

# Problem Set 3

## ECON 465 — Market Power and Public Policy

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1. (20 points) Vertical Markets

Consider a retailer serving a market with a demand curve given by:

$$Q = 10 - 2P$$

The retailer ( $R$ ) purchases the input at price  $w$  from an upstream manufacturer  $M$ . The manufacturer has a cost function of  $C(Q) = 2Q$ .

- What is the retail price  $p$ , wholesale price  $w$ , and quantity sold in this market? What are profits for the retailer and manufacturer?
- Now suppose that the retailer  $R$  makes take-it-or-leave-it offers  $w$  to the manufacturer, specifying the price at which they will purchase the good. The manufacturer can then supply as much, or as little of the good as she chooses. What is the outcome of this scenario in terms of retail price  $p$ , wholesale price  $w$ , and quantity sold in this market? What are profits for the retailer and manufacturer?
- The antitrust authority is now considering a merger between the upstream and downstream firms. What are the effects of this merger if the manufacturer chooses the price to sell its good, versus the case where the retailer makes take-it-or-leave-it offers? Would you approve it if you did not know who makes offers to whom?
- A second retailer  $R_2$  now enters, and both retailers compete in prices in the downstream retail market. Suppose as well that the manufacturer chooses the price  $w$  that it will sell its good. What is the retail price  $p$ , wholesale price  $w$ , and quantity sold in this market? What are profits for the retailers?
- Now a second manufacturer enters, which we call  $E$  for entrant (the old manufacturer is now called  $I$  for incumbent). This new firm has a cost function  $C^I(Q) = Q$ . Both manufacturers compete in wholesale prices. What is the retail price  $p$ , wholesale price  $w$ , and quantity sold in this market?
- Finally, suppose that both the incumbent and entrant manufacturers ( $E$  and  $I$ ) can offer exclusionary contracts at prices  $t^I$  and  $t^E$  to both of the retailers. What will be the “bribes”  $t$  in this scenario? How do things change compared to the situation you looked at in the previous question?

2. (20 points) Model of Exclusives

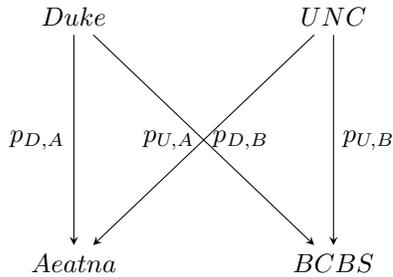
Suppose we have a market with three downstream buyers  $B1$ ,  $B2$ ,  $B3$ , and two incumbents,  $I$  and  $E$ . The demand curve is  $Q = 10 - P$ , and firms compete à la Bertrand in the downstream market. Marginal costs are  $MC^I = 2$  for the incumbent, and  $MC^E = 1$  for the entrant. There is a fixed cost of entry  $F = 5$  for the entrant.

- First, consider the case where the entrant is out of the market. The game proceeds as follows:  $I$  sells the good to each of the three firms at prices  $w_1$ ,  $w_2$ , and  $w_3$ , and these firms compete à la Bertrand in the retail market. What wholesale prices will  $I$  choose? What are the profits of  $B1$ ,  $B2$ , and  $B3$ , and  $I$ ?

- (b) Second, the entrant comes into the market (it does not make an entry decision, it is in the market for sure). What will be the equilibrium of this game in terms of the prices that the incumbent chooses  $w_1^I, w_2^I, w_3^I$ , and the prices that the entrant chooses  $w_1^E, w_2^E, w_3^E$ ? What are the profits of B1, B2, and B3, I and E?
- (c) Now suppose that the incumbent approaches B1, B2, and B3, in sequence, and makes exclusivity offers in exchange for a payment  $t_1, t_2$ , and  $t_3$ , so that the retailers promise not to buy from the entrant. After observing the set of exclusive contracts, the entrant can enter or not. What is the outcome of this game?
- (d) What is the socially efficient (or competitive) outcome of this game? What is the welfare loss from exclusion here.

3. (20 points) Bargaining and Hospital Mergers

Suppose we have a market with two hospitals, and two insurance companies that cover patients. We will call these insurance companies MCO's – managed care organizations. These MCO's are firms such as AETNA or Blue Cross, Blue Shield. As well, just to make this more concrete, let's call the hospitals Duke and UNC – which are in the fact some of the largest hospital groups in the triangle.



Denote the prices paid by the MCO's to the hospitals as  $p_{ij}$ , so  $p_{D,A}$ , for example, would be the price that Aetna pays to Duke Hospital System.

Profits for the MCOs (before they make payments to hospitals), depend on the network that have formed (say if they have hospitals 1 and 2 in their network that they offer to insurees), but also depend on the network offered by the rival MCO, since this affects demand in the market for insurance.

To make things simple, let's keep Aetna and Blue Cross Blue Shield's profits exactly the same. The following table shows the firm's profits as function of it's own network (rows), and it's rival's network (row).

Own Network	Rival's Network			
	None ( $\emptyset$ )	Duke	UNC	Duke and UNC
None ( $\emptyset$ )	0	0	0	0
Duke	80	60	70	40
UNC	60	55	50	30
Duke and UNC	100	80	90	60

and clearly if you have no hospitals in your network, you get zero profits.

Furthermore, suppose that the hospitals have zero marginal costs, and make all their income from selling services to MCOs.

Finally, we assume that price are negotiated, using 50-50 Nash Bargaining, i.e. equal division of surplus.

- (a) What are the prices paid by each MCO to each Hospital if there is a full network; i.e. each hospital contracts with each MCO?

- (b) Suppose that Duke and UNC Hospitals Merge. What happens to prices in this market? Why?
- (c) What does this tell you about mergers in this market? Could this merger have a downward effect on prices if the payoffs in this game were slightly different? Give an example.  
\*\*\_hard\*\*\_hard\*\*\_hard
- (d) (\*\*\_hard points) Now suppose that Aeatna and Duke merge (instead of having UNC and Duke Merging). What is the price that Duke and BCBS will now agree to? (you don't have to compute the entire set of prices here)
- (e) In the market for Medicare, the Government sets prices. We can think of this as the government making take-it, or leave-it offers. Suppose that Blue Cross, Blue Shield (BCBS) can make take-it or leave it offers, what price will it pay to Duke and UNC Medical Centers? How do these prices change?
4. (5 points) For the Home Shopping Networks (HSN and QVC), what does Chipty find is the effect of vertical integration between content provider and cable TV company?
5. (5 points) Suppose that there are two mergers in the hospital industry. One involves cataract surgery, the other involves OB-GYNs. Which merger do you think is likely to pose the most antitrust issues and why.
6. (5 points) What type of programming is the most contentious in the bargaining process between cable TV systems and content providers (people who produce tv shows)? Why?
7. (5 points) Suppose that there is increased competition in the market for hospital services, which leads to lower prices for hospital services. Does this mean that individuals will pay less for health care?
8. (5 points) What was the remedy in the Highland Park, Evanston Northwestern Merger? Does it make sense. Discuss.
9. (10 points) Case of a Vertical Merger: AMD and Intel  
Read the two documents, Joshua Gans's article on the AMD and Intel case, and the European Union Competition Commission's decision.
- (a) What is the market definition used in this case.
- (b) What are the efficiencies that Intel is using to argue for it's rebate practices. Do you find these compelling or not. What could they be?
- (c) In the model that we presented in class on exclusion, there was a fixed cost of entry. What is the fixed cost in this setting.
- (d) Could the rebates to Dell be justified in a way other than exclusion. Have we seen other reasons why a firm might employ this type of non-linear (not just a fixed price per unit) pricing scheme? Discuss.
- (e) This complaint does address the issue of innovation. How would future innovation change the reasoning in this case? Discuss.