Prof. Charles Moul Economics 452: Industrial Organization March 7, 2007
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. Assume you're from New Zealand (35 points)

You are a rancher and use your sheep for first wool and then mutton production. The production of each good follows a Cobb-Douglas function: wool output is $Y^W = 10\, S^{½}\, T^{½}$ and mutton output is $Y^{Mutton} = 50\, S^{½}\, B^{½}$. Notation-wise, S, T, and B denote number of sheep, man-hours of trimming, and man-hours of butchering respectively. Denote the price of sheep as P and the hourly wages of trimmers and butchers as Q and R. For what follows, the algebra can be messy … if it's helpful, when you get to the appropriate place, let $D = Q(Y^W/10)^2 + R(Y^M/50)^2$.

A. Find the conditional factor demands for the three inputs. [Hint: Don't try to solve by setting the marginal rate of transformation equal to the ratio of factor prices.]
B. Calculate the simplified cost function.
C. There are two ways to show that the aggregate rancher production exhibits everywhere constant returns to scale. Show with one and how you would apply the other.
D. Using the appropriate measure, show that your ranch exhibits scope economies at all possible combinations of outputs.

2. Xirius (5 points)

The proposed satellite radio "merger of equals" between Sirius and XM has sparked concern among antitrust authorities. Make an argument about whether or not the Department of Justice should seek an injunction preventing the merger. An ideal answer will not only address points supporting your argument but also undercut points that work against your position.

3. Just because it's hype doesn't mean we can't analyze it (15 points)

The St. Louis market for bottled water is served by five firms, whose marginal costs are constant and given by the following table:

Firm	1	2	3	4	5
C in $	0.80	0.70	0.85	0.65	0.85

The market price for a bottle is $1.21. Assume that you can use the Cournot model with linear demand to describe how this market operates.

A. Which firm has the highest market share? Support your answer using the Cournot first-order condition.
B. Find the elasticity of market demand for bottled water at the above market price.

4. You should have heard his price for bat removal (10 points)

Local exterminators address squirrels in the attic by plugging all holes but one to the outside and installing a spring-loaded wire noose around the remaining hole. After installation, the exterminator comes when called by the homeowner to remove squirrel carcasses. (Homeowners cannot do this on their own.) It is common for exterminators to charge a two-part tariff for squirrel removal: $125 for installation and the first squirrel, $60 for each additional squirrel. Do you think that this pricing is more indicative of price discrimination or cost? Explain. In an ideal real-world experiment, what sort of data variation might you be able to use to distinguish between these two explanations?

5. Erin go bragh (35 points)

You have a monopoly on the sale of (green) beer for the St. Louis St. Patrick's Day Parade route. You expect that 10,000 potential consumers will be spread evenly along the 5 mile path of the parade. Research shows that all parade-goers are willing to pay $5 to consume one beer, and a new anti-drunk regulation guarantees that no more than one beer per parade-goer will be purchased. Parade-goers also dislike walking to beer stands and are willing to pay 25 cents to avoid having to walk ¼ of a mile and return. Each beer costs you 50 cents, and each beer stand that you open incurs $400 in fixed costs.

A. If you have a single, optimally located stand, do you want to cover the entire market (i.e., is it profit-maximizing for you to sell to all parade-goers)? Explain.
B. Show that, if you choose to cover the entire market and are limited to a simple pricing regime, your profit maximizing number of beer stands is N=8. [Hint: where would you locate two stands?] Given eight stands, what price do you charge?
C. Express cumulative travel costs as a function of the number of beer stands. [Hint: Find the average travel cost given a fixed number of beer stands and work from there.]
D. Now assume that you can deliver beers at the same cost that parade-goers face. Conditional upon serving the entire parade-route, what is your profit-maximizing number of beer stands, and what are your profits? What is the efficient (welfare-maximizing) number of beer stands? Explain.