



FINAL DECISION
Murraylink transmission
determination
2018 to 2023

Attachment 3 – Rate of return

April 2018

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Note

This attachment forms part of the AER's final decision on Murraylink's transmission determination for 2018–23. It should be read with all other parts of the final decision.

The final decision includes the following documents:

Overview

Murraylink transmission determination 2018–2023

Attachment 1 – Maximum allowed revenue

Attachment 2 – Regulatory asset base

Attachment 3 – Rate of return

Attachment 5 – Regulatory depreciation

Attachment 6 – Capital expenditure

Attachment 8 – Corporate income tax

Attachment A – Negotiating framework

Attachment B – Pricing methodology

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Shortened forms

Shortened form	Extended form
AARR	aggregate annual revenue requirement
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
ASRR	annual service revenue requirement
augex	augmentation expenditure
capex	capital expenditure
CCP	Consumer Challenge Panel
CESS	capital expenditure sharing scheme
CPI	consumer price index
DMIA	demand management innovation allowance
DRP	debt risk premium
EBSS	efficiency benefit sharing scheme
ERP	equity risk premium
MAR	maximum allowed revenue
MRP	market risk premium
NEL	national electricity law
NEM	national electricity market
NEO	national electricity objective
NER	national electricity rules
NSP	network service provider
NTSC	negotiated transmission service criteria
opex	operating expenditure
PPI	partial performance indicators
PTRM	post-tax revenue model
RAB	regulatory asset base
RBA	Reserve Bank of Australia
repex	replacement expenditure
RFM	roll forward model
RIN	regulatory information notice

Shortened form	Extended form
RPP	revenue and pricing principles
SLCAPM	Sharpe-Lintner capital asset pricing model
STPIS	service target performance incentive scheme
TNSP	transmission network service provider
TUoS	transmission use of system
WACC	weighted average cost of capital

3 Rate of return

The allowed rate of return provides a network service provider a return on capital that a benchmark efficient entity would require to finance (through debt and equity) investment in its network.¹ The return on capital building block is calculated as a product of the rate of return and the value of the regulatory asset base (RAB). The rate of return is discussed in this attachment.²

3.1 Final decision

Our final decision is to reject Murraylink's revised rate of return proposal³ and determine an allowed rate of return of 5.69 per cent (nominal vanilla). We are satisfied that this rate of return achieves the allowed rate of return objective (ARORO).⁴ That is, we are satisfied that this allowed rate of return is commensurate with the efficient financing costs of a benchmark efficient entity with a similar degree of risk as that which applies to Murraylink in providing prescribed transmission services.⁵

This allowed rate of return will apply to Murraylink for 2018/19. A different rate of return will apply to Murraylink for the remaining regulatory years of the 2018/19–2022/23 regulatory control period. This is because we will update the return on debt component of the rate of return each year to partially reflect prevailing debt market conditions in each year. We discuss this annual update further below.

Our allowed rate of return is a weighted average of our return on equity and return on debt estimates (WACC) determined on a nominal vanilla basis that is consistent with our estimate of the value of imputation credits.⁶ In deriving the WACC, and the estimated efficient debt and equity financing costs, we have applied the benchmark efficient entity gearing ratio of 0.6 (debt):0.4 (equity) that we proposed in the 2013 Rate of Return Guideline (Guideline). We are to determine the allowed rate of return such that it achieves the ARORO.⁷ Also, in arriving at our decision we have taken into account the revenue and pricing principles (RPPs) and are also satisfied that our decision will or is likely to contribute to the achievement of the National Electricity Objective (NEO).⁸ Our rate of return and Murraylink's proposed rate of return is set out in table 3-1.

¹ The term network service provider relates to service providers that provide gas and electricity transmission and distribution services.

² We are currently reviewing the rate of return guideline, and the AER has issued several discussion papers in this process. A draft decision is due in June 2018.

³ Murraylink, *Murraylink revised revenue proposal effective July 2018 to June 2023*, December 2017, p. 27.

⁴ NER, cl. 6.5.2(b); cl. 6A.6.2(b); NGR, cl. 87(2).

⁵ NER, cl. 6.5.2(c); cl. 6A.6.2(c); NGR, cl. 87(3).

⁶ NER, cl. 6.5.2(d)(1) and (2); cl. 6A.6.2(d)(1) and (2); NGR, cl. 87(4).

⁷ NER, cl. 6.5.2(b); NER, cl. 6A.6.2(b); NGR, r. 87(2).

⁸ NEL, s.16; NGL, s. 28.

Table 3-1 Final decision on Murraylink's rate of return (% nominal)

	Previous allowed return (2014-18)	Murraylink's revised proposal (2018/19-22/23)	AER final decision (2018/19)	Allowed return over 2018/19–22/23 regulatory control period
Return on equity (nominal post-tax)	8.72	8.9	7.4	Constant (%)
Return on debt (nominal pre-tax)	6.69	4.7	4.55	Updated annually
Gearing	60	60	60	Constant (60%)
Nominal vanilla WACC	7.5	6.4	5.69	Updated annually for return on debt
Forecast inflation	2.5	2.5	2.45	Constant (%)

Source: AER analysis; Murraylink, *Murraylink revised revenue proposal effective July 2018 to June 2023*, December 2017, pp. 18 & 27.

Murraylink and we are in agreement on the gearing ratio of 60 per cent and the approach to estimating the forecast expected inflation. The reasons for our decision on gearing and inflation are set out in our draft decision and the values for this final decision are set out in Table 3-1.

Our return on equity estimate is 7.4 per cent. This rate will apply to Murraylink in each regulatory year. In its revised rate of return proposal, Murraylink adopted the Guideline approach to estimating the return on equity except for how it determined two parameters input values. These two parameters are the MRP and equity beta. Our return on equity point estimate and the parameter inputs along side Murraylink's are set out in Table 3-2.

Table 3-2 Final decision on Murraylink's return on equity (nominal)

	AER previous decision (2014–18)	Murraylink's revised proposal (2018/19–2022/23)	AER final decision (2018/19–2022/23)
Nominal risk free rate (return on equity only)	3.52%	2.78% ^a	2.84% ^b
Equity risk premium	5.2%	6.16%	4.55%
MRP	6.5%	7.7%	6.50%
Equity beta	0.8	0.8	0.70
Nominal post-tax return on equity	8.72%	8.9%	7.4%

Source: AER analysis; Murraylink, *Murraylink revised revenue proposal effective July 2018 to June 2023*, December 2017, p. 27.

^a Based on Murraylink's indicative averaging period adopted for its revised proposal of 20 business days to 31 October 2017

^b Calculated with a final averaging period of 17 to 31 January 2018.

Our return on equity estimate for this final decision is derived by applying the same approach we set out in our Guideline and draft decision. This is also the same approach applied to determine the allowed return on equity in our recent decisions.⁹ The Australian Competition Tribunal (Tribunal) has upheld this approach.¹⁰ This approach entails applying the Guideline approach referred to as the foundation model approach.¹¹ We applied the same approach in previous decisions.¹² This is a six step process, where we have regard to a considerable amount of relevant information, including various equity models. At different stages of our approach we have used this material to inform the return on equity estimate.

Murraylink's revised proposal has adopted our draft decision on estimating the return on debt.¹³ We accept Murraylink's revised proposal and our final decision on the return on debt is set out below, and reasons for this decision are set out in our draft decision. Our return on debt estimate for the 2018/19 regulatory year is 4.55 per cent. This estimate will change each year as we partially update the return on debt to reflect prevailing interest rates over Murraylink's debt averaging period in each year. Our return on debt estimate for future regulatory years will be determined in accordance with the methodology and formulae we have specified in the draft decision and accepted by Murraylink in its revised proposal.¹⁴

Due to updating the return on debt each year, the overall rate of return and Murraylink's revenue will also be updated annually.

Our decision on the return on debt approach consistent with our Guideline and draft decision is to:

- estimate the return on debt using an on-the-day approach (that is, based on prevailing interest rates near the commencement of the access arrangement period) in the first regulatory year 2018/19 of the 2018/19–2022/23 regulatory control period, and

⁹ For example, see: AER, *Final decision APA VTS gas access arrangement 2018 to 2022 Attachment 3—Rate of return*, November 2017; AER, *Final decision: AusNet, Attachment 3—Rate of return*, April 2017; AER, *Final decision: TasNetworks, Attachment 3—Rate of return*, April 2017; AER, *Final decision: Powerlink, Attachment 3—Rate of return*, April 2017. Also see our decisions on SA Power Networks, Ergon Energy and Energex.

¹⁰ For example, see Australian Competition Tribunal, *Applications by Public Interest Advocacy Centre Ltd and Ausgrid [2016] ACompT 1*, 26 February 2016, para 813.

¹¹ AER, *Better regulation: Rate of Return Guideline*, December 2013.

¹² AER, *Draft decision, AusNet Services Transmission Revenue Review 2017-2022, Attachment 3—Rate of return*, July 2016; AER, *Final decision: Jemena determination 2016–20, Attachment 3—Rate of return*, May 2016; AER, *Final decision: CitiPower determination 2016–20, Attachment 3—Rate of return*, May 2016; AER, *Final decision: AusNet, Attachment 3—Rate of return*, April 2017; AER, *Final decision: TasNetworks, Attachment 3—Rate of return*, April 2017; AER, *Final decision: Powerlink, Attachment 3—Rate of return*, April 2017.

¹³ Murraylink, *Murraylink revised revenue proposal effective July 2018 to June 2023*, December 2017, pp. 18–27.

¹⁴ Murraylink, *Murraylink revised revenue proposal effective July 2018 to June 2023*, December 2017, pp. 19–20.

- gradually transition this approach into a trailing average (that is, a moving historical average) over 10 years by annually updating 10 per cent of the return on debt to reflect prevailing market conditions in that year.¹⁵
- estimate the return on debt in each regulatory year by reference to:
 - a benchmark credit rating of BBB+
 - a benchmark term of debt of 10 years
 - independent third party data series—specifically, a simple average of the broad BBB rated debt data series published by the Reserve Bank of Australia (RBA) and Bloomberg, adjusted to reflect a 10 year estimate and other adjustments¹⁶
 - an averaging period for each regulatory year of between 10 business days and 12 months (nominated by the service provider and agreed to by us), with that period being consistent with certain conditions that we proposed in the Guideline.¹⁷ These periods are set out in confidential appendix D.

3.2 Reasons for our decision – return on equity

Our return on equity estimate of 7.4 per cent for this decision is based on an application of the Guideline foundation model approach (a more detailed discussion of why we use the Guideline foundation model approach to estimate the return on equity is in Appendix A of our draft decision).

We consider that 7.4 per cent is the best estimate to combine with a return on debt estimate to form an overall allowed rate of return that achieves the ARORO. We also consider that 7.4 per cent is consistent with the prevailing conditions in the market for equity funds.

We hold these views because:

- We derive our estimate using the Sharpe–Lintner CAPM as our foundation model, which:
 - transparently presents the key risk and reward trade-off¹⁸ that is at the heart of our task¹⁹

¹⁵ This decision determines the return on debt methodology for the 2018/19–2022/23 regulatory control period. This period covers the first five years of the 10 year transition period. This decision also sets out our intended return on debt methodology for the remaining years.

¹⁶ For the RBA curve, our final decision is to interpolate the monthly data points to produce daily estimates, to extrapolate the curve to an effective term of 10 years, and to convert it to an effective annual rate. For the Bloomberg curve, our final decision is to extrapolate it to 10 years using the spread between the extrapolated RBA seven and 10 year curves (where Bloomberg has not published a 10 year estimate), and to convert it to an effective annual rate. While we do not propose estimating the return on debt by reference to the Reuters curve, we do not rule out including doing so in future determinations following a proper period of consultation.

¹⁷ AER, *Rate of return guideline*, December 2013, pp. 21–2; AER, *Explanatory statement—Rate of return guideline*, December 2013, p. 126.

¹⁸ That is, systematic risk priced via expected returns on equity.

- is widely and consistently used for estimating the expected return on equity by financial market practitioners, academics, and other regulators²⁰
- has well-accepted and unbiased methods for estimating its parameters, and these parameters can be estimated with tolerable accuracy, unlike the alternative models that have been proposed in the past (such as the dividend growth model, the Black CAPM and the Fama-French model).
- We have regard to the prevailing market conditions for equity funds. We use the dividend growth model and conditioning variables to inform our estimate of the market risk premium. We use other relevant sources of information to cross-check the foundation model estimate. The triangulation of estimates from relevant market participants broadly supports our foundation model estimate of the return on equity. (see Appendix D and E of our draft decision and Appendix B of this decision).
- Our estimate is supported by comparisons to estimates from the Wright specification of the CAPM, broker reports, valuation reports and other regulators' decisions.
- The consistency over time of our Sharpe-Lintner CAPM estimation approach (reflective of a risk premium above a prevailing risk free rate) has been supportive of investment. While taking into account the downward trends in both our risk premium and the risk free rate,²¹ service providers have continued to invest in their networks and propose to continue to grow their asset bases.²²
- Our return on equity estimate is approximately 284 basis points above the prevailing yield-to-maturity on BBB-rated debt with a 10 year term-to-maturity. For a benchmark efficient entity with a similar degree of risk as Murraylink, we would not expect the return on equity to be a long way above the prevailing return on debt.²³ We do not consider that the current 284 basis points difference between the equity risk premium allowed in this decision and debt risk premiums²⁴ to be too low (see Appendix A.3.3 of our draft decision and Appendix B.2 of this decision).

¹⁹ As set out in NER cl.6; NER cl. 6A; NGR r. 87.

²⁰ See AER, *Explanatory statement to the rate of return guideline (appendices)*, 17 December 2013, pp. 12–13.

²¹ Our regulatory determinations and rate of return guidelines since 2009 have set an equity risk premium ranging from 5.2 per cent to 4.55 per cent [AER, *Final Decision, Electricity transmission and distribution network service providers, Review of the weighted average cost of capital (WACC) parameters*, 1 May 2009].

²² Between 2007–08 and 2013–14, the regulated transmission and distribution service providers across the national electricity market have invested in the order of more than \$44 billion in capital expenditure. The annual capital expenditure has remained largely stable at around \$6 billion per year.

²³ Due to the regulatory regime and the businesses' monopoly positions shielding them from systematic risk; as well as the measured prevailing debt yields likely overstating the expected return on debt due to default risk. For more information, see section pages 96 to 99 of Attachment 3 to our preliminary decision for AusNet Services' 2016-20 distribution determination.

²⁴ The debt risk premiums to CGS are calculated as the extrapolated effective annual yield to maturity on BBB rated debt with 10 years to maturity less the effective annual yield to maturity on CGS with 10 years to maturity). BBB bond yields have been used instead of BBB+ because the RBA quotes BBB yields to maturity. This is calculated over the same averaging period as the equity risk free rate.

- We have come to this estimate following the application of our foundation model approach, which:
 - involves consideration of all relevant material submitted to us, and the role for each piece of material that would best achieve the ARORO; and
 - was developed through extensive consultation during our Guideline review process.
 - Was reviewed and upheld by the Tribunal²⁵

The Sharpe-Lintner CAPM provides that the return on equity can be calculated as the risk-free return and a premium for risk above the risk-free rate, with the risk premium calculated as the product of the market risk premium and equity beta.

Our Sharpe-Lintner CAPM estimate is based on:

- a risk free rate estimate of 2.84 per cent
- a market risk premium estimate of 6.5 per cent, and
- an equity beta estimate of 0.7.²⁶

Murraylink submitted that approaching the rate of return decision in the way of Attachment 3 to the AER's draft decision led to confusion as to the precise nature of Murraylink's proposal. We do not agree with Murraylink.²⁷ As set out in our draft decision, our foundation model approach is a six step process where we consider all of the relevant material. Our draft decision explained in detail our consideration of Murraylink's original proposal and the reasons for rejecting its return on equity proposal.

In this section we respond to the issues raised in Murraylink's revised proposal whilst reiterating that all of our reasoning in the draft decision is relevant to this decision.

3.2.1 Market risk premium and equity beta

The difference between Murraylink's proposed return on equity estimate of 8.9 per cent and our estimate is driven by the different values for the market risk premium and equity beta.²⁸ Murraylink considers that the appropriate value for market risk premium should be 7.7 per cent and 0.8 for equity beta whereas our estimate is 6.5 and 0.7, respectively.

²⁵ Australian Competition Tribunal, *Applications by Public Interest Advocacy Centre Ltd and Ausgrid [2016] ACompT 1*, 26 February 2016, paras 813, 993, 983; Australian Competition Tribunal, *Application by Jemena Gas Networks (NSW) Ltd [2016] ACompT 5*, 3 March 2016, paras 47, 49, 95.

²⁶ Calculated as: 7.4% = 2.84% + 0.7 * 6.5%.

²⁷ Murraylink, *Murraylink revised revenue proposal effective July 2018 to June 2023*, December 2017, p. 18.

²⁷ Murraylink, *Murraylink revised revenue proposal effective July 2018 to June 2023*, December 2017, p. 18.

²⁸ Murraylink, *Murraylink revised revenue proposal effective July 2018 to June 2023*, December 2017, p. 27.

3.2.1.1 Market risk premium

Our Guideline, developed after extensive consultation with stakeholders, sets out our preferred approach to estimate the market risk premium. We have consistently applied this approach since publication of the Guideline in 2013 which was upheld by the Tribunal in its decision for AusGrid.²⁹ We also note the Tribunal upheld our use of and decision on the various relevant materials we relied upon in making our estimates.³⁰

Having considered all the relevant material before us we do not consider there is satisfactory evidence to warrant departure from the Guideline approach and our 6.5 per cent point estimate. For example, the conditioning variables indicate there has not been a material change in market conditions to warrant adjusting the market risk premium.³¹ We consider that the Guideline approach will best contribute to achieving the rate of return objective. We consider 6.5 per cent to be the best estimate of the market risk premium to contribute to the achievement of the ARORO because:

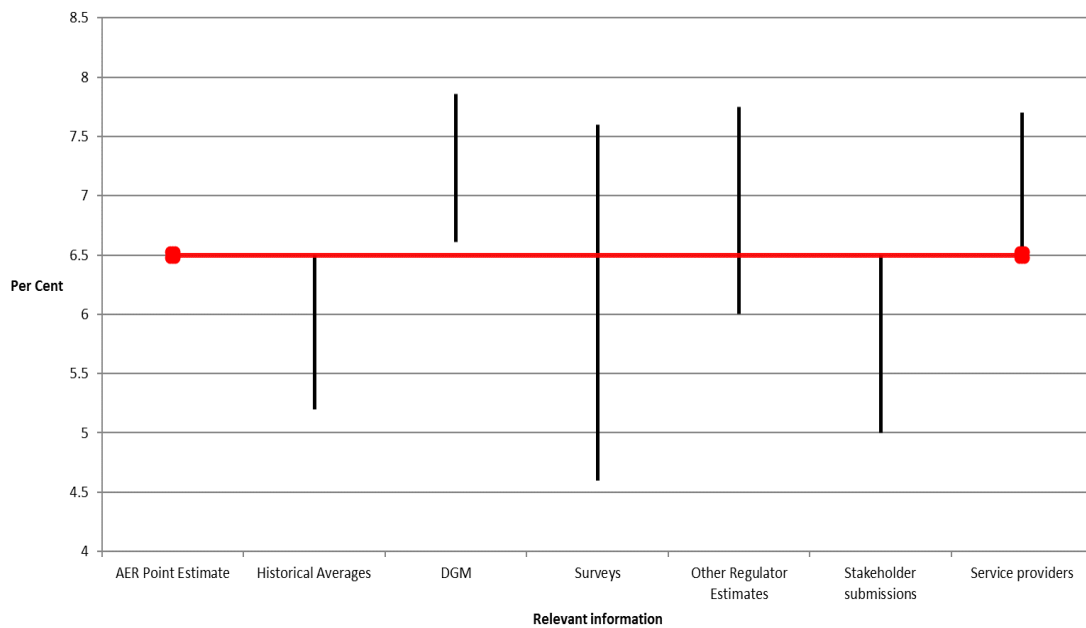
- It is supported by our consideration of all relevant material submitted to us (following consideration and scrutiny of their relative merits)
- It is corroborated and verified by our cross-checks on the overall return on equity and equity risk premium. This further supports our estimate of the equity risk premium (of which the market risk premium is a component)
- It provides a balanced outcome between submissions by service providers and other stakeholders.
- The next figure shows the market risk premium estimates from the relevant material that we have used to inform our decision. These estimates range from a low of 5.2 per cent to a high of 7.86 per cent.

²⁹ Australian Competition Tribunal, *Application by Public interest Advocacy Centre Ltd and Ausgrid [2016] ACompT 1*, 26 February 2016, p. 202, 221–222.

³⁰ Australian Competition Tribunal, *Application by Public interest Advocacy Centre Ltd and Ausgrid [2016] ACompT 1*, 26 February 2016, p. 221–222.

³¹ See 'Steps four and five: other information and evaluation of information set on overall return on equity' and Appendix B.

Figure 3-1 Comparison of estimates of the market risk premium



Source: AER analysis

Note: The range of regulator's decisions was formed from data from other regulator's most recent decisions. The top of the range (7.75 per cent) and the bottom of the range are from the IPART³². The stakeholder submissions range is intended to reflect the views of consumer groups and those who use/engage with the energy network or pipeline, and as such it does not include submissions from service providers. The bottom and top of the stakeholder range comes from a range of consumer groups.³³ The bottom and top of the

³² For example, see: IPART, *Sydney Desalination Plant Pty Ltd - Review of prices from 1 July 2017 to 30 June 2022*, 27 June 2017; IPART, *Review of prices for rural bulk water services from 1 July 2017 (MDB Valleys)*, 13 June 2017.

³³ For example, see: CCP5, *response to AER draft decision on AusNet services transmission review*, September 2016; CCP5, *Transmission for the Generations III—Response to: Revised revenue proposal by AusNet Services for Transmission Revenue Review 2017–22*, October 2016, pp. 9–10; CCP4 (Hugh Grant), *Submission to the AER: AER draft 2018–22 revenue decision Powerlink revised 208–22 revenue proposal*, 23 December 2016, p. 44; CCP4 (David Headberry), *Response to the AER Draft Decision and Revised Proposal to Powerlink's electricity transmission network for a revenue reset for the 2017-2019 regulatory period*, 19 December 2016, p. 21; Queensland farmers' federation, *Re: Response on Australian Energy Regulator (AER) Draft Decision on Powerlink's revenue proposal for the 2017/18 –2021/22 regulatory period*, 30 November 2016; CCP Sub-panel 9, *Response to proposals from TransGrid for a revenue reset for 2018-19 to 2022-23*, 12 May 2017, p.6; CIT, *CIT Submission to Murraylink Revenue Proposal 2018 – 2023*, 2 March 2017; CCP sub panel 9, *Response to proposals from Murraylink for a revenue reset for the 2018-23 regulatory period*, 12 May 2017, p. 8; CCP9, *Response to Draft Decision and Revised Proposal for Revenue Reset for Murraylink for 2018–2023*, 29 January 2018, p. 4; Government of SA, *Submission on Murraylink's revised proposal*, 18 December 2017; Business SA, *Submission on Murraylink's revised proposal*, 12 January 2018.

service provider proposed range comes from revised submissions by Murraylink, ElectraNet and TransGrid.³⁴

We derive our point estimate from within this range by considering the relative merits of all of the relevant material. The application of our approach is set out as follows:

- Historical excess returns provide a baseline estimate and indicates a market risk premium of less than 6.5 per cent from a range of 5.2 per cent to 6.5 per cent. We consider both geometric and arithmetic averages of historical excess returns when considering this result. However we are aware of evidence that there may be a bias in the geometric averages. We take this into account when forming our result and baseline estimate, and as such our range for historical returns is based on arithmetic averages and informed by the geometric averages.
- Dividend growth model estimates indicate a market risk premium estimate above this baseline with a range of 6.61 to 7.86 per cent, which when conducting sensitivity analysis expands to 6.05 to 8.58 per cent. We consider our dividend growth model is theoretically sound but that there are many limitations in practically implementing the model. As previously stated in our assessment of the dividend growth model, it may capture current conditions to a certain extent but fails to adequately provide a 'true' estimate of the forward looking market risk premium. We consider our, and other, dividend growth models are likely to produce upward biased estimates in the current market due to reasons provided in appendix B.4 of our draft decision. We also take into consideration that our model, and other models, may not accurately track changes in the return on equity for the market. For these reasons, we do not consider that the dividend growth model estimates are reliable on their own, but they do provide an indication for a point estimate above the range derived from the historical returns, as the guideline method shows. The guideline designated the dividend growth model to inform on whether the market risk premium may be above or below the historical estimates.³⁵ The substantial widening in the range of results from the sensitivity analysis is indicative of the unreliability stressed by the limitations we discuss in appendix B.4 of our draft decision.
- We also look at other regulator's decisions when considering our estimate of the market risk premium, after we have accounted for differences in objectives and approved calculation methods, as a cross check. Regulatory decisions over the past 12 months indicate a market risk premium of 6.5 per cent is reasonable. See Appendix B for more detail on regulators' decisions.

³⁴ Murraylink, *Murraylink revised revenue proposal effective July 2018 to June 2023*, December 2017, p. 27; ElectraNet, *Revised revenue proposal 2018-19 to 2022-23*, 22 December 2017, p. 42; TransGrid, *Revised revenue proposal 2018/19–2022/23*, December 2017, p. 138.

³⁵ AER, *Explanatory statement, Rate of Return Guideline*, December 2013, pp. 14.

- Conditioning variables indicate that there has not been a material change in market conditions since our May and April 2016 decisions to warrant an increase to the market risk premium. See Appendix A.3 for more detail on conditioning variables.
- Survey evidence generally supported a market risk premium around 6.0 per cent or less.

Service user submissions have generally supported a market risk premium at or below the 6.5 per cent. We have considered the submissions and our analysis of the relevant evidence and all material before us indicate that the forward looking 10 year estimate of the market risk premium is 6.5 per cent. These submissions are summarised in Table 3-3 below

Table 3-3: Stakeholder Submissions on the Return on Equity and market risk premium

User	Submission Content
Consumer Challenger Panel 9 (CCP9) on Murraylink revised proposal	<p>CCP9 supports the AER’s application of the Rate of Return Guideline.³⁶</p> <p>In the revised proposal it narrowed the range of information further, using only recent estimates by Frontier Economics of the market ROE using the AER DGMs.³⁷ The AER should be very cautious in adjusting the MRP in response to short to medium term variations in the forward-looking estimates of the MRP derived from the DGM. It is important that any change in the assumed MRP can be shown to be consistent with investment fundamentals and the impacts of market conditions on the relative risks and demand for different asset classes.</p> <p>However, problems with the DGM limit the weight that can be placed on it and how it can be used³⁸</p> <p>Murraylink has not demonstrated a persistent increase in the estimates of ROE and MRP and changes in indicators of the investment climate do not support and increase in the MRP.³⁹</p>

³⁶ CCP9, *Response to Draft Decision and Revised Proposal for Revenue Reset for Murraylink for 2018–2023*, 29 January 2018, p. 4.

³⁷ CCP9, *Response to Draft Decision and Revised Proposal for Revenue Reset for Murraylink for 2018–2023*, 29 January 2018, p. 27.

³⁸ CCP9, *Response to Draft Decision and Revised Proposal for Revenue Reset for Murraylink for 2018–2023*, 29 January 2018, p. 27–28.

³⁹ CCP9, *Response to Draft Decision and Revised Proposal for Revenue Reset for Murraylink for 2018–2023*, 29 January 2018, p. 30.

User	Submission Content
Government of South Australia	It remains appropriate that the AER's indicative rate of 5.7 per cent for 2018–19 in the Murraylink draft decision be retained. ⁴⁰
Business SA on Murraylink revised proposal	We would expect that the rate of return from the AER's draft decision is not adjusted from its current 5.7% to meet Murraylink's revised proposal of 6.4%. ⁴¹
Consumer Challenge Panel 9 (CCP9)	When a wider range of market evidence is considered, the current approach to the WACC and the parameters used by the AER – including the MRP – appear to more than meet market expectations. ⁴² The AER should exercise caution in adjusting the MRP in response to variations in the forward looking estimates of the DGM. The AER should continue to give weight to the long term realised MRP's as an anchor for long term expectations ⁴³
Central Irrigation Trust (on Murraylink's original proposal)	The proposed Rate of Return and Return on Equity should both be lowered. ⁴⁴
CCP9 submission on Murraylink original proposal	The CCP submitted that the AER should reject Murraylink's proposed change in approach to the estimation to the MRP ⁴⁵ , and that it should not increase either the MRP or the current Beta estimate. ⁴⁶

⁴⁰ Government of SA, *Submission on Murraylink's revised proposal*, 18 December 2017.

⁴¹ Business SA, *Submission on Murraylink's revised proposal*, 12 January 2018.

⁴² CCP Sub-panel 9, *Response to proposals from TransGrid for a revenue reset for 2018-19 to 2022-23*, 12 May 2017, p.6.

⁴³ CCP Sub-panel 9, *Response to proposals from TransGrid for a revenue reset for 2018-19 to 2022-23*, 12 May 2017, p. 80.

⁴⁴ CIT, *CIT Submission to Murraylink Revenue Proposal 2018 – 2023*, 2 March 2017

⁴⁵ CCP sub panel 9, *Response to proposals from Murraylink for a revenue reset for the 2018-23 regulatory period*, 12 May 2017, p. 4.

⁴⁶ CCP sub panel 9, *Response to proposals from Murraylink for a revenue reset for the 2018-23 regulatory period*, 12 May 2017, p. 8.

User	Submission Content
CCP11 submission on APA VTS	The CCP continued to push that the AER should not accept APA VTS's proposed change in approach to the estimation of the MRP, and should not increase either the MRP or Beta estimate ⁴⁷ . The DGM's usefulness going forward should also be considered. ⁴⁸
CCP11 submission on AGN, AusNet Services and Multinet	The CCP submitted that the estimate for MRP represent a cautious choice by the AER when considering the evidence available. ⁴⁹ The CCP also state that the AER was correct to reject an 'alpha' adjustment and a longer equity averaging period proposal. ⁵⁰

Murraylink's approach for the market risk premium

Murraylink's revised proposal continues to estimate the market risk premium as the difference between the expected return on the market and the prevailing risk free rate, as they did in their original proposal.⁵¹

However, they now propose to use the return on equity from the dividend growth model as the expected return on the market. This resulted in a market risk premium of 7.7 per cent for Murraylink.⁵² Murraylink maintains that its revised proposal is the appropriate implementation of the Sharpe-Lintner CAPM.⁵³

We disagree.

We note that Murraylink's revised proposal appears substantively similar to APA and APTPPL's revised proposals which we considered (and rejected) in our November 2017 decisions.⁵⁴ Given the similarity and lack of substantively new information in Murraylink's revised proposal, we consider the reasoning for rejecting APA and APTPPL's revised proposals is also relevant to our consideration of Murraylink's revised proposal.

We first note that Murraylink's revised proposal is a departure from the Guideline. The Guideline estimates the market risk premium based on the roles assigned to each

⁴⁷ CCP subpanel 11, *Final advice to AER following Draft Decision and Revised Proposals from APA VTS*, 12 September 2017, pp. 27-36

⁴⁸ CCP subpanel 11, *Final advice to AER following Draft Decision and Revised Proposals from APA VTS*, 12 September 2017, pp. 38-41

⁴⁹ CCP subpanel 11, *Final advice to AER following Draft Decision and Revised Proposals from AusNet, AGN and Multinet*, 12 September 2017, p. 36

⁵⁰ CCP subpanel 11, *Final advice to AER following Draft Decision and Revised Proposals from AusNet, AGN and Multinet*, 12 September 2017, pp. 37-40

⁵¹ Murraylink, *Murraylink revised revenue proposal effective July 2018 to June 2023*, December 2017, pp. 22–27.

⁵² Murraylink, *Murraylink revised revenue proposal effective July 2018 to June 2023*, December 2017, pp. 22–27.

⁵³ Murraylink, *Murraylink revised revenue proposal effective July 2018 to June 2023*, December 2017, pp. 24–26.

⁵⁴ For example, see: AER, *Final decision APA VTS gas access arrangement 2018 to 2022 Attachment 3–Rate of return*, November 2017.

piece of relevant material and independent of the risk free rate (as the market risk premium is not readily observed).⁵⁵ This was the result of extensive consultation and took into account the relative strengths and weaknesses of each piece of relevant material and their suitability for our regulatory task.

Our approach for estimating the market risk premium is consistent with common practice and, as acknowledged by some service providers, is used by practitioners and in many finance textbooks.⁵⁶ Partington and Satchell has previously advised that it is common market practice to 'treat the MRP as the exogenous variable'⁵⁷ to the Sharpe-Lintner CAPM. This contrasts with Murraylink's proposal which appears to be suggesting that the market risk premium should be estimated within the model (as the difference between the expected return on the market and the prevailing risk free rate) and the expected return on the market is the exogenous variable. We accept Partington and Satchell's advice and do not agree with Murraylink's view that "treating the market risk premium as an exogenous variable is inconsistent with the conceptual and theoretical foundations of the model."⁵⁸

The Guideline approach for estimating the market risk premium has also been upheld by the Tribunal (as part of its decision on the return on equity),⁵⁹ adopted by other service providers and supported by consumer and user groups.⁶⁰

The CCP9 has also supported our Guideline approach for estimating the market risk premium. It noted that the Guideline provides 'a structured approach' to considering relevant information.⁶¹ The CCP9 noted that Murraylink's revised proposal is 'contrary to common practice and can result in unstable and counter-intuitive outcomes' and 'has not identified significant new research or raised new substantive issues not considered in the development of the Rate of Return Guideline'.⁶²

We agree with the CCP submission which is also consistent with Partington and Satchell's advice.

We note that Murraylink's revised approach shares similarities with a Wright CAPM, and appears to be an alternative specification of the CAPM at the very least (see

⁵⁵ AER, *AER Explanatory statement - rate of return guideline*, December 2013, p. 11.

⁵⁶ APA VTS, *Access arrangement revision proposal submission*, 14 August 2017, p. 79; APTPPL, *Access arrangement submission*, 14 August 2017, p. 75.

⁵⁷ Partington and Satchell, *Report to the AER: Discussion of estimates of the return on equity*, April 2017, pp. 17, 34.

⁵⁸ Murraylink, *Murraylink revised revenue proposal effective July 2018 to June 2023*, December 2017, pp.23–25.

⁵⁹ Australian Competition Tribunal, *Applications by Public Interest Advocacy Centre Ltd and Ausgrid [2016] ACompT 1*, 26 February 2016, para 813.

⁶⁰ For example, see TransGrid, *Revised Revenue Proposal 2018/19–2022/23*, December 2017, p. 138; AGN, *Revised final plan attachment 10.9 Response to draft decision: financing costs*, August 2017, p. 1; CCP9, *Response to Draft Decision and Revised Proposal for Revenue Reset for Murraylink for 2018–2023*, 29 January 2018, p. 4;

⁶¹ CCP9, *Response to Draft Decision and Revised Proposal for Revenue Reset for Murraylink for 2018–2023*, 29 January 2018, p. 27.

⁶² CCP9, *Response to Draft Decision and Revised Proposal for Revenue Reset for Murraylink for 2018–2023*, 29 January 2018, pp. 4, 24.

Appendix B.5 of our APA VTS final decision for more discussion of this approach).⁶³ For example, it implies a perfectly offsetting relationship between the risk free rate and the market risk premium, which is similar to an assumption under the Wright CAPM.

Murraylink has also submitted that it did not propose to use the Wright CAPM to estimate the return on equity in its original proposal.⁶⁴ However, we continue to note that the original proposal shares similarities with a Wright CAPM and appears to be at least a historical/alternative specification of the CAPM:⁶⁵

- It implies a perfectly offsetting relationship between the risk free rate and the market risk premium, which is similar to an assumption under the Wright CAPM.
- Murraylink relies on the ERA's observations of (effectively) a Wright CAPM estimate of the return on market.
- It does not account for changing market conditions.
- It uses the AER's Wright CAPM estimate to estimate the market risk premium.

Partington and Satchell have also previously advised that the sort of method proposed by Murraylink in its original proposal is not as independent from the Wright CAPM as the service provider claims in their previous advice on APA's regulatory proposal. They noted that this method 'assumes stability of the market rate of return over time'⁶⁶ due to 'heavy reliance on the long run historic average for the return on the market'.⁶⁷ They also observed 'an inverse relation between the equity risk premium and the interest rate [arise] as a consequence of assuming stability in the market return',⁶⁸ which again contradicts Murraylink's table of assumptions. We do not consider these alternative specifications of the CAPM (such as the Wright CAPM or the alternative specification proposed by Murraylink in its revised and original proposals) are appropriate when estimating market risk premium. Our assessment indicates that these materials contain limitations that make them unsuitable for our regulatory task. This is discussed in more detail in section 3.4.1 and in Appendix B.5 of our draft decision.

Further, Murraylink's approach leads to a market risk premium significantly above the historic average. Partington and Satchell has advised previously that 'it is more likely that the MRP is below the long run historic average than that it has risen'⁶⁹ and that the resulting MRP provided by the service providers is implausible.⁷⁰ They also considered

⁶³ AER, *Final decision APA VTS gas access arrangement 2018 to 2022 Attachment 3 Rate of Return*, November 2017.

⁶⁴ Murraylink, *Murraylink revised revenue proposal effective July 2018 to June 2023*, December 2017, p. 25.

⁶⁵ AER, *Draft decision Murraylink transmission determination 208 to 2023 attachment 3 – rate of return*, September 2017, p. 85.

⁶⁶ Partington and Satchell, *Report to the AER: Discussion of submissions on the cost of equity*, 29 May 2017, p. 47.

⁶⁷ Partington and Satchell, *Report to the AER: Discussion of submissions on the cost of equity*, 29 May 2017, p. 47.

⁶⁸ Partington and Satchell, *Report to the AER: Discussion of submissions on the cost of equity*, 29 May 2017, p. 47.

⁶⁹ Partington and Satchell, *Report to the AER: Discussion of estimates of the return on equity*, April 2017, pp. 18–19.

⁷⁰ Partington and Satchell, *Report to the AER: Discussion of submissions on the cost of equity*, 29 May 2017, p. 47.

recent evidence from the Credit Suisse Global Investment Yearbook 2017 which indicates that the average risk premium for Australia has decreased over time.⁷¹

We also disagree with Murraylink's use of and complete reliance on the dividend growth model in its revised proposal.

Our assessment of the relevant evidence in the Guideline and regulatory decisions indicates that the dividend growth model is most suited to inform whether the point estimate lies above or below the historical excess returns. Murraylink's revised proposal gives insufficient consideration to the limitations of the model and relative merits of the relevant evidence.

The CCP9 has also opposed Murraylink's sole reliance on the dividend growth model. The CCP9 noted that this is 'inconsistent with widely acknowledged limitations of the dividend growth model estimates and practice of considering a broad range of estimates and models and changes in levels that are sustained over a longer period'.⁷² CCP9 added that problems with the DGM limit the weight that can be placed on it and how it can be used.⁷³

Partington and Satchell have previously advised against giving more weight to dividend growth model estimates because of inaccuracy, upward bias of the estimates and sensitivity of the model to inputs and assumptions.⁷⁴

Murraylink also submitted that it did not propose a Wright CAPM in its original proposal.⁷⁵ However, its original proposal is at the very least an alternative version of the Sharpe Lintner CAPM (if not the Wright CAPM). We rejected Murraylink's original proposal for reasons similar to those on the previous page and a more detailed discussion is in our draft decision for Murraylink.⁷⁶

We also disagree with Murraylink's statement that 'without offering any rationale for its approach, the AER assumes that a historical average of excess returns is an estimator of the market risk premium of the Sharpe-Lintner CAPM'.⁷⁷

We have consistently outlined our considerations and methods in the Guideline, and application of the Guideline in regulatory decisions to date.⁷⁸ Our estimation of the market risk premium is informed by a range of relevant material with historical excess

⁷¹ Partington and Satchell, *Report to the AER: Discussion of estimates of the return on equity*, April 2017, p. 19.

⁷² CCP9, *Response to Draft Decision and Revised Proposal for Revenue Reset for Murraylink for 2018–2023*, 29 January 2018, p. 27.

⁷³ CCP9, *Response to Draft Decision and Revised Proposal for Revenue Reset for Murraylink for 2018–2023*, 29 January 2018, p. 27.

⁷⁴ Partington and Satchell, *Report to the AER: Discussion of estimates of the return on equity*, April 2017, pp. 18–19.

⁷⁵ Murraylink, *Murraylink revised revenue proposal effective July 2018 to June 2023*, December 2017, pp. 25–26.

⁷⁶ AER, *Draft decision Murraylink transmission determination access arrangement 2018 to 2023 Attachment 3–Rate of return*, September 2017.

⁷⁷ Murraylink, *Murraylink revised revenue proposal effective July 2018 to June 2023*, December 2017, pp. 25–26.

⁷⁸ See: AER, *Final decision SA Power Networks determination 2015-16 to 2019-20: Attachment 3–Rate of return*, October 2015, pp. 33–144.

returns being one source of material.⁷⁹ Our use of relevant material (including historical excess returns and dividend growth models) is informed by the roles assigned to them which are based on their relative merits and suitability for our regulatory task (a summary is provided in the table below).⁸⁰ Further, Partington and Satchell has previously supported the use of historical excess returns and discussed their reasons for doing so.⁸¹

Table 3-4: Role assigned to each source of relevant material in determining the market risk premium

Relevant material	Role	Reasons for chosen role
Historical excess returns	Given the most reliance	Meets most of the rate of return criteria set out in the Guideline. The main potential limitation is slow response to changes in market conditions. This is not a limitation if investor expectations of the 10 year forward looking market risk premium move similarly slowly. Further, considering other sources of evidence reduces this limitation.
Dividend growth models (AER's construction)	Given the second most reliance	Meets most of the rate of return criteria set out in the Guideline. The main limitation is its sensitivity to assumptions, which is significant. It is also likely to produce upward biased estimates. ⁸² Since it can readily reflect changes in market conditions, it complements our use of historical excess returns. However, its tracking ability is limited if it produces inaccurate results.
Survey evidence	Given some reliance (point in time estimate)	Its main strength is that it estimates investor expectations. However, limitations related to survey design and representativeness of respondents can reduce the value of these estimates. Triangulation of survey evidence may reduce these limitations.
Conditioning variables (dividend yields, credit)	Given some reliance (directional information only)	Their main strength is their ability to detect changing market conditions. However, it is difficult to derive an MRP estimate from this

⁷⁹ See for example: AER, *Final decision SA Power Networks determination 2015-16 to 2019-20: Attachment 3–Rate of return*, October 2015, pp. 43–106.

⁸⁰ See for example: AER, *Final decision SA Power Networks determination 2015-16 to 2019-20: Attachment 3–Rate of return*, October 2015, pp. 43–106.

⁸¹ For example, see: Partington and Satchell, *Report to the AER: Cost of Equity Issues 2016 Electricity and Gas Determinations*, April 2016, pp. 24–27.

⁸² McKenzie and Partington, *Report to the AER: Part A, return on equity*, October 2014, pp. 26, 28–30; Partington, *Report to the AER: Return on equity (Updated)*, April 2015, pp. 46–50, 59; Partington & Satchell, *Report to the AER: Analysis of criticism of 2015 determinations*, October 2015, pp. 43–44.

Relevant material	Role	Reasons for chosen role
spreads, implied volatility)		information in a robust manner. Academic and empirical evidence on this information is mixed.
Other Australian regulators' market risk premium estimates	Cross check on how we consider information	This is indirect evidence of the market risk premium, which we do not use to estimate the market risk premium. However, we consider it useful to have regard to the approaches other regulators are taking to consider the evidence before them.
Dividend growth models (SFG's construction)	Does not inform our market risk premium estimate	We consider this dividend growth model is unnecessarily complex and produces unrealistic growth rates. We consider SFG overstates its benefits because it transfers where one makes assumptions, rather than reducing the need to make assumptions. (see appendix B—DGM)
Imputation credit adjustment (AER, Brailsford et al.)	Adjust market risk premium estimate under the dividend growth model and historical excess returns	This is consistent with economic and finance principles and empirical analysis. The adjustment is also transparent and replicable.
Imputation credit adjustment (SFG)	Does not inform our market risk premium estimate	This applies a formula (from Officer) differently to how we apply the Officer framework in the PTRM. Applying the formula, as SFG proposed could cause problems because it is based on perpetuity assumptions and assumes no capital gains.
Independent valuation reports	Does not inform our market risk premium estimate	More suitable for use at the overall return on equity level because writers of these reports can adjust individual parameters to obtain an overall result.
The Wright approach	Does not inform our market risk premium estimate	More suitable for informing the overall return on equity because it is designed to provide information at the return on equity level and does not use a direct estimate of the MRP.

Source: AER analysis.

3.2.1.2 Equity beta

Equity beta measures the sensitivity of an asset or business's returns to the movements in the overall market returns (systematic or market risk).⁸³

We adopt an equity beta point estimate of 0.7 from a range of 0.4 to 0.7. Our equity beta estimate is required to be commensurate with a similar degree of risk as that which applies to Murraylink's provision of prescribed transmission services.⁸⁴ We are satisfied that an equity beta of 0.7 reflects a similar degree of systematic risk as Murraylink is exposed to in providing prescribed transmission services. We hold this view because:

- Our range and point estimate give most weight to direct measurements (that is, empirical estimates) of the equity beta that businesses with a similar degree of risk as Murraylink have exhibited in the past. We consider these are reliable indicators of the prevailing, forward-looking equity beta for an efficient business (or benchmark efficient entity) with a similar degree of risk as Murraylink
- Our range and point estimate are consistent with our conceptual analysis. This suggests the systematic risk of Murraylink⁸⁵ would be less than the systematic risk of the market as a whole (that is, its equity beta would be less than 1.0). Our conceptual analysis is supported by McKenzie and Partington.⁸⁶
- The theoretical principles underpinning the Black CAPM are reasonably consistent with an equity beta towards the upper end of our range. For firms with an equity beta below 1.0, the Black CAPM theory may support using a higher equity beta than those estimated from businesses with a similar degree of risk as Murraylink when used within a Sharpe-Lintner CAPM. This is a result of the Black CAPM relaxing an assumption underlying the Sharpe-Lintner CAPM, which allows for unlimited borrowing and lending at the risk free rate.⁸⁷ However, we do not consider the theory underlying the Black CAPM warrants a specific uplift or adjustment to the equity beta point estimate. We have explained the reasons for our use of the Black CAPM theory in Appendix B.2 in our previous determinations⁸⁸ and do not

⁸³ McKenzie and Partington, *Risk, asset pricing models and WACC*, June 2013, p. 21; Brealey, Myers, Partington, Robinson, *Principles of Corporate Finance*, McGraw-Hill Australia: First Australian Edition, 2000, p. 187.

⁸⁴ More precisely, for distribution network service providers, the rules refer to standard control network services, see: NER, cl. 6.5.2(c). For transmission network service providers the rules refer to prescribed transmission services, see NER, cl. 6A.6.2(c). For gas network service providers the rules refer to reference services, see NGR, r. 87(3).

⁸⁵ More precisely, an efficient business (or benchmark efficient entity) with a similar degree of risk as that which applies to Murraylink in the provision of prescribed transmission services.

⁸⁶ See: McKenzie and Partington, *Report to the AER, Part A: Return on equity*, October 2014, pp. 10–12; Partington, *Report to the AER: Return on equity (Updated)*, April 2015, p. 31; Partington and Satchell, *Report to the AER: Return on equity and comment on submissions in relation to JGN*, May 2015, p. 6; Partington & Satchell, *Report to the AER: Analysis of criticism of 2015 determinations*, October 2015.

⁸⁷ However, the Black CAPM replaces this with an assumption of unlimited ability to short sell stocks.

⁸⁸ For example, see: AER, *Final decision APA VTS access arrangement 2018 to 2022 Attachment 3–Rate of return*, November 2017.

repeat them in this decision as Murraylink has not submitted issues with our use of the Black CAPM.

- We recognise the importance of providing stakeholders with transparency and predictability in our rate of return decisions, which we consider is consistent with the achievement of the ARORO.⁸⁹ In this context, a point estimate of 0.7 is consistent with our Guideline (which was developed following extensive consultation) and is a modest step down from previous regulatory determinations.⁹⁰ It also recognises the uncertainty inherent in estimating unobservable parameters, such as the equity beta for a benchmark efficient entity.

We have reviewed Murraylink's revised proposal and consider its materials are substantively the same as those considered in draft decision for Murraylink and in our November 2017 final decisions.⁹¹ We do not find satisfactory evidence of an increase to depart from our range and point estimate. Our updated analysis remains consistent with Henry's range which supports our range (0.4–0.7) and point estimate (0.7).

We also note empirical studies submitted by service providers previously such as the November 2016 CEG report submitted by Multinet.⁹² While these reports are from separate regulatory processes and not directly relevant to the current process, we still include them because they are useful for informing our decision and for completeness.

We discuss Murraylink's material in the 'Murraylink proposal for an equity beta of 0.8' section below.

We also consider a number of other empirical studies of the equity beta of Australian energy network businesses. We do not repeat the details of our consideration in this decision as Murraylink did not submit new empirical studies in its revised proposal. However, we reference our previous regulatory decisions (as they are still relevant for informing this decision) and note these empirical studies show a consistent pattern of equity beta estimates that is robust to the use of different econometric methods and time periods.⁹³ We observe that these empirical studies present equity beta estimates that converge on the range of 0.4 to 0.7.⁹⁴

⁸⁹ Stakeholders, particularly service providers, sought greater certainty of process. See: AER, *Explanatory statement: Rate of return guideline*, December 2013, p. 51; AEMC, *Final rule determination*, November 2012, pp. 42–43, 45, 50; RARE Infrastructure Limited, *Submission to AER's rate of return guidelines consultation paper*, June 2013; The Financial Investor Group, *Response to the AER's rate of return guidelines consultation paper*, June 2013, p. 1; ENA, *Submission to AER's rate of return guidelines issues paper*, February 2013, p. 4; PIAC, *Submission to AER's rate of return guidelines issues paper*, February 2013, p. 17.

⁹⁰ That is, determinations prior to the 2012 Rule change. From 2010 to early 2014, all our regulatory determinations have applied an equity beta of 0.8. See: AER, *Review of the WACC parameters: final decision*, May 2009, p. v.

⁹¹ For example, see: AER, *Final decision APA VTS access arrangement 2018 to 2022 Attachment 3–Rate of return*, November 2017, pp. 78–80.

⁹² CEG, *Replication and extension of Henry's beta analysis*, November 2016; Frontier, *An equity beta estimate for the benchmark efficient entity*, January 2017.

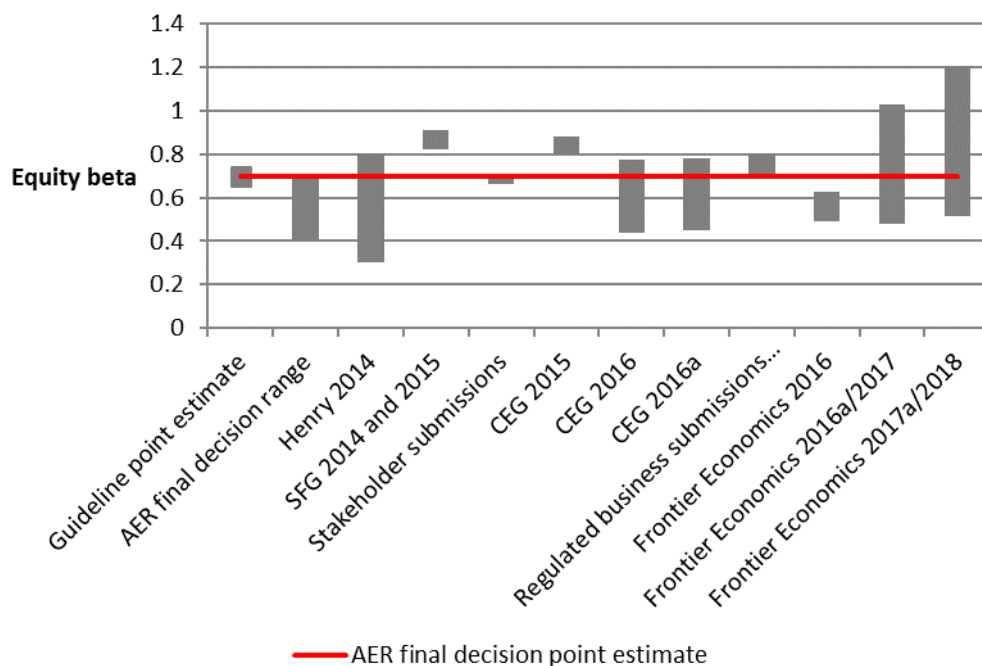
⁹³ For example see For example, see: AER, *Final decision APA VTS access arrangement 2018 to 2022 Attachment 3–Rate of return*, November 2017, p. 246.

⁹⁴ As discussed in detail in section G of our final decision for APA VTS we do not consider individual firm equity beta estimates in isolation. This is because no particular energy network firm in our comparator set is perfectly

We have considered equity beta estimates for international energy businesses, which range from 0.3 to 1.0. However, the pattern of international estimates is not consistent and we consider international businesses are less likely than Australian businesses to have a similar degree of systematic risk as Murraylink. More information on empirical estimates can be found in section G of our draft decision for Murraylink.

We have considered international estimates which, in conjunction with considerations of the Black CAPM and investor certainty (as discussed above) support a higher estimate and an estimate at the upper end of our range.⁹⁵ Our equity beta point estimate also provides a balanced outcome given the submissions by stakeholders and services providers, as shown in Figure 3-2.

Figure 3-2 Submissions on the value of the equity beta



Source: AER analysis⁹⁶

representative of the benchmark efficient entity. We consider averages of individual firm estimates and estimates from various portfolios of firms are more likely to be reflective of the benchmark efficient entity. However, we place no material reliance on time varying portfolio estimates, as according to Henry, they are not grounded in financial theory and are prone to measurement error. See: Henry, *Estimating β : an update*, April 2014, p. 52.

⁹⁵ But does not support an estimate beyond our range. We hold this view based on:

- (1) the outcome of our conceptual analysis that a business with a similar degree of risk as AusNet Services (in providing regulated services) is likely to have an equity beta less than one;
- (2) our assessment of the relative merits of the material, and conclusion that greater weight should be placed on Australian empirical estimates than international estimates or the theory of the Black CAPM.

⁹⁶ Based on our decision and the following reports: AER, *Rate of return guideline*, 17 December 2013, p. 15; Henry, *Estimating β : An update*, April 2014, p. 63; SFG/Frontier submitted 0.82 (under multiple model approach for return on equity) in SFG, *The required return on equity for the benchmark efficient entity*, 25 February 2015, p. 20; SFG, *Beta and the Black capital asset pricing model*, 13 February 2015, p. 4; and Frontier, *Estimating the equity beta for*

Note: Henry 2014 presents the range specified in Henry's 2014 report (0.3 to 0.8). The stakeholder submissions range is intended to reflect the views of consumer groups and those who use/engage with the energy network (or pipeline). The lower bound of this range is based on Origin's submission to Multinet, AusNet and AGN's regulatory proposal and the upper bound is based on various submissions to Murraylink's revised proposal. The SFG 2014 and 2015 range lower bound is based on multiple model regression analysis of Australian and US firms and the upper bound is based on SFG multiple model based equity beta estimates (under its 'foundation model' approach for the return on equity). CEG 2015 figures are from CEG January 2015 paper on estimating the cost of equity, equity beta and MRP. CEG 2016 beta range is the result of CEG's re-estimation of the Henry 2014 paper with extension to 30 June 2016 submitted with AusNet Services Revised revenue proposal in September 2016. CEG 2016a beta range is the result of CEG's update to its 2016 estimation using data to October 2016. Frontier Economics 2016 range is drawn from Australian energy network estimates in their January 2016 reports for Jemena, ActewAGL, AusNet Services, Australian Gas Networks, CitiPower, Powercor and United Energy on beta estimations. Frontier 2016a/2017 range is from Australian energy network estimates in its December 2016 report for APA and January 2017 report for TransGrid. Frontier 2017a/2018 range is from Australian energy network estimates in its August 2017 report for APA VTS and APTPPL and January 2018 report for ActewAGL/Evoenergy.

the benchmark efficient entity, January 2016, p. 3. SFG/Frontier submitted 0.91 (under alternative 'foundation model' approaches for return on equity) in SFG, *Beta and the Black capital asset pricing model*, 13 February 2015, p. 35; Frontier, *The required return on equity under a foundation model approach*, January 2016, p. 11; CEG, *Replication and extension of Henry's beta analysis*, 21 September 2016, pp. 2-3,14; CEG, *Replication and extension of Henry's beta analysis*, November 2016; Origin Energy, *Victorian Gas Access Arrangement Review-2018-22 Response to Gas Distribution Business' proposals*, 17 February 2017; Business SA, *Submission on Murraylink's revised proposal*, 12 January 2018; Government of SA, *Submission on Murraylink's revised proposal*, 18 December 2017.

Murraylink proposal for equity beta of 0.8

Murraylink continued to propose an equity beta of 0.8 in its revised proposal. After reviewing the revised proposal, we consider that Murraylink does not provide substantively new material in support of an equity beta of 0.8.

A focus of Murraylink's revised proposal appears to be an argument from its original proposal.⁹⁷ That is the equity beta should be 0.8 because we previously set an equity beta of 0.8 in 2013 for Murraylink. Murraylink's key point is that the estimate of 0.8 made by the AER in 2013 (consequent to the Statement of Regulatory Intent 2009)⁹⁸ remains appropriate in 2018.⁹⁹

The reason put forward by Murraylink is that the 0.8 value was based on the same empirical range as that used to set a value of 0.7 in the Guideline. Murraylink interprets this as the AER in 2013 of having found that 0.8 achieves the broader requirements of the NEO.

We reiterate that we previously set a 0.8 equity beta (slightly above the range of 0.4–0.7) for Murraylink to account for the precision of estimates.¹⁰⁰ This was the main driver of that decision. However, the substantial increase in the number of data points at the time of the Guideline, and the fact that estimates across both relatively stable and volatile periods supported our range of 0.4–0.7, gave greater confidence in our range.¹⁰¹ As a result, we have greater confidence that the equity beta is in the range of 0.4–0.7.

This is supported by CCP9 who noted that the previous Murraylink decision pre-dated the Rate of Return Guideline and it is the Guideline that is the basis for AER's decisions and expectations about those decisions.¹⁰²

Murraylink's revised proposal stated that the analysis from ERA, CEG and Frontier referenced in its original proposal pointed to but did not confirm an increase in empirical equity beta estimates since Henry's 2014 study.¹⁰³ Murraylink also stated that it did not claim there has been a material change in beta on the basis of those

⁹⁷ Murraylink, *Murraylink Revenue Proposal Effective July 2018 to June 2023*, January 2017.

⁹⁸ AER, *Final decision Electricity transmission and distribution network service providers Review of the weighted average cost of capital (WACC) parameters*, May 2009.

⁹⁹ Murraylink, *Murraylink revised revenue proposal effective July 2018 to June 2023*, December 2017, p. 21.

¹⁰⁰ AER, *Final decision Electricity transmission and distribution network service providers Review of the weighted average cost of capital (WACC) parameters*, May 2009, pp. 307, 343–344; AER, *Final decision Murraylink Transmission determination 2013–14 to 2017–18*, April 2013, pp. 34–35; AER, *APT Petroleum Pipeline Pty Ltd Access arrangement final decision Roma to Brisbane Pipeline 2012–13 to 2016–17*, August 2012, p. 20; AER, *Access arrangement final decision APA GasNet Australia (Operations) Pty Ltd 2013–17 Part 2 Attachments*, March 2013, p. 93;

¹⁰¹ AER, *Better Regulation Explanatory Statement: Rate of return guideline*, December 2013, pp. 84–85.

¹⁰² CCP9, *Response to Draft Decision and Revised Proposal for Revenue Reset for Murraylink for 2018–2023*, 29 January 2018, p. 34

¹⁰³ Murraylink, *Murraylink Revenue Proposal Effective July 2018 to June 2023*, January 2017, pp. 32–40.

reports.¹⁰⁴ We note these reports submitted by Murraylink with its original revenue proposal were done in the context of justifying an increase in equity beta since Henry's 2014 study.¹⁰⁵ For reasons outlined in our draft decision,¹⁰⁶ we maintain our view that the reports do not support an increase to our range and point estimate for equity beta.

We do not agree with Murraylink's observation that our update of Henry's 2014 study to be 'inconsistent' with our range of 0.4–0.7.¹⁰⁷ The results of our updated analysis remains consistent with Henry's range which supports our range (0.4–0.7), point estimate (0.7) and does not suggest increasing our point estimate of equity beta since Henry's study.¹⁰⁸

3.2.2 Final decision

We step through the six-step foundation model approach in making our decision.

Step one and two: identify relevant material and role

We have had regard to a large amount of material including estimation methods, financial models, market data and other evidence and determined the role we consider that each piece of material should play in estimating the return on equity. In previous regulatory decisions, we set out in detail the way in which the information is used either as the foundation model, to inform our foundation model input parameters, or as other information—other than as the foundation model, to inform our return on equity estimate.¹⁰⁹ We discuss this in the draft decision and its appendices B to H.

Step three: implementing the foundation model

Choice of equity models

We apply the Sharpe-Lintner CAPM as our foundation model. We consider the Sharpe-Lintner CAPM is the best model for estimating the efficient costs of equity financing because it:

- transparently presents the key risk and reward trade-off¹¹⁰ that is at the heart of our task¹¹¹
- is widely and consistently used for estimating the expected return on equity by financial market practitioners, academics, and other regulators¹¹²

¹⁰⁴ Murraylink, *Murraylink revised revenue proposal effective July 2018 to June 2023*, December 2017, p. 22.

¹⁰⁵ Murraylink, *Murraylink Revenue Proposal Effective July 2018 to June 2023*, January 2017, pp. 32–40.

¹⁰⁶ AER, *Draft Decision Murraylink transmission determination 2018 to 2023 Attachment 3 Rate of Return*, September 2017, pp. 68–71.

¹⁰⁷ Murraylink, *Murraylink revised revenue proposal effective July 2018 to June 2023*, December 2017, p. 21.

¹⁰⁸ AER, AER staff beta analysis June 2017, June 2017.

¹⁰⁹ AER, *Final decision SA Power Networks determination 2015–16 to 2019–20: Attachment 3–Rate of return*, October 2015, pp. 43–106.

¹¹⁰ That is, systematic risk priced via expected returns on equity.

¹¹¹ As set out in NER cl.6; NER cl. 6A; NGR.

- has well-accepted and unbiased methods for estimating its parameters, and these parameters can be estimated with tolerable accuracy, unlike the alternative models proposed by some service providers.

Our consultants have also agreed with our use of the Sharpe-Lintner CAPM as the foundation model. Handley stated:¹¹³

[t]he AER's choice of the Sharpe-CAPM as foundation model is entirely appropriate and reasonable for this purpose. The Sharpe-CAPM is the standard (equilibrium) asset pricing model. It has a long established and well understood theoretical foundation and is a transparent representation of one of the most fundamental paradigms of finance - the risk-return trade off.

McKenzie and Partington indicated with respect to the Sharpe–Lintner CAPM:¹¹⁴

With regard to the CAPM, its efficacy comes from the test of time. This model has been around for in excess of half a century and has become the standard workhorse model of modern finance both in theory and practice. The CAPMs place as the foundation model is justifiable in terms of its simple theoretical underpinnings and relative ease of application. The competing alternatives, which build upon the CAPM, serve to add a level of complexity to the analysis.

Murraylink has adopted the Sharpe-Lintner CAPM as the foundation model for estimating the return on equity.¹¹⁵

Parameter inputs

Risk free rate

Applying the Sharpe-Lintner CAPM requires estimating the risk free rate.

We consider 10 year CGS yields are the most suitable proxy for the risk free rate. We use 10 year CGS yields because we adopt a 10 year term. A 10 year term emphasises the long term nature of cash flows in equity investments and the long lived nature the benchmark efficient entity's assets.

We apply a risk free rate of 2.84 per cent in this decision. This risk free rate is based on an averaging period from 17 January to 31 January 2018 which was proposed by Murraylink in its letter dated 16 August 2017¹¹⁶ and accepted in our draft decision.¹¹⁷

¹¹² See AER, *Explanatory statement to the rate of return guideline (appendices)*, 17 December 2013, pp. 12–13.

¹¹³ Handley, *Advice on the return on equity*, 16 October 2014, p. 4.

¹¹⁴ McKenzie and Partington, *Report to the AER part A: Return on equity*, October 2014, p. 9. This position was also supported by Partington, *Report to the AER: Return on equity (updated)*, April 2015, p. 29; Partington and Satchell, *Report to the AER: Return of equity and comment on submissions in relation to JGN*, May 2015, p. 7; and Partington and Satchell, *Report to the AER: Analysis of criticism of 2015 determinations*, October 2015, pp. 17, 21.

¹¹⁵ Murraylink, *Murraylink revised revenue proposal effective July 2018 to June 2023*, December 2017, pp. 19–20.

¹¹⁶ Murraylink, *Letter from Mark Allen Regulatory Manager to Warwick Anderson General Manager AER - Murraylink - Averaging Periods*, 16 August 2017.

¹¹⁷ AER, *Draft Decision Murraylink transmission decision 2018 to 2023 Attachment 3: Rate of return*, September 2017, pp. 59–60.

We use this to inform our final decision on the return on equity for Murraylink's regulatory period. Murraylink did not oppose our draft decision in its revised proposal.¹¹⁸

While we recognise that the 10 year CGS yields have changed since 31 January 2018, these rates after the averaging period do not inform our decision. We are satisfied with our estimate of the risk free rate and how this informs our estimate of the return on equity for this decision because:

- That our risk free rate contributes to the achievement of the allowed rate of return objective.¹¹⁹
- The averaging period is consistent with the conditions set out in the Guideline.¹²⁰
- Our approach to estimating the market risk premium and risk free rate is internally consistent because both are 10 year forward looking estimates.¹²¹

We are satisfied that an estimate of 2.84 per cent is the best estimate of the risk free rate at this time.

Market risk premium and equity beta

These have been discussed in section 3.2.1 above.

Steps four and five: other information and evaluation of information set on overall return on equity

To inform the reasonableness of the Guideline's foundation model return on equity estimate, we estimate and evaluate values from other relevant sources of information (steps four and five of the foundation model approach).¹²² In having regard to prevailing market conditions we have also examined recent movements in the relevant material.

Our task is to set the allowed rate of return to be commensurate with a similar degree of risk as that which applies to Murraylink with respect to the provision of prescribed transmission services.¹²³ This requires us to consider the additional riskiness of Murraylink¹²⁴ relative to the risk free asset, and the commensurate return that equity

¹¹⁸ Murraylink, *Murraylink revised revenue proposal effective July 2018 to June 2023*, December 2017, pp. 19–20

¹¹⁹ NER, cl. 6.5.2(f); NER, cl. 6A.6.2(f); NGR, r. 87(6).

¹²⁰ AER, *Rate of return guideline*, 17 December 2013, p. 15, 74–82.

¹²¹ This was recognised in Australian Competition Tribunal, *Application by APA GasNet Australia (Operations) Pty Limited (No 2) [2013]*, *ACompT 8*, 18 September 2013, paras 279, 302–308.

¹²² This includes broker reports, independent valuation reports, other regulators' decisions, the Wright approach and comparison between the return on equity and return on debt.

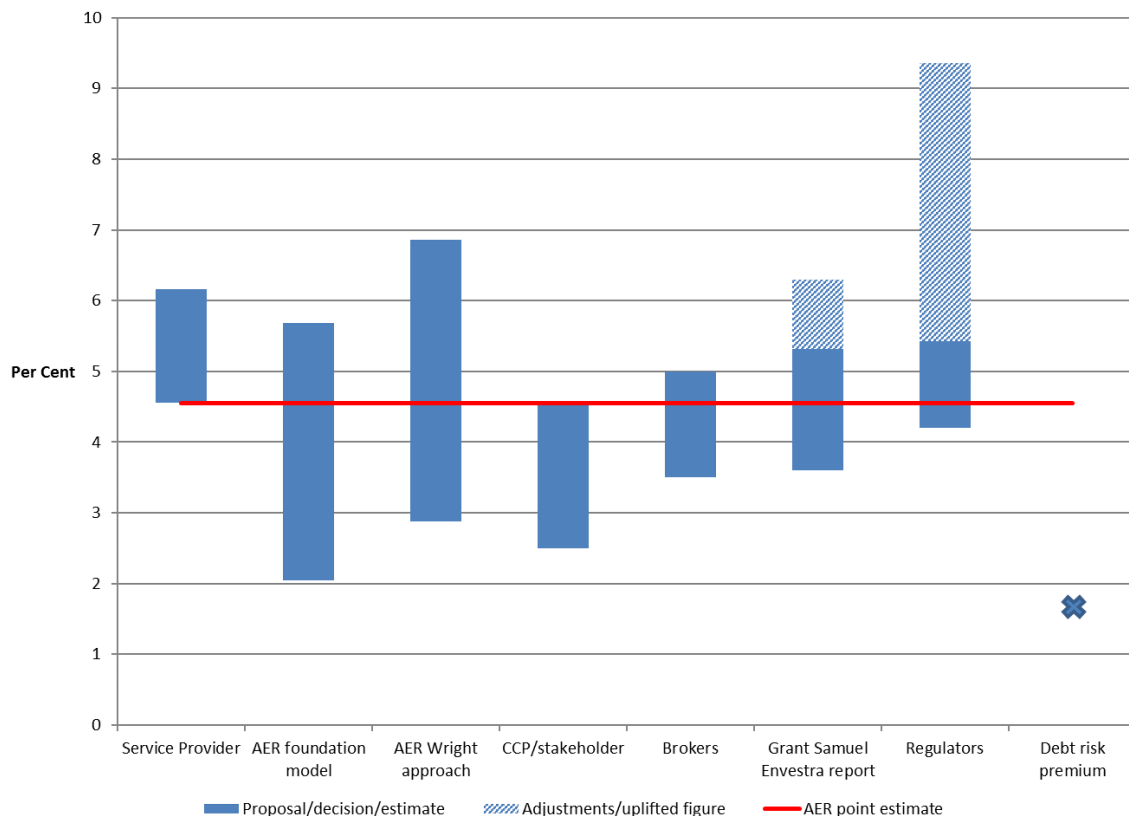
¹²³ In respect of the provision of network services. While there may be many various risks associated with providing regulated network or pipeline services, we consider that (consistent with modern portfolio theory) the rate of return will be commensurate with efficient financing costs if it reflects only non-diversifiable risks. Diversifiable risk can be addressed through other regulatory mechanisms, such as capex and opex allowances.

¹²⁴ Or more precisely, a benchmark efficient entity with a similar degree of risk as Murraylink in respect of the provision of prescribed transmission services.

investors require to take on this additional risk. Hence, the critical allowance is the allowed equity risk premium over and above the estimated risk free rate at a given time. Appendix B compares our foundation model equity risk premium to other relevant material¹²⁵ that can inform our estimate of return on equity and equity risk premium.

We consider that, on the whole, the other material¹²⁶ broadly supports our foundation model estimate of the return on equity. We do not find this information indicate a material, sustained change in market conditions since our most recent November 2017 decisions¹²⁷ sufficient to cause us to move away from our foundation model estimate.

Figure 3-3 Comparison of foundation model equity risk premium



Source: AER analysis and various submissions and reports.

Notes: The AER foundation model equity risk premium (ERP) range uses the range and point estimate for market risk premium and equity beta. The calculation of the Wright approach is set out in section B.1 The

¹²⁵ The Rate of Return Guideline outlines the use of certain other material to inform our final estimate of the return on equity: the Wright approach, other regulators' estimates, broker returns, independent expert reports and comparison with return on debt. See: AER, *Better Regulation: Explanatory Statement, Rate of Return Guideline*, December 2013, p. 61.

¹²⁶ The other material includes our construction of the Wright CAPM, other regulators' estimates, comparison with return on debt and relevant broker and independent expert reports.

¹²⁷ For example, see: AER, *Final decision APA VTS gas access arrangement 2018 to 2022 Attachment 3–Rate of return*, November 2017.

calculation of brokers and other regulators ranges is outlined in Appendix B. The calculation of debt risk premium is in Appendix B.2.

Grant Samuel's final WACC range included uplift above an initial SLCAPM range. Grant Samuel made no explicit allowance for the impact of Australia's dividend imputation system. The upper bound of the range shown above includes the uplift and an adjustment for dividend imputation, while the lower bound does not. The upper shaded portion of the range includes the entirety of the uplift on return on equity and a full dividend imputation adjustment.¹²⁸

The shaded portion of the other regulators range represents the impact of rail, transport and retail gas decisions on the range. We consider these industries are unlikely to be comparable to the benchmark efficient entity.

The service provider proposals range is based on the revised proposals from businesses¹²⁹ for which we will make decisions in April 2018. The lower bound of the CCP/stakeholder range is based on CCP5 and CCP9 submission,¹³⁰ the upper bound is based on various consumer groups' submission to Murraylink's revised proposal.¹³¹

Our implementation of the foundation model approach results in a return on equity of 7.4 per cent and an equity risk premium of 4.55 per cent. This is consistent with equity risk premium ranges from broker reports, valuation reports, other regulators' decisions, and the Wright approach as shown in appendix B. The range of equity risk premium estimates from valuation reports and other regulators' decisions have not materially changed since our May and August 2016 decisions. The estimated equity risk premium range from the Wright approach has also remained broadly stable since we made the October and November 2015 decisions. As set out in section 3.2.1.1, we do not agree with the underlying premise of the Wright CAPM that there is a clear inverse relationship between movements in the risk free rate and market risk premium. Consequently we place limited reliance on the Wright approach.

The return on debt material shown in the figure above does not support any change to our foundation model return on equity estimate. Our analysis indicates that the equity risk premium is about 284 basis points¹³² above the prevailing return on debt. The return on debt is a relative indicator and we expect that, most of the time,¹³³ investors' expected return on equity will exceed the expected return on debt. For a benchmark efficient entity with a similar degree of risk as Murraylink, we would not expect the

¹²⁸ Grant Samuel, *Envestra: Financial services guide and independent expert's report*, March 2014, Appendix 3.

¹²⁹ ElectraNet, Murraylink and TransGrid.

¹³⁰ CCP5, *Submission on AusNet transmission revised proposal*, October 2016; CCP Sub-panel 9, *Response to proposals from TransGrid for a revenue reset for 2018-19 to 2022-23*, 12 May 2017, p.6; CCP sub panel 9, *Response to proposals from Murraylink for a revenue reset for the 2018-23 regulatory period*, 12 May 2017.

¹³¹ CCP9, *Response to Draft Decision and Revised Proposal for Revenue Reset for Murraylink for 2018-2023*, 29 January 2018, p. 4; Government of SA, *Submission on Murraylink's revised proposal*, 18 December 2017; Business SA, *Submission on Murraylink's revised proposal*, 12 January 2018.

¹³² Estimated as the difference between our estimate of the equity risk premium and the prevailing debt risk premium.

¹³³ We consider that the expected return on debt is likely to exceed the expected return on equity during periods of financial distress because holders of debt are typically ranked ahead of equity holders in the event of bankruptcy. We also consider that equity and debt may face different types of risk. Inflation risk is one risk that is likely to affect debt more significantly than equity. Movements in the risk premia for these different types of risk may, theoretically, result in an expected return on debt that exceeds an expected return on equity.

return on equity to be a large margin above the prevailing return on debt.¹³⁴ We do not consider that the current 284 basis points difference between the equity risk premium allowed in this decision and debt risk premiums¹³⁵ to be too low (see Appendix B for more discussion).

The spread between the equity and debt premiums has remained fairly constant in early 2017 after widening in the latter part of 2016 and it remains above the estimate at the publication of the Guideline in December 2013 (see Figure 3-9 in appendix B.2). It remains broadly consistent with those observed in previous regulatory decisions.¹³⁶ We consider the current difference is not too low, given the low risk profile of a benchmark efficient entity with a similar degree of risk as Murraylink in providing prescribed transmission services.¹³⁷ Further, measured debt yields likely understate the expected yield spread due to default risk.¹³⁸

The regulatory regime to date has been utilising the Sharpe-Lintner CAPM to set the return on equity and has been supportive of investment. There is no evidence to suggest that the service providers we regulate have not been able to raise capital on reasonable terms to undertake extensive investment programs.¹³⁹ This suggests the allowances set in the past using the Sharpe-Lintner CAPM was at least adequate to recover efficient costs.¹⁴⁰ We also note that broker reports suggest that our recent determinations have not removed the ability for listed networks to maintain payment of

¹³⁴ Due to the regulatory regime and the businesses' monopoly positions shielding them from systematic risk; as well as the measured prevailing debt yields likely overstating the expected return on debt due to default risk. For more information, see section pages 96 to 99 of Attachment 3 to our preliminary decision for AusNet Services' 2016-20 distribution determination. And for example pages 78–80 of our final decision for AusNet Services (distribution) in May 2016.

¹³⁵ The debt risk premiums to CGS are calculated as the extrapolated effective annual yield to maturity on BBB rated debt with 10 years to maturity less the effective annual yield to maturity on CGS with 10 years to maturity. BBB bond yields have been used instead of BBB+ because the RBA quotes BBB yields to maturity. This is calculated over the same averaging period as the equity risk free rate.

¹³⁶ For example, SAPN, Final decision, p. 509; AER, *Final Decision CitiPower distribution determination - attachment 3 - rate of return*, May 2016, p. 76.

¹³⁷ Due to the regulatory regime and the businesses' monopoly positions shielding them from systematic risk. For more information, see pages 96 to 99 of Attachment 3 to our preliminary decision for AusNet Services' 2016-20 distribution determination. And for example pages 78–80 of our final decision for AusNet Services (distribution) in May 2016.

¹³⁸ The debt risk premium to CGS is calculated as the extrapolated effective annual yield to maturity on BBB related debt with 10 years to maturity less the effective annual yield to maturity on CGS with 10 years to maturity. BBB bond yields have been used instead of BBB+ because the RBA and Bloomberg quote BBB yields to maturity.

¹³⁹ See, for example, DUET, *Successful completion of DUET's \$200 million placement offer*, 1 April 2016; DUET, *DUET completes \$1.67 billion placement and entitlement offer*, 13 August 2015; DUET, *DUET completes \$396.7 million entitlement offer*, December 2014; SP AusNet, *SP AusNet completes A\$434 million Entitlement Offer*, 15 June 2012. ASX & SGX-ST release, *AusNet Services successfully prices HKD 1.2bn offer*, 9 December 2016; ASX & SGX-ST release, *AusNet Services successfully prices NOK 1bn offer*, 10 January 2017; ASX & SGX-ST release, *AusNet Services successfully prices USD 80m offer*, 19 January 2017.

¹⁴⁰ RARE infrastructure submitted that "[t]here are many characteristics of the Australian Regulatory framework that makes its energy network potentially attractive investments" RARE Infrastructure, *Letter to the AER*, 13 February 2015;

dividends.¹⁴¹ This provides confidence that our estimate for this decision, while taking account of the downward trends of equity beta and risk free rate, is likely to provide Murraylink a reasonable opportunity to recover at least the efficient costs of providing prescribed transmission services.

In addition to the equity risk premium ranges shown in Figure 3-3, we have analysed movements in various conditioning variables (yield spreads, dividend yields, and the volatility index for the ASX200).¹⁴² These conditioning variables can provide information about prevailing market conditions and whether or not the market is in a period of heightened risk aversion. Overall, the conditioning variables appear fairly stable and close to their long term averages. There was broad agreement from consumer groups on the application of our foundation model approach as set out in our Guideline.¹⁴³ We consider that this means applying the overall approach, parameter estimation and use of other information¹⁴⁴ as relevant cross-checks.

While supporting our Guideline, some consumer groups have submitted that it reflects conservative choices¹⁴⁵ that may result in over-estimating the return on equity and that parameter estimates (and rate of return) can be lowered further.¹⁴⁶ Submissions also

¹⁴¹ For details, see section L.1 of Confidential Appendix L in Attachment 3 to our preliminary decision on AusNet Services' 2016-20 distribution determination.

¹⁴² See appendix A.3 for further discussion.

¹⁴³ We received submissions from consumer groups and other stakeholders that provided clear submissions on the approach for estimating the rate of return. No submission opposed the application of our Guideline for estimating the return on equity.

¹⁴⁴ Broker reports, independent expert reports, other regulators' estimates, comparison with return on debt and our construction of the Wright CAPM.

¹⁴⁵ CCP4 (David Headberry) - *Submission on Powerlink draft decision and revised proposal*, p. 21, 21 December 2016; CCP5, *Submission on AusNet transmission revised proposal*, October 2016 p10; AGL, *Submission on the AER's draft decision on AGN's 2016–21 access arrangement*, 4 February 2016, p. 2; ECCSA, *A response to the AER draft decision on AGN's AA2016 revenue reset*, February 2016, p. 36; EUCV, *A response to AusNet revenue reset proposal for the 2017–2022 period*, 9 February 2016, p. 40; CCP (panel 5), *Transmission for the generations: Response to proposal by AusNet Services transmission group pty ltd and AER issues paper for AusNet Services transmission revenue review 2017–22*, February 2016, p. 41; VECUA, *Submission on the AER: AER preliminary 2016–20 revenue determinations for the Victorian DNSPs*, 6 January 2016, p. 2; CCP (panel 3), *Submission to the Australian Energy Regulator (AER): An overview Response to AER Preliminary Decisions and revised proposals from Victorian electricity distribution network service providers for a revenue reset for the 2016–2020 regulatory period*, 25 February 2016. pp. 10 & 29–30; CCP (11), *Response to the AER's draft decisions and the revised proposals from AGN, AusNet and Multinet for a revenue reset/access arrangement for the period 2018 to 2022*, 12 September 2017, p. 30.

¹⁴⁶ CCP4 (Hugh Grant) - *Submission on Powerlink draft decision and revised proposal*, 23 December 2016, p39-42.; CCP5, *Submission on AusNet transmission revised proposal*, October 2016, p10; ECCSA, *A response to the AER draft decision on AGN's AA2016 revenue reset*, February 2016, p. 36–37; VECUA, *Submission on the AER: AER preliminary 2016–20 revenue determinations for the Victorian DNSPs*, 6 January 2016, p. 2, 12, 17; CCP (panel 5), *Transmission for the generations: Response to proposal by AusNet Services transmission group pty ltd and AER issues paper for AusNet Services transmission revenue review 2017–22*, February 2016, p. 40; CCP (panel 3), *Submission to the Australian Energy Regulator (AER): An overview Response to AER Preliminary Decisions and revised proposals from Victorian electricity distribution network service providers for a revenue reset for the 2016–2020 regulatory period*, 25 February 2016, p. 10 & 29; CCP Sub-panel 9, *Response to proposals from TransGrid for a revenue reset for 2018-19 to 2022-23*, 12 May 2017, p.72; CCP sub panel 9, *Response to proposals from Murraylink for a revenue reset for the 2018-23 regulatory period*, 12 May 2017, p. 4.

noted that we need to give more weight to market data and realised returns such as financial performance and asset sales when considering the overall return on equity.¹⁴⁷

Step six: distil point estimate

We are satisfied that an expected return on equity derived from the Sharpe-Lintner CAPM should be the starting point for estimating the return on equity. We are also satisfied that the other information does not indicate that our equity risk premium estimate should be uplifted or downshifted to contribute to the achievement of the allowed rate of return objective.

Following our estimation approach and having considered and given the relevant material due weight on their merits, we are satisfied that an expected return on equity estimate of 7.4 per cent derived from our implementation of the Sharpe-Lintner CAPM will contribute to the achievement of the allowed rate of return objective. We are also satisfied that this estimate is consistent with prevailing market conditions.

¹⁴⁷ VECUA, *Submission on the AER: AER preliminary 2016–20 revenue determinations for the Victorian DNSPs*, 6 January 2016, p. 2, 12, 17; EUCV, *A response to AusNet revenue reset proposal for the 2017–2022 period*, 9 February 2016, pp. 40–41; CCP (panel 3), *Submission to the Australian Energy Regulator (AER): An overview Response to AER Preliminary Decisions and revised proposals from Victorian electricity distribution network service providers for a revenue reset for the 2016–2020 regulatory period*, 25 February 2016, p. 10; ECCSA, *A response to the AER draft decision on AGN's AA2016 revenue reset*, February 2016, pp. 36–37.

A Market risk premium

We have regard to historical excess returns, dividend growth model (DGM) estimates, survey evidence and conditioning variables. We also have regard to recent decisions by Australian regulators.¹⁴⁸ This appendix sets out these evidence.

A.1 Historical excess returns

Historical excess market returns are sensitive to the method of averaging returns over multiple periods. The arithmetic average return is the simple average annual return. The geometric average return is the average compounded annual return.¹⁴⁹

In estimating the market risk premium, we have regard to both arithmetic and geometric average historical excess returns. Table 3-5 sets out our estimates of historical excess returns, measured using both arithmetic and geometric averages, and estimated over different sample periods up until the 2017 calendar year end.¹⁵⁰ Arithmetic average measures range between 6.0 and 6.5 per cent and geometric average measures range between 4.2 and 5.0 per cent.

Table 3-5 Historical excess returns (per cent)

Sampling period	Arithmetic average	Geometric average
1883–2017	6.3	5.0
1937–2017	6.0	4.2
1958–2017	6.5	4.2
1980–2017	6.4	4.2
1988–2017	6.0	4.5

Source: Handley, *An estimate of the historical equity risk premium for the period 1883 to 2011*, April 2012, p. 6. AER update for 2012–2017 market data.

Notes: Based on a theta of 0.6.

A.2 Dividend growth model

Results in Table 3-6 show that, for the two month period up to end–January 2018, the dividend growth models produce a range of market risk premium estimates between 6.61 to 7.86 per cent.

¹⁴⁸ AER, *Rate of return guideline*, 17 December 2013, p. 16.

¹⁴⁹ The arithmetic average is measured as the sum of N numbers divided by N. The geometric average is measured as the Nth root of the product of N numbers.

¹⁵⁰ We have traditionally taken historical excess returns as a calendar year-end estimate. For consistency, and given these change slowly throughout time, we maintain this convention.

Table 3-6 Market risk premium estimates under dividend growth models (per cent)

Growth rate	Two stage model	Three stage model
3.8	6.61	6.73
4.6	7.39	7.38
5.1	7.86	7.78

Source: Bloomberg, AER analysis.

Notes: Growth rate is nominal, for more detail on derivation of these long term dividend growth rate estimates see section B.2.1 of Attachment 3 to our preliminary decision for AusNet Services' 2016-20 distribution determination. Market risk premium estimates are based on an assumed theta of 0.6, and a 2 month average (December 2017 to January 2018) of analysts' dividend forecasts.

We consider that market risk premium estimates from dividend growth models are very sensitive to input assumptions such as the:

- Long term dividend growth rate.
- Period estimates are averaged over.
- Use of analyst forecasts, which are likely to be biased.

Table 3-7 shows how sensitive our dividend growth model is to these factors.

Table 3-7 Sensitivities in the dividend growth model (per cent)

Sensitivity	Two stage model	Three stage model
Baseline		
4.6% long-term growth rate		
2 month average to end January 2018	7.39	7.38
unadjusted analysts' forecasts		
5.1% long-term growth rate	7.86	7.78
3.78% long-term growth rate	6.61	6.73
6 months to end January 2018	7.53	7.52
12 months to end January 2018	7.50	7.43
Analysts' forecast + 10%	7.95	7.94
Analysts' forecast - 10%	6.83	6.82
Combined – low	6.05	6.15
Combined – high	8.58	8.48

Source: Bloomberg, AER analysis.

Notes: All market risk premium estimates are based on an assumed theta of 0.6.

Combined - low is based on 3.78% growth, 2 month averaging, analysts' forecasts - 10%.

Combined - high is based on 5.1% growth, 6 month averaging, analysts' forecasts + 10%.

A.3 Conditioning variables

Conditioning variables are market data that can be used to inform (or 'condition') an initial estimate. We do not consider conditioning variables provide reliable estimates on their own.¹⁵¹ However, we consider that this information is relevant and may be useful for indicating changes in prevailing market conditions.

In the Guideline we stated that we would consider three types of conditioning variables to inform our estimate of the market risk premium: dividend yields, yield spreads and implied volatility.

A.3.1 Implied volatility

The implied volatility approach assumes that the market risk premium is the price of risk multiplied by the volume of risk (volatility).¹⁵² Figure 3-4 shows volume of risk in the market portfolio estimated using the implied volatility index.

Implied volatility was high during the global financial crisis and the height of the European debt crisis. However, recent implied volatility levels have generally been below the long run average of 17.89 per cent (measured from the start of the data series in 1997). We note that after a spike in volatility levels in mid to late 2015 levels have fallen again to below the long term average.

Figure 3-4 shows the value of this measure of implied volatility relative to its long run average level since the start of the data series in 1997 to 31 January 2018. We observe that the volatility index appears to remain broadly stable over the past year:

- The index was 12.14 per cent if averaging over the year ending 31 January 2018.
- The index was 11.15 per cent over the placeholder risk free rate averaging period (3 January to 31 January 2018).
- The index was 12.36 per cent on 31 January 2018.

Overall, it is not clear there is a sustained movement away from the long term average but recent measures over the past year remain below the long term average.

Partington and Satchell also previously advised that a decline in the Implied Volatility could have downward pressure on the market risk premium. In their most recent report to the AER they stated:

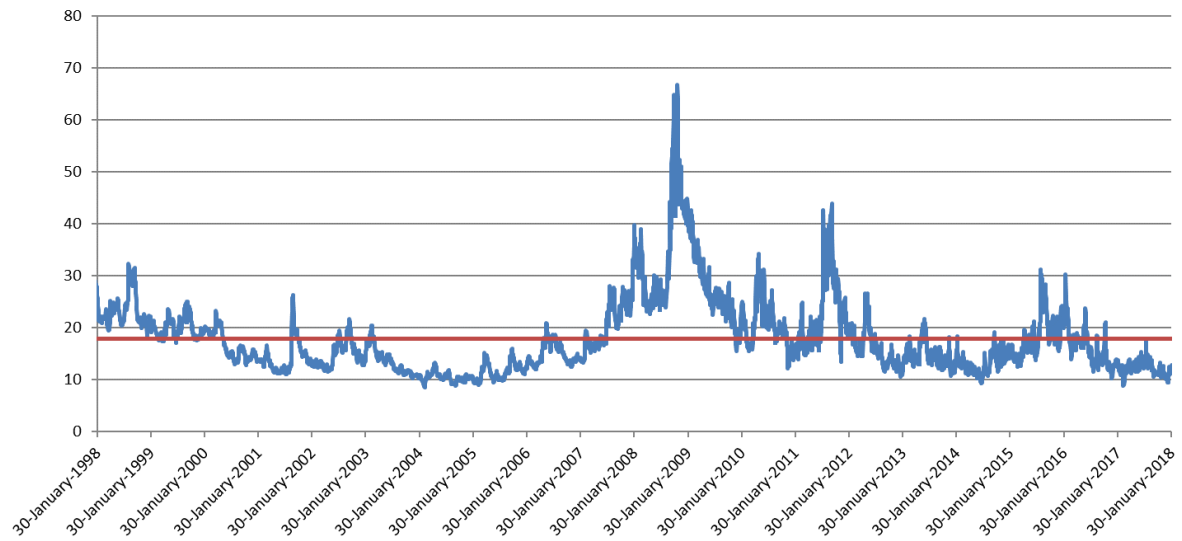
“Currently the ASX VIX index, a measure of market volatility, has been trading at an implied standard deviation of returns on the market of around 12% per annum. This is a particularly low level of volatility as a value of about 20% per annum, would be considered a normal level of volatility. It seems an unlikely

¹⁵¹ See: AER, *Explanatory statement—Rate of return guideline*, December 2013, pp. 94 and 97.

¹⁵² This was based on Merton, R.C., 'On Estimating the Expected Return on the Market: An Exploratory Investigation', *Journal of Financial Economics*, 1980, Vol. 8, pp. 323–361.

outcome to have a relatively high market risk premium when market volatility is particularly low.”¹⁵³

Figure 3-4 Implied volatility (VIX) over time



Source: AER analysis; ASX200 VIX volatility index, sourced via Bloomberg code AS51VIX from 2/1/2008 and code CITJAVIX prior to 2/1/2008.

A.3.2 Dividend yields

We use dividend yields as a directional indicator of the market risk premium.¹⁵⁴ We consider this information by comparing current dividend yields with the average dividend yield through time.¹⁵⁵ Figure 3-5 shows dividend yields against their historical average up to 30 June 2017.

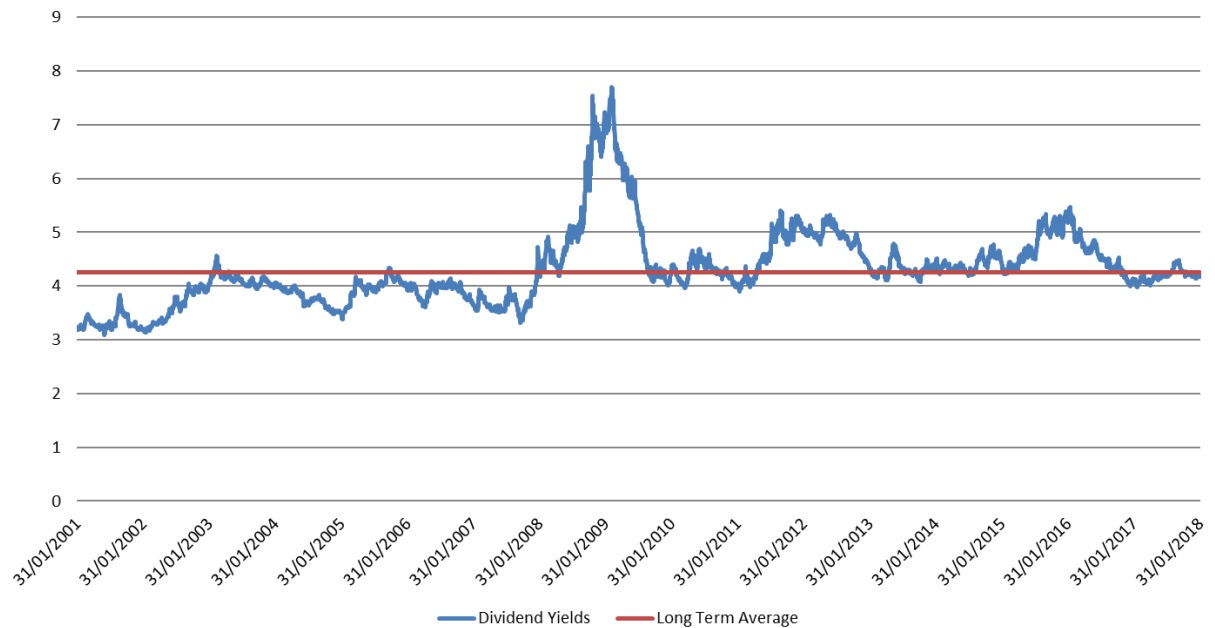
Figure 3-5 shows dividend yields are currently slightly above their long term average of 4.25 (measured from 3rd April 2000). This decrease occurred during 2016 and appears to offset the increase from 2015. It is unclear whether this downward trend will continue however there is no strong evidence to suggest a sustained movement away from the long term average.

¹⁵³ Partington and Satchell, *Report to the AER: Discussion of submissions on the cost of equity*, 29 May 2017, p. 47

¹⁵⁴ AER, *Explanatory statement rate of return guideline (appendices)*, 17 December 2013, p. 94.

¹⁵⁵ For a similar approach, see SFG, *Market risk premium: Report for APT Petroleum Pipelines Ltd*, October 2011, p. 13.

Figure 3-5 Dividend yields



Source: Bloomberg AS51 Index, AER analysis.

A.3.3 Yield spreads

Yield spreads are the difference between the yields on different assets, typically debt instruments. We examine two categories of yield spreads:

- Credit spreads, used to inform our market risk premium estimate.
- The spread between our equity risk premium and debt risk premium, used to inform our overall return on equity estimate.

Credit spreads are the spreads between the risk free rate (the yield on Australian government securities) and the return on debt for different debt instruments. We use credit spreads as a directional indicator of the market risk premium.¹⁵⁶ We consider this information can be used to indicate changes in market conditions. That is, to indicate whether spreads are widening, stabilising or narrowing.

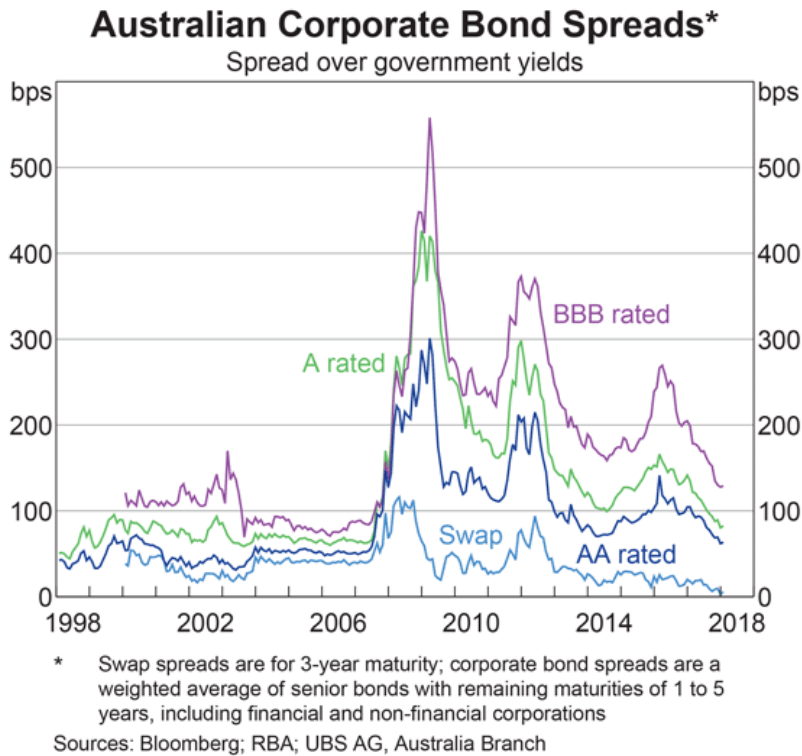
Figure 3-6 shows credit spreads for A-rated, AA-rated, and BBB-rated corporate debt instruments over yields on Australian government securities. These credit spreads were showing a clear downward trend in recent years and are around or below their 2013/14 level.

Most credit spreads are also above their pre-2007 levels, while the swap rate spread is at or below its pre-2007 levels. In essence, lower quality debt is further from pre-2007

¹⁵⁶ AER, *Explanatory statement rate of return guideline (appendices)*, 17 December 2013, p. 96.

levels than higher quality debt. However, the credit spreads are all substantially lower than they were between 2008 and 2013.

Figure 3-6 Australian bond spreads over government yields

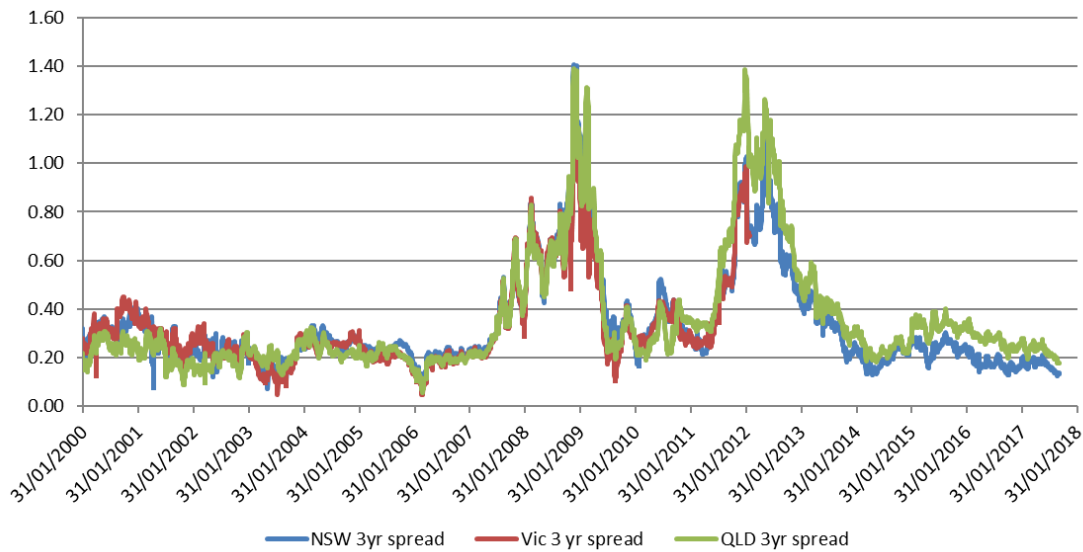


Source: RBA, Chart Pack, download 7 March 2018 (data to 1 March 2018).

Note: Swap spreads are for a 3 year maturity. Corporate bonds are a weighted average of senior bonds with remaining maturities of 1 to 5 years and include financial and non-financial corporates.

Figure 3-7 shows the spread between state government debt and Australian government debt up to 30 June 2017. This uses maturities of three years as more data are available. Figure 3-7 shows that credit spreads were falling since late 2012, and are now around their pre-2007 levels with no discernible trend.

Figure 3-7 State government bond spreads over government yields



Source: AER analysis, Bloomberg.

A.4 Surveys

Survey estimates explore investor expectations about the market risk premium. They achieve this by directly asking investors and market practitioners what their expectations are and/or what they apply in practice. We place some reliance on survey estimates in estimating the market risk premium.

Table 3-8 shows that market risk premium estimates, from surveys published since 2013, cluster around 6.0 per cent. This provides some evidence to suggest that investor expectations of the market risk premium have not increased, and may have eased.

Table 3-8 Key findings on market risk premium from recent surveys

Survey	Numbers of responses	Mean (%)	Median (%)	Mode (%)
Fernandez et al (2013)	73	5.9	6.0	N/A
KPMG (2013) ^a	19	N/A	6.0	6.0
Fernandez et al (2013)	17	6.8	5.8	N/A
Asher and Hickling (2013)	46	4.8	5.0	6.0
Fernandez et al (2014) ^b	93	5.9	6.0	N/A
Asher and Hickling (2014) ^c	27	4.4	4.6	6.0
Fernandez et al (2015)	40	6.0	5.1	N/A
KPMG (2015) ^d	~27	N/A	6.0	6.0
Asher and Carruther (2015)	29	4.9	N/A	N/A

Fernandez et al (2016)	87	6.0	6.0	N/A
Carruther (2016)	24	5.3	N/A	N/A
Fernandez et al (2017)	26	7.3	7.6	N/A
KPMG (2017)	45	N/A	6.0	6.0

Sources: Several survey reports.¹⁵⁷

- Notes:
- a) While this survey had 23 market participants, 19 specified what market risk premium they used.
 - b) The 2014 survey did not report the response rate. AER staff obtained this information from Professor Fernandez via email correspondence on 22 July 2014.
 - c) The response rate for this survey is lower than the response rate in previous Asher and Hickling surveys because the survey took place from 5 December 2014 to 14 December 2014, which was very close to Christmas. AER staff obtained the mode from Associate Professor Anthony Asher via email correspondence on 17 September 2015.
 - d) The KPMG (2015) survey had 29 market participants, but figure 24 indicates that not all the market participants gave a response for the market risk premium. However, visual inspection indicates that the response rate was approximately 27.

Several factors should be considered when examining survey evidence:¹⁵⁸

- Timing of the survey—we consider the timing of each survey is clear in all but two surveys we consider. The earliest survey we consider was published in January 2013 but its questionnaires were sent out in May and June 2012.¹⁵⁹
- Sample of respondents—financial managers and analysts, expert valuers, actuaries, finance academics, investment banks, professional services firms and infrastructure funds were among the target respondents of surveys. These professionals apply the market risk premium, so we consider the surveys' target

¹⁵⁷ Fernandez, Ortiz, Acín, *Market risk premium used in 71 countries in 2016: a survey*, May 2016; KPMG, *Australian valuation practices survey 2015*, May 2015; Fernandez, Ortiz, Acín, *Discount rate (risk-free rate and market risk premium) used for 41 countries in 2015: a survey*, April 2015; Asher and Hickling, *Equity Risk Premium Survey 2014*, Actuaries Institute, April 2015; Fernandez, Linares, Acín, *Market Risk Premium used in 88 countries in 2014*, IESE Business School, June 2014; Asher and Hickling, *Equity Risk Premium Survey*, Actuary Australia, December 2013; Fernandez, Arguirreamalloa and Linares, *Market Risk Premium and Risk Free Rate used for 51 countries in 2013*, IESE Business School, June 2013; KPMG, *Valuation Practices Survey 2013*, February 2013; Fernandez, Arguirreamalloa and Corres, *Market Risk Premium used in 82 Countries in 2012*, IESE Business School, January 2013; Asher and Carruther, *Equity Risk Premium Survey 2015, Actuaries Digital*, May 26 2016; David Carruthers, *Equity Risk Premium Survey 2016*, 8 March 2017; Fernandez, Linares, Acín, *Discount Rate (Risk-Free Rate and Market Risk Premium) used for 41 Countries in 2017: a survey*, April 2017; KPMG, *KPMG Valuation Practices Survey*, July 2017.

¹⁵⁸ As noted in: Australian Competition Tribunal, *Application by Envestra Limited (No 2) [2012] ACompT 3*, 11 January 2012, paragraphs 165–166.

¹⁵⁹ The KPMG valuation practices surveys do not clearly state the time period over which the survey was made. Fernandez, Ortiz, Acín, *Discount rate (risk-free rate and market risk premium) used for 41 countries in 2015: a survey*, April 2015, p. 2; Asher and Hickling, *Equity Risk Premium Survey 2014*, Actuaries Institute, April 2015, p. 1; Fernandez, Linares, Acín, *Market Risk Premium used in 88 countries in 2014*, IESE Business School, June 2014, p. 2.

populations can make informed judgments about the market risk premium. Each survey also sets out the selection of the sample surveyed (or respondents).¹⁶⁰

- Wording of survey questionnaires—we consider the adequacy of survey wording can be subjective to judge and often relies on the quality of the authors. However, we also consider confidence in this area can be enhanced when the work is published in a refereed academic journal, or when the survey is repeated. In our sample, only the KPMG survey has not been repeated at least three times.
- Survey response rate and non-response bias—McKenzie and Partington suggested a sample size of more than 30 is sufficiently large statistically so a representative sample of 30 respondents is expected to be adequate.¹⁶¹

After having regard to the above factors, we consider that the survey estimates in Table 3-8 are useful for informing our market risk premium estimate. We note that triangulation across surveys can reduce the limitations associated with particular survey evidence.¹⁶²

A.5 Other regulators

The estimates of the market risk premium from other regulators' decisions (dated between January 2017 to January 2018) range from 6 to 7.75 per cent.¹⁶³ Figure 3-8 shows that our estimate (6.5 per cent) of the market risk premium is consistent with the range of estimates from other regulators over time.

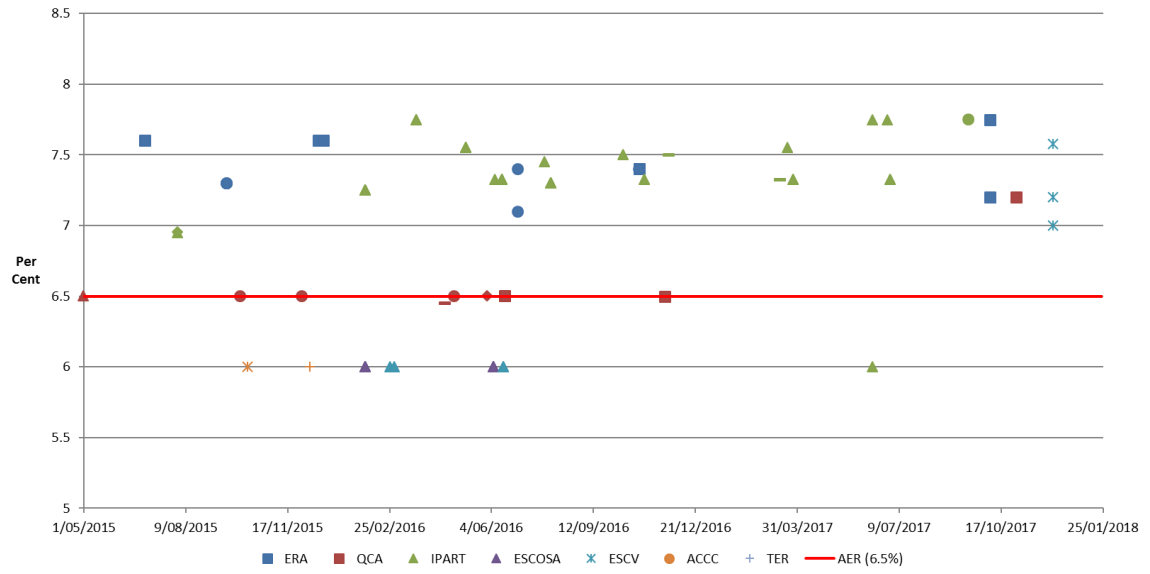
¹⁶⁰ KPMG, *Australian valuation practices survey 2015*, May 2015, p. 2; Fernandez, Ortiz, Acín, *Discount rate (risk-free rate and market risk premium) used for 41 countries in 2015: a survey*, April 2015, p. 3; Asher and Hickling, *Equity Risk Premium Survey 2014*, Actuaries Institute, April 2015, p. 1; Fernandez, Linares, Acín, *Market Risk Premium used in 88 countries in 2014*, IESE Business School, June 2014, p. 2.

¹⁶¹ McKenzie and Partington, *Supplementary report on the MRP*, February 2012, pp. 17–18.

¹⁶² McKenzie and Partington considered triangulation increases their confidence in the results from survey evidence. McKenzie and Partington, *Supplementary report on the MRP*, February 2012, pp. 17, 19–20.

¹⁶³ IPART, *Review of maximum fares for private ferry services in 2017*, 11 October 2016; ERA, *Public Transport Authority- Determination on the 2016 Weighted Average Cost of Capital for the Freight and Urban Railway Networks and for Pilbara Railways*, 27 October 2016; *Prices for wholesale water and sewerage charges- Sydney Water Corporations and Hunter Water Corporations - draft report*, November 2016; QCA, *DBCT 2015 Draft Access Undertaking Final decision*, 21 November 2016; IPART, *Maximum fees and charges for cruise ships in Sydney Harbour Final decision*, 25 November 2016; IPART, *Review of Prices for Sydney desalination plant Ltd*, 1 March 2017; IPART, *Review of Prices for rural bulk water services from 1 July 2017 to 30 June 2021*, 1 March 2017; IPART, *Review of prices for rural bulk water services from 1 July 2017 (MDB and Coastal Valleys)*, 13 June 2017; IPART, *Sydney Desalination Plant Pty Ltd - Review of prices from 1 July 2017 to 30 June 2022*, 27 June 2017; ; IPART, *Price for wholesale water and sewerage services Sydney Water Corporation and Hunter Water Corporation*, 30 June 2017.

Figure 3-8 Market risk premium estimates from other regulators' decisions



Source: AER analysis of other Australian regulators since 2015

B Information considered under steps four and five of our foundation model

To inform the reasonableness of the Guideline's foundation model return on equity estimate, we estimate and evaluate values from other relevant sources of information (steps four and five of the foundation model approach).¹⁶⁴

These estimates may be relevant material that can inform our return on equity estimation.

Relevant estimates are typically sourced from, broker reports valuation reports, and other regulators' decisions. Such estimates are discussed further in the subsections below.

We have focused on return on equity estimates for companies with a similar degree of non-diversifiable risks as Murraylink in providing prescribed transmission services. This means that greater reliance is placed on electricity and gas network service providers over other types of businesses. Greater reliance is also placed on businesses with revenues that are substantially regulated over businesses with less regulated revenue. We take this approach as it better reflects the degree of risk of Murraylink in relation to the provision of prescribed transmission services.

B.1 The Wright approach

We estimate the return on equity under the Wright approach using a range for the long term historical average return on the market. We use a range because the estimated return on the market will vary depending on the time period used.¹⁶⁵

Table 3-9 sets out our estimates of historical returns on the market portfolio. The nominal return ranges from 10.1 to 12.6 per cent.

¹⁶⁴ This includes broker reports, independent valuation reports, other regulators' decisions, the Wright approach and comparison between the return on equity and return on debt.

¹⁶⁵ AER, *Explanatory statement: Rate of return guideline (appendices)*, December 2013, pp. 26–27.

Table 3-9 Historical returns on the market portfolio (per cent)

Sampling period	Market return (real)	Market return (nominal)
1883–2017	8.6	11.3
1937–2017	7.4	10.1
1958–2017	8.9	11.6
1980–2017	9.8	12.6
1988–2017	9.2	11.9

Source: Handley, *An estimate of the historical equity risk premium for the period 1883 to 2011*, April 2012, p. 6. AER update for 2012–2017 market data.

Notes Historical market returns are estimated using arithmetic averages, assuming a theta value of 0.6, and assuming an inflation rate of 2.5 per cent. Nominal figures calculated by the AER using the Fisher equation:

$$1+i=(1+r)(1+\pi) \text{ where } r \text{ denotes the real return, } i \text{ denotes the nominal return and } \pi \text{ denotes the inflation rate.}$$

We estimate a return on equity under the Wright CAPM¹⁶⁶ by combining the historical nominal market return with our prevailing risk free rate estimate¹⁶⁷ and equity beta estimates.¹⁶⁸ As shown in Table 3-10, our estimated range for equity beta and market return results in Wright CAPM return on equity estimates ranging from 5.7 to 9.7.

Table 3-10 Wright CAPM return on equity (per cent)

AER equity beta estimate	Wright CAPM return on equity based on 10.1 market return	Wright CAPM return on equity based on 12.6 market return
0.4	5.7	6.7
0.7	7.9	9.7

Source: AER analysis.

Notes: Based on a final risk free rate estimate of 2.84 per cent.

B.2 Return on debt relative to the return on equity

On the comparison between the return on equity and return on debt, we consider that prevailing debt market conditions provide support for the view that:

- our estimated return on equity is not below efficient financing costs¹⁶⁹
- Murraylink’s proposed return on equity is likely to exceed efficient financing costs.

¹⁶⁶ See section **Error! Reference source not found.** for details on the Wright CAPM.

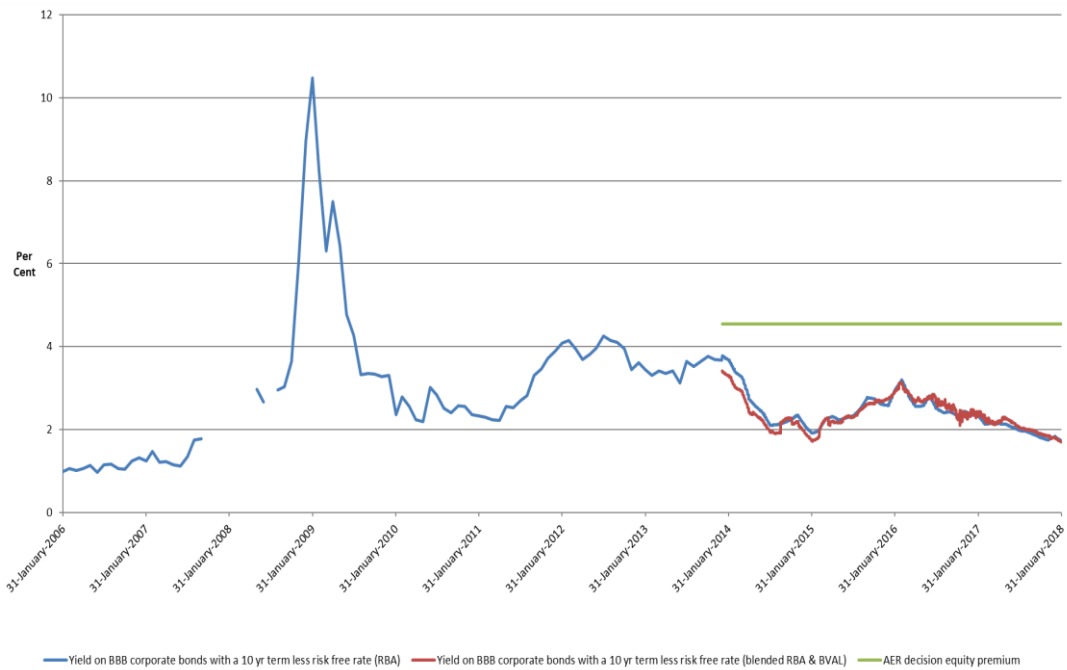
¹⁶⁷ Our risk free rate estimate is 2.84 per cent.

¹⁶⁸ Our estimated range for equity beta is 0.4 to 0.7. For more detail, see section 3.2.

¹⁶⁹ Efficient financing costs for a benchmark efficient entity with a similar degree of risk as that which applies to the distribution (or transmission) network service provider in respect of the provision of standard control services, prescribed transmission services or reference services. See: NER, cl. 6.5.2(c); NER, cl. 6A.6.2(c); NGR, r.87(3).

The current debt market is indicating a premium over the risk free rate of about 1.71 per cent.¹⁷⁰ This compares to our foundation model equity premium over the risk free rate of 4.55 per cent (given a market risk premium of 6.5 per cent and a beta of 0.7). Figure 3-9 shows the current and historical debt risk premium and our foundation model equity risk premium.

Figure 3-9 Comparison of equity risk premium and indicative debt risk premiums



Source: AER analysis, RBA interest rates statistics, Bloomberg data.

We do not consider that the current 284 basis points difference between the equity risk premium allowed in this decision and debt risk premiums¹⁷¹ to be too low, on the basis of:

- the low risk nature of a benchmark efficient entity as outlined above
- the gap between the equity risk premium and debt risk premium is likely to be wider than stated above, since it compares a promised, pre-tax return on debt to an expected, post-tax return on equity.¹⁷²

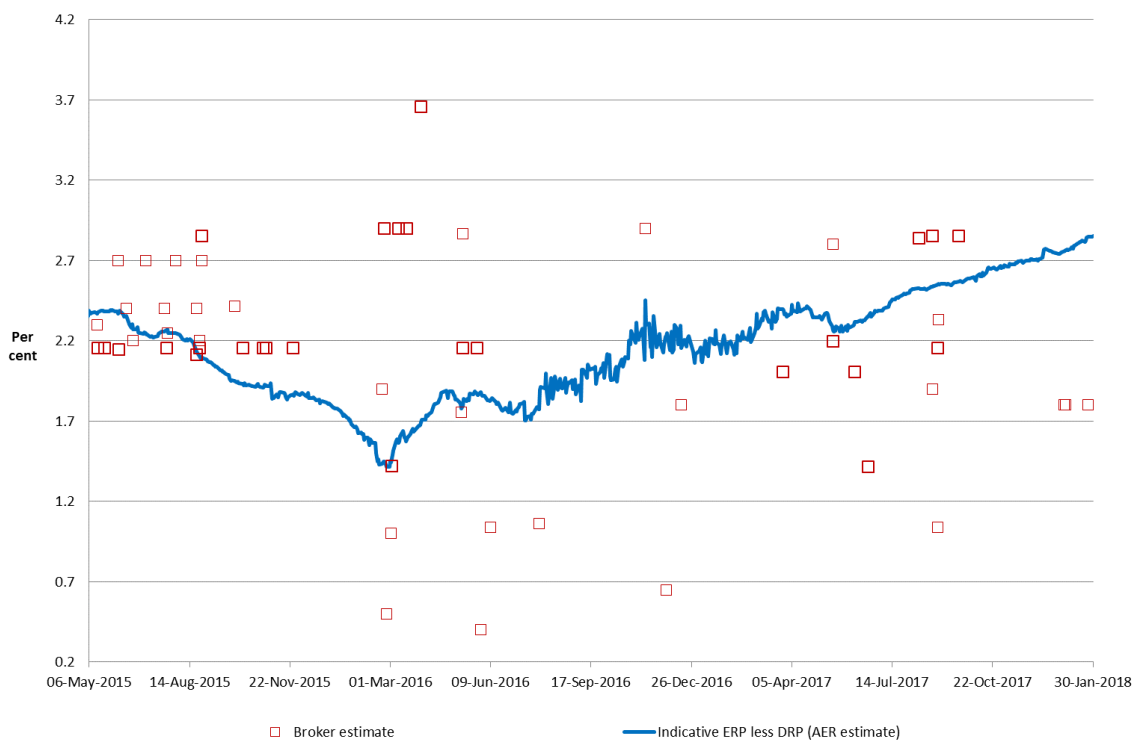
¹⁷⁰ Based on the spread to CGS from our estimation of the cost of debt (based on an average of the RBA's data (on yield to maturity on BBB-rated corporate bonds with a ten year term and the Bloomberg BBB-rated AUD BVAL curve). Averaging period is 17 to 31 January 2018.

¹⁷¹ The debt risk premiums to CGS are calculated as the extrapolated effective annual yield to maturity on BBB rated debt with 10 years to maturity less the effective annual yield to maturity on CGS with 10 years to maturity). BBB bond yields have been used instead of BBB+ because the RBA quotes BBB yields to maturity. This is calculated over the same averaging period as the equity risk free rate.

We note that the overall directional evidence shows that debt risk decreased since early and keeping them below the levels in December 2013 (when our Rate of Return Guideline was published), as shown in Figure 3-9.

We have also examined estimates from broker reports of the spread between debt and equity risk premiums for comparable businesses (see Figure 3-10). However, we note that the variance in the most recent broker estimates has increased. We consider that this data does not provide a clear indication of brokers' views on recent movements in risk premiums.

Figure 3-10 Difference between equity and debt premiums in broker reports



Source: AER analysis of various relevant broker reports, RBA and Bloomberg data.

Notes: The broker estimate of the difference between equity and debt risk premium is calculated by deducting brokers' debt risk premium from their equity risk premium.

The indicative estimate is calculated by deducting an estimate of the indicative debt risk premium from the equity risk premium for this decision. The indicative debt risk premium is estimated as the yield on BBB-

¹⁷² We consider that promised returns will always exceed expected returns and pre-tax returns will always exceed corresponding post-tax returns. For further explanation, see McKenzie and Partington, *Report to the AER: The relationship between the cost of debt and the cost of equity*, March 2013, pp. 7, 21; 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 3, p. 48.

rated corporate bonds (a simple average of the RBA corporate bond data and Bloomberg BVAL curve) less the yield on 10-year CGS.

B.3 Broker reports

Table 3-11 shows the estimates of return on equity and premium above the risk free rate contained in broker reports which we have examined between 30 June 2017 to 31 January 2018.¹⁷³

Table 3-11 Recent broker reports

		Return on equity	Equity risk premium
Broker estimate—no imputation adjustment	Minimum	6.3	3.5
Broker estimate—no imputation adjustment	Maximum	8.3	5.0
Broker estimate—adjusted for imputation	Minimum	6.7	4.1
Broker estimate—adjusted for imputation	Maximum	8.9	5.7

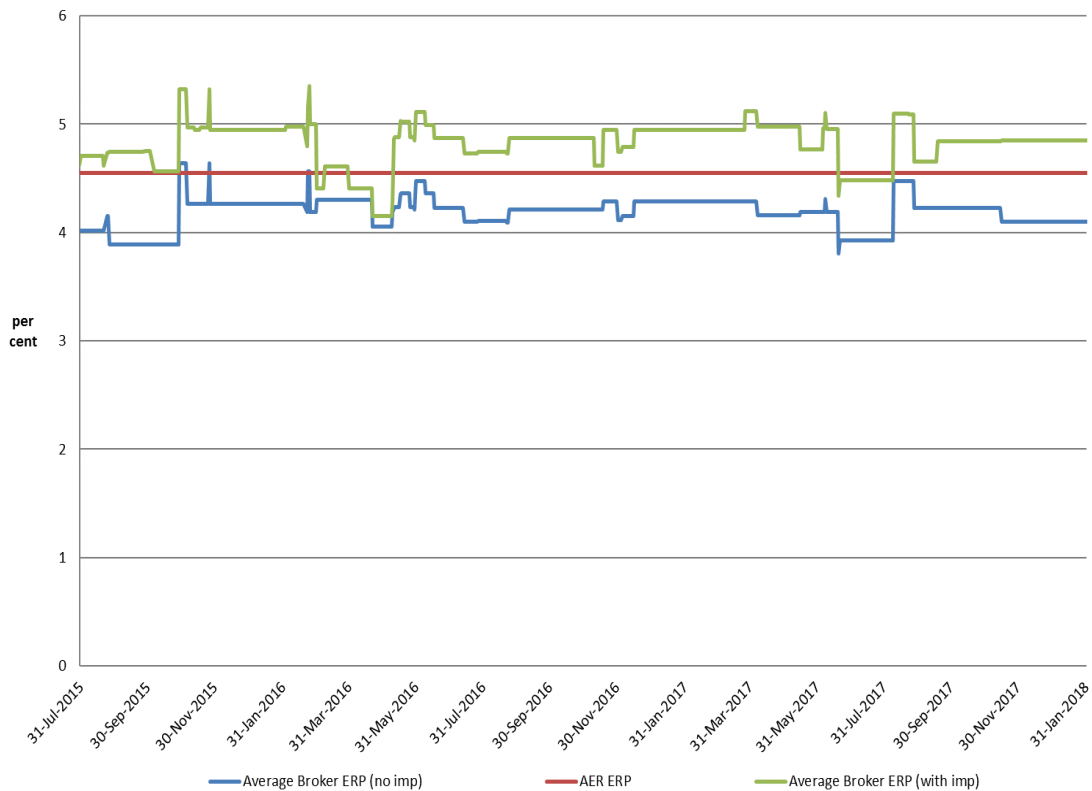
Source: AER analysis of broker reports, dated 30 June 2017 to 31 January 2018 by Credit Suisse, JP Morgan, Morgan Stanley, and Macquarie Bank that include a valuation for AusNet Services, Spark Infrastructure, APA Group, and/or DUET Group.

The equity risk premium from the AER's foundation model of 4.55 per cent is within the range of premiums recently estimated by brokers, even when these estimates are adjusted for imputation. Murraylink's proposed equity risk premium of 6.16 per cent is above the upper bound of the range of premiums recently estimated by brokers.

Directionally, as shown in Figure 3-11, the equity risk premium has remained within similar parameters for the duration of 2016 and 2017 although there has been a slight downward movement since the end of 2017. Our equity risk premium estimate remains, in general, below the imputation-adjusted broker estimates and above the unadjusted broker estimates. We do not consider that the directional evidence currently supports a move away from the return on equity resulting from our Guideline approach.

¹⁷³ The ranges given in Table 3-11 capture the most recent report from each broker on each of the stated companies in this time period.

Figure 3-11 Equity risk premium estimates from broker reports



Source: AER analysis of broker reports by Credit Suisse, JP Morgan, Morgan Stanley, and Macquarie Bank that include a valuation for AusNet Services, Spark Infrastructure, APA Group, and/or DUET Group.

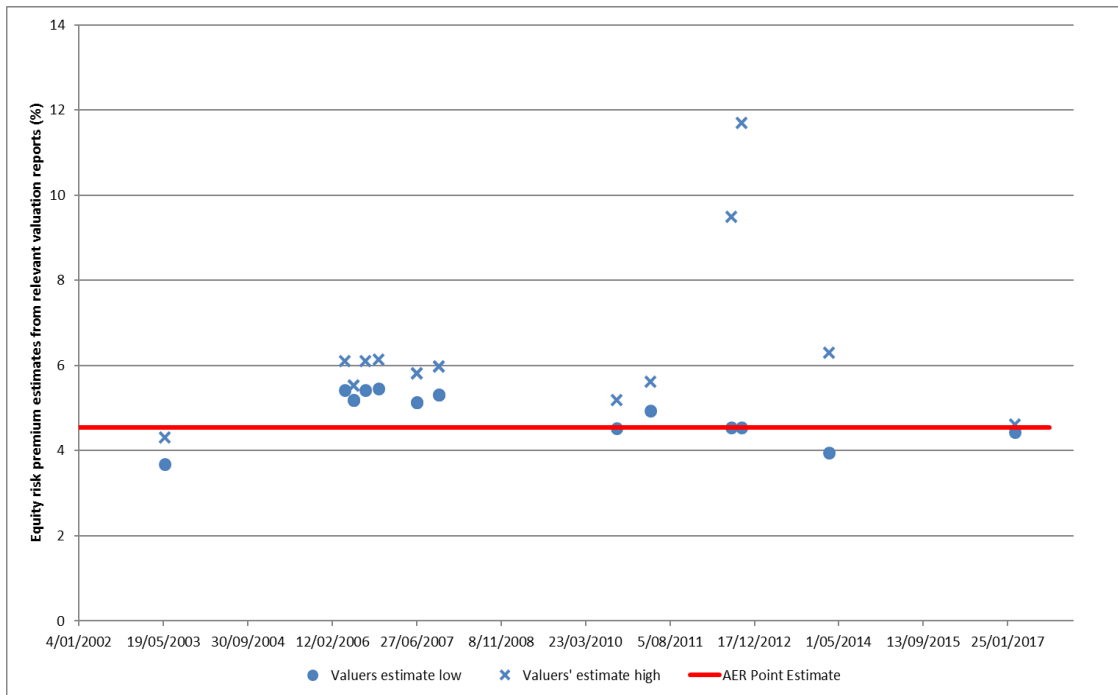
Notes: Average broker ERP is the mean of estimates from all brokers and for all businesses available at the time.

B.4 Valuation reports

Figure 3-12 outlines the range of return on equity and equity risk premium estimates from relevant independent valuation reports. We consider that the number of reports is too low and the concentration of reports among only a few valuers is too high to be able to place significant reliance on the evidence from valuation reports.¹⁷⁴

¹⁷⁴ We note that the correction of a small number of errors in Incenta Economic Consulting's analysis of valuation reports resulted in material changes to its results. See: Incenta Economic Consulting, *Addendum to report titled 'Update on evidence on the required return on equity from independent expert reports'*, 20 August 2014, p. 1.

Figure 3-12 Equity risk premium from relevant valuation reports over time



Source: AER analysis of reports from the Thomson Reuters Connect4 database

Notes: We have shown the equity risk premium based on a nominal vanilla WACC, expert reports using a different WACC form have been adjusted accordingly. This equity risk premium ('Valuers estimate-high') also reflects the impact of any discretionary uplifts applied by the independent valuer.

There have been only 19 relevant independent valuation reports spanning a period going back to 1991.¹⁷⁵ Only 13 reports included a discounted cash flow analysis with information on a return on equity estimate. These 13 reports were provided by only four independent valuation firms, with 9 of the 13 reports being provided by Grant Samuel & Associates.

We note that the ranges for return on equity and equity risk premium estimates contained in Figure 3-12 include the final values used in the independent valuation reports and reflect any uplifts applied. However, as noted in previous decisions we have concerns about the applicability of these uplifts to the allowed rate of return objective.¹⁷⁶ We also have concerns that the adjustment for dividend imputation may not be appropriate (see Appendix I in our draft decision for Murraylink for more detail). The risk premium appropriately reflecting dividend imputation is likely somewhere

¹⁷⁵ The Thomson Reuters' Connect 4 database contains reports going back to 1991, but contains no reports between 1991 and 1998 for comparable electricity or gas network businesses. A list of the reports assessed in this report can be found in Table 3-20 of AER, *Draft Decision: TransGrid transmission determination*, 2015–16 to 2017–18, Attachment 3–Rate of return, November 2014.

¹⁷⁶ See Appendix E.6. 'Return on equity estimates from other practitioners' in the October and November 2015 decisions for more detail.

between the adjusted and unadjusted premiums, but we are unable to distil a precise estimate due to a lack of transparency in valuation reports.

The most recent report for a regulated energy business is KPMG's report for DUET released on 7 March 2017. This report indicates an equity risk premium of 4.44 to 4.62 per cent (without adjustment for dividend imputation).

B.5 Other regulators

The estimates of return on equity from other regulators' decisions (dated between January 2017 and January 2018) range from 6.8 to 11.85 per cent. The premium above the risk free rate from these return on equity estimates decisions ranges from 4.2 to 9.36 per cent.¹⁷⁷

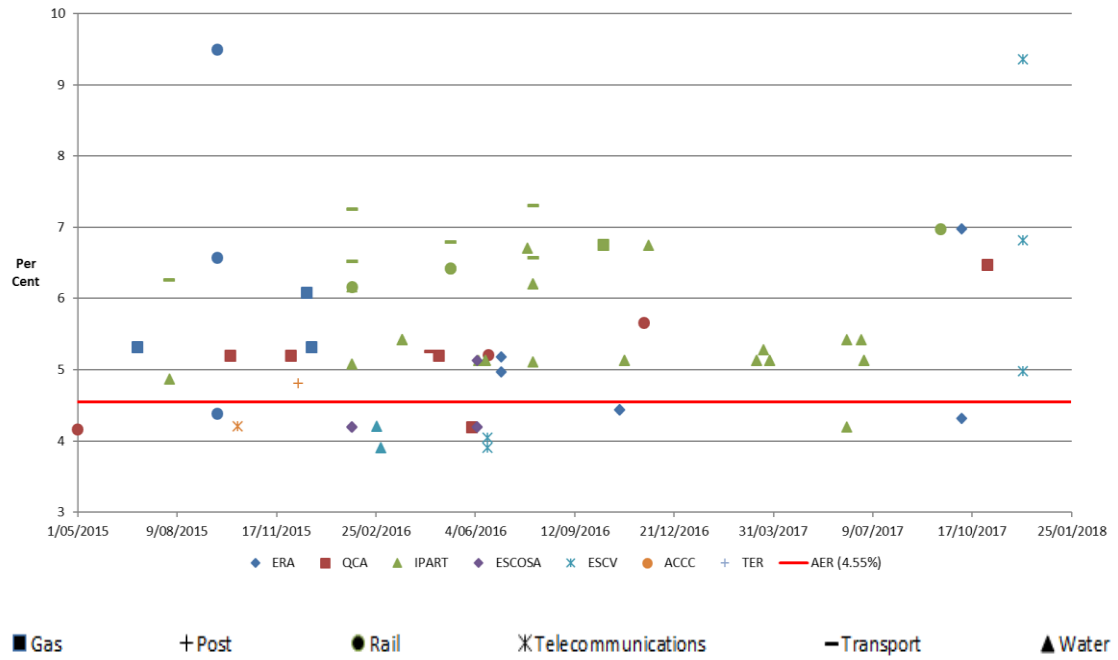
The equity risk premium from our foundation model of 4.55 per cent is within the range of premiums recently estimated by other regulators. Directionally, the range of equity risk premium estimates appears broadly consistent with those examined in our previous decisions¹⁷⁸ as shown in Figure 3-13.¹⁷⁹

¹⁷⁷ IPART, *Review of Prices for Sydney desalination plant ltd*, 1 March 2017; IPART, *Review of Prices for rural bulk water services from 1 July 2017 to 30 June 2021*, 1 March 2017; IPART, *Review of prices for rural bulk water services from 1 July 2017 (MDB and Coastal Valleys)*, 13 June 2017; IPART, *Sydney Desalination Plant Pty Ltd - Review of prices from 1 July 2017 to 30 June 2022*, 27 June 2016; IPART, *Price for wholesale water and sewerage services Sydney Water Corporation and Hunter Water Corporation*, 30 June 2017; IPART, *Draft Report Review of Fares for Private Ferry Services for 2018*; ERA, *Determination on the 2017 WACC for the Freight and Urban Railway Networks*; QCA, *Seqwater Bulk Water Price Review 2018-21*.

¹⁷⁸ Our April and June 2015 decisions examined decisions by other regulators from November 2014 to March 2015. Our October and November 2015 decisions examined decisions by other regulators from March to June 2015. Our 2016 and 2017 decisions examined decisions by other regulators over 2016–2017.

¹⁷⁹ Note that the risk characteristics of rail businesses such as The Pilbara Infrastructure Pty Ltd (an operator of a rail network that transports iron ore freight) may be significantly different to those of the benchmark efficient entity (for example, due to demand risk). Similar concerns may be expressed about Brookfield Rail and IPART Transport decisions. We also note that the ERA's use of the Wright approach to estimating market risk premium is influenced by its annuity pricing framework. The ERA states: "A key consideration in the context of the rail WACC relates to the purpose. The estimate is required to contribute to the annuity that will deliver the value of the rail infrastructure assets, over their economic life. Given the length of the rail asset economic lives, the estimate is long term." [ERA, *Review of the method for estimating the Weighted Average Cost of Capital for the Regulated Railway Networks – Revised Draft Decision*, November 2014, p. 89.] Nevertheless, we have included these decisions for comparative purposes.

Figure 3-13 Equity risk premium estimates from other regulators' decisions



Source: AER analysis of other Australian regulators since 2015

C Equity and debt raising costs

In addition to compensating for the required rate of return on debt and equity, we provide an allowance for the transaction costs associated with raising debt and equity. We include debt raising costs in the opex forecast because these are regular and ongoing costs which are likely to be incurred each time service providers refinance their debt. On the other hand, we include equity raising costs in the capex forecast because these costs are only incurred once and would be associated with funding the particular capital investments.

Our final decision forecasts for debt and equity raising costs are included in the opex and capex attachments, respectively. In this appendix, we set out our assessment approach and the reasons for those forecasts.

C.1 Equity raising costs

In our draft decision, we accepted Murraylink's proposal of zero equity raising costs.¹⁸⁰ However, Murraylink has proposed equity raising costs of \$0.02 million (\$2017–18) in its revised proposal.¹⁸¹

After assessing the revised proposal and determining the relevant inputs, we estimate zero equity raising costs for the 2018/19–22/23 period in this final decision.

We observe that Murraylink proposed imputation tax credit payout ratio of 72.5 per cent in its revised proposal. This is a departure from the 70 per cent value in its original proposal and from our PTRM.¹⁸² However, we do note that Murraylink has adopted our draft decision on the value of imputation credits which includes the value for the payout ratio.¹⁸³ We do not form a position on Murraylink's proposed departure at this stage as it does not make any difference to Murraylink's equity raising costs which is zero for this decision. That is, irrespective of whether we adopt 0.7 or 0.725, the equity raising costs is zero.

Equity raising costs are transaction costs incurred when a service provider raises new equity from outside its business. We use a benchmark approach to determine these costs and this approach allows the costs of two means by which a service provider could raise equity from outside its business—dividend reinvestment plans and seasoned equity offerings. Equity raising costs are an unavoidable aspect of raising equity that a prudent service provider acting efficiently would incur. Accordingly, we

¹⁸⁰ AER, *Draft decision Murraylink transmission determination 2018 to 2023 Attachment 3 – Rate of return*, September 2017, p. 385.

¹⁸¹ Murraylink, *Attachment 8.1 – Murraylink – PTRM–20171201*, December 2017.

¹⁸² Murraylink, *Murraylink-Attachment 10.1 – Murraylink – PTRM – 20170131*, 31 January 2017; AER, Networks DMS – Library-PTRM-TNSP-template version 3-January 2015-Appendix A, available at: <https://www.aer.gov.au/networks-pipelines/guidelines-schemes-models-reviews/post-tax-revenue-models-transmission-and-distribution-%E2%80%93-january-2015-amendment/final-decision>

¹⁸³ Murraylink, *Murraylink revised revenue proposal effective July 2018 to June 2023*, December 2017, p. 18.

provide an allowance to recover an efficient amount of equity raising costs. This is where a service provider's capex forecast is large enough to require an external equity injection to maintain the benchmark gearing of 60 per cent.

While the rate of return guideline does not set out an approach for estimating these costs, we apply an established method for estimating equity raising costs. We initially based our method for determining benchmark equity raising costs on the 2007 advice from Allen Consulting Group (ACG).¹⁸⁴ We amended this method in our 2009 decisions for the ACT, NSW and Tasmanian electricity service providers.¹⁸⁵ We further refined this approach, as discussed and applied in the 2012 Powerlink decision.¹⁸⁶

C.2 Debt raising costs

Debt raising costs are transaction costs incurred each time debt is raised or refinanced. These costs may include arrangement fees, legal fees, company credit rating fees and other transaction costs. Debt raising costs are an unavoidable cost of raising debt that would be incurred by a prudent service provider, and data exists such that we can estimate them. Accordingly, we provide an allowance to recover an efficient amount of debt raising costs.

Final decision

We determine debt raising costs using our benchmark based approach. In our draft decision, we accepted Murraylink's proposed debt raising cost allowance of \$0.04 million over the 2018/19–2022/23 period as part of our acceptance of Murraylink's proposal total opex allowance.¹⁸⁷

Murraylink has proposed a debt raising cost of \$0.03 million (\$2017–18) in its revised proposal.¹⁸⁸ However, as set out in the overview to our final decision for Murraylink, we accept Murraylink's proposed total opex allowance in its entirety.¹⁸⁹ This includes its proposed debt raising cost allowance of \$0.03 million (\$2017–18) over the 2018/19–22/23 period, as set out in Table 3-12.

¹⁸⁴ ACG, *Estimation of Powerlink's SEO transaction cost allowance-Memorandum*, 5 February 2007.

¹⁸⁵ AER, *Final decision, ACT distribution determination 2009–10 to 2013–14*, April 2009, appendix H; AER, *Final decision, NSW distribution determination 2009–10 to 2013–14*, April 2009, appendix N; AER, *Final decision, TransGrid transmission determination 2009–10 to 2013–14*, April 2009, appendix E; AER, *Final decision, TransGrid transmission determination 2009–10 to 2013–14*, April 2009, appendix E.

¹⁸⁶ AER, *Final decision, Powerlink Transmission determination 2012-13 to 2016-17*, April 2012, pp. 151-152.

¹⁸⁷ AER, *Draft Decision Murraylink transmission determination 2018 to 2023 Attachment 3 Rate of Return, September 2017*, p. 386.

¹⁸⁸ Murraylink, *Attachment 8.1 – Murraylink – PTRM-20171201, December 2017*.

¹⁸⁹ AER, *Final decision Murraylink transmission determination 2018 to 2023 overview*, April 2018.

Table 3-12 AER's final decision on debt raising costs (million, \$ 2017–18)

2018–19	2019–20	2020–21	2021–22	2022–23	Total
0.01	0.01	0.01	0.01	0.01	0.03

Source: AER analysis.

Note: Columns may not add to total due to rounding for presentation in table.

AER's assessment approach

Our standard approach to forecasting debt raising costs is based on the approach in a report from the Allen Consulting Group (ACG), commissioned by the ACCC in 2004.¹⁹⁰ However, we relied on updated market data from 2008–13, as submitted in a recent report by PricewaterhouseCoopers (PwC) during the rate of return guideline process.¹⁹¹ The approach uses a five year window of up to date bond data to reflect current market conditions. Where PwC has updated the data or the method, we have compared it against our standard approach and we are broadly satisfied it is reasonable.

The ACG method involves calculating the benchmark bond size, and the number of bond issues required to rollover the benchmark debt share (60 per cent) of the RAB. Our standard approach is to amortise the upfront costs that are incurred using the relevant nominal vanilla WACC over a ten year amortisation period. This is then expressed in basis points per annum (bppa) as an input into the post-tax revenue model (PTRM). This rate is multiplied by the debt component of a service provider's projected RAB to determine the debt raising cost allowance. The ACG approach recognises that credit rating costs can be spread across multiple bond issues, which lowers the benchmark allowance (as expressed in bppa) as the number of bond issues increases.

¹⁹⁰ The Allen Consulting Group, *Debt and equity raising transaction costs: Final report*, December 2004.

¹⁹¹ PricewaterhouseCoopers, *Energy Networks Association: Debt financing costs*, June 2013, p. i.

D Averaging Period (confidential appendix)