

# MICROECONOMICS 2009/10

## PROFIT MAXIMIZATION, COMPETITIVE SUPPLY AND MARKET EFFICIENCY

1. The licorice's industry can be defined as a competitive industry. In particular, every firm produces 2 millions of licorice bars per year. The average cost is 20 cents while the price is 30 cents.

- (a) Which is the marginal cost of producing one licorice bar?
- (b) Would it be reasonable to state that this industry is in the long run equilibrium? Use a graphical analysis to justify your answer

2. Consider the following statement: a firm, who competes with other firms under perfect competition in the short run, is maximizing profits; however revenues cannot cover total costs.

- (a) What does maximizing profits mean (if the firm is getting losses)?
- (b) Should the firm be closed? Explain under which conditions you would recommend to do so
- (c) What about if we are in the long run?
- (d) Assume now that in the short run, the producer is getting some profits; is it possible to keep those profits in the long run? Explain this theoretical result through a graphical analysis

3. The average costs of a competitive firm are given by  $AC_{sr} = 9Q + 8 + 144/Q$ . If the market price is  $p=20$ , show whether the firm should close or keep producing.

4. Leonardo's Pizza is a price taker firm having the following costs:

$$SRTC(Q) = Q^3 - 16Q^2 + 120Q + 400; \quad LRTC(Q) = Q^3 - 20Q^2 + 200Q;$$

Where the first cost function is the short run cost function and the second is the long run total cost function

- (a) If  $p=168$ , which is the number of pizzas that maximizes Leonardo's profits
- (b) Which is the closing price of Leonardo?
- (c) Obtain the short run supply curve of Leonardo's Pizza?
- (d) Which are the prices that may make Leonardo leave the market?
- (e) At which prices other firms would have the incentive to enter in the market?
- (f) Which is the long run equilibrium price?

5. A competitive firm that maximizes long run profits has the following total cost  $TC(Q) = Q^3 - 4Q^2 + 10Q$ . If the industry is composed by identical firms and firms may enter and exit for free. Which is the individual demand perceived by the firms that compose the industry?

6. For the following cost functions:

(i)  $C(q) = q^3 + 7q^2 + 17q + 66$

(ii)  $C(q) = q$

(iii)  $C(q) = q^2 + 10$

(iv)  $C(q) = q + F$  donde  $F > 0$

- (a) Find and represent graphically average cost, average variable cost and marginal cost
- (b) Find the short run supply curve and represent it graphically

7. Assume that in a competitive market, the market price is  $p=9985$ . If the total cost is  $C(q) = q^3 - 7q^2 + 10000q + 100$

Which is the quantity to be produced? Why is it not producing  $q=10/6$  if  $p=mgC$  also holds?

8. The bike's industry of Seville is composed by 100 firms with the following cost function  $C(q) = 2 + q^2/2$ , whereas 80 firms displays the following cost  $C(q) = q^2/6$ . Find the supply curve of this industry

9. A competitive industry is composed by firms having the following cost function

$$C(q) = 43.200 + 3q^2$$

On the other hand, the demand is given by

$$q^d(p) = \begin{cases} 0 & \text{si } p > 960 \\ 19200 - 2p & \text{si } p \leq 960 \end{cases}$$

(a) Assume that  $p=600$ , how many units will a firm produce? What about the level of profits?

(b) Find the short run supply curve for an individual firm and represent it graphically

(c) Assume there are 24 firms in this industry. Find the short run supply curve for the industry and represent it graphically.

(d) Find equilibrium price and quantity

(e) Find individual production and profits level in equilibrium.

Assume that long run cost functions coincide with the short run ones. Thus,

(f) Could the solution stated previously in (e) be considered the long run equilibrium? Could you briefly explain the dynamics to reach the long run equilibrium? Find the long run equilibrium price and the number of firms needed to achieve this long run equilibrium

10. Minimum wage legislation is one the most prominent laws in any of the institutional frameworks. However, some economists claim that these measures might foster unemployment among non qualified employees. To keep the discussion clear, consider that the supply and demand functions are

$$D(w) = 7000 - 20w \text{ y } S(w) = 3000 + 80w$$

(a) Find the equilibrium wage and level of employment

(b) The regulator fixes a minimum wage to be at least 125 Ameros, find the level of unemployment

(c) Compare the situation of employees in both cases. Discuss the results obtained.