AUSTRALIAN ENERGY REGULATOR

Regulated Rate of Return Fundamentals

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14 October 2020

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Presentation Overview

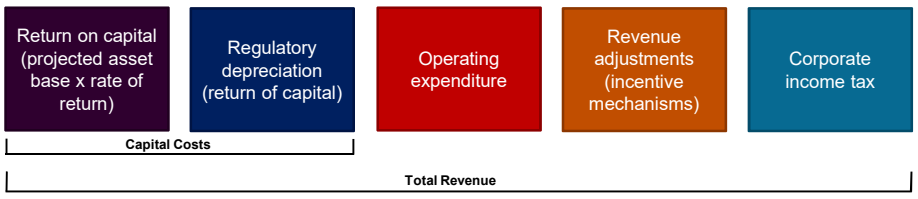
- Building block framework for incentive regulation
- Rate of return regulatory approach
  - Introduction
  - Gearing
  - Return on equity
  - Return on debt
  - Imputation credits
- Potential implications of 2018 Instrument

Part One

Building Block Framework

Building Block Approach

- We seek to promote the National Electricity/Gas Objectives:
  - To promote efficient investment in, and efficient operation and use of, energy services for the long term interests of consumers of energy – with respect to price, quality, safety, reliability and security of supply
- We use a building block framework to determine revenue



Building Block Approach

- Revenue requirement is the sum of expected costs across the regulatory period
  - Economic costs include a return on capital invested
- Requires ex-ante forecasts of efficient costs for each year of the regulatory control period:
  - Regulatory Asset Base (RAB)
  - Operating expenditure (opex)
  - Capital expenditure (capex)
  - Market conditions (e.g. demand, input costs)
  - Financial conditions (e.g. interest rates, inflation)
  - Other (incentive payments)

Incentive regulation

- Regulated revenues reflect expected costs for the network across a set period (typically five years)
  - Network retains benefit where it is able to reduce costs below our forecast (or wears detriment if costs exceed forecast)
- Revealed cost approach:
  - Efficiency gains benefit the network in the short term, but are taken into account in subsequent regulatory resets, benefitting consumers in the long term
  - We use benchmarking across networks to inform estimates of efficient costs

Incentive schemes

EBSS

Efficiency Benefit Sharing Scheme – Shares opex efficiency gains (and losses) made during a regulatory control period between NSPs and customers

STPIS

Service Target Performance Incentive Scheme – Provide rewards (and penalties) for network reliability and service performance

DMIS

Demand Management Incentive Scheme – Provide financial incentives for NSPs to implement efficient non-network alternatives and manage demand

CESS

Capital expenditure Sharing Scheme – Allow for the benefits/costs of capex underspends/overspends to be shared between NSPs and their customers

Inflation and Delivery of Real Rate of Return

- We specify a nominal rate of return, but underlying target is the delivery of the *ex ante* real rate of return
  - An estimate of expected inflation is used to calculate the expected real rate of return
  - Value of RAB and revenues will vary in line with inflation outcomes - preserve purchasing power for investors and customers
  - Joint outcome across our regulatory models (post-tax revenue model, annual pricing process, and roll forward model)
- Ongoing inflation review

Rate of Return Instrument

- Our Rate of Return Instrument sets out the approach by which we will estimate the rate of return on capital.
  - Binding Instrument – both the AER and NSPs must follow the current instrument
  - Outcome of legislative amendments introduced in 2018 (replacing Rate of return guideline, which was not binding)
- Four year cycle for each Instrument
  - 2018 Instrument applies until December 2022
  - Networks on staggered cycle of resets (typically five years) and Instrument applies from date of next reset

Rate of Return Instrument

- 2018 Instrument specifies:
  - Some elements fixed for the four year life of the Instrument
  - Some elements set using market data at the time of each regulatory reset
  - Some elements updated using market data each year
- Rate of return parameters set with regard to market evidence of efficient costs
  - Use of comparator sets of firms with comparable risk to regulated energy networks
  - Explanatory statement sets out our reasoning

Part Two

Rate of Return Regulatory Approach

Rate of Return Formula

- We calculate the rate of return for each regulatory year, t in a regulatory control period as follows:

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

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

Gearing Ratio (G)

- Gearing is the ratio of the value of debt to total capital (that is, debt and equity). The gearing ratio is used to weight the expected required return on debt and equity to derive the weighted average cost of capital (WACC).
- There are two types of gearing: market and book. In 2018 greater weight was given to market gearing rather than book.
- In the 2018 Instrument we set the gearing ratio as 60%. This was determined from observing gearing ratios of listed Australian energy networks.

Return on Equity (k^e)

- Return on equity is the return shareholders of the business will require for them to continue to invest.
- In the 2018 Instrument k^e is calculated using the standard Sharpe-Lintner Capital Asset Pricing Model (SL-CAPM). There are three parameters of this model:
  - risk free rate (k^f)
  - beta (β)
  - market risk premium (MRP)

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

Return on Equity: Risk Free Rate (k^f)

- The 'risk free rate' is the theoretical return on an asset with conceptually zero compensable risk. (This includes no default risk). Note that this does not exist in real life.
- We estimate the risk free rate by observing the yield on ten-year Commonwealth Government Securities and using this as a proxy.
- Networks are able to nominate the averaging period over which their risk free rate is calculated. Under the 2018 Instrument this period must be:
  - 20 to 60 business days in length
  - Occur between 3 and 7 months before the start of their regulatory control period

Return on Equity: Beta (β)

- Equity beta measures systematic or 'undiversifiable' risk. It is a measure of the risk an asset will add to a fully diversified portfolio.
- Under the 2018 Instrument the AER determines equity beta (β) by using domestic estimates of firms most comparable to our regulated firms. Most weight is given to long term data and firms with mostly regulated revenue.
- In 2018, we estimated an equity beta value of 0.6 relative to the Australian listed equity market. For context, the overall market has a beta of 1 (by definition)

Return on Equity: Market Risk Premium (MRP)

- The market risk premium is the difference between the expected return on the market portfolio and the risk free rate.
  - It is the additional return an investor expects from holding a risky market portfolio instead of risk free assets.
- Under the 2018 Instrument the AER estimates the MRP primarily by using historical excess returns (HER), which is the historical return on the Australian sharemarket above the risk free rate.
- In 2018, we estimated the MRP as 6.1%.

Return on Debt (k_t^d)

- Return on debt is the interest rate the network business pays when it borrows money to invest.
  - Our goal is to closely align the cost of debt with the efficient debt financing costs of regulated networks.
- Return on debt is updated each year using a 10-year trailing average portfolio (we are currently transitioning to this), reflecting gradual issuance of debt across time
  - We using averaging periods nominated by each network. The averaging periods must:
    - Be between 10 business days and 1 year in length
    - Occur between 4 and 16 months ahead of the regulatory year
- When calculating benchmark return on debt, the AER considers:
  - The credit rating of the debt
  - The term of the debt
  - Debt data providers' estimates of debt costs (or yields) for a given term and credit rating

Return on Debt (k_t^d) – Credit Rating

- Credit ratings affect how much it will cost a business to borrow money. The higher the credit rating of that business, the less 'risky' they are and will subsequently pay less interest on their issued debt.
- In the 2013 and 2018 reviews, the AER benchmarked using median credit ratings of a sample of firms considered comparable to an efficient firm in the supply of regulated energy services. Results are below.

Issuer	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Industry median	BBB/ BBB+	BBB/ BBB+	BBB+	BBB	BBB	BBB	BBB	BBB/ BBB+	BBB+	BBB+	BBB+	BBB+

Source: Bloomberg (S&P Global), AER analysis

- These results were cross checked using actual debt data supplied by businesses (on average BBB+).

Return on Debt (k_t^d) – Debt Term

- The term of debt is the length of time that debt must be paid back over and it influences the cost of borrowing.
- In the 2018 Instrument we set the benchmark debt term as 10 years. This decision was based on the typical term of debt at the time of issuance and the view it would converge to around 10 years under a 10 year trailing average.
- Actual debt data supplied by the networks showed average term at issuance of somewhat less than ten years (7.4 years). Our debt data working paper explores this calculation methodology and the varying nature of the data sources.

Return on Debt (k_t^d) – Trailing Average

- Includes ten annual estimates once transition is complete (calculated and included once a year).
- Prior to the 2013 Guideline all businesses were on an on-the-day approach (spot rate), which was reset every five years.
- To ensure ex-ante efficient compensation all businesses had to transition from the on-the-day approach to a trailing average. All businesses are currently still transitioning. An example is below:

Year	k_t^d (%)
Year 1 (transition)	5.5
Year 2	5.1
Year 3	5.3
Year 4	4.1

Trailing Average Update for Year 4:

$$k_t^d = (70\% \times 5.5) + (10\% \times 5.1) + (10\% \times 5.3) + (10\% \times 4.1)$$

$$k_t^d = 5.3\%$$

Imputation Credits – Gamma (γ)

- Under the Australian imputation tax system, investors receive imputation credits for tax paid at the company level. For eligible shareholders, imputation credits offset their Australian income tax liabilities.
- We factor the value of imputation credits (known as gamma or 'γ') into regulation to recognise that imputation credits benefit equity holders, in addition to any dividends or capital gains they receive.

$$\gamma = distribution\ rate \times utilisation\ rate$$

- Gamma is set as 0.585, which is the product of our estimated utilisation rate of 0.65 and our estimated efficient distribution rate of 0.90 (or 90 per cent).

Part Three

Potential Implications of 2018 Instrument for consideration

Implications potentially for consideration

- Low risk free rate environment and impact on RoE
- Are benchmark assumptions, including gearing, consistent with financing ability/practice in the current low rf rate environment?
- Large decreases in debt yields since the commencement of the transition to the trailing average. Is this of concern?
- Cross checks and what is appropriate

Low risk free rate environment

- This has materially lowered the RoE under our current (fixed MRP) approach. In our 2016 decisions the RoE was around 7% to 7.5% p.a. nominal. Currently, it would be around 0.85%+3.66% = 4.51%
- Is the RoE (on average) moving around one for one with the estimated rf rate?
- Has the low rf environment impacted gearing and capital issuance behaviour? Next slide

Benchmark assumptions under low interest rates

- The low RoE reduces free cash flows (and credit metrics at a fixed gearing ratio)
  - Are firms adjusting to lower free cash flows through reducing gearing?
  - How are rating agencies viewing the regime and are they lowering metrics (or being flexible in application)?
  - Should we decrease our gearing assumption? Is this material and does this matter?
- A low RoE combined with indexation of the asset base can result in a negative profit after tax
  - Is this an issue given the underlying return includes the increase in the asset base from indexation?

Large decreases in debt yields

- The cost of debt (debt yields) on BBB debt have decreased from over 6% in 2014 to around 2.5% now. Similar relative drops for A rated debt.
- As a result the trailing average return on debt for most (if not all NSPs) is well above debt yields at issuance.
  - How does this impact investment incentives?
  - Is this impacting gearing?
  - Is this impacting issuance choices (term, type of debt and so on)?
- Note we currently have no issue with the trailing average from an NPV (over the life of the assets compensation) perspective.

Cross Checks

- What cross checks are appropriate?
- Do past cross checks remain appropriate?
- Are some new cross checks appropriate?
- What can various cross checks be used for?

Questions?