Problem Set 6

Note: Some of the material in this problem set won't be covered until Session #15

1) In the early 1990s, there was a sales boomlet in an exercise device called an "abs machine," a small frame of steel tubing with padding that you put on the floor that helped you to do sit-ups, crunches, and other exercises to tighten your abdominal muscles thereby reducing dreaded flab. Suppose that the abs machine industry had the following history:

> - In December 1992, nobody in the United States has heard of an abs machine.

> - In January 1993, Venture Aerobic Productions introduces the "Abs Roller." It becomes an immediate market success**.....**

> - In July 1993, Fitness Max Corporation introduces the "Abs-of-Steel Machine" which is very similar to the "Abs Roller" except for slightly different padding on the steel tubes, etc.

> - By December 1993, seven other companies have introduced their own abs machines - "Flat Stomach Express," the "Looking Good Machine," and so on. The machines differ from each other slightly - in color, in exact shape - but they basically do the same thing.

> - In March 1994, Venture Aerobic Productions introduces the "Abs Roller Plus," a slightly fancier version of their original "Abs Roller." It is the first abs machine to include a fifteen minute video cassette (no DVD's yet) which shows how to do exercises on an abs machine. Abs Roller Plus was also the first abs machine to include a built-in digital timer.

a) Using several diagrams, compare the demand curve faced by Venture Aerobic Productions, the first firm in the industry, in January 1993, May 1993, August 1993, and January 1994. In your diagrams, show what happens to both the position of the demand curve and its elasticity. Accompany your diagrams with a verbal explanation.

b) Over the same four periods, discuss as well as you can what happens to the percentage markup between the price Venture Aerobics charges for the Abs Roller and Venture's marginal cost of production. Illustrate your argument using any relevant formulae.

c) Using words, explain in a general way why Venture introduced the "Abs Roller Plus" in March 1994 rather than just continuing to produce the original "Abs Roller."

2) In 1965, Congress passed a law banning cigarette advertising on television. From a game theory perspective, we can think of an established cigarette maker – call it Company A - using advertising for either or both of two purposes.

- One purpose is to increase sales by convincing current smokers of other brands to switch to Company A's cigarettes.

- A second purpose is to expand the size of the market by encouraging current non-smokers to start smoking Company A cigarettes.

a) It is plausible that Congress wouldn't have passed the television advertising ban if established cigarette markers had violently opposed it. Focus on the first reason above and construct a prisoners' dilemma model that explains why the major cigarette makers might have been willing to go along with the television advertising ban. To keep the exercise simple, structure the game as Company A versus Company B where Company B represents all other established cigarette firms who, we assume, act in the same way.

b) Unlike Company A and the other established companies, Company X is a start-up company that is trying to introduce a new brand of cigarette to market. Describe what you think their position be on the television advertising ban. What effect, if any would the existence of Company X have on Company A and B's positions on the ban?

3) Black Hills is a town of 20,000 persons in an isolated part of Wyoming - it is a drive of over 150 miles to reach another town of any size. Until five years ago, if you wanted to buy blue jeans in Black Hills - men's or women's - there was only one store you went to: Suzanne's Pants on 4'th Street. Suzanne had a large selection of jeans and she gave good customer service. She would let you try on jeans in the store to see if they fit, etc.

Suzanne's marginal cost for a pair of jeans was a constant $25.00 and, like every other clothing store in Wyoming, she had to pay a $5.00 "jeans tax" to the Wyoming state government on every pair of jeans she sold. Suzanne estimated that the demand curve for jeans in Black Hills had the form:

$$P = \$75 - .05Q \quad \text{where } Q = \text{pairs of jeans sold in Black Hills/month.}$$

Five years ago, the residents of Black Hills received their first mail order catalog from Jeans-R-Us, a large firm in Wisconsin that sold jeans by mail throughout the nation. Jeans-R-Us was very much in the Amazon/Lands End mode with a web site, a toll free telephone number and 2 day shipping. Assume Jeans-R-Us has the same marginal cost as Suzanne for the jeans but because Jeans-R-Us is located in Wisconsin, they are not required to collect the Wyoming "jeans tax" even on jeans shipped to persons in Wyoming.

a) Today, Suzanne believes the best she can do is to divide the market with Jeans-R-Us in a Cournot/Nash equilibrium. If she succeeds in doing this, how many pairs of jeans per month will Suzanne sell and how many will Jeans-R-Us sell?

b) Recently, Suzanne called the Black Hills representative in the state legislature to complain about the $5.00 Wyoming jeans tax. "It really hurts me," she said. "Because my store is in Wyoming, I have to pay the tax on my sales. But when Wyoming residents purchase jeans from Jeans-R-US, Jeans-R-US doesn't have to pay the tax and so they face lower costs than I do.

Is Suzanne exaggerating? Suppose she didn't have to pay the $5.00 tax. Would her monthly sales in the Cournot/Nash equilibrium look much different than it looks now? Explain.

c) Suppose Jeans-R-Us didn't have a web site or toll free number and any Jeans had to be ordered by mailing them a check. Do you think a Cournot model would still be appropriate to examine this market? Briefly explain your reasoning.

4) In economic policy, there is an ongoing debate over when, if ever, it is appropriate for the government to subsidize specific industries. The normal argument against subsidies is that they arise from inappropriate politics – e.g. political contributions from the industry being helped – and they only serve to freeze out more efficient foreign producers. Potentially, however, there are other cases. Several years ago, Paul Krugman created this example:

Consider the civilian aircraft industry where there are now two large competitors in Europe/America – Boeing and Airbus. Developing a new airliner involves large initial costs and so each company needs, say, 300 new orders over the first three years to break even. The problem is that the world market is likely to generate only 400 orders over the next three years.

Suppose Boeing and Airbus are each considering developing a new passenger airliner. Given the nature of the market, the pay off matrix for profit looks like this (Boeing's profit is the first in each pair).

	Airbus	
	Develop	Do not Develop
Boeing Develop	(-7, -7)	(25, 0)
Boeing Do Not Develop	(0, 25)	(0,0)

a) Does this competition have a Nash equilibrium? Explain.

b) Suppose that while the two companies are examining their positions, the U.S. government announces that it will give Boeing a subsidy of 9 units to develop the airplane – i.e. a payment that would not have to be returned as long as Boeing developed the plane and brought it to market. How might that influence how the game evolves.

5) As you walk down the aisles of a supermarket, you will see that many firms engage in "product proliferation". Nine-Lives Cat Food produces about a dozen different flavors of cat food – Seafood Delight, Tuna in Sauce, several meat-flavored cat foods that cannot be mentioned here. Tide laundry detergent produces five or six different varieties of Tide - Tide Original, Tide with Fresh Scent, Tide with Bleach Substitute, liquid Tide etc.

Typically, these varieties all sell for about the same price so they are not a way of achieving price discrimination. Rather, as the kinked demand curve suggest, product proliferation is a form of non-price competitive strategy. One part of the strategy involves appealing to various consumer tastes. In the context of a supermarket, what other strategic reason might these manufacturers have for producing so many similar products?

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11.203 Microeconomics
Fall 2010