

14.01 Principles of Microeconomics, Fall 2007
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Lecture 23

Monopoly and Monopsony

Outline

1. Chap 10: *Multi-Plant Firm*
2. Chap 10: *Social Cost of Monopoly Power*
3. Chap 10: *Price Regulation*
4. Chap 10: *Monopsony*

1 Multi-Plant Firm

How does a monopolist allocate production between plants?

Suppose the firm produces quantity Q_1 with cost $C_1(Q_1)$ for plant 1, and quantity Q_2 with cost $C_2(Q_2)$ for plant 2. The total quantity is

$$Q_T = Q_1 + Q_2.$$

And the profit is

$$\pi = Q_T P(Q_T) - C_1(Q_1) - C_2(Q_2) = (Q_1 + Q_2)P(Q_1 + Q_2) - C_1(Q_1) - C_2(Q_2).$$

To solve, use the first order constraint:

$$\frac{d\pi}{dQ_1} = P(Q_1 + Q_2) + (Q_1 + Q_2) \frac{dP(Q_1 + Q_2)}{dQ_1} - \frac{dC_1}{dQ_1} = 0,$$

Since

$$P(Q_T) + Q_T \frac{dP(Q_T)}{dQ_1} = P(Q_T) + Q_T \frac{dP(Q_T)}{dQ_T} = MR(Q_T),$$

$$MR(Q_T) = MC_1(Q_1).$$

Similarly,

$$MR(Q_T) = MC_2(Q_2).$$

Thus,

$$MR(Q_T) = MC_1(Q_1) = MC_2(Q_2).$$

3 Price Regulation

In perfectly competitive markets, price regulation causes deadweight loss, but in monopoly, price regulation might improve efficiency. Now we discuss four possible price regulations in monopolistic markets. P_1, P_2, P_3, P_4 are:

- $P_1 \in (P_C, P_M);$

- $P_2 = P_C;$

- $P_3 \in (P_0, P_C);$

- $P_4 < P_0.$

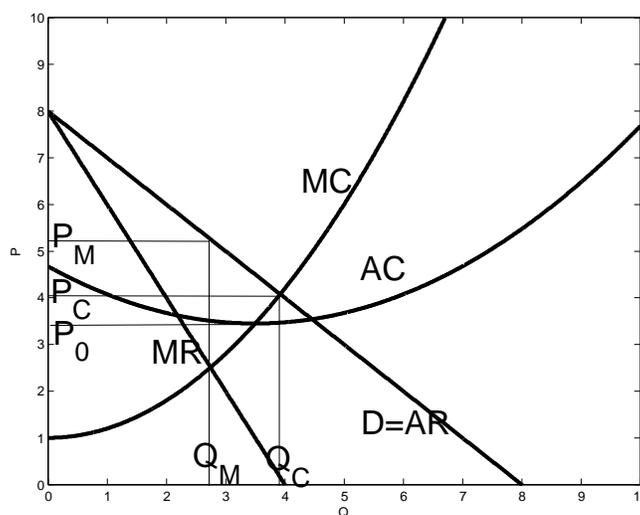


Figure 2: Comparing Competitive and Monopolist Market.

Price between the competitive market price and monopolist market price.

Suppose the price ceiling is P_1 . The new corresponding AR and MR curves are shown in Figure 3. Given the new MR curve, the equilibrium quantity will be Q_1 .

$$Q_1 \in (Q_M, Q_C).$$

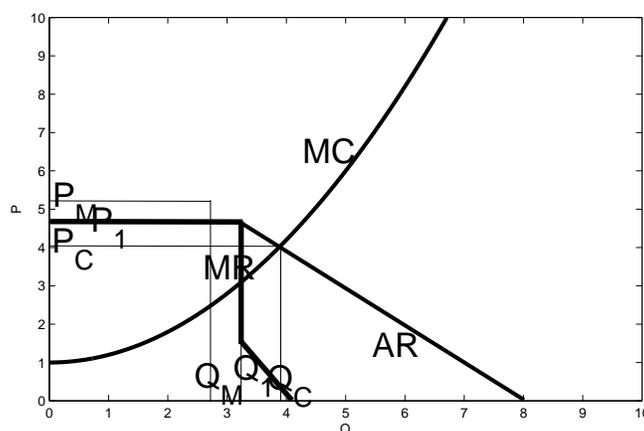


Figure 3: Price between the Competitive Market Price and Monopolist Market Price.

Price equal to the competitive market price. The new corresponding MR and AR curves are shown in Figure 4. In this case the equilibrium price and quantity are as same as those of the competitive market.

Price between the competitive market price and the lowest average cost. Suppose the price ceiling is P_3 . The new corresponding MR and AR curves are shown in Figure 5. The equilibrium quantity will be Q_3 .

$$Q_3 \in (Q_C, Q_0).$$

The new bold line describes the relation between price and quantity.

Price lower than the lowest average cost. The firm's revenue is not enough for the cost, thus it will quit the market. There is no production.

The analysis shows that if the government sets the price ceiling equal to P_2 , the outcome is the same as in a competitive market, and there is no deadweight loss.

Natural monopoly. In a natural monopoly, a firm can produce the entire output of the industry and the cost is lower than what it would be if there were other firms. Natural monopoly arises when there are large economies of scale (see Figure 6). If the market is unregulated, the price will be P_M and the quantity will be Q_M . To improve efficiency, the government can regulate the price. If the price is regulated to be P_C , the firm cannot cover the average cost and will go out of business. P_R is the lowest price that the government can set so that the monopolist will stay in the market.

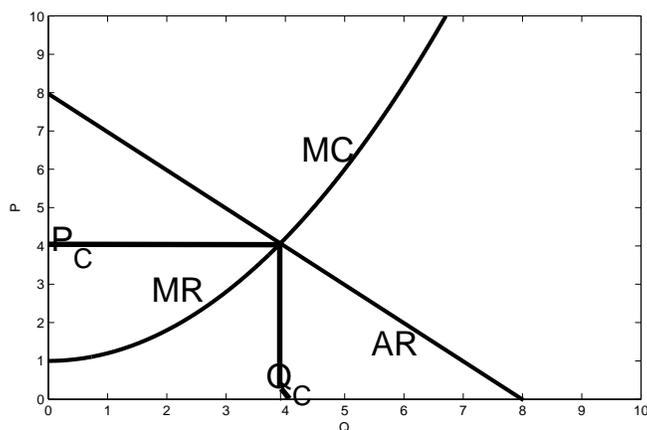


Figure 4: Price Equal to the Competitive Market Price.

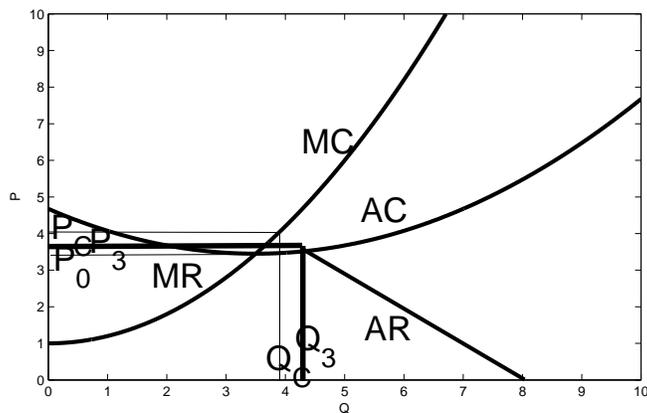


Figure 5: Price between the Competitive Market Price and the lowest Average Cost.

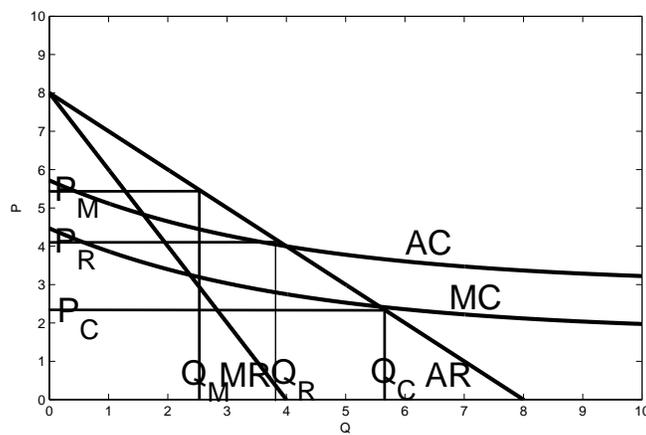


Figure 6: Regulating the Price of a Natural Monopoly.

4 Monopsony

Monopsony refers to a market with only one buyer. In this market, the buyer will maximize its profit, which is the difference of value and expenditure:

$$\max \Pi(Q) = V(Q) - E(Q).$$

When the profit is maximized,

$$\frac{d}{dQ}(V(Q) - E(Q)) = 0.$$

Thus

$$MV = ME,$$

namely, the marginal value (additional benefit from buying one more unit of goods) is equal to the marginal expenditure (additional cost of buying one more unit of goods).