Problem Set III

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The problem sets are due in class on Wednesday, March 8.

1. Electric Utilities and Restructuring:

(a) How did PURPA and the 1992 Energy policy Act contribute to the movement toward restructuring the U.S. electricity industry?

(b) Explain what a restructured electric utility industry would look like under the consumer choice model. Explain what a restructured electric utility industry would look like under the portfolio manager model. Discuss the issue of information

(c) Define stranded costs. Explain the reasons for an against recovery of stranded costs.

(d) Define and explain briefly what an ISO is. Discuss the incentives the ISO has for optimal use of the transmission network.

2. Optional versus mandatory price caps

Suppose a regulator has decided to introduce a price cap on a natural monopoly, currently regulated on an ROR basis. The regulator picks a factor, $x$, by which real prices have to be lowered from their current levels. $x$ is a measure of productivity improvement.

If the regulator sets $x$ above a level $x_m$, which is known only to the firm, then the firm will go out of business, and consumers will get net benefits $B_l$ as a result. If the regulator sets a rate below $x_m$, then the consumers get benefit $(1 + x)B_h$, where $B_h$ is the level of benefits under the current regime. You may assume that $B_h > B_l$. The regulator acts so as to maximize the expected level of consumer benefits, which is given by:

$$\mathbb{E}B = F(x)B_l + (1 - F(x))B_h(x + 1).$$

Here, $F(x)$ summarizes the regulator's beliefs, and is the probability that $x$ is greater than $x_m$. You should take the specific functional form $F(x) = x/10$, where $x \in [0, 10]$ for the whole of this question.

(a) Find the optimal value of $x$ the regulator will choose in this case.

(b) What are expected consumer benefits at this optimal value?

(c) Under the compulsory price cap, discuss briefly whether or not the monopolist is better off than under the ROR regime.

(d) Now suppose the regulator gives the monopoly the option to decide for itself whether it follows the price cap, $x$, or continues with rate of return regulation. In this case, if the regulator sets the price cap too strictly, the monopolist carries on under ROR regulation, and the consumers still get the old level of benefits, $B_h$. The expected benefit is, therefore:

$$F(x)B_h + (1 - F(x))B_h(x + 1).$$

(e) Tell me, in one sentence with no math., why the monopolist must be happier with the optional price cap than the mandatory price cap, given a cap at the same level in both cases.
(f) Find the optimal $x$ the regulator chooses in the optimal cap regime.

(g) Comment on the relation between the $x$ in the compulsory cap regime and the $x$ the regulator chooses in the optional cap regime.

(h) What are expected consumer benefits in the optional cap regime? How do they compare with consumer benefits under the mandatory cap regime? With the ROR regime?

(i) Explain, briefly, what would happen if the regulator reset the price cap as soon as the monopolist had revealed his or her maximum productivity improvement if the monopolist knew the regulator would do this?

(j) What does this suggest to you about the efficiency of price caps over ROR regulation in a dynamic setting?

3. In an advertisement in the New York Times of March 4, 1997, MCI says the following:

The FCC explains that more than 40 cents of every long distance dollar goes to local monopolies because they begin and end long distance calls. That charge should amount to a mere 5 cents because that is the cost of the access.

(a) Explain briefly what this charge is and where it comes from.

(b) What is the meaning of MCI’s claim that the cost of access is five cents?

(c) Give a better rationale for this payment. Think of an analogue in electric power regulation.

(d) Does it matter that the local telephone companies are free to use these revenues in any way they want?

4. Telecommunications: Bell Atlantic, an RBOC, has a local network with a fixed cost of 800. The long run incremental cost of connecting a call (whether long distance or local) is 0.5. The demand for local calls is 1000, and it is independent of the price charged. The demand for long distance calls is also 1000, and also is independent of price. There are no other costs.

(a) What is the name of the policy measure that prohibited Bell Atlantic from providing inter-LATA telephone service? When was it enacted? What is the name of the subsequent policy measure that would allow Bell Atlantic to re-enter the inter-LATA telephone service market? When was it enacted?

(b) Suppose Bell Atlantic could offer both local and long distance phone service. What is the range of prices for long distance service for which the price of long distance service is subsidy-free?

(c) If the retail price for local-exchange service is 1.0 and the FCC estimates TSLRIC for local-exchange service as 0.6, what resale price does the ACPR indicate the FCC should set? (Assume no excess profits and no X-efficiency.) If we observe entrants with marginal cost of 0.7 entering, what does this suggest about FCC resale pricing? Explain. Suppose the FCC decides to initiate a policy of subsidizing public school access to the Internet. The subsidy is equal to 100. The marginal cost per access to the Internet is 0.2. There are no other costs incurred by using the Internet.

(d) What is the efficient two part tariff to charge each school? (Assume the demand for Internet access is the same for all schools)

(e) What reason did the FCC give for financing the public school Internet access subsidy by increasing long distance access charges rather than the subscriber line charge? Which theory of regulation explains the FCC’s rationale? Which theory indicates he opposite choice? Explain.