Agenda

- Regulation
- Incentive Regulation
- Interconnection Pricing
- Efficient Component Pricing Rule
- Theoretical Model
- Summary/Recommendations

Regulatory Goals

- Correct Prices
  - Retail
  - Intermediate Goods
- Cost Minimization
- Rent Extraction
  - (Monopoly)
- Universal Service

Regulatory Solutions

- Rate of Return Regulation (ROR)
- No Regulation
- Benchmark (Yardstick)
- Incentive Regulation

Regulatory Solutions

- Rate of Return Regulation
  - Traditional, Many States
- Benchmark (Yardstick)
  - Singapore, Macau
- No Regulation
  - New Zealand
**Regulatory Solutions**

- **Rate of Return Regulation**
- **Benchmark (Yardstick)**
- **No Regulation**
- **Incentive / Price-caps Regulation**
  - Most Countries
  - Many States in USA

**Incentive / Price Caps Regulation**

- **Rationale**
  - Rate of Return Regulation
  - Privatization
- **Features**
  - Prices Change with the CPI
  - Basket of Goods
  - Productivity Factor

**Rationale**

- **Problems with ROR**
  - Cost Plus Regulation
  - Lack of Incentives

**Rationale**

- **Price Caps Improvements**
  - Cost Savings Incentives
  - Reduced Administration

**Agenda**

- **Regulation**
- **Incentive Regulation**
  - Features
  - Promotion of Competition
  - Why?

**Incentive Regulation**

- **Promotion of Competition**
- **Incumbent’s Price Flexibility**
- **Price Caps & Productivity goal**
  \[ \sum_{i} w_i \Delta P_i - X \leq \Delta CPI \]
Incentive Regulation

Price

$P$

Quantity

Role of Competition

- Allocation of Resources
- Incentive for Efficiency
- Threat of Entry Discipline

Additional Motivation for Competition

- Product Differentiation
- Cost Differences
- Benchmark Competition (Yardstick)

Agenda

- Regulation
- Incentive Regulation
  - Interconnection Pricing
    - Problem
    - Goals
    - Solution?
Intermediate Pricing Problem

- Essential/Bottleneck Facility
- Natural Monopoly
- Input to Competitive Service

=> Interconnection Price Critical

Intermediate Prices Goals

- Encourage Entry:
  - Avoid Inefficient Bypass
  - Avoid Network Duplication
  - Incentive for Incumbent to Develop & Maintain Network
  - Promote Competitive Market Transition

Prices Intermediate Goods

- Efficient Component Pricing Rule:
  - ECPR
  - Baumol/Willig Rule
  - Parity Principle
- Incremental + Opportunity Cost

Prices Intermediate Goods

- Efficient Component Pricing Rule

  An example:

Agenda

- Regulation
- Interconnection Pricing
- Efficient Component Pricing Rule ECPR
  - Critique
  - Laffont/Tirole
  - Vickers/Armstrong/Doyle

Efficient Component Pricing

- What is Covered?
- What is not Covered?
### ECPR, Covered

- Incremental Cost plus
- Opportunity Cost

### ECPR, Not Covered

- Monopoly Rents
- X-inefficiency
- Embedded Cross-Subsidies
- Universal Service Obligation
- Demand Expansion

### X-inefficiency

- RBOC and GTE Down-sizing
- IXC's Down-sizing
- BT's Profit Improvement
- New Zealand's Down-sizing

### ECPR, Other Constraints

- Contestable Market
- Fixed Production Coefficients
- No Bypass
- Homogeneous Products
- Linear Prices

### Incentive Regulation / Price Caps

- Contestability
  - Foundation of Theory
  - Challenge to Theory

### Benchmark Model

- No Distortions
- No Bypass
- No Entry Costs
- No Entrant Market Power

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Agenda

- Regulation
- Interconnection Pricing
- Efficient Component Pricing Rule
- Theoretical Model
  - Benchmark Model
  - Regulatory Implementation
  - Global Price-caps

Theoretical Framework

\[ Q = q_0 + q_1 + q_2 \]

- \( k \): fixed cost (access deficit)
- \( c_0, c_1, c_2 \): average incremental costs

Prices:

- \( a \): access
- \( p_0 \): exchange
- \( p_1 \): incumbents toll
- \( p_2 \): competitive toll

First Best (all prices = marginal costs):

\[
\begin{align*}
p_0 &= c_0 \\
p_1 &= c_0 + c_1 \\
p_2 &= c_0 + c_2 \\
a &= k
\end{align*}
\]

Access deficit recovered via state funds

Note: An inefficient entrant is defined as one whose cost is \( c_2 > c_1 \), but entry occurs.

That is the entrant’s cost is greater than the incumbent’s.

31-36
**Theoretical Framework**

**Long Run Incremental Costs (Australia):**

\[ a = c_0 \]

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**Objections to FDC**

- **Incentives**
  - Cost-plus like
- **Lack of Discrimination**
  - Inelastic segments favored
  - Non-linear prices not possible
- **Inefficient Entry Possible**

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**Efficient Component Pricing Rule (California & New Zealand):**

\[ a = (p_1 - c_1) = c_0 + (p_1 - c_0 - c_1) \]

*incremental + opportunity costs*

**Access price a depends on**

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**Theoretical Framework**

**Full Distributed Costs (add mark-up to LRIC):**

\[
\begin{align*}
p_0 &= c_0 + (k/Q) \\
p_1 &= c_0 + (k/Q) + c_1 \\
p_2 &= c_0 + (k/Q) + c_2 \\
a &= c_0 + (k/Q)
\end{align*}
\]

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**Theoretical Framework**

**OFTEL Rule ("tax" mark-up on profits):**

\[
\begin{align*}
\pi_0 &= (p_0 - c_0)q_0 \\
\pi_1 &= (p_1 - c_0 - c_1)q_1 \\
\pi_2 &= (a - c_0)q_2, \quad \text{(profit from entrant)} \\
a &= c_0 + (k/Q)(\pi_1/(\pi_0 + \pi_1 + \pi_2))
\end{align*}
\]

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**Theoretical Framework**

**Optimal Regulation (Ramsey-Boiteux):**

\[
\begin{align*}
\frac{(p_0 - c_0)/p_0}{(p_0 - c_0)/p_0} &= \left[ \frac{\lambda}{1 + \lambda} \right](1/\eta_0) \\
\frac{(p_1 - c_0 - c_1)/p_1}{(p_1 - c_0 - c_1)/p_1} &= \left[ \frac{\lambda}{1 + \lambda} \right](1/\eta_1) \\
\frac{(p_2 - c_0 - c_2)/p_2}{(p_2 - c_0 - c_2)/p_2} &= \left[ \frac{\lambda}{1 + \lambda} \right](1/\eta_2)
\end{align*}
\]

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37-42
Theoretical Framework

Optimal Regulation (continued):

\[ a = p^2 - c^2, \text{ by assumption, implies } \]
\[ a = c_0 + \left[ \frac{\lambda}{1 + \lambda} \right] \left( \frac{p_2}{\eta^2} \right) \]

Global Price-caps

- Intermediate Good as Final Good
- Ramsey Optimal Rate Structure
- Partial Price-caps Distorting

Implementing Optimal Regulation

- Informationally Demanding
  - Marginal Costs
  - Demand Elasticities

Implementing Optimal Regulation

- Informationally Demanding
  - Compounded by:
    - Informational asymmetries
    - Regulatory capture

Implementing Optimal Regulation

- Informationally Demanding
- Compounded by:
  - Cost-based Price Incorrect
    - Usage must be considered

Summary / Recommendations

- Global Price-cap Preferred
- ECPR Useful with Global Price-caps
- Instruments Must Equal Goals
- Informationally Demanding
- No Simple Solution