International Approaches to Regulated Rates of Return

A REVIEW

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PRESENTED TO

Australian Energy Regulator

Stakeholder Forum

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THE Brattle GROUP

Disclaimer

This presentation is based on *A Review of International Approaches to Regulated Rates of Return*, a paper prepared by The Brattle Group for the Australian Energy Regulator, dated June 2020 and published here. The authors of the report are Brattle Principals Toby Brown, Dan Harris and Bente Villadsen, as well as Brattle Associates John Anthony, Lucrezio Figurelli and Nguyet Nguyen. The report analyses information published by the AER as well as regulators in other jurisdictions. The authors are not lawyers; nothing in the report is intended to provide any legal analysis or opinion as to the nature of legal rights or obligations. The report and this presentation reflect the analyses and opinions of the report authors and do not necessarily reflect those of The Brattle Group or its clients. There are no third party beneficiaries with respect to this work, and The Brattle Group does not accept any liability to any third party in respect of the contents of the report and this presentation, or any actions taken or decisions made as a consequence of the information contained.

Agenda

- Comparability across jurisdictions
  - Do different regulators target the same thing when determining the authorized rate of return?
  - Do different regulatory frameworks create different risks, compensated in the rate of return?
- Observed differences and similarities
  - In terms of method
  - In terms of results
- Suggested best practice

Scope of our review

- We examined
  - Australia (Australian Energy Regulator, AER)
  - Netherlands (Authority for Consumers and Markets, ACM)
  - USA energy (Federal Energy Regulatory Commission, FERC)
  - USA freight rail (Surface Transportation Board, STB)
  - Italy (Regulatory Authority for Energy, Networks and the Environment, ARERA)
  - New Zealand (Commerce Commission, NZCC)
  - Great Britain energy (Office of Gas and Electricity Markets, Ofgem)
  - Great Britain water (Water Services Regulation Authority, Ofwat)
- For each, we documented the rate of return methodology and the results from one recent rate of return decision

Comparability across jurisdictions

Different “flavours” of the rate of return

- In some jurisdictions (eg, USA) all investor returns come from current earnings
  - Authorised return is equal to the (nominal) cost of capital
- In many other jurisdictions, the asset base is adjusted for inflation
  - Authorized return is a “real” cost of capital
- Some set the tax building block equal to the tax rate times all of the authorized rate of return
  - Authorized return is the after tax cost of capital (“ATWACC”)
- Others provide a tax allowance on the equity return only
  - Authorized return is the “vanilla WACC”
- Others include tax within the rate of return (“pre-tax WACC”)
- For the most part, we can convert between the “flavours”

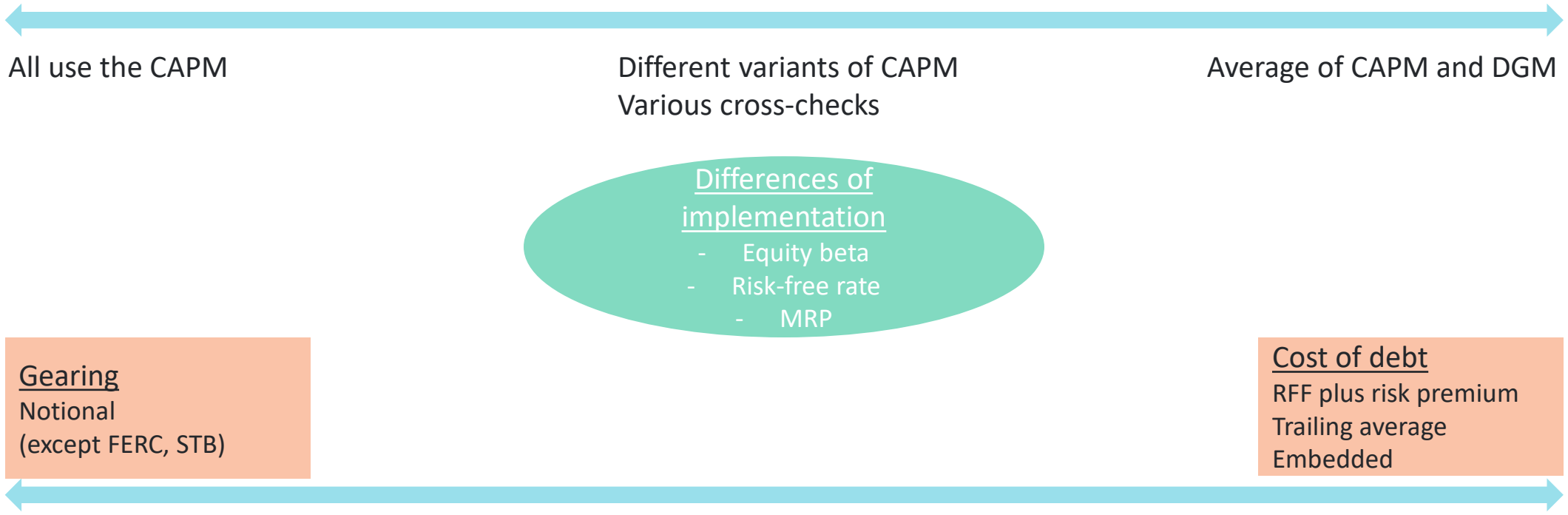
Risk differences due to regulation

- Do different regulatory frameworks create different risks which are compensated in the rate of return?
  - First, all regulators* (say that they) set the allowed return equal to the estimated cost of capital
  - There is no "wedge" or additional return
- Second, risk differences from incentive arrangements probably do not increase systematic risk
  - So do not increase the cost of capital
- Therefore, rate of return methodologies should be comparable

*Note: Ofgem has recently indicated that it will set the authorised return on equity *below* its estimate of the cost of equity, because of "expected outperformance" – ie, because it anticipates that the utilities will underspend relative to Ofgem's expenditure assumptions. This approach is controversial. (See reference materials for details.)

Observed differences and similarities

Methodologies



Comparability of results

- Using the results published by each regulator, we expressed the authorised rate of return in “real vanilla WACC” terms where possible

- We have not adjusted for effects of when the decisions were taken
  - Most obviously impacts the risk-free rate
  - Debt and equity premiums can also be influenced by timing, but likely less so than risk-free rate

Equity and debt premiums

- We calculate equity and debt premiums as the difference between:
  - the authorised return on equity (or debt) and
  - the regulator's determination of the risk-free rate

		AER	ACM	FERC	STB	ARERA	NZCC	Ofgem	Ofwat
Decision year		2020	2016	2020	2018	2019	2019	2019	2019
Nominal risk-free rate	[1]	1.03%	1.28%	2.70%	3.02%		1.12%		
Real risk-free rate	[2]	-1.24%				1.89%		-0.75%	-1.39%
Equity premium	[3]	3.66%	3.74%	7.35%	10.84%	3.88%	4.75%	5.55%	5.58%
Debt premium	[4]	3.73%	0.76%		1.14%	0.50%	1.60%	2.68%	3.43%

Notes:
Please see Brattle paper for sources and calculations.
All figures relate to energy transport utilities except STB (rail) and Ofwat (water).

Equity beta and MRP

		AER	ACM	FERC	STB	ARERA	NZCC	Ofgem	Ofwat
Decision year		2020	2016	2020	2018	2019	2019	2019	2019
MRP	[1]	6.10%	5.05%	8.60%	6.91%	5.50%	*7.29%*	*7.32%*	7.89%
Equity beta	[2]	0.60	0.74	0.84	1.11	0.71	*0.65*	*0.76*	0.71

Notes:

Please see Brattle paper for sources and calculations.

Figures in italics are calculated by Brattle; other figures are reported in the regulator's decision.

All figures relate to energy transport utilities except STB (rail) and Ofwat (water).

Suggested best practices

SUGGESTED BEST PRACTICES

Make the cost of equity forward looking

- Many regulators use a purely backwards-looking MRP
  - Some incorporate or rely on forward-looking assessments
- A backwards-looking MRP may not reflect market conditions when
  - Real risk-free rate is negative
  - Market-wide DGM results not consistent with historical MRP
- Suggest
  - Incorporate forward-looking estimates into MRP (or risk-free rate)
  - “Incorporate” means give this evidence non-zero weight

SUGGESTED BEST PRACTICES

Use multiple models for the cost of equity

- All regulators use the CAPM
- Many regulators only use the CAPM
  - Some give equal weight to the CAPM and the DGM
  - Some use the DGM as a cross-check
- Using a single model means throwing away information
  - DGM uses share prices and analyst dividend forecasts
  - CAPM uses covariance of share and market returns
- Suggest
  - Take account of more than one model
  - Put less than 100% weight on CAPM results

SUGGESTED BEST PRACTICES

Updating the cost of equity

- In different jurisdictions, cost of equity is determined:
  - as part of the price control (usually runs for 5 years)
  - in a separate rate of return proceeding
  - with or without updating during the price control

- The parameters of the cost of equity are not constant over time and are not independent
  - Risk-free rate may be correlated with MRP
  - Macro events impact risk-free rate, MRP and equity beta

- Suggest
  - Adjusting revenues to reflect updated cost of equity more often than every five years, but
  - Update all cost of equity parameters together

SUGGESTED BEST PRACTICES

Estimation window for equity beta

- Equity beta is estimated from a time series of share prices
  - Most regulators use 3 – 5 years of data
  - Some use both local and international data
- Equity beta can vary over time
  - For example, US utility betas seem to have increased over the first half of 2020 (see reference materials slide)
- Suggest
  - Use recent data
  - Use a five year window, or shorter (two or three years is a good default)

Reference materials

- Brattle's paper for the Australian Energy Regulator (on which this presentation is based)
  - *A Review of International Approaches to Regulated Rates of Return*, prepared by the Brattle Group for the Australian Energy Regulator, June 2020, here
- For recent developments in Great Britain, in particular proposals to set the authorised return on equity below the cost of equity
  - *RIIO-2 Draft Determinations – Finance Annex*, Ofgem, 9 July 2020, here
- For an example of utility betas changing over time, see
  - *Global Impacts and Implications of COVID-19 on Utility Finance*, The Brattle Group, June 2020, p. 23, here

Glossary

- CAPM: Capital Asset Pricing Model, can be used to estimate the cost of equity by measuring “equity beta” (covariance of returns on a portfolio of utility shares with returns on the market as a whole)
- DGM: Dividend Growth Model, can be used to estimate MRP and the cost of equity using equity analyst dividend forecasts and current share prices (also known as the “DCF model”)
- MRP: Market Risk Premium, defined as the expected additional return above the risk-free rate from investing in risky assets

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Dr. Toby Brown specializes in infrastructure access pricing, economic regulation, and the gas and electricity sectors. He heads Brattle's Sydney office.

Dr. Brown advises pipelines, utilities, energy market operators and regulators, and has particular expertise in the design of incentive mechanisms for the economic regulation of energy networks. He has provided expert advice in proceedings to modify the framework of utility regulation in Australia, New Zealand, the U.S. and Canada. He has advised in connection with disputes over pricing in electricity distribution, electricity transmission, gas distribution, natural gas and oil pipelines, and rail and water sectors.

In addition to his regulatory work, Dr. Brown has also provided asset valuations in commercial disputes and tax matters, and he has advised on the pricing of natural gas and LNG. He has submitted expert reports in regulatory proceedings in Australia, New Zealand, the U.S. and Canada, and in commercial litigation in Australia.

Prior to joining Brattle, Dr. Brown worked at the UK energy regulator, Ofgem. He holds a B.A. (Hons) and a D.Phil. in Chemistry from the University of Oxford.

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Dr. Villadsen specializes in finance and accounting matters with an emphasis on the energy industry.

She is a frequent author and speaker on regulatory return and risk issues and has testified on rate of return and discount rate matters as well as accounting and damages in many jurisdictions including the FERC, US state and Canadian provincial settings, U.S. and international arbitrations, and the U.S. federal court.

Her recent work has included the determination of the cost of capital for electric power, electric utilities, pipelines, and water companies in Australia, Canada, Mexico, the Netherlands, and the United States. She has evaluated the appropriate recovery or value of asset retirement obligations for pipelines and the effect of power purchase agreements on the risk of both the power producer and buyer. In addition, Dr. Villadsen has been deeply involved in analyzed credit and capital structure issues, risk management and the prudence hereof, as well the impact of regulatory initiatives such as energy efficiency and de-coupling on credit, cost of capital, and earnings.

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