ATCO

16 February 2022

Mr Steve Edwell
Chair
Economic Regulation Authority
Level 4, Albert Facey House
469 Wellington Street
Perth WA 6000

Dear Mr Edwell

Re: Rate of Return Instrument Discussion Paper

Thank you for the opportunity to respond to the Rate of Return Instrument Discussion Paper published in December 2021. This letter outlines a submission from ATCO Gas Australia (ATCO).

As an owner and operator of energy and logistics infrastructure in Australia for over 60 years, ATCO is proud of its ongoing commitment to supporting the communities in which we operate. ATCO is a long-term investor with a clear vision of delivering customer value through sustainable growth, continuous investment, improvement and innovation.

Since 2018 there have been changes in our operating environment that must be considered throughout the rate of return review process.

Australia's commitment to be net zero by 2050 was formalised at COP26 in Glasgow in 2021. This is welcomed by ATCO and aligned with ATCO's own path, however this commitment creates uncertainty for future gas use across Australia. This disruption highlights the importance of regulatory certainty and appropriate investment signals to ensure that customers continue to receive safe, affordable and reliable energy.

Our stakeholders, investors, rating agencies, and other key financial, policy and government stakeholders are increasingly looking for companies to make their environmental, social and governance (ESG) performance more transparent and publicly commit to decarbonise. In January 2022, ATCO first shared its ESG targets for achievement by 2030 and its net zero by 2050 commitment. ATCO is not alone in making these commitments and this is reflected in sentiment across society. These targets will help us measure our progress in many areas, including accelerating the energy transition. ATCO is exploring many areas to reduce emissions and we are committed to offset any residual emissions. The emerging influence of ESG on the rate of return for gas networks has not been reflected in the Discussion Paper. This is an important matter for the ERA to consider ahead of its draft Rate of Return Instrument and could potentially affect the cost of debt or equity.

ATCO is concerned that there continues to be a material difference in the regulated rate of return between other jurisdictions, including North America, and the ERA's position in the Discussion Paper. The Alberta Utilities Commission (AUC) commenced their Generic Cost of Capital Review to determine the rate of return applicable for 2023 in January 2022. The AUC are considering extending the current nominally based 8.5% return on equity cost-of-capital parameters into 2023. A decision on the 2023 cost of capital is expected by 31 March 2022. The AUC will then undertake a review of its cost of capital

on a go-forward basis from 2024. This review will occur over the second half of 2022 and the first half of 2023. ATCO will bring relevant submissions and expert testimony from these processes to the attention of the ERA as they become available.

ATCO is an active strategic investor as opposed to a passive financial investor. This allows us to innovate and create the conditions for our communities and customers to directly benefit from this work. The continuation of the low returns outlined in the Discussion Paper will have the unintended consequence of curtailing innovation, growth and competitiveness when it is needed most by the community.

During this review we encourage the ERA to further consider what changes are needed to the Rate of Return Instrument in order to reflect the new circumstances that were not as prevalent when the 2018 Instrument was made. Adjusting elements of the rate of return to address these new circumstances should be subject to further investigation by the ERA throughout this review.

Overarching comments

The ERA's Discussion Paper outlines an incremental approach in this review of the Rate of Return Instrument. Whilst ATCO supports the regulatory stability that comes from an incremental review, we recognise that some areas of the Rate of Return Instrument need change to reflect the new circumstances that were not as prevalent when the Instrument was made in 2018. Amendments are needed to adapt to the evolving landscape, the evolution of our operating environment driven by decarbonisation and to ensure the right balance between sustainable investment, customer needs and the long term viability for owners and consumers.

ATCO makes the following overarching comments on the changes that are needed to the Rate of Return Instrument. The attached submission elaborates on these observations:

- **Nominal modelling** – ATCO supports the application of the rate of return framework on a nominal basis. Nominal modelling is part of the regulatory response to the uncertainty flowing from decarbonisation and other changes in the operating environment. The ERA must consider a transition to a nominal revenue modelling approach as part of this rate of return review given the intergenerational impacts to customers (future customers pay for today's inflation cost) and to reduce the uncertainty of the timing of the recovery of efficient costs.

- **Term of equity risk-free rate** – ATCO does not support the 5 year term for the equity risk free rate and instead supports long dated bonds being adopted to estimate the equity risk free rate. This is because long dated bonds reflect investors' long term investment horizons, and is consistent with the underlying financial theory, market and other regulators' practice (within Australia and globally). ATCO does not agree that the regulatory period is the relevant time horizons for estimating the equity risk free rate.

- **Market risk premium (MRP)** – ATCO's view is that: 1) in determining the historic MRP that the ERA must rely solely on the arithmetic mean and replace the 1988 to 2021 dataset with the 2000 to 2021 period, 2) that explicit weight should be applied to the DGM forward estimate and 3) that the MRP must be calculated mechanistically at the time of each Access Arrangement decision.

- **Beta** – ATCO supports the ERA further developing it's set of international comparators.

- **Gamma** – ATCO encourages the ERA to also seek clarification from the Australian Taxation Office (ATO) on tax statistics and adopt the simpler ATO method of calculating gamma based on franking credits redeemed divided by franking credits created to avoid an estimate based on inconsistent data.

I look forward to continuing to work with the ERA throughout this review process. If you have any questions or would like to discuss any of these matters further please contact me or Hugh Smith, General Manager Regulation and AA6 Lead.

Yours sincerely
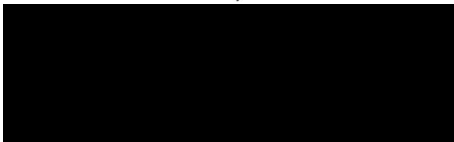
John Ivulich
Chief Financial Officer

Attachment 1: ATCO submission

ATTACHMENT 1: ATCO SUBMISSION
2022 RATE OF RETURN INSTRUMENT DISCUSSION PAPER

GAS DIVISION

16/02/2022

Contents

1. INTRODUCTION

ATCO welcomes the opportunity to respond to the Economic Regulation Authority's (ERA) Discussion Paper titled "2022 Gas Rate of Return Instrument Review" dated December 2021.

The ERA's Discussion Paper outlines an incremental approach in this review of the Rate of Return Instrument. Whilst ATCO supports the regulatory stability that comes from an incremental review, we recognise that change in some areas of the Rate of Return Instrument is needed. This is in order to reflect the new circumstances that were not as prevalent when the Instrument was made in 2018.

1.1 Overview

ATCO's response to the Discussion Paper is summarised in the following table:

Table 1-1: Summary of ATCO's support for the ERA's Initial Position in the Discussion Paper

Parameter	Summary of ATCO's position
Nominal Modelling	ATCO supports the application of the rate of return framework on a nominal basis because of the intergenerational impacts to customers (future customers pay for today's inflation cost) and to reduce the uncertainty of the timing of the recovery of efficient costs.
Term of the WACC	ATCO does not support the 5 year term for the equity risk free rate and instead supports long dated bonds being adopted to estimate the equity risk free rate because it reflects investors' long term investment horizons.
	ATCO supports the 5 year term for the debt risk free rate and the forecast of inflation.
Averaging period process	ATCO supports the initial position to allow the averaging period to be extended up to 40 business days, but does not support changing the debt risk premium period from 2 months to 3 months prior to the end of the calendar year.
Gearing	ATCO supports the initial position to adopt 55%.
Inflation	ATCO supports the initial position to continue to apply the Treasury bond implied inflation approach.
Return on debt	
Risk free rate of return	ATCO supports the initial position to adopt the bank bill swap rate for the risk free rate.
Benchmark credit rating	ATCO supports the initial position to continue to adopt BBB+
Debt risk premium	ATCO supports the initial position to continue to adopt the 10 year hybrid trailing average method
Debt and equity raising costs	ATCO supports the ERA undertaking further consultation on the findings of Chairmont's review when it is complete to ensure that all efficient costs are recovered.
Return on equity	
Risk free rate of return	ATCO supports the initial position to continue to adopt Commonwealth Government Securities

Parameter	Summary of ATCO's position
Market risk premium	ATCO does not support the initial position and instead considers that the ERA must adopt the arithmetic averaging method, must place explicit weight on the DGM and that the MRP must be calculated mechanistically at each Access Arrangement decision. The DGM is important because it provides a forward-looking estimate of the MRP, and because the evidence shows that the MRP and the RFR are not independent.
Equity beta	ATCO supports the initial position and considers that the ERA should further develop the method to incorporate international comparators into the estimate of beta. Since there is very little current evidence on beta from the Australian market, it is necessary either to look internationally or to rely on out-of-date Australian data. The former is much better than the latter.
Gamma	ATCO does not support the initial position and instead encourages the ERA to seek clarification from the Australian Taxation Office (ATO) on tax statistics and adopt the simpler ATO method of calculating gamma based on franking credits redeemed divided by franking credits created to avoid an estimate based on inconsistent data.

1.2   Document structure

This document details ATCO's submission on the Discussion Paper. The document is structured as follows:

- Section 2 outlines ATCO's support for the application of the rate of return framework on a fully nominal basis. The ERA should consider incorporating a transition to a nominal revenue modelling approach as part of the rate of return review.

- Sections 3 – 9 are largely structured around the questions posed by the ERA in the Discussion paper. We restate the question followed in each case by ATCO's response.

- Section 10 discusses the need for the Rate of Return Instrument to address the effect of financial market shocks more explicitly by updating the DGM and historical arithmetic average estimate of MRP at the time of setting an access arrangement rate of return.

2. A NOMINAL FRAMEWORK

ATCO supports the application of the rate of return framework on a nominal basis.

The ERA should consider incorporating a transition to a nominal revenue modelling approach as part of the rate of return review. A nominal modelling framework better matches expected returns to allowed returns and supports the long term interests of consumers. Better matching of expected to allowed returns provides incentives for greater alignment to efficient investment in the long term interests of consumers. A nominal modelling framework is additionally in the long term interests of consumers by improving intergenerational equity in a no longer perpetually growing market and also lowering the lifetime costs to consumers.

The benefits of a nominal modelling framework compared to a PTRM framework are detailed in the following sections.

2.1 Expected returns

A nominal allowed revenue modelling framework aligns allowed returns to investors' expected returns to create better incentives for efficient investment due to deficiencies in the PTRM revenue modelling framework.

The PTRM framework:

- Results in a real return on the regulated asset base rather than the nominal return which is required at any point in time to compensate both debt and equity investors in cash. These issues have been covered extensively in the AER's 2020 inflation review[1].

- Requires that a forecast of inflation be made to determine the estimated real return expected by investors. Requiring an estimate to be made adds another source of potential error to the return estimate.

- Breaches the NPV = 0 principle. Efficiently incurred debt costs are nominal and do not vary with outturn inflation. Modelling debt contracts "as if" interest payments rise/fall with actual inflation does not reflect reality and will not result in revenue matching benchmark efficient costs (will not result in an NPV=0 outcome). The estimated nominal portion of expected returns at the start of an access arrangement period is not received. Instead, some likely different amount is added to the RAB at the end of the access arrangement period. Where the actual inflation added to the RAB at the end of an access arrangement period differs from the estimate of inflation deducted from the RAB depreciation during the access arrangement period the NPV=0 principle is breached. The investor has not received the expected nominal return as at the start of the access arrangement period.

A nominal modelling framework provides:

- **Reduced complexity:** Inflation and real returns do not have to be estimated nor indexation of the RAB calculated.

- **Better investment signals:** NSP's recover efficient financing costs. Investment decisions lie correctly with the NSP. Investment and financing risks are correctly allocated to the party that can best manage the risk. Period to period windfall gains and losses to consumers and NSP's are eliminated. A source of potentially breaching the NPV=0 principle is eliminated.

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[1]   AER, Draft position paper, Regulatory treatment of inflation, October 2020, available at: https://www.aer.gov.au/system/files/AER%20-%20Draft%20position%20paper%20-%20Regulatory%20treatment%20of%20inflation%20-%20October%202020_0.pdf: and for example Energy Networks Australia response available at; https://www.aer.gov.au/system/files/ENA%20-%20Submission%20to%20draft%20position%20-%202020%20inflation%20review%20-%20November%202020.pdf

2.2 Long-term interests of consumers[2]

A considered transition to full nominal modelling is in the long-term interest of consumers for the following reasons:

- **More equitable allocation of costs to consumers over time** - The National Gas Objective has an emphasis on the long term, dynamic dimension of efficiency and on future consumers. Continuing the current PTRM approach of deferring revenue is not in the interests of future consumers as it does not account for rapid technology changes. The consequent flattening of total demand will place an increased burden on future customers. Adoption of a nominal modelling approach by stopping the deferral of revenue under the PTRM framework will provide a more equitable intergenerational allocation of costs and achieve a flatter real tariff path over time.

- **Lower aggregate network costs for consumers** - Over time the nominal approach results in consumers paying less, in total, to network service providers than the current approach. This is because of the compounding that occurs in the regulated asset base resulting in the total bills paid by consumers being higher than under the nominal approach. Over time the nominal approach results in a net present value benefit to consumers when compared against the opportunity cost of the average consumer's mortgage.

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[2]   These matters were covered in detail in ATCO's submission to the AER's inflation review available at:
https://www.aer.gov.au/system/files/ATCO%20Australia%20-%20Submission%20to%20draft%20position%20-
%202020%20inflation%20review%20-%20November%202020.pdf

3. THE TERM OF THE WACC

> **Question 1**
>
> Do you agree with the use of a five-year term of estimates of the rate of return? If not, please explain why and your alternative approach.

ATCO does not support the 5 year term for the equity risk free rate and instead supports long dated bonds being adopted to estimate the equity risk free rate because it reflects investors' long term investment horizons. ATCO supports the 5 year term for the debt risk free rate and the forecast of inflation.

ATCO agrees with the ERA that the term of the required rate of return on an asset relates to the expected investment time horizon.[3] However, ATCO does not agree that the regulatory period is the relevant time horizon for estimating all of the parameters of the rate of return for regulatory purposes. Although the rate of return applies for the regulatory period, the regulatory period is not the expected investment time horizon for an investor which is typically longer due to the long life of infrastructure assets. Therefore, the rate of return parameters should be set with regard to this longer investment time horizon.

Dr Lally, in his report to the AER, found that the term of the risk free rates for debt, equity and the inflation forecast period are independent of each other.[4] In light of this finding ATCO's position on the time horizon for each element of the rate of return are:

- **Equity** - ATCO does not agree with the continued adoption of the five-year term for equity returns. A longer term for the equity risk free rate is more appropriate given investors' longer investment time horizon. ATCO is not aware of any other regulator using a five-year term for the cost of equity, except for the NZCC. The NZCC uses a five-year risk free rate but the NZCC also estimates a distribution for the vanilla WACC and sets the allowed rate of return above the mid-point of the vanilla WACC. All other regulators use a longer term risk free rate.

- **Debt** - ATCO supports continuation of a five year term for the debt risk free rate and a ten year term of the debt risk premium as it is consistent with the debt strategy that underpins the cost of debt estimates.

- **Inflation** - ATCO supports continuation of a five year term for inflation as it relates to cost increases expected over the regulatory period.

The following sections provide further discussion on the term for each element of the rate of return.

3.1 Equity

ATCO supports a longer than five year term for the equity risk free rate because it is more reflective of investors' longer investment time horizon.

A 10 year or longer term best promotes the National Gas Objective (NGO) and efficient investment in gas networks by ensuring that investors receive a rate of return that is estimated as best as possible to match their expected return on the investment. Investors in gas networks take a long-term view of their investment and they expect a return based on a longer term investment horizon, which is generally regarded as ten years or more. To set a return estimated based on a shorter period would be inconsistent with the NGO.

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[3]   ERA, 2022 Gas Rate of Return Instrument Review - Discussion Paper, December 2021, pg 20
[4]   Lally, M., *The appropriate term for the allowed cost of capital*, April 2021, pg 21

The ERA must adopt a longer than 5 year term for the equity risk free rate for the following reasons:

1. Best meets the NPV = 0 principle
2. Consistent with theory underpinning the Sharpe Lintner CAPM and academic literature
3. Consistent with application of the CAPM by market practitioners
4. Consistent with regulatory practice

The sections below expand on each of these points.

3.1.1 Achieving NPV=0 requires a risk free rate term greater than 5 years

The NPV = 0 principle is the basis for the ERA's initial position of using a five year term for the equity risk free rate.[5] In reaching its initial position the ERA has relied on Dr Lally's recent advice to the AER stating to achieve the NPV = 0 principle it is necessary to match the term of the risk free rate to the regulatory term of five years.[6]

The ERA must reconsider the relationship between the term of the equity risk free rate and the NPV = 0 principle because:

- The NPV=0 principle requires that the allowed return is just enough to cover the required return of and on invested capital over the *life of the asset* not necessarily the regulatory period.

- Equity has a perpetual term, and the equity risk-free rate should as closely as possible match the horizon over which equity investors assess required returns.

- Equity investors in network infrastructure assets have a long-term investment horizon that may extend beyond the life of any one asset and certainly extends beyond the length of a 5-year regulatory rate-setting cycle.

- Dr Lally's conclusions rely on unrealistic assumptions.

NPV = 0 principle relates to the life of the asset

The NPV=0 principle is generally regarded as being related to the life of the investment. The AER in its 2018 RORI review described it as:

> "A zero NPV investment means that the ex-ante expectation is that **over the life of the investment** the expected cash flow from the investment meets all the operating expenditure and corporate taxes, repays the capital invested and there is just enough cash flow left over to cover investors' required return on the capital invested."[7]

The AER's 2018 RORI review also considered consistency of a ten-year and a five-year risk free rate term with the NPV = 0 principle. In particular, the AER confirmed that it could set the rate of return in a way that is consistent with the NPV=0 principle but not be tied to the length of the regulatory period:

> "As the regulatory regime is ex-ante, we consider a rate of return that meets the objectives [NEO and NGO] must provide ex-ante compensation for efficient financing costs. This is a zero net present value (NPV) investment condition, …"[8]

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5   ERA, 2022 Gas Rate of Return Instrument Review - Discussion Paper, December 2021, pg 20
6   Lally M., The appropriate term for the allowed cost of capital, May 2021
7   AER, Rate of Return Instrument Explanatory Statement, December 2018, pg 35, emphasis added
8   AER, Rate of Return Instrument Explanatory Statement, December 2018, pg 35, emphasis added

Our conclusion is that the AER viewed its compliance with the NEO and NGO through the lens of the NPV=0 principle. The AER achieved consistency with the NPV = 0 principle by adopting a 10 year term for the risk free rate rather than aligning to the regulatory period of five years. Generalising the reasoning behind the conclusion reached by the AER, the NPV=0 principle is satisfied by considering the returns over an asset's economic life. Further, the discount rate for the NPV calculation should reflect the investment returns available in capital markets for investments in securities of equivalent risk (*i.e.*, the opportunity cost of capital), which for equity investors in network infrastructure assets is informed by a long-term investment horizon. Given the long life of regulated utility assets, and that ten-year bonds are the longest easily observable term for Australian Government bonds, a 10 year risk free rate is a best available proxy of the risk free rate to determine the required equity returns to discount cash flows over an asset's economic life.

Dr Lally's conclusion

ATCO acknowledges that Dr Lally's previous advice to regulators concludes that the term of the risk free rate should match the regulatory period.[9]

ATCO supports the detailed analysis of Dr Lally's work contained in the Energy Networks Association's (ENA) submission to the AER on this matter.[10] The ENA's analysis finds that it would be wrong to conclude that the term of the risk free rate must be set to five years in order to be consistent with the NPV=0 principle.

In particular, ATCO does not support Dr Lally's conclusions because:

- **Assumption that the market value is certain at the end of the period** - The conclusion reached by Dr Lally relied on the assumption that the market value of the firm at the end of the regulatory period is *assumed* to be known with certainty at the beginning of the regulatory period.[11] Subsequently, Dr Lally in his 2021 report to the AER acknowledges that the end of period market value of the RAB, which should be the market value of the firm, cannot be known with certainty.[12] Dr Lally attributes this, for example, to errors on the part of the regulator in setting revenues for subsequent periods.[13] This acknowledgement renders Dr Lally's conclusion not applicable in the real world.

- **Market value of gas networks have never been more uncertain** – The value of equity investors' investments in gas networks has never been more uncertain due to Government policy to achieve the net zero by 2050 target and the resultant potential Government actions that limit the future viability of gas networks. The market value at the end of the period cannot be known with any certainty. This gas network specific uncertainty is also relevant to the estimation of beta discussed in section 7.4.

3.1.2 Consistency with Sharpe-Lintner CAPM and academic literature

Relating the term of the risk free rate to a single regulatory period is not required by nor consistent with the use of the Sharpe Lintner CAPM.

In adopting a 5-year term the ERA have stepped away from the theoretical underpinnings of the Sharpe-Lintner CAPM model. The concept underpinning the Sharpe-Lintner CAPM is that an investor has a single investment horizon and the investor holds their fixed portfolio for that single fixed investment horizon. At the end of that period the investor sells all their assets and

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[9]   For example: Lally, M., The risk free rate and the present value principle, August 2012, and Lally M., The appropriate term for the allowed cost of capital, May 2021
[10] Energy Networks Australia, July 2021, The term of the rate of return, Response to Draft AER Working Paper, pg 35-42
[11] Lally, M., The risk free rate and the present value principle, August 2012, pg 14
[12] Lally, M., The appropriate term for the allowed cost of capital, May 2021, pg 9
[13] Ibid.

(presumably) consumes. There is no reinvestment in the Sharpe-Lintner CAPM. There is reinvestment in modifications to the Sharpe-Lintner CAPM (such as the Consumption CAPM).[14] However, the estimation of beta in those models is fundamentally different – with correlation of returns to rates of return on reinvestment being an important determinant of risk. The only reasonable assumption to use when implementing the Sharpe-Lintner CAPM is to adopt a proxy for the risk free rate that matches the investment horizon of investors.

In the Sharpe-Lintner CAPM an investor can optimise returns over their investment horizon, for a given level of risk, by holding the optimal amount of investments in riskless savings deposits or the optimal amount of borrowing (at the risk free rate). The risk free rate as used in the Sharpe-Lintner CAPM is the pure rate of interest that an investor can earn by lending at the pure rate or borrowing at the pure interest rate for a riskless asset.[15] This theory provides no support for linking the term of the risk free rate to the length of the regulatory period.

The SL-CAPM is a single period model with no term structure. The key assumption which underpins Dr Lally's conclusion that the term of the risk free rate must match the regulatory period is that equity has a term structure.[16] This is fundamentally inconsistent with the CAPM not having a term structure. The proposed ERA approach to the term of the risk free rate which relies on Dr Lally's rationale is therefore not consistent with the underpinning theory. This point has been addressed by Partington in a note to the AER's 2022 Concurrent Evidence Sessions:

> "If we seek guidance from the CAPM about the term structure of equity, we find that there is no term structure for either equity returns, or interest rates, since the CAPM is a single period model. The duration of the single period is undefined in the CAPM, it is the investment horizon assumed to be homogenous across investors. Unfortunately, investors are not in reality homogenous in their investment horizons. However, since equity is generally used as a long-term source of finance, the return on equity is generally considered a long-term rate of return. Given the nature of the underlying assets of the networks and the nature of their investors, for example pension funds, it is almost certain that the investment is made with very long-term rates of return in mind. Therefore, there are grounds to argue for a long horizon in implementing the CAPM." [17]

The traditional textbook application of the Sharpe-Lintner CAPM model adopts long-dated government bonds to estimate the risk free rate.[18] Other academic works support the use of a 10 year term for the risk free rate on the basis that longer dated, compared to shorter dated, Government bonds better reflects the long-term investment horizon of infrastructure investors. Academic works include those by Pratt & Grabowksi (2010), and Damodoran (2008) who argued that 10 year CGS yields were appropriate proxies for the risk free rate, as they reflect the long-term nature of the underlying assets.[19]

The leading Berk and DeMarzo finance textbook for example, supports the use of longer dated Government bonds for setting the risk free rate.

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14   Lucas, Robert E., "Asset Prices in an Exchange Economy". Econometrica. Vol.46, No. 6, November 1978, pg 1429–1445; Duffie, Darrell and Zame, William The Consumption-Based Capital Asset Pricing Model, Econometrica Vol. 57, No. 6 (Nov., 1989), pg 1279-1297

15   Sharpe, William F., Capital Asset Prices: A Theory of Market Equilibrium under Conditions of Risk, The Journal of Finance, Vol. 19, No. 3 (Sep., 1964), pg 431-433

16   See APGA, APGA Submission to the AER on Draft working papers term and the rate of return and cashflows in a low interest rate environment, 2 July 2021, pg 7

17   G. Partington, Concurrent Evidence Session: Commentary on Lally's Term Analysis, 7 February 2022, pg 4

18   Berk, J & DeMarzo, P, Corporate Finance, 3rd edition, 2014, Pearson, pg 404-406
      Brailsford, T., Heaney, R. & Bilson, C, Investments - Concepts and Applications, 2nd edition, 2004, pg 179
      Pierson, G., Brown, R., Easton, S. & Howard, P., Business Finance, 8th edition, 2003, pg 460

19   Shannon Pratt and Roger Grabowski, Cost of Capital: Applications and Examples, 4th ed. Hoboken: Wiley, 2010, pg 118– 120; Aswath Damodaran, 'What is the risk free rate? A search for the basic building block', December 2008

> *"When discounting risk-free cash flows we match the maturity of the interest rate to that of the cash flows. It is common to do the same when applying the CAPM…For example, where valuing a long-term investment with an indefinite horizon, such as a stock, most financial analysts report using the yields of long-term (10-30 year) bonds to determine the risk-free interest rate."[20]*

In summary, the academic literature supports adopting a ten year term to estimate the risk free rate. A ten year term better reflects the long term investment horizon of infrastructure investors and therefore provides a better estimate of the required return by those investors.

3.1.3   Market practice

Consideration of market practice in setting the equity rate of return is an important consideration because the rate of return should be as expected by investors in order to ensure efficient investment in the regulated asset.

The common market practice is to set the term of the risk free rate to 10 years on the basis that this is the longest easily observable term for Australian Government bonds. This practice is consistent with the view that infrastructure investments, including those subject to regulation, are long-lived investments with a long period over which cash flows are uncertain.

For example, the standard approach used in independent expert valuation reports is to set the risk free rate equal to the yield on 10-year Government bonds. These reports usually contain a statement to the effect that the use of a 10-year term assumption is standard practice among valuation professionals in Australia. Importantly, independent valuation experts uniformly adopt a ten year term when determining the risk free rate for infrastructure assets, including regulated infrastructure assets across a range of different industries.

The AER, in its 2018 Rate of Return Review, cited the 2013 and 2017 KPMG market practitioner surveys which indicated around 85 per cent of practitioners use 10 year CGS's as a proxy for the risk free rate.[21]

Further support of this market practice can be found in the ENA's submission to the AER regarding its Term of the rate of return draft working paper.[22]

3.1.4   Regulatory practice

Regulatory practice has evolved over the last decade with most Australian regulators adopting a 10-year term for the risk free rate.

Some Australian regulators previously adopted a 5-year risk free rate, but have since determined that a 10-year rate would be more consistent with their regulatory task because it better reflects the long-lived nature of the assets and standard commercial practice.

For example, iPART changed to a 10-year risk free rate in its 2013 WACC Review and has adopted a 10-year rate in all subsequent decisions. Similarly, in its assessment of Queensland Rail's 2020 draft access undertaking, the QCA moved from applying a 5-year term for estimating the risk free rate (which it has adopted in previous regulatory decisions) to applying a 10-year term.[23] In making this change, the QCA noted that other regulators have generally accepted the argument that the term

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[20]   Berk, J. and P. DeMarzo, 2020, Corporate Finance: Global 5th edition, pg 447-448, emphasis added
[21]   AER, Rate of Return Instrument Explanatory Statement, December 2018, pg 127
[22]   ENA, The Term of the rate of return, Response to Draft AER working paper, 2 July 2021, pg 28-29
[23]   QCA, *Decision – Queensland Rail 2020 draft access undertaking*, February 2020, pg 41-42

of the bond should be a proxy for the life of the regulated asset. It considered that a longer-term bond may also better reflect the expectations of investors, given the long-term nature of infrastructure asset investment.

Similarly, in its 2020 determination for SA Water, ESCOSA noted that a 10-year term was consistent with the long lived nature of the assets and with the standard commercial approach.[24]

Furthermore, most international regulators adopt a term greater than 5 years, as shown in the table below.

Table 3-1: International risk free rate term[25]

	Regulatory term (years)	Risk free rate term (years)				
		5	10	15	20	30
ACM	5		✓			
FERC	Varies *					✓
STB	1				✓	
ARERA	6		✓			
NZCC	5	✓				
Ofgem	5				✓	
Ofwat	5			✓		
CMA	5				✓**	

Note:

* FERC price determinations are evergreen until the utility, customers or FERC requests a new determination

** CMA determines the lower bound of the risk free rate using a 20-year maturity index linked gilt and the upper bound of the risk free rate using the average of the IHS iBoxx £ Non-Gilt AAA 10+ and 10-15 indices

The table shows that apart from the New Zealand Commerce Commission (NZCC) all international regulators included in the study used a term greater than 5 years. The NZCC however, sets the allowed return on capital at the 67th percentile of its WACC distribution. This system of setting the allowed return above the mid-point estimate is a key part of the New Zealand regulatory framework, and has the effect of lifting the 'effective' risk free rate (along with other WACC parameters).

In addition to the jurisdictions indicated in the table above, ATCO is also very familiar with rate of return determinations of the provincial regulator in Alberta, Canada. The regulator in Alberta relies on evidence about the 30-year risk free rate when determining the equity return.[26] Similarly, the provincial regulators in Ontario and Quebec use the 30-year risk free rate.[27] ATCO is not aware of any international regulators (other than the NZCC) using a risk free rate of shorter than 10 years.

In the light of Australian regulatory practice and the evidence from international regulators, the use of a ten year term (or greater) has been accepted as meeting the regulatory task at hand.

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24   ESCOSA, *SA Water regulatory determination 2020 – Final determination: Statement of reasons*, June 2020, pg 218
25   AER, Term of the rate of return draft working paper, May 2021, pg 21
26   For example, Alberta Utilities Commission Decision 22570-D01-2018, section 8.2.1
27   For example, OEB Staff Report, EB-2009-0084, Review of the Cost of Cost of Capital for Ontario's Regulated Utilities, January 14, 2016 and Régie d l'énergie, Decision D-2011-182, English Version

3.1.5   Conclusion

Basing the risk free rate on a longer rather than shorter term will provide a better estimate of the expected return to equity holders and is therefore more likely to promote achievement of the NGO. To achieve efficient investment, the rate of return must be set to match the required return of investors. If the return is too low under investment will occur. If the return is too high over investment will occur. Given that investors take a long term view and require returns commensurate with that view the term of the risk rate should also reflect that view.

A clear guide to the term of the risk free rate as it relates to investors' expected returns is provided by market practice, finance literature and the extensive consideration given to this matter by regulators which overwhelmingly point to a term of the equity risk free rate being a long-term rate, closer to the economic life of the underlying assets than to the term of the regulatory determination. In the Australian capital market, the ten year CGS is therefore an appropriate benchmark, and, in the context of the ERA's RORI framework, the ten year CGS is superior to the five year CGS.

3.2   Debt risk free rate

ATCO supports the risk free rate for debt being the five-year bank bill swap rate as the proxy to estimate the risk free rate for the return on debt. Use of the five-year bank bill swap rate is consistent with the efficient and implementable hybrid trailing average debt strategy.

Under the hybrid approach the business will enter into swap contracts to hedge the risk free rate every time it is reset during the regulatory review process. This strategy facilitates the service provider's ability to repeat the process for the next regulatory period. The continued adoption of the five-year bank bill swap rate is necessary for regulatory certainty to support this financing strategy.

To reiterate, the risk free rate terms for debt and equity are independent and need not be the same. For debt, a five year term is consistent with the efficient debt strategy. For equity a 10 year term is consistent with setting a rate of return expected by equity investors in the gas network.

3.3   Inflation estimation period

ATCO supports the term for the inflation estimate period being five-years. The primary consideration in determining the period over which inflation is estimated is ensuring the service provider receives the required return as it is estimated at the start of the regulatory period and to reflect expected inflation increases over the regulatory period.

The aim of the post tax revenue model (PTRM) used by Australian regulators to set regulated revenues is to preserve a real return to service providers. This is achieved by:

•   Adding actual inflation to the RAB to preserve the value of the investment in real terms.

•   Allowing a nominal rate of return on the RAB.

•   Deducting forecast inflation on the opening asset base from allowed nominal depreciation so that the inflation component of return is not received twice.

As it is actual inflation over the five year access arrangement period that is added to the RAB at the end of the period, to preserve the total nominal return to the service provider as best possible requires that inflation be estimated over five years. That is the forecast for inflation is of the actual inflation that will be added to the RAB[28]. Matching the period provides the best estimate of the inflation to be deducted from depreciation at the start of the period such that it as closely as possible matches the inflation added to the RAB at the end of the period. Therefore, the term of the inflation estimate is five years.

The AER in its inflation review summarised the situation as follows:

> *"We consider that it is more appropriate to match the length of the regulatory period rather than the term in the rate of return. Current market conditions have illustrated that not doing so may have a material impact on investment returns. In turn, this could lead to consumers paying more than necessary in the long run. **Matching the term of the regulatory period allows service providers to receive, ex-ante, the nominal rate of return set out in the Instrument** and may reduce financeability concerns."*[29]

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[28]   Note: The inflation forecast typically is done a fefew months prior to the start of an access arrangement period at a time consistent with the observation period of the risk free rate. Similarly, actual inflation added to the RAB has a lag of about three months to allow calculation of the RAB to be rolled forward into the subsequent access arrangement period at the time of the subsequent access arrangement decision.

[29]   AER, Final position, Regulatory treatment of inflation, December 2020, pg 48

4. AVERAGING PERIOD PROCESS

> **Question 2**
>
> Do you agree with the standardised averaging period process? If not, please explain why and your alternative approach

ATCO generally supports the ERA's proposed standardised averaging period process, including extending the averaging period to be up to 40 days. However, ATCO does not support changing the debt risk premium averaging period from 2 months to 3 months prior to the end of the calendar year.

The ERA has proposed that the averaging period for the debt risk premium within the access arrangement period must fall within a window of at least three months, but no longer than seven months, before the relevant regulatory year.[30] ATCO supports the continued adoption of the averaging window concluding two months before the end of the relevant regulatory year because:

- To date a period for 2 months has caused no issues for ATCO with completing the TVM calculations and submissions on time.

- TVM calculations cannot be completed in any case until the availability of inflation data. Therefore, a change to at least two months before the relevant regulatory period causes no additional delay.

- It allows for the estimate to be undertaken closer to the relevant regulatory year.

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[30]   ERA, 2022 Gas Rate of Return Instrument Review - Discussion Paper, December 2021, pg 26

5.   GEARING

> ### Question 3
>
> Do you support the use of a gearing level of 55 per cent for the 2022 gas instrument? If not, please explain why and your alternative approach.

ATCO supports the use of a gearing level of 55 per cent for the 2022 gas instrument because it allows for the recovery of efficient costs, consistent with the revenue and pricing principles.

> ### Question 4
>
> When determining gearing do you support the ERA adjusting debt and equity to recognise hybrid securities and what is a suitable method for allocating hybrid securities between debt and equity? If not, please explain why and your alternative approach.

ATCO supports in principle adjusting debt and equity for hybrid securities.

However, in order to support the specific outcomes, such as gearing resulting from the ERA adjusting debt and equity for hybrid securities, more information is required regarding how the ERA has made this adjustment. For example, the ERA must provide more information on what were the debt and equity characteristics of the hybrid securities considered by the ERA when allocating securities to debt or equity.

ATCO considers that a debt like instrument that can, or will be, converted into equity in some circumstances can be categorised as a "hybrid debt/equity" security in that it has some of the characteristics of debt and some of the characteristics of equity.

The ERA must carefully review the instruments identified in the dot points on page 28 of the Discussion Paper[31] to ensure that they meet the criteria for hybrid debt/equity instruments and that they are consistently categorised wherever gearing is used in the rate of return calculations.

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[31]   ERA, 2022 Gas Rate of Return Instrument Review - Discussion Paper, December 2021, pg 28

6.   RETURN ON DEBT

6.1   Method

> **Question 5**
>
> Do you support the use of a hybrid trailing average approach for the cost of debt estimation? If not, please explain why and provide details of your alternative approach, including transitionary arrangements.

ATCO supports the use of a 10-year hybrid trailing average approach for the cost of debt estimation.

6.2   Benchmark credit rating

> **Question 6**
>
> Do you support the use of a benchmark credit rating of BBB+ for the 2022 gas instrument? If not, please explain why and your alternative approach

ATCO supports the use of a benchmark credit rating of BBB+ for the 2022 gas instrument.

6.3   Debt risk premium

> **Question 7**
>
> Do you support the use of the revised bond yield approach for estimating the debt risk premium? If not, please explain why and your alternative approach.

ATCO supports the use of the revised bond yield approach for estimating the debt risk premium.

6.4   Debt and equity raising costs

ATCO supports the ERA undertaking further consultation on the findings of Chairmont's review when it is complete to ensure that all efficient costs are recovered.

The ERA's initial position is that it considers that an annual allowance of debt-raising costs and debt-hedging costs should be included for the return on debt estimation. The ERA considers that direct debt-raising costs will be recompensed in proportion to the average annual issuance, and will cover:

- Gross underwriting fees
- Legal and roadshow fees
- Company credit rating fees
- Issue credit rating fees
- Registry fees
- Paying fees

The ERA's initial position is to reject indirect costs. However, a full review of debt raising costs must include indirect costs paid to underwriters such as how the price of the bonds given to underwriters effects the direct costs paid to underwriters. Failure to consider indirect costs has the potential to lead to serious errors. In particular, where bonds are sold to underwriters at a price below the

expected value of the bond it is conceivable that the underwriter will charge very low, or even zero, underwriting fees. The ERA needs to account for the ample evidence that the size of gross underwriting fees is directly inversely proportional to the discounted bond prices offered to underwriters.

The ERA should also widen the scope of its analysis from "debt raising" costs to "debt portfolio management" costs. The latter would include costs associated with early refinancing of debt (i.e., before the maturity date) and other costs associated with maintaining liquidity – such as fees on undrawn facilities. In addition, fees associated with ESG Evaluations are an emerging cost.

The ERA has engaged Chairmont Consulting to review debt issuing and hedging costs for a regulated benchmark energy network that is operating efficiently consistent with the ERA's debt approach.

ATCO notes the ERA's intention to further consult on the findings of Chairmont's review when it is complete. It is important that service providers are able to respond to the results of Chairmont's review prior to the ERA's draft decision. This will allow service provider's views to be an input to the ERA's draft decision.

7. RETURN ON EQUITY

7.1 Method

ATCO accepts the overall method to estimate the return on equity using the Sharpe-Lintner CAPM model on the basis that it is consistent with the method historically adopted by the ERA and therefore promotes regulatory certainty and stability.

However, the CAPM is a model that relies on certain assumptions and the statistical estimates of parameters used in the model. The result of applying the model must be assessed as to its reasonableness in the light of current market conditions and the relevance of the result to regulatory determinations within the RORI period. For example, as discussed in section 7.3 a forward looking estimate of the MRP could be updated at the time of an access arrangement determination to incorporate current market conditions consistent with the risk free rate estimated at that time.

7.2 Risk free rate

> **Question 8**
>
> When estimating the return on equity do you support the use of Commonwealth Government bonds as the risk free asset? If not, please explain why and your alternative approach.

ATCO supports using Commonwealth Government securities (CGS) as the best estimate of the equity risk free rate while noting the term of the risk free rate should be 10 years as discussed in section 3.1.

Since the AA5 final decision the risk free rate has declined to historically low levels leading to negative real risk free rates. Brattle in their June 2020 report to the AER, where they discuss the calculation of the return on equity using a CAPM framework, find it difficult to "reconcile a negative real interest rate with finance theory".[32] Whilst, ATCO supports the use of the CAPM as the ERA's model to estimate the cost of equity the implementation of the model requires careful consideration of the best estimate of the risk free rate in current and likely future market conditions. Possible amendments to the method of estimating the equity risk free rate worth consideration are:

- Put a floor of zero on the real risk free rate as has been suggested by the AER's consumer reference group which would be consistent with CAPM operating with a zero or positive risk free rate.[33] A negative real risk free rate is difficult to reconcile with established finance theory.[34] Internationally, some regulators have explicitly recognised this with a formal floor on the real risk free rate,[35] while others implicitly avoid the problem by considering forecasts of future long-term interest rates.

- Use a 10 year CGS as the estimate of the risk free rate as it is less effected by market intervention from the RBA.

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[32] The Brattle Group, A Review of International approaches to Regulated Rates of Return, Prepared for the Australian Energy Regulator, June 2020, pg 60

[33] CRG, Rate of return: Equity Omnibus – Draft working paper, CRG Preliminary response, 11 August 2021, slide 15

[34] The Brattle Group, A Review of International approaches to Regulated Rates of Return, Prepared for the Australian Energy Regulator, June 2020, para 221

[35] For example, the Italian regulator ARERA has a 0.5% floor for the real risk free rate (see Brattle report for the AER *A Review of International Approaches to Regulated Rates of Return*, June 2020, para 395).

- Making an adjustment, either as part of the risk free rate or MRP, for other risk factors as done by the Alberta Utilities Commission in its recent decisions may be warranted. For example, the Alberta Utilities Commission reviewed the evidence on record and then made a judgment regarding the ROE that did not match any one model. [36]

7.3   Market risk premium

Question 9

When estimating the historical market risk premium do you support the use of sampling periods post-1958? If not, please explain why and your alternative approach.

ATCO is supportive of the use of sampling periods post-1958 as it is from the period that has the most reliable data and is likely to better estimate a forward looking MRP rather than data from earlier periods. The ERA should incorporate the latest information and include the 2021 year in the datasets. ATCO has updated the BHM data to include 2021 and our estimates of the MRP are set out below.

Table 7-1: Updated BHM data to 2021 (using ERA theta estimate of 0.6).

Time Period	Arithmetic mean	Geometric mean
1958-2021	7.00%	4.81%
1980-2021	7.03%	5.00%
1988-2021	6.77%	5.35%
2000-2021	7.03%	5.54%
ERA method (first 3 periods)	6.06%	
ERA method (all periods)	6.16%	

ATCO notes that it was able to closely replicate the ERA's estimates for the period ending 2020 (always within 10 basis points and mostly within 5 basis points). Therefore, ATCO is confident that the ERA update to 2021 will be similar.

Question 10

When estimating the historical market premium do you support expanding the sampling periods to include a new period of 2000 to current? If not, please explain why and your alternative approach.

ATCO supports the inclusion of the 2000-21 period. Moreover, ATCO considers that this should replace the 1988-2021 period. This will leave 3 periods each starting roughly 20 years apart. The 1988-21 period currently sits oddly with the other estimates starting only 8 years after the 1980 period and 12 years before the 2000 period.

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[36]   Alberta Utilities Commission (AUC), 2021 Generic Cost of Capital (GCOC) Proceeding ID 22570-D01-2018, pg 100-104

> **Question 11**
>
> When estimating the historical market premium do you support the approach to only consider the Brailsford, Handley and Maheswaran (BHM) dataset? If not, please explain why and your alternative approach.

ATCO supports the ERA decision to only consider the Brailsford, Handley and Maheswaran (BHM) dataset when estimating the MRP from 1958 onwards.

> **Question 12**
>
> When estimating the historical market premium do you support the approach to calculate the historic market risk premium through the average of the arithmetic and geometric means? If not, please explain why and your alternative approach.

ATCO does not support estimating the historical market risk premium by a simple average of the arithmetic and geometric means. The use of the geometric mean to estimate the historical average MRP is not sound. The arithmetic average should solely be used to estimate the historical MRP.

7.3.1   Arithmetic average is the correct historical MRP measure

The evidence is compelling that when estimating expected returns from historical data the arithmetic rather than geometric average should be used. Evidence includes explanations in leading finance textbooks as well as expert advice to the AER.

The principle of why an arithmetic average must be used is summed up by Brealey, Myers and Allen (2020) in their highly regarded finance textbook.[37] The expected rate of return is the correct rate of return to discount future expected cash flows to calculate the value of the firm. The expected rate of return is also the opportunity cost of capital. If the expected rate of return is estimated by the arithmetic average of returns over a number of periods it calculates the period by period return on average. This is the same period by period return that is used to discount future cashflows to arrive at the value of the firm. The average compound return estimated over the same prior periods would be a lower number and therefore if used to set returns investment would not be forthcoming.

To put it another way, a geometric "return" is an average growth rate in an investment over a number of periods assuming returns from prior periods are reinvested. It is not a measure of period by period expected returns. This concept is important in the context of the PTRM which does not contemplate a compounding of returns. Dr Lally has previously communicated this point to the AER:

> "The AER's belief that geometric averages are useful apparently arises from a belief that there is a compounding effect in their regulatory process (AER, 2012, Appendix A.2.1), and therefore the analysis of Blume (1974) and Jacquier et al (2003) applies. However, I do not think that there is any such compounding effect in regulatory situations and the absence of a compounding effect leads to a preference for the arithmetic mean over the geometric mean. If historical average returns are used, they should be arithmetic rather than geometric averages."[38]

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[37]   Brealey, R., S. Myers and F. Allen, 2020, *Principles of Corporate Finance*, 13th edition, McGraw-Hill, pg 170
[38]   Lally, M., *The cost of equity and the market risk premium*, Victoria University of Wellington, 25 July 2012, pg 31-32

Dr Lally has also advised the AER that use of the geometric average is inconsistent with the NPV=0 principle. He presents a detailed algebraic analysis to evaluate whether each form of average is consistent with the NPV=0 principle and concludes that:

> *"The geometric mean fails this test whilst the arithmetic mean will satisfy it if annual returns are independent and drawn from the same distribution. So, if historical average returns are used, they should be arithmetic rather than geometric."*[39]

Dr Lally's view was supported by a number of experts in the AER's 2018 RORI second concurrent evidence session.[40]

The ENA in its submission to the AER regarding equity returns and the AER 2022 rate of return instrument provide an extensive and compelling review of the evidence in this matter.[41] ATCO recommend that the ERA refer to this further evidence.

To be clear, use of the arithmetic mean rather than the geometric mean, or any combination of the two, is not a matter of opinion or judgement. Based on the mathematical facts the arithmetic average is the correct measure to use when estimating the historical MRP.

Question 13

When estimating the market risk premium do you support the current approach of estimating and considering the market risk premium and the risk free rate independently from one another? If not, please explain why and your alternative approach. Specifically, the ERA is interested in:

- The empirical relationship (magnitude and direction) between the ex-ante market risk premium and the ex-ante risk free rate in Australia and the conceptual logic underpinning such a relationship.

- Whether the relationship is sufficiently stable and persistent (that is, not volatile and transitory) on an ex ante basis.

- Ways in which the relationship can be implemented to estimate the market risk premium in a manner suitable for regulatory purposes.

ATCO does not support the current approach of estimating and considering the market risk premium (MRP) and the risk free rate independently from one another.

CEPA was commissioned by the AER to investigate this relationship in the context of a low interest rate environment where the combined assumptions of a fixed MRP and an independently varying risk free rate has seen regulated returns set at historically, and some argue unsustainably, low levels.

CEPA summarise their findings as follows:

> *"Our assessment is that (i) there is acceptance that MRP is not stable and (ii) it is possible that there is an inverse relationship between the forward looking MRP and the RfR, and (iii) there is no good evidence that the MRP should be assumed to be independent of the RfR, the current implicit assumption of the AER's approach, and*

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[39]   Ibid., pg 32
[40]   Energy Networks Australia, AER Rate of Return Guideline - Submission to the AER, September 2018, pg 113
[41]   Energy Networks Australia, Estimating the cost of equity - Response to AER's Pathway to 2022 rate of return instrument Draft equity omnibus working paper, September 2021, pg 43-48

(iv) there is no conclusive theoretical basis for an assumption of independence or dependence."[42]

CEPA go on to say it is up to the AER to use an approach where either the MRP is fixed or the total market return (TMR), MRP plus risk free rate, is fixed and offers the view that the TMR approach may provide a better estimate of the forward looking MRP consistent with the AER's duty.

Wright et al (2018), in their advice to UK regulators, argue that while the risk free rate is not stable, the actual return on equity is remarkably stable. The authors show a chart of 30 year rolling compound returns for equities, cash and bonds. They state this figure, reproduced below, "brings out the remarkable stability of the US stock return over more than two centuries" and that it highlights "the distinct lack of stability of long-term returns on competing asset classes, the real return on "cash" … and on bonds" (emphasis is original).

Figure 7-1: Reproduction of Figure 4.4 from Wright et al (2018)
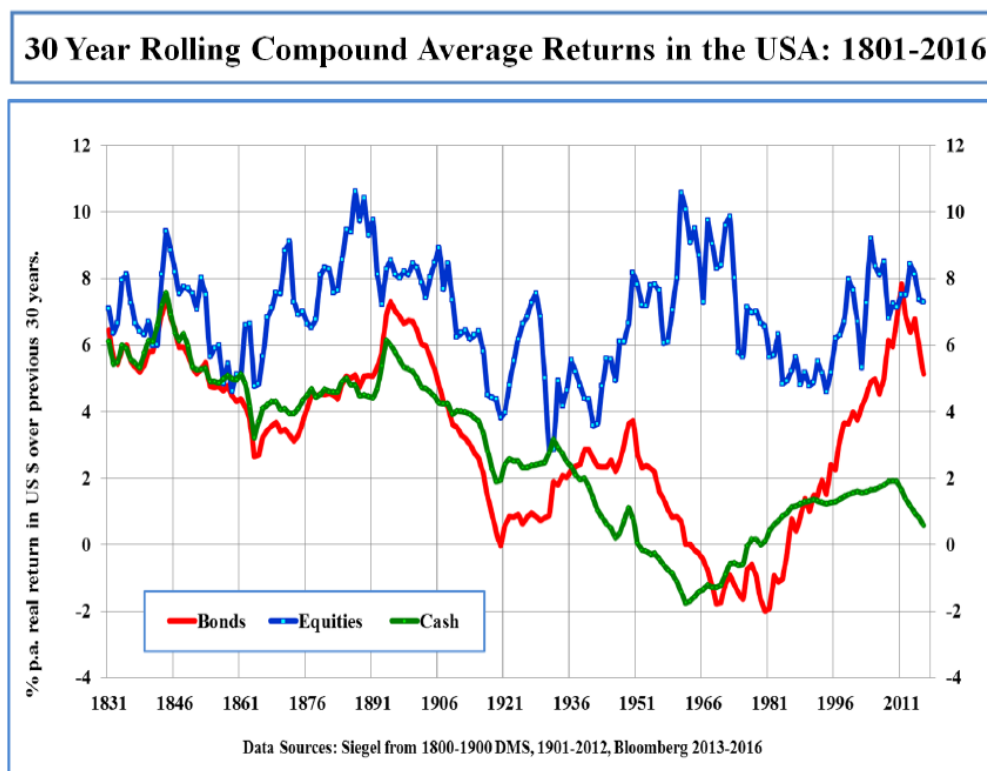

ATCO consider this, along with similar evidence from other countries, to be compelling evidence of the relative stability of actual and expected equity returns over time – and the lack of any strong and stable relationship between total equity returns and risk free rates unlike the ERA's assumption that the risk free rate and equity returns are perfectly positively correlated due to the assumptions of a fixed MRP independent of the risk free rate. In fact, the graph indicates an inverse relationship between the MRP and risk free rate.

The theoretical basis for believing in an inverse relationship between the risk free rate and the MRP is illustrated by the events of the financial crisis of 2008/09. Most analysts would agree that risk premiums rose sharply during the financial increase in the estimated cost of equity observed during the 2008/09 financial crisis. This is amply illustrated in the following figure published by the Independent Pricing and Regulatory Tribunal of NSW.

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[42]   CEPA, Relationship between RFR and MRP, 21 June 2021, pg 6-7

Figure 7-2: MRP estimates and debt margin (bps, %)
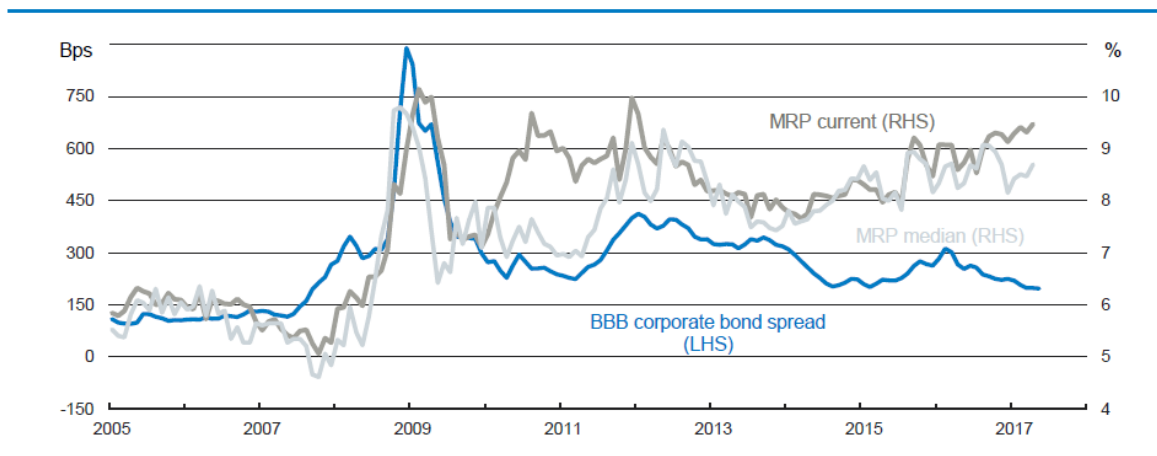
Data source: IPART and SFG analysis of RBA, Bloomberg and Thomson Reuters data
Source: IPART, 2018, "Review of our WACC method", Figure 5.1

As one would expect, the upheaval of the 2008/09 financial crisis was associated with extremely high estimated risk premiums. The debt risk premium on BBB bonds, which is relatively easily observable, rose from around 100 basis points per annum (bppa) from 2005 to 2007 to a maximum of 800 bppa in late 2008 (as shown by the blue line above). The prevailing MRP, estimated using a variety of contemporaneous methods, rose from around 6% pa from 2005 to 2007 to around 10% pa in late 2008 (as shown by the dark grey line above).

However, over the same period 10 year risk free rates fell from over 6% to around 4%. That is, the risk free rate fell by around one third at the same time that risk premiums were rising to unprecedented levels.

This is entirely consistent with the predictions of finance theory. Specifically, when there is heightened risk aversion, such as in a financial crisis, investors tend to sell off risky assets and buy safe assets. This is known as "flight to safety". A "flight to safety" tends to simultaneously:

- Push up the price, and lower the required returns for investing in low or risk free assets (i.e., investors require a lower interest rate for holding risk free assets in a crisis); and

- Push down the price, and raise the return required to persuade investors to invest in risky assets (i.e., investors demand a higher return for holding risky assets during a crisis as they perceive them as even higher risk than in other times).

The problem with combining a historical average MRP with a prevailing risk free rate is manifest in this circumstance. Such an internally inconsistent approach assumes that risk premiums in equity markets are constant. ATCO considers that this is inconsistent with the finance literature that clearly demonstrates market risk premiums vary through time and do so in a relatively predictable manner. The Nobel prize winning finance academic Eugene Fama, along with his co-author Kenneth French, conclude that the MRP is inversely related to business conditions. Their abstract reads as follows: [43]

> "Expected returns on common stocks …. contain a term or maturity premium that has a clear business-cycle pattern (low near peaks, high near troughs). Expected returns also contain a risk premium that is related to longer-term aspects of business conditions. The variation through

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[43]   Fama, Eugene F., and Kenneth R. French, 1989, Business conditions and expected returns on stocks and bonds, Journal of Financial Economics 25, pg 23-49

time in this premium is stronger …. for stocks than for bonds. The general message is that expected returns are lower when economic conditions are strong and higher when conditions are weak."

The inverse relationship between the market risk premium and economic conditions also gives rise to an inverse relationship between the market risk premium and the prevailing risk free rate. Put simply, when interest rates are lower than average, the market risk premium will tend to be higher than average (and vice versa).

The Australian Competition Tribunal recognised this in the context of the global financial crisis. The NSW electricity businesses appealed the AER's decision to pair a historical average MRP with a prevailing estimate of the risk free rate that was at (then) historical lows. The Tribunal concluded:

> *The Applicants submitted that these facts demonstrated that basing a risk-free rate on the AER's specified averaging periods would not achieve the objective of an unbiased rate of return consistent with market conditions at the date of the final decision.* **They appealed to expert opinion that the market risk premium was far higher than its deemed value while the risk-free rate was abnormally low, so that the return required by investors was much higher than the AER's specified averaging period would generate**.
>
> *…*
>
> **The Tribunal considers that an averaging period during which interest rates were at historically low levels is unlikely to produce a rate of return appropriate for the regulatory period.** [44]

The section below outlines why alternative methods of estimating the MRP are required and possible solutions.

Alternative approaches to estimating MRP

An estimate of the MRP must:

1. Be capable of handling the potential effects of a financial market shock.
2. Be forward looking.
3. Take account of the factors required to be considered by the National Gas Law (NGL).

An estimate of the total return on equity should be robust to market shocks. The assumption of a constant MRP in the face of recent negative real risk free rates has been no less unreasonable than the same assumption the Australian Competition Tribunal overturned in 2009.

The issue arises because the RORI is estimated at a point in time different to the time it is applied to calculate the allowed rate of return at an access arrangement final decision. This timing difference allows changes in financial markets, such as RBA market intervention, to occur in a way not contemplated by the RORI and therefore corrupt the results attained from a mechanistic application of the RORI in its current form.

It is not appropriate for the MRP to be fixed in the RORI and then used in an access arrangement determination which will potentially still be on foot up to 9 years after the RORI is determined. The MRP should be updated (mechanically) at the start of the AA, when the risk free rate is updated so that both parameters reflect the market conditions at the time.

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[44] Application by EnergyAustralia and Others (includes corrigendum dated 1 December 2009) [2009] ACompT 8 (12 November 2009), paragraph 117

The COAG Energy Council's intention when setting up the RORI mechanism was that the method outlined in the rate of return instrument is capable of handling the potential effects of a financial market shock[45]. The AEMC was also explicit about this in relation to the rate of return guidelines that preceded the RORI and were directly responsive to the 2009 Tribunal decision. The AEMC summarised their decision as follows:

> *The most significant changes made in response to these rule change requests relate to how the rate of return for service providers is determined under the NER and the NGR.*
>
> *The amendments in relation to the rate of return provisions in the NER and NGR provide for a common framework that enables the regulator to make the best possible estimate of the rate of return **at the time a regulatory determination is made. When making the estimate the regulator must take into account the market circumstances,** estimation methods, financial models and other relevant information.* [46]

The RORI is used to estimate expected returns over an upcoming access arrangement period and therefore must estimate forward looking financial parameters. The ERA's RORI must also have regard to the factors listed in the National Gas Law (NGL): [47]

1. The revenue and pricing principles;

2. Estimation methods, financial models, market data and other evidence relevant to making the instrument;

3. Prevailing conditions in the market for equity funds;

4. The interrelationships between financial parameters used, or to be used, in relation to deciding the rate or value.

Based on the requirements to be considered in setting the MRP and noting the RORI must be applied in a mechanistic way consideration should be given by the ERA to:

• Providing explicit weight to a dividend growth model (DGM) in estimating the MRP.

• Updating both the historical MRP and DGM at the time of an access arrangement determination

Providing weight to a DGM will:

• Allow the estimated MRP and total return to equity to respond to market shocks

• Provide an outcome more consistent with the NGO and the revenue and pricing principles by providing a forward looking return to promote efficient investment.

• Take into account the relationships between financial parameters.

Updating the historical MRP and DGM at the time of an access arrangement determination will make them consistent with the prevailing conditions in the market for equity funds including the risk free rate estimated at that time.

Dividend growth models

The DGM has a number of important strengths:

• It has a theoretical foundation accepted by experts and regulators;

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[45] COAG Energy Council, Senior Committee of Officials, Bulletin, Binding rate of return guideline, June 2018

[46] AEMC, Rule Determination National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012 National Gas Amendment (Price and Revenue Regulation of Gas Services) Rule 2012, 29 November 2012, pg iii

[47] National Gas Access (WA) Act, As at 10 October 2020, sections 30A(e) and 30D(5)

- It is commonly used in practice (including by other regulators); and
- It produces a forward-looking estimate of the market risk premium that is commensurate with prevailing conditions while providing insulation against financial market shocks.

Relevant to question 13, the DGM makes no assumption about the relationship between the RfR and the MRP, it is derived as part of the estimation. In the current context Brattle confirm the continued use of dividend growth models by regulators to estimate equity returns.[48] North American regulators put significant weight on forward-looking estimates of the MRP, and some (for example, the Federal Energy Regulatory Commission) only use forward-looking estimates.

ATCO's submission to the ERA's 2018 RORI draft instrument outlines the ERA's past use of the DGM.[49]

Table 7-2: ERA's past use of the DGM

Decision	Date	MRP range	MRP Point Estimate	Implied DGM Weighting
ATCO	Sep-15	5.40% - 8.80%	7.50%	**62%[50]**
Goldfields Gas Pipeline	Jun-16	5.40% - 8.80%	7.40%	**59%**
DBP	Jun-16	5.40% - 8.80%	7.40%	**59%**
WA Rail	Oct-17	6.90% - 7.20%	7.20%	**100%**
Water Inquiry	Nov-17	5.40% - 8.80%	6.90%	**44%**
Western Power	Sep-18	5.70% - 7.60%	6.00%	**16%**

Source: ATCO analysis

ATCO also in its 2018 submission listed the objections raised to the use of the DGM by the ERA in 2018. Those objections were not new and had been recognised and addressed by the ERA in its 2013 Guidelines. Moreover, all of the concerns raised by Partington and Satchell[51], and cited by the ERA, were available to the ERA when it made its 2017 WA rail decision which placed weight on the DGM

ATCO refers the ERA to ATCO's 2018 submission for a complete discussion of issues with the DGM raised by the ERA and how it has dealt with them while providing weight to the DGM in past decisions[52].

ATCO considers that ERA concerns around the weaknesses of the form of the DGM can be addressed as follows:

- The Guidelines could adopt the two-stage dividend growth model preferred by the ERA[53]; or
- Adopt the "calibrated" DGM as proposed by the ENA to the AER[54].

The IPART regularly updates four different DGM methods and the time series for these are publicly available. There is no reason why the ERA could not similarly set out the method for updating its

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48   The Brattle Group, A Review of International approaches to Regulated Rates of Return, Prepared for the Australian Energy Regulator, June 2020, pg 44
49   ATCO, Attachment 1: ATCO Submission, Draft rate of return guidelines, 28 September 2018
50   Economic Regulation Authority, Revised decision of the Economic Regulation Authority's access arrangement for the Mid-West and South-West Gas Distribution Systems, 25 October 2016, para 57
51   Partington and Satchell, Report to the AER: Discussion of Estimates of the Return on Equity, April 2017
52   Available at: https://www.erawa.com.au/cproot/19888/2/ATCO%20Gas%20Australia%20-%20public%20submission.pdf, pg 18-25
53   Economic Regulation Authority, Explanatory Statement for the Rate of Return Guideline, 16 December 2013, para 611
54   Energy Networks Australia, Estimating the cost of equity - Response to AER's Pathway to 2022 rate of return instrument - Draft equity omnibus working paper, September 2021, pg 54-56

own DGM model in the RORI and update this model (consistent with the specifications in the RORI) at the time the risk free rate is measured for each determination. The application of this method overtime is shown below.

Figure 7-3: IPART generated time series of DGM TMR and MRP.
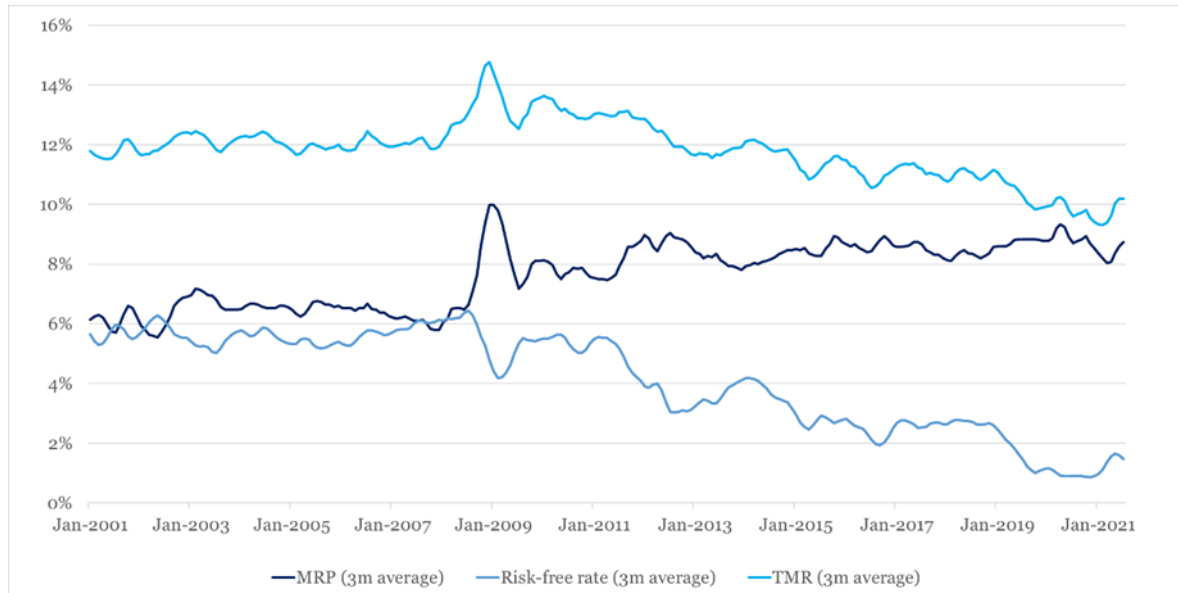
Alternatively the ENA has proposed a "calibrated" dividend growth model.[55] This model can be used if the ERA considers that the DGM model should be calibrated to deliver an historical average excess return that is consistent with the historical average observed realised return. In this model:

- The long-run growth parameter is "calibrated" to the long historical MRP. There is a unique long-run growth estimate that equates the average of the DGM estimates with the average from the historical excess returns approach. Under this approach, there is no debate about what figure should be used for the growth parameter and no need for testing sensitivities to alternative growth estimates; and

- By definition, there is no bias in the DGM estimates relative to the historical excess returns estimates – both are constructed to have the same average. The only difference is that the historical excess returns approach is essentially constant over time, whereas the DGM estimates will fluctuate around the average figure as market conditions change.

The ENA provides an example[56] of the calculation of the DGM MRP and total market return based on a growth rate of 6.1%. The result is intuitively appealing as the MRP generally increases after 2010, while the total market return falls somewhat. This occurs because the increase in the MRP estimates only partially offset the decline in government bond yields over that period. This result reinforces the DGM as an estimate that protects the estimated return calculated by the RORI from market shocks while being forward looking.

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55   Ibid.
56   A guide to the ENA's model is available at: https://www.aer.gov.au/system/files/ENA%20models%20user%20guide.pdf

Figure 7-4: ENA example application of a calibrated DGM
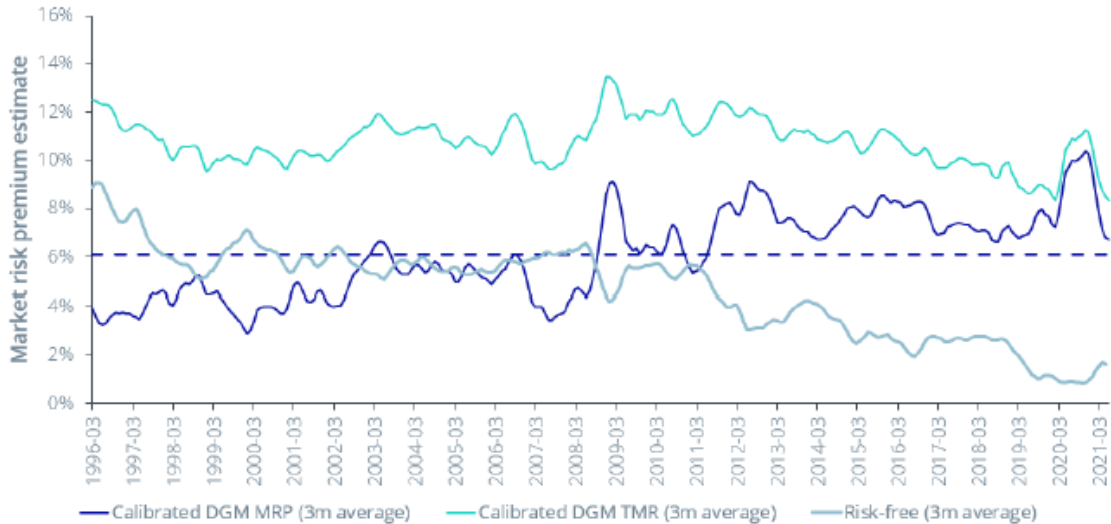
Source: Frontier Economics calculations.

ATCO submits that the Guidelines must place material weight on the DGM estimate:

- It is relevant evidence that can be relied upon, with other evidence, to derive an estimate of the market risk premium.

- Placing material and explicit weight on the DGM estimates recognises that the market risk premium is a forward-looking estimate and is necessary in order for service providers to be provided with a reasonable opportunity to recover at least the efficient costs the service provider incurs in providing reference services consistent with revenue and pricing principles.

- Use of the DGM in concert with a historical arithmetic average MRP will help insulate total equity returns from market shocks and maintain consistency with expected equity returns over an access arrangement period by updating the DGM as part of the access arrangement determination process.

ATCO considers that the evidence of the weights adopted by the ERA in past determinations suggest that a 50% weight could reasonably be applied to the DGM estimate in the Guidelines. This will result in the Guidelines placing material weight but less reliance on the DGM than in the majority of the ERA's decisions since 2013 but prior to the current RORI.

Applying a 50% weight would result in a market risk premium estimate that has regard to all relevant estimates, the prevailing conditions in equity markets and accordingly gives rise to the best empirical estimate of the market risk premium, necessary for the achievement of the National Gas Objective.

ATCO would welcome further opportunity to discuss with the ERA how a DGM might be implemented in the RORI.

Estimating MRP - Conclusions

The current RORI embodies assumptions which make it vulnerable to financial market shocks.

- A fixed MRP
- The risk free rate varies independently of the MRP

These assumptions make estimates of the equity market return made at the time of the RORI subject to unforeseen market conditions, such as RBA market intervention, at the time of any access arrangement determination. Additionally, there is no basis to these assumptions being better than other assumptions about MRP and the relationship of the MRP and the risk free rate. In fact, there is evidence it is more likely there is a negative relationship between the MRP and the risk free rate.

The RORI can be improved by giving explicit weight when estimating the MRP to a forward looking DGM – which should also be updated in a mechanistic way at the time of an access arrangement determination. The historical average MRP should also be updated in a mechanistic way at the time of an access arrangement determination. The mechanistic way in which the MRP is updated at the time of and access arrangement determination can be specified in the RORI.

Taking these actions will help achieve the NGO and:

• Make estimation of the MRP and total equity return less vulnerable to financial market shocks

• Make the MRP and equity return more forward looking

• Make the total equity return more likely to be consistent with the revenue and pricing principle; allow for a return commensurate with the regulatory and commercial risks involved in providing the reference service.

The historical average MRP must be calculated solely on an arithmetic basis. This is not a matter of judgement but of being mathematically correct.

7.4 Beta

Beta is a measure of systematic or market risk. More specifically it is a measure of how the returns for a specific firm, or group of firms vary with returns on the market.

In the context of a declining domestic beta sample to one company it is imperative to consider widening the beta sample as the ERA has done to improve reliability of the estimate. International evidence is that betas in recent times have been increasing which is difficult to confirm for the Australian sample of firms due to the small sample size although it is likely true.

Question 14

Do you support the continued use of domestic energy networks to estimate equity beta?
If not, please explain why and your alternative approach

ATCO does not support relying solely on the domestic energy networks to estimate equity beta because restricting the universe of potential comparators to Australian firms forces reliance on a small sample that does not permit calculation of statistically reliable beta estimates. This is especially important in the context of changing risk environments for gas transport businesses – such that asset beta estimates from the past are not a reliable estimate of current or future asset betas. The recent acquisitions of Spark Infrastructure and Ausnet will result in fewer firms actively traded in the market to estimate beta into the future. From a statistical perspective, it is not appropriate to rely exclusively, or primarily, on such a small set of comparator firms.

The New Zealand Commerce Commission (NZCC) has always faced the problem of limited domestic comparators. Consequently, it has developed a detailed set of foreign energy comparators and has used this evolving sample to determine regulated equity betas for over a decade. Details of the

most recent application of this methodology in 2016 are available on the NZCC website.[57] This includes detailed consideration of whether higher observed asset betas for gas businesses justified adoption of different gas and electricity samples. At that time, the NZCC decided that this was not justified on the grounds that the betas were estimated with insufficient accuracy (of the "true" underlying beta) to be confident that gas and electricity businesses betas were actually different (as opposed to simply being estimated to be different). This example illustrates how the expansion of sample sizes through incorporation of international comparator companies may permit a regulator to draw useful statistical inferences that could not be derived using a smaller sample.

This difference between the "true" and "estimated" betas is an important distinction in the current context. Statistical estimates of a single firm's beta tell us something about the similarity of the movements in a firm's returns relative to movements in the market in the historical period being examined. However, statistical confidence intervals from beta regressions do not tell us anything about the accuracy of the estimate to the true systematic risk of the firm. Rather, these confidence intervals only tell us the confidence that we can have about the estimated asset beta in the future if the future is the same as the past (or, more exactly, the generation process for future equity return data is the same as it was in the estimation period).

To explain, there are two reasons why a firm's beta estimate might vary over time – because the true systematic risk of the firm varies, or due to random chance depending on the extent to which important firm-specific events during the sample period happen to occur which may or may not be correlated with market movements. Estimates of statistical precision for an estimate of a single firm's provide no indication of the extent to which each of these factors, systematic risk or firm specific events, in the observation period, are driving the variation in equity beta estimates[58].

Consequently, it is only by averaging over a statistically large sample of beta estimates derived for separate individual comparator firms that it is possible to gain confidence regarding the "true beta" that is characteristic of the systematic risk of a particular type of investment. Relying on a sample of four or fewer firms is therefore problematic, since an average of beta estimates from a small sample is more susceptible to the impact of firm specific events rather than systematic risk. ATCO will return to this issue below when responding to the ERA's statement that lower estimated asset betas in Australia than other jurisdictions are likely to be explained by lower risk of operation in Australia. ATCO does not consider that this is a statistically valid conclusion.

The ERA has previously used data for firms meeting its criteria for a benchmark efficient firm. The four available sample companies are APA Group, DUET Group, SP AusNet and Spark Infrastructure. With regard to the current use of domestic comparators DUET Group should be omitted, or given less weight because it is no longer listed, and therefore contributes no information on the prevailing conditions in the market for equity funds.

Given the shrinking domestic sample size, ATCO supports the ERA considering how the benchmark sample can be changed to incorporate an international sample of energy networks and other domestic infrastructure service providers, alongside the existing domestic energy network sample. By addressing now how the ERA will estimate beta in response to the reducing sample size will promote regulatory certainty and stability. It should be part of the ERA's considerations how it will start to transition to the new method in the 2022 Rate of Return Instrument.

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[57] Available here: https://comcom.govt.nz/regulated-industries/input-methodologies/projects/201516-im-review/process-and-consultation/cost-of-capital

[58] For further explanation of this matter and examples see; Energy Networks Australia, Estimating the cost of equity - Response to AER's Pathway to 2022 Rate of Return Instrument: Draft Equity Omnibus Working Paper, 3 September 2021, pg 72-79, Available from: https://www.aer.gov.au/system/files/ENA%20-%20Submission%20-%20Equity%20-%203%20September%202021.pdf

Question 15

Do you support the use of a sample of domestic and international comparators to estimate equity beta? If not, please explain why and your alternative approach.

Yes, ATCO supports the use of international and domestic comparators to provide a more robust estimate of beta.

Domestic comparators

ATCO supports the ERA further examining adding domestic infrastructure providers to the domestic comparator set but recognises it as a second best option to using international energy infrastructure comparators. ATCO notes that the Discussion Paper does not support an expanded domestic sample incorporating companies in rail, transportation, ports, airports and telecommunications. However, there was limited evidence of the analysis undertaken by the ERA to support this conclusion. For example, beta estimates for the firms were not incorporated into the Discussion Paper.

ATCO recognises that international energy networks are a superior source of comparators as they allow inclusion of firms which perform similar services and are subject to similar regulatory regimes. However, other domestic infrastructure firms are an alternative way of expanding the comparator set and represent the next best set of comparators.

ATCO encourages the ERA to provide further information and analysis on why other domestic infrastructure companies are or are not suitable comparators.

International comparators

ATCO supports the ERA examining adding listed international firms operating energy networks in the United States, Canada, United Kingdom and New Zealand to the domestic comparator set.

The fundamental advantages of including international firms in the estimation of equity beta process relate to the large sample of firms available:

- Including a larger number of firms not only increases the statistical reliability of measures but also the impact of any one seemingly anomalous beta estimate, for example due to a firm specific event, is not significant when taking an average or median beta from all the firms in the larger sample.[59]

- Alongside the statistical advantages that using an international sample offers, it also allows greater flexibility when choosing comparators by allowing to focus on more relevant firms while maintaining a sample size less likely to be affected by outliers.

To the extent that there may be country-specific effects on beta estimates, these can be limited by using a sample of relevant firms from a cross-section of countries where possible.

In this context, ATCO considers that the ERA is mistaken when its states:

The ERA notes that most equity betas appear to be greater in magnitude in other jurisdictions than in Australia. As previously discussed in the 2018 gas explanatory statement, it seems

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[59]   For example, there are 8-10 publicly traded gas distribution utilities in the U.S. alone (the range is listed because depending on the cutoff for distribution services, 1 or 2 may not be considered distribution only).

likely that differences in regulatory, market and operational activities are responsible for some of these differences. [60]

The first sentence of this paragraph is not statistically robust and, consequently, neither is the conclusion in the second sentence. This is because the Australian sample is too small to reliably make the first statement. It is true that the *average* of the *measured* asset betas in Australia are lower than the *average* of the *measured* asset betas in any of the other jurisdictions the ERA surveys. However, the average compresses considerable variation and is, in the case of Australia, derived from a very small sample.

Statistician methods can be used to derive an estimate of the confidence that can be assigned to the average equity beta in Australia. When ATCO does this it finds that the upper end of the 95% confidence interval for the mean of the Australian sample using LAD is 0.92.

That is, the sample of four LAD estimates published by the ERA in its Table 6 must be conceived of as having been drawn from a larger hypothetical population of potential Australian asset betas for regulated networks. The variation in that small sample (0.43 to 0.90) implies a high degree of uncertainty about the true population mean. The table below explains specifically why a 0.92 upper confidence interval exists around the sample mean.

Table 7-3: Confidence interval for Australian mean beta

Sample	LAD
APA	0.896
AST	0.532
DUE	0.430
SKI	0.505
Mean	**0.591**
σ (sample standard deviation)	0.208
N (number of observations)	4
Standard error of the mean ($\sigma/\sqrt{N}$)	0.104
Degrees of freedom	3
T score for 95% Confidence Interval	3.182
Confidence interval for Australian mean equity beta upper bound	**0.922**

This value for 0.92 is well above the LAD mean equity beta for all other countries reported as 0.71 in the ERA's Table 7. This means that it is not statistically sound to conclude, as the discussion paper does at paragraph 485, that mean Australian asset betas are lower than asset betas in foreign jurisdictions.

ATCO notes that the same conclusion holds at the level of asset beta and also for LAD + OLS estimates. Based on the Australian jurisdiction average gearing reported in Table 7, the implied asset beta associated with a 0.92 equity beta is 0.44. The mean of the "all countries" asset beta (derived from LAD) reported by the ERA is 0.318 – well below the 0.44 Australian asset beta upper bound. The following table summarises the outcome of the above analysis and also an analysis using the average of LAD + OLS estimates.

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[60] Para 485 of the ERA discussion paper

Table 7-4: Confidence interval for Australian mean beta vs mean of all countries reported by ERA

	LAD	LAD + OLS
95% Upper bound of Australian mean equity beta	0.922	0.847
Mean of all countries equity beta reported by ERA	0.707	0.760
95% Upper bound of Australian mean asset beta	0.442	0.406
Mean of all countries asset beta reported by ERA	0.318	0.342

In all calculations the upper bound Australian estimate is well above the mean of all countries reported by the ERA. It must also be noted that the comparison here is between the Australian upper bound and the mean of all countries. If the comparison was made between the Australian upper bound and the lower bound for all countries, then the overlap would be even larger. That is, even before taking account of uncertainty in the foreign estimates we know that we cannot conclude the Australian mean is below the "all countries" mean.

This conclusion is even stronger when we factor in the uncertainty about the individual asset beta estimates. Specifically, the above 95th percentile estimate for the Australian LAD + OLS population mean assumes that there is zero uncertainty about the true beta for each of the four Australian firms (i.e., that the estimate for each of these firms is "correct"). However, as is clear from the divergence between the OLS and LAD estimates for each of these firms (e.g., AST's LAD/OLS estimate is 0.53/0.29 – which are very different).

The key point is that the above calculations of the 95% confidence interval for the Australian mean are predicated on an assumption that the measured asset betas for each of the four Australian comparators are exactly correct estimates of the true beta for that comparator. This is clearly not the case and, indeed, cannot be the case where the OLS and LAD estimates are not the same. This means that the true 95th percentile confidence interval is even wider than reported above – although exactly quantifying this would depend on a number of statistical assumptions that ATCO does not attempt to undertake in this submission.

This analysis highlights the critical problem with relying on a sample of only four Australian firms to reach any reliable conclusion. It also highlights the problem with relying on a sample of one Australian firm after AST, DUE and SKI are delisted. This is why ATCO considers that it is critical that the ERA includes comparators from outside Australia. It is also why ATCO considers that it is a mistake to argue that Australian equity betas are lower than in foreign jurisdictions. More fundamentally, there is no reason to expect that betas would be lower in Australia than in other jurisdictions: the activity of distributing gas is no different operationally in Australia than in other jurisdictions. In addition, regulatory frameworks for gas distribution are similar in many jurisdictions: while there may be some differences, ATCO is not aware of any reason to think that these differences would result in lower systematic risks in Australia than in other countries.

We observe from US and Canada beta analysis recently submitted to the AUC that there is evidence of rising betas.[61] The market evidence indicates that the risk of utility investments has increased relative to the broader capital markets. This is directly observable in the market betas of publicly traded utility stocks, which have increased markedly since 2018, and especially since the onset of the COVID-19 pandemic. As shown in the chart below, since year-end 2019 (pre COVID-19), betas increased by 0.04 for the companies in the Canadian Utility proxy group, by 0.38 for U.S. Gas LDCs companies, and by 0.54 for companies in the U.S. Electric proxy group. Notably, the Canadian Utilities proxy group increased earlier than those for U.S. electric and gas utilities, so that by year-

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[61] Alberta Utilities Commission (AUC), 2023 Generic Cost of Capital (GCOC) Proceeding ID 27084, Exhibit 27084-X0029, Evidence of Dr Bente Villadsen, pg 7

end 2021, the average of all three proxy group are within a narrow band of 0.92 and 1.05. It is statistically impossible to say that the same is not happening in Australia due to the small domestic sample and weight must be given to this observed international trend.

Figure 7-5: Equity Betas for US and Canadian Utility Proxy Groups[62]

Source: Bloomberg.
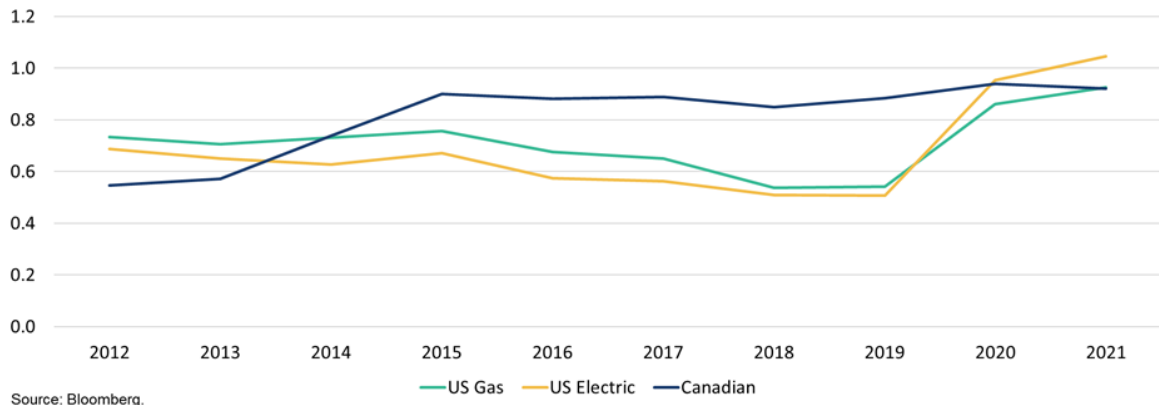
Question 16

If an international sample is to be used for estimating equity beta, which jurisdictions and companies could be considered as part of the sample?

ATCO supports the ERA adding listed international firms operating energy networks to the equity beta estimation process from several jurisdictions.

The United States, Canada, United Kingdom and New Zealand should be added to the domestic comparator set. These countries have capital markets that are sufficiently deep, liquid, large and informationally efficient. They also have stable regulatory regimes.

In selecting jurisdiction: market diversity and liquidity need to be considered to ensure sufficient diversification options are available to investors and market movements are not dominated by factors particular to any one industry sector. Additionally, the availability of listed comparable firms need to be considered. Country risk is also a factor as one off events such as a natural disaster or war could affect the market as a whole in that country.

7.4.1   Companies for consideration

ATCO supports the ERA further reviewing the suitability of the international comparator set identified in Appendix 4 of the Discussion Paper based on a set of appropriate screening criteria.[63] For example,

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[62]   This chart shows Blume-adjusted equity betas estimated based on weekly returns on market-capitalization-weighted portfolios of US Gas, US Electric, and Canadian utility stocks, measured over a rolling 3-year estimation window ending at the end of the specified year. The US Gas portfolio consists of 9 gas distribution utility companies traded on U.S. stock exchanges; the US Electric portfolio consists of 28 electric and combination utility companies traded on U.S. stock exchanges; the Canadian portfolio consists of 8 Canadian companies engaged in rate regulated infrastructure businesses. The U.S. portfolio betas are estimated relative to the S&P 500 index; the Canadian portfolio betas are estimated relative to the TSX index. See Alberta Utilities Commission (AUC) 2023 Generic Cost of Capital (GCOC) Proceeding ID 27084, Exhibit 27084-X0029, Evidence of Dr Bente Villadsen, pg 7.

[63]   Alberta Utilities Commission (AUC), 2021 Generic Cost of Capital (GCOC) Proceeding ID 24110 Responses on Evidence to: Alberta Utilities Commission (AUC), Exhibit 24110-X0077, Evidence of Dr Bente Villadsen, pg 73

- To ensure business risk comparability for an energy firm beta estimate, the company should be predominantly engaged in energy transmission or distribution, with, for example,

  ○ At least 70% of revenues are in relevant regulated utility businesses[64]

  ○ At least 50% of their assets dedicated to regulated utility service[65]

  Note that the particular thresholds established for revenue, cash flow, or asset value proportions may be tuned to strike an appropriate balance between obtaining a statistically adequate sample and selecting comparators that are as close as possible to pure play energy network operators.[66]

- A company must also have sufficient liquidity to allow its share price to move as its risk relative to the market changes. This could be measured by the percentage of the company's shares traded over, say a week on average or require that the companies have an investment grade credit rating, and more than $US300 million in revenues to ensure liquidity. QCA has found companies with a market capitalisation of over $US 150 million have sufficient liquidity for reliable beta estimation.

- Eliminate companies whose stock return data may have been affected by M&A transactions during the relevant beta estimation window; a threshold for the size of the transaction in proportion to the company's market cap (e.g., 30%) may be established to identify material M&A activity.

- Ideally observations for a company should be available for the entire observation period to avoid any issues related to listing or de-listing.

IPART as part of its estimating equity beta review published a possible screening process although it did not publish numerical values for all criteria to be used in selecting comparator companies.[67]

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[64] Queensland Competition Authority, Rate of return review, Final report, November 2021, pg 74. Note that in some instances, it may be appropriate to replace or supplement revenue metrics with cash flow metrics (such as operating profit or EBITDA) in assessing the importance of regulated energy transmission or distribution operations to the company's business.

[65] Alberta Utilities Commission (AUC), 2021 Generic Cost of Capital (GCOC) Proceeding ID 24110 Responses on Evidence to: Alberta Utilities Commission (AUC), Exhibit 24110-X0077, Evidence of Bente Villadsen, pg 73

[66] For example, with respect to proxy group selection for setting the allowed rate of return on equity for natural gas or oil pipelines under its jurisdiction, FERC applies a 50% cash flow threshold to North American pipeline companies, but applies that standard flexibly, relaxing it when necessary to obtain a proxy group of at least 5 members. *Policy Statement on Determining Return on Equity for Natural Gas and Oil Pipelines*, 171 FERC ¶ 61,155, paragraph 64 (2020).

[67] IPART, Estimating equity beta for the weighted average cost of capital, August 2020, pg 5

Figure 7-6: IPART comparator firm screening

Table 2.1   Sample selection rule summary

Criteria
Pre-estimation screening rules
Industry
What industry, or industries, should be used to identify proxy firms?
Firm Characteristics
Does the firm operate in the nominated industry?
Does the firm undertake its activities in capital markets that are sufficiently similar to Australia?
Does the firm have a similar operating profile to the benchmark efficient firm?
Market
Is the sovereign's government bond market sufficiently deep and liquid?
Is the sovereign's equity market sufficiently deep and liquid?
Operating Profile
Is the firm's revenue predominately in the nominated industry?
Liquidity filters & data quality
Remove a weekly observation for a given stock if there is less than 2 days of trading data available.
Remove a weekly observation for a given stock if the calculated Amihud measure exceeds the threshold of 25.
Remove the firm if it has less than 260 weeks of trading data available.
Post-estimation screening rules
Is the sample size sufficiently large?
Are the estimates consistent (no extreme outliers)?
Are there obvious biases in the results?
Are there any data consistency issues (eg. Is the stock's listing exchange consistent with its actual operating market?)

Source: IPART analysis

> **Question 17**
>
> If an international sample is to be used for estimating equity beta, how should these international estimates be incorporated into the equity beta estimation method?

Matters regarding how international beta estimates should be incorporated into the beta estimation method primarily relate to two issues:

• How the international beta is estimated; and

• How the estimate influences the final beta estimate when combined with domestic beta estimates.

7.4.2   How the international beta is estimated

There are several international beta estimate matters to consider:

• **Use of the market on which the firm is listed to calculate beta, a domestic CAPM model, or an international CAPM model** – ATCO supports use of betas calculated with reference to a company's domestic market. This is consistent with generally accepted regulatory and financial practitioner practice and ensures the general market forces to which the company is subjected are the same as those for the "market".[68]

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[68] The Brattle Group, A Review of International approaches to Regulated Rates of Return, Prepared for the Australian Energy Regulator, June 2020, pg 41

- **De-levering and levering beta estimates** – beta is affected by the degree of leverage. Therefore, beta estimates should be de-levered and re-levered to the benchmark gearing. The generally accepted standard formulas for de-levering and re-levering are well documented, for example, by Brealey, Myers and Allen,[69] and consistently used by Australian regulators. The same formulae should be used across jurisdictions.

- **Statistical validity of the estimate** - In the previous section several criteria were listed in selecting firms to ensure statistical validity of the result. ATCO supports the use of LAD to reduce the effect of outliers.

- **Estimation time window** – the beta estimate should come from at least two years of data, and up to five years can be used. Longer windows than five years should not be used because that would incorporate out-of-date information.

7.4.3 How should these international estimates be incorporated into the equity beta estimation method

How the international beta estimates should be incorporated into the final beta estimate relates to how much weight should be given to those international beta estimates.

- Betas value weighted or simple averages – Unless it is believed that the larger the business the more reliable the estimated beta there is no reason to value weight. ATCO notes that, assuming the exclusion of small illiquid firms, it would seem to suggest that there is little to be gained from value weighting.

- Weight applied to international comparators – the weight applied to international comparators should not necessarily be fixed in advance of determining the sample of comparators. The weight will depend to some extent on how many comparators are from each jurisdiction and how directly comparable they are to the benchmark firm. It is also likely these international estimates being a larger sample than domestic firms will be less effected by short term firm specific events overall. Given there are many more foreign comparators and given that many of these will be highly comparable the simple average of countries taken by the ERA should be regarded as a minimum weight to international comparators.

Question 18

When considering equity beta should the ERA consider shocks such as COVID-19 and takeover announcements? If so, please explain why and how these events can be accounted for.

Yes, the ERA should consider the effect of the COVID-19 market shock and the effect of takeovers on estimates of beta. Caution must be exercised in removing observations from the dataset to avoid arbitrary or inconsistent adjustment.

ATCO supports in the first instance use of the Least Absolute Deviations (LAD) regression, rather than the OLS, estimator to improve the robustness of estimates. However, the estimates calculated cannot be mechanically adopted and should be tested for reasonableness, for example by comparison to values calculated by international regulators.

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[69]   Brealey, R., S. Myers and F. Allen, 2020, *Principles of Corporate Finance*, 13th edition, McGraw-Hill

In its September 2021 submission to the AER the ENA showed that the equity beta estimates for the three live domestic comparators have varied considerably over time.[70] For all three firms, the OLS beta estimates:

•   Increased substantially between the 2013 Guideline and the 2018 RoRI;

•   Continued to increase through to the COVID crash in early 2020; and

•   Declined substantially in February 2020 when the ASX fell sharply at the peak of uncertainty about the COVID pandemic.

The ENA's analysis explores the question as to whether the sharp reduction in beta estimates associated with the COVID crash reflects a sharp reduction in the true systematic risk of these firms, and an associated reduction in the true cost of equity capital, or whether the changes are a statistical artefact related to the COVID crash.

The ENA conclude that unusual or extreme events should not be systematically identified and removed, but rather make the point that beta estimates based on a very limited dataset can be highly sensitive to a very small number of highly influential observations, and that this sensitivity should be taken into account when exercising judgment within the criteria of sustainability and longevity.[71]

The ENA view is supported by the recommendation from Economic Insights that the statistical estimates of beta are just the starting point, and should not be mechanically adopted.[72]

The use of Least Absolute Deviations (LAD) regression is designed to give relatively less weight to extreme observations such as might be caused by takeover announcements or the COVID-19 pandemic. ATCO support the ERA continuing to consider both the OLS and the LAD methods to estimate equity beta. However, given the small set of domestic comparators and consequent statistical imprecision, ATCO supports the ERA giving primary weight to the LAD estimate to provide a more reliable estimate of the systematic risk of the benchmark energy networks.

Research commissioned by the ENA shows how the LAD estimator is less subject to influence from outliers and is a more reliable measure of beta[73]. The two graphs below based on that research show how the use of the LAD estimator produces more stable beta estimates.

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[70]   Energy Networks Australia, Estimating the cost of equity - Response to AER's Pathway to 2022 Rate of Return Instrument: Draft Equity Omnibus Working Paper, 3 September 2021, Figures 20, 21, 22 & 23, Available from: https://www.aer.gov.au/system/files/ENA%20-%20Submission%20-%20Equity%20-%203%20September%202021.pdf
[71]   Ibid., pg 81-82
[72]   Economic Insights, June 2021, Methodological issues in estimating the equity beta for Australian network energy businesses, pg 28
[73]   Energy Networks Australia, Estimating the cost of equity - Response to AER's Pathway to 2022 Rate of Return Instrument: Draft Equity Omnibus Working Paper, 3 September 2021, pg 83-84

Figure 7-7: Rolling OLS beta estimates for the live domestic comparators

Source: Bloomberg data; Frontier Economics calculations. Rolling 1-year OLS beta estimates using daily data. Re-levered to 60%.

Figure 7-8: Rolling LAD beta estimates for the live domestic comparators
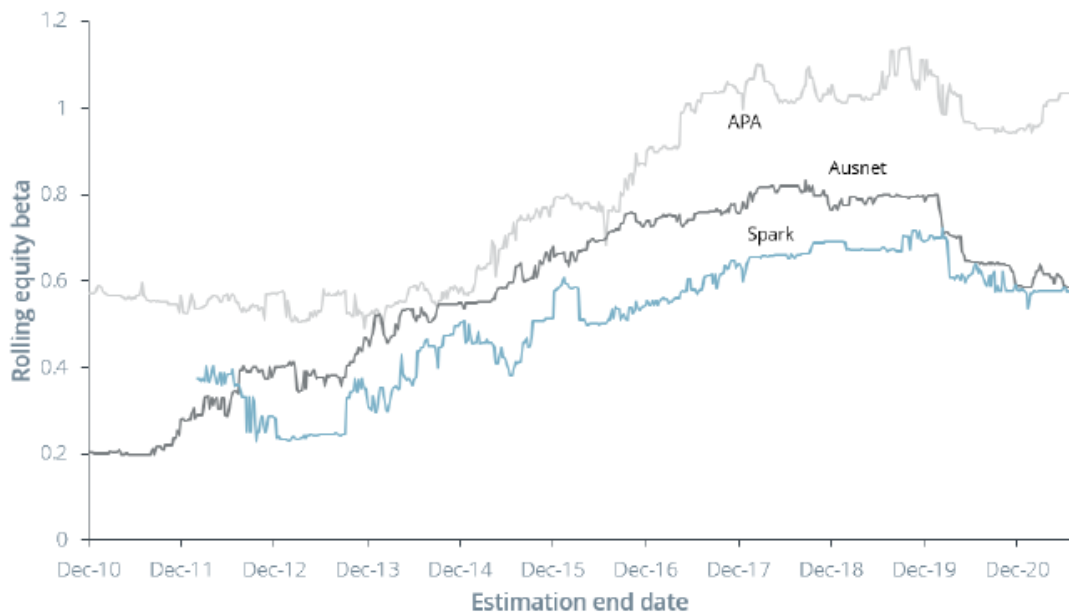
Source: Bloomberg data; Frontier Economics calculations. Rolling 5-year LAD beta estimates using weekly data. Re-levered to 60%.

Question 19

Do you support the ERA's general approach and simplifications for estimating equity beta (regardless of any potential changes to the sample firms)? If not, please explain why and your alternative approach. Specifically, the ERA is interested in views on the following aspects of the method applied to estimate equity beta in this paper:

- Use of a 5-year estimation window with weekly returns.

- Use of the Bloomberg total return index for individual stocks and market indices.

- Use of the Ordinary Least Squares estimator, with the Least Absolute Deviations method as a robust estimator.

ATCO accepts:

- Use of a 5-year estimation window with weekly returns provided that the sample of comparators is sufficiently large, and from a diverse set of equity markets. This proviso reflects the fact that 5-year equity betas estimated for individual firms can be noisy and a large/diverse sample is required to ensure that this noise cancels out across estimates.

- Use of the Bloomberg total return index for individual stocks and market indices.

- Use of the Ordinary Least Squares estimator, with primary weight given to the Least Absolute Deviations method as a robust estimator.

In particular, ATCO supports the use of the LAD as the primary beta estimator to remove the impact of outliers from statistical estimates of beta as stated in the response to question 18.

8. INFLATION

> **Question 20**
>
> When estimating the expected rate of inflation do you support the use of Treasury bond implied inflation approach? If not, please explain why and your alternative approach.

The Position Paper details the ERA's support for continuing to estimate the expected inflation rate mechanistically using the Treasury bond implied inflation approach.

The ERA's application of the Treasury bond implied inflation approach uses:

• the observed yields of 5-year Commonwealth Government Securities (which reflect a market-based estimate of the nominal risk free rate) and 5-year indexed Treasury bonds (which incorporate a market based estimate of a real risk free rate)

• the Fisher equation to estimate the expected inflation rate from the observed yields

• a trading day observation period that is consistent with the risk free rate observation period

ATCO supports the ERA's continued use of the Treasury bond implied inflation approach to estimate the expected inflation rate because ATCO is of the view that market expectations provide the best estimates of expected inflation for the regulatory period. The Treasury bond implied inflation approach allows for the recovery of efficient costs, consistent with the revenue and pricing principles.

As discussed in section 3.3, inflation should continue to be estimated over a five-year period as close as practical to the regulatory period.

9. GAMMA

ATCO maintains it position that the ERA's estimate of gamma through the application of the Monkhouse formula does not give rise to the best estimate of gamma. It is an internally inconsistent approach that involves estimating the proportion of credits that are distributed to one group of shareholders (50 large firms) and the proportion that are redeemed by an entirely different group of shareholders (all equity, including unlisted firms). Estimating gamma using different and inconsistent approaches/data for the two components does not result in an appropriate or best estimate of gamma consistent with the National Gas Objective and the Revenue and Pricing Principles.

ATCO have previously advocated for determining the estimate of gamma from aggregate tax statistics data published by the ATO.[74] This method calculates gamma directly as the proportion of created credits that are actually redeemed by investors in Australia. Under this approach, gamma is estimated directly as the ratio of total credits redeemed to total credits created, where each component is obtained from official ATO taxation statistics.

As noted by the ERA in its Discussion paper the AER has sought additional information from the ATO on its tax statistics. The AER has stated the purpose of seeking the updated information as follows:

> *"Our initial assessment is that the utilisation rate should take into account the imputation credits that are recycled within companies. When estimating the utilisation rate we need to determine what proportion of investors can use imputation credit (resident investors) vs investors that cannot use imputation credits (non-resident investors). Effectively assuming investors in a company can use 100 per cent of the imputation credits it receives may therefore result in an upward biased utilisation rate estimate.*
>
> *As a result, out of the two measures proposed by the ATO for the utilisation rate, we consider the 'net franking credit usage' measure would be more consistent with our assessment.[75]"*

The ATO in response[76] has provided information to the AER regarding "Net distribution (actual credits claimed, not including companies, vs distributions to entities who can use credits, not companies)". The data shows an average utilisation rate of 54% over the years 2012 to 2016. In comparison the ERA's initial position of a utilisation rate of 60% based on the national accounts appears high.

ATCO encourages the ERA to also seek clarification from the ATO on the tax statistics and to adopt the simpler ATO method of calculating gamma based on franking credits redeemed divided by franking credits created. The fewer parameters required to be estimated and the more they are estimated based on consistent data the less estimation error likely.

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[74]   ATCO, ATCO Submission – Draft Rate of Return Guidelines, pg 27-35, Available from:
       https://www.erawa.com.au/cproot/19888/2/ATCO%20Gas%20Australia%20-%20public%20submission.pdf
[75]   AER, Overall rate of return, Draft working paper, July 2021, pg 44
:[76]   Available at: https://www.aer.gov.au/system/files/ATO%20Note%20-%20Franking%20account%20reconciliation%20-
       %2011%20December%202018_0.pdf

10. EFFECTS OF FINANCIAL MARKET SHOCKS

The policy framework for the Rate of Return Instrument was designed to enable for the potential effects of financial market shocks to be accounted for in the rate of return methodology.

Whilst the Discussion Paper addresses shocks after they have occurred and to the extent that they affect the estimation of the different parameters (for example Question 18) it does not address how the effects of a new financial shock will be addressed during an Access Arrangement decision process and the five year access arrangement period if they arise.

The recent historic lows for the risk free rate are a case study for how there can be unintended consequences of rate of return instrument if it doesn't provide for addressing financial shocks. The recent low risk free rates have had a material effect on the return on equity.

As discussed in our response to Question 13 the ERA's initial position continues to embody assumptions that make it vulnerable to financial market shocks, including:

• A risk free rate that varies independently of the MRP, noting that the risk free rate is observed at the date of the access arrangement determination and paired to an MRP estimated at the date of the RORI decision.

• A fixed MRP, however the MRP and the risk free rate are estimated at times of potentially different market conditions.

These assumptions make estimates of the return on equity subject to unforeseen market conditions, such as RBA market intervention, and financial shocks. The risk free rate is observed at the date of the access arrangement determination and paired to an MRP estimated at the date of the RORI decision. The MRP and the risk free rate are estimated at times of potentially different market conditions. The situation has been summed up by Brattle:

> "All in all, the CAPM is a well-founded and commonly used model that relies primarily on readily available information. However, it can be overly variable (or unstable)— i.e., produce results which are sensitive to exactly when the estimates are done— because changes in interest rates affect the risk-free rate and market volatility affects the beta estimates. Thus, it is not clear that the MRP or beta remains constant as the risk-free rate changes. Instead, Bloomberg's analyses of the forward-looking MRP show that the MRP increases as the risk-free rate declines, so that the resulting market return moves less than the risk-free rate."[77]

Addressing financial shock between the setting of the RORI and an Access Arrangement decision

One way to address financial shocks through the rate of return instrument is to update both the historical arithmetic average and the DGM estimate of MRP at the time of setting an access arrangement rate of return. Using any DGM model, including the ENA's proposed calibrated DGM model, it is possible to update the DGM in a mechanistic way. The updated DGM helps capture any movement in the estimated MRP relative to a movement in the risk free rate leading to more stable estimates of equity returns. By using an updated DGM the MRP used to set the allowed rate of return would be a more current and consistent with the risk free rate estimate of the MRP and therefore result in a better estimate of the cost of equity funds in the prevailing conditions in the market for equity funds as required by the revenue and pricing principles. Updating the historical

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[77] The Brattle Group, A Review of International approaches to Regulated Rates of Return, Prepared for the Australian Energy Regulator, June 2020, pg 37

average MRP will likely have less movement than a DGM update due to the period it is estimated over but should still capture movements bet went he RORI and an access arrangement decision.

More broadly combining the DGM estimate of the MRP with the historical average of the MRP provides additional information to the process of setting the cost of equity and increases the likelihood that the estimate arrived at reflects current market conditions:

> "Relying on multiple models, or a crosscheck based on alternative models, allows the regulator to consider a broader set of information about market conditions and the industry. For example, the CAPM using a historical MRP relies on backward-looking information, while the Dividend Growth Model (DGM) uses forward-looking information. During periods of changes in financial markets, it becomes important to consider both historical (stable) and forward-looking (contemporaneous) information."[78]

Providing a mechanism to enable updates of MRP through the Rate of Return Instrument at the time of an access arrangement determination will enable the Rate of Return Instrument to address financial shocks and allow the resulting return on equity to better reflect conditions in the market at that time. The mechanism could operate as follows:

- The Rate of Return Instrument would set out the historical estimate of the MRP and the weighting of the historical returns and forward looking returns

- The forward looking return would be calculated at the same time as the risk free rate is calculated for an Access Arrangement final decision using a DGM, such as the calibrated DGM of the form proposed by the ENA[79].

- The MRP would be calculated as the updated DGM estimate combined with the historical average MRP in the weights specified in the RORI

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[78]   Ibid., pg 35
[79]   A copy of the ENA model is available at:
       https://www.aer.gov.au/system/files/ENA%20models%20%E2%80%93%202022%20RORI%20scenario%20testing%20and%20calibrated%20DGM.xlsm   A copy of the user guide is available at: https://www.aer.gov.au/system/files/ENA%20models%20user%20guide.pdf