

*You should know the definition of the competitive equilibrium market and understand the behavior of a monopoly.*

<p>An economy of production and of consumption is a pure perfect competition economy when all firms and all consumers are price taken. In such an economy, the firm 's behavior is stick to the choice of the quantity to produce, <i>This choice is called offer</i>, any consumer 's behavior is stick to the choice of the quantity to consume, <i>This choice is called demand</i>. Equilibrium Price and quantity coordinate those behavior. In the Samuelson model, the equilibrium allocation maximises the total surplus of the economy.</p>	<p>A set of strategies (that could be mixed strategies) is a Nash equilibrium whenever there is no unilateral deviation of the players.</p>
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## 1 Back to a competitive equilibrium and to the monopoly

Let consider an homogeneous good, seven consumer and six producers. Let suppose that in that market the consumers are interested in consuming 1 or 0, depending on the comparison of the selling price with their reservation price., and the firms are interested in producing 1 or 0, depending on the comparison of the selling price with their (marginal) unit cost. The characteristics of the consumers and of the producers are the following :

$$\begin{aligned}
 r^1 = 120 \quad r^2 = 57 \quad r^3 = 18 \quad r^4 = 12 \quad r^5 = 9 \quad r^6 = 8 \quad r^7 = 7 \\
 c^1 = 1 \quad c^2 = 7 \quad c^3 = 8 \quad c^4 = 12 \quad c^5 = 18 \quad c^6 = 20
 \end{aligned}$$

- 1) Describe the equilibrium if that market is a pure competition one
- 2) Let suppose that there is only one firm, from which we know her marginal cost

$$c^1 = 1 \quad c^2 = 7 \quad c^3 = 8 \quad c^4 = 12 \quad c^5 = 18 \quad c^6 = 20$$

What is her optimal price, given the demand described before? [Hint : use a tableur to make computations]

- 3) Is that true that the quantity sold under monopoly is less than the quantity sold under market competition?
- 4) Redo the Comparison between the pure competition market and the monopoly market when the characteristics of the consumers and the producers are the following

$$\begin{aligned}
 r^1 = 953 \quad r^2 = 788 \quad r^3 = 783 \quad r^4 = 757 \quad r^5 = 695 \quad r^6 = 684 \quad r^7 = 657 \quad r^8 = 605 \quad r^9 = 468 \quad r^{10} = 349 \quad r^{11} = 318 \quad r^{12} = 250 \quad r^{13} = 181 \quad r^{14} = 131 \\
 c^1 = 44 \quad c^2 = 86 \quad c^3 = 311 \quad c^4 = 345 \quad c^5 = 385 \quad c^6 = 439 \quad c^7 = 495 \quad c^8 = 524 \quad c^9 = 527 \quad c^{10} = 550 \quad c^{11} = 574 \quad c^{12} = 585 \quad c^{13} = 624 \quad c^{14} = 709
 \end{aligned}$$

## 2 Monopoly

- 1) Let consider the case such that  $c_m = 2q$ ,  $D(p) = 120 - p$ , which we rewrite  $p(q) = 120 - q$ . Compute  $q^{**}$  and  $p^{**}$  in a monopoly market if the firm is alone. Check that the quantity produced is inferior to the quantity that the firm would have produced under a competitive market.
- 2) Let consider a firm that produces two goods in quantity  $q_1$  and  $q_2$ , which are substitute, such that the demand of each good is

$$q_1 = 10 - 2p_1 + p_2 \quad q_2 = 10 + p_1 - 2p_2$$

We suppose that the marginal cost is constant equal to  $c$ .

- 3) For the preceding firms comment the variation of the tarif and of the profits with  $c$ .
- 4) Compare the tarif with the situation in which the goods would not be substitute.