

Economics 70361: Problem Set 4  
(due Monday, October 28)

Fall 2013

Professor Jensen

1. Consider an oligopoly with 5 firms, each producing  $q_i$  units of a homogeneous good. Inverse demand is

$$P(Q) = A - Q$$

where  $A$  is a positive constant and  $Q = q_1 + q_2 + \dots + q_5$ . Each firm produces under CRS technology with constant unit and marginal cost  $c$ , where  $c$  is a positive constant less than  $A$ . If firms 1 and 2 merge, then the new firm  $M$  gains from cost efficiencies, and its new constant unit and marginal cost of production is  $c_M = c - \varepsilon$ , where  $\varepsilon$  is a positive constant less than  $c$ .

- a. For what values of  $\varepsilon$  is post-merger price less than pre-merger price, so consumer surplus increases? Do the profits of each firm increase or decrease in this case? (Note that, by symmetry, you only need to compute the profit of firm  $M$  and any one of firms 3, 4, or 5.)
- b. For what values of  $\varepsilon$  does the merger increase total surplus (consumer plus producer surplus)? Compare this outcome to that in part a from the perspective of who wins and who loses from the merger.

2. Now consider an acquisition game in which the objective is merging to gain market power (i.e., mergers do *not* change production costs). The specific game is the following: firm 1 acquires firm 2 if the price it is willing to pay, namely the increase in profit from the acquisition, is greater than or equal to the amount the firm 2 must be paid to sell itself, namely its current profit. Then, if a merger occurred, the new firm 1 considers acquiring firm 3; and so on until the acquisitions stop because the gain to acquiring the next firm is less than its cost. Assume as above that inverse demand is  $P(Q) = A - Q$  and unit and marginal cost is  $c$  for each firm. Will acquisitions continue until the industry is monopolized? Explain why or why not?