# Rate of return Annual Update

December 2021

AUSTRALIAN ENERGY REGULATOR

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Inquiries about this publication should be addressed to:

Australian Energy Regulator
GPO Box 520
Melbourne Vic 3001

Tel: 1300 585165

Email: AERInquiry@aer.gov.au
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# 1 Introduction

In December 2018 the AER published the first rate of return instrument (2018 instrument).[1]

This binding instrument specifies how we determine the allowed rate of return on capital invested in regulated electricity and gas networks for the following four-year period. The rate of return is a significant driver of regulated revenue, and estimation of the rate of return is complex and contentious. The next rate of return instrument (2022 instrument) will be published in December 2022.

The intent of our annual update series is to provide stakeholders with regular information on rate of return data, particularly time series market data, showing changes since the publication of the 2018 instrument.[2] We have not attempted to update all data series considered during the 2018 review, but have selected content with regard to its importance and practical considerations such as availability of data.

The tables and figures in this update have been prepared using our existing calculation approaches, as used to inform the 2018 instrument, so that stakeholders can compare changes in market data on a consistent basis.[3] If there is a new method of analysis arising from a final working paper, our approach is to seek to include where possible both the new measure and the 2018 method for comparability.[4]

Relative to the 2020 update,[5] this update includes the latest estimates of the distribution rates prepared by Dr Martin Lally[6] (Table 13). We published Dr Lally's estimates of the distribution rates in the 2019 update[7] but did not update those in the 2020 update. The latest estimates cover the period of 2000-2020.

In addition, in the 2019 update, we included additional data arising from our *Energy networks debt data* final working paper:[8]

- additional analysis on the energy infrastructure credit spread index (EICSI) reweighted by tenor
- the EICSI based on our risk free rate estimate rather than the current bank bill swap rate (BBSW)
- the weighted average term to maturity at issuance (WATMI) using EICSI yield data.

We have provided an update of this analysis based on the debt cost RIN data we collected from the industry this year.

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1 AER, *Rate of return instrument*, December 2018 (v1.02 as amended April 2019).

2 We see the annual rate of return update as complementary to our working paper series, which facilitates discussion on the interpretation of the available data or methodological issues.

3 See AER, *Rate of return instrument, Explanatory statement*, December 2018.

4 In several areas our rate of return estimates are informed by proprietary data, which we report in aggregated form in order to protect confidentiality.

5 AER, *Rate of return, Annual update*, December 2020.

6 Lally, Estimating the distribution rate for imputation credits for the top 50 ASX companies, 24 June 2021, p. 6.

7 Lally, *Estimating the distribution rate for imputation credits for the top 50 ASX companies*, 22 November 2019, p. 6.

8 AER, *Rate of return, Energy network debt data, Final working paper*, 18 November 2020.

Our intent is that our annual updates should help to provide a foundation for substantive, constructive discussion with all stakeholders during the 2022 review.

# 2 Indicative rate of return

Table 1 presents key rate of return parameters and an indicative rate of return given the application of the 2018 instrument using current market data. To that end, in Table 1 we have:

- updated those parameters where the 2018 instrument specifies a method informed by market data at each regulatory determination.
- kept constant those parameters where the 2018 instrument specifies that the value is fixed.

### Table 1 Key components of the regulated rate of return (2018 to 2021)

| Parameter | 2018 Instrument (as at November 2018) | 2019 annual update (as at August 2019) | 2020 annual update (as at August 2020) | 2021 annual update (as at August 2021) |
|---|---|---|---|---|
| Indicative overall rate of return (nominal vanilla) | 5.36% | 3.45% | 3.27% | 3.41% |
| Gearing ratio | 60% | 60% | 60% | 60% |
| Indicative return on debt (annual estimate) | 4.70% | 2.69% | 2.40% | 2.49% |
| Market risk premium | 6.10% | 6.10% | 6.10% | 6.10% |
| Equity beta | 0.60 | 0.60 | 0.60 | 0.60 |
| Indicative risk-free rate | 2.70% | 0.94% | 0.91% | 1.14% |
| Indicative return on equity | 6.36% | 4.60% | 4.57% | 4.80% |
| Value of imputation credits (gamma) | 0.585 | 0.585 | 0.585 | 0.585 |
| Benchmark credit rating | BBB+ | BBB+ | BBB+ | BBB+ |

Comparator: Table 1 (pages 13–16) of the 2018 explanatory statement.

Notes: Uses indicative averaging period across all business days in November 2018 (2018 instrument), 20 business days to 31 August 2019 (2019 update), 20 business days to 31 August 2020 (2020 update), and 20 business days to 31 August 2021 (this update). Indicative rates are based on 'on-the-day' return on debt estimates and do not reflect a trailing average portfolio.

Source: AER analysis, AER, *Rate of return instrument*, December 2018 (v1.02 as amended April 2019).

The indicative return on debt presented in Table 1 is an on-the-day rate, reflecting the annual (spot) cost of debt in the indicative averaging period. As specified in the 2018 instrument, energy networks are in the process of transitioning from an on-the-day approach to a trailing average portfolio that reflects ten years of historical return on debt. The transition itself takes ten years. The regulated return on debt for each service provider will therefore depend on the date at which it commenced the transition to the trailing average portfolio approach.

# 3 Gearing

## 3.1 Estimation based on market values

Table 2 presents gearing estimates for five comparator businesses over the past five and ten years using market values of equity and debt (with book value of debt used as a proxy for the market value of debt).[9]

### Table 2 Gearing based on market values (2006 to 2021)

| Year | ENV | APA | DUE | AST | SKI | Average |
|---|---|---|---|---|---|---|
| 2006 | 66% | 51% | 79% | 56% | 60% | 62% |
| 2007 | 65% | 59% | 67% | 55% | 57% | 61% |
| 2008 | 77% | 73% | 76% | 59% | 70% | 71% |
| 2009 | 75% | 68% | 80% | 70% | 70% | 73% |
| 2010 | 74% | 61% | 80% | 64% | 65% | 69% |
| 2011 | 66% | 53% | 79% | 64% | 62% | 65% |
| 2012 | 63% | 47% | 72% | 59% | 59% | 60% |
| 2013 | 53% | 46% | 71% | 57% | 62% | 58% |
| 2014 | 47% | 45% | 64% | 58% | 55% | 54% |
| 2015 | | 50% | 62% | 59% | 56% | 57% |
| 2016 | | 49% | 51% | 57% | 54% | 53% |
| 2017 | | 49% | | 52% | 52% | 51% |
| 2018 | | 45% | | 56% | 57% | 52% |
| 2019 | | 45% | | 55% | 59% | 53% |
| 2020 | | 45% | | 59% | 59% | 55% |
| 2021 | | 49% | | 57% | | 53% |
| **5 year average** | | 47% | | 56% | 57% | 53% |
| **10 year average** | 54% | 47% | 64% | 57% | 57% | 54% |

Comparator: Table 4 (page 65) of the 2018 explanatory statement.

Notes: Spark Infrastructure (SKI) estimates are as at 31 December each year. AusNet Services (AST) estimates are as at 31 March each year. Duet Group (DUE), APA Group (APA) and Envestra (ENV) estimates are as at 30 June each year. The average for all firms in a year does not make any adjustment for these timing differences.

Source: Annual reports, AER analysis; AusNet services, *Annual report 2021*, May 2021, p. 68, 91, 131; APA, *Annual report 2021*, August 2021, p. 9, 43, 57, 58; Spark Infrastructure, *2020 Annual report,* February 2021, p. 3, 71, 85,

9 Our gearing estimation method is described in AER, *Rate of return instrument, Explanatory statement*, December 2018, pp. 64–72.

104; Spark Infrastructure, *31 December 2020 Full year factbook,* February 2021, p. 8, 12, 16; other data is the same as published with the explanatory statement.

## 3.2 Estimation based on book values

Table 3 presents gearing estimates for five comparator businesses over the past five and ten years using book values of equity and debt.[10]

### Table 3 Gearing based on book values (2006 to 2021)

| Year | ENV | APA | DUE | AST | SKI | Average |
|---|---|---|---|---|---|---|
| 2006 | 91% | 67% | 82% | 57% | 81% | 76% |
| 2007 | 90% | 69% | 75% | 57% | 80% | 74% |
| 2008 | 82% | 71% | 76% | 58% | 89% | 75% |
| 2009 | 80% | 70% | 79% | 67% | 85% | 76% |
| 2010 | 79% | 68% | 79% | 62% | 66% | 71% |
| 2011 | 78% | 63% | 77% | 60% | 69% | 70% |
| 2012 | 78% | 64% | 77% | 61% | 68% | 70% |
| 2013 | 71% | 63% | 79% | 61% | 68% | 68% |
| 2014 | 71% | 65% | 76% | 64% | 67% | 69% |
| 2015 | | 68% | 74% | 69% | 66% | 69% |
| 2016 | | 71% | 65% | 66% | 69% | 68% |
| 2017 | | 71% | | 64% | 69% | 68% |
| 2018 | | 70% | | 68% | 73% | 70% |
| 2019 | | 74% | | 71% | 76% | 74% |
| 2020 | | 77% | | 76% | 77% | 77% |
| 2021 | | 77% | | 73% | | 75% |
| **5 year average** | | 74% | | 70% | 74% | 73% |
| **10 year average** | 73% | 70% | 74% | 67% | 70% | 71% |

Comparator: Table 5 (page 66) of the 2018 explanatory statement.

Notes: Spark Infrastructure (SKI) estimates are as at 31 December each year. AusNet Services (AST) estimates are as at 31 March each year. Duet Group (DUE), APA Group (APA) and Envestra (ENV) estimates are as at 30 June each year. The average for all firms in a year does not make any adjustment for these timing differences.

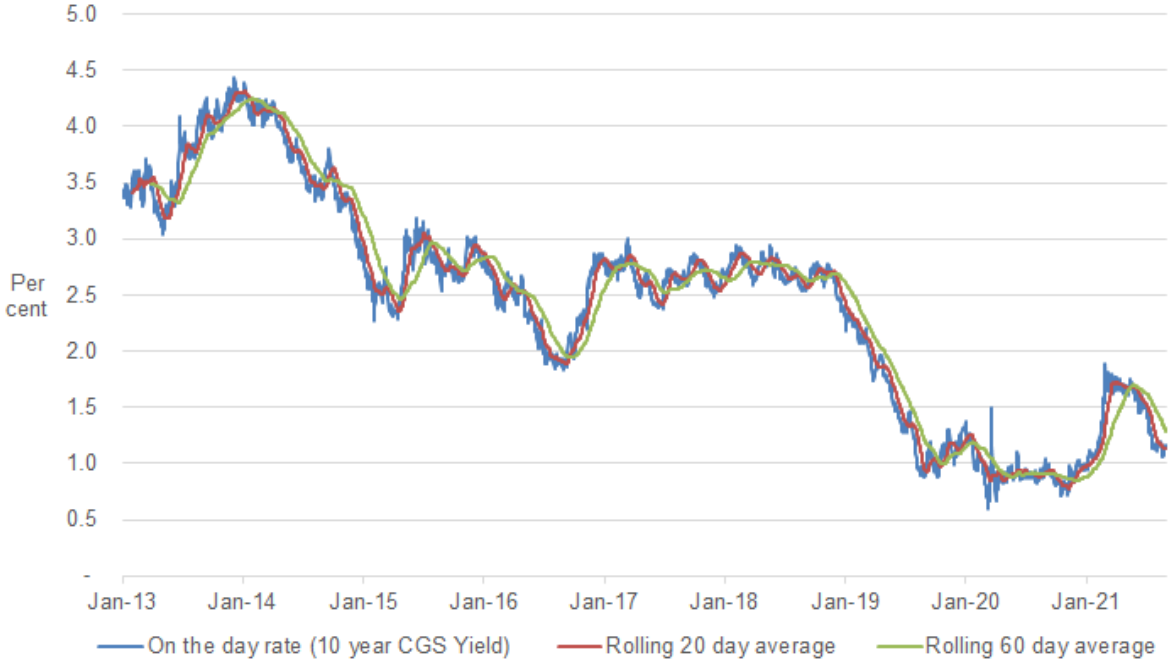
Source: As per Table 2. Annual reports, AER analysis; AusNet services, *Annual report 2021*, May 2021, p. 91; APA, *Annual report 2021*, August 2021, p. 57; Spark Infrastructure, *2020 Annual report,* February 2021, p. 85, 104; all other data is the same as published with the explanatory statement.

10 Our gearing estimation method is described in AER, *Rate of return instrument, Explanatory statement*, December 2018, pp. 64–72.

# 4 Risk-free rate

The risk-free rate is an important parameter in the calculation of return on equity, which we estimate using the yield on Commonwealth Government Securities (CGS).[11]

### Figure 1 10-year interpolated CGS yields (January 2013 to August 2021)




Comparator: Figure 10 (page 133) of the 2018 explanatory statement.

Source: RBA interest rate statistics F16, AER analysis.

11 Our use of the risk-free rate is described in AER, *Rate of return instrument, Explanatory statement*, December 2018, pp. 125–141.

# 5 Equity Beta

The equity beta is a key parameter within the Sharpe–Lintner CAPM which we use to estimate the return on equity. It measures the 'riskiness' of a firm's returns compared with that of the market. Specifically, the equity beta measures the standardised correlation between the returns on an individual asset or firm with that of the overall market.[12]

In determining a value for equity beta in the 2018 Instrument, we considered empirical estimates of equity beta from relevant Australian energy network businesses (domestic estimates) and international energy network businesses.[13] We present the results of our update (to August 2021) in the sections below.

## 5.1 Domestic estimates

Table 4 presents the re-levered weekly equity beta estimates for a range of portfolios using ordinary least squares (OLS) regression.

Our comparator firms include:

- AGL Energy Limited (AGL)
- Alinta (AAN)
- APA Group (APA)
- AusNet Services (AST)
- DUET Group (DUE)
- Envestra Limited (ENV)
- GasNet (GAS)
- Hastings Diversified Utilities Fund (HDF)
- Spark Infrastructure (SKI)

There are eight portfolios (labelled P1 to P8) with differing constituent firms and differing time periods, as listed in the table.

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

13 AER, *Rate of return instrument, Explanatory statement*, December 2018, p. 142.

## Table 4 Re-levered weekly equity beta estimates from AER update (OLS, weekly) (June 2000 to August 2021)

| Firms | | P1 | P2 | P3 | P4 | P5 | P6 | P7 | P8 |
|---|---|---|---|---|---|---|---|---|---|
| Firms | Avg of firm estimates | APA, ENV | AAN, AGL, APA, ENV, GAS | APA, DUE, ENV, HDF, AST | APA, DUE, ENV, HDF, SKI, AST | APA, DUE, ENV, SKI, AST | APA, DUE, SKI, AST | APA, SKI, AST | SKI, AST |
| Start | | 23 Jun 2000 | 28 Dec 2001 | 23 Dec 2005 | 09 Mar 2007 | 09 Mar 2007 | 09 Mar 2007 | 09 Mar 2007 | 09 Mar 2007 |
| End | | 12 Sep 2014 | 06 Oct 2006 | 23 Nov 2012 | 23 Nov 2012 | 12 Sep 2014 | 28 Apr 2017 | 27 Aug 2021 | 27 Aug 2021 |
| **Equal weighted** | | | | | | | | | |
| Longest available period | 0.56 | 0.49 | 0.50 | 0.54 | 0.52 | 0.43 | 0.46 | 0.51 | 0.41 |
| Post tech boom & excl. GFC | 0.59 | 0.53 | 0.51 | 0.59 | 0.58 | 0.50 | 0.54 | 0.59 | 0.47 |
| Recent 5 years | 0.59 | | | | | | 0.62 | 0.53 | 0.38 |
| **Value weighted** | | | | | | | | | |
| Longest available period | n/a | 0.53 | 0.68 | 0.47 | 0.47 | 0.44 | 0.49 | 0.55 | 0.40 |
| Post tech boom & excl. GFC | n/a | 0.58 | 0.69 | 0.56 | 0.55 | 0.53 | 0.58 | 0.62 | 0.47 |
| Recent 5 years | n/a | | | | | | 0.70 | 0.59 | 0.37 |

Comparator: Table 13 (page 182) of the 2018 explanatory statement.

Note: Our comparator firms include AusNet Services (AST). This firm was included in the 2013 Guidelines under its former name of SP Ausnet (SPN). It was renamed in 2014. Portfolio estimates for a scenario reflect beta estimates available over that scenario. Portfolio estimates can start and end on different dates.

Source: AER analysis; Bloomberg.

Table 5 shows estimates from two subsets: still listed firms (APA, SKI, and AST); and still listed firms that have majority regulated revenues (SKI and AST).

### Table 5 Whole comparator set compared to listed comparators (OLS, weekly) (June 2000 to August 2021)

| Equal and value weighted portfolio estimates | Whole comparator set [P1 to P8] | Still listed firms (APA, SKI, AST) [P7] | Still listed majority regulated firms (SKI, AST) [P8] |
|---|---|---|---|
| **Longest period** | | | |
| 2018 review | 0.42 - 0.67 | 0.52 - 0.55 | 0.42 - 0.43 |
| 2019 update | 0.42 - 0.68 | 0.53 - 0.56 | 0.42 - 0.43 |
| 2020 update | 0.40 - 0.68 | 0.51 - 0.54 | 0.40 - 0.41 |
| 2021 update | 0.40 - 0.68 | 0.51 - 0.55 | 0.40 - 0.41 |
| **Post tech boom and excl. GFC** | | | |
| 2018 review | 0.50 - 0.67 | 0.64 - 0.67 | 0.52 - 0.53 |
| 2019 update | 0.50 - 0.69 | 0.64 - 0.68 | 0.54 - 0.55 |
| 2020 update | 0.47 - 0.69 | 0.60 - 0.62 | 0.47 - 0.47 |
| 2021 update | 0.47 - 0.69 | 0.59 - 0.62 | 0.47 - 0.47 |
| **Recent 5 years** | | | |
| 2018 review | 0.49 - 0.88 | 0.81 - 0.88 | 0.70 - 0.72 |
| 2019 update | 0.69 - 0.89 | 0.83 - 0.89 | 0.73 - 0.74 |
| 2020 update | 0.44 - 0.69 | 0.59 - 0.68 | 0.44 - 0.44 |
| 2021 update | 0.37 - 0.70 | 0.53 - 0.59 | 0.37 - 0.38 |

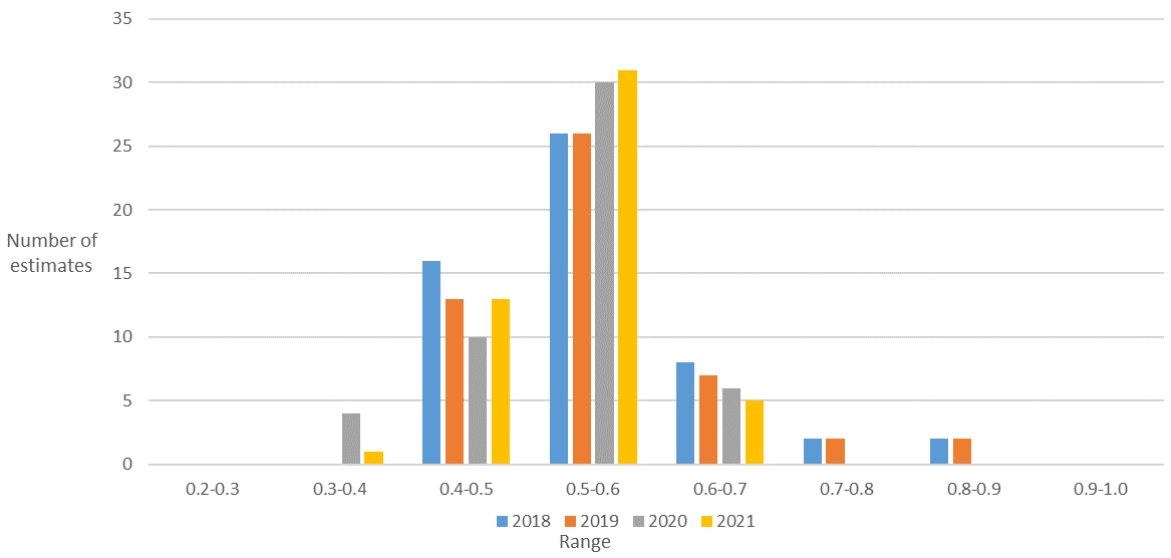
Comparator: Table 14 (page 183) of the 2018 explanatory statement.

Notes: The results for the 2020 update have been revised due to an anomaly in SKI data.

Source: AER analysis; Bloomberg.

Figure 2 plots a distribution of the updated estimates.

## Figure 2 Distribution of re-levered weekly beta by range (OLS, all periods)




Comparator: Figure 16 (page 189) of the 2018 explanatory statement.

Notes: There are fewer total estimates from 2019 onwards because the 'recent 5 years' category no longer includes those portfolios ending in 2014 (P1 and P5).

Source: Bloomberg, AER analysis

A comparison with estimates from Professor Olan Henry's 2014 study, our 2018 update (used in the 2018 instrument) as well as the 2019, 2020, and 2021 updates are provided in Table 6 below.[14]

## Table 6 Comparison of re-levered weekly average firm equity beta estimates (OLS) (data to June 2013/September 2018/August 2019/August 2020/August 2021)

| Period | Average of firm-level estimates | | | | |
|---|---|---|---|---|---|
| | Henry | Sep 2018 | Aug 2019 | Aug 2020 | Aug 2021 |
| Longest period | 0.52 | 0.57 | 0.56 | 0.56 | 0.56 |
| Post tech boom and excluding GFC | 0.56 | 0.61 | 0.61 | 0.59 | 0.59 |
| Recent 5 years | 0.46 | 0.72 | 0.72 | 0.56 | 0.59 |

Comparator: Table 15 (page 193) of the 2018 explanatory statement.

Notes: The results for the 2020 update have been revised due to an anomaly in SKI data.

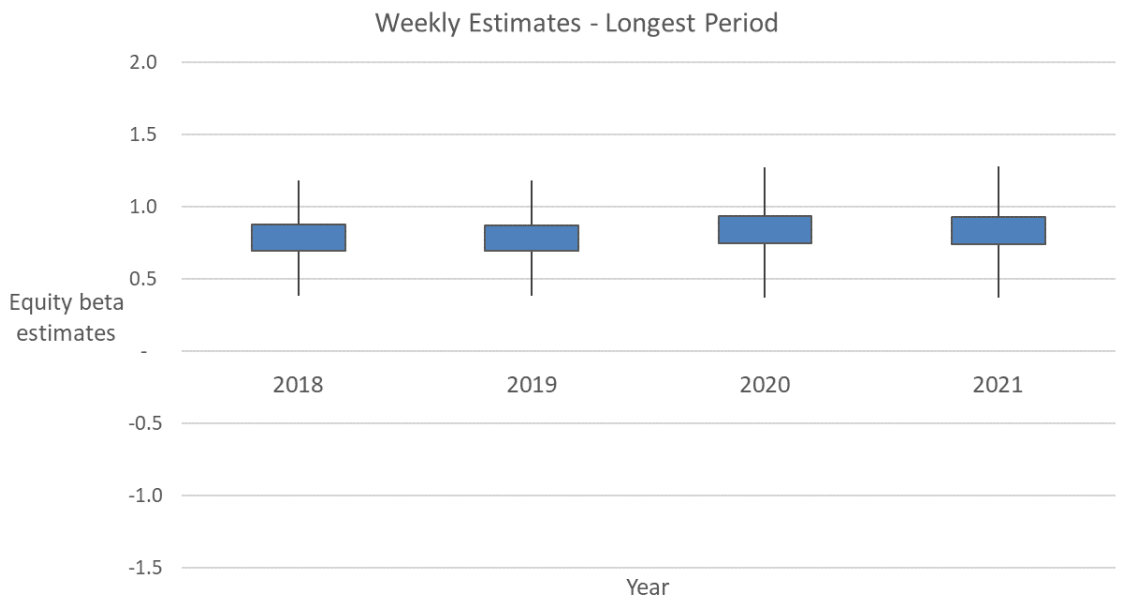
Source: AER analysis; Bloomberg; Olan Henry, *Estimating beta: An update*, April 2014.

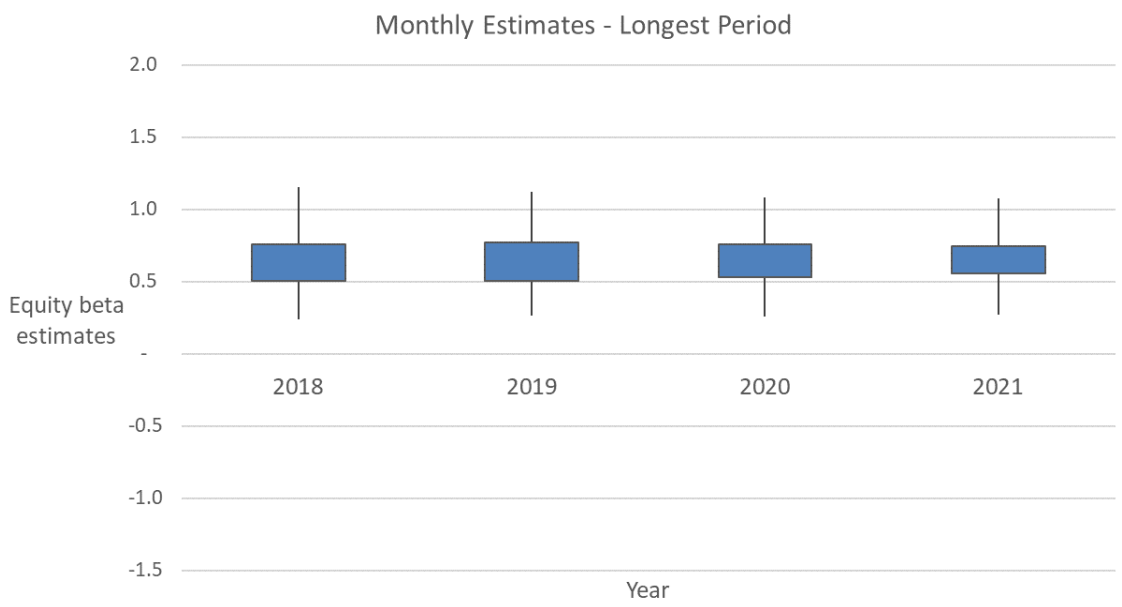
14 Our 2019 rate of return update included further comparison of portfolios P1 to P5 (table 7 and table 8 in that document). These have not been repeated as no new data has entered these portfolios since the 2019 update.

## 5.2 International estimates

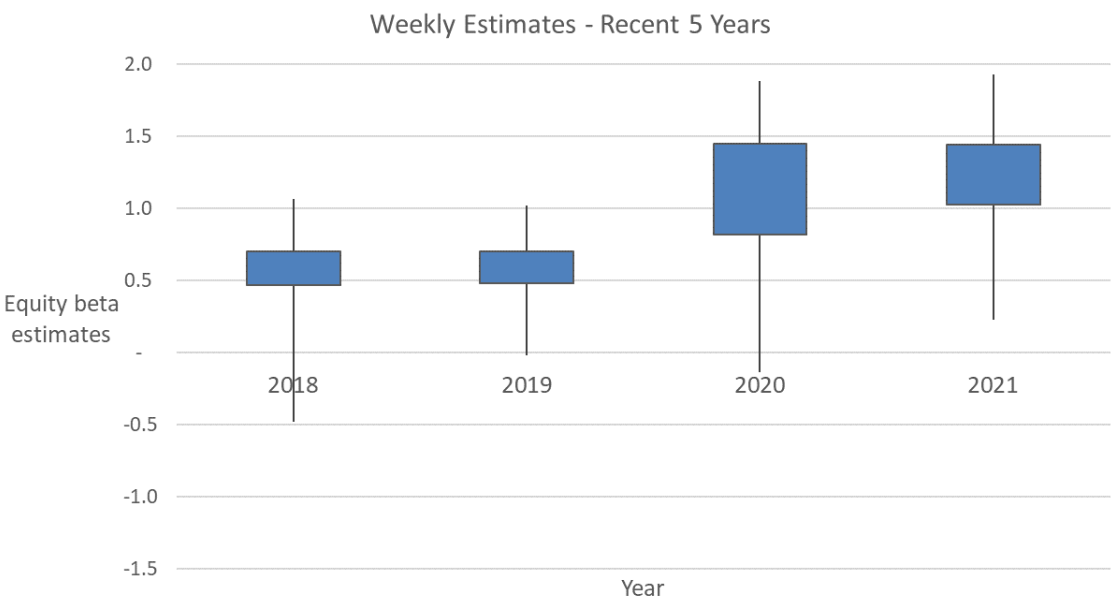
Figure 3 summarises the range of results of our updated international estimates and compares against estimates from the 2018 Instrument.[15]

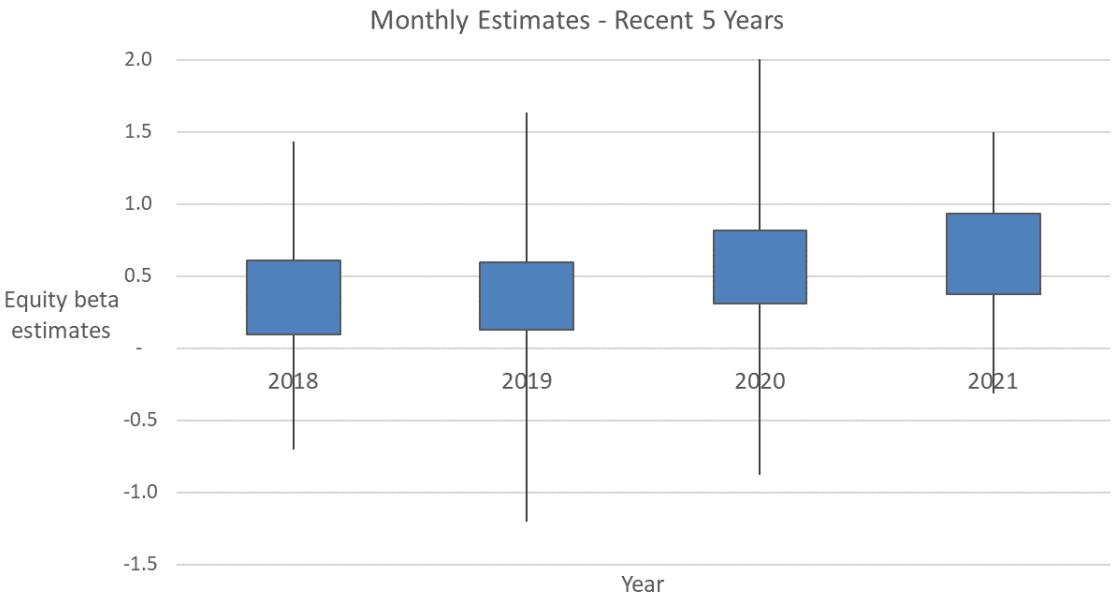
### Figure 3 Summary of international estimates of equity beta




15 Our use of international estimates for equity beta is described in AER, *Rate of return instrument, Explanatory statement*, December 2018, pp. 183–185. We have used total return data and have recalculated our 2019 update using this data.




Comparator: Figure 15 (page 184) of the 2018 explanatory statement.

Note: This figure shows the quartile distribution of estimates by charting the minimum, first quartile, third quartile and maximum of the relevant estimates. The top of the top line indicates the maximum and bottom of the bottom line indicate the minimum. The bottom of the rectangle represents the first quartile. The top of the rectangle represents the third quartile.

Source: AER analysis; Bloomberg.

# 6 Market risk premium

## 6.1 Historical excess returns

We calculate historical excess returns updated to end of calendar year 2020, and show the annual market returns above the risk-free rate in different periods.[16] We present arithmetic averages in Table 7 and geometric averages in Table 8.[17]

### Table 7 Historical Excess Returns – Arithmetic average (per cent)

| 2018 Review | | 2019 Update | | 2020 Update | | 2021 Update | |
|---|---|---|---|---|---|---|---|
| Sampling Period | Average | Sampling Period | Average | Sampling Period | Average | Sampling Period | Average |
| 1883-2017 | 6.3 | 1883-2018 | 6.2 | 1883-2019 | 6.3 | 1883-2020 | 6.4 |
| 1937-2017 | 6.0 | 1937-2018 | 5.9 | 1937-2019 | 6.0 | 1937-2020 | 6.1 |
| 1958-2017 | 6.6 | 1958-2018 | 6.4 | 1958-2019 | 6.5 | 1958-2020 | 6.6 |
| 1980-2017 | 6.5 | 1980-2018 | 6.2 | 1980-2019 | 6.4 | 1980-2020 | 6.6 |
| 1988-2017 | 6.1 | 1988-2018 | 5.8 | 1988-2019 | 6.0 | 1988-2020 | 6.3 |

Comparator: Table 7 (page 91) of the 2018 explanatory statement, repeated as Table 20 (page 268).

Notes: Calculated using an assumed imputation utilisation value (or theta value) of 0.65.

Source: Handley, *An estimate of the historical equity risk premium for the period 1883 to 2011*, April 2012, p. 6; AER update for 2012–2021 market data.

### Table 8 Historical Excess Returns – Geometric average (per cent)

| 2018 Review | | 2019 Update | | 2020 Update | | 2021 Update | |
|---|---|---|---|---|---|---|---|
| Sampling Period | Average | Sampling Period | Average | Sampling Period | Average | Sampling Period | Average |
| 1883-2017 | 5.0 | 1883-2018 | 4.9 | 1883-2019 | 4.9 | 1883-2020 | 5.0 |
| 1937-2017 | 4.2 | 1937-2018 | 4.1 | 1937-2019 | 4.2 | 1937-2020 | 4.3 |
| 1958-2017 | 4.3 | 1958-2018 | 4.1 | 1958-2019 | 4.2 | 1958-2020 | 4.4 |
| 1980-2017 | 4.3 | 1980-2018 | 4.1 | 1980-2019 | 4.3 | 1980-2020 | 4.5 |
| 1988-2017 | 4.6 | 1988-2018 | 4.3 | 1988-2019 | 4.5 | 1988-2020 | 4.8 |

Comparator: Table 7 (page 91) of the 2018 explanatory statement, repeated as Table 20 (page 268).

Notes: Calculated using an assumed imputation utilisation value (or theta value) of 0.65.

16 Our historical excess returns estimations method is described in AER, *Rate of return instrument, Explanatory statement*, December 2018, pp. 239–253.

17 See AER, *Rate of return instrument, Explanatory statement*, December 2018, pp. 90, 246–247.

Source: Handley, *An estimate of the historical equity risk premium for the period 1883 to 2011*, April 2012, p. 6; AER update for 2012–2021 market data.

## 6.2 Dividend growth model

The dividend growth model (DGM) uses analyst forecasts of dividend growth to estimate a forward looking MRP. We use a range of assumptions and input growth rates in order to arrive at a range of estimates.[18]

### Table 9 Dividend growth model results with sensitivity analysis (2018 to 2021)

| Sensitivity | Two stage model (2018) | Three stage model (2018) | Two stage model (2019) | Three stage model (2019) | Two stage model (2020) | Three stage model (2020) | Two stage model (2021) | Three stage model (2021) |
|---|---|---|---|---|---|---|---|---|
| Baseline | 7.54 | 7.23 | 8.81 | 8.34 | 8.33 | 9.82 | 7.81 | 6.93 |
| 4.6% long-term growth rate | | | | | | | | |
| Average over recent 2 months* | | | | | | | | |
| unadjusted analysts' forecasts | | | | | | | | |
| 5.1% long-term growth rate | 8.02 | 7.64 | 9.28 | 8.75 | 8.81 | 10.21 | 8.29 | 7.36 |
| 3.78% long-term growth rate | 6.67 | 6.52 | 8.03 | 7.67 | 7.54 | 9.18 | 7.02 | 6.22 |
| Average over recent 6 months* | 7.45 | 7.18 | 8.48 | 7.76 | 8.83 | 9.72 | 7.59 | 7.13 |
| Average over recent 12 months* | 7.48 | 7.33 | 8.26 | 7.63 | 8.65 | 8.84 | 7.97 | 8.30 |
| Analysts' forecast +10% | 8.12 | 7.78 | 9.36 | 8.85 | 8.80 | 10.41 | 8.26 | 7.30 |
| Analysts' forecast -10% | 6.97 | 6.77 | 8.26 | 7.83 | 7.86 | 9.23 | 7.36 | 6.56 |
| Combined - low | 6.10 | 5.96 | 6.90 | 6.42 | 7.07 | 7.64 | 6.35 | 5.84 |
| Combined - high | 8.59 | 8.28 | 9.83 | 9.25 | 9.82 | 10.79 | 8.92 | 9.20 |

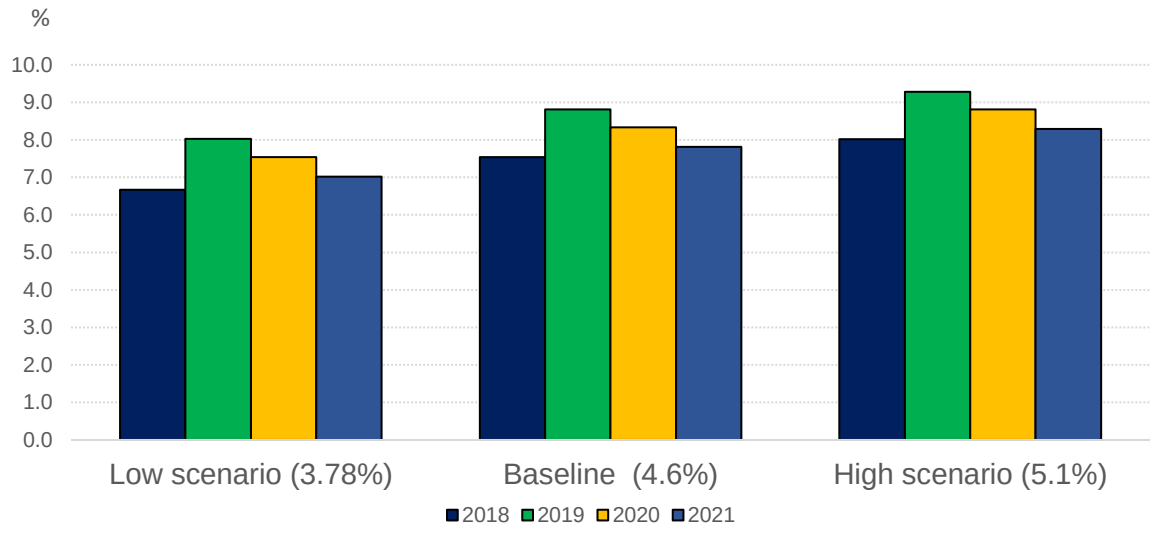
Comparator: Table 21 (page 269) of the 2018 explanatory statement.

Notes: All market risk premium estimates are based on an assumed theta of 0.65.
Combined - low is based on 3.78% growth, 6 month averaging, analysts' forecasts - 10% (2-stage) and 3.78% growth, 2 month averaging, analysts' forecasts - 10% (3-stage)
Combined - high is based on 5.1% growth, 12 month averaging, analysts' forecasts + 10%.
Recent averages (marked with *) are over the period to September 2018 (2018 instrument), August 2019 (2019 update), August 2020 (2020 update), August 2021 (2021 Update).

Source: Bloomberg, AER analysis.

18 Our DGM estimation method is described in AER, *Rate of return instrument, Explanatory statement*, December 2018, pp. 253–267.

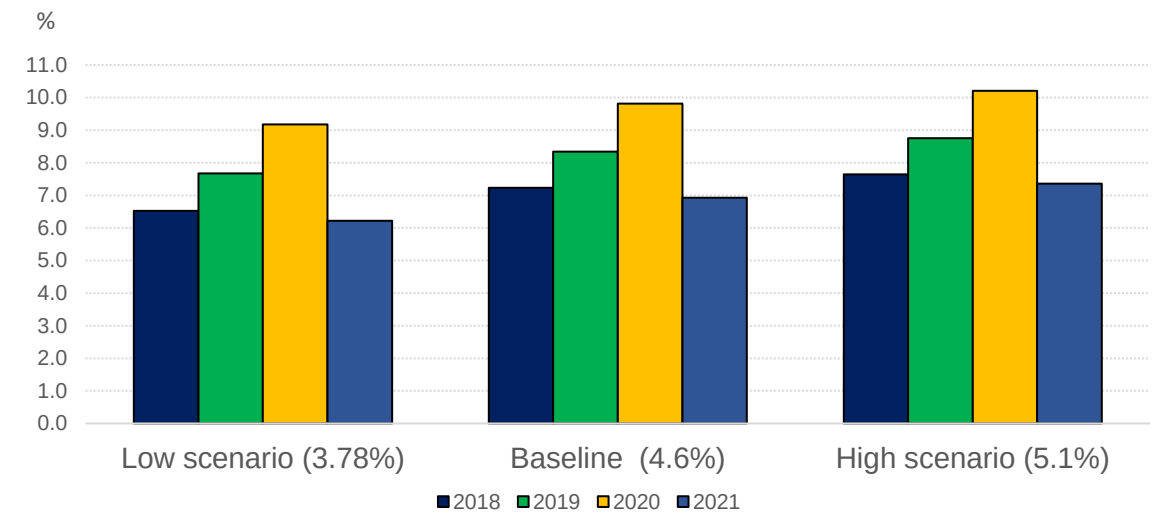
## Figure 4 Two stage dividend growth model results (2018 to 2021)




Notes: All market risk premium estimates are based on an assumed theta of 0.65.
Each of the growth rate results are based on 2 month averaging.
The most recent data runs up until August 2021.

Source: Bloomberg, AER analysis.

## Figure 5 Three stage dividend growth model results (2018 to 2021)




Notes: All market risk premium estimates are based on an assumed theta of 0.65.
Each of the growth rate results are based on 2 month averaging.
The most recent data runs up until August 2021.

Source: Bloomberg, AER analysis.

## 6.3 MRP survey results

We note survey evidence comes from market practitioners who are asked what they expect the MRP to be in the Australian market. These surveys take on different forms and can vary in different ways, including questions asked, type of participants and number of participants. As such it is important to view each piece of evidence in the context it is presented. In reporting the results for the MRP, we note that the survey results indicate some market participants adjust the risk free rate rather than the MRP.[19] In the approach to date, we have used the survey evidence to inform our MRP estimate. It informs us about investors' and market practitioners' expectations and/or what they apply in practice.[20]

### Table 10 MRP survey results (2012 to 2021)

| Survey | Number of responses | Mean (per cent) | Median (per cent) | Mode (per cent) |
|---|---|---|---|---|
| Fernandez et al (2012) | 73 | 5.9 | 6.0 | N/A |
| Fernandez et al (2013) | 17 | 6.8 | 5.8 | N/A |
| Fernandez et al (2014) | 93 | 5.9 | 6.0 | N/A |
| Fernandez et al (2015) | 40 | 6.0 | 5.1 | N/A |
| Fernandez et al (2016) | 87 | 6.0 | 6.0 | N/A |
| Fernandez et al (2017) | 26 | 7.3 | 7.6 | N/A |
| Fernandez et al (2018) | 74 | 6.6 | 7.1 | N/A |
| Fernandez et al (2019) | 54 | 6.5 | 6.1 | N/A |
| Fernandez et al (2020) | 37 | 7.9 | 6.2 | N/A |
| Fernandez et al (2021) | 31 | 6.4 | 6.3 | N/A |
| | | | | |
| KPMG (2013) | 19 | N/A | 6.0 | 6.0 |
| KPMG (2015) | ~27 | N/A | 6.0 | 6.0 |
| KPMG (2017) | 45 | N/A | 6.0 | 6.0 |
| KPMG (2018) | 56 | 5.5 | 6.0 | 6.0 |
| KPMG (2019) | 59 | 5.9 | 6.0 | 6.0 |
| | | | | |
| Asher and Hickling (2013) | 46 | 4.8 | 5.0 | 6.0 |
| Asher and Hickling (2014) | 27 | 4.4 | 4.6 | 6.0 |

19 Cross reference to the final omnibus paper.

20 Our MRP survey results estimation method is described in AER, *Rate of return instrument, Explanatory statement*, December 2018, pp. 270–271.

| | | | | |
|---|---|---|---|---|
| Asher and Carruther (2015) | 29 | 4.9 | N/A | N/A |
| Carruther (2016) | 24 | 5.3 | N/A | N/A |

Comparator: Table 22 (page 271) of the 2018 explanatory statement.

Source: KPMG, *Valuation practices survey 2018,* November 2018; Fernandez, Ortiz, Acín, *Market Risk Premium and Risk-Free Rate used for 69 countries in 2019: a survey*, April 2019; KPMG, *Valuation practices survey 2019,* February 2020; Fernandez et al, *Survey: Market risk premium and risk- free rate used for 81 countries in 2020,* March 2020; Fernandez et al, *Survey: Market Risk Premium and Risk-Free Rate used for 88 countries in 2021*, June 2021. All other data is the same as published with the 2018 explanatory statement.

## 6.4 Conditioning variables

Conditioning variables are market data and indicators that provide information on the potential risk in the market.[21]

Dividend yields can be measured over time to give a signal of potential risk.

### Figure 6 Dividend yields from ASX200 (April 2000 to August 2021)

Comparator: Figure 24 (page 273) of the 2018 explanatory statement.

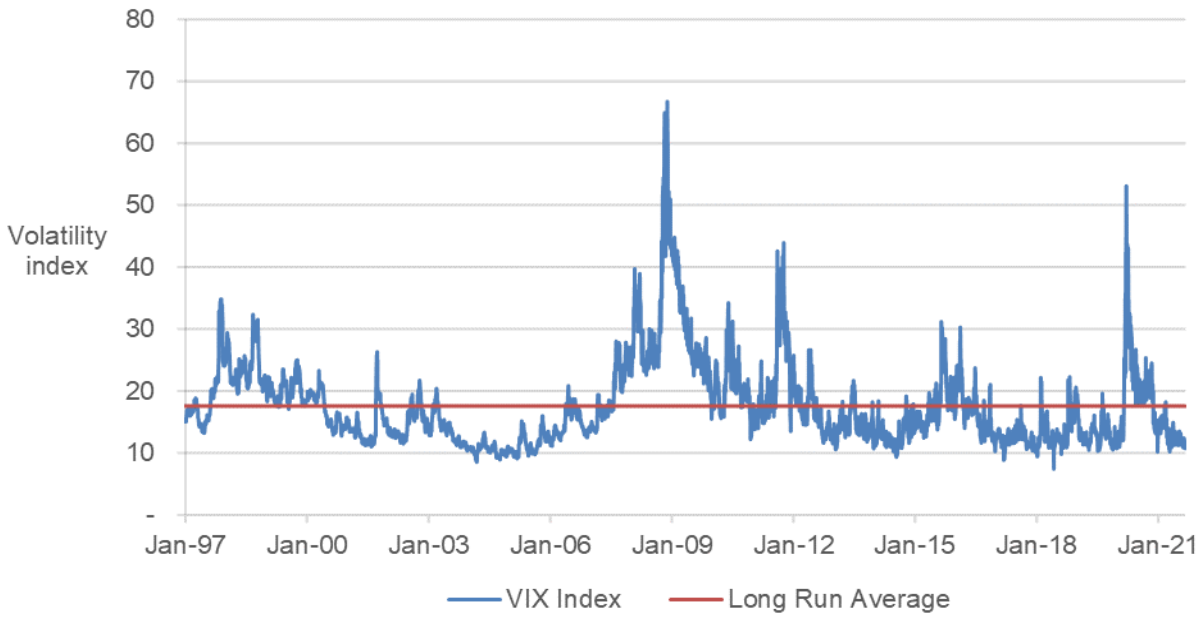
Notes: Long run average taken from the start of the data series in 2000.

Source: AER analysis; sourced via Bloomberg code AS51.

The ASX200 volatility index (VIX) uses year ahead option prices to arrive at a measure of market volatility over time.

21 Our use of conditioning variables is described in AER, *Rate of return instrument, Explanatory statement*, December 2018, pp. 237–239, 272–274.

## Figure 7 Volatility index ASX200 (January 1997 to August 2021)

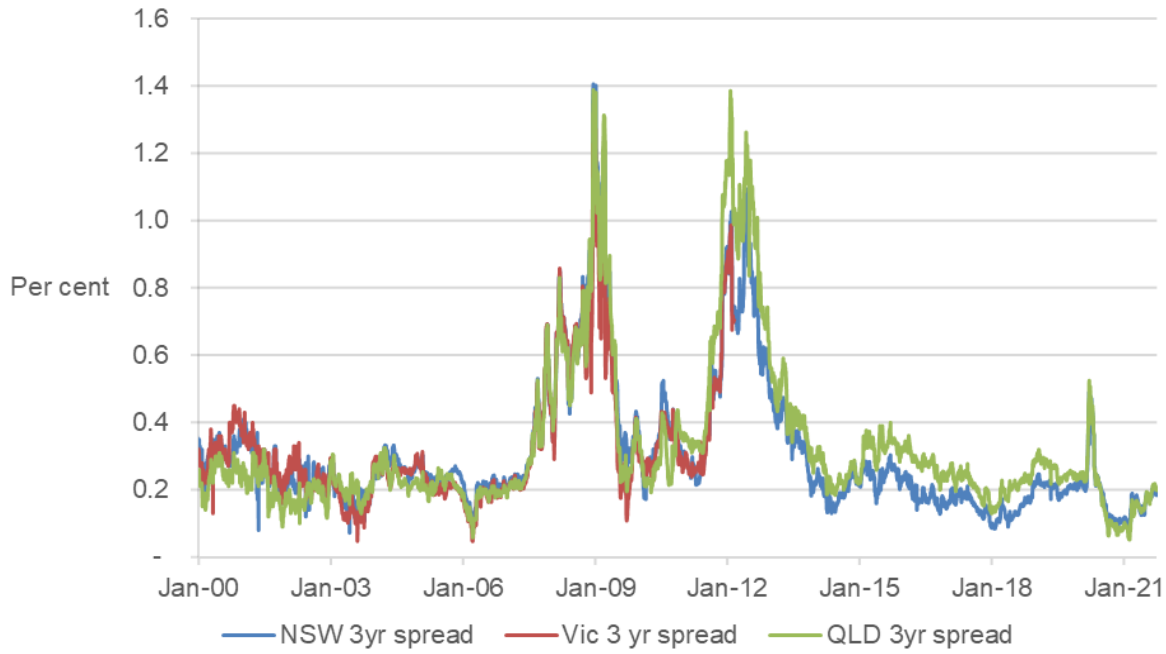



Comparator: Figure 25 (page 273) of the 2018 explanatory statement.

Source: AER analysis; ASX200 VIX volatility index, sourced via Bloomberg code AS51VIX from 2/01/2008 and code CITJAVIX prior to 2/01/2008. Long run average taken from the start of the data series in 1997.

Credit spreads from state government debt can indicate risk in the market.

## Figure 8 Credit spreads from state government debt (January 2000 to August 2021)




Comparator: Figure 26 (page 273) of the 2018 explanatory statement.

Source: AER analysis; Spreads from Australian government securities to state government bonds with 3 years term to maturity, sourced via Bloomberg interest rate statistics.

# 7 Return on debt

## 7.1 Benchmark credit rating

Table 11 presents the median credit rating over time.[22]

### Table 11 Median credit rating (2010 to 2021)

| | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Industry Median | BBB+ | BBB | BBB | BBB+ | BBB+ | BBB+ | BBB+ | BBB+ | BBB+ | BBB+ | BBB+ | A- |

Comparator: Table 25 (page 284) of the 2018 explanatory statement.

Source: Bloomberg, Standard & Poor's, Moody's. All other data is the same as published with the explanatory statement.

## 7.2 Return on debt from third party yield curves

Figure 9 presents the 'on-the-day' regulated return on debt calculated under the 2018 instrument, which uses a weighted average of BBB-rated and A-rated yield curves sourced from RBA, Bloomberg and Thomson Reuters.[23]

### Figure 9 Third party yield curve time series (January 2014 to August 2021)

Source: Bloomberg, RBA, Thomson Reuters, AER analysis.

22 Our benchmark credit rating estimation method is described in AER, *Rate of return instrument, Explanatory statement*, December 2018, pp. 284–289.

23 Our return on debt estimation method is described in AER, *Rate of return instrument, Explanatory statement*, December 2018, pp. 276–376 (choice of third party providers is discussed on pp. 291–294). We have not reported the yield curves by individual provider because this data is proprietary.

The return on debt presented in Figure 9 is the on-the-day rate. As noted in section 2, energy networks are in the process of transitioning from an on-the-day approach to a trailing average portfolio that reflects a rolling ten year window of the historical return on debt.

Table 12 presents an indicative trailing portfolio return on debt for a regulated network that commenced the transition in 2015. In that year, the portfolio was set using the on-the-day rate (the annual estimate). In each subsequent year, the most recent annual estimate is added to the portfolio with 10 per cent weight and the weight on the first year decreases by 10 per cent.

### Table 12 Indicative trailing average portfolio return on debt (2015 to 2021)

| Year | Annual estimate | Trailing average portfolio | Portfolio composition (weight x return on debt year) |
|---|---|---|---|
| 2015 | 4.92%* | 4.92% | 100% x 2015 |
| 2016 | 4.15%* | 4.85% | 90% x 2015, 10% 2016 |
| 2017 | 4.45%* | 4.80% | 80% x 2015, 10% x 2016, 10% x 2017 |
| 2018 | 4.42%* | 4.75% | 70% x 2015, 10% x 2016, 10% x 2017, 10% x 2018 |
| 2019 | 2.69% | 4.53% | 60% x 2015, 10% x 2016, 10% x 2017, 10% x 2018, 10% x 2019 |
| 2020 | 2.40% | 4.27% | 50% x 2015, 10% x 2016, 10% x 2017, 10% x 2018, 10% x 2019, 10% x 2020 |
| 2021 | 2.49% | 4.03% | 40% x 2015, 10% x 2016, 10% x 2017, 10% x 2018, 10% x 2019, 10% x 2020, 10% x 2021 |

Notes: Indicative averaging periods were chosen in August each year. Calculations prior to 2019 (marked with *) use the return on debt calculation method specified in the 2013 rate of return guideline. The 2018 figure here (4.42%) differs from the 2018 figure in Table 1 (4.70%) because they reflect different calculation methods (2013 guideline vs 2018 instrument) and different averaging periods (August 2018 vs November 2018).

Source: Bloomberg, RBA, Thomson Reuters, AER analysis.

## 7.3 Energy infrastructure credit spread index

The energy infrastructure credit spread index (EICSI) was developed by Chairmont during the 2018 review, using data on actual debt costs collected from regulated networks.[24] It reports a rolling 12-month historical average of all new debt instruments issued by privately owned energy networks.[25] The primary EICSI metric is the spread over the swap rate (broadly equivalent to the debt risk premium), but the EICSI dataset is also used to report average debt term and credit rating. It was used as a sense check on our proposed regulated return on debt approach.[26]

24 Chairmont, *Aggregation of return on debt data*, 28 April 2018.

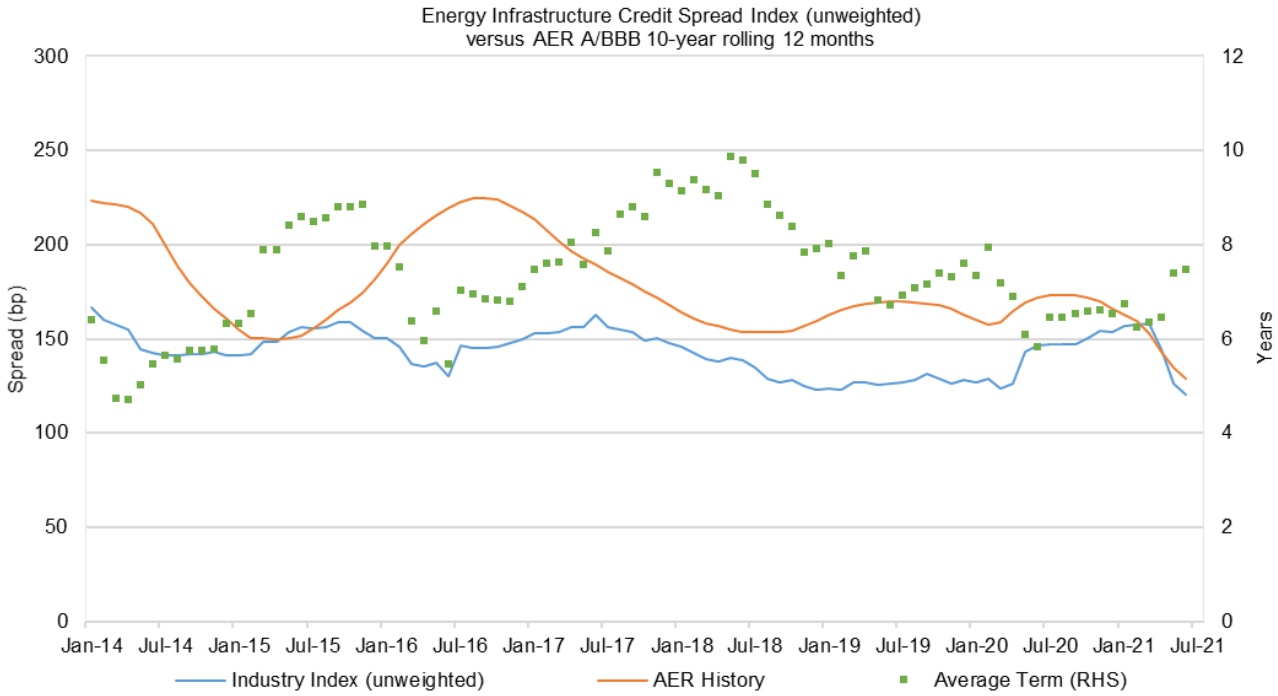
25 See AER, *Discussion paper, Estimating the allowed return on debt*, May 2018, pp. 27–35.

26 Our use of the EICSI is described in AER, *Draft rate of return instrument, Explanatory statement*, December 2018, pp. 451–459; and AER, *Rate of return instrument, Explanatory statement*, December 2018, pp. 299–300.

Figure 10 to Figure 12 present the updated EICSI with additional information on the average term to maturity of actual debt issuance by regulated networks. The average term is reported on a rolling 12 month window based on new debt issued (green squares). For comparison purposes, the spread on the AER's regulated return on debt is also presented (orange line). The base analysis uses the same approach used by Chairmont in its 2018 report and considered in the 2018 review.

Figure 10 displays the unweighted EICSI, updated with the most recent actual cost of debt information and revisions to historical data.[27]

## Figure 10 Comparing the EICSI (unweighted) against the bank bill swap rate (BBSW) (January 2014 to June 2021)




Comparator: Graph 3 (page 10) of the 2018 Chairmont report

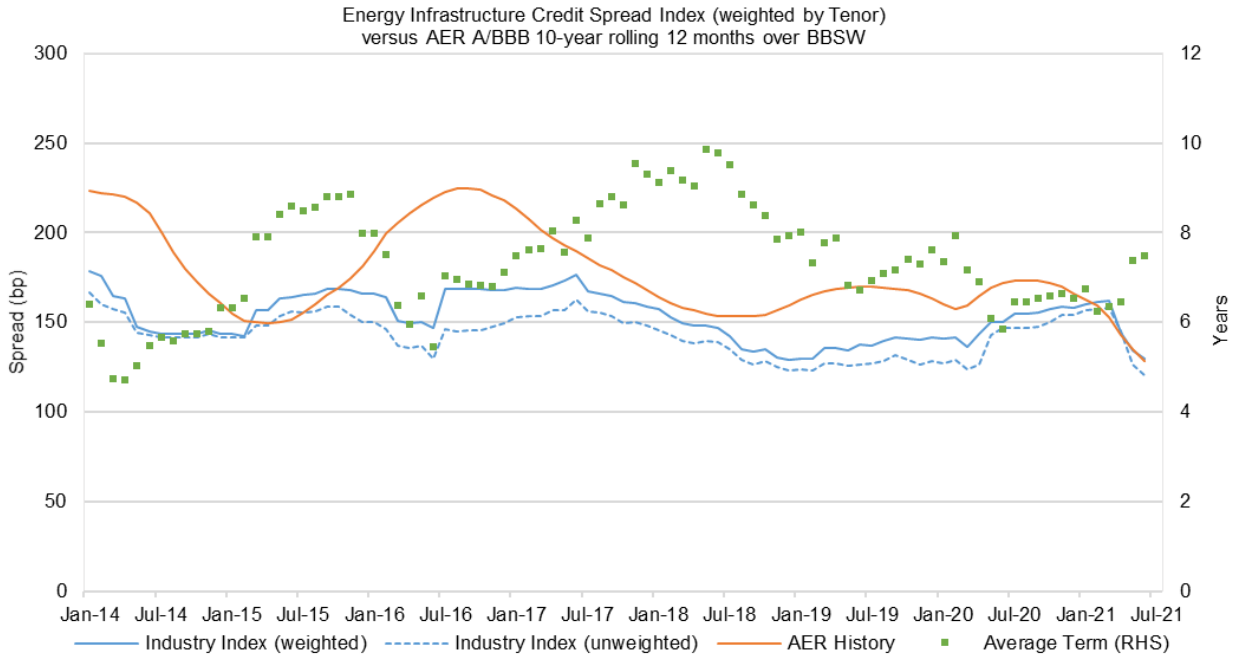
Notes: Spread is reported in basis points above the variable 3-month bank bill swap rate.

Source: AER analysis; Chairmont, *Aggregation of return on debt data*, 28 April 2018.

Figure 11 displays the EICSI reweighted by tenor to account for the difference in issuing long term debt compared to short term debt. That means the spread of longer term debt in the rolling data window (12 months) is given more weight than the spread of shorter term debt.

27 In 2021 we collected actual debt costs from private-sector regulated networks through a Regulatory Information Notice (RIN). This information was received on 27 September 2021 and included new debt issued between 1 July 2020 and 30 June 2021 as well as resubmission of all old debt issued back to 1 July 2013.

## Figure 11 Comparing the EICSI weighted by tenor against the bank bill swap rate (BBSW) (January 2014 to June 2021)

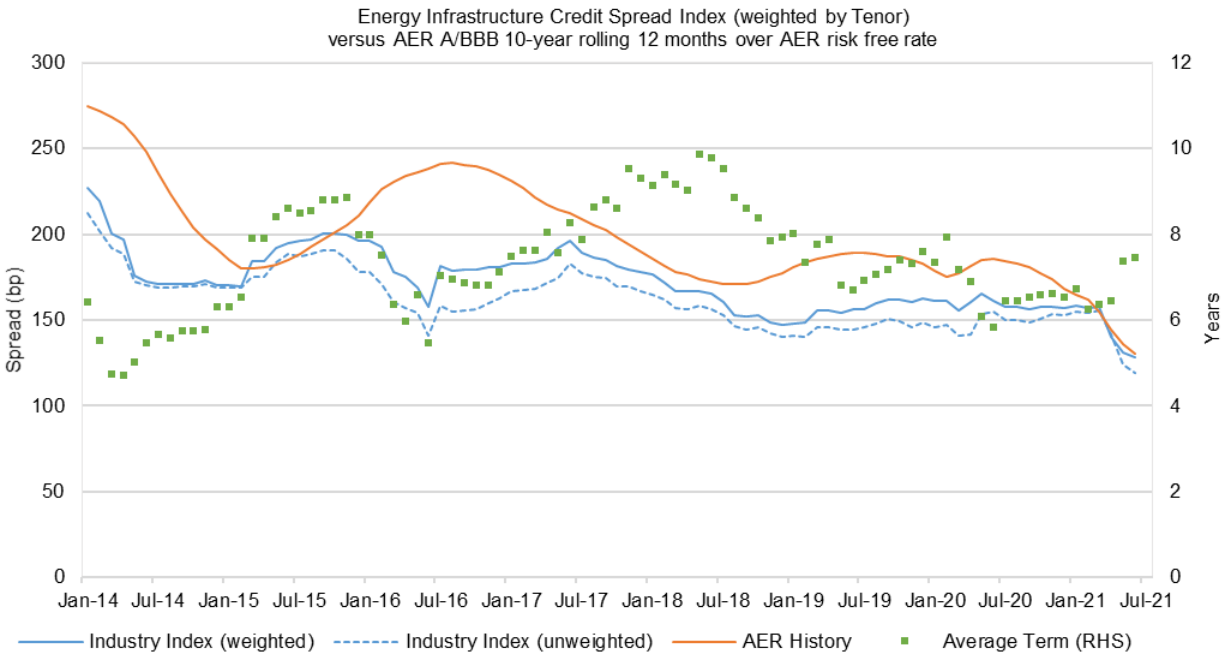



Notes: Spread is reported in basis points above the variable 3-month bank bill swap rate.

Source: AER analysis; Chairmont, *Aggregation of debt data for portfolio term to maturity*, 28 June 2019.

Figure 12 presents the EICSI recalculated as a spread over the AER risk free rate (from 10-year Commonwealth Government Securities) instead of the bank bill swap rate (BBSW).

## Figure 12 Comparing the EICSI weighted by tenor against the risk free rate (January 2014 to June 2021)




Source: AER analysis; Chairmont, *Aggregation of debt data for portfolio term to maturity*, 28 June 2019.

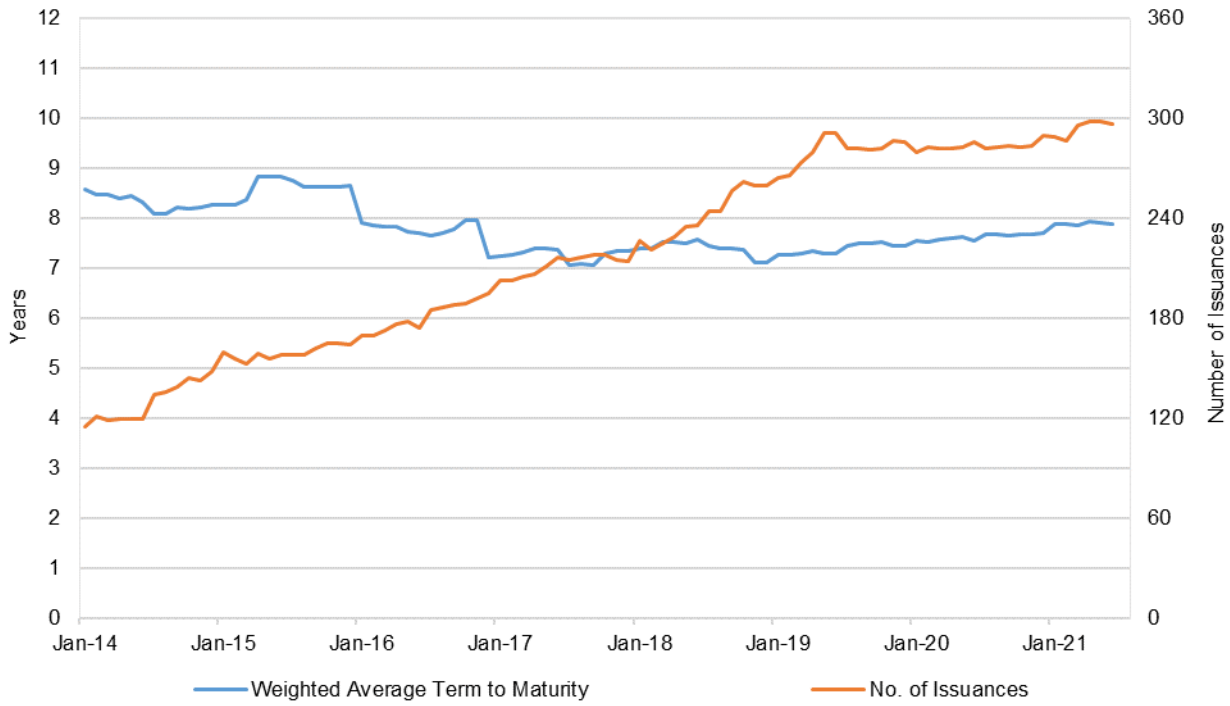
## 7.4 Debt term to maturity

The average term shown as green dots in Figure 10 is the *simple* average of all issuance in the 12 month data window. Figure 13 shows a graphical representation of the weighted average term to maturity at issuance (WATMI) for the period 2013-2021. WATMI is dependent on three parameters:

- Term to Maturity;
- Face value of issuance; and
- Number of debt issuances.

To obtain the industry WATMI, the drawdown sensitivity is taken as 100% (i.e. all debt instruments are fully drawn) and the term of each issuance is weighted by its face value. Debt is included in the WATMI from issuance until its maturity date. This analysis uses the same approach used by Chairmont in its 2019 report.

### Figure 13 WATMI and number of debt issuances (January 2014 to June 2021)

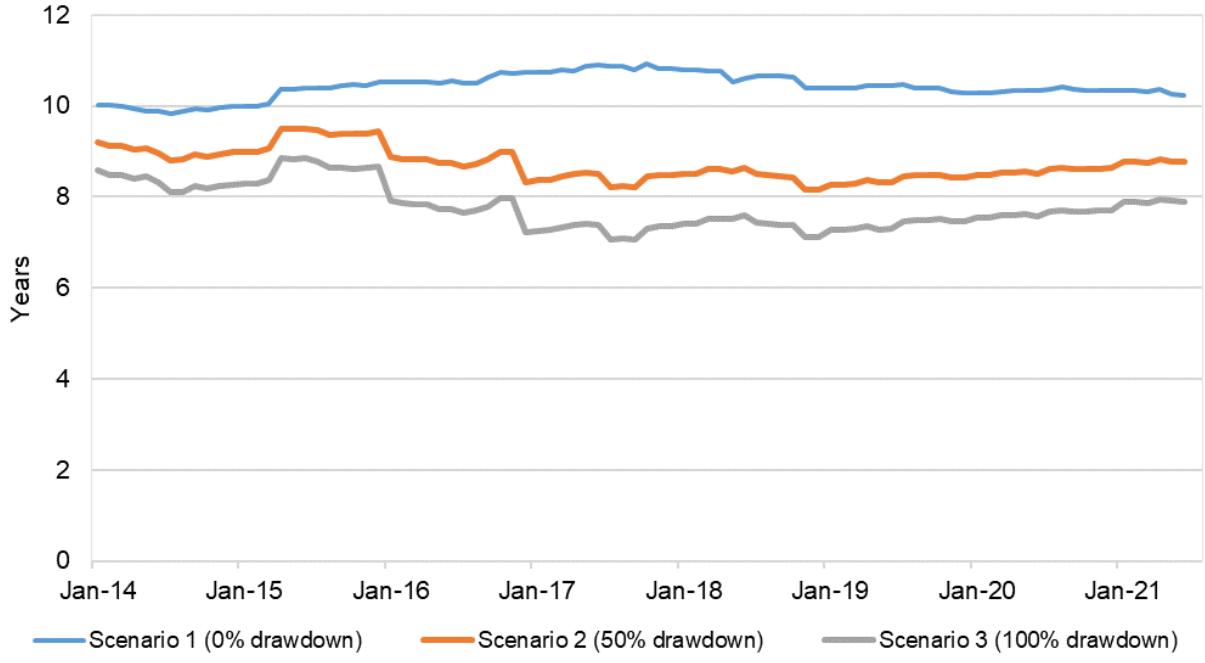



Notes: The figure presented in the 2020 annual update included an error in the 'No. of Issuances' series where the number was reflecting a different drawdown scenario. This error has been addressed in this update. Data has also been updated to reflect information received through the formal RIN received on 27 September 2021.

Source: AER analysis; Chairmont, *Aggregation of debt data for portfolio term to maturity*, 28 June 2019.

Figure 14 is a comparison of WATMI at different drawdown sensitivities on a month-to-month basis. Scenarios 1, 2 and 3 represent drawdowns of 0%, 50% and 100% respectively.

## Figure 14 WATMI drawdown scenarios (January 2013 to June 2021)




Source: AER analysis; Chairmont, *Aggregation of debt data for portfolio term to maturity*, 28 June 2019.

# 8 Return on equity cross check

## 8.1 Equity risk premium versus debt risk premium

We compare our equity risk premium (ERP) and debt risk premium (DRP).[28] This figure compares on-the-day ERP against the on-the-day DRP, not a trailing average portfolio.

### Figure 15 Comparison of ERP and DRP (January 2013 to August 2021)

Comparator: Figure 6 (page 111) of the 2018 explanatory statement.

Source: AER analysis; Bloomberg; Thomson Reuters; RBA.

28 Our comparison of ERP and DRP is described in AER, *Rate of return instrument, Explanatory statement*, December 2018, pp. 110–113.

# 9 Value of imputation credits

## 9.1 Distribution rate from ASX top 50

One component of our estimate of the value of imputation credits (gamma) is the distribution rate (or payout ratio).[29] This is the proportion of imputation credits generated that are distributed to investors.[30] Dr Martin Lally estimated the distribution rate for the top 50 ASX companies as part of the 2018 review.[31] The table below shows the overall distribution rate from an updated report by Dr Lally, which we have released alongside this annual report.

### Table 13 Distribution rates for the ASX top 50

| ASX top 50 | 2018 review (2000–2017) | 2019 update (2000–2018) | 2021 update (2000–2020) |
|---|---|---|---|
| Imputation distribution ($m) | 235,970 | 260,292 | 317,085 |
| Tax payments ($m) | 265,770 | 294,179 | 357,298 |
| Distribution rate | **0.888** | **0.886** | **0.887** |

Comparator: Tables 1 and 2 (pages 5–7) of October 2018 Lally report.

Notes: The top 50 ASX companies were determined at 1 August 2018, consistent with the 2018 report.

Source: Lally, *Estimating the distribution rate for imputation credits for the top 50 ASX companies*, 22 November 2019, p. 6; Lally, *Estimating the distribution rate for imputation credits for the top 50 ASX companies*, 24 June 2021, p. 6.

## 9.2 Utilisation rate from equity ownership

A component of our estimate of the value of imputation credits is the utilisation rate. This is the utilisation value to investors in the market per dollar of imputation credits distributed. In the 2018 review our estimate of the utilisation rate was informed by the equity ownership approach which uses data from the Australian Bureau of Statistics (ABS) to identify the proportion of equity in Australian firms held by domestic owners (rather than foreign investors).[32] The table below shows the utilisation rates with updated data.

29 Our approach to gamma is discussed in AER, *Rate of return instrument, Explanatory statement*, December 2018, pp. 307–381.

30 Our use of ASX data to estimate the distribution rate is described in AER, *Rate of return instrument, Explanatory statement*, December 2018, pp. 338–352.

31 Lally, *Estimating the distribution rate for imputation credits for the top 50 ASX companies*, 17 October 2018.

32 Our use of equity ownership to estimate the utilisation rate is described in AER, *Rate of return instrument, Explanatory statement*, December 2018, pp. 311–313, 359–366.

### Table 14 Utilisation rates from the equity ownership approach (2000 to 2021)

| | 2018 review (2000–2018) | 2019 update (2000–2019) | 2020 update (2000–2020) | 2021 update (2000–2021) |
|---|---|---|---|---|
| Range of annual results | 0.612–0.697 | 0.606–0.697 | 0.606–0.697 | 0.618–0.702 |
| Most recent point estimate | 0.638 | 0.643 | 0.639 | 0.647 |
| Average over last five years | 0.646 | 0.651 | 0.649 | 0.646 |
| Average over last ten years | 0.643 | 0.658 | 0.646 | 0.646 |

Comparator: Page 366 of the December 2018 explanatory statement.

Notes: ABS data commences in September 2000 and runs to June 2018 (2018 review), June 2019 (2019 update), June 2020 (2020 update) and June 2021 (2021 update). We have recalculated the 2019 update figures using the latest ABS data revision.

Source: AER analysis; ABS statistical release series 5232 available at https://www.abs.gov.au/AUSSTATS.