NEW ZEALAND INSTITUTE FOR THE STUDY OF COMPETITION AND REGULATION INC.

The Cost of Capital for the Regulated Firm:

Background Issues

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Industry Specific Regulation

- Industry specific regulation uses estimates of cost to set prices / revenues
  - Cost includes the competitive return on investment (cost of capital).
- Quite different from standard Commerce Act determinations of the past
  - Public benefits (counterfactual)
  - Use of market power

Commerce Commission Consideration of the Cost of Capital

- Airports
- Electricity Lines
- Fonterra
- TSO business of Telecom

  (supply of local access services to commercially non-viable customers)

Time for an assessment of the trends

Significance

- If the WACC is too high the network operator is over-compensated and investment is encouraged.
- If the WACC is too low, the network operator is under-compensated and investment will be discouraged.
- Very large dynamic efficiency costs of a WACC that is too low.

Regulated Industries

- Associated with substantial fixed and irreversible investment
- Implications:
  - The location as well as the quantum of investment, matters
  - Options created and destroyed by regulation or investment have substantial value

Regulated Industries

- Regulation sets a maximum return not a guaranteed return
- Regulated firm is exposed to competition, technical change and movements in customers that will affect return:
  - The risk of asset stranding is material

The Commission’s Approach

The weighted average cost of capital (WACC) as measured by a post-tax form of the capital asset pricing model (CAPM)

=

The appropriate measure of the rate of return required by investors in regulated firms

The Commission's Approach

Key drivers of the WACC are:

- Risk-free rate
- Market Risk Premium
- Beta – a measure of the sensitivity of asset returns to market returns

The Commission’s Approach

- Only systematic risk matters

  “…the TSO cost of capital is only concerned with compensation for non-firm specific risk, and therefore firm-specific risks …need not be compensated..”

  - *An assumption of the model and a statement of fact?*

The Commission's Approach

- Firms with similar elasticities of demand and regulatory review periods, but in different industries, will have comparable asset betas.

  Unregulated firms in the same industry are not comparable: they share industry-specific rather than systematic risk, and systematic risk does not affect beta.

The Commission's Approach

Incentive regulation affects only firm-specific risk so does not affect the required return.

RoR for Rate of Return Regulation

=

RoR for Price Cap (incentive) Regulation

The Commission's Approach

- Firm-specific risk should be captured in the cash flows rather than reflected in the required rate of return.

  – What does this mean?

The Commission's Approach

- Possible interpretations:
  - Investors do not require compensation for firm specific risk
  - The risk is symmetrical around the expectation and therefore offsetting
  - The expected cash flows are adjusted to compensate for both the expectation and the uncertainty around that expectation
  - Full ex post compensation for firm specific risk is to be provided through adjustment of the cash flows

The Commission's Approach

If regulation:

Reduces systematic risk (eg insulating cash flows from market shocks),

But

Increases firm-specific risk (eg. greater exposure to competition)

The required rate of return falls.

Type	WACC
Electricity Lines	**6.9%**
Airports - Auckland	**8.4%**
Airports – Wellington	**9.3%**
Airports – Christchurch	**8.9%**
TSO	**6.0%**

Why Do Airports Have A Higher WACC?

- Higher income elasticity of demand
- No fixed price element in charges
- Competition and technical change may provide greater risk of stranding in electricity lines and telecommunications, but (in the CAPM) this does not affect the required return

The Commission's Approach

- The risk-free rate should be the rate of return on government bonds
  - at the beginning of the regulatory period and
  - having the same duration as the regulatory period.

The Acid Test

- Is the Commission's approach appropriate for the task of calculating the rate of return required by investors in regulated firms?

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Summary and Conclusion

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CAPM

- Assumptions are unrealistic
  - This is not unusual in theoretical models
  - CAPM has no role for the issues that have been the focus of microeconomics for 30 years (eg information asymmetries)
- Inconsistent with practitioner evidence
- Widespread skepticism about rate of return estimates based on the CAPM

Assumptions and Conclusions

- The exclusion of firm specific risk rests on the perfect market assumptions of the CAPM.
- The claim that specific risk does not affect the required rate of return is an assumption of the CAPM, not an empirical fact.
- Rejecting compensation for specific risk because it does not affect the required rate of return in the CAPM effectively offers assumptions as conclusions.

No Easy Solution

- Hard to “prove” alternative views
- Can’t value every option
- No simple model of how to make adjustments for the limitations of CAPM.
- Declining to acknowledge the limits of the CAPM is not an adequate response.

Term of the Risk Free Rate

- Substantial implications for the WACC
- Clear in respect of rate of return regulation, but has no role for specific risk associated with incentive regulation
- A major challenge for those who use the long-term rate
  - If long rates just provide some adjustment for firm-specific risk, it is time to develop a better and more explicit methodology.

Asset Beta

- In a rate of return framework and CAPM world, shocks that are fully compensated by the regulator will not affect Beta
- Firm specific risk in a regulatory framework where compensation is not provided is still to be addressed
  - This issue assumes greater importance under incentive regulation than it did with rate of return regulation

Asset Stranding

- A specific example of violation of the assumptions of the CAPM
  - Irreversible investment given uncertain demand

Asset Stranding

- Rate of return regulation imposes risk on customers, whereas incentive regulation imposes risk on the firm's shareholders.
  - Other things equal, the CAPM says that investors will require the same rate of return under both regimes.

Regulated Industries

- High levels of firm specific risk associated with irreversible investment
  - Often exacerbated by the effects of regulation
- Greater divergence between the CAPM and the market's required return than in other industries

Overall

- The Commission has provided a rigorous application of the CAPM, and has advanced our understanding of its application to regulated industries.
- The assumptions of the CAPM are unrealistic, and strong enough to drive perverse conclusions about the rate of return where market risk is small and specific risk is large.

Overall

- The limitations of CAPM are most apparent under incentive regulation
  - Systematic risk is relatively low and specific risk is relatively high
- The CAPM provides a starting point for thinking about the required return for the regulated firm, not the end point.