

Cost of Capital

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Cost of Capital
CAMPUT Energy Regulation Course
May 28, 2024
1:00 - 2:15 p.m.

Agenda

- What is the cost of capital?
- What are the principles that guide regulatory discretion?
- How are the key components determined?
- Why is cost of capital so controversial?
- Decisions and Discussion Document

Things to Keep in Mind

- Exercise to determine legitimate and real costs
- For the purpose of setting just and reasonable rates
- Exercise in informed judgment

What is the Cost of Capital?

➤ The cost of capital (CoC) to a utility is:

equivalent to the aggregate return on investment investors require to keep their capital invested in the utility and to invest new capital in the utility

Net total capital investment is generally described as “Rate Base”
(RB)

What is the Cost of Capital?

➤ Aggregate return ON rate base:

- Capital structure – \$ amount of debt and equity that support rate base
- Cost of debt – short and long-term debt (%)
- Cost of equity – common equity (%)

➤ Return OF capital is companion concept: decline in economic value of an asset over time or consumption of fixed capital

Just and reasonable rates must provide for a return OF capital and a return ON capital

What is the Cost of Capital?

- In formulaic terms, the aggregate return on rate base to investors can be stated as being equal to:

$$RB (\$) \times [(D/RB \times \% \text{ Cost of Debt}) + (E/RB \times \% \text{ Cost of Equity})]$$

Just and reasonable rates must provide for a return OF capital and a return ON capital

What is the Cost of Capital?

Example: Hydro One Networks Tx – 2018 Approved Metrics

Description	OEB Approved 2018 (\$ Millions)	% Of Base Revenue Requirement	Base Revenue Requirement as % of Rate Base
OM&A	394.3	24.65%	
Depreciation	468.6	29.30%	
Return on Debt	289.9	18.13%	
Return on Equity	391.5	24.48%	
Income Tax	<u>55.1</u>	3.45%	
Base Revenue Requirement	1,599.4		
Rate Base	11,488.0		13.92

What are the Principles that Guide Regulatory Discretion?

➤ Fair Return Standard (FRS)

- *Bluefield Waterworks & Improvement Co. v. Public Service Commission of West Virginia et. al.* 262 U.S. 679 (1923)
- *Northwestern Utilities Limited v. City of Edmonton*, [1929] S.C.R. 186
- *Federal Power Commission v. Hope Natural Gas* 320 U.S. 591 (1944)

What are the Principles that Guide Regulatory Discretion?

➤ FRS as defined by National Energy Board in RH-2-2004:

A fair or reasonable return on capital should:

- Be comparable to the return available from the application of invested capital to other enterprises of like risk (the *comparable investment standard*);
- Enable the financial integrity of the regulated enterprise to be maintained (the *financial integrity standard*); and
- Permit incremental capital to be attracted to the enterprise on reasonable terms and conditions (the *capital attraction standard*)

What are the Principles that Guide Regulatory Discretion?

➤ Takeaways from FRS and experience applying it:

- All three elements of FRS must be satisfied, and none ranks in priority to the others
- Meeting the FRS is a legal requirement and is not optional
- FRS refers to an opportunity CoC concept and is prospective not retrospective

What are the Principles that Guide Regulatory Discretion?

➤ Takeaways from FRS and experience applying it:

- Overall return on equity (ROE x equity portion of RB) must be determined solely on a company's cost of equity capital. The impact of any resulting toll or rate increase is an irrelevant consideration in that determination
- Investor and consumer interests are not balanced in determining the CoC – investor and consumer interests are balanced in the setting of rates

What are the Principles that Guide Regulatory Discretion?

➤ Takeaways from FRS and experience applying it:

- A CoC determination does not represent a reward or payment greater than the opportunity cost of capital
- It is determined based on the “stand alone” costs related to the provision of regulated utility services

FRS is sufficiently broad such that the use of regulatory discretion to determine cost of capital requires informed judgment.

What are the Principles that Guide Regulatory Discretion?

➤ Four capital markets concepts implicit in definition of CoC:

1. Forward-looking – CoC is an expected rate of return
2. Opportunity cost of investing
3. Determined in and by the capital market
4. Reflects risk of the investment – how the funds are used and not source of funds

How are Key Components Determined?

➤ Capital Structure

Refers to the amount of debt and equity that supports rate base, the costs of which must be recovered in just and reasonable rates

How are Key Components Determined?

➤ Capital Structure

Business risk – inherent variability of a firm's operating earnings

Financial risk – added risk borne by shareholders due to the substitution of debt for equity

Regulatory risk – includes changes in government policy, issues requiring regulatory consideration, and outcomes from regulatory processes that have or may be perceived to have an adverse impact on utility's ability to earn its allowed ROE

How are Key Components Determined?

➤ Capital Structure

- Capital markets conditions and access to capital
- Economic data and forecasts
- Monetary policy and inflation
- Corporate credit ratings
- Technological change and obsolescence
- Climate change
- Impact of new policy (statutory)
- Impact of regulatory decisions
- Court decisions
- Experience and metrics of comparator group(s)

Analysis may focus on incremental change since last review

How are Key Components Determined?

➤ Capital Structure

Deemed capital structure is the capital structure reflected in rates and used as part of the analysis to determine whether the FRS has been met

Actual capital structure can differ from deemed capital structure

How are Key Components Determined?

➤ Cost of Debt

- Not usually controversial
- Generally transparent
- Established, time-tested processes to determine cost

How are Key Components Determined?

➤ Cost of Debt: Long-term debt (LTD)

- 3rd Party LTD usually afforded the actual or forecast rate
- Weighted cost of embedded LTD is determined
- Amount and cost of new LTD for test year(s) factored into weighted cost
- Weighted cost of new and embedded LTD recovered in rates
- Debt instruments and rates are subject to prudence review in application for rates
- Total estimated cost of LTD should be close proxy for actual costs in rate year

How are Key Components Determined?

➤ Cost of Debt: Short-term debt (STD)

- Used for an unfunded portion to true-up deemed capital structure and actual capital structure
- Typically small amount
- Forecast of amount and cost is provided for test year and subject to review

How are Key Components Determined?

➤ Cost of Equity

Common methods of estimating cost of equity

- Equity Risk Premium (ERP)
- Capital Asset Pricing Model (CAPM)
- Discounted Cash Flow (DCF)
- Other Methods - Risk Premium Regression Models

How are Key Components Determined?

➤ Cost of Equity: Equity Risk Premium (ERP)

$$\text{Expected Return on Stock} = r_f + (r_i - r_f)$$

Where: r_f is the return on the risk-free security

r_i is the return on the stock

$(r_i - r_f)$ is the difference between the return on the stock and risk-free rate

How are Key Components Determined?

➤ Cost of Equity: Equity Risk Premium (ERP)

Key Assumption:

- Investors require higher returns on riskier investments

Drawbacks:

- Market return on stock vs risk-free rate must be measured
- Government bond yield is proxy for risk-free rate
- Circularity – analysis of past basis for future expectation
- Not all subject utilities are publicly traded

How are Key Components Determined?

➤ Cost of Equity: Capital Asset Pricing Model (CAPM)

$$\text{Expected Return on Stock} = r_f + \beta (r_m - r_f)$$

- Where:
- r_f is the return on the risk-free security
 - r_m is the return on the efficient market portfolio
 - $(r_m - r_f)$ is the difference between the return on the market portfolio and risk-free rate
 - β is the covariance of returns on the stock with returns on the market portfolio, divided by the variance of market portfolio returns

How are Key Components Determined?

➤ Cost of Equity: Capital Asset Pricing Model (CAPM)

Key Assumptions:

- Investors require higher returns on riskier investments
- Investors seek to diversify asset holdings to eliminate diversifiable or unsystematic risk
- Investors are compensated only for non-diversifiable or systematic risk

How are Key Components Determined?

➤ Cost of Equity: Capital Asset Pricing Model (CAPM)

Drawbacks:

- Return on efficient market portfolio must be measured
- Stock market indices are used as proxy for all assets in economy (market portfolio)
- Investors seek return opportunities based on diversifiable risk
- Government bond yield is proxy for risk-free rate
- Low- β stocks (utilities) earn higher returns than CAPM predicts and high- β stocks return less

How are Key Components Determined?

➤ Cost of Equity: Discounted Cash Flow (DCF)

$$\text{Expected Return on Stock} = D_1/P_0 + g$$

- Where:
- D_1 is the next period expected dividend
 - P_0 is the current period common share market price
 - g is the expected long-term (perpetual) dividend growth rate

How are Key Components Determined?

➤ Cost of Equity: Discounted Cash Flow (DCF)

Key Assumptions:

- Cost of equity is expected dividend yield plus rate of future dividend growth
- Single stage dividend growth model
- Can be adjusted to reflect multiple stages, each with different expected dividend growth rates
- Prospective calculation using analysts' published estimates

How are Key Components Determined?

➤ Cost of Equity: Discounted Cash Flow (DCF)

Drawbacks:

- Analyst estimates may be optimistic and subject to short-termism
- Dividend growth rate may be bounded by estimated GDP growth
- Multi-stage model introduces new variables
- Not all subject utilities are publicly traded; proxy groups needed

How are Key Components Determined?

➤ Cost of Equity: Other Methods

- Risk Premium Regression Models
- Comparable Earnings
- Arbitrage Pricing Theory
- Bespoke ERP Econometric Models
- Experienced ERP Approach

How are Key Components Determined?

➤ Cost of Equity: Observations

- Past poor indicator of expected future performance
- Rational interpretations of historical data can result in different predictions about the future
- All models are simplistic representations of market outcomes – none work well
- All estimates use comparator groups that are highly contested
- Data are subject to empirical issues

How are Key Components Determined?

➤ Cost of Equity: Observations

- CAPM, DCF, M-DCF, and Risk Premium Regression Models common methodologies used
- Result is a return on equity range, with CAPM estimate at the bottom and Risk Premium Regression estimates at the upper end
- Range is likely to be sufficiently wide such that it will not meaningfully inform regulatory discretion

Why is Cost of Capital Controversial?

➤ Sources of controversy

- Cost of equity not transparent
- Confusion about “profit” versus “opportunity cost”
- Guaranteed profit versus opportunity to earn
- Government ownership
- Actual ROE greater than ROE in rates - PBR
- Profit is “bad”
- Perceived transfer of risk to customers from shareholders
- Biggest line items in revenue requirement
- Effect on customer rates
- Rate affordability

Decisions and Discussion Document

➤ Cost of Capital Decisions:

- Nova Scotia Utility and Review Board – 2023 NSUARB 12 M10431 (February 2, 2023)
- British Columbia Utilities Commission – Decision and Order G-236-23 (September 5, 2023)
- Alberta Utilities Commission – Decision 27084-D02-2023 (October 9, 2023)

➤ Discussion Document: Isolating a market-based range of ROE and ERP

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Questions?