

Homework 3, Managerial Economics: Eco 685
Due: Friday, February 25, 2005

Question 1

Explain the rationale for the anti-trust laws that prohibit firms from discussing prices with each other. Give one way firms can improve outcomes in a setting where they cannot collude.

Question 2

Explain why K-Mart and other retailers have sales at random times (Blue Light Specials).

Question 3

Best Buy (B) and Circuit City (C) are competitors in the consumer electronics market. Both have relatively large margins on plasma TV's. Essentially, they have driven up the price of such TV's well above marginal costs because consumers of these TVs tend to be wealthy, and thus tend to have less time, and thus tend to be less price sensitive. However, some consumers will shop around and thus each firm could steal business from the other by cutting prices.

		B	
		Hold prices	Cut prices
C	Hold prices	8,8	4,10
	Cut prices	10,4	6,6

Table 1: Profits in millions of dollars

- Calculate all (if any) dominant strategies.
- Calculate all (if any) Nash equilibria. For each calculate the profits for each firm.
- Rank all of the payoffs from highest to lowest social benefit. Does the Nash equilibrium correspond to the highest social benefit? Why or why not?
- Suppose both firms introduce a price matching policy. Calculate the new payoff matrix and repeat (a) and (b).

Question 4

Consider the following theory of price dispersion. In the retail market for shoes, the inventory costs of carrying odd sizes and carrying a large selection (some of which may quickly go out of style) is quite large. Therefore, retailers tend to pursue one of two strategies: keep a large selection and charge high prices, or be a "discount" store and charge low prices but keep a low selection. Thus for an *individual shoe* prices can be quite different across retailers. Now let us suppose the retailers wish to forecast demand and know the customers will react to the price dispersion.

The discount store and charges \$5, while the high priced firm charges \$10. Thus each type of customer (1 and 2, assume there are 1000 of each type) who shops discount has a payoff of -\$5 at the discount store and -\$10 at the high priced store. However, if both customers shop at the discount store, then the store is likely to run out. In that case, with 50% probability the customer gets the shoe for \$5 and then with 50% probability the customer is inconvenienced and has to pay \$10 anyway, for a total expected payoff of -\$13. Similarly, if both go high priced, then the expected payout is -\$11. Summarizing all of this gives:

		2	
		shop discount	shop high price
1	shop discount	-13,-13	-5,-10
	shop high price	-10,-5	-11,-11

Table 2: Profits in millions of dollars

- a. Calculate all (if any) Nash equilibria.
- b. Find all (if any) mixed strategy equilibria.
- c. For each Nash and mixed strategy forecast the demand at each type of firm.

Question 5

Transport Equipment (TE) sells buses to schools. The Santa Barbara County School District (SB) wants to reduce pollution by requiring buses to be run on electric power. This would require TE to construct a specialized facility to make buses for which SB is the only buyer. TE knows that SB could attempt to renegotiate the price after the facility is built (it would be difficult to sue the government for breach of contract, and a public relations problem to sue a school district in any event).

- The cost of the facility is \$100 million.
- The proposed contract gives TE \$200 million in profits (over and above all costs EXCEPT the cost of the facility).
- The proposed contract gives SB a payoff equal to the difference between the next lowest bid, equal to \$300 million and the bid of TE (\$200 million).
- SB could renegotiate the contract after the facility is constructed so that TE gets \$50 million in profits.
- If the contract is not signed, both players get zero.

- a. Construct the tree diagram for the game where TE moves first by signing or not signing the contract and SB moves second (if necessary) with the decision to renegotiate or not and TE moves third (if necessary) by either accepting the renegotiated contract or not.
- b. Find all (if any) Nash Equilibria. According to the Nash Equilibrium concept, is a promise by SB not to renegotiate credible?
- c. Find all (if any) Sub Game Perfect Equilibria. According to the sub game perfect concept, is a promise by SB not to renegotiate credible?
- d. In general, give one way TE and/or SB could get a better outcome (hint: find the root cause of the problem).