Chapter 3

Welfare Economics

Contents:

General Analysis Overview

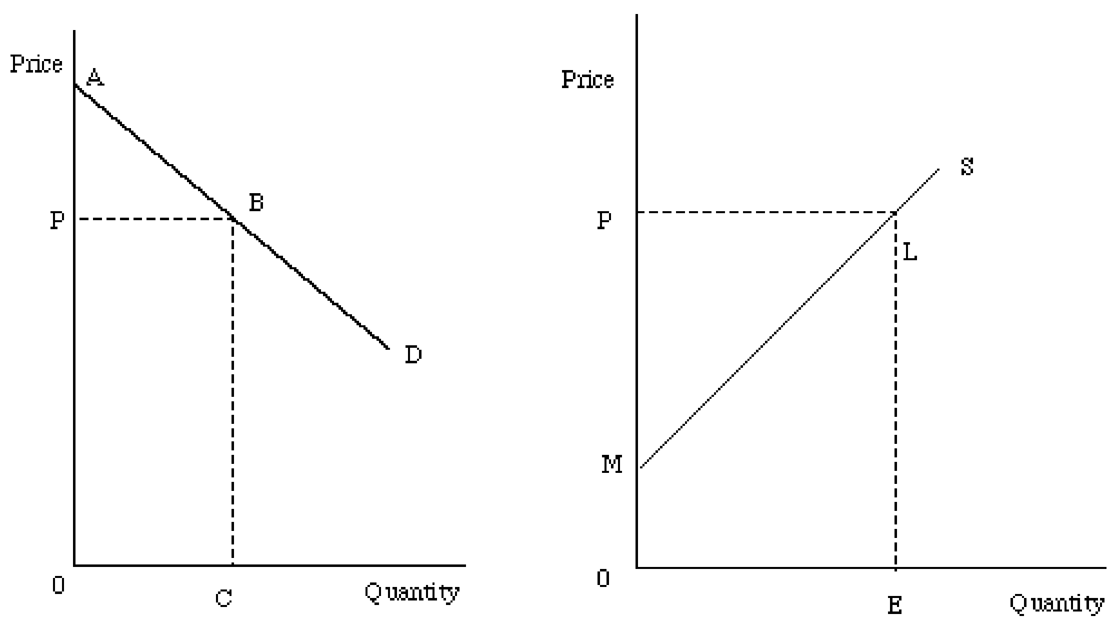
Welfare analysis is a systematic method of evaluating the economic implications of alternative allocations. Welfare analysis answers the following questions:

1. Is a given resource allocation efficient?
2. Who gains and who loses under various resource allocations? By how much?

Welfare economics: A methodological approach to assess resource allocations and establish criteria for government intervention.

Partial analysis: Evaluates outcomes in a subset of markets assuming efficiency in others.

Figure 3.1

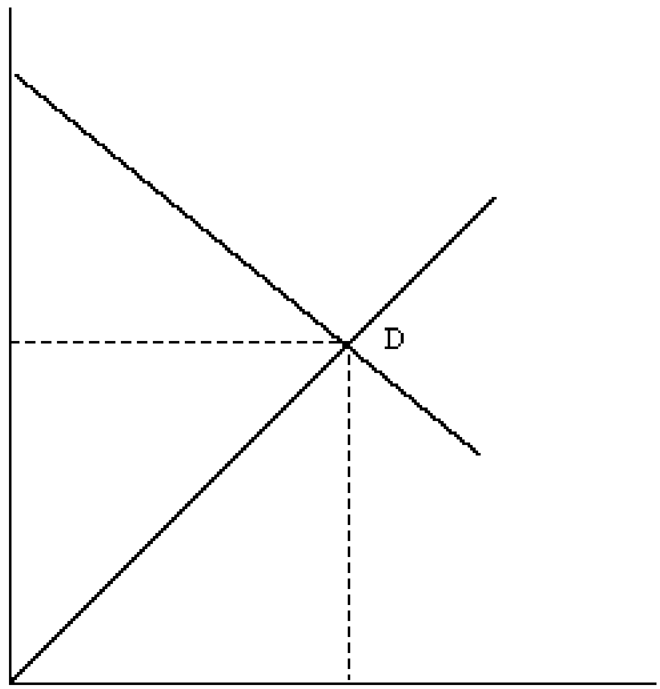


D = demand curve
Area under demand curve *ABC*0 = gross benefits from consumption.
ABP = consumer surplus area between demand and price.

S = supply curve
Area under supply curve 0*ELM* = cost of production.
PLM – area between price and supply = producer surplus.

When there are no externalities, an efficient outcome occurs where the sum of consumers' and producers' surplus is maximized.

Figure 3.2



- Area under demand = gross benefits
- Area under supply = gross cost
- Social surplus = gross benefit – cost
- A competitive equilibrium is efficient. It maximizes sum of consumer and producers surplus.

Welfare Under Monopoly

A monopoly is the only seller in a market. The basic condition for a monopoly is below:

$$\underset{Q}{\text{Maximizes}}\ P(Q)\,Q - C(Q)$$

$P(Q)$ = Inverse demand: price as a function of quantity
$C(Q)$ = quantity.

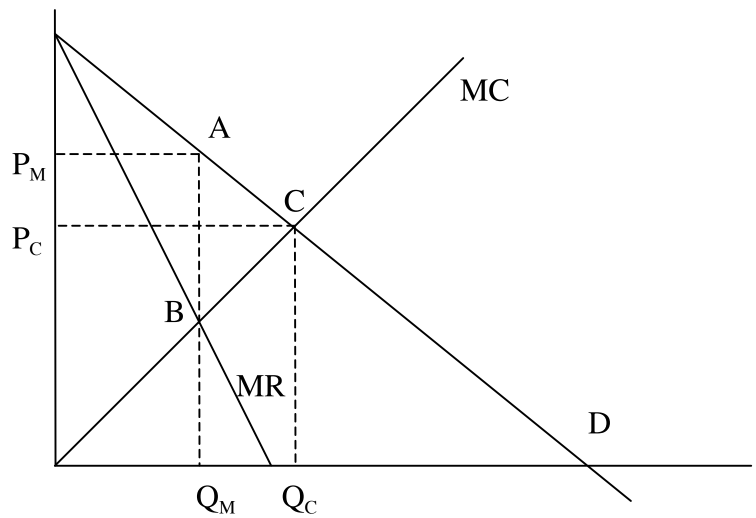
Optimality occurs where:

$$P + Q\frac{\partial P}{\partial Q} - \frac{\partial C}{\partial Q} = 0$$

$$MR(Q) - MQ(Q) = 0$$

MR = marginal revenue MC = marginal cost.

Figure 3.3



Q_C = quantity under competition

P_c = price under competition

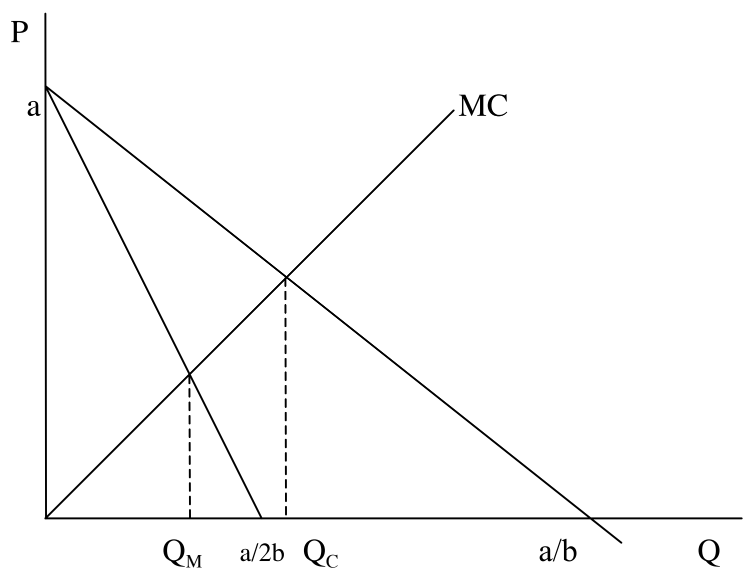
P_M = price under monopoly

Q_M = quantity under monopoly.

A monopoly produces too little and charges too much. Welfare loss under monopoly is ΔABC.

Figure 3.4

Linear Example of Monopoly



inverse demand = P(Q) = a - bQ
revenue = (a - bQ)Q = aQ-bQ^2
supply = c + dQ
competitive outcome = a - bQ = c + dQ

$$Q_c = \frac{a-c}{b+d}$$

$$P_c = a - \frac{ba-bc}{b+d}$$

$$P_c = \frac{ad+bc}{b+d}.$$

Under monopoly,

$$a - 2bQ = c + dQ$$

$$Q_M = \frac{a-c}{2b+d}$$

$$P_M = a - \frac{b(a-c)}{2b+d} = \frac{a(b+d)+bc}{2b+d}$$

demand = $10 - Q$
supply = $1 + Q$

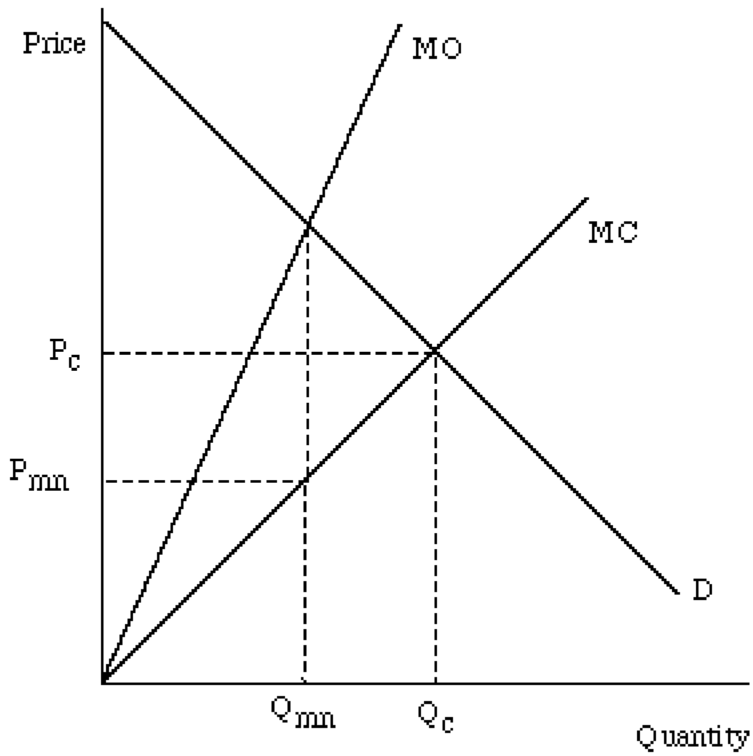
$$Q_C = \frac{10-1}{2} = 4.5 \qquad P_C = \frac{10+1}{2} = 5.5$$

$$Q_M = \frac{9}{3} = 3 \qquad P_M = 7$$

Welfare under Monopsony

A monopsony is the only buyer in a market.

Figure 3.5



$$\underset{Q}{\text{Maximize}} \quad B(Q) - QMC(Q)$$

$B(Q) = \int_0^Q P(z)dz$ = area under demand. The optimality condition is:

$$\frac{\partial B}{\partial Q} = Q\frac{\partial MC}{\partial Q} + MC(Q)$$

P_{mn} = price paid by monopsonist
Q_{mn} = quantity produced by monopsonist
$MC(Q)$ = marginal cost of producers.

Price paid by monopsony

$$MO = \text{marginal outlay} = MC(Q) + \frac{\partial MC}{\partial Q}Q.$$

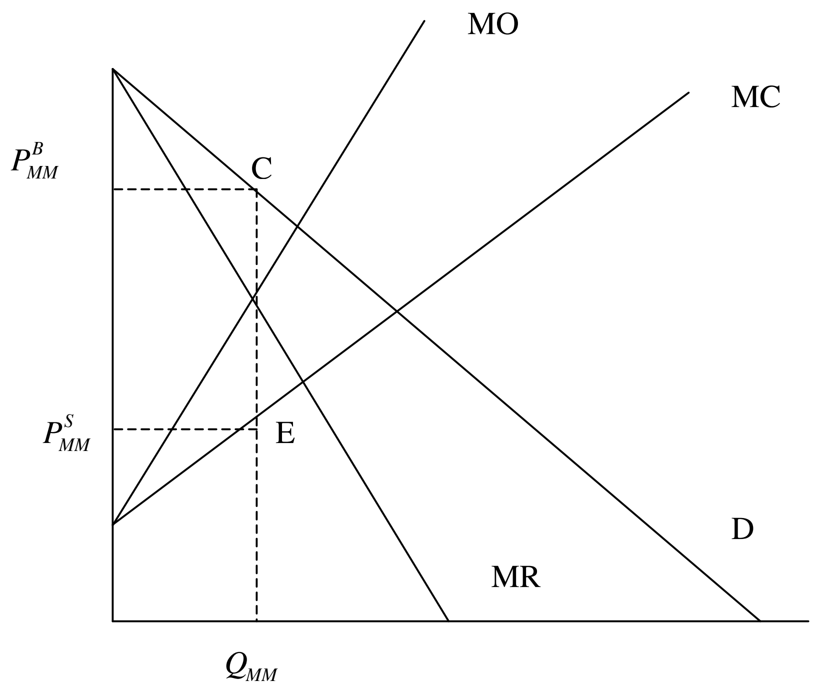
=> **Monopsonist:** Under buys and underpays.

Monopolist: Under sells and overprices.

Welfare under Middlemen

A middleman is the only buyer and seller of product.

Figure 3.6



Q_{MM} = middlemen output

P^S_{MM} = price paid by middlemen to suppliers

P^B_{MM} = price paid to middlemen by buyers

$P^B_{MM}\ CE\ P^S_{MM}$ = middlemen profit

The middleman produces where MO=MR.