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Approaches to Economic Regulation

ERERA / WAGPA WORKSHOP

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PRICE-SETTING PROCESS

SETTING OBJECTIVES

GOVERNMENT/CUSTOMER
PRIORITIES

INDUSTRY GOALS

SPECIAL INTERESTS/OVERARCHING
ISSUES



CHOOSING REGULATORY APPROACH- THE AVERAGE PRICE

REVENUE
REQUIREMENT

RATE OF RETURN

PRICE CAP

REVENUE CAP

BENCHMARKING

HYBRID



TARIFF DESIGN – WHO PAYS WHAT?

CUSTOMER GROUPING

CATERING FOR SPECIAL GROUPS –
FARMERS,

FUNDING NEW EXTENSIONS



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Regulatory Objectives

Aim: Induce the operator to achieve government objectives

Typical Policy Objectives

Service Expansion

Low prices

New investments

Aggregate benefit to

Consumers

Operators

Externalities



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Obstacles to regulation

Information asymmetry on:

- Patterns of customer demand
- Possible efficiencies
- Effort/investment required for operator to be efficient

Possible approaches:

- Subject operator to **competition**
- **Gather information** on the operator and the market
- Control market power through **incentive** regulation



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Competition

COMPETITION

Subject operators to competitive pressures by liberalizing market and promoting competition

- Competition **IN** the market – multiple providers
- Competition **FOR** the market –e.g. bidding for franchises
- Competition **BETWEEN** markets - benchmarking

BEHAVIORS

Operator provides the best quality service at lowest price that covers cost

If operator is state-owned, competition presses private-sector behavior in order to stay in business (BUT MUST HAVE NO ACCESS TO OTHER FUNDS AND NO FAVOURED TREATMENT)



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Competition

Advantages

- Limits government's ability to
 - use regulation to favor some stakeholders or
 - sacrifice long term efficiency for short term political goals
- May stimulate new investment



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Secure and Analyze Information

Collect necessary data from Financial Statements in regulator-specified format

Balance sheets
Capital Structure
Income Statements

Cash flow statements
Depreciation schedules

TYPICAL STATISTICS

- prices,
- quantities of individual services sold,
- numbers of customers,
- numbers of employees

- quality of services
- sources of fuel or water,
- operating statistics (plant availability, loading factors, etc.)



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Incentive Regulation

Regulator designs and implements incentive schemes that reward the operator for using its private information to achieve the government's objectives;

- *Incentive regulation is the use of rewards and penalties to induce the utility to achieve desired goals where the utility is afforded some discretion in achieving goals* Lewis and Garmon (1997)



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Outcomes of Regulation

Possible Requirements

- *Stable Profits for the company*
- *Strong Incentives for cost containment*
- *Fairly Balance Risk between consumers and the company*
- *Prices must reflect the current market environment*
- *The mechanism must accommodate unforeseen events*
- *The mechanism should incentivize the company to reveal its true costs through its operation*
- *Balance must be struck between “rules” and “discretion”*



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Regulatory Schemes

Four main types

- Rate of Return (or cost of service)
- Price Cap Regulation (or RPI-X regulation)
- Revenue Caps (Same as 2, but formula applied to revenues)
- Hybrid: e.g. ROR and PCR



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Rate of Return Regulation

Adjusts overall price according to the operator's accounting costs and cost of capital

The regulator decides what part of capital investment (*Rate Base*) earns a pre-set rate of return

The Regulator allows the utility to recover “prudently incurred” expenses including depreciation and certain taxes Regulator takes a position on



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Rate of Return Regulation

Regulator takes positions on

Allowed Rate of Return (r)

The Rate Base (B)

Expenses (E)

Depreciation (d)

Taxes (T)

Quantities to be sold (Q)

The Revenue Required is:

$$P Q = B r + E + d + T$$

P is the Unit Price,

Q is the assumed quantity of units sold



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Rate of Return Regulation

Summary Features of RORR

- 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



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Rate of Return Regulation

Possible advantages of RORR

- Provides operator with stable earnings – neither excessive nor too meager.
 - Avoiding excessive earnings may be politically desirable.
- Allows current prices to reflect recent changes in input market conditions. However there is generally a lag.
 - E.g. fuel adjustment clauses in electric and gas.
 - Emergency repairs to broken water mains



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Rate of Return Regulation

Possible advantages of RORR

- Initial cost forecast are not critical, as they are effectively updated on an ongoing basis through the use of pass-through clauses.
- If there is a significant regulatory lag, there can be incentives for cost containment.



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Rate of Return Regulation

Possible disadvantages or RORR

- Insufficient incentive for efficiency improvements:
 - Information asymmetry problem: the utility knows what it can really do, but the regulator does not know how well the utility can do
- With respect to capital costs :
 - If the allowed rate of return is greater than the cost of capital, then there is an *incentive to over-invest*.
 - If the allowed rate of return is less than the cost of capital, then there is an *incentive to under-invest*. (*Averch-Johnson effect*)



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Rate of Return Regulation

objective	outcome
<i>Stable Profits for the company</i>	YES
<i>Strong Incentives for cost containment</i>	NO
<i>Fairly Balance Risk between consumers and the company</i>	NO
<i>Prices must reflect the current market environment</i>	YES
<i>The mechanism must accommodate unforeseen events</i>	NO
<i>The mechanism should incentivize the company to reveal its true costs</i>	NO
<i>Balance must be struck between “rules” and “discretion”</i>	?



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Price Cap Regulation

What it does:

- Allows operator to change prices according to a measure of inflation, I , less a productivity index, X .
- Also known as RPI – X regulation
- RPI = Retail Price Index or other inflation measure
- X = Productivity Offset – expected efficiency gain
- X is positive when prices need to reduce, negative to increase



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Price Cap Regulation

Starting Price:

- Common to set initial price as under **RORR**.
- $P_0 = (B r + E + d + T)/Q_0$
- Where P_0 is the price in the test year, and
- Q_0 is the quantity sold in test year.

Price Variation

- From year-to-year prices are allowed to increase (in percentage terms) by RPI-X, i.e.
- $(P_{t+1} - P_t)/P_t = RPI_t - X$
- Where $t = 0, 1, 2, 3, 4, \dots$



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Price Cap Regulation

Possible Advantages of PCR

- Strong incentives for *cost reduction* and *technological innovation* during the initial period of price cap regulation by severing the link between realized costs and authorized price levels.
 - Cost reduction in both capital expenditures and operating expenditures.
- The longer the PC period the stronger are the incentives.



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Price Cap Regulation

Possible Advantages of PCR

- Can reduce regulatory costs by limiting the number of regulatory hearings (in theory).
- Consumers are insured against many market place risks, at least in the short-to-medium term.
- In theory, may not be as information intensive, as RORR since the idea is to let utilities reveal their “true” costs.



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Possible Disadvantages of PCR

- Realized earnings may depart significantly from intended levels.
 - 'Excessive' profits could cause political backlash.
- The regulated firm is exposed to considerable earnings risk.
 - This increases the cost of capital for firms. Firms face a greater risk insolvency.
- No incentives for superior service quality, reliability, or social programs under pure price caps.
 - This may require a separate set of rewards and penalties to induce the desired level of service quality or social objective



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objective	outcome
<i>Stable Profits for the company</i>	NO
<i>Strong Incentives for cost containment</i>	YES
<i>Fairly Balance Risk between consumers and the company</i>	NO
<i>Prices must reflect the current market environment</i>	NO
<i>The mechanism must accommodate unforeseen events</i>	NO
<i>The mechanism should incentivize the company to reveal its true costs</i>	YES, possibly
<i>Balance must be struck between “rules” and “discretion”</i>	?



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