503   QTC advised of this update to the original specification of the relationship due to an error it found in its data transposition.

Figure 8.8 **Comparison of Bloomberg and survey-based SRP term premium (10-yr minus 7-yr)**

Legend:
- Bloomberg/BBSW SRP term premium (10-yr minus 7-yr)
- Average survey-based SRP term premium (10-yr minus 7-yr)
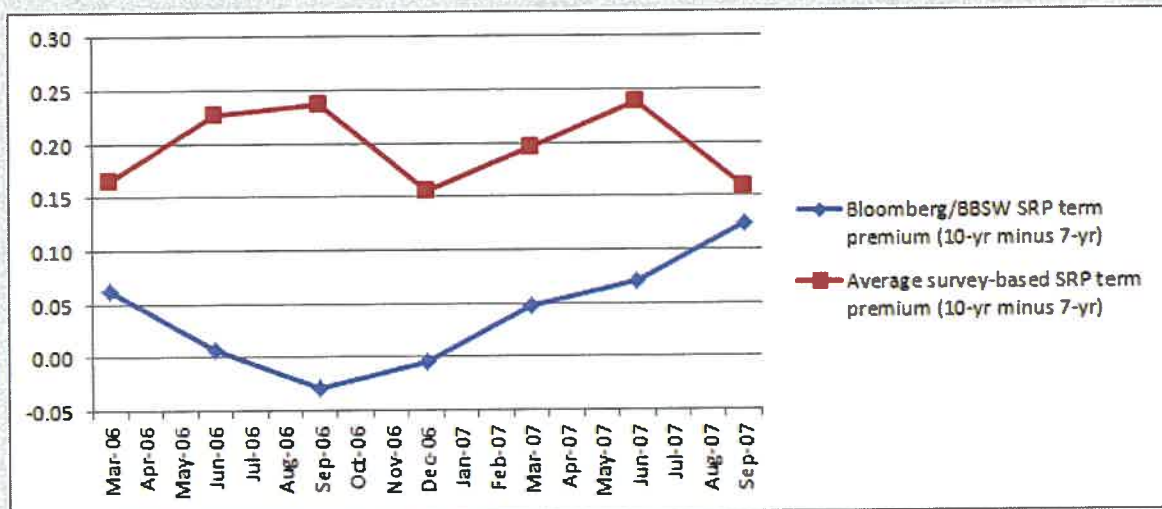
Source: QTC credit margin survey, Bloomberg, AER analysis.

Note: The Bloomberg/BBSW SRP term premium (10-yr/7-yr) is the difference between the 10-yr SRP (Bloomberg BBB+ 10-year FVC yield less the BBSW 10-year rate) and the 7-yr SRP (Bloomberg BBB+ 7-year FVC yield less the BBSW 7-year rate)

We also note that during the 2006-07 period the QTC 7-year SRP and Bloomberg 7-year SRP were closely aligned. However, it can be seen in Figure 8.9 that the 7-year QTC SRP and the 7-year BBB Bloomberg FVC/BBSW SRP have diverged frequently since July 2007. The difference between the 7-year QTC SRP and the 7-year BBB Bloomberg FVC/BBSW SRP was on average 17 basis points, between March quarter 2006 and June quarter 2013. The minimum and maximum were -219 and 113 basis points respectively (see Figure 8.9). We consider that these two sources of error margins are significant such that we do not propose to make an upfront commitment to using the QTC method in the guideline.

Figure 8.9 **Comparison of Bloomberg and survey-based 7-yr SRP**

Legend:
- Bloomberg/ BBSW SRP 7-yr
- Average survey-based 7-yr SRP
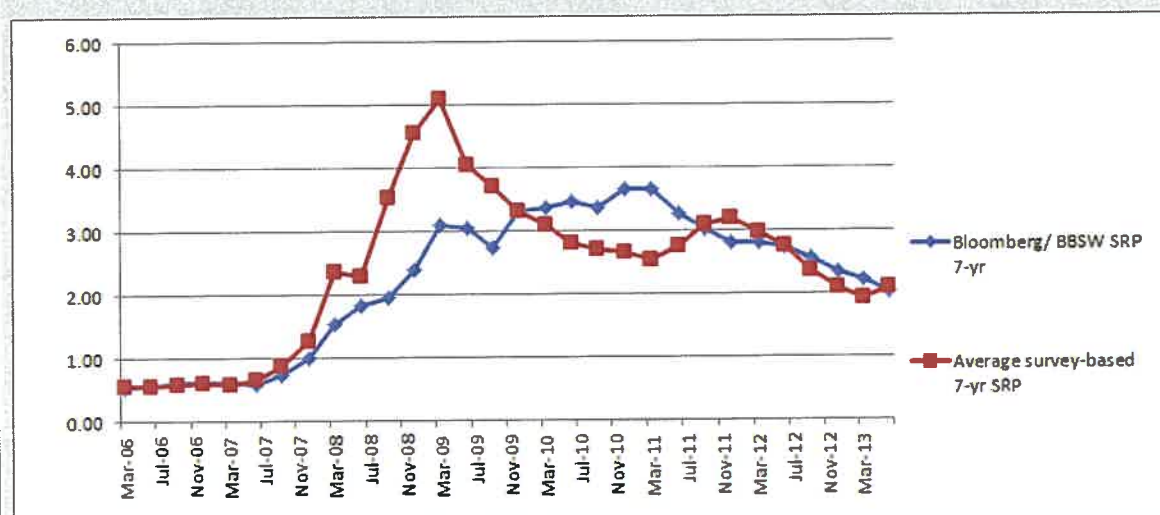
Source: Bloomberg, QTC credit margin survey, AER analysis.

Note: The Bloomberg/BBSW SRP 7-yr premium is the Bloomberg BBB+ 7-year FVC yield less the BBSW 7-year rate. The QTC SRP 7-yr is the swap risk premium reported by debt market specialists, collected quarterly by QTC.

We consider that the use of two separate datasets may result in inconsistencies. QTC survey data is used to establish the coefficients describing the relationship between the 7- and 10-year credit margins (equation (1)) for inclusion in estimating the 10-year BBB+ debt yield (equation (2)). However, as the QTC data is only available on a quarterly basis, AFMA and Bloomberg data is used to estimate the daily 10-year BBB+ yield in the second step (equation (2)). The validity of using one data set to establish the coefficients and then another data set to populate the relationship is questionable. As the data sources are different there may be inconsistencies which lead to error.

The 7-year/10-year credit margin relationship is estimated over a historical period of seven years between March 2006 and June 2013 so is not a contemporary indication of the credit margin relationship, as would be expected for annual updating. The coefficients describing the relationship are sensitive to the time period chosen.

Approximately five years of quarterly data (18 observations) is required to achieve statistical significance at a 5 per cent significance level. At this time, in advance of a determination, it is unclear whether the five years of data is representative of the conditions prevailing at the time of the annual updating of the debt yield estimate. For example, if there were to be a reversal in interest rate trends shortly before a determination, it would be unlikely to be reflected in a linear relationship estimated over 5 years. The ENA noted that the actual difference in any given period could be much greater than the long run average estimate.[504] We consider the reverse may also be true—that the actual difference in any given period could be much less than the long run average estimate.

For the reasons discussed in Box 8.1 we do not consider that it is advisable to commit to the method proposed by QTC in advance of considering the specific circumstances of a determination.

AFMA also proposed a method of extrapolation which involved:[505]

- Using the AFMA 10-year swap rate, which AFMA states would account for a significant component of the debt risk premium, and adding a margin for the BBB versus swap component at a 10-year tenor

- AFMA suggests that the margin may be calculated as the difference between the 7-year BBB Bloomberg FVC yield and the 7-year AFMA swap rate plus an additional adjustment for the 7 to 10-year BBB Bloomberg FVC yield.

The AER consider that the difficulty with this method is arriving at a consensus on estimating the additional adjustment for the 7- to 10-year BBB Bloomberg FVC yield.

Materiality of 10-year/7-year yield spread

In the explanatory statement accompanying the draft guideline, we noted that actual Bloomberg 10-year and 7-year BBB FVC yield data was only available up to October 2007. We calculated a yield spread of 21 basis points over the period for which both the 10-year and 7-year Bloomberg BBB FVC were available. However, a number of submissions stated that they considered the 10-year/7-year yield spread to be material.[506]

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[504] ENA, *Response to the draft guideline*, October 2013, p. 59.
[505] AFMA, *Submission to the draft guideline – Benchmark term of debt*, October 2013, p. 3.
[506] ENA, *Response to the draft guideline*, October 2013, p. 58; SP AusNet, *Submission on the draft guideline*, October 2013, pp. 2-3; Transgrid, *Submission to the draft guideline*, October 2013, p. 4; Energex, *Submission to the draft guideline*, October 2013, p. 2.

QTC analysed the AER's decisions from 2012 to date, which were calculated using the paired bond approach. It found an average 10-year/7-year term premium of 64 basis points.[507] APIA submitted that recent ANZ evidence on the 10-year/7-year spread on A- to A+ bonds is on average 30 basis points. It states that this creates a WACC difference of 18 basis points.[508] AFMA stated that the spread between the 10-year and 7-year swap rate for the last ten years has ranged between -23 and 40 basis points. It stated that the current spread is approximately 35 basis points. It indicated that the swap difference is only a proxy for the BBB curve spread, which is likely to be wider, as lower credits tend to have steeper curves. It stated that this indicates that the term premium is likely to be quite material at times.[509]

Conclusion on extrapolation

We note that there is no Bloomberg data beyond October 2007 against which the accuracy of an extrapolation method is able to be assessed. After this date, extrapolation methods are being compared against each other with no "truth" comparison available. It is not clear which method should be held up as the base "best performer", against which other methods should be compared.

We consider that the 10-year/7-year risk free component of debt yield is able to be robustly estimated due to the current existence and expected future existence of 10-year and 7-year CGS data. As such, whether we estimate an extrapolation of the total debt yield or separately estimate the risk free rate and DRP components (if extrapolation is required), we consider that the risk free component should be applied at the annual update.

On balance, we consider that where the 10-year/7-year BBB+ DRP component of debt yield is able to be robustly estimated in a mechanistic way that it should be applied. We consider that there are a number of alternative methods and no method addresses the issue of containing unexpected errors. For the purposes of the guideline, we do not consider that we are able to specify a method which will satisfy this requirement at the time of each determination. We therefore intend to consider the method of extrapolation (if required) for annual updating of the return on debt at a service provider's determination.

At the time of each service provider's determination we will be better placed to consider the contemporaneous performance of QTC-type specifications for extrapolation. If there continues to be a concern regarding exposure to material error in extrapolating the DRP, we will consider setting bounds on the DRP estimate, consistent with DRP estimates observed close to the time of each determination.

8.3.4 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 propose to use a benchmark credit rating of BBB+ or its equivalent to estimate the return on debt. Our position is based on:

- a single credit rating of BBB+ is consistent with the definition of the benchmark efficient entity

- the view that credit ratings should be relatively steady for businesses considered to be close comparators to the benchmark efficient entity over time

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[507] QTC, *Submission to the draft guideline*, October 2013, p. 14.
[508] APIA, *Submission to the draft guideline*, October 2013, p. 34.
[509] AFMA, *Submission to the draft guideline – Benchmark term of debt*, October 2013, pp. 3-4.

- empirical evidence of credit ratings from businesses considered to be the closest comparators to the benchmark efficient entity

- a credit rating of BBB+ is consistent with the previously adopted value.

Overall, we have informed our view by examining empirical evidence based on expanded samples which include the full sample of regulated networks and the historical rating data series. Further, we consider that as discussed in the 2009 WACC review, in considering empirical evidence, there is a trade-off in determining the length of the estimation period. In particular, older data might be considered less reflective of current risk assessments (which would suggest a shorter period) but recent data may not provide reliable (which would suggest using a longer period). On balance, we consider it reasonable to use an estimation period of at least five years consistent with our approach to estimating the equity beta. Accordingly, this analysis supports the adoption of BBB+ or its equivalent for the benchmark efficient entity.

Our reasoning is detailed below.

The definition of the benchmark efficient entity

The rate of return objective requires that the benchmark efficient entity must have a similar degree of risk as that which applies to the service provider.[510] We consider that the relevant risks between gas and electricity and transmission and distribution businesses are sufficiently similar (refer to chapter three). As such we consider that there should be a single 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 three).

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.

APA submitted that there is no basis for the use of a single credit rating, given that there is no basis for the single 'benchmark'.[511] We disagree with this view. We consider that the risks between gas and electricity and transmission and distribution businesses are sufficiently similar, as discussed in chapter three and the equity beta section in chapter six. Accordingly, we maintain a single credit rating is appropriate for a single 'benchmark'.

Median credit ratings

For the draft guideline, we derived a median credit rating from the full sample of regulated energy networks operating within Australia over the period 2002–2013.[512] The full sample comparators are listed below:[513]

- APT Pipelines Ltd

- ATCO Gas Australian LP

- DBNGP Trust

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[510] NER, cl. 6.5.2(c). It similarly applies for the Transmission Network Service Providers, see NER, cl. 6A.6.2(c).
[511] APA Group, *Submission on the draft guideline*, October 2013, pp. 35–37.
[512] AER, *Explanatory statement: Draft rate of return guideline*, August 2013, pp. 111–112.
[513] 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).

- DUET Group

- ElectraNet Pty Ltd

- Energy Partnership (Gas) Pty Ltd

- Envestra Ltd

- ETSA Utilities

- Powercor Australia LLC

- SP AusNet Group

- SPI (Australia) Assets Pty Ltd

- The CitiPower Trust

- United Energy Distribution Pty Ltd

This evidence supports a BBB+ credit rating. This analysis covered 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.

ENA and service providers recommended a BBB credit rating based on recent market evidence.[514] Envestra submitted that credit ratings are forward looking and the analysis on historical credit rating medians between 2002 and 2012 is irrelevant. Envestra stated that the main reason for this is that until 2009 the AER adopted an equity beta value of one, which provides higher equity returns and a larger cash flow buffer from which to service interest payment obligations (that is, the service provider has a stronger financial risk profile).[515] ENA also considered that there is no basis to have regard to credit ratings prior to 2008–2009.[516]

ENA also stated that there is a need to:[517]

> .....consider the interrelationships between the financial risk profile and the credit rating, and ensure the combination of allowed RoD, RoE, RoR, expenditures and related revenue building blocks in the PTRM result in FFO-to-Interest and FFO-to-Debt that are commensurate with the benchmark credit rating.

> Based on the credit matrix analysis submitted by Kanagra, recent AER's regulatory decisions have resulted in rating on the lower limit of BBB and this is below the BBB+ benchmark proposed in the draft guideline.

As we discussed in the 2009 WACC review, in the context of using empirical evidence to estimate the equity beta in determining the length of the estimation period, there is a trade-off. On one hand, older data might be considered less reflective of current risk assessments (which would suggest a shorter period). On the other hand, in order to obtain a robust and statistically reliable equity beta estimate we need to have sufficient number of observations (which would suggest a longer period). The sample of Australian businesses that can be considered close comparators to the benchmark efficient entity is limited. Therefore, one option to increase the number of observations is to consider the longest available time period. On balance, we consider it reasonable to use an estimation period of at least five years consistent with our approach to estimating the equity beta.

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[514] ENA, *Response to the draft guideline*, October 2013, pp. 73–75.
[515] Envestra, *Response to the draft guideline*, October 2013, p. 7.
[516] ENA, *Response to the draft guideline*, October 2013, pp. 73–75.
[517] ENA, *Response to the draft guideline*, October 2013, pp. 73–75.

Further, we disagree with the view that the most recent information at one point in time on credit ratings should inform the benchmark credit rating on the basis that:

- Credit ratings are relatively steady for regulated service providers over a longer period of time.

- We are unaware of evidence that supports the view that the overall financial risk profile for regulated service providers has changed since 2009 WACC review.

It is not clear that overall the financial risk profiles for service providers have changed due to the new equity beta value since last WACC review. We note while we lowered equity beta from 1.0 (and 0.9) to 0.8 since the 2009 WACC review, both MRP and gamma increased (even though gamma is not part of return of equity).[518] We are unaware of any specific financial performance thresholds which suggest that lower (higher) credit matrix outcomes will automatically result in a lower (higher) credit rating. Further, the equity beta only applies to the return on equity component of the building block revenue allowance. This means even where a service provider incurs a relatively reduced revenue requirement on this revenue component, they will still receive revenues from all other components of the building blocks, which may also change.

We are unaware of any evidence suggesting that service providers' financial risk profiles have changed since the last WACC review. On the contrary, 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.[519]

The rating agency Moody's 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:[520]

> 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 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.

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[518] Gamma changed from 0.65 to 0.25 in the 2011 Victorian electricity appeal and has remained 0.25 since. We changed the MRP in the 2009 WACC review from 6.0 per cent to 6.5 per cent for all distribution determinations, until the gas distribution determination in 2011, when MRP went back down to 6.0 per cent. For transmission network service providers, MRP has remained 6.5 per cent for all determinations since the 2009 WACC review.
[519] M. McKenzie, and G. Partington, *Risk, asset pricing models and WACC*, June 2013, p. 15.
[520] Moody's, *Industry outlook: Australian Regulated Utility Networks*, 21 February 2013, p. 8.

Further, Standard and Poor's consider that the regulatory framework itself is the most critical aspect that underlies regulated utilities' creditworthiness.[521] 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.[522] While a rating agency's exact method is proprietary, it seems likely 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.

Empirical evidence

To inform our view on the benchmark credit rating we have had regard to empirical evidence. We consider that the empirical evidence supports a BBB+ credit rating or its equivalent.

Table 8.3   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 (November 2013)	BBB

Source: AER analysis.

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). We also note that there have been some recent credit downgrades. Notwithstanding, our view is that credit ratings are relatively steady for regulated energy businesses over a period of time. Therefore, we consider a historical credit rating analysis produces a more reliable result.

In the draft guideline, we also replicated Kanangra's full sample analysis using a median credit rating approach rather than using its average approach.[523] As indicated in table 8.4, 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-.

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[521]   Standard and Poor's, *Key credit factors: Business and financial risks in the investor–owned utilities industry*, November 2008, p. 8.

[522]   Standard and Poor's, *Key credit factors: Business and financial risks in the investor–owned utilities industry*, November 2008, p. 17.

[523]   AER, *Final decision: WACC review*, May 2009, p. 267. During the last WACC review, we considered that examining median credit ratings of sample businesses was the most appropriate approach to determining a benchmark efficient credit rating.

Table 8.4   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, ENA, *Response to the AER's rate of return guidelines consultation paper, Attachment 16: Credit Ratings for Regulated Energy Network Services, table 15, KANANGRA*, June 2013, p. 25.

Note: NB: "Pos" = positive outlook.

9 Imputation credits

In this chapter, we outline our proposed position on the value of imputation credits in building block revenue determinations and their relationship to the rate of return. We set out our proposed conceptual approach for estimating the value of imputation credits (gamma)—determined as the imputation credit payout ratio multiplied by the utilisation rate. We also apply that approach to estimate a value of imputation credits.

9.1 Issue

Under the Australian imputation tax system, investors receive an imputation credit for income tax paid at the company level.[524] For eligible investors, 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 affects the estimation of building block revenue allowances. However, the manner in which imputation credits are accounted for 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, the value of imputation credits is a WACC parameter. In contrast, under a post-tax WACC framework, the value of imputation credits is not a WACC parameter.[525] 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.[526]

9.2 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 investors through utilisation of imputation credits. This is consistent with the Officer framework, which models the value of imputation credits via the parameter gamma (usually labelled using the Greek letter, γ):[527]

> γ [gamma] is the proportion of tax collected from the company which gives rise to the tax credit associated with a franked dividend.

Further, and consistent with the Monkhouse formula, we propose to estimate gamma as the product of two parameters:[528]

- The payout ratio, which is the proportion of imputation credits generated by the benchmark efficient entity that are distributed to investors.[529] In estimating the payout ratio, our proposed approach primarily considers tax statistics (on franking account balances).

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[524] See *Income Tax Assessment Act 1997*, parts 3–6.
[525] However, in estimating the MRP, the AER 'grosses up' the measurement of observed excess returns (from capital gains and dividends) to consistently value the imputation credits distributed with those dividends. This is to be consistent with a framework that is after company tax but before personal tax.
[526] NER, cl. 6.5.3, NER, cl. 6A.6.4 and NGR r.87A.
[527] R. Officer, 'The cost of capital of a company under an imputation tax system', *Accounting and finance*, May 1994, vol. 34(1), p. 4.
[528] See P. Monkhouse, 'The Valuation of Projects Under the Dividend Imputation Tax System', *Accounting and finance*, 1996, vol. 36(2), pp. 185–212.
[529] The imputation credit payout ratio is distinct from the dividend payout ratio, which is the proportion of available firm free cash flow distributed to equity holders via dividends. This choice of terminology is consistent with the draft guideline and

- The utilisation rate, which is the extent to which investors can use the imputation credits they receive to reduce their personal tax.[530] In estimating the utilisation rate, our approach considers implied market value studies, including both dividend drop off studies and alternative market value studies. Our approach also considers equity ownership, tax statistics, conceptual analysis and other supporting information.

We propose that gamma be set with regard to a benchmark efficient entity informed by market wide behaviour rather than with regard to industry or firm specific values.

Applying this approach, we propose to adopt 0.5 as the value of imputation credits. This is the product of:

- A payout ratio of 0.7. This is NERA's estimate for the payout ratio, based on taxation statistics.[531]

- A utilisation rate of 0.7. We have chosen this value with regard to the alternative estimation approaches presently before us, and their relative strengths and weaknesses. In particular, we have higher regard to those approaches that:

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

  - Are simpler and more transparent

  - Produce reasonable estimates in light of empirical realities and conceptual considerations. These are namely that, most investors are eligible to redeem imputation credits and that investors in the possession of imputation credits have the incentive to redeem them.

The estimation approaches we considered were:

- The equity ownership approach, which suggests a utilisation rate of 0.7 to 0.8. We have significant regard to this approach. This is primarily because we consider that it is consistent with our interpretation of the conceptual framework provided by Officer and Monkhouse. This approach is also simple, intuitive and uses a relatively transparent source of data.

- Tax statistics studies, which suggest a utilisation rate of 0.4 to 0.8. We have regard to this approach. This is mainly because we consider it is consistent with our interpretation of the conceptual framework provided by Officer and Monkhouse. However, we acknowledge that the authors of some of these studies report problems with data quality and consistency.

- Implied market value studies, which suggest a utilisation rate of 0 to 0.5. We have somewhat less regard to this approach. This is mainly because we consider it is not consistent with our interpretation of the conceptual framework provided by Officer and Monkhouse. It also employs complex and sometimes problematic estimation methodologies.

- The conceptual goalposts approach, which suggest a utilisation rate of 0.8 to 1.0. This is not an empirical estimation approach like the three above. Rather, this approach suggests there are

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most submissions on this issue. It is sometimes called the distribution rate or the access fraction, and in equations is sometimes referred to using the symbol F.

[530] More formally, as set out below, the utilisation rate is the complex weighted average (by value and risk aversion) of individual investors' utilisation rates. In turn, these reflect each investor's expected ability to use imputation credits to reduce their tax (or get a refund).

[531] NERA, *The payout ratio: A report for the Energy Networks Association*, June 2013.

conceptual boundaries for estimates of the utilisation rate. That is, the utilisation rate should produce a return on equity that lies between the return on equity under complete market segmentation and the return on equity under complete market integration.[532] Estimates of the utilisation rate in the range 0.8 to 1.0 meet this test.[533]

- Other supporting evidence, including observations about market practice, government tax policy, and imputation equity funds.

On balance, we consider that an estimate for the utilisation rate of 0.7 reasonably reflects the estimates produced by the alternative approaches presently before us. This is with due regard to the strengths and weaknesses of each approach. The equity ownership approach, to which we have most regard, suggests a utilisation rate of 0.7 to 0.8. Taxation studies, to which we have regard, suggest estimates of 0.4 to 0.8. These give us some cause to consider that a reasonable estimate lies closer to 0.7 than 0.8. We have less regard to implied market value studies and the conceptual goalposts approach. However, the former suggests the utilisation rate might be lower than 0.7, and the latter suggests it might be higher than 0.7. In view of the limitations of these final two approaches, and the offsetting directional implications, we consider our estimate is reasonable.

9.3 Reasons for approach

We consider that our approach is reasonable because it:

- is consistent with our interpretation of the conceptual framework for the value of imputation credits provided by Officer and Monkhouse

- is consistent with the role of imputation credits in the regulatory framework, as this framework reflects the Officer framework

- estimates parameters on a market-wide basis, and this is supported by stakeholders and an expert review from Lally

- estimates the payout ratio in a manner that is simple and intuitive, uses long-term, published data, and is supported by stakeholders and an expert review from Lally

- estimates the utilisation rate in manner that recognises the strengths and weaknesses of the existing body of utilisation rate estimates.

9.3.1 The conceptual framework for the value of imputation credits

We have re-evaluated the conceptual task of estimating the value of imputation credits. In this section, we discuss the results of this analysis.

Imputation credits are an additional return to investors, beyond the capital gains and dividends they receive from owning shares. Under the rules, the value of imputation credits is applied as a reduction to the estimated cost of corporate income tax.[534] This is because some of the tax that the company pays generates imputation credits. Where investors receive and redeem these imputation credits, the

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[532] Under complete segmentation, there are no foreign investors in domestic equity and no domestic investors in foreign equity. Under complete integration, domestic and foreign equity markets (and investors) are completely integrated.
[533] M. Lally, *The estimation of gamma*, 23 November 2013, pp. 46–47 (Lally, *The estimation of gamma*, November 2013).
[534] NGR, r. 87A; NER, cl. 6.5.3 and NER, cl. 6A.6.4.

government reduces their tax liability or pays them a cash refund to the face value of the credit.[535] Further, to operate consistently with the rate of return, the value of imputation credits should fit within the Officer and Monkhouse frameworks in the presence of imputation credits.[536]

Those frameworks require that:

- The value of imputation credits is investors' expected reduction of effective company tax paid because of h imputation credits. Specifically, this is the reduction of company tax measured before personal tax.

- The value of imputation credits is calculated as a weighted average across investors in the defined market.[537] Specifically, investors are weighted by their value of shares owned and their risk aversion.[538] Consequently, 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, all investors collectively set the market price, to the extent they participate in the defined market. Consistent with the 2009 WACC review, we propose that the defined market is an Australian domestic market that recognises the presence of foreign investors to the extent they invest in the Australian market.[539] This definition reflects the realities of capital markets. It also sits between the purely theoretical definitions of a 'fully segregated' and a 'fully integrated' market. This definition has critical implications for the value of imputation credits.

- The CAPM assumes investors value the equity returns over the full CAPM period, with no trading during that period.[540] In reality, trading is ongoing. However, where the model's inputs draw on trading data, it is important that this data has arisen throughout the trading year. This ensures that the data is not especially sensitive to any specific trading circumstances at particular times.

To varying extents, these framework requirements relating to the conceptual task have been discussed in past regulatory analysis.[541] 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.[542]

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. The debate has also solely relied on a particular class of evidence that has a number of significant limitations.[543] 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.

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[535] 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.

[536] See R. Officer, 'The cost of capital of a company under an imputation tax system', *Accounting and finance*, May 1994, vol. 34(1), pp. 1–17; P. Monkhouse, 'The cost of equity under the Australian dividend imputation system', *Accounting and finance*, November 1993, vol. 33(2), pp. 1–18.

[537] See, for example: P. Monkhouse, 'The cost of equity under the Australian dividend imputation system', *Accounting and finance*, November 1993, vol. 33(2), pp. 1–18; M. Lally and T. van Zijl, 'Capital gains tax and the capital asset pricing model', *Accounting and finance*, July 2003, vol. 43(2), pp. 187–210.

[538] See M. Lally and T. van Zijl, 'Capital gains tax and the capital asset pricing model', *Accounting and finance*, July 2003, vol. 43(2), p. 192.

[539] AER, *Final decision: WACC review, May 2009*, pp. 97–101.

[540] 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*, February 1965, vol. 47(1), p. 15.

[541] For example: Handley, *Further comments on imputation credits: A report prepared for the AER*, April 2009, p. 12.

[542] This includes the analysis in the 2009 WACC review (including the material submitted by stakeholders) and in the regulatory decisions that were the subject of Tribunal appeal in 2010 and 2011.

[543] See 'Implied market value estimates' in section 9.3.5.

Much of the regulatory debate from the 2009 WACC review and the Tribunal review focused on evaluating detailed technical issues around specific studies or pieces of evidence. It would have assisted us and the Tribunal to have taken a step back from the detail and to have started from a better conceptual understanding of imputation credits within the building block revenue model. The Tribunal stated:[544]

> 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.

In responding to the Tribunal's comments, we have now considered the questions raised in McKenzie and Partington's March 2011 report.[545] We have also 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 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.

9.3.2 The role of imputation credits in the regulatory framework

Under the rules, we are 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.[546] 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. It also includes 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 own the service provider's benefits from its operating profits, and/or capital gains. As an example, holding all else constant, if a service provider paid tax but was not compensated for its taxation expense, this shortfall would reduce the pool of funds available for reinvestment or for distributing dividends to investors. Therefore, all building block revenue allowances ultimately affect the total return to investors. In this way, increasing or decreasing a building block revenue component will increase or decrease the return to investors, all else being equal.

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[544] Australian Competition Tribunal, *Application by Energex Limited (No 2) [2010] ACompT* October 2010, paras 149, 150.
[545] M. McKenzie and G. Partington, *Report to the AER: Response to questions related to the estimation and theory of theta*, 7 March 2011.
[546] NER, cl. 6.4.3; NER, cl. 6A.5.4; NGR, r. 76.

One important expense that a company faces is taxation. An allowance for taxation can be estimated as a separate building block allowance, or through the rate of return. Either way, the service provider and, ultimately investors are compensated for the company's tax liability. The difference is only how this return is presented. The rules specify that the AER must estimate a nominal vanilla rate of return.[547] Amongst other things, this means the return on capital does not include an allowance for the cost of taxation.[548] 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.[549]

The cost of company tax rule

The electricity distribution rule governing the cost of company tax includes this adjustment.[550]

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

The electricity transmission rules and gas rules contain equivalent provisions.[551]

This formula can be broken down into two components which explain the intuition of the rule:

- $(ETI_t \times r_t)$ is an estimate of the benchmark efficient entity's tax payments to the government.

- $(1 - \gamma)$ 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 investors through imputation credits.

9.3.3 Selection of market–wide, industry–wide or firm–specific basis of estimation

A key question is whether to estimate gamma on a market–wide, industry–wide or firm–specific basis. Consistent with the draft explanatory statement and the 2009 WACC review, we propose to estimate gamma (and its components) as a market-wide parameter.[552]

We propose to continue estimating gamma as a market-wide parameter. This is because:

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[547] NGR, r. 87; NER, cls. 6.5.2, 6A.6.2.
[548] 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.
[549] See appendix H.
[550] NER, cl. 6.5.3
[551] NGR, r. 87A and NER, cl. 6A.6.4.
[552] AER, *Final decision: WACC review*, May 2009, p. 421.

- Estimating the utilisation rate on a market-wide basis is consistent with our interpretation of the nature of this parameter in the Officer framework. In his report, Lally explains why, conceptually, the utilisation rate is a market-wide parameter under the Officer framework.[553]

- We prefer to estimate the payout ratio on a market-wide basis given the likely problems presented by estimating it on either a firm-specific or industry-wide basis. Lally's recent report supports this position.[554]

- Stakeholders supported estimating gamma as a market-wide parameter.[555]

Lally demonstrates that, in the Officer framework, the utilisation rate is a market-level parameter while the distribution rate (that is, the payout ratio) is a firm-specific parameter.[556] Therefore, the utilisation rate should be estimated on a market-wide basis. For the payout ratio, however, Lally suggests that firm-specific estimation would present the following problem:[557]

> However firm-specific estimates of the distribution rate are subject to the difficulty that, if the firm's dividends are fully franked, then the firm will be able to manipulate (raise) its price or revenue cap by reducing its dividends (so as to reduce its distributed credits, which lowers its distribution rate and therefore raises its cost of capital estimated from the Officer model used by regulators).

Lally suggests that the alternatives, industry-wide or market-wide estimation, represent a trade-off between statistical reliability versus potential bias.[558] On current evidence, and from a pragmatic perspective, Lally favours market-wide estimation.[559]

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.[560] There were also no further substantive comments from stakeholders on this question in submissions to the draft guideline.[561]

9.3.4 The payout ratio

We propose to apply the cumulative payout ratio approach (based on taxation statistics) to estimate the payout ratio. Applying this approach, we propose to adopt a payout ratio of 0.7.

Consistent with our analysis in the explanatory statement accompanying the draft guideline, we consider that the cumulative payout ratio method is likely to produce a reasonable estimate of the payout ratio. This is because:

- it is simple and intuitive

- it uses long-term, published data

- it was broadly supported in submissions to the consultation paper, and there were no further substantive comments on the payout ratio in submissions to the draft guideline[562]

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553   Lally, *The estimation of gamma*, November 2013, pp. 10–11.
554   Lally, *The estimation of gamma*, November 2013.
555   For example, see: ENA, *Response to AER rate of return guideline consultation paper*, 28 June 2013, p. 82.
556   Lally, *The estimation of gamma*, November 2013, pp. 10–11.
557   Lally, *The estimation of gamma*, November 2013, p. 50.
558   Lally notes that bias 'will arise if industry or market-level data are used because the parameter value varies over firms. Industry-level data is likely to be less biased because firms within the same industry are likely to be less variable than firms in general'. M. Lally, *The estimation of gamma*, 23 November 2013, pp. 50–51.
559   Lally, *The estimation of gamma*, November 2013, p. 54.
560   ENA, *Response to AER rate of return guideline consultation paper*, 28 June 2013, p. 82.
561   However, regarding the rate of return guideline as a whole, some stakeholders argue against the use of a single benchmark entity. These arguments are considered in chapter 3.

- it is supported by Lally's report on our estimation of gamma in the explanatory statement accompanying the draft guideline.[563]

Further, we note that, based on current evidence, the method produces a value for the payout ratio that is consistent with that previously determined by the Tribunal (that is, 0.7).[564]

The payout ratio is the proportion of imputation credits that the benchmark company or market distributes, out of the total credits it generates. 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 one dollar of imputation credits per one dollar of tax they pay, this is equivalent to the value of imputation credits distributed divided by the total value of company tax paid.

In section 9.3.3, we consider it is preferable to estimate the payout ratio as a market-wide parameter for practical reasons. This section sets out our approach to estimating the payout ratio on a market-wide basis.

As noted above, we propose the cumulative payout ratio method be used to estimate the payout ratio. 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. Using this method, NERA estimates the cumulative payout ratio from 1987–88 to 2010–11 as 0.7.[565]

We have also considered whether the payout ratio might be rising over time. We do not find the current evidence conclusive. However, we propose that future consideration is warranted regarding our previous suggestion that a payout ratio of 0.7 was more likely to understate than overstate a forward looking payout ratio.[566]

9.3.5 The utilisation rate

The utilisation rate is the before-personal-tax reduction in company tax per one dollar of imputation credits that the representative investor receives. For this 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, implied market value studies and the conceptual goalposts approach. With current evidence, we consider this suggests a utilisation rate of 0.7. This is a departure from the value for the utilisation rate that the Tribunal adopted. In light of only one source of evidence which it considered in 2011, the Tribunal determined that the utilisation rate should be 0.35.[567] This estimate was based on a single dividend drop off study.[568]

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562   ENA, *Response to AER rate of return guideline consultation paper*, 28 June 2013, p. 83; APIA, *Submission on the 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; FIG, *Response to the consultation paper*, 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.
563   Lally, *The estimation of gamma*, November 2013, pp. 4–5.
564   Australian Competition Tribunal, *Application by Energex Limited (Distribution Ratio (Gamma)) (No 3) [2010] ACompT 9*, 24 December 2010, para 4.
565   NERA, *The payout ratio: A report for the Energy Networks Association*, June 2013, p. ii. Also, see appendix H for our analysis of the NERA report.
566   See appendix H for a more detailed discussion.
567   Australian Competition Tribunal, *Application by Energex Limited (Gamma) (No 5) [2011] ACompT 9*, May 2011, para 42.

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, various implied market value estimates, and the conceptual goalposts approach.

The representative investor and observed utilisation estimates

We consider 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). We consider this relationship is critical in assessing what we are estimating and which estimation methods are 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[569]

- 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 9.3.1, and further in appendix H. 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. This was with an incomplete conceptual framework. The Tribunal acknowledged this incomplete framework at several points in its reasons.[570]

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.[571]

    - 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

568 SFG, *Dividend drop-off estimate of theta, Final report, Re: Application by Energex Limited (No 2) [2010] ACompT 7,* 21 March 2011.

569 R. Officer, 'The cost of capital of a company under an imputation tax system', *Accounting and finance,* May 1994, vol. 34(1), pp. 1–17; P. Monkhouse, 'The cost of equity under the Australian dividend imputation system', *Accounting and finance,* November 1993, vol. 33(2), pp. 1–18; M. Lally and T. van Zijl, 'Capital gains tax and the capital asset pricing model', *Accounting and finance,* July 2003, vol. 43(2), pp. 187–210; and M. Lally, 'The CAPM under dividend imputation', *Pacific accounting review,* December 1992, vol. 4(1), pp. 31–44.

570 We have summarised the Tribunal's commentary in appendix H.

571 See, for example: P. Monkhouse, 'The cost of equity under the Australian dividend imputation system', *Accounting and finance,* November 1993, vol. 33(2), pp. 1–18; and M. Lally and T. van Zijl, 'Capital gains tax and the capital asset pricing model', *Accounting and finance,* July 2003, vol. 43(2), 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 the utilisation rate (a dividend drop off study) does not produce an estimate for the representative investor. This is because dividend drop-off studies give the value weighted investor's valuation of imputation credits:

- Based on the combined package of imputation credits, dividends, and other entitlements (unless adjusted for). That is, a 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 H.

- 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

Consistent with the 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 or even a definitive approach. Rather, we propose to consider the range of expert estimates and opinions on the utilisation of imputation credits. This section addresses:
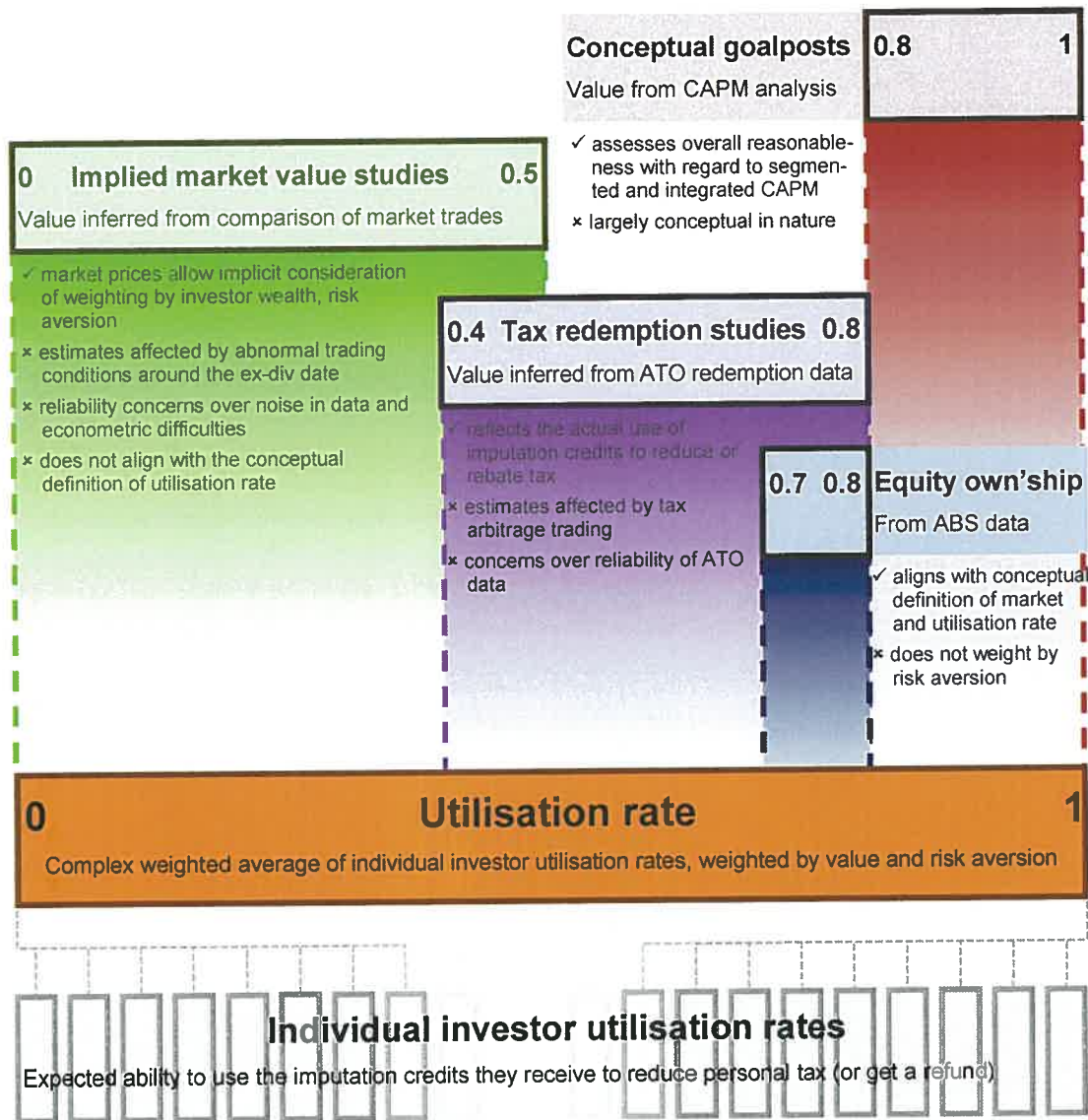
- the equity ownership approach—on current evidence, this suggests an estimate between 0.7 and 0.8

- tax statistic estimates—on current evidence, these suggest an estimate between 0.4 and 0.8

- implied market value studies—on current evidence, these suggest an estimate between 0 and 0.5

- conceptual goalposts approach—on current evidence, this suggests an estimate between 0.8 and 1.0

- other supporting evidence—including observations about market practice, government tax policy, imputation equity funds, which do not suggest a specific quantitative estimate.

Having considered all of these sources of evidence with regard to their strengths and weaknesses, we propose to apply a utilisation rate of 0.7. We consider this approach is consistent with McKenzie and Partington's recommendation to 'triangulate' different sources of evidence.[572] 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.

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[572]   M. McKenzie and G. Partington, *Report to the AER, Evidence and submissions on gamma*, 25 March 2010, p. 4.

The following diagram sets out the main sources of evidence and some of their key strengths and weaknesses. It does not include the supporting evidence which, though it might provide some qualitative information, does not produce a reasonable quantitative estimate.

Figure 9.1   Overview of different approaches to estimating the utilisation rate

| Conceptual goalposts | 0.8 | 1 |

Value from CAPM analysis

✓ assesses overall reasonable-ness with regard to segmented and integrated CAPM
× largely conceptual in nature

| 0   Implied market value studies   0.5 |

Value inferred from comparison of market trades

✓ market prices allow implicit consideration of weighting by investor wealth, risk aversion
× estimates affected by abnormal trading conditions around the ex-div date
× reliability concerns over noise in data and econometric difficulties
× does not align with the conceptual definition of utilisation rate

0.4 Tax redemption studies 0.8

Value inferred from ATO redemption data

✓ reflects the actual use of imputation credits to reduce or rebate tax
× estimates affected by tax arbitrage trading
× concerns over reliability of ATO data

| 0.7 0.8 | **Equity own'ship** |

From ABS data

✓ aligns with conceptual definition of market and utilisation rate
× does not weight by risk aversion

| 0 | **Utilisation rate** | 1 |

Complex weighted average of individual investor utilisation rates, weighted by value and risk aversion

Individual investor utilisation rates

Expected ability to use the imputation credits they receive to reduce personal tax (or get a refund)

Source: AER analysis.

Figure 9.1 shows that several of the different estimation approaches produce broad ranges of possible utilisation rates. As a set, the different approaches generate estimates that span the entire range of possible utilisation rates, from 0.0 to 1.0. There is relatively little overlap between them, and no common core of possible utilisation rates that is included in every approach. Every available approach has weaknesses that result in each approach providing a flawed picture of the true utilisation rate we seek to estimate.

We engaged Associate Professor Lally of the Victoria University of Wellington to undertake a critical review of the imputation credit related sections of the draft guideline. Associate Professor Lally assessed the strengths and weaknesses of each of the five approaches (see table 9.1), and

presented his expert opinion on the utilisation rate estimate arising from each of the first four approaches. He considered that the material underlying the fifth approach (other supporting evidence) could not be used to generate a reasonable estimate of the utilisation rate. He also included a reasonableness check that was closely aligned to his first approach (consistency with the conceptual definition).

Table 9.1   Summary of utilisation rate approaches in the Lally report

Method for estimating the utilisation rate	Lally estimate	Notes on Lally report
1. Conceptual definition	1.0	This is Lally's preferred approach. It is also linked to the reasonableness check below.
2. Equity ownership approach	0.7	This is Lally's second best option.
3. Tax statistics studies	0.40–0.80	The midpoint of the range (0.60) is referenced when deriving a point estimate.
4. Implied market value studies	0.39 (average)	Lally takes an average of the most relevant studies, after excluding implausible results.
5. Other evidence (including market practice)	NA	Lally notes some recent evidence indicates 0.75, but no robust estimate can be derived from this type of evidence.
Reasonableness check (conceptual goalposts)	1.0, or close to it.	New approach suggested by Lally, involves comparison of the return on equity between (full) segmentation and (full) integration.

Source: M. Lally, *The estimation of gamma*, 23 November 2013, pp. 3–4, 15–16, 46–47.

Table 9.1 shows that Lally's preferred option is to follow approach one (conceptual definition). His second preference is to follow approach two (equity ownership approach). Lally's third best option was to take an average of the first four approaches (1.0, 0.7, 0.6 and 0.39), but applying less weight to options three and four. Here is Lally's conclusion:[573]

> Using the three criteria described above, my preferred estimate is 1 from the [conceptual definition] approach and my second preference is 0.70 from the [equity ownership] approach. If these three criteria were rejected, I would favour use of the results from the first four approaches, with values of 1, 0.70, 0.60 and 0.39; the problems associated with the [implied market value and tax statistics studies] warrant a lower weighting than on the other methods and therefore an estimate for *U* [the utilisation rate] of about 0.80.

To aid readability, in this quote we use our labels for each of the approaches (in the original quote Lally refers to the approaches only by number). Lally's overall conclusion is that the utilisation rate should be 0.7, 0.8 or 1.0.

Our evaluation of these approaches has changed since the draft guideline, in response to submissions and also as a result of Associate Professor Lally's critical review. In summary:

- Our assessment of the equity ownership approach has changed to reflect updated Australian Bureau of Statistics (ABS) data. It has also changed to recognise that there is unlikely to be a bias arising from the clientele effect. In the draft guideline, we considered that this approach supported an estimate of 0.7. This estimate has now increased slightly to the range 0.7–0.8.

- Our assessment of tax statistic estimates responds to submissions but does not include major changes. In the draft guideline, we considered this approach suggested an estimate of 0.45–0.8.

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573   Lally, *The estimation of gamma*, November 2013, p. 4

This estimate has now altered slightly to the range 0.4–0.8. This primarily reflects an intention to avoid inappropriate specificity.

- Our assessment of implied market value studies has changed to more explicitly reflect the strengths and weaknesses of individual studies. Consistent with the draft guideline, we still consider it inappropriate to rely upon just one study (even if it were possible to resolve which study was the best available estimate). However, it would be incorrect to imply that all studies had equal strengths and weaknesses. In the draft guideline, we considered that this approach suggested an estimate of 0.0 to 1.0. This estimate has now altered considerably to the range 0.0–0.5.

- The conceptual goalposts approach has arisen from submissions and consultant reports in the period since the draft guideline. Therefore, we did not report this approach in the draft guideline. The primary basis for our conceptual goalposts approach is the reasonableness check presented by Lally. However, it is also linked to the 'conceptual definition' approach he advocates.

- Our assessment of the other supporting evidence continues to reflect the difficulty in establishing a quantitative estimate from this approach, which is largely qualitative or anecdotal in nature.

Table 9.2 sets out the differences between the AER's position in the draft guideline and our current approach.

Table 9.2   Comparison of utilisation rate approaches in the draft and final guideline

Method for estimating the utilisation rate	Draft guideline	Final guideline	Notes on change from draft to final
Equity ownership approach	0.7	0.7–0.8	Minor change reflects new data from ENA
Tax statistics studies	0.45–0.8	0.4–0.8	Minor change reflects level of precision in data, including consideration of ENA submissions
Implied market value studies	0.0–1.0	0.0–0.5	Major change reflects evaluation of strengths and weaknesses of individual studies, reflects comments made by ENA and Lally
Conceptual goalposts approach	NA	0.8–1.0	New approach suggested by Lally, responds to ENA submissions
Other evidence	NA	NA	Largely qualitative, so not used to derive a specific figure.

Source: AER, *Better regulation, Explanatory statement, Draft rate of return guidelines*, 30 August 2013, p. 119; AER analysis.

Based on the available evidence, including the strengths and weaknesses of each of the approaches set out above, we propose to adopt a utilisation rate of 0.7. The expert advice from Associate Professor Lally suggests that our determination of a utilisation rate of 0.7 is reasonable, based on the evidence currently available.

The rest of this section sets out the basis for each of the five approaches, and the result of applying each approach in current market conditions.

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 one dollar per dollar

of credit they receive. In contrast, ineligible investors reduce company tax by zero dollars per dollar of credit they receive.

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. So the proportion of equity held by domestic investors (instead of foreign investors) provides an estimate of the underlying utilisation rate. We refer to this approach as the 'equity ownership approach'.

In the explanatory statement accompanying the draft guideline, we relied upon an estimate that domestic investors held 71 per cent of Australian equity.[574] This was based upon a 2007 feature article by the ABS.[575] We also stated that we would seek to update this estimate for the final guideline.

The September 2013 report by Hathaway provides updated domestic to foreign equity ownership percentages, on a year-by-year basis from 1988 to 2012.[576] These percentages are drawn from the same underlying ABS statistical tables as the 2007 feature article we previously referenced. Hathaway calculates that across the last 24 years, the percentage of Australian equity held by domestic investors has moved between a relatively narrow band between 75 per cent and 81 per cent. This is shown in the following graph from Hathaway's report. We note that the right hand axis shows the percentage of *foreign* ownership of Australian equity. This is, between 25 per cent and 19 per cent.

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[574] AER, *Explanatory statement: Rate of return guideline*, August 2013, p. 130.
[575] 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
[576] Hathaway makes no explicit comment on the use of the 'equity ownership' approach to estimate the utilisation rate; these equity ownership percentages are presented in the context of describing the overall flow of imputation credits. See N. Hathaway, *Imputation Credit Redemption ATO data 1988-2011, Where have all the credits gone?*, September 2013, pp. 16–21.

Figure 9.2   Foreign ownership of Australian equity, calculated from ABS data by Hathaway

Rest of World holding of Australian Equity
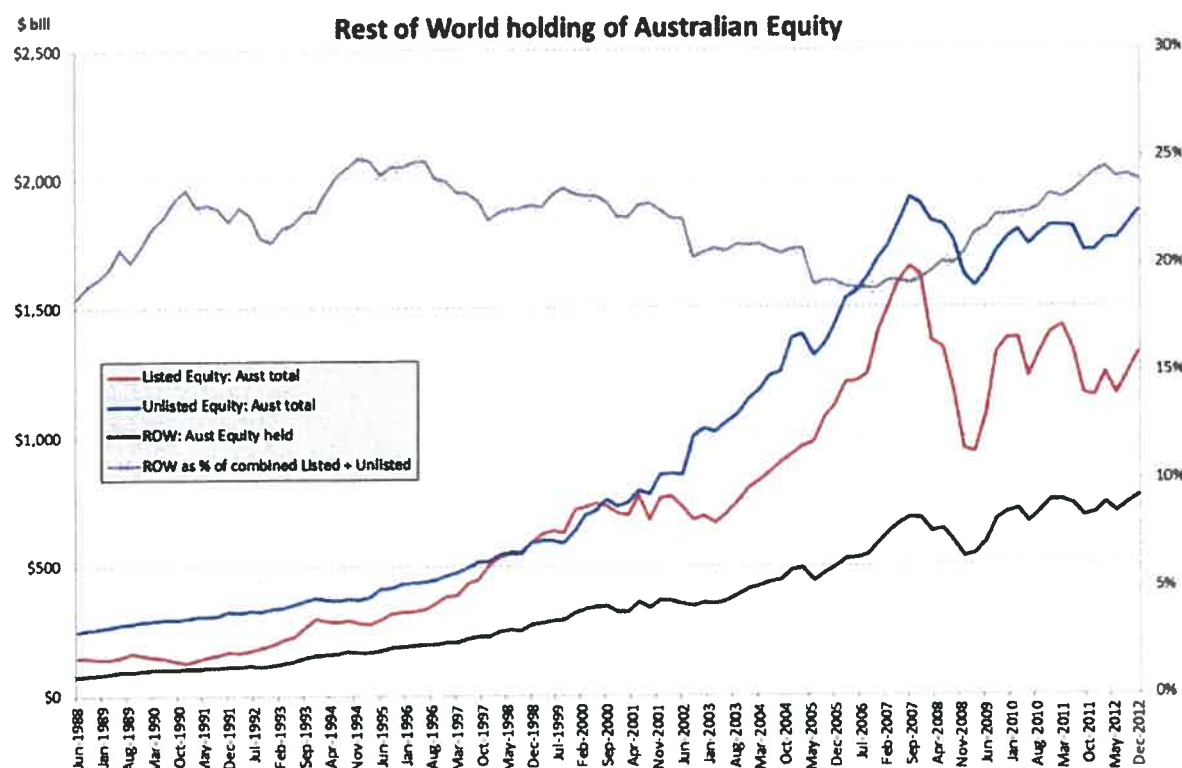
Source: N. Hathaway, *Imputation credit redemption: ATO data 1988-2011, Where have all the credits gone?*, September 2013, p. 19 (figure 5).

Even though they are both drawn from ABS data, Hathaway's estimates do not align with the reported ABS figures (in their 'feature article') for the period where they overlap. For example, the ABS reported the domestic ownership percentage as constant at 71 per cent from 2004 to 2007. This is when Hathaway has the equivalent figure moving around 80 per cent. Given they are the primary authors of this data, the ABS reported figures might be considered more reliable. However, the Hathaway data is more recent, and may reflect revisions (corrections) to the ABS data since 2007.

In view of this evidence, we consider that estimates of the utilisation rate based on the equity ownership approach lie in the range 0.7 to 0.8. This assessment has changed slightly since the draft guideline. In the draft guideline, we considered that the equity ownership approach indicated a point estimate of 0.7.

In his review, Lally considers that this estimation technique aligns with our conceptual framework:[577]

> In respect of estimating U *[the utilisation rate]*, the AER draws upon three principal methods. The first of these is the equity ownership approach, in which U is estimated as the proportion of Australian shares held by Australians (AER, 2013, section 8, pp. 120-131). Since U is a value-weighted average over investors, and the AER includes foreigners in this set, and foreigners can't use the credits (except through tax arbitrage, which is heavily constrained by legislation), and virtually all local investors can fully utilise them, it follows that U is the proportion of Australian shares held by Australians. Drawing upon data from the Australian Bureau of Statistics (2007), the estimate is 70%. With the inclusion of foreigners in the relevant set of investors, this methodology for estimating U follows directly from the AER's definition of U.

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[577]   Lally, *The estimation of gamma*, November 2013, p. 16.