New Regulatory Economics

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Overview

- Regulation is the public economics aspect of industrial organization.
    - Deals with how government interferes with industries, for good or for bad.
    - In a world that has more or less given up debates on socialism versus capitalism, economic regulation brings to fore the debate on more or less government interference.
    - Natural monopoly regulation under complete information is the starting point for study of economic regulation.
    - However, in real world, regulators are constrained by lack of information on firms they are regulating.
    - By making explicit these constraints, there is intellectual progress in the field of regulatory economics.

Background

- Essence of free enterprise
  - Economic agents allowed to make their own decisions.
  - Consumers: decision to consume, save, hours of work
  - Producers: quantity of production, type of output, price charged, inputs used.
  - Competition ↔ atomistic/ self-interested behavior leads to Pareto optimal outcomes ↔ First Welfare Theorem
  - But, some conditions need to be met: full set of markets, no externalities, many firms with none dominant, free entry and exit, zero transactions costs.

Motivation

- When one or more of these conditions not met
  - Intervention in market required to ensure that goals of private profit making and social welfare maximization are reconciled.
  - Purpose of regulation -- to ensure socially desirable outcomes when market competition can't be relied upon.
  - However, regulator must work through inducing the firm to produce the desired outcomes, especially in case he does not have complete information on the firm.
  - In this case, incentive schemes needed to induce the firm, through its desire to earn profits, to attain socially optimal outcomes.
  - Thus, effective regulation requires
    - Characterizing optimal regulation
    - Designing regulatory mechanism that induces firms to seek outcomes that are socially optimal but also generate most profit for it ↔ firms choose them voluntarily

Traditional Regulatory Paradigms

(1) Rate of Return (RoR) regulation (by Averch-Johnson, 1962)

- Utility regulation implemented in most countries (incl US & UK) by constraining rate of return on capital base
- Allowable return, s, larger than, r, the opportunity cost of capital
- Firms free to choose inputs to maximize profits while meeting rate of return constraint
- Necessary to attract investment to utilities while avoiding monopoly power
- Prices equate to average costs with this imputed charge for capital
- Prices unchanged during regulatory lag until new regulatory review Criticisms
  - If rate of return constraint binds, inefficient production plan results, whereby equilibrium K-L ratio exceeds cost-minimizing level and firm accumulates excessive amount of capital.
  - Price equals average costs – no incentive for cost minimization, except due to regulatory lags.

Traditional Regulatory Paradigms

(2) Ramsey-Boiteux (Boiteux, 1956, Spulber, 1989)

- Contrasts with RoR regulation – this is outcome of a well-defined optimization process – focus on pricing
- Regulator maximizes social welfare by choosing tariffs such that firm's budget constraint is satisfied
  - Enormous informational burden on the regulator – never used even by Electricite de France, where it originated
  - Role of budget constraint not established theoretically
  - Incentives problems (information related) completely ignored

Agenda of new regulatory economics: neglected role of information asymmetry

- Whatever maybe their objectives, regulators are constrained by lack of full information on the firms they are regulating
- Types of informational constraints
  - Adverse selection: firm having more information about its costs/ efficiency/ demand as compared to regulatory agency – exogenous – `market for lemons'
  - Moral hazard: firms' discretionary action that affect cost and quality of output not observable to regulator – endogenous – `mediclaim policies'.
  - These permit excess rent-making possibilities to agents (in our case, firms)
- Need to formulate regulation as a principal-agent problem -- formulate incentive regulation.

Incentive regulation

Incentive regulation means that regulator delegates pricing decisions to the firm and the firm reaps profit increases from cost reduction.

- Incentive regulation makes use of firm's information advantage and its profit motive.
- Worldwide, incentive regulation introduced as part of regulatory reforms movement – e.g. privatization, liberalization, and deregulation in UK and US is electricity, water, gas, telecom sectors.
- Due to pre-existing rate of return regulation well-established in US, switch to incentives more difficult in US.
- In UK, technology development induced incentive regulation.

Incentive regulation

- Characteristics of incentive regulation: Bayesian versus Non-Bayesian
  - □ Bayesian mechanisms

    These mechanisms describe regulator's lack of information by subjective probabilities that the regulator holds on parameters of the regulatory optimization problem
    - Baron and Myerson (1981): Bayesian incentive regulation with adverse selection on cost parameter of firms.
    - Sappington (1983): added ex-post observability of costs
    - Laffont & Tirole (1986): added moral hazard to incentive problem.

Incentive regulation

☐ Bayesian (contd.)

- Regulator assumed to maximize his objective function under the constraints that regulated firms use their information advantage to maximize profits and that those firms are entitled to some minimum profit

- They are optimal but in a restricted sense.

- Although typical objective function puts less weight on producer surplus than consumer surplus or government revenue, excess economic profits to firm not ruled out.

- While influential among regulatory economists, Bayesian mechanisms have less applicability compared to non-Bayesian mechanisms.

Extensions

- Dynamic regulation
- Politics and regulatory capture

Incentive regulation

- **Non-Bayesian mechanisms**

  These attempt only to use observable and verifiable (book-keeping) data and independent of the regulator.

  - ☐ Since the accounting data cannot be foreseen, these mechanisms are not optimal.
  - ☐ Rather, these strive for stepwise improvement over the status-quo and convergence to an optimum over time.
  - ☐ Such mechanisms efficiency properties are sensitive to external changes, to which the mechanism can respond only with a lag.
  - ☐ The most-popular being price cap regulation and yardstick competition – which are a mix between Bayesian and Non-Bayesian mechanisms

Non-Bayesian mechanisms (1)

- **Price caps**
  - Price cap is an index of regulated service adjusted annually by (1) economy-wide inflation, (2) X-factor reflecting efficiency of firm, (3) Y-factor, denoting pass through of costs outside firm's control.
  - Adjusted every 3-5 years, typically due to adjustment of X- and Y-factors.
  - Have high cost-reducing inducement – high powered incentive scheme.

Non-Bayesian Mechanisms

- ## Yardstick competition
  - ☐ Regulator uses costs of comparable firms to infer firm's attainable cost level – may entail comparison with private and state-controlled firms. Examples
    - ■ Medicare policies
    - ■ Utility regulators
- By relating utility's price to costs of firms similar to it, regulator induces competition amongst firms serving different markets.

  Benefits are several:
  - ☐ If one firm reduces its cost, while others do not, it profits from it; if it does not, while others do, it loses.
  - ☐ Regulator need not have information on cost-reduction technology – accounting data suffice to achieve efficiency
  - ☐ May attain social optimum even when firms are heterogeneous, provided heterogeneity is accounted for adequately.

Conclusions

- Over last 20 years, public utility regulation has found new tools in the form of price cap, cost-model benchmarking, and incentive regulation.

- Regulation in US, Europe etc in telecom, electricity and gas industries.

- Even though price caps or incentive regulation are theoretically strong, efficiency of implementation depends on whether regulator is biased and/ or lacks resources.

- Thus, sometimes, finding ways to introduce competition in place of regulation becomes important.