

Economics 220B
TAKEHOME FINAL EXAM

INSTRUCTIONS: Answer each of the first four questions and then choose just one of the last two questions. In each case keep your answers concise. Due the end of business on Friday, May 17th.

1. Suppose that all firms have available the technology characterized by the cost function:

$$C(y_1, y_2) = a y_1 + b y_2 + c \max \{y_1, y_2\}$$

where y_1 and y_2 are quantities of the two goods, 1 and 2. Further suppose that the market demand for y_1 exceeds that for y_2 at all relevant output prices.

- (a) For $y_1 > y_2 > 0$, determine whether this cost function exhibits economies of scope, economies of scale over the entire product set, economies of scale specific to good 1 or economies of scale specific to good 2.
- (b) Find the first-best output price for the industry to charge for the two goods. Determine the configuration of firms in the industry that produces the corresponding industry wide outputs at least cost for the industry.
- (c) Prove that the industry configuration and prices given in your answer to part (b) satisfies the requirements of sustainability.
- (d) Describe in words what kinds of circumstances might lead to cost functions like this one.

2. A regulated firm produces two products: A and B. The firm is required by regulators to earn no more than is necessary to cover its operating costs plus a competitive return on invested capital. Assume that product B exhibits constant marginal cost of production equal to c_B .

- (a) Describe the solution to the Ramsey pricing problem. In the process be certain to make explicit whatever demand and cost assumptions you need to support your answer.
- (b) Now suppose that an unlimited number of unregulated firms can enter into the market for product B at a constant marginal cost of c_E where $c_E > c_B$. How does this affect the regulated firm's pricing, and what is the effect on consumer welfare?
- (c) Now suppose that $c_E < c_B$. Demonstrate that the regulated firm might gain by selling product B at a price (slightly) below c_E .
- (d) Since, in general, the regulator does not know the relative sizes of c_B and c_E , what are the pros and cons of allowing the regulated firm to produce B?

3. Many schemes for regulating natural monopolies have been tried, and many more have been proposed. Listed below are some of the schemes studied in this class.

- (i) Rate-of-return regulation
(ii) Vogelsang-Finsinger iterative mechanism
(iii) Yardstick regulation
(iv) Price cap regulation
(v) Demsetz-type franchise auction

Choose two off of this list, and compare their relative merits in terms of each of the following criteria:

- (a) short-run allocative efficiency,
- (b) speed and likelihood of achieving first/second best outcomes over the long run,
- (c) cross subsidization across products
- (d) the rents that accrue to producers,
- (e) vulnerability to political influence by producers and/or consumers,
- (f) incentives to invest in cost-reducing innovations,
- (g) informational requirements for implementing the mechanism.

4. Consider the application of the Baron-Myerson Bayesian incentive mechanism to the following special situation. Suppose that production requires an unknown constant marginal cost and a known fixed cost: $C(y, \theta) = \theta y + F$, where θ is distributed uniformly over the unit interval $[0, 1]$. Let demand for the single product be linear: $D(p) = a - bp$. Assume that $a/b > 1$. Finally, assume that the weight attached to consumer surplus, $V(p(\theta), t(\theta))$, is one and the weight attached to firm's profit is α where $0 < \alpha < 1$.

- (a) Find the optimal two-part pricing rule: $p(\theta)$, $t(\theta)$. What values do they take on at the extreme of least cost $\theta = 0$ and at highest cost $\theta = 1$?
- (b) At the optimal solution compute the consumer surplus and the firm's profit as a function of θ . Again find the values they take on at the extreme of least cost $\theta = 0$ and at highest cost $\theta = 1$.
- (c) Describe the unit price, fixed fee, consumer surplus and firm profit as α approaches 1.
- (d) Compute the profit-maximizing uniform price $p(\theta)$. Find values for α and θ for which this unregulated monopoly price is less than the regulated price.

5. Choose one of the following industries and periods:

- (i) Electric power generation and distribution in the 1960s
- (ii) Long distance telephone service in the 1970s
- (iii) Passenger air transportation in the 1980s
- (iv) For-profit hospitals in the 1990s

In that case describe what economic research has to say about the presence of economies of scale and scope, vertical economies and the prevalence of transactions costs. Describe the predominant form of regulation in that industry during that period in the U.S. Evaluate the match between the cost conditions and the form of regulation based on efficiency criteria.

6. Intense debate has broken out over the years over whether certain industry practices represent an efficient response to market conditions, or an expression of anti-competitive behavior. Identify one of the following practices:

- (i) predatory pricing
- (ii) exclusive dealing
- (iii) product bundling or tying
- (iv) resale price maintenance

For the practice that you chose, describe the current antitrust treatment based on court decisions and policies of antitrust authorities. (These may not be unambiguous.) Report the positions of the different sides of the debate, especially the arguments that view the practice as efficiency enhancing and as competitively harmful. Make a persuasive argument for one of these two positions, or for a third position.