



Mestrado em Economia e Políticas Públicas

regulação, concorrência e tarifação

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Outline of the course

- I. Introduction (1 lecture)
 - I. Definition and instruments of regulation
 - II. Theories of regulation
- II. Economic regulation and pricing (5/6 lectures)
 - I. Regulation with transfers and pricing
 - II. Regulation without transfers and pricing
 - III. Regulation under asymmetric information
- III. Competition policy (1/2 lectures)
 - I. Horizontal and vertical agreements, fusions, price discrimination
- IV. Case studies (4 lectures)

Case studies - industries that can be examined

Industry

- Electricity
- Cable tv
- Wireline/less telephone

- Trucks
- Railways
- Airlines
- Pharmaceuticals
- Internet music

Regulatory approach

- Price regulation
- Franchise auction
- Price regulation/spectrum auction

- Price regulation
- Deregulation
- Deregulation
- Patents
- Copyright

References

- The recommended textbooks are:
 - Laffont, J-J. and Tirole, J., *A Theory of Incentives in Procurement and Regulation*, 1993, MIT Press. A serious reference for theoretical issues, referred to as **LT**.
 - Motta, M., *Competition Policy. Theory and Practice*, Cambridge University Press, 2004, Cambridge, MA. On competition, referred to as **MM**.
 - Viscusi, K., Vernon, J. and Harrington, J., *Economics of Regulation and Anti-Trust*, 2000, MIT Press. A light introduction, referred to as **VVH**.
- It is at some points advisable to take a look at:
 - Tirole, J., *The Theory of Industrial Organization*, 1988, MIT Press.
- And at a series of seminal papers given as we proceed



lecture 1 - introduction
references: ch. 1, 2, and 10 VHV

The context

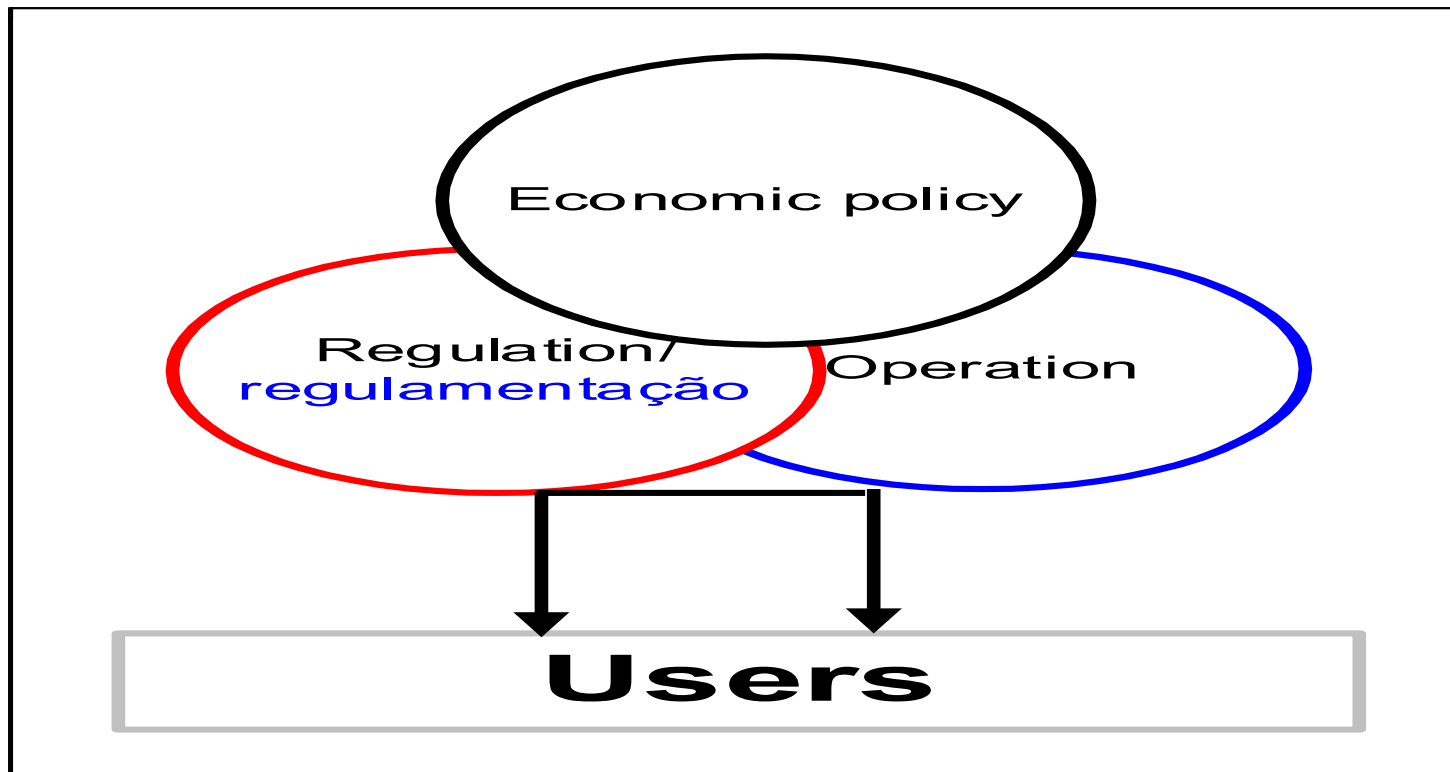
- From state-owned industries to market-based reform: The need for regulation
- In most countries, infrastructure industries have traditionally been monopolies, owned and operated by the public sector
- Since the late 1980s, however, there has been a shift to both private ownership (privatisation) of these industries as well as competitive provision of services within parts or all of these sectors (liberalisation)

The context

- Four roles in the provision of infrastructure services:
 - **Policy**: government decisions regarding the framework for the infrastructure sector, including issues such as private sector participation, liberalisation, the nature of the regulatory regime and institutions, and social assistance;
 - **Regulation**: developing, monitoring and enforcing rules that influence the behaviour of suppliers and consumers of infrastructure services;
 - **Operation** : management of day to day service delivery and
 - **Ownership**: carrier of equity risk of infrastructure operations, oversight of infrastructure managers.

The context

- Administrative model (before the 80s)



The context

- Administrative model (before the 80s)
 - In a traditional public sector model (administrative model) for infrastructure services prior to any reform, there is likely to be a great deal of overlap and confusion between these various roles.
 - The utility operator may also have regulatory responsibilities, or regulation may be conducted by the same authority responsible for policy making.

The context

- Liberalization, privatization and regulation
- Two Phases:
 - **Late 70s – 80s** : “Deregulation” / reform / privatization primarily on “competitive” industries, such as airlines, freight transportation, energy, cable TV, banking,...
 - **Mid 80s – present**: privatization/restructuring of traditional utility or natural monopoly sectors such as electricity, telecommunications, roads, etc ...

The context

- Liberalization, privatization and regulation

- Two Phases:

- Late 70s – 80s : “Deregulation” / reform / privatization primarily on “competitive” industries, such as airlines, freight transportation, energy, cable TV, banking,...



COMPETITION POLICY

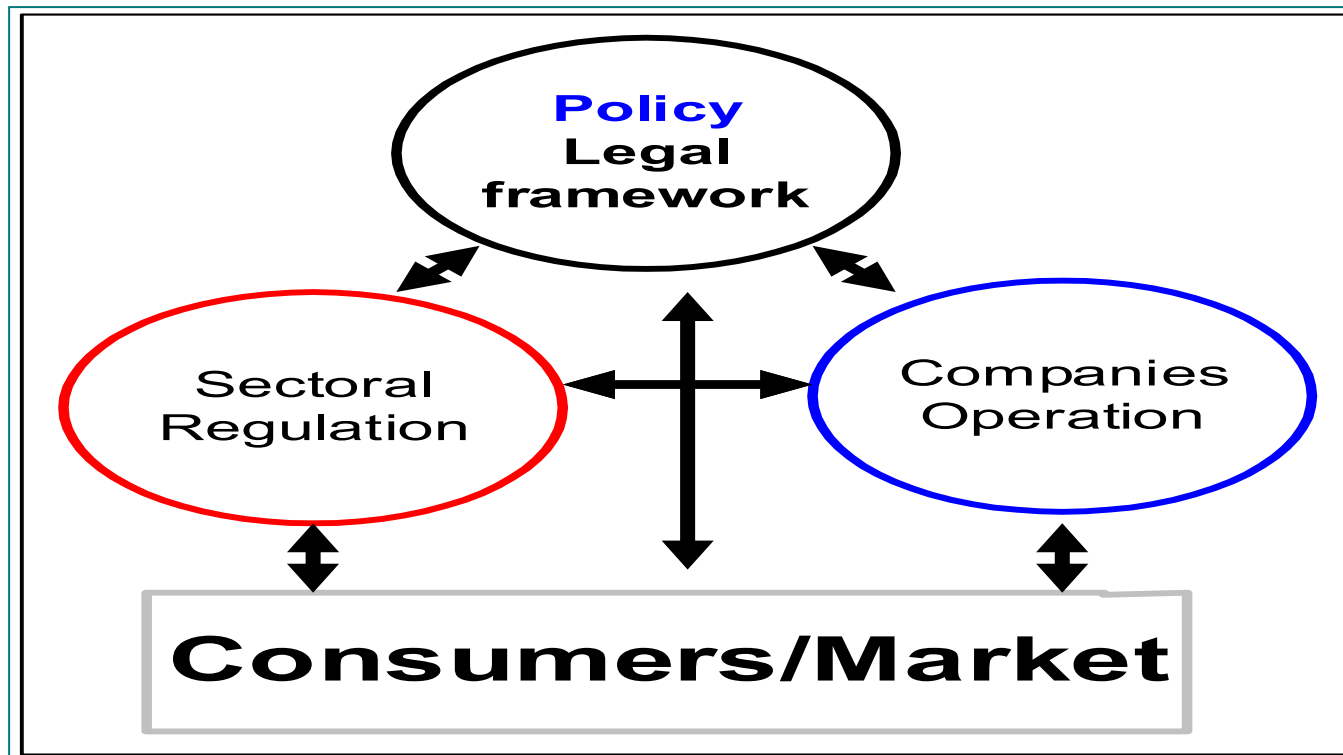
- Mid 80s – present: privatization/restructuring of traditional utility or natural monopoly sectors such as electricity, telecommunications, roads, etc...



REGULATION

The context

Economic model (after the 80s)



Regulation

Definition

- At its broadest, regulation can be defined as all forms of law or legislation enacted by government
- **Government regulation of industry** is EU/ federal, state or local government control of firm behavior via the mechanisms of setting prices or controlling the quantity and quality of goods and services produced, i.e., it refers only to rules governments or public authorities apply to market-based activities.
- Examples: setting rates for electricity service and other public utilities, control of pollution emitted, allocation of FCC spectrum, product safety standards...

Regulation

- The behavior of individuals is also affected by regulation either:
 - Directly: using seat belts,...
 - Indirectly: regulations that affect prices or the mix of available products, jobs ,...

Regulation

Questions

1. Rationale: why do we observe regulation of particular industries?
2. State vs. regulation: Is the state ownership of particular industries a true substitute for economic regulation?

Regulation

Rationale

- In a world that functioned in accordance with the **perfect competition** paradigm there would be no need for regulation

Perfect competition I

assumptions

- Consumers maximize utility given budget constraints
- Producers maximize profits given their production functions
- Producers have similar non-increasing returns to scale technologies
- All agents are small with respect to the market
- There are no externalities
- Agents are perfectly informed

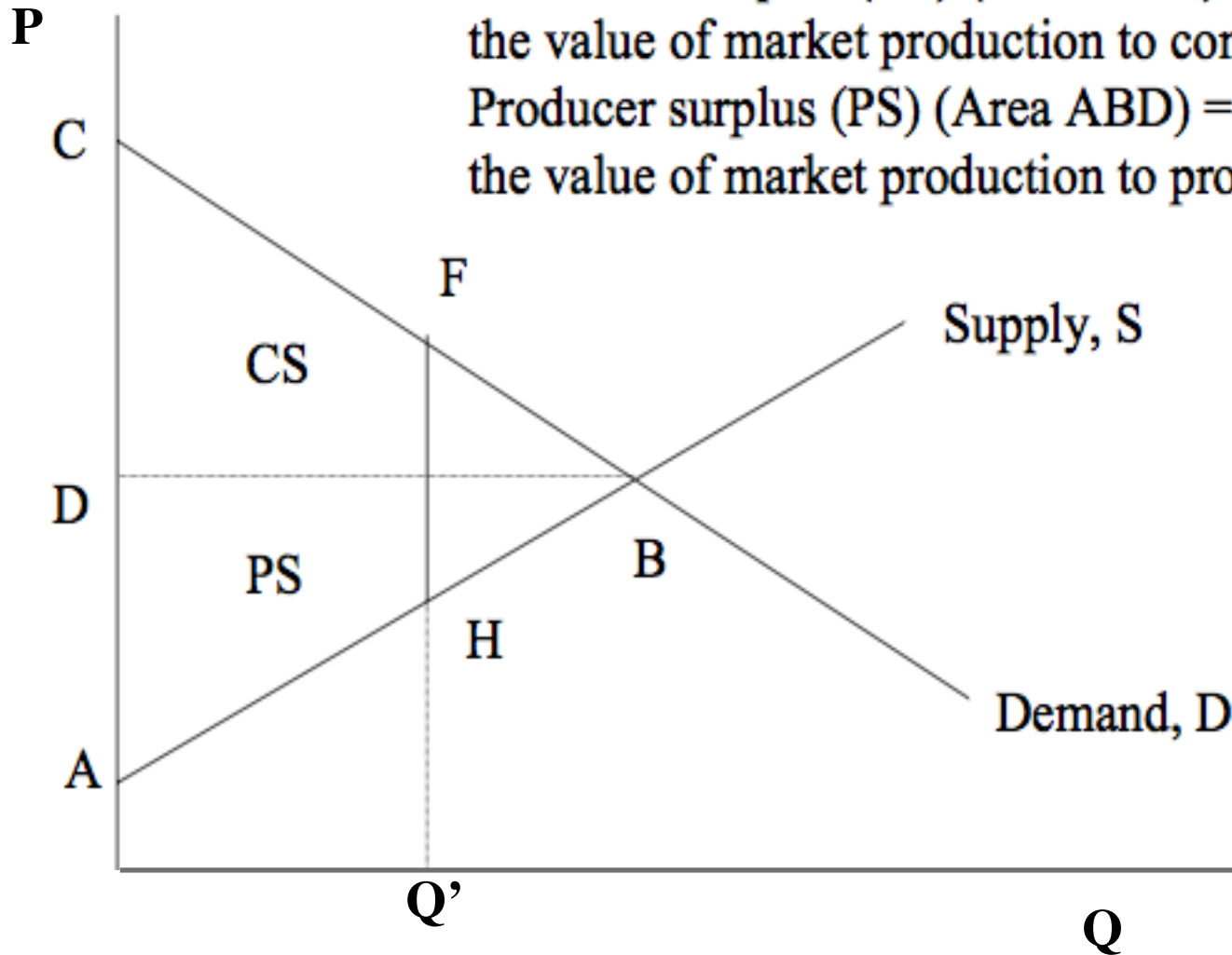
Perfect competition II

equilibrium

- Def: set of prices s.t. markets clear
- First Welfare Theorem: the competitive equilibrium is Pareto optimal
- Price = marginal cost
- No super-normal profits
- BUT, economic regulation is usually concentrated on industries where the assumptions of perfect competition do not hold and it aims at stimulating some of its properties

Perfect competition III

Consumer surplus (CS) (Area CDB)=
the value of market production to consumers
Producer surplus (PS) (Area ABD) =
the value of market production to producers



Regulation

Rationale

- In a world that functioned in accordance with the **perfect competition** paradigm there would be no need for regulation
- A firm in competition with other firms attempts to:
 - reduce costs
 - increase quality
 - introduce new products to gain competitive advantage
- These effects will in turn tend to increase welfare overall
- Perfect competition results in static **efficiency**
 - Productive and allocative efficiency
 - Welfare maximization

Efficiency I

Pareto efficiency

- definition: the welfare of one agent cannot be improved without hurting another agent
- No fairness!
- Weak criterion!
- Kaldor–Hicks efficiency: an outcome is more efficient if those that are made better off could *in theory* compensate those that are made worse off (but no compensation occurs)

Efficiency II

Static efficiency

- Optimizing the use of existing resources and technology (technology is given!)
- Two dimensions:
 - Productive efficiency (no more output without additional inputs; minimum costs; producing on the PPF)
 - Allocative efficiency (optimal distribution of resources – $P = MC$, because then $MU = MC$)

Efficiency III

Dynamic efficiency

- Technical progress: resources are allocated to develop new technologies (that expand the PPF)

Regulation

Rationale

- The main rationale for regulation is to deal with so-called 'market failure' where competition is either not feasible or does not produce results that are perceived to be compatible with maximizing social welfare (public interest theory).

Example: market failure in infrastructure industries

- natural monopoly components, largely derived from network elements. Regulation protects customers from:
 - private monopolists seeking to levy prices significantly above costs to earn greater profits; or
 - public monopolies that allow costs to rise above efficient levels or offer services of inferior quality.
- information failures: customers are unable to assess the quality of the service they are buying (e.g. drinking water quality, safety of transport vehicles).

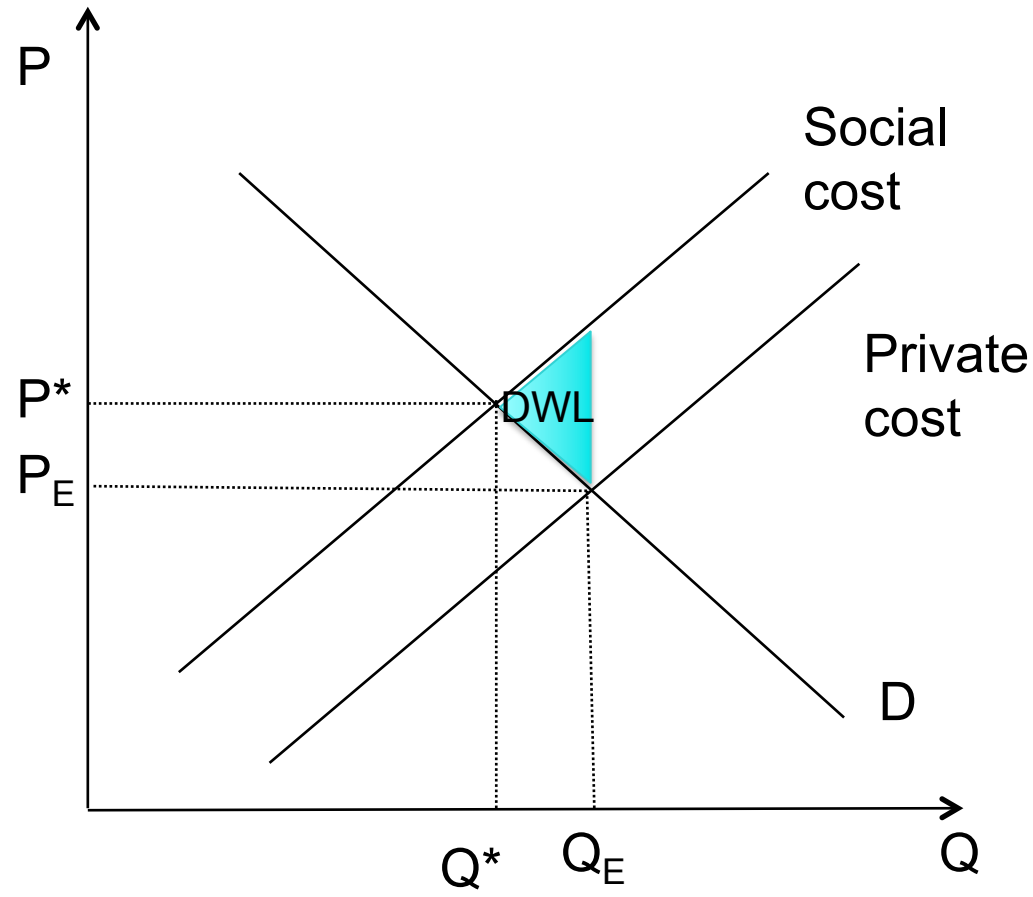
Example: market failure in infrastructure industries

- **externalities** are present in a number of infrastructure sectors (e.g. environmental costs associated with: greenhouse gas emissions in electricity generation; sewerage disposal in sanitation; and pollution in the transport sector)

Externalities I

- Situation in which the private costs or benefits to the producers or the consumers of a good differ from the social costs or benefits entailed in its production or consumption
- An individual's actions affects others in ways that need not be paid according to the existing notion of property rights
- A negative externality (or external cost) results when part of the cost of producing or consuming a good is born by a firm or household other than the producer or purchaser
- A positive externality (or external benefit) results when part of the benefit of producing or consuming a good accrues to a firm or household other than that which produces or purchases it

Externalities II



Example: market failure in infrastructure industries

- externalities are present in a number of infrastructure sectors (e.g. environmental costs associated with: greenhouse gas emissions in electricity generation; sewerage disposal in sanitation; and pollution in the transport sector)
- many infrastructure services may be considered 'essential' to life; regulation may be enacted so as to guarantee access to these services

Regulation

State vs. regulation

- Until recently (before the 80's) the state was seen as the best vehicle for ensuring efficient outcomes from natural monopoly (NM) provision.
- *Rationale* for state ownership of network industries (nationalized infrastructure)
 - To ensure social ownership of production
 - To allow economic planning of the sectors
 - To distribute income
 - Because they can provide positive externalities
 - Because they create a less adversarial relations with the environment
 - **And because of the existence of NM**

Regulation

State vs. regulation

But not if you believe in

- **Public Choice Theory** : Government employees motivated by self interest and/or
- **Property Rights Theory**: There is no direct interest in the yield from state assets because there are no share holders (with property rights)
- Political, economic, social and technological factors favoured private sector participation through
 - privatization: private ownership of some industries
 - liberalization: competitive provision of some services

Regulation

State vs. regulation

- Liberalization, privatization and regulation - two Phases:
 - **Late 70s – 80s** : “ Deregulation” / reform / liberalization primarily on “competitive “ industries, such as airlines, freight transportation, energy, cable TV banking
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Regulation

State vs. regulation

- This lead to:
 - Need for regulation of natural monopoly functions and
 - Promotion of competition in “competitive” sectors

Regulatory failure

- **Incompetence:** lack of qualified staff
- **Information problems:** unrealistic to expect regulators know everything they should! Regulators usually know less than the firms: *adverse selection*. Firms have incentive to conceal or misreport information damaging to their interests.
Uncontractible decisions by the firm's managers: *moral hazard*
- **Lack of predictable long-term policy** (commitment issues): governments don't look far beyond next election, firms do
- **Transaction costs:** difficulty to write complete regulatory contracts, hence incomplete
- **Corruption and capture:** Regulators readily become sympathetic to firms they "regulate." Entry may be limited at the request of the firm. Revolving doors
- **Political Constraints:** Some type of contracts for regulation are politically unfeasible even if economically sound (e.g. transfers)

Regulation

Forms of regulation

- **economic regulation**

government control of firm behavior in industries lacking competition (namely problems of NM power in infrastructure; e.g. electricity rates);

- **social regulation**

government control of individual and firm behavior with respect to environmental, health, and safety implications of production and consumption of goods and services (e.g. emissions from power plants)

Regulation

Components

- Regulation of industry **structure**, which seeks to promote competition by setting rules regarding both market entry and the shape of corporate entities operating in the market.
- Regulation of market **conduct**, which regulates outcomes in monopoly markets (primarily, price and quality) and may also involve the regulation of key production inputs (e.g. investment).

Which one is preferable?

Regulation

Tools

- Legal tools
 - Authorizations, licences, concessions
 - Environmental, social, financial and technical standards
 - Legal obligations (public service ...)
- Economic instruments
 - Prices: to prevent both predatory pricing and over charging
 - Quantity: universal service obligations, maximum production limits
 - Entry and exit (n^o of firms): NYC cabs
 - Other: product quality, advertising, investment; e.g. control of quality of emissions, customer service levels, safety,...

Regulation in practice

(Stylized) implementation

- Government appoints a regulatory agency (RA) with a mandate to achieve certain objectives
- The RA has discretion within its mandate to set regulations
- In both the EU and the US, regulation is complicated by overlapping regulatory jurisdictions: local, state, and federal agencies may regulate aspects of the same type of behavior (e.g., health and safety)

Deregulation

- It usually refers to attempts to reduce controls on prices,... to stimulate greater competition
- BUT effective deregulation usually implies some 're-regulation'
- Hoped-for advantages:
 - Lower prices
 - Lower costs
 - More choice

Competition policy vs. regulation

Where competition is not effective, the government can also use a (complementary) institutional device:

Competition Policy: to eliminate impediments to competition, making on-going government intervention unnecessary

Different from **economic regulation:** since there remain industries in which effective competition is not an immediately available alternative to the existing market structure; e.g. the so-called network industries (electricity, telecommunications, railway etc..)

Regulation

vs. procurement

- **Procurement:** the firms procure the service to the governments that then provides it to the consumers.
- **Regulation:** the firm procures the service directly to the consumers on behalf of government.
- An important difference: with procurement the firm must receive a transfer from the government whilst with regulation this is not necessary (for consumers may pay the price for the service)

Theories of regulation

Why is there regulation?

- Public interest theory
- Capture theory
- Economic theories of regulation

Public interest theory

- Regulation occurs in industries with market failures:
 - natural monopoly (NM) → price + entry regulation
 - Positive or negative externalities → subsidy or tax
- Normative analysis as a positive theory (NPT): public interest theory uses normative analysis to produce a positive theory
- Critique:
 - Incomplete (occurs when it should be potential for welfare gain generates public demand for regulation... how?)
 - Empirical evidence (many regulated industries without the efficiency rationale, some firms supported regulation, ...)

Capture theory

- Up to the 60's in the US, regulation increased industry profit! *
- Regulation is supplied in response to the industry's demand for regulation.
 - Regulatory agencies are created by captured legislatures.
 - Regulatory agencies come to be controlled by industry.
 - This suggests a pro-producer theory (i.e. pro-producer surplus theory) of regulation.

Capture theory

- Evidence:
 - Revolving doors

- Critique:
 - Incomplete: how do agencies become captured? Why should agencies be captured by the industry and not by consumers?

 - Some empirical regularities are inconsistent with theory:
 - cross-subsidization (inconsistent with profit-maximization)
 - regulation biased toward small producers
 - cannot explain why some industries were regulated and later deregulated

- Most regulation would seem to be motivated by a combination of the above two theories.

Economic theory of regulation – Chicago theory

Stigler-Peltzman Model

- Stigler (1971) puts forth a set of assumptions that generates a set of predictions (similar to those of CT)
- Assumptions:
 - Regulatory legislation redistributes wealth.
 - Agents are rational:
 - Behavior of legislators is driven by desire to remain in office (leg to max political support);
 - Interest groups want to maximize income
 - Interest groups compete by offering political support in return for favorable legislation.
- Predictions: small groups with strong preferences win!
 - Example: electric power rates: residential, commercial and industrial power rates showed lower price-cost ratios for industrial customers relative to residential ones, why?

Economic theory of regulation

Stigler-Peltzman Model

- But, there are some counter-examples:

Uniform prices are set for rail transport, water supply, telecommunications,... even though costs differ (for some groups of consumers, $P < MgC$).

And, cross-subsidization works against profit maximization!

Cross-subsidization is explained by Peltzman (1976)

Economic theory of regulation

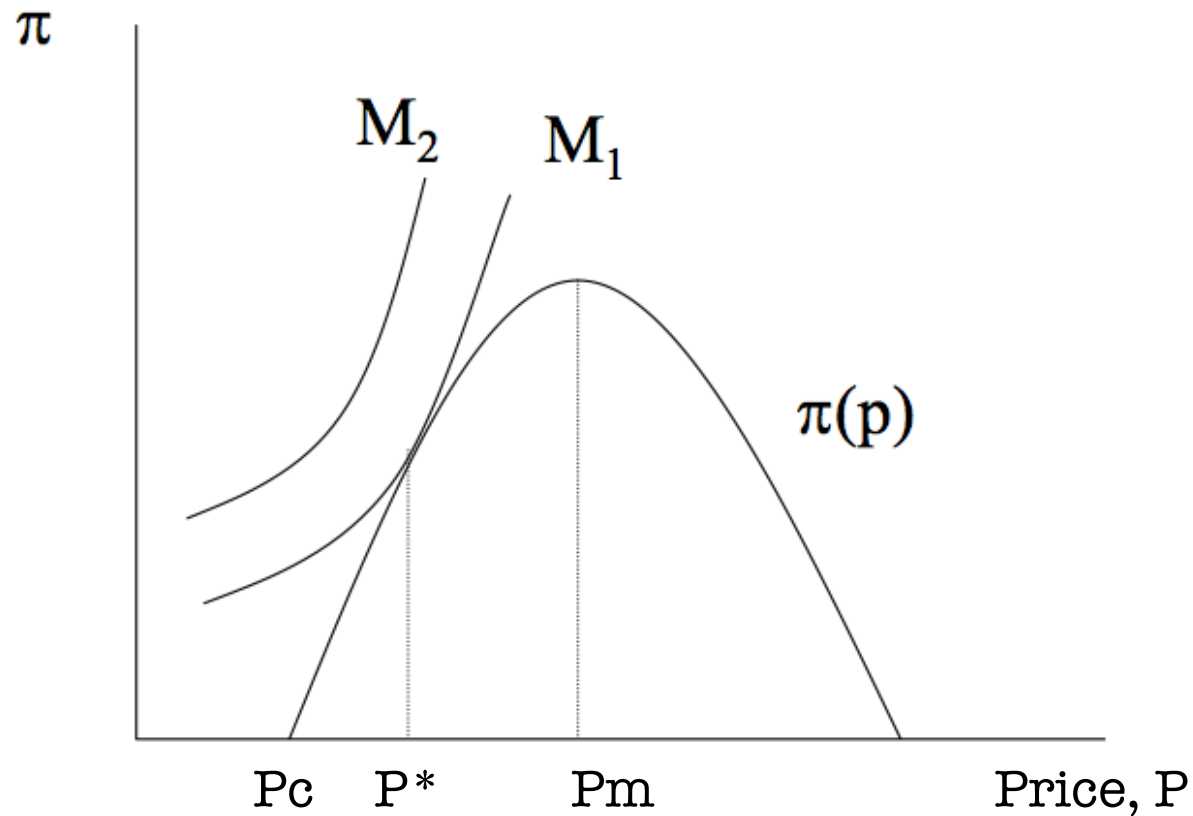
Peltzman Model

- This model explains which industries are regulated
- Politicians choose their policy of regulation such that political support is maximized
- It will benefit industry and consumer groups able to organize themselves effectively.
- Lower prices are favorable to consumers, higher prices generate more political support from industry.
- *Efficient regulation*: what price level should be settled such that the gain in votes resulting from the income transfer balances the loss of votes resulting from the rise in prices?

Economic theory of regulation

Peltzman model

- The regulator chooses policy to maximize political support



Economic theory of regulation

Peltzman Model

- Predicts that competitive branches and monopolistic branches will be regulated.
- In the first case, the branches have a keen interest in regulation and, in the second case, consumers have a great interest in regulation.
- Regulation is unlikely in intermediate branches where the regulated price level will not deviate widely from the unregulated price level.
- Reality confirms this: regulated branches are either monopolistic, such as rail transport and telecommunications, or highly competitive, such as freight, agriculture, independent professions and cab companies.

Economic theory of regulation

Becker model

- Regulation leads to wealth transfers; here, political pressure groups lobby for a subsidy or against the resulting tax.
- These groups get their wishes according to an "influence function" that takes three factors into account: the amount of pressure exerted by those favoring a subsidy, the amount or pressure from those opposing the tax, and the relative sizes of these two groups.
- What matters is competition between interest groups, not interactions between interest groups and legislators per se;
- So, (relative) pressure → influence → wealth transfer

Economic theory of regulation

Becker model

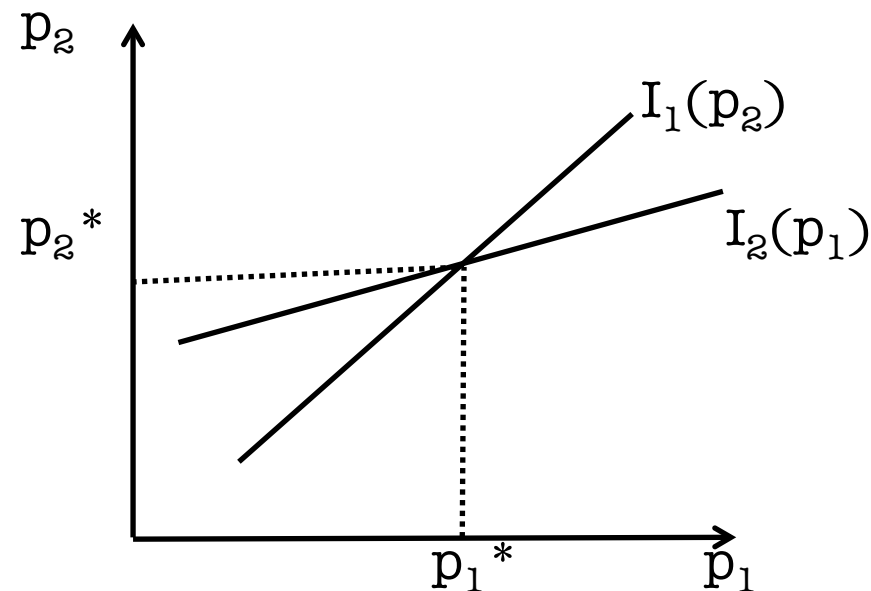
MODEL:

- $T = I_1(p_1, p_2)$ is the the influence function of group 1: it is assumed that the function is increasing in the pressure of group 1 and decreasing in the pressure of group 2.
- $I_2(p_1, p_2)$ is the the influence function of group 2: it is assumed that the function is increasing in the pressure of group 2 and decreasing in the pressure of group 1.
- In order to transfer wealth T , from group 2 to group 1 it is assumed that 2's wealth must be reduced by $(1+x)T$, where $x > 0$. The amount $x \cdot T$ is the welfare loss from regulation
- Aggregate influence is fixed, so what is important for determining regulation (revenue transfer between groups) is the influence of one group *relative* to the influence of another group.

Economic theory of regulation

Becker model

- Taking into account the benefits and costs of pressure one can derive the optimal strategy of group 1 (the one that maximizes welfare), p_1 , given any value of p_2 .
- I_1 is group's 1 best response function; I_2 is group's 2 best response function.
- The intersection point is the political equilibrium



Economic theory of regulation

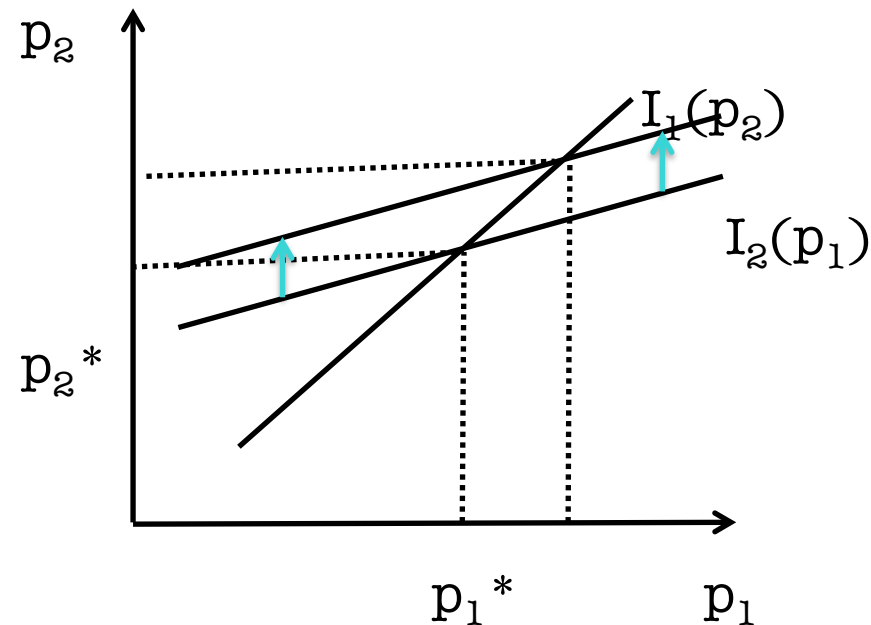
Becker model

- In general, the political equilibrium is not Pareto optimal: both groups could invest fewer resources and achieve the same level of relative influence

Economic theory of regulation

Becker model

- An increase in costs of regulation x decreases the amount of regulation (measured by T)
- In fact, an increase in x means that group 2 incurs a higher loss for any transfer received by group 1, so that 2's reaction function shifts up; in the new equilibrium, group 1's rise in pressure is smaller than group 2's, so that there is less pressure for regulation



Economic theory of regulation

conclusions

- Tendency for regulation to be designed to benefit relatively small groups with strong preferences relative to big groups with weak preferences.
- Pro-producer tendencies are disciplined by consumer groups meaning that price is less than the monopoly level.
- Regulation most likely in competitive or monopoly industries as there is strong incentive for one group to lobby for regulation.
- In the presence of market failure regulation is likely because of the large losses this inflicts on some interest groups.