Rate of return and cashflows in a low interest rate environment

Draft working paper

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AUSTRALIAN ENERGY REGULATOR

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Amendment Record

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Contents

Shortened forms

Shortened form	Extended form
2018 Instrument	The rate of return instrument published on 17 December 2018
2022 Instrument	The rate of return instrument to be published in 2022
AER	Australian Energy Regulator
AEMC	Australian Energy Market Commission
CAPM	CAPM Capital asset pricing model (Sharpe-Lintner CAPM)
CGS	Commonwealth government securities
CPI	Consumer Price Index
DRP	Debt Risk Premium
FFO	Funds from operations
HER	Historical excess returns
Instrument	Rate of return instrument
MRP	Market risk premium
NEO	National electricity objective
NGO	National gas objective
NPAT	Net Profit After Tax
SL CAPM	Sharpe-Lintner Capital Asset Pricing Model (or just CAPM)
WACC	Weighted average cost of capital

1 Overview

The rate of return and cashflows in a low interest rate environment is the third topic in a series of working papers that we will produce as part of our pathway to the 2022 rate of return Instrument (2022 Instrument). The outcomes from these working papers will feed in to the active phase of our 2022 Instrument review. The working paper outcomes will assist us to develop a 2022 Instrument that sets a rate of return in line with efficient financing costs, such that consumers pay no more than is necessary for the safe and reliable delivery of electricity and gas.

1.1 What do we want to achieve through our working papers?

The aim of this working paper series is to consider technical aspects of the rate of return ahead of the active phase. It is important for stakeholders and ourselves that we make progress toward settling positions through the working papers. Clearly we cannot bind ourselves ahead of our decision on the 2022 Instrument, but we have an opportunity now to narrow and focus the issues in play.

In this paper, we consider how the rate of return and the cash flows set by the AER behave in an environment of lower than historical interest rates. As part of this analysis, we also consider the flow-on effects to the networks' ability to continue to finance themselves.

1.2 Why does the rate of return matter?

Investors in any business expect to receive an additional return above their initial investment (or capital). We use the phrase 'rate of return on capital'—or just 'rate of return'—to refer to this additional amount when expressed as a percentage of the initial investment.

We estimate the rate of return for regulated energy businesses by combining the returns of two sources of funds for investment: equity and debt. The rate of return provides the business funds to service the interest on its loans and give a return to shareholders.

The best possible estimate of the expected rate of return—neither too high nor too low—will promote efficient investment in, and efficient operation and use of, energy network services. While the capital market transaction is between investors and networks/pipelines, the ultimate effects will flow through to consumers.

If the rate of return is set too high:

- Investors will be over compensated for the risk involved in supplying capital to networks, so will show increased willingness to invest in regulatory assets in comparison with other investments in the economy.
- Networks will have an incentive to over-invest in regulated assets over the longer term, increasing the regulatory asset base above the efficient level.
- Energy consumers will pay inefficiently higher prices, which will distort energy consumption decisions, and downstream investment decisions. This will result in

efficiency losses where consumers use less energy network services than otherwise and non-monetary impacts such as disconnection of vulnerable consumers.

If the rate of return is set too low:

- Investors will be under compensated for the risk involved in supplying capital to networks, so will show reduced willingness to invest in regulatory assets in comparison with other investments in the economy.
- Networks will not be able to attract sufficient funds to be able to make the required investments in the network. Over the longer term there will be declines in quality, reliability, safety and/or security of supply of electricity or gas.
- Consumers of energy will pay lower prices, at least in the short term; but will wear the risk of adverse outcomes for quality, reliability, safety and/or security of supply of energy services. Lower prices will also distort energy consumption and downstream investment decisions (though in the opposite direction to the previous case). This new level of downstream investment will be inefficient for the Australian economy.

Hence, the best possible estimate of the expected rate of return is necessary to promote efficient prices in the long term interests of consumers. We evaluate the two sources of funds for investment--debt and equity--to determine what return is just sufficient to attract the necessary capital investment.

1.3 Why this topic, our considerations and the 2022 Instrument

Interest rates paid on debt by government and corporate issuers have substantially declined over the past decade. Such declines have been wide spread, occurring for both shorter term debt (for example, debt maturing in less than a year) and for longer term debt (for example, those maturing in 5-10 years). Economists and other commentators have noted many contributing economic factors to creating this environment of lower interest rates, such as an increased desire to save and lower economic growth (see Chapter 3 for more details).

Such changes in interest rates are important to the AER, the networks we regulate and their customers. Changes in interest rates affect both the level of revenues and prices that we allow the regulated networks to charge, and the costs that the networks face in providing services and ultimately the prices consumers pay.

We have selected this topic as a working paper because we want to assess, as part of setting the 2022 Rate of Return Instrument, whether our rate of return instrument is appropriate in a lower interest rate environment. In addressing this, we will explore whether we are determining an appropriate rate of return for the Network Service Providers for both equity and debt, and whether the cash flows from regulated services remain appropriate in this environment.

As part of the 2020 Inflation review and some of our other recent processes, we received a number of submissions from networks and their investors expressing concerns about lower

interest rates, cash flows and financeability.[1] We use this draft working paper to explore these issues.

As part of this draft working paper we consider three broad questions:

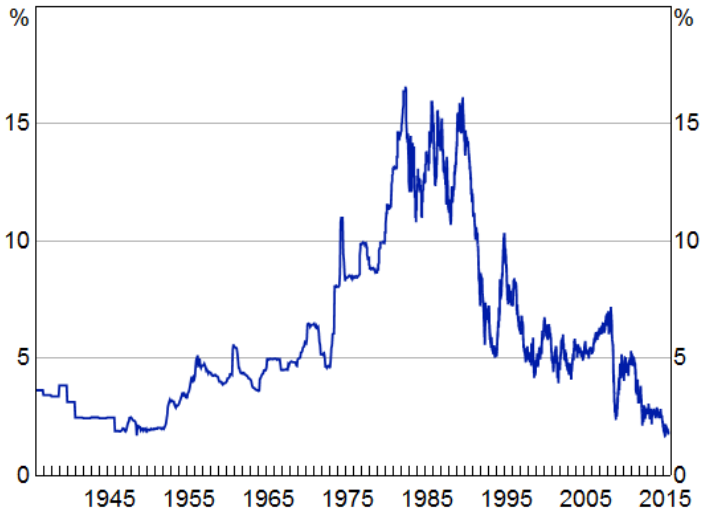
1. Whether we are in a low interest rate environment;
2. If we are, what are the consequences of lower interest rates; and finally,
3. Does this suggest that there is something that needs to be addressed?

Question one: Are we in a low interest rate environment?

For the purposes of this working paper there are two measures of interest rates that are most relevant. First, interest rates charged that are representative of those on debt instruments issued by the businesses we regulate are important as they indicate an efficient regulated firm's cost of debt. Second, the interest rates of Commonwealth Government Securities which are commonly used as proxies for interest rates on risk free assets when pricing other riskier assets. We also analyse estimates of historical real returns as they are relevant for our analysis on estimating return on equity.

The concept of low interest rates is subjective - we ask 'low compared to what?', and we are interested in whether these measures are low compared to historical interest rates. As we explore in Chapter 3, going back to the 1940's we find that recent interest rates and large movements in interest rates are not without precedent. However, there has been a prolonged decline in interest rates and key measures of interest rates are lower than they have been for some time (Figure 1). As such, we agree that we are in a low interest rate environment.

Figure 1 Historic Australian interest rates on 2 year Government bond yields



Sources: Bloomberg; Global Financial Data

1 A summary of some of these submissions can be found in Chapter 5 and Appendix A.

Question two: What are the consequences of interest rates being low?

Changes in real and nominal interest rates affect revenues of the regulated networks through their impact on allowed returns.

We calculate the rate of return by combining estimates of the return on debt with the return on equity, using an estimated gearing level. Under our approach declines in interest rates reduce the rate of return through changes in our estimates of the return on debt and equity parameters.

In line with the general lower observed interest rates, our estimates of returns to corporate debt have declined over the past decade. This has been incorporated into our estimates of the appropriate return on debt and has also been observed in our estimates of actual networks' debt costs.

Our estimates of return on equity have also declined over this period as they are directly linked to the interest on Commonwealth Government Securities. As a result, our estimates of the total rate of return have also fallen.

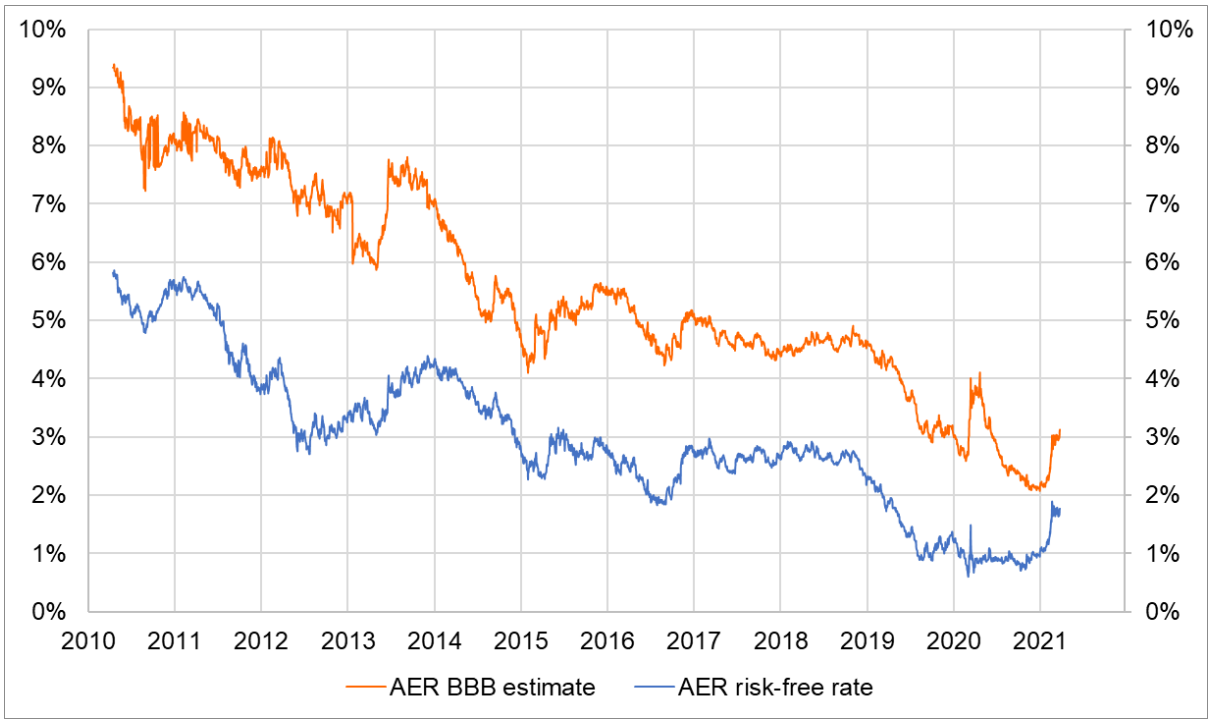
This lower estimate has also had a flow on impact onto the networks' cash flows. As revenues have declined, so have measures related to cash flows such as Net profit after tax (NPAT) and Funds from operations (FFO) to net debt. This can be attributed to lower estimates of return on equity and our RAB indexation adjustments to cash flows (see Chapter 5 for more details).

Question three: Does this suggest that there is something that needs to be addressed?

While there are a number of flow on impacts of lower interest rates, an important question is whether the current changes to allowed revenues are appropriate and are in line with achieving the National Electricity and Gas Objectives. Below, we provide a summary of our considerations on the return on debt, return on equity and cash flows in turn.

First, our return on debt estimates are based on measures of the cost of debt for comparable business that have broadly moved in line with (or declined slightly more than) the changes in Commonwealth Government Securities interest rates (see Figure 2). These trends are also broadly consistent with movements in the networks' costs of debt (see Chapter 4 for more details). Consequently, the reduction in our return on debt has been in line with movements in the broader market for debt and aligns with the costs the regulated businesses face. That is, our return on debt has declined significantly, but so have the costs of securing debt.

Figure 2 Comparison of AER BBB estimate and AER risk free rate



Sources: RBA; Bloomberg; AER

Second, for the return on equity it is more challenging to make an assessment as no direct observation can be made of expected equity returns and as a result, an assessment of a range of indicators needs to be made. At a broad theoretical level, debt and equity are substitutable and it can be argued that as debt costs decrease there would be some fall in the expected return for equity. When we developed the 2018 rate of return Instrument we noted that expected returns may not change one-for-one with movements in interest rates. But we concluded that the evidence indicated that over the long term the realised return on equity moved, on average, in line with movements in interest rates. Given the difficulties in observing expected returns, we concluded that assuming a constant margin above the risk free interest rates provided the best estimate of expected market returns.

With recent movements in interest rates we now want to reconsider the best estimate of the relationship between Commonwealth Government Securities and the expected return on equity. For example, even though interest rates on debt have declined in line with or slightly greater than government bonds over the past decade, it could be that the expectations of equity investors have not declined to the same extent. Additionally, we review if there is something unique about the current circumstance that could generate changes in this relationship? Is it dependent on whether the changes are in the real interest rate or expected inflation?

We provide some initial considerations of this issue in Chapter 4, including descriptions of findings from select academic literature. We are aware that there are differing views on return on equity and whether it moves with interest rates (these can be considered in real and nominal terms). One view is that the expected return on equity moves on average with interest rates. Another view is that the expected return on equity on average may not change with movements in interest rates. There are also a range of possibilities between these two

extremes, or it may even be the case that expected returns on equity could decline, on average, by more than interest rates. At the current time when interest rates have declined significantly, we consider it is important to review the available material on this relationship again. Any approach we adopt must be capable of being implemented in a manner that is sufficiently robust, transparent and evidence based to be suitable for regulatory purposes.

We remain at a preliminary stage in our assessment of whether return on equity moves with interest rates, but have laid a foundation for further consideration. This is an area that we are intending to more deeply explore in our return on equity paper. The return on equity draft working paper is scheduled for release in early July for consultation. That paper will have further analysis of the available material on the relationship between the risk free rate and return on equity. We have engaged Cambridge Economic Policy Associates Ltd (CEPA) to provide advice on this subject matter and our consideration of the CEPA report will also be included in the return on equity draft working paper.

We will undertake more substantive engagement through our consultation on the equity working paper. We encourage stakeholders to provide views on this issue in response to our return on equity draft working paper.

We are more firm on our finding that using Commonwealth Government Securities as a proxy for the risk free rate remains appropriate when determining return on equity. These securities can be bought on the open market and held to achieve the stated return to maturity. This does not change if additional demand is introduced from the Central Bank, if there is additional supply produced by Federal Government to enable stimulus or from increased demand due to Basel III liquidity requirements. These factors may impact the price but they do not change the underlying characteristics of Commonwealth Government Securities as an effective proxy for the risk free rate. We also still see a high level of liquidity in the Commonwealth Government Securities market.

Third, when assessing cash flows and the special case of financeability, we recently assessed this in the context of the Australian Energy Market Commission (AEMC) review of the TransGrid and ElectraNet rule changes. The view we expressed in that process was that financeability considerations should not be used to directly adjust our rate of return parameters and further consideration has not altered our view based on the information currently before us. We have considered the impact of lower interest rates on measures such as NPAT and FFO to net-debt (see Chapter 5), and have obtained advice from the ACCC Regulatory Economics Unit (REU).[2]

The AEMC rule change process rejected the proposal to bring forward cash flows in order to improve financeability metrics, and concluded that the regulatory framework does not create a barrier to financing large projects. Consistent with the AEMC decision, REU's advice and our recent submissions to the AEMC process, we remain of the view that decisions about how to manage cash flows and financeability, such as the level of gearing, are primarily for the individual networks. We query whether regulated network service providers ability to raise capital is impacted in a manner that requires a regulatory response. We also note that evidence of any such impacts were not presented during the AEMC's process. While

2 ACCC - Regulatory Economic Unit, *Rate of Return and Cash Flows in a Low Return Environment,* 19 April 2021.

financial metrics considered by credit rating agencies are impacted by lower interest rates, these changes do not of themselves indicate a regulatory framework problem.

What do we propose for the 2022 Rate of Return Instrument?

We are still exploring whether any changes should be made in response to the current lower interest rate environment in the 2022 Rate of Return Instrument. We encourage submissions on this topic in general, and in particular to methods of estimation for particular rate of return parameters. The relationship between interest rates and the return on equity will be explored in our equity working paper.

1.4 Next steps

We invite stakeholder submissions in response to this working paper by 2 July 2021.

Our past practice was to hold a public forum in person during the consultation period, where stakeholders can ask questions of the AER and interact directly to hear each other's perspectives. However, our experience during the COVID-19 pandemic has demonstrated the practicality and value of online forums. Therefore, our current intent is to hold an online event during the consultation period. Information about the online forum will be available on the AER's website in due course.

After consideration of submissions, we expect to conclude this working paper topic with the release of a final working paper.

1.4.1 Making a submission

Written submissions should be emailed to the AER at RateOfReturn@aer.gov.au, by close of business, 2 July 2021.

Alternatively, submissions can be sent to:

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We prefer that all submissions be sent in an electronic format in Microsoft Word or other text-readable document form and publicly available, to facilitate an informed, transparent and robust consultation process.

Submissions will be treated as public documents and posted on the AER's website unless prior arrangements are made with the AER to treat the submission, or portions of it, as confidential. Those wishing to submit confidential information are requested to:

- clearly identify the information that is the subject of the confidentiality claim; and
- provide a non-confidential version of the submission in a form suitable for publication.

All non-confidential submissions will be placed on the AER's website at www.aer.gov.au. For further information regarding the AER's use and disclosure of information provided to it, see the ACCC/AER Information Policy, June 2014 available on the AER's website.

Enquiries about this paper, or about lodging submissions, should be directed to the Network Reporting and Finance branch of the AER on (03) 9290 1800.

2 Process background

2.1 What is the rate of return Instrument?

The rate of return Instrument specifies how we determine the allowed rate of return on capital in regulatory determinations for energy networks. It specifies the mathematical formulae we will use to calculate the rate of return, and how we will obtain inputs for those formulae. It specifies some inputs (fixed for the duration of the Instrument) and for others specifies the process by which we will measure market data and use it as an input at the time of a decision.

The current rate of return Instrument was published on 17 December 2018 (the 2018 Instrument). In December 2022 we will publish the next rate of return Instrument (the 2022 Instrument). This binding Instrument will determine the allowed rate of return on capital for the following four year period.

Estimating the rate of return is a complex task. We estimate the returns required by investors in view of the risks associated with energy network companies compared to their other investment opportunities. We make this judgement by examining a broad range of evidence including financial market data, models of financial returns, the latest investment knowledge and the views of all stakeholders

2.2 What is our 'Pathway to 2022'?

We use the term 'Pathway to 2022' to describe the process by which we will develop the 2022 Instrument. We consulted with stakeholders about what steps should be included and what role various reference groups should play.[3] We issued a position paper in May 2020 setting out our high level plan.[4]

The active phase of the 2022 review will commence in mid-2021. Prior to this, our pathway to 2022 includes:

- Rate of return annual updates—to provide information on rate of return data in the years between reviews; particularly updated times series data used in the 2018 Instrument (or used to inform the development of the 2018 Instrument).
- Establishing reference groups—to ensure we hear stakeholder perspectives from consumers, investors and retailers.
- Working papers—such as this paper.

Outcomes from our 2020 Inflation review will also flow into the development of the 2022 Instrument.[5]

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3 AER, *Consultation paper, Pathway to the 2022 rate of return Instrument*, November 2019; see also The Brattle Group, *Stakeholder feedback on the AER's process for the 2018 rate of return Instrument*, 27 June 2019.

4 AER, *Position paper, Pathway to the 2022 rate of return Instrument*, 29 May 2020.

5 AER, *Initiation notice, 2020 review of inflation approach*, 7 April 2020; AER, *Final position*, *Regulatory treatment of inflation*, 17 December 2020.

We will consult further on the process for the active phase of the review, including lower-level details not addressed in our May 2020 position paper, as we get closer to 2022.

2.3 What is the intent of the working paper series?

Our rate of return working papers discuss issues and evidence on key rate of return topics, and allow us to hear from stakeholders in response.

On each chosen topic, we expect to release a draft working paper (usually accompanied by an expert report), before a submission period. We will facilitate discussion with stakeholders, such as by hosting an online meeting. We will then release a final working paper with our response to submissions. These working positions will describe our preferred option (or options) and identify where further work is required.

In selecting topics for working papers, we have had regard to whether topics could be constructively considered as discrete issues in advance of the active phase of the review.[6] We have also taken into account stakeholder feedback on the topics of interest or importance.[7]

We intend that all this material will feed in to the main phase of the review, providing a foundation for constructive discussion and helping alleviate time pressure in the active phase.

The topic of this paper was selected to assess the impact or current interest rates on our rate of return and cashflows for the networks we regulate. It is also an opportunity to consider whether changes might be made when setting the 2022 rate of return Instrument in an environment of lower than historical interest rates. As part of this paper we open a discussion with stakeholders on the relationship between the risk free rate and other rate of return parameters. We will continue our exploration of the relationship between interest rates and other parameters (such as the market risk premium and the appropriate debt series) in the equity, debt and total returns omnibus papers later this year.

2.4 How does this interact with other working papers?

We have published three working papers thus far in our suite of working papers:

- *Energy network debt data* – This paper explored options for using the Energy Infrastructure Credit Spread Index (EICSI) in the Rate of Return Instrument and recommended a preferred approach.[8]
- *International regulatory approaches to the rate of return* – This paper analysed the decisions of international regulators and how they used different methods and data to set the rate of return. The paper outlined some ways this might influence the rate of return in our decisions.[9]

6 AER, Position paper, Pathway to the 2022 rate of return Instrument, 29 May 2020, pp. 9–10.
7 AER, Position paper, Pathway to the 2022 rate of return Instrument, 29 May 2020, p. 22.
8 AER, Rate of return, Energy network debt data, Final working paper, 18 November 2020.
9 AER, Rate of return, International regulatory approaches to the rate of return, Final working paper, 17 December 2020.

- *CAPM and alternative return on equity models* – This paper identified our current understanding of various equity models and our preferred options for how they could be used to determine the rate of return.[10]

In addition to above, this draft working paper has been published at the same time as the draft working paper on another topic: the term of the rate of return. That working paper investigates whether the terms for return on equity, return on debt and the overall rate of return set in the 2018 Instrument are still appropriate.[11]

10 AER, Rate of return, CAPM and alternative return on equity models, Final working paper, 16 December 2020.
11 AER, Rate of return, Term of the rate of return, Draft working paper, May 2021.

3 Are we in a low interest environment?

Over the past decade, Australia and many other advanced economies have experienced historically low interest rates. The Reserve Bank of Australia (RBA) has attributed this to a number of structural changes, including demographic changes, a decline in potential output growth and changes in households' and firms' risk appetite.[12]

While in this working paper we do not define a specific threshold to characterise a 'low interest rate environment', we agree (as explored in this Chapter) that there has been a prolonged decline in interest rates and rates are currently lower than they have been historically. Some of our stakeholders have referred to these recent changes as constituting as a low interest rate environment.[13] This is a broadly accepted view. For example, a number of organisations, such as the RBA, Bank of England, and Bank of International Settlements (BIS) have also described the current environment as a low rate environment.[14]

In the 2018 Instrument, our final decision was to use the return on Commonwealth Government Securities with a term of 10 years as our proxy for the risk free rate. We selected Commonwealth Government Securities as they were considered the best proxy of an Australian investment with the minimum amount of risk and the appropriate term.[15] We consider whether this remains appropriate in Chapter 4.

In this chapter we explore changes to Commonwealth Government Securities yields over the near and longer term, and explore changes in other interest rates that are relevant to the Networks that are regulated by the AER including corporate debt and estimates of real interest rates.

3.1 Commonwealth Government Security rates

Long term trends

Figure 3 provides nominal interest rates on 10 year Government bond yields from the 1950s through to 2021.

Interest rates were relatively low and steady in the 1940s, following the Great Depression and World War II, through to the early 1960s. This period saw sustained growth combined with low unemployment and low inflation.[16]

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12 Guttmann, Lawson & Rickards, *The Economic Effects of Low Interest Rates and Unconventional Monetary Policy*, 17 September 2020, https://www.rba.gov.au/publications/bulletin/2020/sep/the-economic-effects-of-low-interest-rates-and-unconventional-monetary-policy.html.

13 Frontier Economics, *The impact of artificially supressed government bond yields*, 23 November 2020, p. 3.

14 RBA*, Speech: Risk and Return in a Low Rate Environment*, 16 March 2018, https://www.rba.gov.au/speeches/2018/sp-dg-2018-03-16.html. BIS*, working paper BIS Working Papers No 612 Monetary policy and bank lending in a low interest rate environment: diminishing effectiveness?*, February 2017, BoE, Speech: Financial Stability and Low for Long, October 2019, https://www.bankofengland.co.uk/-/media/boe/files/speech/2019/financial-stability-and-low-for-long-speech-by-jon-cunliffe.pdf?la=en&hash=D8721FC53A74F611335548FB350264BD2AEC0C2B,

15 AER, *Rate of return instrument*, 17 December 2018 (v1.02 as amended on 4 April 2019), p.125.

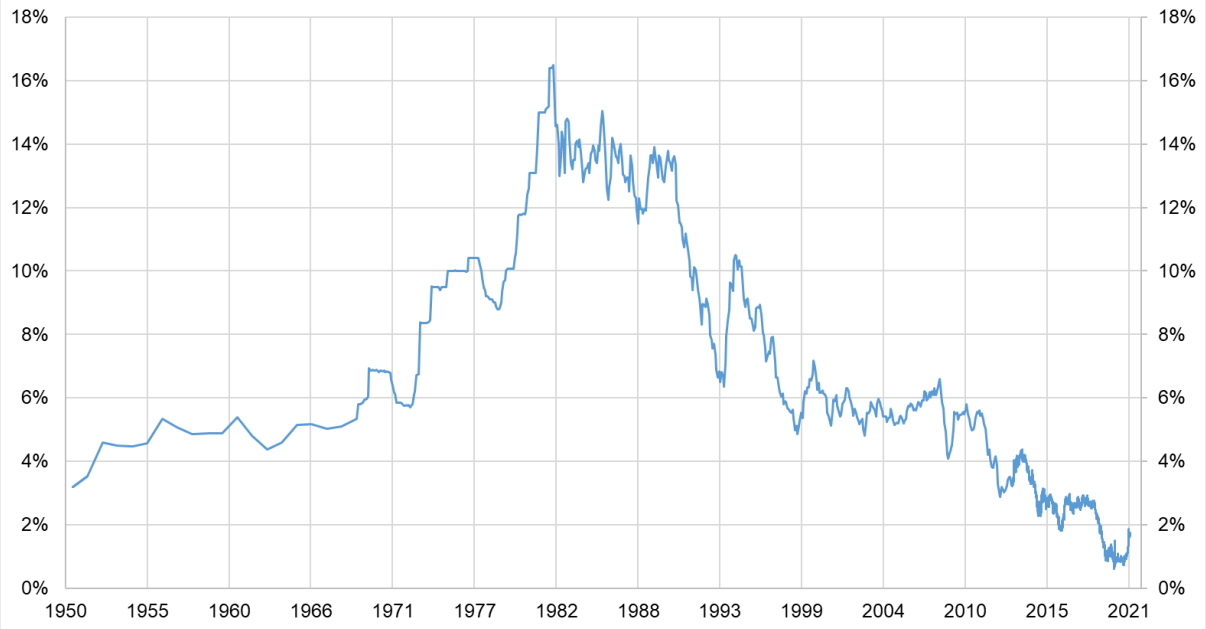
16 RBA, *Speech: Low Interest Rate Environments and Risk*, 8 October 2015, https://www.rba.gov.au/speeches/2015/sp-so-2015-10-08.html.

The late 1960s and early 1970s saw large economic change worldwide. Advanced economies across the world moved from fixed to floating exchange rates and deregulated their financial systems. The 1970s, saw interest rates rise and a period of stagflation from a rapid escalation in oil prices.[17]

Interest rates remained high until 1987, when Australia's and other advanced economies experienced stock market crashes, led by a mass sell-off of US shares. Following this, Australia entered a period of recession throughout the early 1990s and in 1993, the RBA began inflation targeting.

Interest rates have steadily dropped since, with a noticeable drop following the Global Financial Crisis in 2008. Compared to the 1970s, current interest rates are relatively low. Interest rate movements from 2013 to 2021 are discussed in greater detail in the section below.

Figure 3 Historic Australian interest rates on 10 year Government bond yields

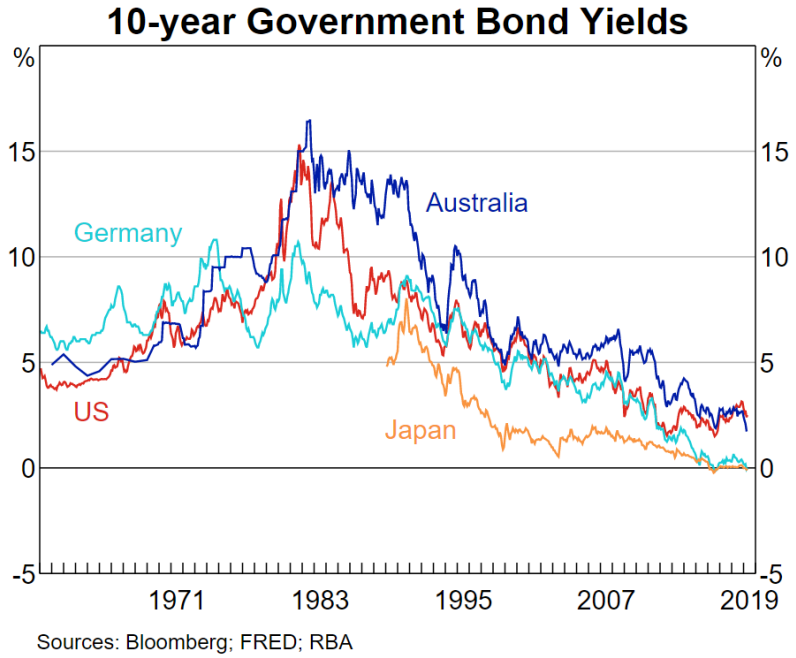


Source: RBA

Figure 4 compares long term interest rate trends in Australia to Germany, Japan and the US. Many of the movements described above can be seen in other economies' interest rates, in particular the US. Australia is not the only advanced economy currently experiencing a period of lower interest rates.

17 RBA, Oil prices and the Australian Economy, September 2008, https://www.rba.gov.au/publications/bulletin/2008/sep/pdf/bu-0908-1.pdf.

Figure 4 10-year Government bond yields (Germany, US, Japan & Australia)



Sources: Bloomberg; FRED; RBA

Movements since setting the 2018 rate of return Instrument

Since we have published the 2018 rate of return Instrument, yields on 10 year Commonwealth Government Securities have fallen noticeably, with Australia reaching historic lows in 2020 (see Figure 5). The RBA attributes these historic lows to a combination of structural and cyclical factors:

> *"On the structural side, there has been, for some time, an elevated desire to save, relative to invest, which has kept real interest rates low. On the cyclical side, the steep declines in GDP, the uncertainty about the future and an expectation of a long period of very low inflation have each played a role."*[18]

In November 2020, however, movements in yields started to reverse and are currently above 1.5%. These are the highest levels since May 2019. The RBA has attributed this rise to:

> *"A lift in investors' expectations of future inflation, although there has also been some bringing forward in the expected timing of future policy rate increases."*[19]

18 RBA, *Speech: The Recovery, Investment and Monetary Policy, 10 March 2021*, https://www.rba.gov.au/speeches/2021/sp-gov-2021-03-10.html.

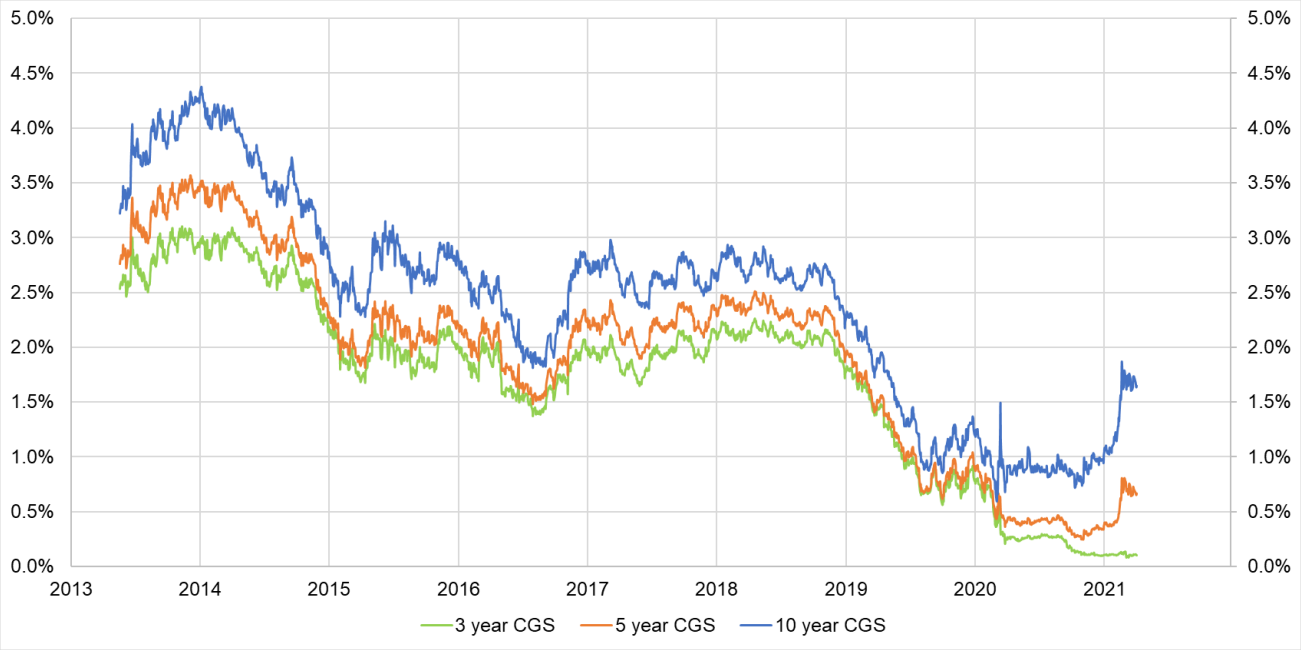
19 RBA, *Speech: The Recovery, Investment and Monetary Policy, 10 March 2021*, https://www.rba.gov.au/speeches/2021/sp-gov-2021-03-10.html.

Figure 5 Yields on Australian government bonds, 10 years maturity (May 2013 to April 2021)

Source: RBA

The yields on 10-year bonds have been compared against shorter-to-medium term, 3 and 5-year bonds in Figure 6. The yields of the 3 and 5-year bonds largely follow a similar pattern to the 10-year bonds, with the exception that the 3-year bonds have not increased from 2020 in 2021.

Figure 6 Comparison of yields on Australian Government 3, 5 and 10 year bonds (May 2013 to April 2021)



Source: RBA

The RBA began purchasing 3 year securities in March 2020 targeting a yield around 0.25 per cent, this was revised to 0.1 per cent in November 2020.[20] This may explain why the 3 year bonds have not increased from late 2020 levels.

The RBA also announced in November 2020 that it would be purchasing $100 billion dollars of 5 to 10 year securities with the intention of lowering longer term yields. An additional $100 billion dollars of purchases was announced in February 2021. Unlike the 3 year securities, there was no target yield for either the 5 or 10 year securities.[21]

Frontier submitted that these recent RBA longer term bond purchases have artificially lowered Commonwealth Government Securities yields below the level that would otherwise have been set by the market.[22] It is unknown what magnitude of effect these purchases have actually had on 5 and 10 year yields to date, particularly when considered in conjunction with the increase of Government issued bonds over the past year.

Figure 7 provides the amount of bonds on issue in Australia from 1991 to 2021. It shows a substantial increase in bond issuance in 2020 by Australian and state governments as they undertook expenditure programs during the COVID-19 pandemic. So while the RBA may have lowered yields by buying bonds, the increased supply of bonds would also be expected to increase yields. We discuss whether these influences would be expected to have an impact on the suitability of Commonwealth Government Securities as the proxy for the risk free rate in Chapter 4. As we have noted in section 1.3 above, at a broad theoretical level debt and equity are substitutable. Hence it would be expected that QE would affect prices and yields for other assets. That is, the reduction in yields for bonds would flow through, to a degree, to reductions in yields for equities. This is supported by empirical evidence, notwithstanding the difficulties of separating out this effect from the effect of other variables. Some studies find that QE and expansionary policies in the US also increased prices, and reduced yields, on other assets, including equities.[23]

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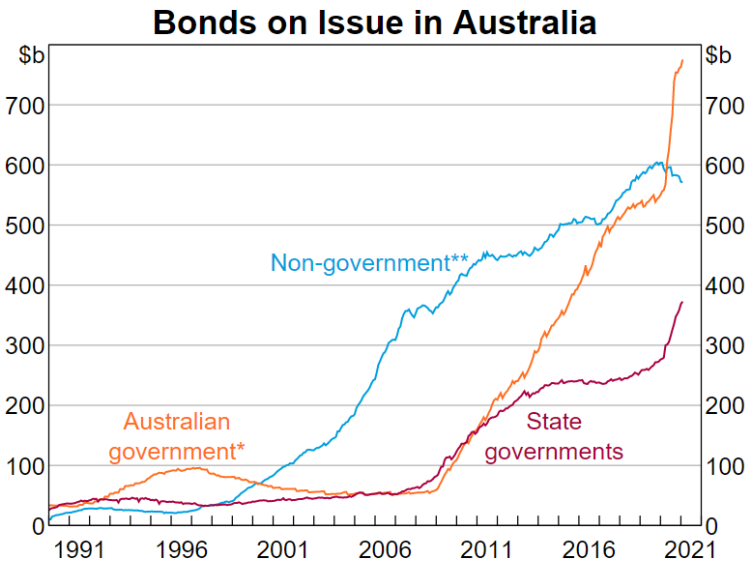
20 RBA, *Statement by Philip Lowe, Governor: Monetary Policy Decision*, 19 March 2020, https://www.rba.gov.au/media-releases/2020/mr-20-08.html; RBA, *Statement by Philip Lowe, Governor: Monetary Policy Decision*, 3 November 2020, https://www.rba.gov.au/media-releases/2020/mr-20-28.html.

21 RBA, *Government Bond Purchases*, https://www.rba.gov.au/mkt-operations/government-bond-purchases.html#fn1.

22 Frontier Economics, *The impact of artificially supressed government bond yields*, 23 November 2020, p. 7.

23 Kiley, T. M., The Response of Equity Prices to Movements in Log-Term Interest Rates Associated with Monetary Policy Statements: Before and After the Zero Lower Bound, Journal of Money, Credit and Banking, August 2014, Vol 46, No 5, pp 1057-1071; Joyce, M. A. S., Lasaosa, A., Stevens, I., Tong, T., The Financial Market Impact of Quantitative Easing in the United Kingdom, International Journal of Central Banking, Vol 7, No 3, September 2011, pp 113 - 161; Rogers, J. HH., Scotti, C., Wright, J. H., Evaluating Asset-Market Effects of Unconventional Monetary Policy: A Cross-Country Comparison, Board of Governors of the Federal Reserve System International Finance Discussion Papers Number 1101, March 2014; I Shah, F Schmidt-Fischer and I Malki, The Portfolio Balance Channel: an analysis on the impact of quantitative easing on the US stock market, Bath Economics Research Working Papers, no.74/18, August 2018.

Figure 7 Bonds on Issue in Australia (1991 to 2021)



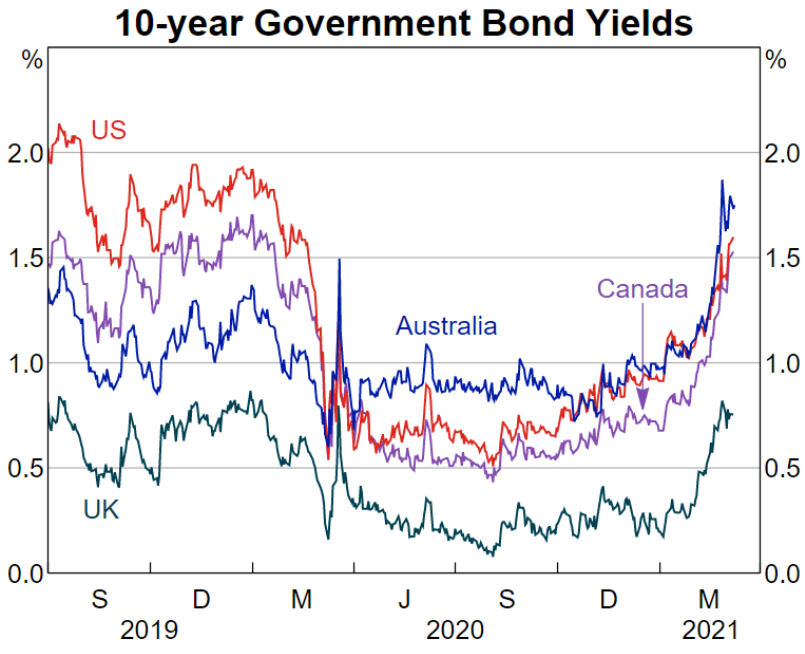
* Excludes bonds purchased by the Australian Government

** Excludes ADIs' self-securitisations, includes government-guaranteed bonds

Sources: ABS; AOFM; Bloomberg; KangaNews; Private Placement Monitor; RBA; State Treasury Corporations

We also note that the recent moves in government interest rates are similar to those in other advanced economies (Figure 8).

Figure 8 10-year Government Bond Yields (2019 to 2021)



Sources: Bloomberg; Yieldbroker

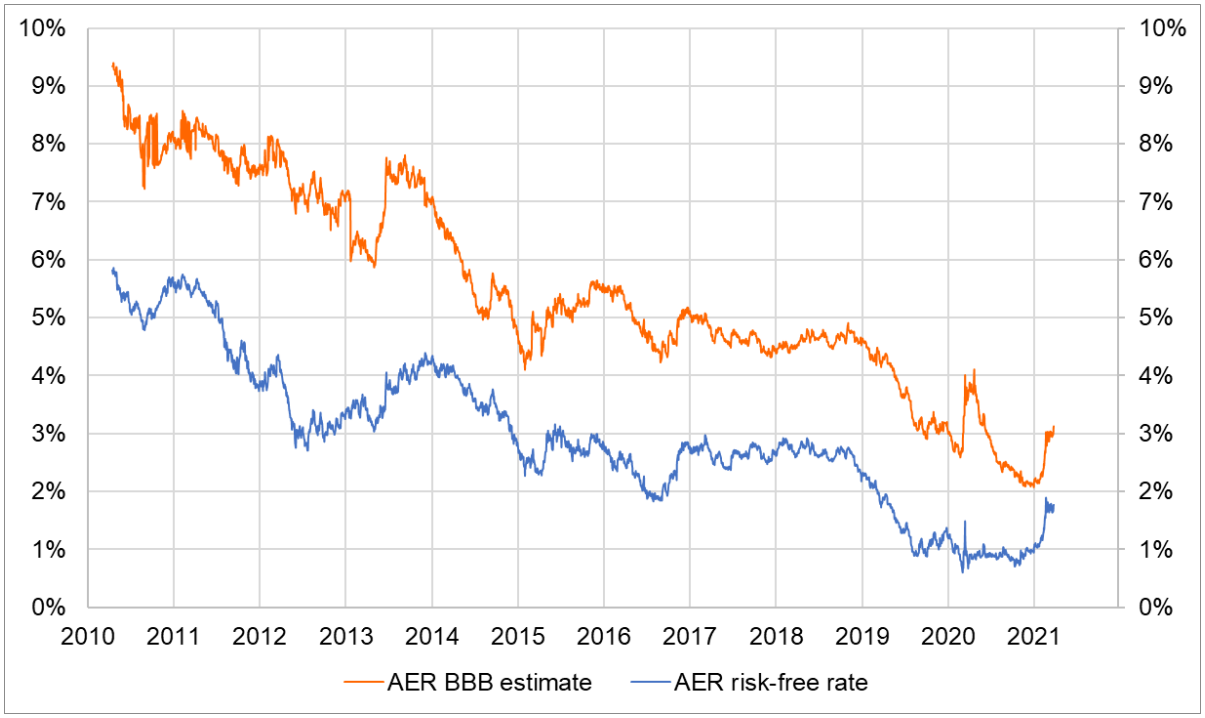
3.2 Network debt interest rates

Data on debt representative of the networks we regulate is less available than that of Commonwealth Government Securities and is available for this draft working paper over a narrower time horizon.

Figure 9 displays the AER's 2013 guideline estimate of a BBB rated bond along with the AER risk-free rate (calculated using RBA 10-year Commonwealth Government Securities yields). Estimates of BBB rated bond yields and Commonwealth Government Securities appear to move in a similar fashion and have declined over the past eight years.

The difference between the BBB and Commonwealth Government Securities yields appears to have narrowed over time, suggesting that the debt risk premium (DRP) has also fallen during the period. This is further explored in Chapter 4.

Figure 9 Comparison of AER BBB estimate and AER risk free rate (May 2010 to February 2021)



Sources: RBA; Bloomberg; AER

3.3 Measures of real interest rates

Real interest rates are particularly important in our regulatory framework. While we set a nominal rate of return, the net effect of the framework set by the NER and NGR is service providers receive a target real return plus compensation for movements in inflation through indexation of the regulatory asset base for actual inflation.[24]

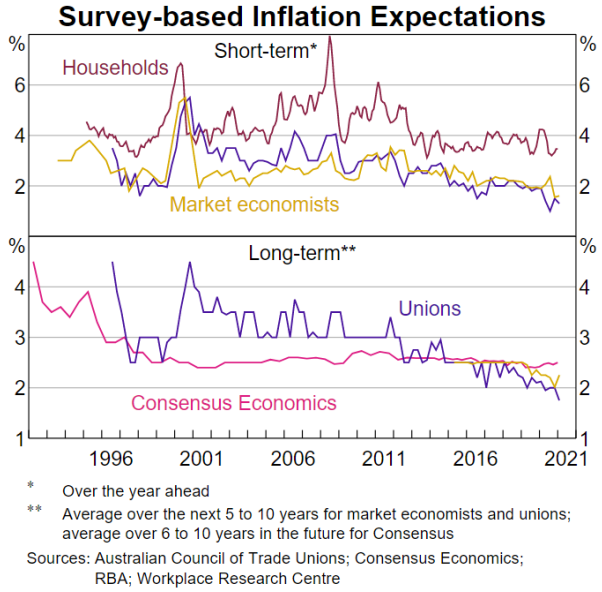
[24] AER, Final Position - Regulatory treatment of inflation, December 2020, pp 9-12.

The interest rates described above are in nominal terms, which can be decomposed into a real return component and an expected inflation component. Examining real interest rates allow us to examine whether nominal interest rates have over time moved as a result of changes in expected inflation or due to real interest rate movements.

There are several difficulties when estimating a long time series of real interest rates. Generally, both nominal interest rate and expected inflation data are required to estimate real interest rates. Estimates of inflation expectations are difficult to estimate accurately over long periods as they are not directly observed and consistent historical estimates are not always readily available. The best method of estimating expected inflation may also change through time, as we observed when we changed our approach in the 2020 inflation review.

Data from Consensus Economics suggests that long-term inflation expectations have been relatively stable around 2.5 per cent since around 1998 (Figure 10).[25] This result is likely due to the introduction of inflation targeting in Australia in the early 1990s.[26]

Figure 10 Survey-based inflation expectations



As a result of this, the broad trends in long-term real interest rates since around 1998 are unlikely to be substantially different from those observed in nominal interest rates after inflation expectations became anchored to the RBA's target band.

We do note, however, that researchers can estimate real interest rates using other methods such as structural economic models or estimate historical inflation expectations using autoregressive processes.

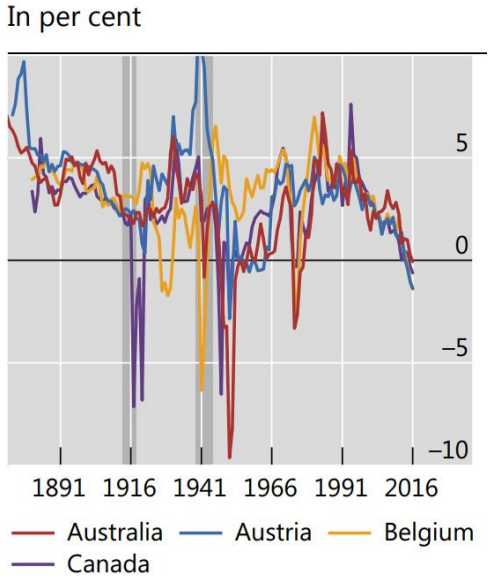
25 We have previously received advice from the RBA that suggests that Consensus Economics estimates of expected inflation has a number of desirable properties (see, RBA, Letter re: Regulatory treatment of inflation - Inflation expectations, 5 July 2017, p. 2-3). However, we don't use the surveys directly as amongst other things, they are proprietary. For more information, see our 2022 inflation review.

26 For more information see: https://www.rba.gov.au/inflation/inflation-target.html.

Working paper No. 685, completed by the Bank of International Settlements, is one such example that uses autoregressive processes.[27] It suggests that real interest rates have had periods, in the 1950s and 1970s, when long-term real rates were lower than current period (Figure 11). It also suggests trends in the past 30 years for long-term real rates are relatively similar to those observed in the nominal Commonwealth Government Securities (Figure 3). That is, like nominal rates, real interest rates have trended down with the decrease in Commonwealth Government Securities.

There are differing views on whether the fall in risk free rates are driven by policy, structural or cyclical factors. In our equity working paper we will explore the evidence whether the different drivers influence the relationship between risk free rate and market risk premium (MRP). Some initial considerations of this relationship are also set out in Chapter 4.

Figure 11 BIS Working Paper estimate of Australia real long-term rates (1866 to 2017)



Source: BIS working paper No. 685

Real neutral rates, such as those calculated by central banks are an example of real rates calculated using structural economic models. Although these rates cannot be observed directly, estimates of the neutral rate can provide a useful guide for both central banks and financial market participants in determining the policy rate required to maintain full employment and stable inflation.[28] It should be noted, however, it is not necessarily an equivalent measure to investors' required real rate of return at that time.

Similar to the BIS chart above, Figure 12 suggests trends in the past 30 years for neutral real rates are relatively similar to those observed in the nominal Commonwealth Government Securities.

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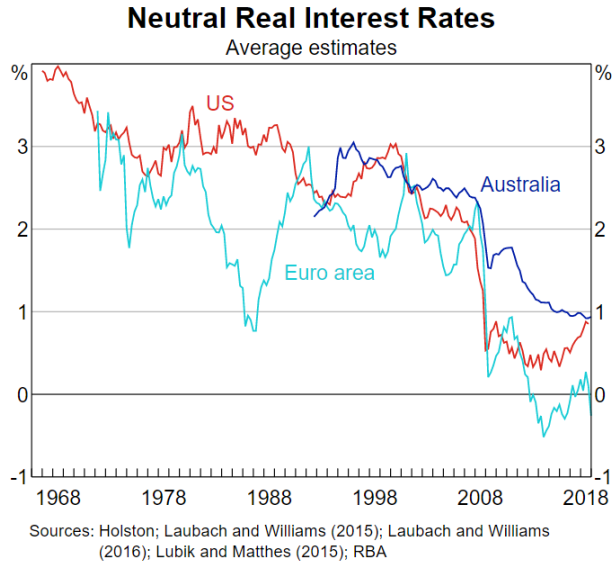
27 BIS, *BIS Working Paper No. 685 - Why so low for so long? A long-term view of real interest rates*, December 2017.

28 RBA, *Statement of Monetary Policy - May 2019 - Box B: Why Are Long-term Bond Yields So Low?*, May 2019, pp. 27-32.

Figure 12 Neutral Real Interest Rates



3.4 Summary

For the purposes of this working paper and setting the rate of return instrument there are two measures of interest rates that are most relevant:

- The interest rates of Commonwealth Government Securities which are commonly used as proxies for interest rates on risk free assets when pricing other riskier assets.
- Interest rates charged that are representative of those on debt instruments issued by the businesses we regulate are important as they provide an indication of an efficient regulated firm's cost of debt.

We also examine select estimates of real interest rates which may assist with future analysis. Going back to the 1940's we find that recent interest rates and large movements in interest rates are not without precedence. However, when compared to recent history, the key measures of interest rates are lower than they have been for some time as part of a sustained downward trend. This suggests that we should consider whether our framework remains appropriate in this environment.

4 How might changes in the risk free rate affect the rate of return?

While there are a number of flow on impacts of lower interest rates, an important question is whether the current level of interest rates has implications for our rate of return and with achieving the National Electricity and Gas Objectives (NEO and NGO).

In this chapter, we provide background on how the rate of return is currently estimated under the 2018 Instrument and explore the effect of lower than historical interest rates for our estimation of return on debt, return on equity and other rate of return parameters.

4.1 Background on how the rate of return is estimated and applied

As part of setting regulated revenues and prices for electricity and gas network service providers, we apply a 'building block' model. The building blocks—return on capital, return of capital (depreciation), capital expenditure, operating expenditure and tax —reflect the expected costs that would be incurred by an efficient entity operating the network.

This is a form of incentive regulation, as building blocks are estimated in advance for a regulatory control period (typically five years) and the network retains any benefit where it is able to reduce costs below the AER's estimates. Likewise, if the firm is inefficient, it bears the detriment of this inefficiency.

The return on capital building block is set by applying a rate of return on capital to the regulatory asset base each year. We currently estimates the allowed rate of return for regulated businesses using the approach set out in the 2018 Instrument.[29] The Instrument is binding under the National Electricity Law and National Gas Law. This means that we are required to set the rate of return according to the current Instrument.

To estimate the allowed rate of return, we estimate both the allowed return on equity and the allowed return on debt. While we can more directly observe the return on debt, it is more difficult to observe the expected return on equity. As a result, estimating the return on equity is more complex and contentious. For return on equity, experts and regulators often reach differing positions on the strengths and weaknesses of different models and how those models should be implemented.

Our current methodology to estimate both returns on equity and debt (which we set in 2018) is set out in the next section.

[29] AER, Rate of return instrument, 17 December 2018 (v1.02 as amended on 4 April 2019).

4.2 How our current return on debt and return on equity methodologies respond to changes in interest rates?

4.2.1 Return on Equity

Throughout the 2018 Instrument process the AER used a 6 step foundation model to inform our decision on return on equity. This foundation model was developed during the 2013 Rate of Return Guideline (2013 Guideline). This model provided a framework for systematically considering relevant information and then exercising our judgement on the appropriate choice of the regulated return on equity. The approach recognised that our task requires us to exercise judgement because we were estimating a forward looking return on equity that will satisfy the national electricity and gas objectives. Further, the information available to inform our decision was imprecise, incomplete and, to some extent, conflicting.[30]

Using the foundation model approach our decision in the 2018 Instrument was to estimate return on equity, k^e using the standard SL-CAPM (Sharpe-Lintner) model:

$$\boldsymbol{k^e = k^f + \beta \times MRP}$$

Under the 2018 Instrument, Beta (β) and the market risk premium (MRP) were fixed at 0.6 and 6.1% respectively. The product of Beta and MRP is the equity risk premium. 10 year government securities were selected as the proxy for the risk free rate (k^f). It is set before the start of the regulatory control period and networks are able to nominate the averaging period over which their risk free rate is calculated.

As we use a fixed equity risk premium, our estimate of return on equity moves percentage point for percentage point with a movement in the risk free rate. This relationship is explored further in Section 4.3.

4.2.2 Return on Debt

The return on debt is more directly observable than the expected return on equity.

Our estimated return on debt, k_t^d is updated each regulatory year *t*, using averaging periods set by each network, which updates one-tenth of the ten year trailing average (more on this below).[31]

Under the 2018 Instrument, the return on debt is calculated using an average of observed corporate bond yields from third-party providers (RBA, Bloomberg and Thompson Reuters) with a term of 10 years and a credit rating of BBB+.[32] Unlike the return on equity, we estimate the yields directly where possible rather than building up from a foundational model. This allows the return on debt to vary more or less than one-for-one with changes in Commonwealth Government Securities.

30 AER, Rate of Return Instrument, Explanatory Statement, December 2018, pp. 74-75.

31 We note that this is after the networks fully transition to the 10 year trailing average.

32 As these providers do not produce 10 year curves with a credit rating of BBB+, a 2/3 BBB 10 year and 1/3 A 10 year blend is used to match a BBB+ credit rating.

While estimated return on equity is set and remains constant for the 5 year regulatory period, return on debt is updated each year in the regulatory period as per the method above. Each spot rate once estimated is factored into a 10 year trailing average which becomes the new return on debt. In other words, each debt update is averaged with the past nine spot rate updates to create a 10 year portfolio. Using a 10 year trailing average provides a dampening effect to changes in the risk free rate or the debt risk premium as it is a moving average of historical rates. As such, our return on debt estimates are less sensitive than return on equity to changes in the risk free rate. This relationship is explored further in Section 4.4.

4.2.3 Overall Rate of Return

The overall rate of return is a function of both the return on equity and the return on debt, as well as the gearing ratio (the ratio of debt to equity). The rate of return, k_t for each regulatory year, t in a regulatory control period is estimated as follows:

$$\boldsymbol{k_t = k^e(1 - G) + k_t^d \times G}$$

Where:

- k_t is the rate of return in regulatory year t (the allowed rate of return)
- k^e is the allowed return on equity
- k_t^d is the allowed return on debt
- G is the gearing ratio

In the 2018 Instrument we set the gearing ratio as 60 per cent. This was determined from observing gearing ratios of listed Australian energy networks. Therefore, return on equity is given a weighting on 40 per cent and return on debt is given a weighting of 60 per cent. However, changing the assumption on gearing has little impact on the overall rate of return.[33]

While the overall rate of return will move with changes in interest rates (through the risk free rate and return on debt), it is a weighted average, so movements to current interest rates will be lessened by the return on debt's trailing average.

4.3 What the current movements in the risk free rate mean for expected equity returns?

This section is separated into three sections based on components of SL CAPM:

- the risk free rate
- market risk premium
- equity beta.

We focus on the Sharpe Lintner CAPM here as it was our foundational model in 2013 and 2018. In each section we consider the potential effects of changing Commonwealth Government Security interest rates on whether our estimate remains appropriate

[33] This is because an increase in gearing also leads to an increase in the equity beta as it concentrates risk on equity.

4.3.1 The risk free rate and Commonwealth Government Securities

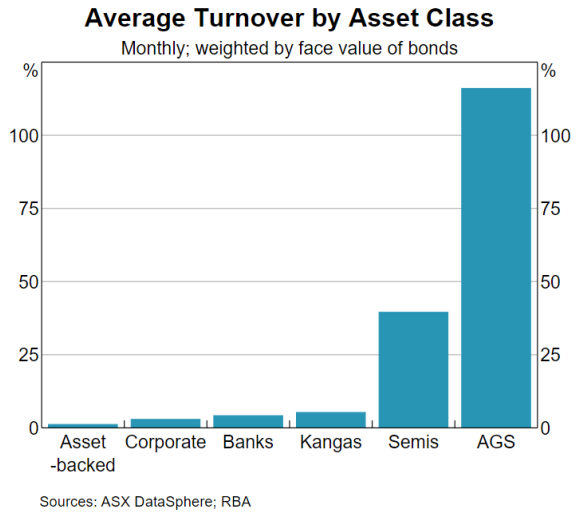
The risk free rate is a key parameter within the Sharpe-Lintner CAPM, our foundation model for estimating the return on equity. The risk free rate measures the return an investor would expect from a 'riskless' investment.

We must choose a proxy for the riskless investment, as in practice it is difficult to observe the returns on a riskless investment. In choosing a proxy, we have to consider which investments have the minimum amount of risk and the appropriate term.

In the 2013 rate of return guideline and the 2018 rate of return Instrument process we decided to use Commonwealth Government Securities as our proxy for the riskless investment. This is a common approach used by almost all market practitioners.

We remain of the view that a nominal return for 10 years can still be achieved with a minimum amount of risk by buying and holding the 10 year Commonwealth Government Securities until maturity. The ability for investors to receive this return does not change if additional demand is introduced from the Central Bank, if there is additional supply produced by Federal Government to enable stimulus or from increased demand from Banks due to Basel III liquidity requirements.[34]

Figure 13 Average Turnover by Asset Class, monthly and weighted by face value of bonds (2015-2017)[35]



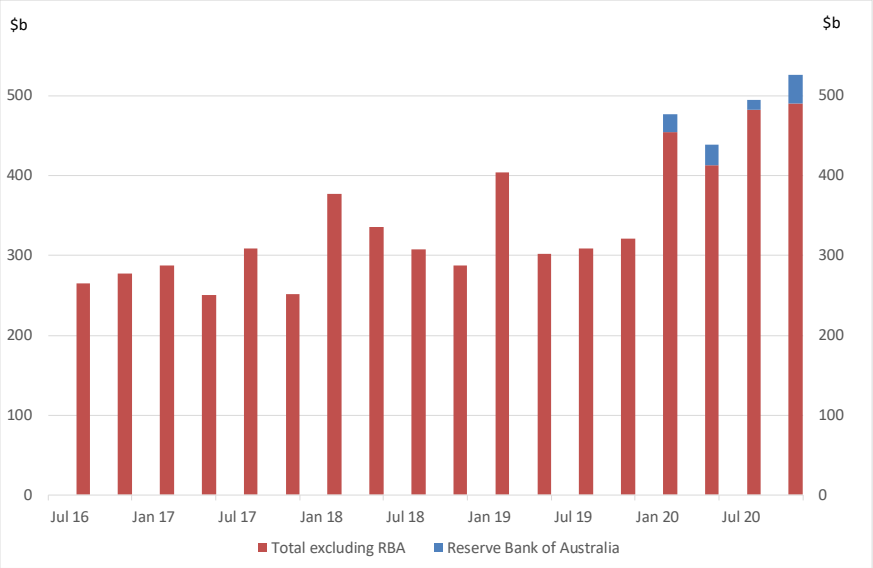
We also find that there continues to be appropriate high levels of turnover in the Commonwealth Government Securities market. According to the RBA, during the period of 2015-2017 turnover was at 120 per cent of face value (Figure 13).[36] This was considerably higher than other categories of bonds. Since then, the face value of Commonwealth Government Securities traded on the secondary market has risen (Figure 14).

34 See Chapter 3 for more details on recent developments.

35 Another name for Commonwealth Government Securities is Australian Government Securities (AGS).

36 RBA Bulletin December 2020, *Secondary Market Liquidity in Bonds and Asset-backed Securities,* 2020, pp. 30–37.

Figure 14 Turnover in face value of Commonwealth Government Securities by quarter*



* RBA data only available from March 2020.

Source: AOFM

We therefore, remain of the view that Commonwealth Government Securities are an appropriate proxy for the riskless investment for our purposes.

4.3.2 The risk free rate and the equity market risk premium

As part of making the 2022 rate of return Instrument we intend to consider the relationship between the risk free rate (either nominal or real) and the market risk premium. Under our current approach, our return on equity has tracked lower as interest rates have declined. We want to consider whether this approach remains appropriate or whether there is new evidence which would point to a different approach. The types of issues we want to explore include:

- Whether any relationship might exist in real or nominal terms;
- The validity, stability, or direction, of any relationship; and
- The regulatory suitability or practicality of implementing a relationship in the 2022 rate of return Instrument.

Such a discussion has been encouraged by a number of our network stakeholders in submissions to our working paper series.[37] Some stakeholders submitted that the one-for-one relationship between the risk-free rate and return on equity is questionable, particularly given the volatility of risk free rates and relative stability of the realised return on equity. The network businesses stated that we should investigate a suitable methodology to estimate the relationship between the risk free rate and market risk premium in the context of a long-term asset-based regulated business.

37 AER, *CAPM and alternative return on equity models*, 16 December 2020.

We previously considered if a relationship between the MRP and the risk free rate should be recognised when we made the first rate of return Instrument in 2018. At that time we decided our best reading of the evidence supported our current approach.[38] However, we did note that the information available to inform our return on equity decision was imprecise, incomplete and, to some extent, conflicting.[39] We have also had submissions on this during prior regulatory processes.[40]

We note that a key challenge is the non-observable nature of the equity risk premium and the fact it is likely to be unstable through time. In this context, while we have primarily focused on historical observed returns over long periods to estimate the market risk premium, this does not imply we consider the market risk premium fixed through time. We have used this historical data because we have considered it the best data we have available for estimating the forward looking market risk premium

This section details some of our initial explorations on the possible relationship between the MRP and the risk free rate. However, we note that these are preliminary and will be taken forward in our working paper on return on equity.

Our return on equity paper will have further analysis of the available material on the relationship between the risk free rate and return on equity. We have engaged CEPA to provide advice on this subject matter and our consideration of the CEPA report will also be included in the return on equity draft working paper.

We will undertake more substantive engagement through our consultation on the equity working paper. We encourage stakeholders to provide views on this issue in response to our return on equity draft working paper.

Considerations pointing to a negative relationship between MRP and the risk free rate

A key argument put forward to support a stable expected real total return on equity in the United Kingdom (or a negative relationship between the real risk free rate and the market risk premium) is that realised real stock returns appear to have been relatively more stable than the return on risk free assets over historical periods.[41]

Figure 15 is a graphical representation from Wright et al. (2018) of what has been previously coined as "Siegel's Constant". It describes a relatively stable geometric mean for the real stock return in the US which is compared to the ex-post real return on bonds.

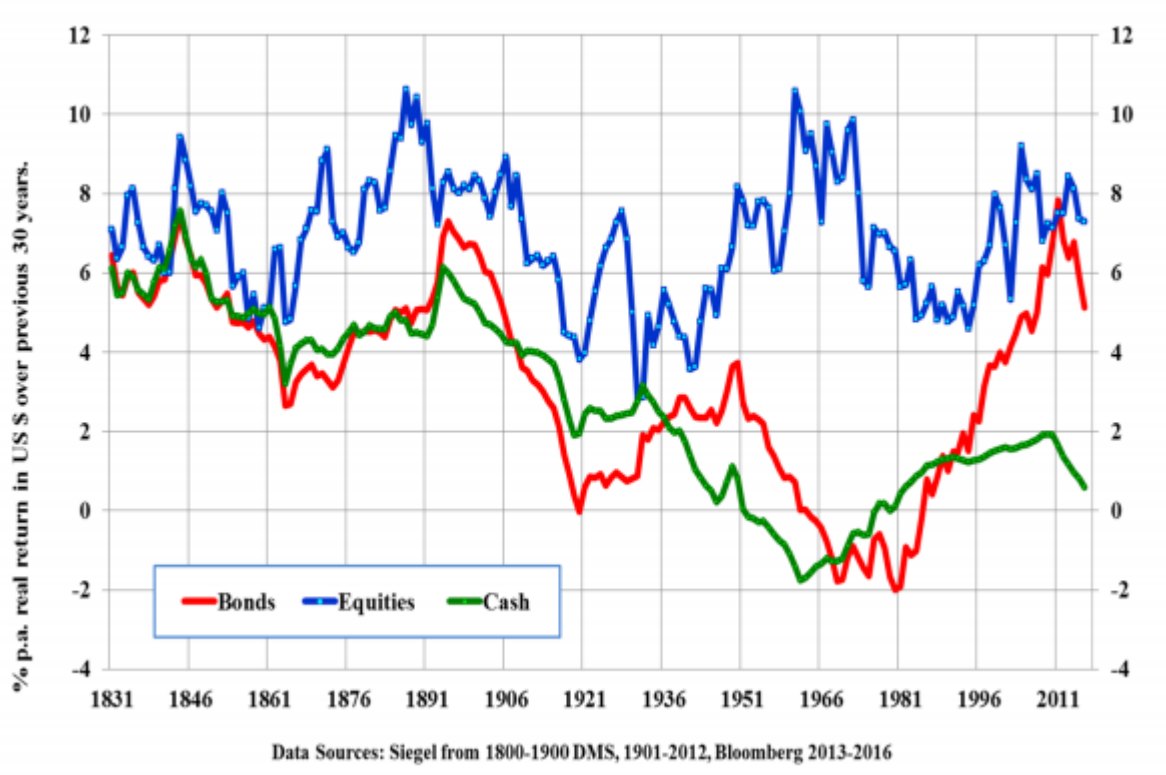
38 AER, Rate of return instrument Explanatory statement, December 2018, p. 232.

39 AER, Rate of Return Instrument, Explanatory Statement, December 2018, pp. 74-75.

40 See for example, Alan Gregory, The AER Approach to Establishing the Cost of Equity - Analysis of the Method Used to Establish the Risk Free Rate and the Market Risk Premium, 2012 available here; and Stephen Wright, Review of the Risk Free Rate and Cost of Equity Estimates: A Comparison of UK Approaches with the AER, 2012 available here

41 Mason, Miles and Wright, Smithers and Co, *A Study into Certain Aspects of the Cost of Capital for Regulated Utilities in the U.K.*, 2003, p. 42.

Figure 15 Thirty year geometric ex-post real returns on Stocks, Bonds and Cash Since 1830 in the United States



We are aware of the implementation of a relationship between the real risk free rate and market risk premium by regulators in the United Kingdom (UK) and Ireland.[42] The UK regulators appear to have effectively recognised a perfectly inverse relationship between the real risk free rate and the market risk premium for nearly 20 years, via the hypothesis that the total real return on the market is stable through time. The initial consulting work supporting this approach was the 2003 work by Mason, Miles and Wright. This was reconsidered by Wright and Smithers in 2013 and then again by Wright, Stephen, Burn, Mason and Pickford in 2018.[43]

From a theoretical perspective, it is possible that investors require a higher equity risk premium to compensate for the extreme risk of losses in low risk free rate environments in

42 See for example, Ofgem, Electricity Distribution Price Control Review - Final Proposals, November 2004, pp 105-106; Commission for Aviation Regulation, Determination on the Maximum Level of Airport Charges at Dublin Airport 2020-24, 24 October 2019, p93. Summaries of cost of capital decisions by UK regulators are available on the UK Regulators Network website, the 2020 Cost of Capital - Annual Update Report is available here: https://www.ukrn.org.uk/wp-content/uploads/2020/12/2020-UKRN-Annual-Cost-of-Capital-Report-Final-1.pdf

43 Smithers, A., & Wright, S., The Cost of Equity Capital for Regulated Companies: A Review or Ofgem, 2013; Wright, S., Burns, P., Mason, R., & Pickford, D., Estimating the cost of capital for implementation of price controls by UK Regulators - An update on Mason, Miles and Wright (2003), 2018.

times of increased market volatility.[44] This would be consistent with the approach of the UK regulators and could imply a counter-cyclical movement in the equity risk premium.

The US Federal Energy Regulation Commission, on the other hand, make no assumptions about the stability or otherwise of the market risk premium. They estimate the market risk premium by deducting the 6-month average yield on 30-year treasury bonds from their estimate of the expected return on the market. The expected return on the market is calculated via a dividend growth model.[45]

As part of our work on this topic we will consider the approach of the United Kingdom regulators and the rationale for their findings. This will include considering:

- The initial 2003 work of Smithers and Company that proposed that the real market cost of capital should be assumed constant on the basis of UK data from long-term historic averages of realised stock returns.[46]
- The 2013 and 2018 consulting work that concluded that the approach of assuming the total market return is relatively constant that had been adopted by the UK regulators remained appropriate.
- The decisions of Ofgem and other regulators where they determined to apply a constant total market return approach.[47]
- Whether we consider any relationship found in the United Kingdom is likely to apply in Australia and could be determined with sufficient validity and stability to warrant Australian regulatory use.

Considerations pointing to a non-existent or positive relationship between MRP and the risk free rate

Arguments to support a relatively more stable market risk premium, or even a positive relationship between the real risk free rate and the market risk premium include:

- There are a number of academic reports which have suggested a positive relationship between the risk free rate and the MRP. Li[48], Kim and Lee[49] and Damodoran[50] each propose that there is a positive relationship between interest rates and equity risk premiums.

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44 Swiss Economics, Dublin Airport Cost of Capital for 2019 Determination Final Report, 30 Sept 2019, p31.

45 The Brattle Group, A Review of International Approaches to Regulated Rates of Return, P92.

46 Mason, Miles and Wright, Smithers and Co, *A Study into Certain Aspects of the Cost of Capital for Regulated Utilities in the U.K.*, 2003

47 In practice UK regulators, such as Ofgem, also consider other factors such as forward looking returns, regulatory precedent and investor studies, "The weight attached to each approach has varied to some extent across sectors. The table shows a notable decrease in the TMR used in decisions post December 2017. This reflects estimates derived using all three approaches that suggest lower TMRs than those used in previous regulatory publications." UKRN, Cost of Capital - Annual Update Report 2020, https://www.ukrn.org.uk/wp-content/uploads/2020/12/2020-UKRN-Annual-Cost-of-Capital-Report-Final-1.pdf, p18.

48 Li, Time-varying risk aversion and asset prices, Journal of Banking and Finance, 2007.

49 Kim & Lee, Stock returns, asymmetric volatility, risk aversion and business cycle: Some new evidence, July 2007.

50 Damodoran, Equity Risk Premiums (ERP): Determinants, Estimation and Implications – the 2012 Edition.

- Graham Partington and Stephen Satchell, expert finance consultants for the AER, indicated they were not aware of any substantive evidence in support of the Wright Approach in the Australian market. They considered it implausible that there is a one for one inverse relationship between the MRP and risk free rate. They also pointed to evidence that there could be either a negative or positive relationship at different points in time.[51]
- Asset prices, including equity prices, appear to have reacted positively to reductions in government bond yields. This implies expected returns on equity may have decreased with decreases in the risk free rate.
- Reductions in corporate bond yields with risk free rates arguably support similar reductions in expected returns on equity because:
    - A dollar of capital can be provided as either debt or equity.
    - To the extent debt became materially cheaper than equity you might expect firms to issue more debt at the margin.
    - The average capital structure of Australian firms has remained relatively stable despite material changes in the risk free rate that have impacted the cost of corporate debt. This may imply debt has not become materially cheaper than equity and the cost of equity is moving similarly to debt with the risk free rate.We do, however, note that this relationship may not necessarily be stable through time.

4.3.3 The risk free rate and Beta

It is unclear if Beta would be affected by the recent changes in the risk free rate. However, we will be able to re-estimate Beta incorporating the recent periods for our regulated firms and will consider this further in our equity omnibus paper.

4.4 Relationship between the risk free rate and the return on debt?

Relationships between the risk free rate and return on debt are more readily observable than the expected return on equity. The return on debt estimates can be split into:

- Spot rates, which are the return on debt observed in an averaging period for that particular regulatory year.
- Trailing average rates, which is a weighted average of spot rates from (up to) the previous 10 regulatory years. The trailing average rate is the return on debt the networks receive each year.

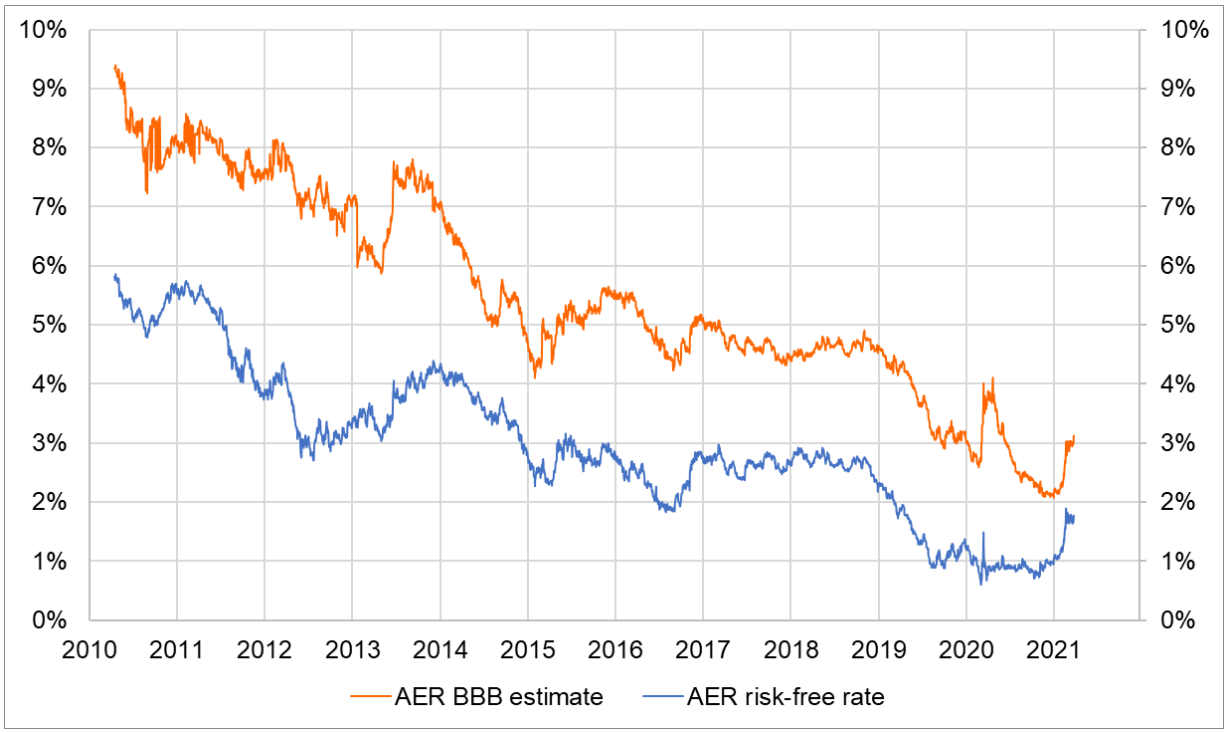
These estimates have different responses to current changes in the risk free rate, which we explore below.

51 Partington G., & Satchell S., Report to the AER: Allowed Rate of Return 2018 guideline review, 25 May 2018, pp 34-35.

4.4.1 Spot rates

Spot rates for return on debt are combined from corporate debt data taken from third-party providers. An example of which can be seen in Figure 16 which shows the AER BBB estimate used in the 2013 guideline. What can be readily observed is that the AER BBB estimates do not move one-for-one with the risk free rate, but nor are they not related.

Figure 16 Comparison of AER BBB estimate and AER risk free rate (May 2010 to March 2021)



Sources: RBA; Bloomberg; AER

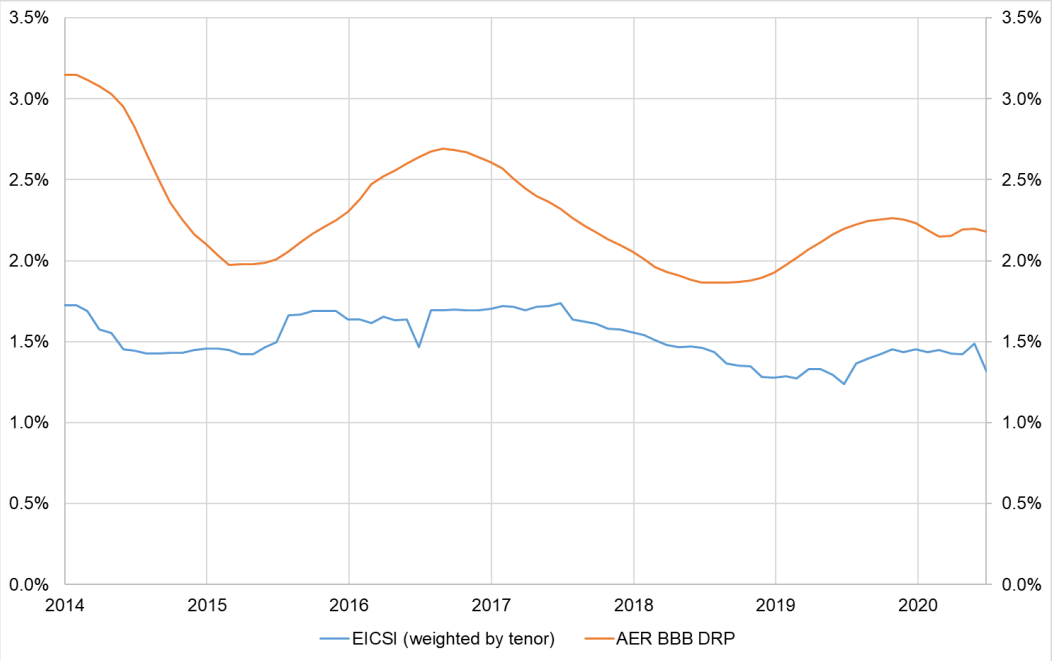
The difference between the BBB estimate and the risk free rate (this can be described as the debt risk premium) can be further observed in Figure 17. The difference between the two estimates has declined over the past decade, but is more stable in absolute terms than the original spot estimate.

Figure 17 AER BBB debt risk premium (May 2010 to March 2021)

Sources: RBA; Bloomberg; AER

We also observe that the DRP estimated using electricity and gas Networks' actual debt costs is also relatively stable relative to changes to the risk free rate (Figure 18). This estimate is based on primary market data and to create the estimate smoothing is applied using a yearly-average of issuance. The graph suggests that networks debt costs may vary in a more one-for-one manner with Commonwealth Government Securities than our third-party estimates. However, more analysis would be necessary to determine if there are other drivers for this.

Figure 18 Energy Infrastructure Credit Spread Index (EICSI), weighted by tenor vs. AER BBB debt risk premium (January 2014 to June 2020)

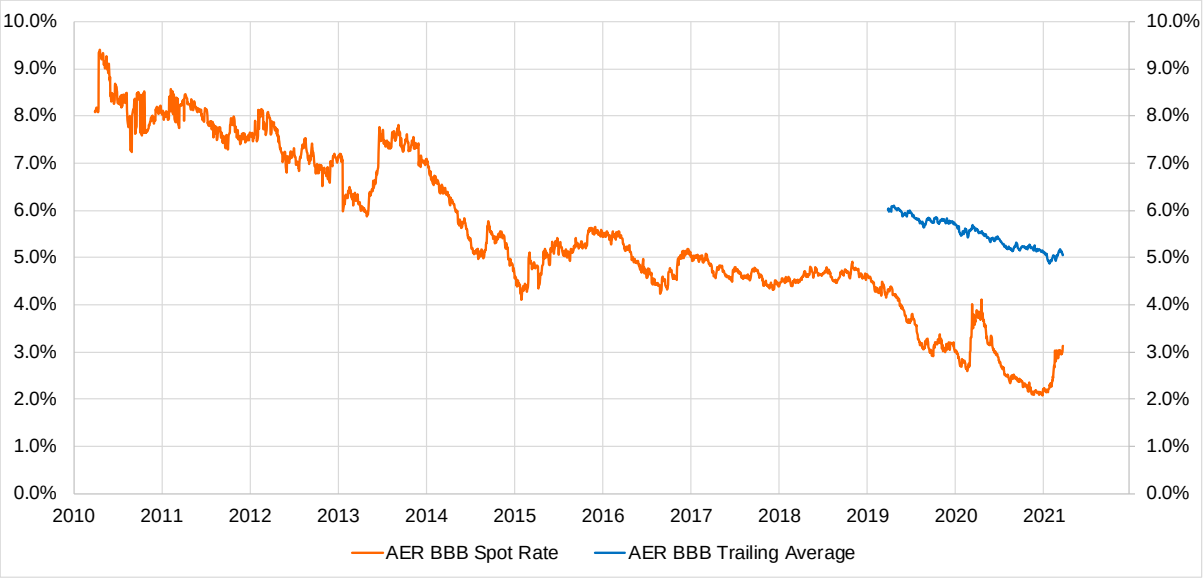


Sources: RBA; Bloomberg; AER analysis

4.4.2 Trailing average

The trailing average is a weighted average of spot rates from (up to) the previous 10 regulatory years. As such, regulated networks under a trailing average have a 90 per cent weight applied to previously calculated spot rates and a 10 per cent weight applied to the current spot rate. This means that recent movements in interest rates of corporate debt and Commonwealth Government Securities has a smaller immediate impact on the trailing average than on the spot rates. This effect is visualised in Figure 19, showing how the spot rate changes influence the trailing average. As expected, the spot rate immediately is more volatile than the trailing average, which responds more slowly.

Figure 19 Risk free rate step change response, trailing average vs. spot rate



Sources: RBA; Bloomberg; AER

Note: This graph creates an example trailing average using 10 spot rates that are each a year apart. In practice averaging periods will be longer and may take place at different times in the year.

4.5 Are there other parameters that could be affected or relationships to explore?

In the sections above, we explored the impact a change in interest rates for 10 year Commonwealth Government Securities has on the return on debt and return on equity. The change in the interest rate for Commonwealth Government Securities may also have an impact on other parameters considered in the rate of return Instrument 2022.

One such example is the gearing ratio. As we explored in the sections above, lower interest rates are associated with a lower return on debt. The exact relationship with the return on equity is, however, less clear. The impact interest rates have on return on debt relative to the impact on return on equity is important because both debt and equity are somewhat substitutable forms of capital. Thus, there could be an incentive for a firm to raise one form of capital over the other if their relative attractiveness changes.

If the change in interest rates affects the form of capital the firm is likely to issue, then it could affect the optimal capital structure of the firm (the gearing ratio). Currently, it is not clear to us the impact recent lower interest rates have had on the gearing ratio. However, we will observe the change (if any) in the gearing ratio when we calculate the Network Service Providers' actual gearing ratios in the overall rate of return omnibus paper (planned for second half of 2021).

We encourage stakeholders to point out and discuss any impacts the interest rate may have on the other parameters of the rate of return instrument in their submission to this draft working paper.

5 Cashflows, interest rates and financeability

This chapter examines the impact lower interest rates will have on the regulated gas and electricity network service providers' (NSPs) financeability. We set out our definition of financeability in section 5.1, and outline how other regulators and credit rating agencies consider financeability in section 5.2.

We consider what stakeholders have said on financeability in previous submissions in section 5.3. Some stakeholders have raised a number of concerns on financeability. Section 5.4 will examine the impacts of lower interest rates on cash return on equity, net profit after tax (NPAT) and on other financial metrics considered by credit rating agencies.

Financeability is not a new concept, and has been considered by us in the past (see Appendix C). We recently examined financeability as part of TransGrid and ElectraNet rule change proposals to the AEMC. In section 5.5 we consider the sources of capital funding by NSPs and section 5.6 outlines our current considerations of financeability.

5.1 What do we mean by financeability

Our definition of financeability is a NSP's ability to meet its financing requirements and to efficiently raise new capital. This is consistent with the definition we used in our rate of return instrument in 2018.[52] Other regulators' definitions are broadly consistent with ours (see section 5.2).

Stakeholders have largely agreed with our definition of financeability and that it is based on a benchmark NSP.[53] However, there has been disagreement on how to determine whether there is a financeability issue (see section 5.3).

In recent submissions (see section 5.3 and Appendix A), some stakeholders submit that a negative cash return to equity holders, the Fund From Operation over Net Debt ratio (FFO/net debt), and a negative net profit after tax can be used to indicate whether a benchmark NSP may be having issues with financeability.

We are interested in financeability because it has been suggested that it may indicate whether a NSP is able to efficiently finance its investment and therefore may impact the long term interest of consumers.

5.2 How do credit rating agencies and other regulators consider financeability?

There is no one definitive measure of financeability amongst regulators and credit rating agencies. Measuring financeability is a subjective process that involves considering a wide range of qualitative and quantitative factors.

52 AER, *Rate of Return Instrument, Explanatory Statement*, December 2018, p. 392.

53 NERA, *Role of financeability in promoting the long-term interests of energy consumers*, 10 December 2020, p. 1.

5.2.1 Credit rating agencies

Credit rating agencies classify bond issues into categories (credit ratings) based upon their assessment of the creditworthiness of the borrower.[54] Despite not being an investment recommendation, the credit rating is one of the many inputs investors often consider as part of their decision-making processes.[55]

The credit rating is important because:

- A higher credit rating will typically be associated with lower yields on debt raised, therefore a higher credit rating, for a given capital structure, will typically make it easier (and/or cheaper) to finance projects
- A lower gearing, for a given project risk, will typically receive a higher credit rating.

Each credit rating agency uses a different credit assessment process to determine an overall credit rating. All credit rating agencies consider a range of quantitative and qualitative factors. While the credit assessment process is different, it is not expected that there would be significant differences between the credit ratings given to an NSP by the major rating agencies.[56]

For this working paper, we will focus on Moody's credit assessment approach. Out of the big three credit agencies, Moody's has more information about its credit rating methodology publicly available. In Appendix D there are extracts from CEPA's report that outlines Moody's credit rating methodology.

The FFO to net debt ratio is a quantitative factor considered by Moody's, and it is commonly cited in stakeholders' submission on financeability (see section 5.3). When determining the overall credit rating, Moody's assigns a 12.5 per cent weighting to the FFO to net debt ratio.[57] While the FFO to net debt ratio is important, there are a number of other considerations that are equally as important, or are more important. For example, the sub-factor 'stability and predictability of regulatory regime' has a 15 per cent weighting in Moody's credit rating methodology.[58]

5.2.2 Other regulators

Some stakeholders have referred to the financeability analysis undertaken by Ofgem in the UK, and IPART in NSW in their submissions (see section 5.3). Overall, our view is that this body of evidence indicates:

- There is a degree of subjectivity in implementing financeability testing because it involves considerable judgement. Transparency and predictability are important considerations.
- Where there appear to be short term dips in financial metrics, other regulators refer these issues to the NSPs to manage in the first instance.

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54 International Financial Management 7th edition p. 311.

55 S&P, *Understanding Credit Ratings* (see: https://www.spglobal.com/ratings/en/about/understanding-credit-ratings).

56 CEPA, *Financeability of ISP Projects*, 27 January 2021, p. 21.

57 CEPA, *Financeability of ISP Projects*, 27 January 2021, p. 24.

58 AEMC, *Consultation paper*, *National electricity amendment (participant derogation — financeability of ISP projects (Transgrid)) rule 2021*, 5 November 2020, p. 10.

- If adjustments are made, these are made through an NPV-neutral adjustment. That is, NSPs would not get a higher rate of return.

5.2.2.1 OFGEM

Ofgem's financeability obligation arises because the licence conditions for regulated electricity and gas service providers explicitly require those service providers to maintain investment grade credit ratings.[59] No such obligation exists in Australia. Ofgem in 2010 stated that:[60]

> [A]s long as the allowed return, depreciation profile and capitalisation policy are set appropriately and that there is consistency in their respective future determinations, the notional company should be financeable.

There are two aspect to Ofgem's financeability tests; equity financeability and debt financeability.[61] For debt financeability, the target rating for the notional company is BBB+/Baa1.[62] While for equity financeability, Ofgem assesses whether its cost of equity and allowed equity return assessment is robust, and hence sufficient for the notional company.[63]

Ofgem does not conduct financeability test for the actual regulated networks. Regulated networks are required to submit as part of their business plan to Ofgem: [64]

> Board assurance that either the plan is financeable on both the notional and actual capital structure bases or that they have considered all applicable mitigating measures to improve financeability.

Ofgem also stated that: [65]

> We have previously indicated that it is the networks and the rating agencies' responsibility to evaluate whether any issues revealed by weak metrics for the actual business should lead to lower levels of gearing, tolerance of lower credit ratings or further evolution in rating methodologies'.

5.2.2.2 IPART

Unlike Ofgem's financeability test, IPART's financeability test does not consider qualitative factors because:[66]

> The qualitative factors considered by ratings agencies are inherently subjective and involve considerable judgement, and for example, could involve IPART making assessments about the transparency and predictability of the regulatory environment. Including these qualitative aspects could reduce the transparency of [their] process, and make it more difficult for stakeholders to replicate [their] analysis.

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59 Joint regulators group, *Cost of capital and financeability*, March 2013, p. 13.

60 Ofgem, *Regulating energy networks for the future: RPI-X@20—Current thinking working paper—Financeability*, May 2010, p. 10.

61 Ofgem, *RIIO-2 Draft Determinations — Finance Annex*, 9 July 2020, p. 95.

62 Ofgem, *RIIO-2 Draft Determinations — Finance Annex*, 9 July 2020, p. 95.

63 Ofgem, *RIIO-2 Draft Determinations — Finance Annex*, 9 July 2020, pp. 95-96.

64 Ofgem, *RIIO-2 Draft Determinations — Finance Annex*, 9 July 2020, p. 95.

65 Ofgem, *RIIO-2 Draft Determinations — Finance Annex*, 9 July 2020, pp. 100-101.

66 IPART, *Review of our financeability test*, November 2018, p. 21.

Businesses are considered financeable when they can at least maintain an investment grade credit rating. [67] However, IPART does not expect that a business will necessarily meet every quantitative financeability ratio in each year of a determination period.[68] Business are considered to be financeable if they are expected to generally meet the ratios, and if the trend in the ratios suggests sufficient improvement.

If the business fails the financeability test, then IPART would only consider NPV-neutral adjustments to prices to address temporary cash flow problems, but not to address imprudent or inefficient investment decisions made by a business.[69]

5.3 Key stakeholder's submissions on financeability

Recently, a number of network service providers raised concerns about their ability to meet their financing requirements and to efficiently raise new capital. These concerns were raised over a number of different processes. In addition to this, we received a memorandum from the Energy Networks Australia (ENA) outlining the issues for consideration in this working paper. Please see Appendix A for the summary of submissions from stakeholders we have recently received (since the 2020 inflation review) on financeability.

Financeability was a concern for the ENA and the QTC in the 2020 Inflation review. They were concerned about how our treatment of inflation would result in negative cash returns to equity holders and negative NPAT for the benchmark firm.[70] In the same process, we also received a submission from the Consumer Reference Group stating there were no financeability issues.[71]

On 23 November 2020, we received a report from Frontier Economics commissioned by AusNet Services, CitiPower, Powercor, and United Energy as part of the Victorian 2021 regulatory resets. The report reiterated the concerns expressed in the 2020 Inflation review, that negative cash flows to the equity holders of the benchmark firm, negative NPAT, and the deterioration in the FFO/Net debt ratio might indicate that there is a problem with our regulatory framework.[72]

NERA Economic Consulting (NERA) on behalf of the ENA submitted a report on 10 December 2020 that was consequently submitted to the AEMC as part of TransGrid and ElectraNet rule change proposal. NERA did not conclude that there is 'a systematic financeability problem' and noted that further investigation is required — one that considers a wider range of metrics.[73] Furthermore, NERA recommend we introduce financeability testing because the benefits of doing so will exceed the cost.[74]

Financeability was considered by the AEMC in its determination for the rule change proposals initiated by TransGrid and ElectraNet in regards to their Actionable Integrated System Plan (ISP) projects. The AEMC received 35 submissions on the rule change

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67 IPART, *Review of our financeability test*, November 2018, p. 50.
68 IPART, *Review of our financeability test*, November 2018, p. 59.
69 IPART, *Review of our financeability test*, November 2018, p. 60.
70 ENA, *Review of the regulatory treatment of inflation — response to AER draft position*, 6 November 2020, p. 63; QTC, *Review of the regulatory treatment of inflation — submission to the AER discussion paper*, 29 July 2020, pp. 9-10.
71 CRG, *Submission to AER review of inflation*, 29 July 2020, p. 18.
72 Frontier Economics, *The impact of artificially supressed government bond yields*, 23 November 2020, pp. 8-10.
73 NERA, *Role of financeability in promoting the long-term interests of energy consumers*, 10 December 2020, p.1.
74 NERA, *Role of financeability in promoting the long-term interests of energy consumers*, 10 December 2020, p. 9.

proposal from stakeholders which included two submissions from the AER. Submissions from stakeholders, excluding our own, are summarised in table 2 Appendix A.

TransGrid and ElectraNet proposed rule change derogations to:

- Allow depreciation on assets that are not yet commissioned; and
- Remove inflation indexation of the RAB thereby allowing in expectation the full nominal return set under the rate of return instrument to be recovered in their regulated revenues each year.

TransGrid and ElectraNet raised financeability concerns, and submitted that the proposed rule changes would help address these concerns.[75] The proposed rule changes would allow more revenue to be recovered in the earlier years of the Actionable ISP projects, albeit in a net neutral present value manner.

In the AEMC rule change process, stakeholders that raised financeability concerns submitted a number of reasons why a regulatory response was needed. The main theme was that the interaction between the real return, lower rate of return allowances, and the large investment requirements are creating financeability issues.

5.4 Impacts of lower interest rates on NPAT and financial metrics

When referring to 'financeability pressures', stakeholders have predominantly raised concerns with two financial indicators: regulatory net profit after tax (NPAT), and the funds from operations (FFO) to net debt ratio. The latter ratio is one of the credit metrics considered by the Moody's credit rating methodology.

In assessing the impact of lower interest rates, we have obtained advice from the ACCC Regulatory Economics Unit (REU).[76] We asked the REU to comment on the effect of low interest rate / low return environment on regulatory cash flows and financeability.

Please see Appendix B for the REU's advice.

5.4.1 Impact of lower interest rates on NPAT

The REU report outlines that other things being equal, both NPAT and cash return on equity[77] for the benchmark firm will be lower when:[78]

- our expected inflation estimate is higher
- gearing is higher
- the allowed return on equity is lower.

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75 TransGrid, Rule Change Proposal, 30 September 2020, p.1; ElectraNet, Rule Change Proposal, 23 October 2020, pp. 5-6.

76 ACCC - Regulatory Economic Unit, *Rate of Return and Cash Flows in a Low Return Environment,* 19 April 2021.

77 Cash return on equity is NPAT divided by the equity value. See: ACCC - Regulatory Economic Unit, *Rate of Return and Cash Flows in a Low Return Environment,* 19 April 2021, p. 6.

78 ACCC - Regulatory Economic Unit, *Rate of Return and Cash Flows in a Low Return Environment,* 19 April 2021, pp. 6-7.

The regulated businesses' total revenue compensation for the return on capital building block is received in two forms:[79]

1. cash flows (income) and
2. RAB indexation (capital gains).

The size and sign of the regulatory NPAT are negatively related to the share of the building block received in these two forms. More specifically, regulatory NPAT is inversely related to the proportion of the return on capital that is recovered via RAB indexation.

It is also worth noting, that if the current NPAT is low due to a higher proportion of the return of capital being recovered via RAB indexation, then NPATs in future years will be higher due to the higher RAB trajectory.[80] Low or negative NPAT is not a reflection of the total return received by investors.

It should be emphasised that to the best of our knowledge, other regulators have addressed financeability issues by bring cash flows forward and not by increasing the return on capital. Overall our return on capital is appropriate and adequately compensates debt and equity investors.

The proportion of return on equity that is recovered via cash flows and hence via NPAT is determined by many factors as outlined in the REU report.[81] For example:

- When expected inflation increases, a greater proportion of the return on equity is recovered via expected RAB indexation. We note our new approach to estimating inflation currently results in a lower estimate of expected inflation, and therefore the new inflation methodology should increase the current regulatory NPAT compared to our previous approach, although it may still be negative.[82]
- Gearing is important as NSP's pay their debt obligations 100 per cent in cash. However, when NSP's are compensated for the cost of debt under the regulatory framework the compensation is a mixture of cash flow (income) and RAB indexation (capital gain that results in higher future cash flows). Hence the cash flow the NSPs have to pay debt holders and the cash flow the NSPs receive from network users may differ and vary over time.

NPAT is positively correlated with our return on equity estimate. All else equal a higher return on equity results in a higher total revenue and therefore higher NPAT. Given our current return on equity is effectively the prevailing risk free rate plus an equity risk premium of 3.66 per cent, NPAT is also positively correlated with the risk free rate.

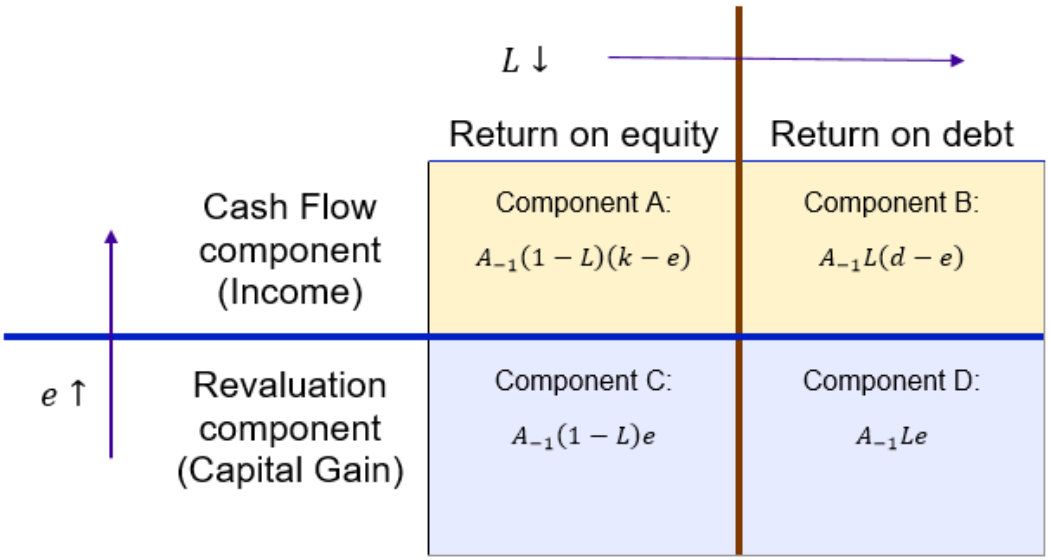
79 ACCC - Regulatory Economic Unit, *Rate of Return and Cash Flows in a Low Return Environment,* 19 April 2021, pp. 5-6.

80 Return on capital building block is determined as the RAB multiplied by the WACC. All else equal, a higher RAB trajectory results in a higher return on capital and return of capital in the future.

81 ACCC - Regulatory Economic Unit, *Rate of Return and Cash Flows in a Low Return Environment,* 19 April 2021, p. 6.

82 ACCC - Regulatory Economic Unit, *Rate of Return and Cash Flows in a Low Return Environment,* 19 April 2021, pp. 8-9, 11.

Figure 20 Components of the return on capital



Where: A = RAB
L = Gearing
e = Inflation
k = return on equity
d = return on debt

Figure 20 is a graphical representation of the four components on the return on capital building block. When component D is larger than component A, NPAT is negative.[83] The size of each component is influenced by many factors. Keeping the total return on capital constant, higher expected inflation increased the size of C plus D at the expense of A plus B. Increasing gearing while keeping all other factor constant increases the size of B plus D at the expense of A plus C. All else equal when the nominal risk free rate increase the return on equity (A+C) increases.[84] However, the overall the return on capital building block is estimated correctly and it is represented by the sum of all components (A+B+C+D). Whether NPAT is positive or negative is simply a reflection of how the big square is divided into the four smaller partitions.

The prevailing NPAT could be increased by removing or reducing expected RAB indexation,[85] which is counterbalanced by a reduction in the future trajectory of NPAT. However, removing RAB indexation would result in the RAB not reflecting its real economic value over time and real prices would decrease over time all else constant. While arguably

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83 NPAT = (1-L)(k-e/(1-L))A
= A(1-L)K - Ae
= Component (A+B) - Component (C+D)
= Component A - Component D

84 When the risk free rate increases the cost of debt (B+D) also increase assuming the debt risk premium does not decrease by more than the increase in the risk free rate.

85 Has the impact of eliminating component C and D as the return on capital is recovered 100 per cent via cash flows (Income).

NPV neutral, this leads to intergenerational wealth transfers where current network users are effectively cross subsidising future network users.

We consider it is not problematic if NPAT for our NSPs becomes negative. Under our framework, even if NPAT is negative over a period of time, the expected NPAT over the life of the investments will be positive. If negative NPAT over the short term is a concern, a NSP is able to take action to address this problem by raising additional equity (changing the gearing). NSPs actual gearing will help us inform the gearing for the benchmark NSP.

It is not uncommon for some enterprises to have negative NPAT, in some cases for many years. For example, leveraged real estate investments can start out as being negatively geared (negative NPAT) and over time become positively geared (positive NPAT). As rental income increases over time while interest costs remain flat (assuming the loan is not paid down) NPAT eventually turns positive. As with investment in regulated utilities, real estate returns are derived from two sources; income and capital gains.[86]

In competitive markets a negative NPAT may, in some but not all situations, be an early indication of financeability issues and the risk of insolvency. However, a negative NPAT for NSPs is not of itself an indication of insolvency risk, rather it is a sign that returns are being realised via capital gains. It should be noted that an NSP's market value should increase if the RAB increases all else equal, as increases in the RAB value determines the future Total Revenue allowance and its net present value.[87]

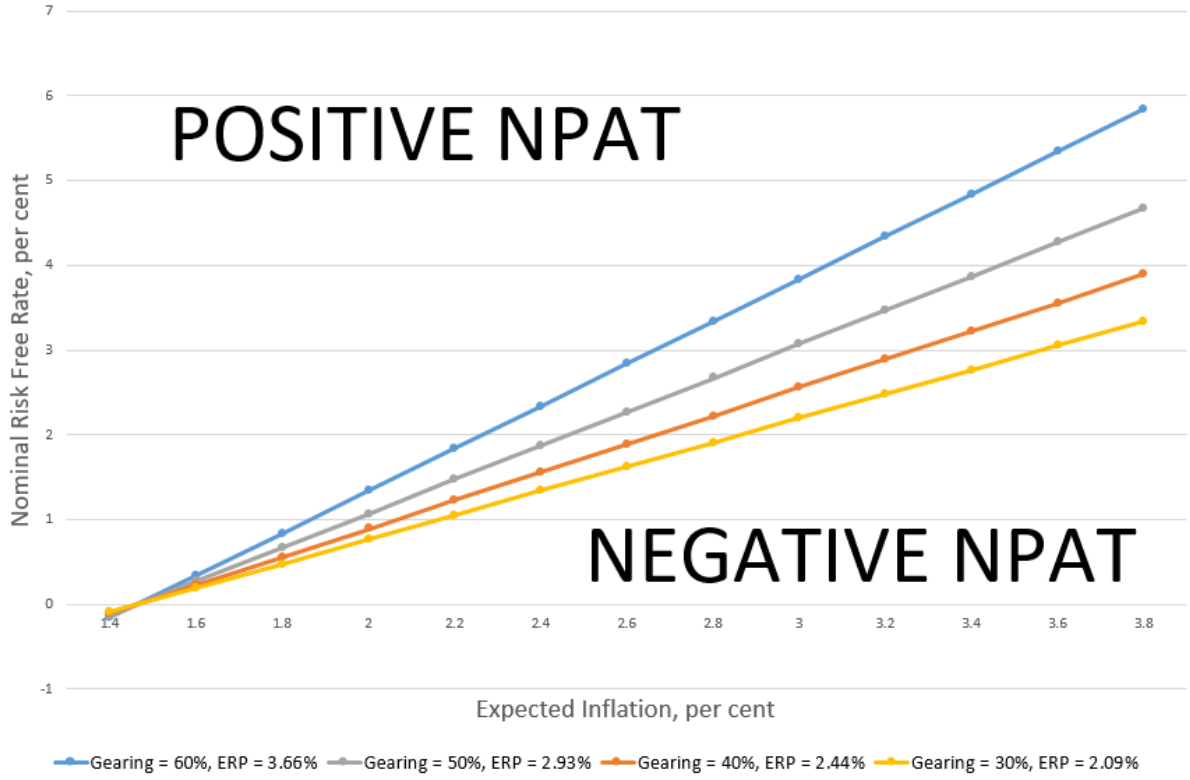
Figure 21 below demonstrates the interaction between the risk free rate, inflation and gearing on NPAT.[88]As is evident, reducing gearing shifts the curve to the right, which results in less combinations of the risk free rate and inflation falling into the negative NPAT region. Therefore reducing gearing increases an NSP's NPAT.

86 Tax is a third source. Negatively geared investments allow tax liabilities to be moved to later years.

87 If the equity investors receive 100 per cent or more of their return in the form of capital gains then the value of their equity investment would increase over time. In this scenario in order for the NSP to maintain gearing at 60 per cent the amount of debt that has to be issued each year would exceed the amount of debt that is expiring. This additional debt financing would provide additional financing cash flows to the NSP. So even though operating cash flows are negative when NPAT is negative, total cash flows may be positive.

88 Figure 21 is a modified version of figure 2 from the REU report: ACCC - Regulatory Economic Unit, *Rate of Return and Cash Flows in a Low Return Environment,* 19 April 2021, p. 8.

Figure 21 Relationship between regulatory NPAT and WACC parameters



It is important to observe that an NSP's actual NPAT could deviate from the regulated NPAT. This is because we determine regulated revenues on a benchmark rather than firm basis. For instance:

- As part of our post tax revenue model, we smooth the regulatory allowance over the regulatory period. Therefore, even if NPAT is negative for some regulatory years within a regulatory period, it may still end up positive after revenue smoothing is applied.[89]
- Actual gearing could be different to the benchmark assumption of 60 per cent. To extent actual gearing is lower, the actual interest deduction will be lower and NPAT will be higher. Second, as noted above a lower gearing implies less return on equity cash flows (Component A) are required to compensate for the return on debt capital gain component (Component D).
- Our approach is modelled on the benchmark firm issuing an equal amount of debt each year. To the extent the NSP deviates from this assumption its actual debt deduction for NPAT purposes will be different to that assumed by us. For instance, the NSP's actual NPAT could be higher if its RAB is increasing due to high capital expenditure and the prevailing cost of debt is lower than the trailing average cost of debt.[90]
- Individual actions and decisions can also impact the NSP's actual NPAT including whether the NSP is spending its opex and capex forecasts and the outcome of incentive schemes.

89 ACCC - Regulatory Economic Unit, *Rate of Return and Cash Flows in a Low Return Environment,* 19 April 2021, p. 11.
90 ACCC - Regulatory Economic Unit, *Rate of Return and Cash Flows in a Low Return Environment,* 19 April 2021, p. 11.

- NSP's actual tax paid may not be equal to the benchmark taxation building block allowance. To the extent the NSPs actual tax paid is less than the benchmark tax allowance, the NSPs actual NPAT will be higher than the benchmark NPAT.

Finally we note that NPAT is an accounting concept and not a reflection of free cash flows. A key driver of reductions in NPAT in recent AER regulatory decisions is the 2017-18 tax review and the consequential recognition of capital expenditure that is immediately deducted for tax purposes. Recognising immediate expensing of capital for tax purposes reduces NPAT, at least when capital intensive firms have ongoing investment programs.

5.4.2 Impact of lower interest rates on financeability metrics

There are a number of financeability and cash flow metrics considered by the credit rating agencies that may change with interest rate movements. The change can be either because the lower interest rate results in the regulated revenue decreasing or the firm's actual debt cost decreases with lower interest rates.

One of the qualitative metrics considered by Moody's is the FFO/Net debt metric. The FFO is the sum of allowed return on equity, net regulatory depreciation (after indexation is removed) and revenue adjustments (see REU report in Appendix B). The FFO is a cash flow measure and is also defined as NPAT plus the return of capital building block.[91]

The REU report observes that other things being equal, regulatory FFO to Net debt ratio would be lower:[92]

- the more the RAB increases from one period to the next
- the lower the depreciation rate
- the higher the gearing
- the lower the allowed rate of return on equity
- the higher the expected inflation.

Similar to the NPAT, the FFO to net debt ratio is impacted by a large number of factors. The interest rate is only one of the many factors that affects the FFO to net debt ratio. Given one determinant of the FFO to net debt ratio is NPAT, a decrease in NPAT results in a decrease in the FFO to net debt ratio, keeping other determining factors constant.[93]

Like NPAT, the FFO to net debt ratio is determined by the proportion of return on equity that is recovered via cash flows (income) vs RAB appreciation (capital gain). When more of the return of equity is recovered via a RAB revaluation gain, the FFO to net debt ratio decreases.

Given the FFO is defined as NPAT plus the return of capital building block, FFO to net debt is not only about the return on capital and how it is divided into the four components as

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91 Assuming the revenue adjustment is zero. ACCC - Regulatory Economic Unit, *Rate of Return and Cash Flows in a Low Return Environment,* 19 April 2021, equation 10.

92 ACCC - Regulatory Economic Unit, *Rate of Return and Cash Flows in a Low Return Environment,* 19 April 2021, pp. 9-10.

93 ACCC - Regulatory Economic Unit, *Rate of Return and Cash Flows in a Low Return Environment,* 19 April 2021, p. 10.

outlined in figure 20.[94] FFO to net debt is also impacted by the depreciation allowance which is estimated separately from the rate of return. For example in the recent Evoenergy final decision, we accepted Evoenergy's proposal to apply shorter asset lives to mitigate the risk of asset stranding. Shorter asset lives result in assets being depreciated at a quicker rate which increases FFO by bringing cash flows forward. However, the Evoenergy decision was driven by asset stranding risk due to the legislated 2045 net zero greenhouse emission targets and not by financeability concerns.[95]

The concerns about the low FFO to net debt ratio was also raised in the TransGrid and ElectraNet rule change proposal. In both the draft and final rule determinations, the AEMC decided not to have cash flows brought forward to improve financeability metrics — in particular the FFO to net debt ratio.[96] The AEMC observed that NSPs have access to significant funding options, and concluded that the regulatory framework does not create a barrier to financing large projects.[97] Furthermore, the AEMC was not satisfied that the proposal to bring forward cash flows to address financeability concerns will, or is likely to, contribute to the achievement of the NEO.[98]

When a hypothetical benchmark regulatory FFO to net debt ratio falls below a prescribed target level set by a credit rating agency for a particular credit rating that does not necessarily indicate a regulatory concern for several reasons including:

- The benchmark assumptions used to set the overall rate of return are used for this purpose and go no further. In particular, the overall rate of return is relatively invariant to the gearing used and we have observed NSPs typically carrying less gearing than our 60 per cent benchmark. A key reason why we did not lower the assumed gearing ratio when we made the 2018 Instrument is that the allowed rate of return was relatively invariant to changes in gearing.
- NSPs are free to deviate from the benchmark and in particular they can deviate from the benchmark gearing assumption of 60 per cent. The NSP's actual practices will help us determine the characteristics of the benchmark firm. We considered this issue in our submission the AEMC rule change process.[99]
- Credit rating agencies consider a wide range of qualitative and quantitative factors when determining the overall credit rating. Hence a deteriorating FFO to net debt ratio does not automatically imply an imminent credit rating downgrade. However, we do acknowledge

94 Assuming revenue adjustment is zero. ACCC - Regulatory Economic Unit, *Rate of Return and Cash Flows in a Low Return Environment,* 19 April 2021, equation 10.

95 AER, *Final decision, Evoenergy 2021-26 Access arrangement, Overview*, April 2021, pp. 9-10.

96 AEMC, *Draft rule determination, National electricity amendment (participant derogation — financeability of ISP projects (Transgrid)) rule 2021*, 4 February 2021, pp. i-iv; AEMC, *Final rule determination, National electricity amendment (participant derogation — financeability of ISP projects (Transgrid)) rule 2021*, 8 April 2021, p. i.

97 AEMC, *Final rule determination, National electricity amendment (participant derogation — financeability of ISP projects (Transgrid)) rule 2021*, 8 April 2021, pp. i-v; AEMC, *Information sheet*, *Final determination on TransGrid's financeability participant derogation*, 8 April 2021, p. 2.

98 AEMC, *Final rule determination, National electricity amendment (participant derogation — financeability of ISP projects (Transgrid)) rule 2021*, 8 April 2021, p. i.

99 AER, *Submission to AEMC consultation paper on TransGrid and EletraNet rule change derogation proposals related to financeability,* 3 December 2020.

that the FFO to net debt ratio appears to be an important consideration in the credit analysis.

Other financial metrics considered by rating agencies include:

- FFO/interest coverage
- net debt/RAB
- FFO/net debt
- regulated cash flow/net debt.

These metrics are also impacted by changes in interest rates. As with the FFO/net debt financial metric, these changes do not of themselves indicate a regulatory framework problem.

5.5 Sources of capital funding by networks

Ensuring a firm is financeable is not unique to NSPs. There are a number of sources of funding available to a NSP to meet its financing requirements, including:

- using retained earnings, that is reducing dividends.
- issuing new debt - all NSPs we regulate do this, and the cost of debt is influenced by the credit rating assigned by credit rating agencies.
- issuing new hybrid securities (such as AusNet who currently does this).
- raising new equity through other capital raisings or right issues including dividend reinvestment plans.

As part of rule change proposals lodged by TransGrid and ElectraNet, we examined if the current regulatory framework supported efficient investment for large transmission investments in 2020 and 2021.

In looking at this we found no evidence that the NSPs we regulate cannot efficiently raise capital. There appears to be a range of options NSPs take to optimise their overall capital structure and to make regulatory investments financeable. Furthermore, it appears the NSPs we regulate have been able to manage their capital structure and cash flows to maintain investment grade credit ratings.

We note that during the AEMC rule change process, no evidence was presented to show NSPs are unable to raise capital in the current low risk free rate environment.

5.6 Current considerations of financeability

Recently we have considered financeability in the context of the TransGrid and ElectraNet rule change proposals.[100] We have also looked at financeability in previous decisions (NSW 2014 and 2018 Instrument) and the 2020 Inflation review. As part of this working paper, we

[100] AER, *Submission to AEMC consultation paper on TransGrid and EletraNet rule change derogation proposals related to financeability*, 3 December 2020.

have further considered the impact of lower interest rates on measures such as NPAT and FFO to net debt.

Lower interest rates lead to lower NPAT and FFO to net debt, but there are other contributing factors such as gearing and expected inflation.[101] We have recently revised our approach to inflation which results in an improvement in NPAT and FFO to net debt for NSPs, at least in the short term.[102] A low NPAT and FFO to net debt ratio does not of itself reflect that the overall rate of return is too low. Rather it may reflect that a greater proportion of the return on equity is recovered via a capital gain rather than income.

Our submission to the AEMC rule change process has informed our views on how financeability fits within the regulatory framework.[103] The rule change proposal sought to address financeability issues by bringing forward cash flows to increase the current FFO to net debt and NPAT.[104] In that process the AEMC's final determination was not to make the rule changes proposed.

It is not clear to us whether the decrease in NPAT and FFO to net debt at a given gearing ratio indicates there is a financeability issue that requires a regulatory response. The FFO to net debt metric is one component of a broader assessment made to assess financeability and credit ratings. Typically, credit rating agencies review a range of quantitative and qualitative factors when making their assessments.[105] While FFO to net debt is an important component of this assessment, a decrease in the metric does not of itself indicate an issue with financeability.

Further, the NSPs' actual financeability is substantially impacted by the practices and choices made by the NSPs. NSPs can, and do, engage in a range of practices specific to managing their own operations. This includes adopting individual financing and capital structure decisions to accommodate circumstances and management choices.

The regulatory framework does not require NSPs to be able to achieve the benchmark assumptions used in making and applying the RORI at all times. We consider sector benchmarks rather than firm specific details in making the RORI and that the NSPs have flexibility in their capital structure decisions and employ this accordingly. However, NSPs' actual practice will help us inform the characteristics of the benchmark firm.

Therefore we remain of the view that we should not use measures of financeability directly when setting the rate of return. For example, we should not adjust the return on equity or the parameters that inform our return on equity in proportion to movements in financeability measures. Further, at this time we do not consider that changes to our usual approach to estimating depreciation are warranted in order to address financeability issues.

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101 ACCC - Regulatory Economic Unit, *Rate of Return and Cash Flows in a Low Return Environment,* 19 April 2021, pp. 6, 9-10.

102 AER, *Final position 2020 Inflation review,* p. 40.

103 AER, *Submission to AEMC consultation paper on TransGrid and EletraNet rule change derogation proposals related to financeability*, 3 December 2020.

104 AEMC, *Final rule determination, National electricity amendment (participant derogation — financeability of ISP projects (Transgrid)) rule 2021*, 8 April 2021, p. i.

105 CEPA, *Financeability of ISP Projects*, 27 January 2021, p.21.

While bringing forward cash flows to address financeability may be net present value neutral, we are concerned such an approach results in current consumers paying for more of the regulatory asset than they consume in a present value sense, while future consumers will pay less. This raises intergenerational equity considerations. Further, the regulatory cash flows will be materially lower in the second half of the assets' lives and this may cause cash flow problems in the future. We have seen this impact in overseas jurisdictions where accelerated depreciation has resulted in worsening future financeability metrics.[106] The REU report raises other issues with net present value neutral re-profiling.[107]

We note that as part of our process for preparing the 2022 Instrument we will be considering a range of issues that intersect with financeability including:

- gearing
- credit rating
- the 10 year-trailing average cost of debt methodology and whether this could be adjusted to more accurately reflect large, lumpy investment. For example by providing all large new investments the spot rate on debt and then transition these new investments to a trailing average.

At this stage, we do not consider that a financeability test is required at the reset determination stage. However, during the reset determination stage we will determine the deprecation allowance which impacts the FFO to net debt metric.

We also query whether a financeability test should be incorporated into the rate of return Instrument. While we considered submissions on financeability in making the 2018 Instrument, our final decision was to not use it to inform our rate of return. However, we will reconsider any role for financeability in our Overall rate of return paper. The AER does not have a formal obligation to consider financeability under the rules. However, where regulators have included financeability tests within the regulatory regime they have generally stressed that the primary responsibility for managing financeability rests with the regulated businesses.

The current regulatory framework provides investors with a stable and predictable regulatory investment framework that includes an ex-ante return on their investments. This allowed return should be commensurate with the efficient financing costs of these regulated investments. As we noted in our 2018 Instrument Explanatory Statement, we consider this is reflected in the prevailing market cost of capital (or weighted average cost of capital) for an investment with a similar degree of risk as that which applies to a service provider in respect of the provision of regulated services. The process for setting revenue and capital expenditure forecasts in regulatory determinations is clearly laid out in legislation.

106 AER, *Submission to AEMC consultation paper on TransGrid and EletraNet rule change derogation proposals related to financeability, 3 December 2020*, p.3.

107 ACCC - Regulatory Economic Unit, *Rate of Return and Cash Flows in a Low Return Environment,* 19 April 2021, pp. 12-14.

6 Glossary

Below are accessible explanations of the more specialised financial terms used in this draft working paper:

- **Averaging period** – The specified days (or weeks or even months) when we observe market data to inform our estimate of specific rate of return parameters.
- **Benchmark term** – This is the term to maturity of government bonds or debt we set that is used to calculate specific rate of return parameters. The term to maturity at issuance is the time between when an instrument is issued and its maturity date.
- **Capital Asset Pricing Model (CAPM)** – The CAPM is a model that estimates the required return on equity using three parameters: the risk-free rate, beta and the market risk premium. It says that the required return on an investment will be related to the systematic risk of the investment. Here 'systematic risk' means risk that cannot be diversified away (by multiple investments in different companies across the market). An investment with higher risk will have a higher required return.
- **Consumer Price Index (CPI)** – The CPI is a common measure of inflation published by the Australian Bureau of Statistics (ABS). It measures quarterly changes in the price of a 'basket' of goods and services which account for a high proportion of expenditure by the CPI population group (i.e. metropolitan households).[108]
- **Consumer Price Index including owner occupiers' housing costs (CPIH)** – The CPIH is a measure of consumer prices and is more comprehensive than the CPI. The CPIH includes owner occupiers' housing costs and council tax, and therefore, their inclusion captures a major component of household spend.[109] Ofgem and Ofwat use the CPIH to determine their real rate of returns.
- **Commonwealth Government Securities (CGS)** – Bonds and notes issued by the Australian federal government to borrow money from investors.
- **Cross checks** – This can be a role assigned to piece of information or a step in the estimation process. It involves comparing estimates against other relevant information sources. It may provide assurance that the calculated estimates are reasonable and consistent with other sources of information.
- **Debt raising costs** - These costs are the transaction costs incurred each time debt is raised or refinanced. These costs may include underwriting fees, legal fees, company credit rating fees and other transaction costs.
- **Dividend Growth Model (DGM)** – The DGM is a valuation model which uses the share price, dividend (or cash flow) forecasts and the expected growth rate of the dividends to infer the required return on equity.
- **Energy Infrastructure Credit Spread Index (EICSI) – the EICSI** was created jointly between Chairmont and the AER in 2018. It reports unadjusted actual debt costs (as a

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108 Australian Bureau of Statistics, *Consumer price index, Australia methodology*, September 2020, <https://www.abs.gov.au/methodologies/consumer-price-index-australia-methodology/sep-2020>

109 Ofgem, *RIIO-2 Sector specific methodology Annex: Finance*, December 2018, p. 66

spread over the swap rate) from networks using a 12 month rolling window. The EICSI dataset also allows calculation of debt term and credit rating.

- **Equity beta** – This is a key parameter within the standard (Sharpe- Lintner) CAPM. It measures the 'riskiness' of a firm compared with that of the market and should only reflect the systematic risk. Systematic risk is risk that is inherent to the entire market and cannot be eliminated through holding a well-diversified portfolio (i.e. diversified away).
- **Financeability** – service provider's ability to achieve the benchmark credit rating applied in the estimation of the rate of return.
- **Gearing** – the proportion of debt in total financing
- **Market risk premium (MRP)** – This is the difference between the expected return on a market portfolio and the return on the risk free asset. It compensates an investor for the systematic risk of investing in the market portfolio or the 'average firm' in the market.
- **Post-tax revenue model (PTRM)** – The post-tax revenue model is a model used by the AER to estimate the annual revenue requirement for each year of a regulatory control period. It brings together the various building block costs that make up the annual revenue requirement for each regulatory year, including the rate of return on capital.
- **Rate of return (or weighted average cost of capital)** – The rate of return on capital is a forecast of the additional return (above the initial investment amount) required to induce investment in its network. It is a combination of the return on debt and return on equity, weighted according to the proportions of debt and equity investment. In the current rate of return instrument, we estimate a make-up of 60% debt and 40% equity. As such, the weighted average cost of capital is formed of 60% return on debt and 40% return on equity. From the investor's perspective it is the return on the funds invested, but from the network's perspective this is the cost of obtaining the funds.
- **Rate of return instrument** – The Instrument is a binding document which sets out the way the AER will calculate the rate of return in regulatory determinations. Neither the AER nor the regulated businesses have the ability to depart from the instrument. The current instrument was published in December 2018 and its replacement is scheduled for December 2022.
- **Reference groups** – Reference groups are appointed by the AER and consist of representatives from various stakeholders including consumers, investors and retailers. Their role is to allow stakeholders to be involved in the rate of return process and contribute to our consultation.
- **Regulated network (or entity)** – a direct control network service for the purposes of the National Electricity Law or a reference service for the purposes of the National Gas Law. Essentially energy businesses that the AER sets revenue allowances for.
- **Regulated control period –** We set the revenues regulated businesses can earn over a certain timeframe in our regulatory determinations which is typically for a 5 year period. This period is called the 'regulatory control period' under the National Electricity Rules or an 'access arrangement period' under the National Gas Rules.

- **Regulatory determinations** – Regulatory determinations are decisions published by the AER and specify the amount of allowed revenue that network businesses can recover from customers during a regulatory control period.
- **Return on debt** – The return on debt is the AER's forecast of the interest costs of maintaining a debt portfolio for a regulated energy network.
- **Return on equity** – The return on equity is the AER's forecast of the return that equity investors (e.g. shareholders) require in order to induce them to invest in a regulated energy network.
- **Risk-free rate –** This is a parameter within the CAPM which is a model for estimating the return on equity. The risk-free rate measures the return an investor would expect from a 'riskless' investment where there is guaranteed return on the invested capital.
- **Total market return** – The total market return is the overall return expected by investors from investing in a diversified benchmark stock market index.
- **Trailing average** – The trailing average is calculated as the simple average of values over a specified number of estimation period which is updated overtime. For example, the 10 year trailing average for the return on debt for the forthcoming year would be calculated as the simple average of the annual return on debt for that year and the annual return on debt estimates for the 9 previous years.
- **Weighted Average Term to Maturity at Issuance (WATMI)** – The WATMI is derived from the EICSI and weighs each debt instrument with regard to the value of that debt as a proportion of total debt.
- **Weighted average cost of capital (WACC)** – See rate of return.

Appendix A. Submission Summary

This appendix contains summaries of submissions received by the AER in response to financeability. A high level summary is provided in section 1.3.

A summary of previous submissions on equity parameters can be found in Chapter 7of our December 2020, final working paper on CAPM and alternative return on equity models.[110]

Table A. 1 Detailed summary of submissions received

Submitter	
ENA	**Financeability** Network financeability (as measured by the Funds from Operation Over Net Debt Ratio) may have deteriorated since the introduction of the 2018 Instrument.[111] Businesses that are not financeable will ultimately face financial distress, which will disrupt services to their customers.[112] Financeability of NSPs in practice is at least partly due to regulatory decision-making.[113] **Financeability testing** Regulators adopt financeability testing to protect consumers rather than NSP's and that the costs of financeability testing are likely to be low relative to the potential benefits.[114] Financeability testing provides an opportunity for stakeholders to test regulators' decision making. This will provide an opportunity to improve the consistency and evidential basis of regulatory decision-making.[115] **International regulators** International regulators, such as in Great Britain (Ofgem and Ofwat) as well as water regulation in New South Wales (IPART) have adopted financeability testing for two main reasons: • Regulatory decisions carry with them a risk of error; • Consumers have a clear interest in the provision of network services by efficient providers.[116] Financeability testing has not been universally adopted internationally, but noted that it is not needed in all situations. Financeability testing is most necessary where

110 Available at: https://www.aer.gov.au/networks-pipelines/guidelines-schemes-models-reviews/capm-and-alternative-return-on-equity-models-pathway-to-rate-of-return-2022
111 NERA, *Role of financeability in promoting the long-term interests of energy consumers*, 10 December 2020, p. 1.
112 NERA, *Role of financeability in promoting the long-term interests of energy consumers*, 10 December 2020, p. 3.
113 NERA, *Role of financeability in promoting the long-term interests of energy consumers*, 10 December 2020, p. 3.
114 NERA, *Role of financeability in promoting the long-term interests of energy consumers*, 10 December 2020, p. 1.
115 NERA, *Role of financeability in promoting the long-term interests of energy consumers*, 10 December 2020, p. 4.
116 NERA, *Role of financeability in promoting the long-term interests of energy consumers*, 10 December 2020, p. 3.

there is the highest risk that the price control allowances will not automatically ensure that the NSP is financeable.[117]

Australia shares many features with British electricity regulation that makes financeability testing an important tool for regulators, including:

- Use of a benchmark cost of debt, instead of passing through actual debt costs;
- Remunerates NSPs with a real return and indexes the RAB with inflation;
- Operates under an incentive regulation rather than under a cost pass-through regime.[118]

Credit rating agencies and financeability testing

Moody's and S&P both publish methodology's setting out their detailed approaches to calculating credit ratings for energy networks that could be used for financeability testing in Australia.[119]

British regulators for electricity and water (Ofgem and Ofwat), as well as, IPART in NSW utilise financeability tests inspired by those used by credit rating agencies.[120]

Benefits for consumers

Moody's and S&P both publish methodology's setting out their detailed approaches to calculating credit ratings for energy networks that could be used for financeability testing in Australia.

Financeability testing, insofar as it results in financeable NSPs, offers four broad categories of benefits for consumers:

- Consumers get access to the investment that they need as testing would identify NSPs that are not financeable;
- Provides confidence in regulatory decision-making as it provides a transparent cross-check;
- Minimises financing costs for consumers as it provides a stable framework;
- Minimises costs of services over time as it will ensure networks are able to be financed at all times, leading to better investments.[121]

The consequences of a reset process that over-rewards investment are additional capex whilst the consequences of under-investment can be lost load, causing higher prices for consumers.[122]

Costs of testing

The benefits of introducing financeability testing will exceed the costs.[123]

The direct costs for financeability testing are low and largely administrative as the AER already produces detailed models of the costs and revenues of NSPs. The

117 NERA, *Role of financeability in promoting the long-term interests of energy consumers*, 10 December 2020, p. 5.
118 NERA, *Role of financeability in promoting the long-term interests of energy consumers*, 10 December 2020, p. 5.
119 NERA, *Role of financeability in promoting the long-term interests of energy consumers*, 10 December 2020, pp. 6-7.
120 NERA, *Role of financeability in promoting the long-term interests of energy consumers*, 10 December 2020, p. 6.
121 NERA, *Role of financeability in promoting the long-term interests of energy consumers*, 10 December 2020, p. 8.
122 NERA, *Role of financeability in promoting the long-term interests of energy consumers*, 10 December 2020, p. 9.
123 NERA, *Role of financeability in promoting the long-term interests of energy consumers*, 10 December 2020, p. 9.

AER would only be required to select a set of credit metrics for analysis and then calculate those metres during the reset process or 2022 Instrument process.[124]

Implementation in Australia

Four dimensions that could be used by government bodies in Australia to design financeability testing:

- Identity of the target firm - identifying the notional firm and a set of accounts;
- Methodology and calculation - determining credit metrics to test financeability;
- Frequency of testing - determining how often the tests need to be conducted;
- Remedies - outlining steps to improve financeability if the test is failed.[125]

Each of the dimensions will require careful design for the Australian context.[126]

Issues for consideration

The ENA suggested a number of questions and topics for us to consider as part of the low interest rate environment working paper. This includes:[127]

1. Value of financeability — policy objectives. ENA wanted to know why other regulators considered financeability, and whether the long term interests of consumers can be better achieved by introducing financeability assessment.
2. Scoping: defining the concept of 'financeability'. They would like the definition of financeability to be clearly defined, and with appropriate measures of finaceability. Furthermore, ENA would like broad agreement from stakeholders on the definition of financeability.
3. Conceptual issues: what is/are the term for financeability to be achieved? ENA submitted that networks are keen to explore the interpretation of the AER and others of appropriate timeframes for financeability.
4. Financeability and the existing framework. ENA wanted to know the role and limitations of financeability assessments in the context of the current regulatory framework/rules.

AusNet Services, CitiPower, Powercor and United Energy	**RBA bond-buying program** The RBA currently has a two-pronged approach in relation to Commonwealth Government Securities: • A yield target at the shorter (3-year) end of the term structure whereby the RBA will purchase government bonds to drive the yield down; and • A bond-buying program at the longer (5-10 year) end of the term structure whereby the RBA will purchase government and semi-government bonds to drive down yields.[128]

124 NERA, *Role of financeability in promoting the long-term interests of energy consumers*, 10 December 2020, p. 9.
125 NERA, *Role of financeability in promoting the long-term interests of energy consumers*, 10 December 2020, pp. 10-11.
126 NERA, *Role of financeability in promoting the long-term interests of energy consumers*, 10 December 2020, p. 11.
127 ENA, *Memorandum to the AER— Issues for consideration on financeability*, 15 March 2021, pp. 2-3.
128 Frontier Economics, *The impact of artificially supressed government bond yields*, 23 November 2020, p. 6.

The rationale and objective of these programs by the RBA is to lower the whole structure of interest rates in Australia.[129]

The RBA's interventions into the government bond market are designed to drive government bond yields below the level that would otherwise have been set by the market, artificially lowering them.[130]

Implications of RBA bond-buying on regulated businesses

The RBA artificially lowering government bond yields has potential implications on regulatory allowances for the return on debt and in particular, the return on equity.[131]

Under the 2018 Instrument a reduction in the 10-year government bond yield flows through, one for one, to a lower regulatory allowance.[132]

The AER could not have anticipated the RBA artificially lowering bond yields when the binding 2018 Instrument was set. Under a binding instrument, there is no opportunity to make any adjustments or correction in response to unprecedented market conditions.[133]

Under the 2018 Instrument, the allowed return on equity is lower than any previous AER allowance, lower than the allowances of comparable regulators and lower than the allowance would have been if the RBA hadn't intervened to suppress government bond yields.[134]

Negative NPAT

The allowed cash return on equity fell below zero after the reductions in the 2018 Instrument and has continued to fall due to subsequent reductions in government bond yields.[135] This is the first time that the AER's allowed cash return on equity has fallen into negative territory.[136]

The negative allowed cash return to equity results in a negative NPAT for the benchmark firm.[137]

Long periods of negative NPAT could impact credit ratings and the ability to attract investors.[138] The FFO/Debt metric in the Victorian DNSP draft decisions' fell below the level that is required to support an investment grade credit rating.[139]

The AER's reduced estimate of inflation would serve to mitigate the problems, but still results in a negative NPAT and the FFO/Debt ratio remain in the BB range.[140]

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129 Frontier Economics, *The impact of artificially supressed government bond yields*, 23 November 2020, p. 6.
130 Frontier Economics, *The impact of artificially supressed government bond yields*, 23 November 2020, p. 7.
131 Frontier Economics, *The impact of artificially supressed government bond yields*, 23 November 2020, p. 7.
132 Frontier Economics, *The impact of artificially supressed government bond yields*, 23 November 2020, p. 8.
133 Frontier Economics, *The impact of artificially supressed government bond yields*, 23 November 2020, p. 8.
134 Frontier Economics, *The impact of artificially supressed government bond yields*, 23 November 2020, p. 8.
135 Frontier Economics, *The impact of artificially supressed government bond yields*, 23 November 2020, p. 8.
136 Frontier Economics, *The impact of artificially supressed government bond yields*, 23 November 2020, p. 10.
137 Frontier Economics, *The impact of artificially supressed government bond yields*, 23 November 2020, p. 9.
138 Frontier Economics, *The impact of artificially supressed government bond yields*, 23 November 2020, p. 9.
139 Frontier Economics, *The impact of artificially supressed government bond yields*, 23 November 2020, p. 11.
140 Frontier Economics, *The impact of artificially supressed government bond yields*, 23 November 2020, p. 12.

International Regulators

In the Brattle report the AER's real return on equity is materially lower than that of any other regulator. The AER's real return on equity of 2.42% was lower than ARERA (5.77%), Ofgem (4.80%) and Ofwat (4.19%).[141]

Out of a sample of 63 European energy network decisions that applied in 2019, 58 set a higher nominal allowed return on equity than the nominal return on equity provided by the AER.[142]

In the two most recent decisions made in the UK (since the Brattle report was published) the real return on equity allowance proposed by the AER for the Victorian DNSPs is between 159 and 178 basis points lower than set by Ofgem and 291 basis points lower than set by CMA.[143]

Ofgem and CMA have set materially higher return on equity allowances than the AER, even though the yield on UK government bonds is close to an all-time low at present (like in Australia).[144]

The differences between the return on equity allowances set by the AER and the UK regulators is in large part due to differences in the methodologies adopted by the regulators.[145] These differences ensured that the return on equity allowances set by the UK regulators were more stable and resilient to market volatility in government bonds than set by the AER.[146]

In past regulatory decisions (prior to 2018), most UK regulators had used risk-free rate allowances that incorporated material 'headroom' above the prevailing yield on government bonds. Since 2018, a number of regulatory decisions have applied risk-free rate allowances that are substantially closer to the prevailing yield on government bonds. Despite this change, UK regulators still set equity allowance materially higher than the AER.[147]

Table A.2 Summary of the submissions to the AEMC

Issues	
Large projects:	Financeability issues are common for large projects.[148]
Benchmark assumptions:	TNSPs can deviate from the benchmark assumption in order to obtain financing for their ISP projects. For instance, TNSP's are free to determine what level of leverage to adopt where financeability issues can be addressed through a reduction in gearing. The low risk regulated

141 Frontier Economics, *The impact of artificially supressed government bond yields*, 23 November 2020, p. 15.
142 Frontier Economics, *The impact of artificially supressed government bond yields*, 23 November 2020, p. 16.
143 Frontier Economics, *The impact of artificially supressed government bond yields*, 23 November 2020, p. 17.
144 Frontier Economics, *The impact of artificially supressed government bond yields*, 23 November 2020, p. 17.
145 Frontier Economics, *The impact of artificially supressed government bond yields*, 23 November 2020, pp. 17-18.
146 Frontier Economics, *The impact of artificially supressed government bond yields*, 23 November 2020, p. 18.
147 Frontier Economics, *The impact of artificially supressed government bond yields*, 23 November 2020, p. 18.
148 TasNetworks, *submission to the consultation paper*, pp. 1-2.

	returns available for network investment would be considered attractive to both TNSPs and providers of finance, particularly given current low interest rates.[149] Given that interest rates are at historic lows, and that the cost of debt benchmark, which is based on a 10-year trailing average, should mean that projects should be able to attract debt financing at well below the AER's current cost of debt benchmark.[150]
Cross subsidisation:	It is normal in most markets that revenue does not flow until benefits are received, and it is necessary for network investment since it best ensures that those that pay for network expenditure are the same customers who receive the benefit of the expenditure. It was noted that the rule change proposal would shift costs to current consumers who will not receive the full benefits of the ISP project and effectively cross-subsidise future consumers who will not be exposed to the full costs.[151] Such an approach does not accord with common accounting treatments.[152] Some considered that the proposed changes would increase costs to consumers without providing corresponding benefits.[153]
NPV neutral:	It is questionable whether the rule change is NPV neutral from a customer perspective. With costs incurred upfront and benefits delivered over the long term, it is more likely that consumers will find that the NPV benefits are negative and that the approach proposed in the rule change will cost consumers more.[154] However, it was submitted that AEMC decision may have overlooked analysis by FTI and ACIL Allen which suggest wholesale price savings in South Australia would be delivered from the time of project commissioning.[155]
Risk Transfer:	Bringing cash flows forward shifts risk from the TNSP to consumers i.e. completion risk, asset stranding risk and inflation risk. Consumers, unlike the TNSP or their investors, have very little ability to manage these risks and so it is inappropriate for the risk to be allocated to them.[156]
Construction of ISP projects:	Projects that are not robust economically should not be built as this leads to higher stranded asset risk.[157] Equally a TNSP should not defer investment which are in the long term interest of consumer but not in the interest of its shareholders.[158]

149 AGL, *submission to the consultation paper*, p. 1.
150 ENGIE, *submission to the consultation paper*, p. 4.
151 PIAC, *submission to the consultation paper*, p. 1.
152 AEC, *submission to the consultation paper*, p. 2.
153 CEC, *submission to the consultation paper*, p. 1.
154 EUAA, *submission to the consultation paper*, p. 11; MEU, *submission to the consultation paper*, p. 6; ERM Power, *submission to the consultation paper*, pp. 2-3; ECA, *submission to the consultation paper*, p. 3.
155 Energy Australia, *Submission to the draft determination*, p. 2.
156 PIAC, *submission to the consultation paper*, p. 1.
157 EUAA, *submission on the draft*, p. 1.
158 EUAA, *submission on the draft*, p. 1.

	TNSPs will still undertake the ISP projects even without the rule change given: (1) the need for large ISP expenditures have been obvious for some years and information on this expenditure was provided to investors when TransGrid was sold to its current owners.[159] (2) publications indicate that new investments are attractive[160] (3) the high RAB multiples paid to acquire regulated assets[161] (4) the regulatory framework does not create a barrier to invest and NSPs with higher gearing than the benchmark efficient entity are still able to attract debt at prices lower than the AER allowance for the benchmark entity[162]
FFO/net debt:	The metric FFO to net debt is not the prime metric that results in ISP projects being non-viable.[163] Rating agencies do place significant weight on qualitative factors and considers other financial ratios as part of their credit scoring. A stable regulatory environment and ownership model drives up the credit rating.[164] However, a drop in the FFO/Debt value for a sustained period can result in a downgrade.[165]
Future Review:	Support the future AEMC review which should consider: (1) The prospect of TNSPs not undertaking Actionable ISP projects.[166] (2) How the AER should treat very large increments in capex additions.[167] (3) Complexity in ISP specific financing arrangements with risk in assuming financing at the average WACC, and consider whether a financeability framework should be introduced.[168] (4) Any practical barrier to the AER addressing financeability concerns at both the RORI stage, and individual network determinations.[169] (5) Whether a financeability framework should be explicitly included in the rules.[170] An alternative and potentially more preferable approach may include making financing and construction of new ISP investments contestable. I.e. the removal of the monopoly rights of TNSPs to build major projects in

159 EUAA, *submission to consultation paper*, pp. 8-11.
160 EUAA, *submission to consultation paper*, pp. 8-11.
161 EUAA, *submission to consultation paper*, pp. 8-11.
162 MEU, *submission to draft determination*, p. 3.
163 MEU, *submission to the consultation paper*, p. 8.
164 AEC, *submission to the consultation paper*, p. 2.
165 AusGrid, *submission to the consultation paper*, pp. 8-9.
166 Energy Australia, *submission on draft*, p. 2.
167 Energy Australia, *submission on draft*, p. 2.
168 Energy Australia, *submission on draft*, p. 2.
169 ENA, *submission on draft*, p. 4.
170 ENA, *submission on draft*, p. 1.

	their own service area.[171] Specifically, the approach used by AEMO in Victoria should be used if the TNSP cannot carry out the project under the current rules.[172] The rule would set a precedent and ultimately flow through to more or all NSP investments.[173] This could lead to a significant near term price impact on consumers.

171 ENGIE, *submission to the consultation paper*, p. 1.
172 MEU, *submission to the consultation paper*, p. 10.
173 MEU, *submission to the consultation paper*, p. 4; ERM Power, *submission to the consultation paper*, p. 2.

Appendix B. REU Advice

This note was prepared by Dr Yuliya Moore of the ACCC's Regulatory Economics Unit (REU) at the request of the AER. The REU provides specialist economic advice to support the functions of the AER. The note reflects the views of the author and may not necessarily reflect the views of the ACCC or the AER.

AER request for advice

The AER has asked the REU to comment on the effect of low interest rate / low return environment on regulatory cash flows and financeability and to address the following questions:

1. What is meant by a low return (low interest rate) environment? What aspects of returns are in focus? Low compared to what?
2. What is meant by financeability? How is it measured or assessed? What are the strengths and limitations of financeability analysis? What relevance might it have to our regulatory framework?
3. How do the aspects identified in Q1 impact cash flow outcomes under the 2018 RoRI, PTRM and RFM?
4. How do the cash flow outcomes identified in Q3 impact financeability?

The context of industry concerns

To interpret the phrase 'low interest rate / low return environment', it helps to consider it in the context of stakeholders' concerns regarding the effect such an environment may have on the regulatory revenues, cash flows and pricing relative to the efficient costs of providing regulated services.

At present, one of the main concerns of the (industry) stakeholders appears to do with the effect of the low interest rate environment on financeability of regulated businesses.[174]

For example, Energy Networks Association (ENA) identified the following three issues as 'underlying emerging financeability pressures':[175]

- 'Reduction in the return on equity parameters in 2018 Rate of Return Instrument (2018 RoRI)'
- 'Historically low risk-free rates'
- 'Existing regulatory inflation estimation approaches'

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174 Energy Networks Association (ENA), Issues for consideration – AER financeability and low bonds yields working paper, Memorandum, n.d.

175 ENA, *Financeability of ISP projects*, *Response to AEMC Consultation Paper: Participant derogation – financeability of ISP projects* (https://www.aemc.gov.au/sites/default/files/documents/rule_change_submission_-_erc0320_-_energy_networks_australia_-_20201203.pdf), 3 December 2020, pp 9–10, accessed 12 April 2021.

ENA then stated that:[176]

> *The combined impact of these factors is resulting in regulatory allowances for mature electricity distribution networks which deliver negative profit after tax for the benchmark efficient firm in every year of the regulatory period. In addition, network decisions following the 2018 RoRI have embedded a negative cash return on equity. … Current Victorian draft determinations also feature negative net profit after tax, and result in FFO/Debt benchmarks that fall below that required for investment grade credit ratings.*

Other stakeholders expressed similar sentiments during the AEMC rule determination on financeability of ISP projects, as well as during the AER's 2020 Inflation Review.[177] A recent report by Frontier also developed similar arguments on behalf of AusNet Services, CitiPower, Powercor and United Energy.[178]

Below we briefly review the concept of financeability and the relevant components of the regulatory revenues and cash flows. We then analyse the stakeholders' concerns regarding financeability in the context of low returns on the Commonwealth Government Securities. We conclude by considering alternative approaches a regulator could use to address perceived financeability concerns.

What is meant by 'financeability'?

In general, the term 'financeability' refers to the ability and ease with which businesses access funds in the capital markets. For example, in 2018 AER described financeability as follows:[179]

> *Financeability refers to a service provider's ability to meet its financing requirements and to efficiently raise new capital. In the regulatory context, it often refers to the service provider's ability to achieve the benchmark credit rating applied in the estimation of the rate of return.*

While (to the best of our knowledge) there are currently no legislative requirements for either the AER or ACCC to conduct financeability assessments as part of their regulatory decision

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176 ENA, loc. cit.

177 See, for example, QTC, *Review of the regulatory treatment of inflation, Submission to the AER discussion paper* (https://www.aer.gov.au/system/files/QTC%20-%20Submission%20to%20discussion%20paper%20-%202020%20inflation%20review%20-%20July%202020.pdf), 29 July 2020, accessed 15 April 2021; AusGrid, *AusGrid submission, AEMC consultation paper: financeability of ISP projects* (https://www.aemc.gov.au/sites/default/files/documents/rule_change_submission_-_erc0320_-_ausgrid_-_20201203.pdf), 3 December 2020, accessed 15 April 2021.

178 Frontier Economics, *The impact of artificially supressed government bond yields, Report for AusNet Services, CitiPower, Powercor and United Energy* (https://www.aer.gov.au/system/files/AusNet%20Services%20-%20Revised%20Regulatory%20Proposal%20-%202021-26%20-%20Frontier%20Economics%20-%20Appendix%207A%20Frontier%20supporting%20report%20-%20December%202020.pdf), 23 November 2020, accessed 12 April 2021.

179 AER, *Rate of return Instrument, Explanatory statement* (https://www.aer.gov.au/networks-pipelines/guidelines-schemes-models-reviews/rate-of-return-instrument-2018/final-decision), December 2018, accessed 12 April 2021, p 392.

making, the ACCC/AER have explored the relevance of financeability assessments in the past.

For instance, the National Electricity Code and the early versions of the National Electricity Rules required the AER, in setting a revenue cap, to take into account the revenue requirements of a TNSP, having regard for a number of matters, including the 'on-going commercial viability of the transmission industry' and 'any other relevant financial indicators'.[180] The ACCC/AER adopted a range of financial indicators, similar to those used by banks and credit rating agencies, to assess the likely impact of its decisions on the financial standing of TNSPs and their ability to obtain credit.[181]

It appears that such analysis was no longer performed by the AER after version 10 (16 November 2006) of the National Electricity Rules (NER) came into effect. Relevance of financeability tests was considered again in 2013 the context of the rate of return guideline.[182]

More recently, the AER considered whether financeability assessments should be used to inform its rate of return decisions and made a decision to maintain the status quo and not to use financeability assessments for the 2018 RoRI.[183]

There is some scope for ambiguity in how the concept of financeability applies in the context of regulated businesses – and therefore the way to evaluate when a financeability issue might exist. Below we discuss two cases where such ambiguity can arise: the object of the assessment and the choice of assessment criteria.

The object of financeability assessment

When designing a financeability test, a regulator first needs to establish whether the object of such a test is a notional entity, such as a benchmark efficient entity, or an actual business. If the test is applied to a benchmark entity, its results can be interpreted as a cross-check for overall consistency of the benchmark parameters (such as gearing, credit rating, return on equity parameters, and so on). On the other hand, applying the test to service provider's actual expenditures and cash flows may help assess financial viability and credit worthiness of that particular service provider.

We consider that if the AER were minded to adopt any financeability test, the relevant object of such test would be a benchmark entity, rather than an actual regulated service provider.

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180 See, for example, National Electricity Rules, Version 9, Chapter 6 (https://www.aemc.gov.au/sites/default/files/content/b2f9aefe-ad78-4c4e-8f38-37e8a1e170c6/Chapter-6-Economic-Regulation-of-Distribution-Service.PDF), accessed 12 April 2021, Clauses 6.2.4 (c) (8) and 6.2.4 (c) (9), p 374.

181 For example, EBIT to funds employed, dividend payout ratio, funds flow net interest cover, gearing and so on. See ACCC, *Statement of principles for the regulation of electricity transmission revenues – background paper* (https://www.aer.gov.au/networks-pipelines/guidelines-schemes-models-reviews/statement-of-principles-for-the-regulation-of-transmission-revenues-december-2004), 8 December 2004, accessed 23 March 2021, pp 123–124.

182 See, for example, AER, *Better regulation, Explanatory statement, Draft rate of return guideline* (https://www.aer.gov.au/system/files/AER%20Explanatory%20statement%20-%20draft%20rate%20of%20return%20guideline%20-%20August%202013_0.pdf), accessed 12 April 2021, pp 114, 208.

183 AER, op. cit., p 392–405.

Firstly, the AER's current regulatory approach has elements of incentive-based regulation (as developed in the AER's 2013 Better Regulation program). For example, the AER has recently made the following comment regarding how it sets the rate of return allowance:[184]

> *We consider the regime should be set to achieve the NEO and provide service providers with a reasonable opportunity to recover at least their efficient costs. However, this does not require service providers to be able to achieve the benchmark assumptions used in making and applying the RoRI [Rate of Return Instrument] at all times. The benchmark assumptions used in making and applying the RoRI are for the purpose of estimating an allowed rate of return that is commensurate with the efficient financing costs of the regulatory investments, but go no further. We do not expect all regulated firms to operate consistently with any or all of these inputs, or the benchmarks they are based on.*

In other words, a regulated business is allowed to collect the amount of revenue and/or set prices) consistent with the regulatory allowance and is free to choose its capital structure, financing practices, production technologies, inputs and so forth in any way its shareholders and management see fit. It then bears both the downside and the upside risks of these decisions – including the risks related to its financial standing and ability to obtain finance.

Secondly, regulated businesses are hardly ever stand-alone, pure-play entities, and may potentially end up with financeability issues for many reasons, some unrelated to regulation. It would appear then the business itself – rather than a regulator – would be in a better position to analyse its financeability, the factors that affect it and possible ways to address it.

Financeability assessment criteria

In addition to deciding on what entity financeability assessment should be applied to, a regulator needs to decide what criteria – or financeability metrics – to use. Regulators usually refer to the financial and performance indicators, or credit metrics, that banks and credit rating agencies use to assess credit worthiness of a business. Credit rating methodologies may look at a range of quantitative metrics and qualitative factors to assess credit risk of a business. Methodologies of different credit rating agencies vary, but rely on similar sets of metrics and qualitative factors and the same underlying finance principles. Depending on the regulatory objectives and relevant legislation, a regulator can choose to adopt any part of an existing methodology, combine elements of different methodologies, or come up with its own financial indicators.

Understanding recent stakeholders' concerns about financeability

As indicated earlier, recent industry stakeholder concerns refer to a set of issues, including historically low risk free rates that appear to result in building up 'financeability pressures'.

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[184] AER, *AER submission – Consultation on TransGrid and ElectraNet participant derogations – Financeability of ISP projects* (https://www.aemc.gov.au/sites/default/files/documents/rule_change_submission_-_erc0320_-_australian_energy_regulator_-_20201203.pdf), 3 December 2020, accessed 12 April 2021, pp 5–6.

We understand that when referring to 'financeability pressures', the stakeholders are predominantly concerned with deterioration in values of two financial indicators: regulatory net profit after tax (NPAT) and fund from operations (FFO) to net debt ratio. We note that the latter is one of credit metrics used by the Moody's credit rating methodology for regulated electric and gas networks.

Frontier suggested that, as the 'government bond yields have fallen to historically low levels' and the equity premium is fixed for the term of the 2018 RoRI, the resulting allowed return on equity is 'lower than any previous AER allowance'.[185] This, in turn, 'implies a negative cash return to equity and a negative profit after tax' and that 'equity holders in the benchmark firm are required to make an equity contribution each year to offset shortfalls in the regulatory allowance'.[186] Further, Frontier pointed out that 'if this situation persists for one more regulatory period, the benchmark firm would have ten years of consecutive losses', which for any business would have 'ramifications in terms of credit ratings and the ability to attract investment'.[187]

Below we examine these statements by using the results derived by Sapere in the report prepared for the AER 2020 Inflation Review.[188]

Computing financial indicators based on the PTRM/RFM regulatory cash flows

First, note that the above submissions mostly refer to values of the two financial indicators (NPAT and FFO to net debt ratio). These indicators are computed for a benchmark efficient entity. Where the computations draw on a value of the regulatory asset base (RAB) and depreciation allowance, the values specific to each regulated business are used.

To highlight the impact of the value of the rate of return allowance on the benchmark entity's financeability, it is common to assume that expenditures of the benchmark efficient entity – such as tax, operating and interest expenditures – are equal to the corresponding regulatory allowances. Also, for simplicity, we can assume revenue adjustments are zero.

Using notation similar to Sapere's equation (3), the net nominal revenue after tax in a particular regulatory year, NNRT consists of return of capital (depreciation) allowance and a 'cash' component of the return on capital allowance:

$$NNRT = A_{-1}(w - e) + D \qquad (1)$$

Here A_{-1} refers to the opening value of the regulatory asset base, w is the nominal WACC, e is the expected inflation and D is nominal straight line depreciation allowance.[189]

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185 Frontier Economics, op. cit., p 4.

186 Frontier Economics, op. cit., p 5.

187 Frontier Economics, op. cit., p 5.

188 Sapere Research Group (Vhari McWha, Kieran Murray, Dean Nutsford, Tony van Zijl), *Target return and inflation, Input to the AER inflation review 2020* (https://www.aer.gov.au/system/files/Sapere%20-%20AER%20Inflation%20Review%202020%20-%20Target%20return%20and%20inflation%20-%2030%20June%202020_Redacted.pdf), 30 June 2020, accessed 23 March 2021.

189 Note that, while Sapere refers to *D* as 'nominal SL depreciation', it is constructed as a straight line depreciation of the real

Note that the total allowed nominal return on capital is $\boldsymbol{A_{-1}w}$ – that is, generally, not all of it would be expected to be paid out as regulatory revenue in any particular year (assuming non-negative expected inflation). The remaining amount would be expected to be recovered in the form of a revaluation gain (see Figure 22).

Indeed, the underlying assumption of the AER regulatory model is that the RAB is expected to grow in line with inflation. Therefore, abstracting from depreciation and new investment, investors would expect a capital, or revaluation, gain of $A_{-1}e$.[190] The revaluation gain, $A_{-1}e$, represents the part of the total allowed nominal return on capital that is expected to be recovered (in present value terms) via return on and return of capital (depreciation) allowance in subsequent periods.

We refer to the term $A_{-1}(w-e)$ as 'cash' component of the allowed return on capital to maintain consistent terminology with Frontier and stakeholder submissions.

Regulatory WACC can be represented as a weighted sum of rate of return on debt, d, and rate of return on equity, k:

$$w = (1-L)k + Ld \tag{2}$$

Here L refers to the gearing ratio.

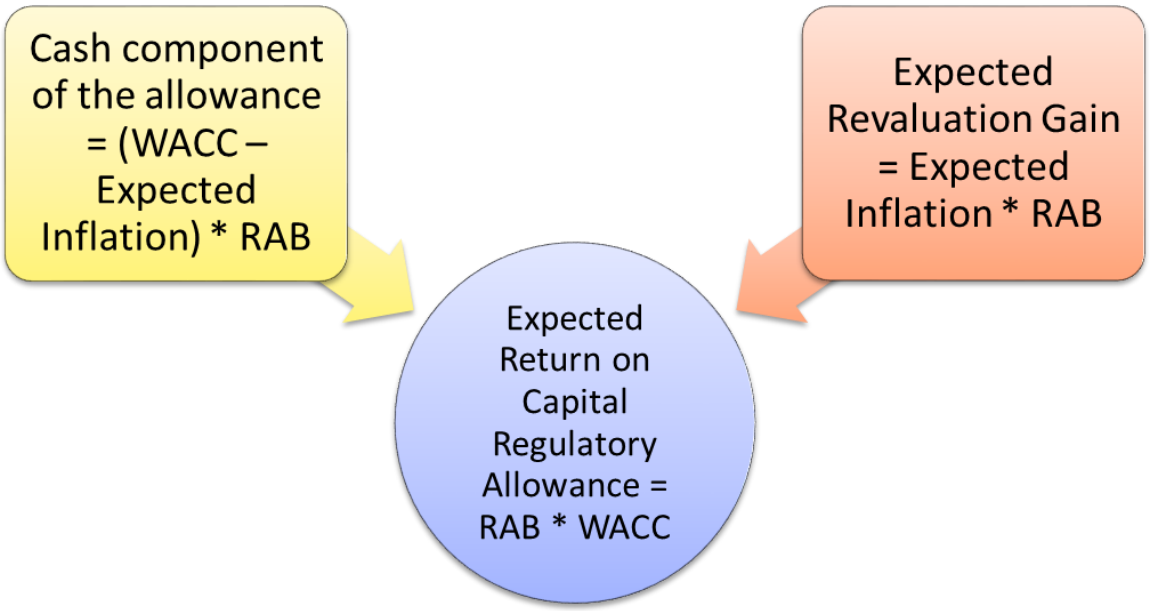
Combining the above equation (2) with the expression (1) for the net nominal revenue after tax:

$$NNRT = A_{-1}(w-e) + D = A_{-1}\left[(1-L)\left(k - \frac{e}{1-L}\right) + Ld\right] + D \tag{3}$$

RAB, expressed in current year's nominal dollars. That is, the same value in real terms in depreciated in each year. Further, note that to obtain the regulatory depreciation allowance in the AER building block model, one would need to adjust *D* for inflation.

190 Provided, of course, that *e* is the expected inflation corresponding to the price index used for the RAB indexation.

Figure 22: Two components of the return on capital regulatory allowance in the PTRM/RFM



Net Profit after Tax (NPAT)

Assume that the benchmark efficient entity borrows and repays debt in nominal terms and the amount to be repaid corresponds to the relevant return on debt allowance. Also assume that the benchmark efficient entity accounts for depreciation in accordance with its regulatory allowance.

Then, we can use the expression (3) for the NNRT to derive the regulatory net profit after tax, NPAT, as the net nominal revenue after tax less depreciation (but without the revaluation component) and interest expenditure:

$$NPAT = NNRT - D - LdA_{-1} \tag{4}$$

Using the derivations in (3) above:[191]

$$NPAT = A_{-1}\left[(1-L)\left(k - \frac{e}{1-L}\right) + Ld\right] + D - D - LdA_{-1} \tag{5}$$

$$NPAT = (1-L)\left(k - \frac{e}{1-L}\right)A_{-1} \tag{6}$$

We can use the NPAT formula (6) to comment on the stakeholders' statements with respect to NPAT and cash return on equity. Note that the 'cash return on equity', referred to by

[191] See paragraph 123 of the Sapere report for more detail.

Frontier, is simply $\left(k - \frac{e}{1-L}\right)$.[192] Therefore, whenever one of the two financial indicators is negative/positive, so will be another.[193] Also note that the AER used gearing to de-lever and re-lever return on equity, therefore, given fixed asset beta and market risk premium, k is actually an increasing function of gearing L.

We observe that, other things being equal, both NPAT and cash return on equity will be lower:

- when expected inflation e is high
- when benchmark gearing ratio L is high
- when allowed rate of return on equity k is low.

Note that under the current 2018 Instrument the allowed rate of return on equity is set as a sum of the nominal risk free rate and a fixed equity risk premium of 3.66 per cent. Therefore, k will be low whenever the nominal risk free rate is low – which for a given level of expected inflation occurs whenever the real risk free rate is low.

[192] As before, 'cash' in this terminology refers to the fact that the relevant revenue is paid out in the current period.
[193] Provided $L < 1$ and RAB is positive.

Figure 23 illustrates the relationship between nominal risk free rate and expected inflation used in the AER modelling and the sign of the regulatory NPAT.

The solid line is constructed using the current 2018 Instrument WACC parameter values, that is, an equity risk premium of 3.66 per cent and gearing of 60 per cent. For any combination of risk free rate and expected inflation exactly on the line, NPAT – and cash return on equity – is zero, for any combination above the line, NPAT and cash return on equity are positive, below the line – negative.

The dotted line illustrates the effect of lowering the benchmark gearing ratio to 50% while keeping other parameters (including equity risk premium) unchanged. The dashed line illustrates the effect of lowering the benchmark gearing ratio to 50%, adjusting (downwards) equity risk premium for the new gearing ratio and keeping other parameters unchanged.

The figure, indeed, illustrates that regulatory NPAT is more likely to be negative when nominal risk free rate is low, other things being equal. However, the effect of low risk free rate can be mitigated when the expected inflation is low. So, it is not just low interest rate environment per se that results in negative NPAT values, it is rather a combination of low risk free rate and relatively high expected inflation estimate. Further, for any (positive) risk free rate – expected inflation pair, the benchmark efficient entity's position with respect to NPAT is improved by adopting a lower gearing ratio.

Figure 23: Relationship between regulatory NPAT and WACC parameters

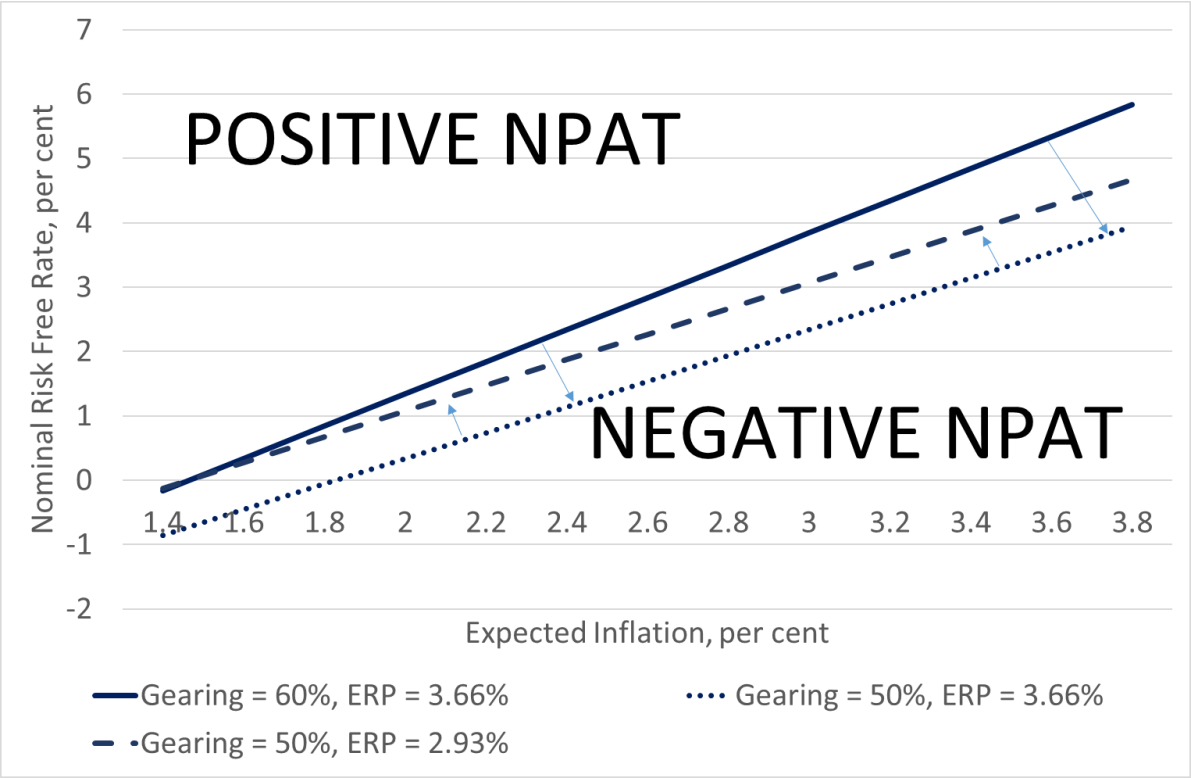


Figure 24 further illustrates the effect of expected inflation on cash returns on equity (and hence NPAT) for the benchmark efficient entity. The expected inflation is calculated using both the AER's new approach to estimating expected inflation (based on a 5-year target inflation horizon) and the approach the AER used prior to the 2020 inflation review (based on a 10-year target inflation horizon).[194] The equity risk premium series was provided by the AER and corresponds to the historical parameter values set by the AER. The risk free rate series was also provided by the AER. All data are at quarterly frequency – which is the frequency of release of the RBA's inflation forecasts. The gearing is set at 60%.

The series charted in blue – using the AER's previous approach to estimating expected inflation – is visibly similar to the series from Frontier's Figure 1, with a slight difference that may be attributed to the chosen data frequency or timing assumptions. As Frontier pointed out, the 'allowed cash return fell below zero after the reductions in the 2018 Rate of Return Instrument, and has continued to fall'.[195]

The series in red is based on the AER's new approach to treatment of inflation. We note that the AER's new approach effectively puts less weight on the mid-point of the inflation target range and more weight on the first two years of the RBA inflation forecast. Under the current economic conditions, this means that the expected inflation estimate under the new approach is lower than that under the previous approach – and the resulting cash return on equity is higher. In fact, as Figure 24 illustrates, the cash return on equity estimated in this manner effectively reversed to zero by November 2020.

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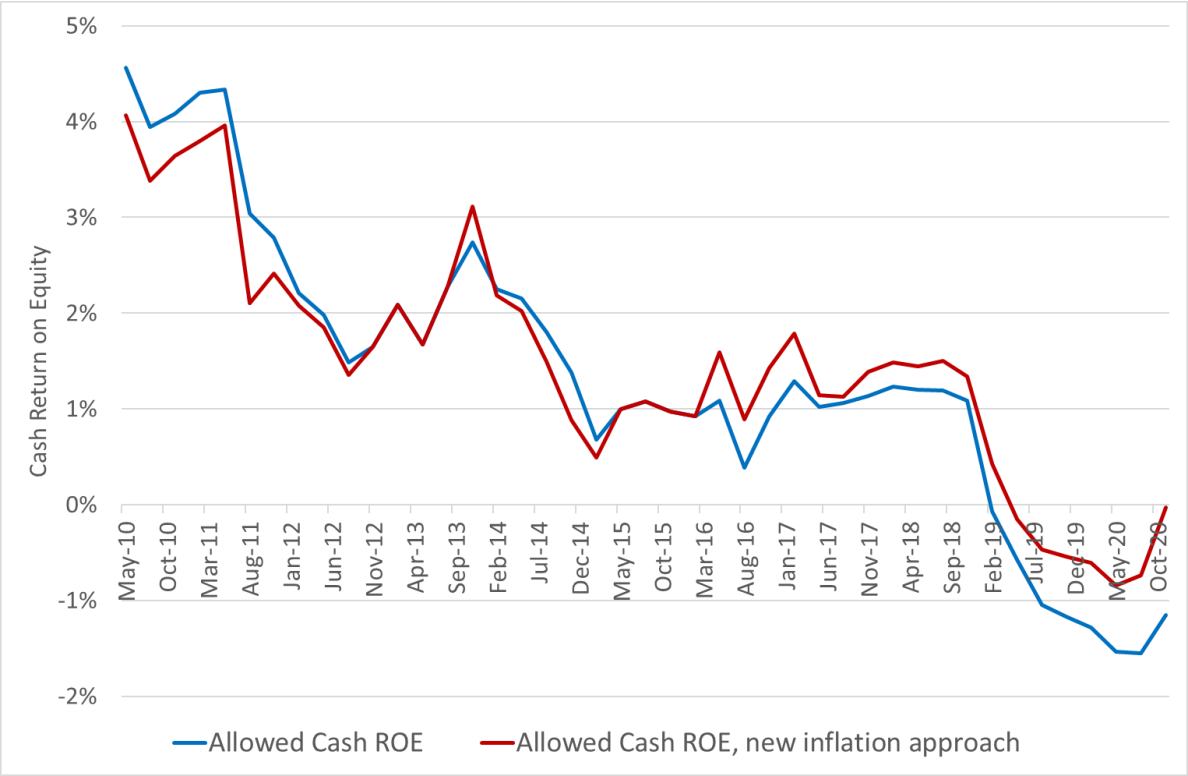
194 AER, *Final Position, Regulatory treatment of inflation* (https://www.aer.gov.au/networks-pipelines/guidelines-schemes-models-reviews/review-of-treatment-of-inflation-2020), December 2020, accessed 15 April 2021, pp 6, 11–12.

195 Frontier Economics, op. cit., p 8.

Figure 24: AER Allowed Cash Return on Equity



Funds from Operations (FFO) to Net Debt ratio

The stakeholders also drew attention to another financial indicator – FFO to net debt ratio.

The AER defined the 'regulated FFO' as a sum of allowed return on equity, net regulatory depreciation (after indexation is removed) and revenue adjustments, and net debt as a simple average of the net RAB debt at the start of the year and that at the end of the year.[196]

As before, assume for simplicity that revenue adjustments are zero.

Then, using the same notation as above, the regulated FFO to net debt ratio:

$$\frac{FFO}{Net\ debt} = \frac{(1-L)kA_{-1} + D - eA_{-1}}{(A_{-1} + A)L/2} \qquad (7)$$

Here A_{-1} refers to the opening value of the RAB at the start of the current regulatory year, A refers to the opening RAB at the start of the following regulatory year, k is the allowed rate of return on equity, L is the gearing ratio, e is the expected inflation, and D is the nominal straight line depreciation allowance.

Define the depreciation rate as the ratio of depreciation component D to the relevant RAB:[197]

[196] AER, *Rate of return Instrument, Explanatory statement* (https://www.aer.gov.au/networks-pipelines/guidelines-schemes-models-reviews/rate-of-return-instrument-2018/final-decision), December 2018, accessed 12 April 2021, p 397.

[197] Note that in case of straight line depreciation the depreciation rate is a reciprocal of the average life of the assets.

$$\delta = \frac{D}{A_{-1}} \tag{8}$$

Then, the FFO to the net debt ratio can be rewritten as:

$$\frac{FFO}{Net\ debt} = \frac{(1-L)\left(k - \frac{e}{1-L}\right)A_{-1} + \delta A_{-1}}{(A_{-1} + A)L/2} \tag{9}$$

or:

$$\frac{FFO}{Net\ debt} = \frac{NPAT + \delta A_{-1}}{(A_{-1} + A)L/2} \tag{10}$$

We note that the FFO to net debt ratio would tend to be low when NPAT is low, keeping other things constant. We further observe that, other things being equal, FFO to net debt ratio would be lower:

- the more the RAB increases from one period to the next
- the lower the depreciation rate δ
- the higher the gearing L
- the lower the allowed rate of return on equity
- the higher the expected inflation.

Given the link between the regulatory NPAT and FFO to net debt ratio, it is often the case that when one observes deterioration in one of these indicators, they also observe deterioration in another.

For example, as we noted above, under the 2018 Instrument, NPAT is more likely to be low/negative when nominal risk free rate is low and at the same time expected inflation is high. With a relatively long remaining asset life (low depreciation rate), relatively high gearing and negative NPAT, the resulting FFO to net debt ratio would also tend to be low and may fall below a prescribed target level set by a credit rating agency for a company with the benchmark credit rating.

These observations raise several questions. First, to what extent is the current environment of low nominal returns on Commonwealth Government Securities causing financeability concerns for the regulated NSPs? And second, what, if anything, should a regulator do to address those concerns? We consider these questions in turn.

Is there a financeability problem?

First, we note that FFO to net debt ratio or similar metrics are used by credit rating agencies such as Moody's to measure a company's ability to generate sufficient cash flow to cover future debt repayments. While such a metric is an informative indicator of a company's dynamic leverage, a range of qualitative and quantitative factors needs to be considered to

determine credit-worthiness of a business.[198] Further, at this time we are not aware of NPAT being used as part of a formal methodology to determine credit-worthiness of a business by a credit rating agency, but if such a methodology exists, presumably, the same argument would hold.

Second, we note that in the PTRM/RFM the allowed revenues are subject to smoothing within each regulatory period. Therefore, equations (6), (9) and (10) can be used at best as an indication of what NPAT and FFO to net debt ratio would look like for each regulatory year. For example, even if NPAT based on unsmoothed regulatory allowances is negative for some regulatory years within a regulatory period, it may still become positive after revenue smoothing is applied.

Third, as we observed earlier, values of NPAT and FFO are determined by interaction of several factors, and nominal risk free rate is just one of them. Consider Figure 24 above that attempts to replicate Figure 1 from the report by Frontier.[199] As Frontier indicated, cash returns on equity (and therefore NPAT) have deteriorated in 2019-2020 and are negative when computed using the AER-determined equity risk premium, gearing and risk free rate and the AER's previous approach to estimating expected inflation. However, if the same indicator is re-calculated using the AER's newly-adopted approach to expected inflation, the deterioration of NPAT is less significant and appears to have ended by late 2020.

Fourth, we made a range of assumptions above, notably an assumption that a benchmark efficient entity's interest expenditures are equal to the return on debt allowance at any point of time. Such an assumption appears problematic for an entity with a growing RAB. Below we provide an example to illustrate.

Example 1

Assume the opening RAB of the benchmark entity is $A_{-1} = \$100$ and its opening RAB in the next period is $A = \$110$. Then, if the benchmark gearing is $L = 60\%$, the entity would finance \$60 (\$66) of its respecting RAB by debt and \$40 (\$44) – by equity. According to the AER's trailing average approach – and the assumption that interest expenditures are in line with the regulatory allowances – this implies that the total interest expenditure of the benchmark entity in the current year is as follows:

$$\$60 * [d_{-9} + d_{-8} + \cdots + d_{-1} + d]/10$$

and in the subsequent year is

$$\$66 * [d_{-8} + d_{-7} + \cdots + d_{-1} + d + d_1]/10$$

where d_{-k} is the spot rate of return on debt k regulatory years ago, d is the spot rate of return on debt in the current period and d_1 is the spot rate of return on debt in the next regulatory year.

198 See, for example, CEPA, *Financeability of ISP projects, Final report* (https://www.aemc.gov.au/sites/default/files/documents/cepa_report_financeability_of_isp_projects.pdf), 27 January 2021, accessed 2 February 2021, p 6.

199 Frontier Economics, op. cit., p 9.

However, it is not obvious what sort of financing practices would reconcile the two interest expenditure profiles, as it is not possible for a business to go back in time and borrow an additional $0.60 a year.

Therefore, the assumption that the regulatory return on debt allowance is precisely offset by the benchmark entity's interest expenditure may not hold, at least for a benchmark entity with a growing RAB profile. In fact, it is more plausible that interest expenditures for such entity would have higher weights assigned to debt issued in more recent years and lower – to the years further into the past. In an environment where interest rates and returns are falling over time, such weighing would tend to mitigate the impact of low interest rates on NPAT and FFO.

Measures to address financeability concerns

If the allowed return on capital and return of capital (depreciation) are correctly determined, then a benchmark efficient entity should generally be able to readily raise capital at a reasonably well-functioning capital market at costs consistent with the regulatory allowance – and therefore should remain financeable. For example, if a benchmark entity can decrease dividend payout or raise additional equity in response to lower NPAT (FFO), then there is no need for a regulatory intervention.

That being said, below we discuss some measures a regulator may choose to use – in case it decided to intervene and address perceived financeability concerns.

Depending on the legislative framework, a regulator may have the following options available:

1. Changes to benchmark parameters
    a. An ongoing long-term poor performance of a benchmark entity in terms of financeability metrics may be an indicator of an inconsistency in how the benchmark parameters are set. In this case, a regulator may perform further, more targeted analysis to uncover the underlying problem and adjust one or several benchmark parameters. We note that the current 'financeability pressures' pointed out by the stakeholders appear to be transitory rather than long-term – at least at the moment. There also does not appear to be evidence of actual regulated businesses having ongoing long-term problems with accessing capital markets.
    b. A transitory deterioration of financeability metrics can also be addressed by adjusting one or several benchmark parameters. For example, adjusting notional gearing or changing other assumptions about capital structure and financing practices of a benchmark entity (such as assuming some of the debt is raised as indexed-linked bond) might resolve some financeability concerns. Given the transitory nature of the phenomenon that led to the adjustments, it would be prudent to periodically re-visit the appropriateness of maintaining the adjustments made.
2. NPV-neutral revenue re-profiling

As we demonstrated above, at least some financeability metrics – such as FFO to net debt ratio – are affected by the regulatory depreciation allowance.[200] Therefore, it may be possible to address financeability concerns by re-profiling depreciation allowance. There are other types of regulatory revenue re-profiling that have a similar effect. For example, removing RAB indexation from the regulatory model.

Some stakeholders – and regulators – advocate for such adjustments noting that they are NPV-neutral, which appears to imply that they are 'costless' for consumers and beneficial for the regulated businesses.

We observe, however, that, in general, such adjustments are not 'costless' – and might not even be NPV-neutral.

a. First, such revenue re-profiling approaches affect the duration of regulatory cash flows (shorten it) and might affect the rate of return on capital that investors would require. For example, Oxera relies on the intertemporal CAPM to note:[201]

…even for risk-free securities, such as government bonds, the rate used to discount cash flows generally increases with maturity (ie, an upward-sloping yield curve). …Applying this framework to regulated utilities, … an increase in cash-flow duration is likely to result in an increased cost of equity as the term-premium effect dominates.

Oxera also notes that there may be another reason for an increase in the required rate of return as cash flow duration increases – time-inconsistency problems in relation to the regulatory regime:[202]

As a result of time-inconsistency problems, investors may perceive increased risk from extending the duration of cash flows unless regulators are able to commit to the 'regulatory contract' over the life of the asset.

It follows from above that allowing for revenue re-profiling (and thus shortening the duration of regulatory cash flows) may in some circumstances decrease the required rate of return. If the revenue re-profiling is NPV-neutral with unchanged rate of return, then it would be NPV-positive once the change in the underlying rate of return is taken into account.

That being said, we note that the regulatory time-inconsistency issue described by Oxera is less likely to be relevant in the context of the Australian energy sector regulation – especially since the introduction of the binding RoR instrument.

b. Second, it is conventional in economics to think of individual consumers as risk averse rather than risk neutral. Therefore, even if a change to consumers' bills leaves their budgets unaffected in net present value terms, it does not

200 Note that both the numerator and denominator of the FFO to net debt ratio are affected by changes to depreciation profile – and, other things being equal, the ratio increases with increases in depreciation allowance.

201 Oxera, Meeting the financeability challenge in energy networks, July 2010 (https://www.oxera.com/wp-content/uploads/2018/03/Meeting-the-financeability-challenge-in-energy-networks_1.pdf), in *Agenda, Advancing economics in business*, accessed 12 April 2021, p 3.

202 Oxera, loc. cit.

follow that their welfare is unaffected. Below we provide two reasons why consumer welfare may deteriorate as a result of a revenue re-profiling even when it is NPV neutral.

i. NPV-neutral revenue re-profiling aims to address financeability concerns in relation to a regulator's decision. Such financeability concerns may arise when a regulator has reasons to believe that a benchmark efficient entity (or possibly an actual regulated entity) has problems accessing funds in capital markets and therefore meeting its financial requirements or efficiently raising new capital. That is, a regulator may be concerned the entity might not be able to raise necessary funds at the rate consistent with the regulatory return on capital allowance.

   While aiming to improve financeability of regulated entities, revenue re-profiling essentially forces consumers to lend at the rate consistent with regulatory allowance – in a situation where neither banks nor private investors are ready to. Such reallocation of risks towards consumers hardly seems like a change that would leave the consumers as well off.

ii. Further, generally a regulator decides on a sequence of regulatory allowances, based on considerations of economic efficiency (as well as other legislative requirements) – such as those described in the National Electricity Objective. Economic efficiency leads to aligning pricing and revenue requirements with efficient economic costs of providing regulated services.

   When revenue allowances are shifted around via revenue re-profiling, gaps arise between the efficient costs of providing services and revenue recovered from the consumers of such services. For example, by accelerating depreciation or tilting revenues forward in some other way, regulated businesses would recover more from the contemporaneous consumers – and less from future consumers. In this way, contemporaneous consumers would be paying inefficiently too much and future consumers too little for the services they obtain.

To summarise the above discussion, a regulator needs to weigh any perceived benefits associated with addressing financeability concerns against the costs such measures might have in terms of economic efficiency and consumer welfare.

Appendix C. Previous work from AER on financeability

Examples of our previous considerations on financeability are set out below.

The AER's financial viability appendix to the NSW 2014-19 determination final positions

Financeability concerns were first raised in the New South Wales 2014-2019 determination process by ActewAGL, Ausgrid, Endeavour Energy and Essential Energy. The New South Wales NSPs claimed their financial viability was at risk due to:

- a large reduction in the operating expense allowance as a result of a change in the methodology used to forecast operating expenditure[203], and
- not immediately receiving the trailing average cost of debt. The Network Service Providers claimed that their debt costs reflected historical debt costs and a transition to the new cost of debt approach was not necessary.[204]

In this process we tested various assumptions from the NSPs. Our consultant, RSM Bird Cameron, modelled several scenarios and found there was not a material risk of insolvency under the scenarios New South Wales NSPs submitted.[205]

The 2018 rate of return instrument

The 2018 rate of return instrument did not implement any financeability assessment as part of determining the rate of return and financeability was not used as a cross-check on the reasonableness of the rate of return.[206] This was consistent with our approach in the 2013 Guideline.

Regulated networks and related parties did raise concern about financeability. Their main concern was that the returns under the draft instrument would place their credit ratings at risk.[207] Furthermore, Energy Networks Australia and The Australian Pipeline and Gas Association suggested the AER conduct financeability test and use it as a cross check for the rate of return instrument.[208]

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203 CEPA, *Benchmarking and setting efficiency targets for the Australian DNSPs: ActewAGL distribution*, January 2015, p. 16.

204 ActewAGL, *Revised Regulatory Proposal*, January 2015, p. 43.

205 RSM Bird Cameron, *Independent review of the AER's internal cash flow analysis of insolvency risk for NSW electricity service providers for the regulatory period 2014-19*, April 2015, p.12.

206 AER, *2018 Rate of Return Instrument*, December 2018, p.393.

207 APA, *Review of the rate of return guidelines APA submission responding to AER draft guidelines*, 25 September 2018, p. 6-7; APGA, *Submission to the AER 2018 rate of return guideline draft decision,* 25 September 2018, pp 33-34; Joint Energy Business, *Submission on AER draft guidelines*, September 2018, pp 4-5; Spark - Follow up letter to the AER after meeting with the Department of Environment on 20 June 2018, p.4.

208 ENA, *AER review of the rate of return guideline response to draft guideline*, 25 September 2018, pp.161-162; APGA, *Submission to the AER 2018 rate of return guideline draft decision*, 25 September 2018, pp 33-34.

The Australian Energy Council (AEC) dismissed the networks' financeability concerns. They provided support for the proposition that NSPs tend to have a higher credit rating than that implied by their leverage and coverage metrics, as per the credit rating agencies' assessment.[209]

In our draft decision, we did not use financeability to inform our rate of return for the following reasons:

- Financeability assessments used by rating agencies considered the overall cash flows of the regulated firm and not just the cash flows from the allowed rate of return
- We did not consider the financeability assessment would be helpful in a regulatory context if it were to be undertaken using the assumptions that underpinned the allowed revenue. Given that the cash flows under the financeability assessment matched the allowed revenues and there were no timing issues.
- We did not consider it would be appropriate to undertake a financeability assessment using the actual costs of a service provider. This was because our objective were to provide an efficient allowance for the benchmark firm. A firms actual costs may not be efficient.

In our final decision, we upheld our draft decision. We considered it unlikely that the 2018 rate of return instrument would place credit rating at risk because any regulated firms under financial metric pressure are expected to take countermeasures to protect their credit profiles. Countermeasures include reducing the proportion of capital expenditures funded by debt, reducing capital or operating expenditures and reducing dividends. Importantly, we found that the overall rate of return would provide sufficient revenue to allow firms to take countermeasures needed to maintain financial metrics to support investment grade credit ratings.[210]

The AER's submission to the AEMC

In this process we made a submission to the AEMC rule change process that examined whether current regulatory framework supported efficient investment for large actionable ISP projects. TransGrid and ElectraNet made a rule change request to the AEMC to (1) remove asset base indexation and (2) allow deprecation to be recovered on an incurred basis for actionable projects in order to make them financeable. The proposed changes had the effect of moving revenue to the earlier years of the ISP project in a net present value manner.

In our submission to the AEMC we considered that TransGrid/ElectraNet had made the case for the proposed rule changes. The financing challenges faced by actionable ISP projects is common for large projects. We also noted:

- The inputs into the RoRI are for calculating an allowed rate of return that is commensurate with the efficient financing costs of the investment, but go no further. We

209 Energy Consumers Australia, *Response to the AER Draft Guideline*, 25 September 2018, pp 9-10.
210 AER, *Rate of Return Instrument, Explanatory Statement*, December 2018, p. 393.

do not expect all regulated firms to operate consistently with the benchmark assumptions.[211]

- Financeability should be principally managed by regulated firms.[212]
- The financing challenges NSPs face on large investments is not unique and is faced by other firms with revenue streams that are increasing with inflation.[213]
- Regulated firms can vary their capital structures. It is expected NSPs will target a credit rating based on their specific position and objectives. Past data indicates there are a range things NSPs do to optimise their overall capital structure and make regulatory investments financeable.[214]
- In the 2018 RoRI we found that the overall allowed rate of return is relatively invariant to changes in gearing. Therefore, our regulated rate of return should be sufficient for all NSPs to finance their operations.[215]

On 4 February 2021 the AEMC released draft determinations rejecting the rule change proposals.[216] We put in a submission in support of the AEMC draft rule determinations.[217] AEMC released its final rule determination on 8 April 2021 which upheld its draft rule determination.[218]

211 AER, *Submission to AEMC consultation paper on TransGrid and ElectraNet rule change derogation proposals related to financeability*, 3 Dec 2020, pp 5-6.

212 AER, *Submission to AEMC consultation paper on TransGrid and ElectraNet rule change derogation proposals related to financeability*, 3 Dec 2020, p. 2.

213 AER, *Submission to AEMC consultation paper on TransGrid and ElectraNet rule change derogation proposals related to financeability*, 3 Dec 2020, p 14.

214 AER, *Submission to AEMC consultation paper on TransGrid and ElectraNet rule change derogation proposals related to financeability*, 3 Dec 2020, p 12.

215 AER, *Submission to AEMC consultation paper on TransGrid and ElectraNet rule change derogation proposals related to financeability*, 3 Dec 2020, p 11.

216 AEMC, *Draft rule determination, National electricity amendment (participant derogation — financeability of ISP projects (Transgrid)) rule 2021*, 4 February 2021, p. iv.

217 AER, *Submission to AEMC draft rule determination paper on TransGrid and ElectraNet rule change derogation proposals related to financeability*, 5 March 2021, p 1.

218 AEMC, *Final rule determination, National electricity amendment (participant derogation — financeability of ISP projects (Transgrid)) rule 2021*, 8 April 2021, p. i.

Appendix D. Moody's credit rating methodology

We took extracts from the AEMC and CEPA report that outlines Moody's credit rating methodology.

The text box below is an extract from CEPA's report that describe the main factors Moody's consider in determining the overall credit rating for regulated electric and gas network.

Text Box 2: Moody's scorecard approach

Moody's adopts a scorecard approach, where the overall credit rating is the result of a weighted average calculation that combines key financial ratios with a range of qualitative elements.

The scorecard includes four main factors:

1. **Regulatory Environment and Asset Ownership Model** – These aspects are capable of affecting the predictability and timeliness of the network's cash flows and the network's ability to earn revenue from its assets.
2. **Size and Complexity of Capital Program** – This factor considers the network's investment plan and the execution risks associated with it.
3. **Financial Policy** – This factor considers the company's management track record of financial policies and whether this is favourable to creditors.
4. **Leverage and Coverage** – This factor considers the network's ability to service its debt in light of its cash flows and asset base.

Each of the above four factors comprises one or more specific sub-factors. The scorecard is used to produce an overall indicated rating for the regulated network through the following steps:

- Moody's rate networks against each sub-factor individually, assigning it an 'alpha' category grade – i.e. one of Moody's broad ratings of Aaa, Aa, A, Baa, Ba, B, and Caa. The assessment of Factor 4, Leverage and Coverage, relies on four financial ratios based on company accounts (FFO / Net Debt, FFO interest coverage, RCF / Net Debt, and Net Debt / RAB), whereas factors 1-3 are based primarily on a more qualitative assessment. An exception to this is Factor 2, where Moody's may consider the ratio of the annual capital expenditure to the existing asset base.
- Each sub-factor's alpha category rating is converted into a numerical score.
- Moody's calculate a weighted average of the numerical scores. This process is based on a set of standard weights that reflect the relative importance of each sub-factor. However, sub-factors that receive a lower rating (Baa or below), are overweighted by applying a multiplier to their standard weight. This reflects the consideration that for the purpose of determining credit risk, a weakness in a specific area would not be completely offset by a strength in another area, and therefore lower scores should have a greater impact on the average than higher scores. Weights are re-scaled to a total of 100% after overweighting is applied.
- The weighted average is mapped back to an alphanumeric rating, this time using more detailed rating bands (e.g., Aaa, Aa1, Aa2, Aa3, A1, etc.), providing an initial overall rating of the network: the 'scorecard-indicated outcome' or 'grid indicated outcome'.
- A fifth factor, 'Structural Considerations and Sources of Rating Uplift from Creditor Protection', is used to adjust the initial scorecard-indicated outcome by 'notching up' the rating. This factor considers features that reduce the likelihood of default or that give creditors the ability to promote corrective action against credit deterioration.

Source: CEPA, Financeability of ISP Projects, 27 January 2021, p.21

Below is an extract from AEMC's consultation paper for the TransGrid and ElectraNet rule change proposal which outlines the weights Moody's assign to each of the factors, and sub-factors.

Table 2.1: Moody's credit rating methodology

FACTOR	FACTOR WEIGHTING	SUB-FACTOR WEIGHTS
Regulatory environment and asset ownership model	40%	1. Stability and Predictability of Regulatory Regime (15%) 2. Asset Ownership Model (5%) 3. Cost and Investment Recovery (15%) 4. Revenue Risk (5%)
Scale and complexity of capital program	10%	Scale and Complexity of Capital Program (10%)
Financial policy	10%	Financial Policy (10%)
Leverage and coverage	40%	1. Funds from operations (FFO) Interest Coverage (10%) 2. Net Debt / RAB (12.5%) 3. FFO / Net Debt (12.5%) 4. Regulated cash flows (FFO minus dividends) / Net Debt (5%)

Source: AEMC, *Consultation paper*, *National electricity amendment (participant derogation — financeability of ISP projects (Transgrid)) rule 2021*, 5 November 2020, p. 10.