

Industrial Organization

Problem Set #2

Universidade Nova de Lisboa
Faculty of Economics
Fall 2008

Instructor: Vasco Santos

Grader: David Henriques

Instructions

- 1. Due date:** October 17, 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.
-

1 Dominant Firm

Consider a market, with demand given by $P = 20 - 2Q$, which is constituted by three firms (A , B and C). Firm A is more efficient than the other two, operating with a constant marginal cost equal to 9. The total costs of firms B and C are given by the function $CT_i = q_i \cdot (q_i + 11)$, with $i = B, C$. Find the equilibrium of the market, supposing firm A acts like a dominant firm and firms B and C like a competitive fringe.

2 Monopolistic Competition

Suppose that all firms in a market under a monopolistic competition environment face an individual demand

$$P = 90 + \frac{20}{n} - 4q,$$

Thus, $n \geq 1$.

The total cost function of each firm operating in this market is,

$$TC(q) = q^2 + 414.05.$$

a) Assume that in the *short run* there are only 4 firms in the market, a firm named NOVA and three other similar competitors. Find the optimal quantity and price as well as the profit earned in the short run by NOVA. What does the sign of the profit level tell you about future market entry (or exit)?

b) Monopolistic competition implies zero profits in *long run* equilibrium. Use this fact to find the number of firms, n , and NOVA's quantity and price in the long run. What do you expect will happen in the long run equilibrium if the fixed cost, $F = 414.05$, increases? Justify intuitively and mathematically.

c) Compare short run and long run consumer surplus (CS).

d) Taking into account the computed equilibrium quantities in *a)* and *b)* and given the total cost function, what can you conclude about the productive efficiency of the firms operating in this market?

e) Compute the Lerner index when $n = n_0$ and show that it is independent of the number of firms n_0 . Explain intuitively the reason why NOVA's market power doesn't decrease with the number of competitors even when $n \rightarrow \infty$.