## **Rate of Return Regulation**

A Presentation at the

## Regulation for Practitioners RERA Training Programme

27<sup>th</sup> -31<sup>st</sup> July 2009 Johannesburg, South Africa

by Raphael Salasini Email: rsalasin@coppernet.zm This presentation is adapted from presentations prepared by Prof Jorry Mwenechanya, Prof Anton Eberhard, Dr Paul Sotkiewicz with revisions and additions by Raphael Salasini.

#### ACKNOWLEDGEMENT

0

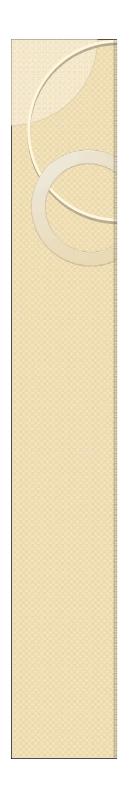


## Outline

- i. Introduction Choices in Regulatory Models
- ii. Principles of RoR Regulation
- iii. RoR and WACC
- iv. Required Revenue
- v. Advantages & Disadvantages
- vi. Some Key Concepts
- vii. Conclusions

# I) Introduction Choices in Regulatory Models –

- Economic efficiency Vs Social consideration
  - Quality of life
  - Tariff subsidies
  - Abuse of market power
  - Solution must be a balanced system



## - Choices in Regulatory Models –

- Rule Basis Vs License Basis
  - License (contract between state & regulated)
    - more favored by lenders & investors. Less flexible.
  - Rule (regulations stated in law)
    - terms & conditions subject to change on ongoing basis. Flexible.



## - Choices in Regulatory Models -

- Cost Basis Vs Price Basis
  - pricing of monopoly services e.g. transmission lines and pipelines.
  - Cost basis is highly fact intensive
    - provides regulatory oversight
  - Price based is theory intensive
    - must choose a rate making formula
  - (RoR Regulation is Cost Based)



## - Choices in Regulatory Models –

- Promote competition Vs Anti-Trust Enforcement
  - competition achieves innovation & efficiency
  - industry structure
  - regulate monopoly power where it exists



## - Choices in Regulatory Models –

- Deliberative Process Vs Administrative Process
  - multiple decision makers with public input
    - transparent
  - single decision maker, may or may not be independent

# 2) Principles of RoR Regulation

- Cost Based
  - "Cost of service" regulation
- Prices are set to allow the utility generate a "fair level of profit" or "rate of return" (RoR) on capital investments
- Capital investments or Regulated Asset Base (RAB) usually equals all capital that is "used and useful" in delivering the service
- The Regulator allow a RoR that would ensure:
  - new investment in the utility
  - replacement of existing assets
  - allows the utility to cover prudently incurred expenses



# 3) RoR and WACC

- RoR is an estimate of the cost of capital for the company:
  - Note the regulator does not set the cost of capital, it is set by the markets
  - However, the regulator can affect the cost of capital
- The allowed RoR is:
  - the marginal cost of finance
  - normally based on a mix of debt and equity
  - forward-looking (over what time horizon?) but based primarily on historic and comparative data
  - the subject of academic debate as to the appropriate way to calculate



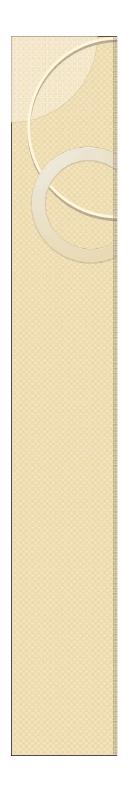
- The RoR sets the return that can be earned on:
  - existing assets; and
  - net investment
  - Weighted Average Cost of Capital (WACC) is normally based on a mix of debt and equity



- If RoR = WACC
  - NPV of utility is 0
  - Operator receives no excess profit
  - Investment should be at the optimal level
  - Comparable to competitive market
  - Operator is financially viable

### If RoR > WACC

- NPV of enterprise > 0
- Operator receives excess profit
- company has an incentive to over-invest
- There is need for increased efficiency incentives
- If RoR < WACC</li>
  - NPV of enterprise is < 0
  - Operator is NOT financially viable
  - company has an incentive to under-invest



# 4) Required Revenue

- The Regulator:
  - allows the utility to recover prudently incurred operating and maintenance expenses
  - determines the Regulated Asset Base (RAB) on which to apply the Rate of Return (RoR) and rate of depreciation
  - assumes quantities to be sold



Required revenue is then:

$$P \times Q = E + d + T + (B \times r)$$

Where:

- P = price
- Q = assumed quantity to be sold
- E = allowed expenses
- d = depreciation
- T = taxes
- B = regulated asset base
- R = rate of return



- Some features of RoR Regulation:
  - Reviews occur when earnings depart significantly from target levels.
  - For expenses, "pass-through" clauses are often employed to avoid frequent reviews.
  - In practice, if the utility "over-earns", rate reviews occur with a time lag if the regulator or consumers lack information on earnings (or they are just not paying attention)

# 5) Advantages & Disadvantages

## Advantages

- Suitable for pricing of monopoly services e.g. transmission lines and pipelines
- Can provide the utility with stable earnings
- Allows current prices to reflect changes in market conditions such as fuel adjustments and emergency repairs to broken water mains
- Facilitates Regulatory oversight

# Disadvantages

- Calculations can be data intensive
- Lack of data, especially for the calculation of the cost of equity
- Information asymmetry problem: the utility and regulator do not have same information
- Insufficient incentive for efficiency improvements
- Complexity of dealing with shifts in the economy that changes the underlying average rate?

- Gives incentive to over-invest when RoR > WACC and incentive to under-invest when RoR < WACC</li>
- When applied with pass-through costs, gives no incentive to hedge against input costs and no reward for keeping costs down

# 6) Some Key Concepts

### • Pass-Through Costs

 Used in regulatory schemes for transmission and distribution. Non-controllable variable costs such as cost of purchased power, technical line losses, intersystem transactions, etc are simply passed through on a one-to-one basis

### • The problem:

• these costs can sometimes be quite substantial

## Calculating WACC

- The RoR is normally calculated as the Weighted Average Cost of Capital (WACC)
- This is a mixture of debt and equity
- Calculations can be data intensive. However, getting this right is important. Lack of data is not sufficient reason to use simple approaches. Comparators and international evidence is available and should be used as a starting point



### The Cost of Debt

- This is the cost of borrowing funds for the utility from the debt markets
- Various methods are used
- It is traditionally estimated by considering bond markets

### • The Cost of Equity

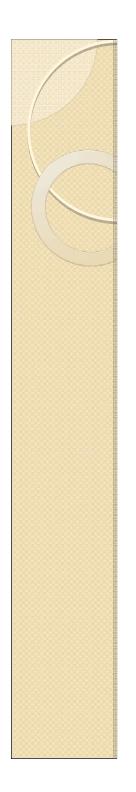
• Several models exist for determining the cost of equity

### Dealing with Data Problems

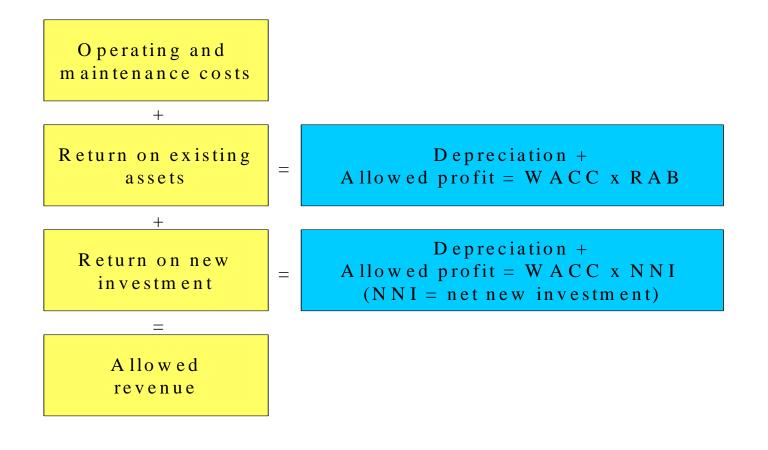
 A concern in many countries is the lack of data, especially for the calculation of the cost of equity

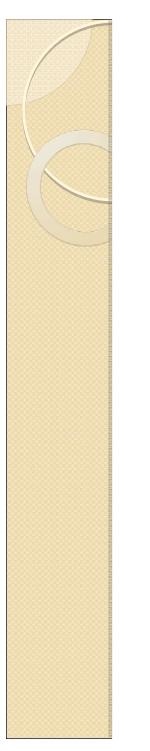
#### • Alternative options have been proposed:

- Comparing with similar companies in other countries
- Using alternative methods such as historic borrowing rates
- Estimating an overall cost of capital for an economy and then considering how utility companies differ from this
- Key issues are consistency, adjustment to fit the country specifics and not relying on a point estimate but a range, possibly built-up from different approaches



### **Dealing with New Investments**

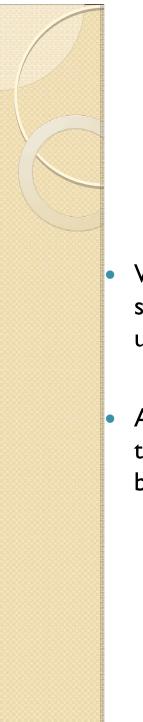




### Depreciation

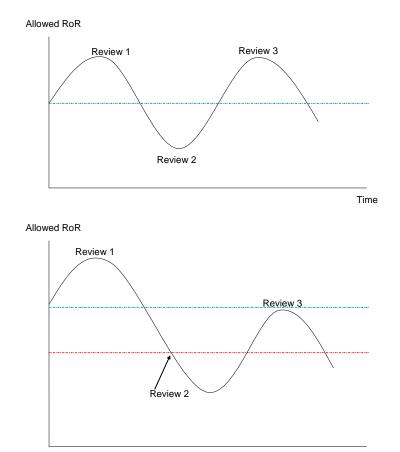
(More details in later presentations)

- The normal usage of assets involves a reduction in their ability to provide a service
- This 'consumption' of the assets' value should be reflected in the operating costs and capital value of the company
- Depreciation is a key charge since it allows the maintenance of the system at the existing capacity
- Consistency in rules is important since this alters the investment incentives for companies



### **Structural shocks**

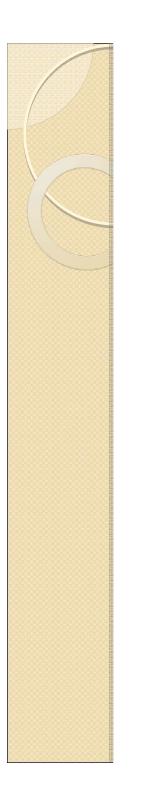
- What happens if the economy shifts in a way that changes the underlying average rate?
  - A downwards shift could lead to problems such as earlier borrowing being penalised





# 7) Conclusions

- It is important to establish the rules as early as possible
- Apply established rules consistently
- No need to have a single asset value different values for the RAB and depreciation base can be established
- Estimating the cost of capital is a key element of any price review
- Lack of data should not be an immediate reason to choose a simple approach
- Share and learn from experiences available from around the world



## Thank You