Problem Set 5
Market Power and Public Policy

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1. Milgrom-Roberts Limit Pricing

Suppose that in the airline industry, there is currently one firms serving the Portland Oregon to Portland Maine route (the Portland^2 route). The demand curve for this market is:

$$Q = 10 - P$$

There is an entrant that is considering entering the market. This entrant has marginal costs $c_E = 4$. Once this entrant comes in, the two firms will compete in quantity (Cournot). The incumbent has a cost function (marginal cost):

$$c_I = \begin{cases} 0 \text{ with probability } x \\ 4 \text{ with probability } 1 - x \end{cases}$$

and call these two costs c_L and c_H.

Finally, the discount rate between period 1 and 2, denoted δ is just one.

(a) (3 points) What is the price and quantity if there is no asymmetric information; i.e., if costs of the incumbents are perfectly known.

(b) (3 points) Now consider the case with asymmetric information, and fixed costs $f = 0$. As well, $x = \frac{1}{2}$. What will be the price in period 1 (given firm 1's type) and what will be the entry choice of firm 2 as well as prices in period 2 (given firm 1's type again)?

(c) (5 points) Now to make this interesting, let fixed costs of entry for the entrant be $f = 2$. What will be the separating equilibrium here?

(d) (5 points) What will be the pooling equilibria in this game?

(e) (3 points) Compare the pooling and separating equilibrium that you found compared to the outcome with no asymmetric information. What are the incentives of the incumbent to provide "hard information" (i.e. certifiable information) about it's costs? (I am looking for more verbal descriptions, rather than a torrent of algebra here)

2. Cournot, Monopoly and Predation

Suppose we are looking at the market for steel pipe. The demand for steel pipe is given by

$$Q^D = 16 - 2P \tag{1}$$

while the cost function for each firm is:

$$C(Q) = 2Q + 6 \tag{2}$$

(a) (5 points) Suppose that there are initially two firms in this market. What are prices and quantities in this market if firms compete in quantities (i.e. à la Cournot)? What are profits?

(b) (5 points) Suppose that there is a merger between these two firms. What are prices and quantities after the merger? What is deadweight loss of merger? What are the cost efficiencies? Would you permit this merger or not?

(c) (5 points) Firm 1 is endowed with $ 10 of capital. Firm 2 has $ 20 of capital. Both firms have a discount rate of 0.5 and live forever (think of their profits from $t = 1, \cdots, \infty$). Suppose Firm 2 can predate on Firm 1, by choosing a quantity that yields zero profit for Firm 1. What will happen?

3. (10 points) How does the American Airlines predation case fit into the Milgrom-Roberts model versus the "Long-Purse" story. Explain. What other theory is used in this case?

4. (10 points) In the New York City Ferry Industry in the 1880's (before subways were built and ferries were the main mode of commuting in the city), there were regular episodes of predation (as nicely documented in "The First Tycoon: The Epic Life of Cornelius Vanderbilt" by Stiles, 2010). Many of these predation episodes were a) started by entering firms owned by Cornelius Vanderbilt – at this point the richest man in the country, and b) ended with the entering (and predating) firm's assets being purchased by the incumbent. Explain these two facts.

5. (5 points) How did price reporting for different grades of concrete in Denmark affect collusion? Why?

6. (5 points) In the paper by Asker on the Stamp Cartel, how did firms run knockout auctions. Why did they use these and why? What was the role of side payments in this cartel?

7. (5 points) For the OPEC Cartel what is the welfare loss coming from differences in production costs.

8. (5 points) In Fiona Scott Morton's paper on predatory pricing what are the three theories for predatory pricing? What evidence does she use to claim that the long purse story fits the data?

9. In the sugar industry, what happened following predatory pricing episodes. Why would this not be permitted today?