The Regulation of Interdependent Markets

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Outline

- Aim of the paper
- Basic structure of the model
- Optimal regulation and welfare comparisons
- Concluding remarks
Aim of the paper

• We consider interdependent markets
  – Choice between centralization (a unique regulator), and decentralization (two different agencies)
  – Two monopolists engage in regulatory capture activities

• Products are substitutes
  – Railroad and motorways; natural gas and electricity; mail and internet services

• Regulation of multiproduct industries
  – Attention from industry structure to regulatory structure.
    • Focus on the number of regulators
Related literature

• Optimal regulation with hidden characteristic
  – Baron & Myerson (1982)

• Capture
  – Stigler (1971)
  – Laffont and Tirole (1991, Lobbying is costly)

• Multi-principal
  – Baron (1985) non localized externalities
  – Martimort (1996)
  – Laffont and Martimort (1999)
    • splitting regulatory duties (on a single market) may act as a device against regulatory capture
Main results

• Under full information, centralizing regulation is always optimal, but relevant distributional issues emerge.

• Under asymmetric cost information, lobbying pays off.

• A unique regulator is more distorted to the industry's interests.
  – Competition between firms in the “political” arena.

• When goods are good substitutes this effect is stronger.
  – Decentralizing regulation can increase social welfare.
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The main ingredients

- Two markets, each run as a monopoly

- The Congress/Parliament has a benevolent objective function

- It delegates regulation either to a unique regulator or two different regulators

- The regulator(s) may have different objective(s) and have different regulatory tools

- Firms lobby the regulator(s)
The regulatory process

• A benevolent principal (Congress) delegates regulation
  – It cares about net consumer welfare minus the subsidization of firms financed by taxpayers

• The regulator decides the policy
  – Its objective function is not observable
  – The regulator may give profits a positive weight (capture)

• Firms have superior cost information
  – They lobby to increase the weight each regulator attaches to profits
Some key points

• The regulator is not a completely self-interested subject
  – the agency can be only in part captured by industry.

• The regulator maximizes the Congress' objective plus a share of profits of the firm(s) it regulates,
  – affected by the lobbying effort of firms
  – this effort in turn depends on the firms’ expected profits
Timing

1. Given its objective function, the Congress decides the regulatory structure

2. The firms lobby towards the regulator(s)
   - This decides the weight of profits in each regulator’s objective function

3. Each regulator announces its policy menu (price-subsidy) conditional on the firm’s type

4. Each firm announces its type and the actual price-subsidy pair is chosen
The formal model

- Two interdependent markets (1 & 2)
  - each monopolised, cost $c_i \in [c_L, c_H]$

- Total gross consumer surplus

\[ U(q_1, q_2) = \alpha_1 q_1 + \alpha_2 q_2 - \frac{1}{2} (\beta_1 q_1^2 + 2\gamma q_1 q_2 + \beta_2 q_2^2) \]

- Linear demand functions

\[ p_i(q_i, q_j) = \alpha_i - \beta_i q_i - \gamma q_j \]
Objective functions

• The Congress’ objective is net consumer surplus CS minus the amount of subsidies \((S_1 + S_2)\) to the firms
  – Little would change if we assumed that profits enter the Congress’ objective function, with a given weight
  – Same introducing a cost of public funds (stronger result)

• Each regulator takes the Congress’ objective function but distorts it towards profits \(\pi_i\) because of firms’ lobbying activity
  – The additional weight on profits is \(\varphi_i\)
Two regulatory structures

• Centralization: only one regulator
  – \( V^C = CS - S_1 - S_2 + \phi^C_1 \pi_1 + \phi^C_2 \pi_2 \)

• Decentralization: one regulator per market
  – \( V^D_i = CS - S_i - S_j + \phi^D_i \pi_i \)
  – Regulator \( i \) only decides variables for firm \( i \)

• Each regulator has expectations about the firm’s costs
  – Density function \( f(c_i) \)
Lobbying activity

• Each firm maximizes its profit wrt its (costly) lobbying effort

\[
\max_{\varphi_i^k \in [0,1]} \left[ \pi_i^k (\varphi_i^k, \varphi_j^k) - \nu (\varphi_i^k) \right]
\]

– \(\nu(.)\) convex

• Each profit depends on the other firm’s output

– …and on its ability to manipulate its regulator
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Full information results

• In all cases, zero equilibrium profits
  – No incentive to lobby

• Different prices
  – $p^C = c$
  – $p^D = c - z(\alpha - c)$ where $z = \gamma / \beta < 1$

• Centralization is socially preferable
  – Obvious
    • no reason not to use all available tools in the best way
Distributional issues

• Decentralization
  – favours consumers (price below cost)
  – at the expense of tax payers

• Notice that even in Baron-Myerson the same issue appears
  – Consumers’ and firms’ interests are aligned
  – Tax payers bear the cost
Asymmetric information results

• Now firms obtain a rent
  – lobbying pays off
    • Under both regimes, $\phi_i > 0$

• Centralization provides bigger incentives to lobby
  – $\phi^C_i > \phi^D_i$

• $\Rightarrow$ A trade-off emerges
Equilibrium prices

• With centralized regulation
  \[ p_i^C(\varphi_i^C) = c + (1 - \varphi_i^C)H \]

• With decentralized regulation
  \[ p_i^D(\varphi_i^D, \varphi_j^D) = c - z(\alpha - c) + H \left[ (1 - \varphi_i^D) + z(1 - \varphi_j^D) \right] \]

• The difference may be either positive or negative
  \[ p^D - p^C \equiv \Delta p = -z\psi - \Delta \varphi(z)H \]

• Where
  \[ \psi \equiv \alpha - c - (1 - \varphi^D)H > 0 \]
The trade off

\[ p^D - p^C \equiv \Delta p = -z\psi - \Delta\varphi(z) H \]

• Both elements depend on z
  – \(-\psi z < 0\) is the direct market interdependence effect (\(I^{AI}\))
    • Prices under D tend to be lower
    • More so, the larger z is
  – \(-\Delta\varphi(z)H > 0\) is the lobbying effect (\(L^{AI}\))
    • Tends to make prices under D higher
    • It increases with z \((\Delta\varphi(z)\) decreases in z\)

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Distributional issues, again

• Whichever regime produces lower prices, it produces the following effects
  – Favours consumers
  – Penalizes taxpayers
  – Yields higher profits
  – Decreases aggregate welfare

• Is centralization always desirable?
Sometimes, centralization always prevails

Low uncertainty ($H$) + Similar lobbying efforts
…or decentralization may be preferable

High uncertainty \((H)\) +
High substitutability
Conclusions

• Centralization is obviously better unless lobbying is so strong (because of strict substitutability) that you need diluting the incentive
  – Could this explain the resistance against the very creation of a transport regulator in Italy?

• When substitutability is strong, full liberalization may be an option

• Other factors to consider
  – Economies of scope in a regulatory authority
  – Lesser accountability with multitasking authority