Welfare Economics


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

\[ D = \text{demand curve} \]

Area under demand curve \( ABC0 \) = gross benefits from consumption.

\[ S = \text{supply curve} \]

Area under supply curve \( 0ELM \) = cost of production.

\[ ABD = \text{consumer surplus} \] area between demand and price.

\[ PLM = \text{producer surplus} \] area between price and supply.
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.
**Monopoly**: Only seller in a market.

Maximizes $P(Q) Q - C(Q)$

$P(Q) = \text{Inverse demand: price as a function of quantity}$

$C(Q) = \text{quantity}$.

Optimality occurs where

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

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

$MR = \text{marginal revenue}$

$MC = \text{marginal cost}$.
$Q_c$ = 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 $\Delta ABC$. 
inverse demand $P(Q) = a - bQ$

revenue $= (a - bQ)Q = aQ - bQ^2$

supply = marginal cost $= c + dQ$

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

\[ Q_c = \frac{10 - 1}{2} = 4.5 \quad P_c = \frac{10 + 1}{2} = 5.5 \]

\[ Q_M = \frac{9}{3} = 3 \quad P_M = 7 \]

**Monopsony:** 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
\[ MO = \text{marginal outlay} = MC(Q) + \frac{\partial MC}{\partial Q}. \]

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

**Monopolist**: Underbuys and oversells.
Middlemen: Only buyer and seller of product.

\[ Q_{MM} = \text{middlemen output} \]

\[ P_{MM}^S = \text{price paid by middlemen to suppliers} \]

\[ P_{MM}^B = \text{price paid to middlemen by buyers} \]

\[ P_{MM}^B \times Q_{MM} = \text{middlemen profit} \]