

V18: Seminar 6 - Information and R&D

ECON3820/ECON4820 - Strategic Competition

April 20th 2018

Problem 1

(exam 2012)

- (a) Consider a duopoly where firm i 's demand is given by

$$D_i(p_i, p_j) = a - bp_i + dp_j,$$

where $i, j = 1, 2$, $i \neq j$, p_i and p_j are the two firms' prices, and a , b , and d are parameters such that $a > 0$ and $b > d > 0$. Suppose the two firms have identical unit costs of production equal to c , where $0 < c < a$, and let firms choose prices simultaneously. Illustrate the equilibrium in this market by drawing firms' best-response curves in (p_1, p_2) space. Explain why firms' prices are strategic complements. Find firms' equilibrium prices.

- (b) Suppose now that firm 1 has a unit cost equal to c_1 , which is known to both firms, while firm 2 has a unit cost equal to c_2 , which is known only to firm 2 itself. Firm 1 only knows that $c_2 = c_L$ with probability x , and $c_2 = c_H$ with probability $(1-x)$, where $c_1 > 0$, $c_H > c_L > 0$, and $0 < x < 1$. Illustrate the equilibrium in this situation with the help of a graph similar to the one used in (a).
- (c) Discuss, in the situation described in (b), how an increase in x , the probability of firm 2 being low-cost, affects equilibrium prices. If firm 2 could choose x , which value would it choose?
- (d) Discuss whether, by way of signalling, the privately informed firm can credibly convey information about its true cost to its rival firm.

Problem 2

(exam 2014)

Consider an industry consisting of $n > 2$ identical firms, each with a constant unit cost of production equal to $c > 0$. The product is homogeneous, and demand is given by the inverse demand function $P(Q) = a - Q$, where Q is total quantity supplied and $a > c$.

- (a) Suppose that the firms compete in quantities. Find the equilibrium quantity offered by each firm.
- (b) Suppose instead that the firms compete in prices. Find the equilibrium price offered by each firm.
- (c) Suppose one of the firms in (2) makes an innovation that reduces its unit cost of production to \hat{c} , where $0 < \hat{c} < c$. Find a condition for this innovation to be non-drastic.
- (d) Explain why the value of the innovation for the innovating firm in (3) is higher than if the firm had been a monopolist.