Industrial Organization

Problem Set #3

Universidade Nova de Lisboa
Faculty of Economics
Fall 2008

Instructor: Vasco Santos
Grader: David Henriques

Instructions

1. Due date: November 5, 6:30 p.m., mailbox #141 (David Henriques).
2. This is **individual work**. Each student has to deliver a solution. The best, and perhaps the only, way to ensure that you understand the material taught in class is to solve these exercises under "exam conditions". One of the advantages of solving these exercises is that they provide a good preparation for the exams.
3. PLEASE **write on the front and back** of each sheet of paper that you use to solve this problem set. It's a waste of paper to write only on one side.

Part I
Cournot Competition

Exercise 1. Consider two firms, 1 and 2, producing a homogeneous product that simultaneously decide how much they want to produce. The market demand is given by $D(P) = 100 - P$. The marginal and average cost of production of both firms is constant and equal to 10. Firm 1 maximises its profit but the manager of the other firm maximises a weighted sum of the profit and the quantity produced, *i. e.*, firm 2 maximises

$$\pi(q_1, q_2) + \alpha q_2.$$

a) Represent graphically the best response functions of both firms.
b) Find the equilibrium quantities.
c) Which value of α maximises the profit of firm 2? Comment the result.

Exercise 2. Suppose a linear demand. There are two firms with constant marginal costs c_1, and c_2, such that $c_1 + c_2 = c$ (where c is a constant). Show that, when firms become more asymmetric, Cournot competition outcome yields a higher concentration index and a higher industry profit.

Part II
Bertrand Competition

Two firms, 1 e 2, with constant marginal and average costs equal to 10, operate in a market with demand $P = 100 - Q$, while competing à la Bertrand. Firm 1 announces a new marketing strategy: "No other company sells cheaper than we do!" To make this strategy credible, firm 1 adopts the price catalog of firm 2, while dropping its own. Firm 2 knows all these decisions.

a) What is the market equilibrium before firm 1's new market strategy?

b) And afterwards? Explain your answer while describing the economic intuition behind it.

c) Suppose that firm 1, though having its competitor's catalog available for consultation, keeps its own, using the former just to prove that its price is never higher. What is the market equilibrium resulting from this other marketing strategy?

d) Should firm 1 use the "aggressive" marketing strategy described in b)? Answer quantitatively.

e) Is firm 2 worse off as a result of it? Quantify.

f) Do consumers benefit? Quantify again.