

Extra Practice, Final Quiz
Managerial Economics: Eco 685

These include questions covering the material from homework 3.

Extra questions from the book:

- Chapter 12, problems 1, 2, 3, 4 (just find the Nash equilibria), 5a and c, and 6.

Question 1

Universal studios charges \$165 for a one day ticket. For \$75, one can add an “express pass” which allows one to move to the front of the line on some rides. Assume (as seems reasonable) the marginal cost of an express pass is zero and the marginal cost of a ticket is \$55. Suppose Universal has two type of consumers: ride lovers, who purchase the express pass, and scaredy-cats, who do not.

- a. Assuming Universal uses upcharge pricing, calculate the price elasticity of the scaredy-cats and ride lovers.

Question 2

I have found the following data for popcorn and movie tickets at Sunset Theater:

- Movie ticket price is \$11.
 - The movie studio keeps 80% of the price of each ticket (true for most movies in the first week). This is the only marginal cost of the ticket.
 - The price of popcorn is \$5.75.
- a. Suppose the theater uses upcharge pricing, and the price elasticity of consumers who buy popcorn with a movie ticket is -2.18. Calculate the marginal cost of popcorn.
 - b. What is the percent markup on popcorn?

Question 3

Consider the mixed strategy Nash equilibrium between customers of TJ Maxx and Macy’s in the notes. Which of the following are true (true/false for each):

- a. April must shop more often at TJ Maxx to deter Jack from shopping all of the time at TJ Maxx.
- b. April must shop more often at TJ Maxx, because April prefers to shop at TJ Maxx, all other things equal.

- c. April must shop more often at TJ Maxx, because Jack prefers to shop at TJ Maxx, all other things equal.
- d. April must shop exactly $\frac{5}{8}$ of the time at TJ Maxx, otherwise April's prediction that Jack shops $\frac{5}{8}$ of the time will not be correct.

Question 4

General Mills (GM) and Quaker Oats (QA) are playing a price war game in which GM moves first. The extensive (tree) form of the game is:

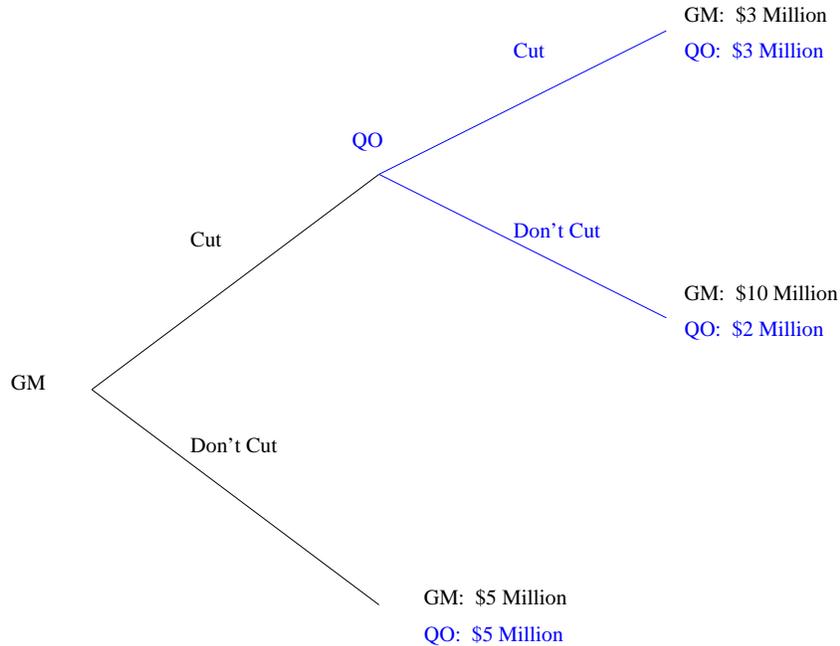


Figure 1: Sequential Price War.

- a. Find all (if any) sub-game perfect equilibria.
- b. Find all (if any) Nash equilibria which are not sub-game perfect.

Question 5

The following is a true story. Over the objections of plant managers, DuPont's CEO ordered each plant to install methane scrubbers.

- Methane is a greenhouse gas, but was not regulated by the EPA (thus DuPont's action was completely voluntary).
- Methane scrubbers are very expensive, and require catalysts that cost \$2.5 million per year.

- At the same time, DuPont's patent on nylon was about to expire. Thus DuPont faced the threat of entry by rival firms.
- DuPont makes \$12.5 million if the rival does not enter and \$7.5 if the rival firm does enter, excluding scrubber costs.
- The EPA has estimated that the benefits of reducing methane are \$0.5 million per year.
- The EPA will thus require firms to have scrubbers if it is not too costly for *existing firms*. If DuPont voluntarily adds scrubbers, the EPA believes they cost \$0, whereas if DuPont does not install scrubbers, the EPA believes they cost \$2.5.
- The game thus has DuPont moving first, the EPA second, and the rival firm last.

The game tree looks like this:

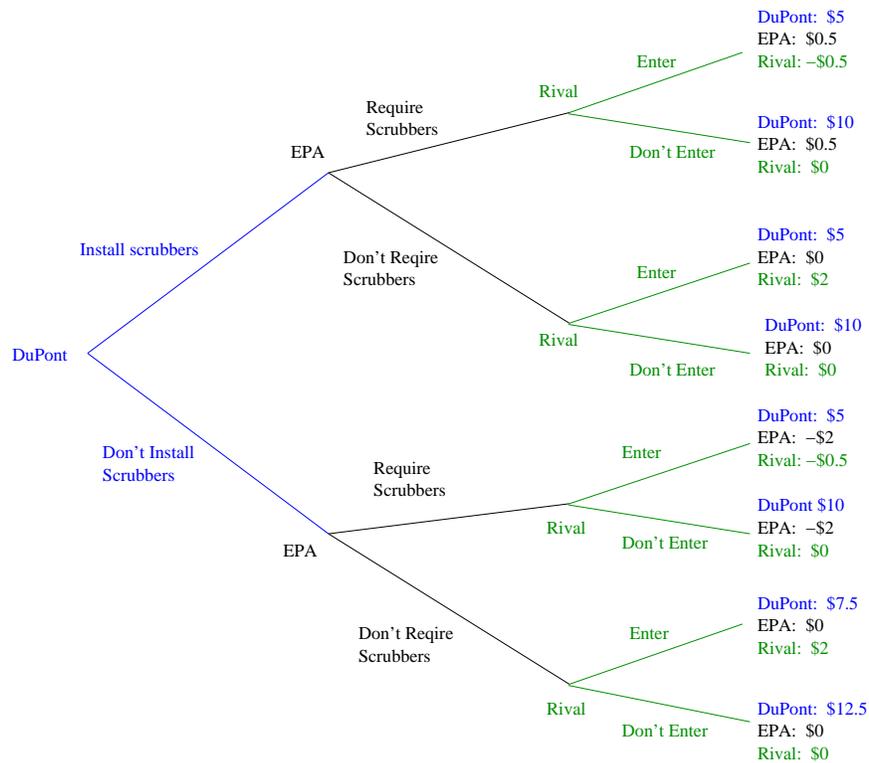


Figure 2: Regulation game.

Notice that DuPont must install the scrubber anyway if the EPA requires.

- Find all (if any) sub game perfect equilibria.
- Find all (if any) Nash Equilibria which are not sub game perfect.

- c. Evaluate the claim of DuPont's CEO that the motivation for installing scrubbers was to improve its image among consumers.
- d. Explain DuPont's preemption strategy.