



The  
Cambridge-MIT  
Institute  
Electricity Project

# 14.23 Government Regulation of Industry

Class 12: Preparation for Midterm Exam

MIT & University of Cambridge

# *How to study for Midterm Exam*

- Go through all numeric problems that were covered in classes and the problem sets and be sure that you are comfortable with how to solve those models.
- For each of the industries that we have covered ensure that you know:
  - The basic outline of the industry
  - Why it was regulated
  - Why it was deregulated (if that happened to be the case)
  - How it was regulated (e.g. price controls, entry controls)
  - The economic consequences of the regulation (in terms of efficiency, ability to do what it was supposed to do, profits, etc.).
  - The level of detail required is that discussed in class.

# *How to study for Midterm Exam*

- You do NOT need to remember all the acronyms for the various government agencies, the names of regulations, the dates of regulation (or similar).
- There are 3 sections to the exam:
  - Part I consists of *short questions/answers* (3 worth 5 points, each). Each should invite 3 - 4 sentence accurate but brief responses. Numeric calculations are short with a few sentences for explanation.
  - Part II consists of one *numeric problem* (worth 25 points). This will take the same format as one of the problem set questions.
  - Part III is an *essay question* (worth 20 points).

# *Industries Covered*

- Electricity
- Cable
- Telephone: Fixed Line
- Telephone: Mobile
- Potentially competitive markets: railroads, trucking and airlines

# *Outline of Topics*

- 1. *Review of theory of the firm*: monopoly, oligopoly, surplus, government intervention, deadweight loss, strategic competition: limit pricing, dynamic entry deterrence. You should be familiar with these models and be able to solve a simple numeric problem using them.
- 2. *Motivations for regulation*: economic, public interest, capture theory. You should know what they are and how they differ from one another. The costs and benefits of regulation.

# *Outline of Topics*

- 3. *Public ownership*: historical roots of public ownership, theory of when public ownership is a good idea (e.g. situations of uncontractable quality, corruption of local government worries), advantages of private ownership; privatization: its objectives and effects.
- 4. *Natural monopoly Regulation*: pricing strategies (average cost, marginal cost, fully distributed costs, Ramsey pricing, peak load pricing); consequences of pricing strategy (cross-subsidization – stand alone and incremental cost tests; cream skimming; inefficiencies); rate of return regulation (how does it work; consequences such as Averch-Johnson effect, inefficiencies).  
ELECTRIC POWER EXAMPLE.

# *Outline of Topics*

- 5. *Do we need regulation at all?* Example of cable and franchise bidding. What are the consequences of franchise bidding? Do we get marginal cost pricing? Do we need to worry about quality? CABLE TV EXAMPLE.
- 6. *Changing markets 1: role of technology and how it can affect the regulation of a natural monopoly (changes in demand, changes in costs – fixed and variable: are you more or less likely to remain a natural monopoly with these changes?).* WIRELINE TELECOMMUNICATIONS EXAMPLE.

# *Outline of Topics*

- 7. *Changing markets 2*: importance of common standards and economic success, spectrum allocation, auction theory, the determination of prices by the number of companies and the independence of pricing from auction fee, English and Dutch Auctions. EUROPEAN 3G MOBILE PHONE AUCTION EXAMPLES.
- 8. *Regulation of potentially competitive markets*: price and entry controls and the economic effects of regulation on the market and on the incumbents and potential entrants. SURFACE FREIGHT AND AIRLINES EXAMPLES.

# *Mock Exam*

- Model Answers to Questions 1-3.
- Model Answer to Question 4.
- Discussion of answer to Question 5.

# *Mock Exam*

- Question 1: The development of microwave transmission technology in the 1950s is often given as a reason why the long distance telephone market stopped being a natural monopoly as sending long distance telephone signals over microwave transmission stations require a much lower fixed cost than doing so over wires. Microwave transmission stations, however, have been largely replaced by fiber optic wire in the 1990s, which has meant a return to stringing wires between locations. Why might long distance telephone not be a natural monopoly industry, even with this technological change?

# *Mock Exam*

- Question 2: Demsetz has suggested that one way to avoid natural monopoly regulation is by auctioning off the right to be a monopolist in a particular market through a franchise license. Does franchise bidding necessarily lead to an efficient outcome? Why or why not?
- Question 3: During regulation, airline prices were fixed above cost and airlines could not compete in price. What was the result of this regulatory practice with respect to food quality and safety, and can you justify the airlines' response in these two areas?

# *Mock Exam*

- Question 4: The peak and off-peak periods of electricity demand are of equal length. Demand in the peak period is  $P^P=100-Q^P$  and in the off-peak period  $P^0=A-Q^0$ . Production is fixed proportions with variable costs of \$2 per unit and capital costs per period of  $\beta$ . Capacity costs are sunk and capacity cannot be adjusted between periods.
  - (a) Suppose that  $A=50$  and  $\beta=4$ . Find the optimal capacity, peak price, and off-peak price.
  - (b) Suppose that  $A=90$  and  $\beta=8$ . Find the optimal capacity, peak price, and off-peak price.

# *Mock Exam*

- Question 5: In 2000 and 2001 a major round of auctions for licenses to operate third generation (3G) mobile phone networks took place in Europe. The licenses gave the holders the right and responsibility to invest in 3G infrastructure and exclusive use of the auctioned spectrum for a fixed number of years.

Discuss these auctions in terms of (1) the motivations for allocating radio spectrum via auctions (2) how they were supposed to work (3) the theoretical and practical problems that may arise. Try to use specific examples and evidence from class to support your views.

# *Final Reminders*

- The exam is closed book - no books or notes - in class.
- We will start at 9am sharp.
- If you are late you lose out.
- I will call time at 10.25am.
- Bring pens and a cheap (non-scientific) calculator.

# *Next*

- *Midterm Exam 9am SHARP Class #13.*