Prof. Charles Moul Economics 452: Industrial Organization March 2, 2006
Midterm Exam

You have the full ninety minutes to complete this exam. Partial credit will be given for partial work, so don't panic if you get hung up on a question. Write neatly, and good luck.

1. (15 pts) Suppose that an industry with many firms producing identical products is in long-run equilibrium. Each firm initially has a cost function $C_0(q) = 1 + q^2$. Discovery of a new production technique lowers the variable cost, making each firm's total cost function $C_1(q) = 1 + \frac{1}{4} q^2$.

A. Calculate the initial long-run equilibrium price (p_0) and the new long-run equilibrium price (p_1).
B. Suppose that market demand is linear and given by $p = 4 - 0.1\ Q$, where p is the market price and Q is the total quantity demanded. Calculate the number of firms in the industry before and after the change in technology.

2. (10 pts) Assume that SBC has a local monopoly in cable TV (good 1) and fast Internet (good 2). The marginal cost of producing either good is zero. There are three customers (A, B, and C) with different reservation prices (RP) for the two goods. Consumer utility from a product equals reservation price less the price of the product. Consumers do not buy unless they get non-negative utility, i.e., they buy if they're indifferent. The reservation prices are as follows:

Customer Type	Good 1's RP	Good 2's RP
A	2	5
B	4	4
C	6	2

A. Suppose the two goods are offered separately. Find the monopoly prices for each good.
B. Now assume that both goods are offered only as a bundle (i.e., not separately). Find the profit-maximizing price for the bundle.
C. Now let the two goods be offered separately at the prices you found in (A) and also as a bundle at the price you found in (B). Determine which customers buy only individual goods and which buy the bundle. What is the most profitable way for SBC to sell the goods (only separately, pure bundling, or mixed bundling)?

3. (10 pts) Assume that consumer tastes for soft drinks can be described by a location model of product differentiation. Let manufacturers have identical marginal costs and set drink prices strategically to maximize profits. Consider three drinks: Coke, Sprite (both made by Coca-Cola Company) and Uncle Chuck's Lemon Mixer. Suppose that consumers perceive Coke and Sprite as different products but cannot tell the difference between Sprite and Uncle Chuck's Lemon Mixer. Del Taco serves only Coke and Sprite, while Hardee's serves only Coke and Uncle Chuck's Lemon Mixer, and Jack-in-the-Box serves only Sprite and Uncle Chuck's Lemon Mixer. All three restaurants have consumers with identical distribution of tastes and willingness to pay.

A. Which drinks at which restaurants will be priced above marginal cost? Which restaurant will have the highest price for Coke and why?
B. Using your results in (A), explain why we observe that restaurants serving Coke do not serve Pepsi and conversely.

4. (20 pts) A local market for milk is served by several farms. Assume that you can describe how this market operates using the Cournot model with linear demand and constant marginal costs that may differ across farms. The price of milk is $2.50 per gallon. Farm A has marginal cost of $1.50 per gallon and has a 25% market share.

A. Farm B has a 20% share of this market. Calculate its marginal cost.
B. Calculate the percentage of Farm B's daily variable profit compared to Farm A's. (Hint: Can the ratio of farms' profits be expressed through market shares?)

5. (40 pts) Suppose that (pre-NAFTA) a monopoly can price discriminate between the U.S. and Canada. In Canada, the inverse demand function is $P_1 = 60 - Q_1$, and in the U.S. the inverse demand is $P_2 = 120 - 4\,Q_2$. The cost of producing $Q = Q_1 + Q_2$ units of output is $C(Q) = Q^2$. For the moment, assume that arbitrage is impossible because of strict customs inspection on the border.

A. Under what production pairs does the monopolist enjoy economies of scope? Support this answer using the definition of SC, the measure of scope economies.
B. When price discrimination is possible, the monopolist has three available strategies regarding which markets to serve. Calculate equilibrium prices and quantities under each strategy.
C. Which of the three strategies is most profitable?
D. As an antitrust regulator who is interested in the U.S. welfare, would you recommend breaking this monopoly into a U.S. company and a Canadian company? Why or why not?

Suppose now that NAFTA passes and consumers are free to trade and to transfer the good between the two markets. With arbitrage now possible, the monopolist can no longer price discriminate and has to charge a uniform price (denoted by P).

E. Calculate the aggregate demand facing the monopolist if the monopolist must charge the same price in the U.S. and Canada.
F. Calculate equilibrium price and quantity for the good as well as the monopolist's profits.
G. List and define the three categories of price discrimination, giving an example of each.

6. (5 pts) Give two (of the many) Chicago School criticisms of the theory and body of evidence regarding the Structure-Conduct-Performance paradigm. Where does the New IO fit within these two schools of thought?