

## Chapter #3: Welfare Economics

<b><u>Contents:</u></b>	<b>General Analysis Overview</b>	<b>Welfare under Monopsony</b>
	<b>Welfare under Monopoly</b>	<b>Welfare under Middlemen</b>

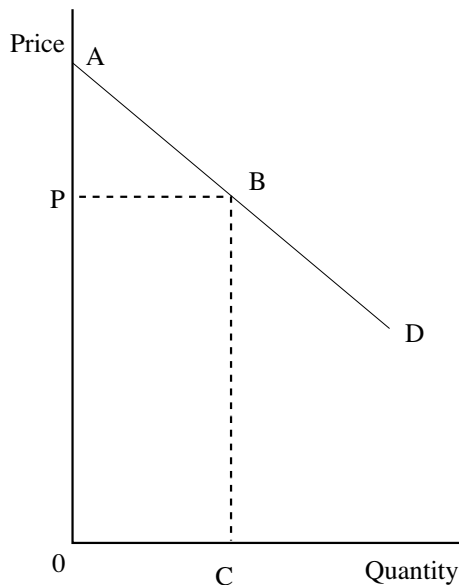
### General Analysis Overview

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

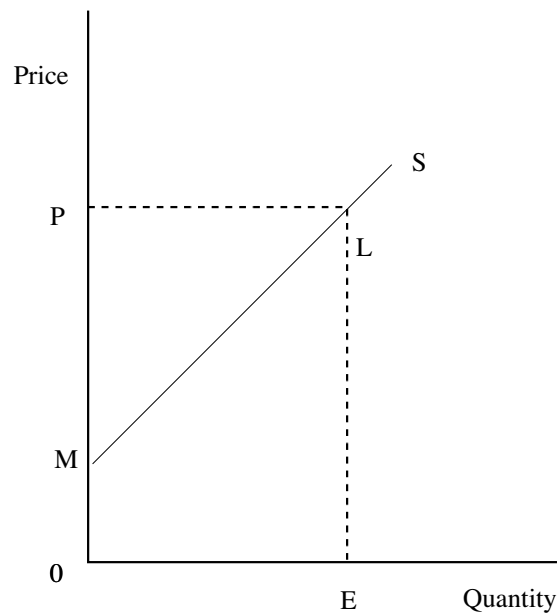
1. Is a given resource allocation efficient?
2. Who gains and who loses under various resource allocations? By how much?

*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.

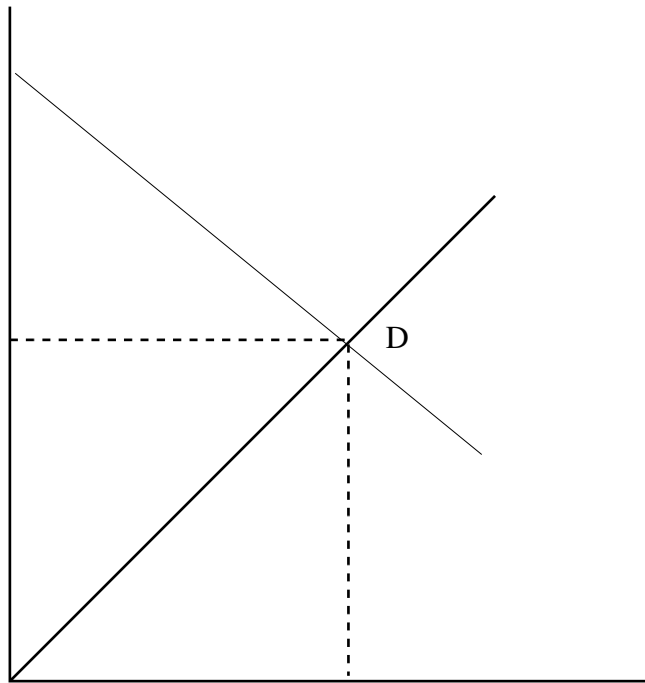


$D$  = demand curve  
 Area under demand curve  $ABC0$  = gross benefits from consumption.  
 $ABP$  = consumer surplus area between demand and price.



$S$  = supply curve  
 Area under supply curve  $0ELM$  = 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.



- 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:

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

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

$C(Q)$  = quantity.

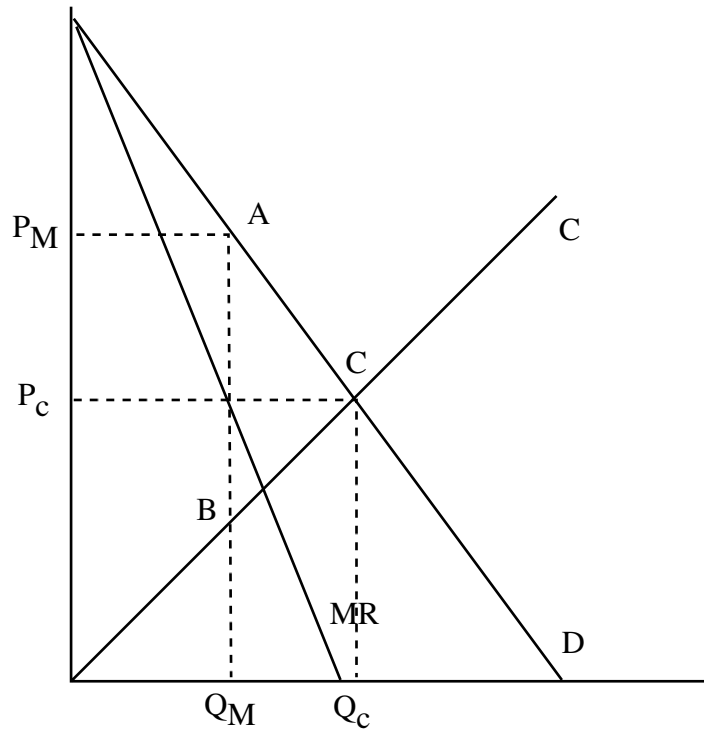
Optimality occurs where:

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

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

$MR$  = marginal revenue

$MC$  = marginal cost.



$Q_C$  = quantity under competition

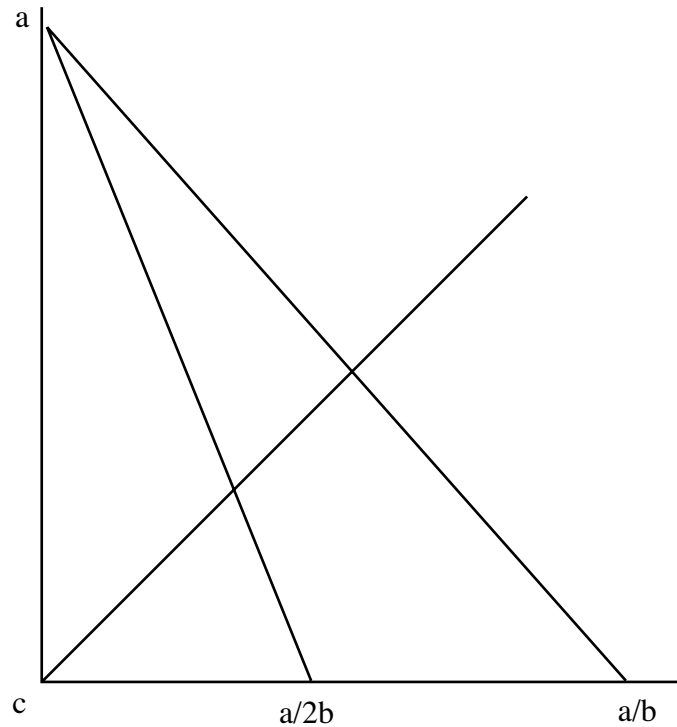
$P_C$  = price under competition

$P_M$  = price under monopoly

$Q_M$  = quantity under monopoly.

A monopoly produces too little and charges too much. Welfare loss under monopoly is  $\Delta ABC$ .

### *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,

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

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

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

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

$$\text{demand} = 10 - Q$$

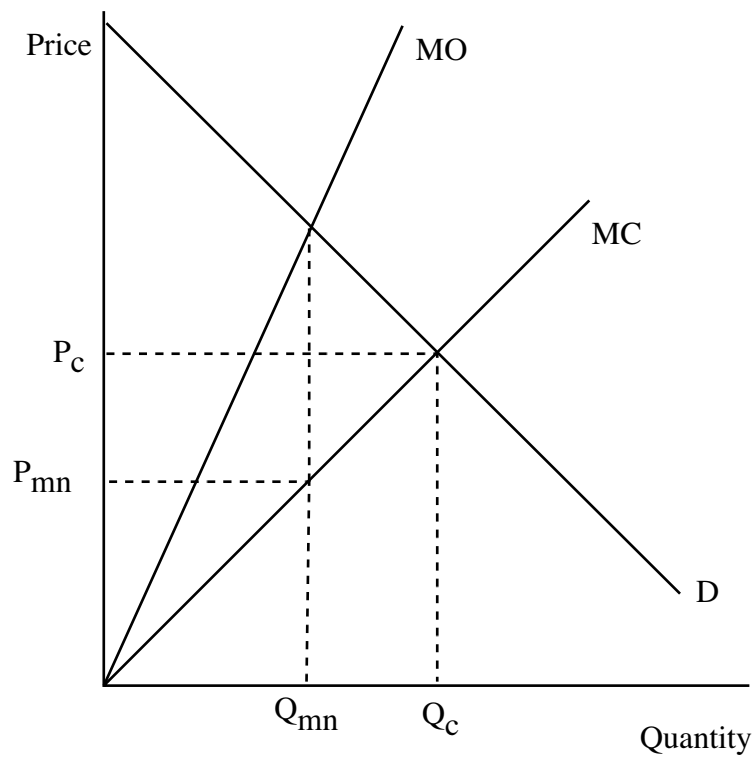
$$\text{supply} = 1 + Q$$

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

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

### Welfare under Monopsony

A monopsony is the only buyer in a market.



Maximize  $B(Q) - QMC(Q)$

$B(Q) = \int_0^Q P(z) dz = \text{area under demand}$ . 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

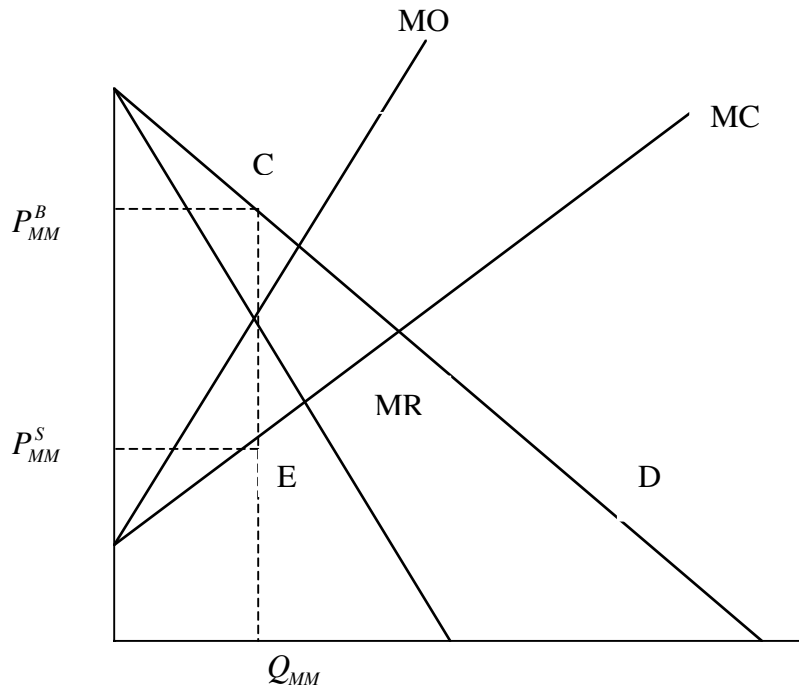
$$MO = \text{marginal outlay} = MC(Q) + \frac{\partial MC}{\partial Q} Q.$$

=> **Monopsonist:** Underbuys and underpays.

**Monopolist:** Underbuys and oversells.

## Welfare under Middlemen

A middleman is the only buyer and seller of product.



$Q_{MM}$  = middlemen output

$P_{MM}^S$  = price paid by middlemen to suppliers

$P_{MM}^B$  = price paid to middlemen by buyers

$P_{MM}^B - P_{MM}^S$  = middlemen profit

