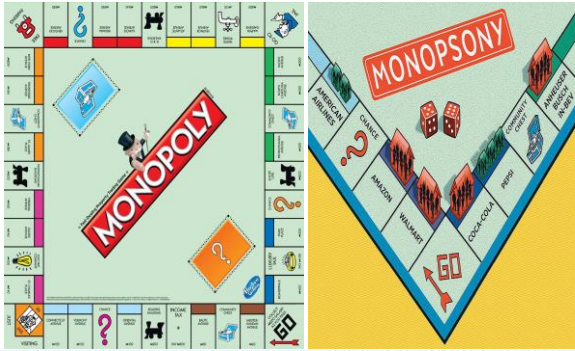


CHAPTER 11 LECTURE – MONOPOLY AND MONOPSONY

CHAPTER 11 LECTURE – MONOPOLY AND MONOPSONY



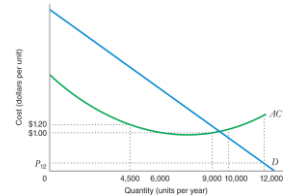
MONOPOLY

- **Monopoly:** a market structure in which a single seller of a product with no close substitutes serves the entire market.
- A monopoly has significant control over the price it charges.

Five Sources Of Monopoly

1. **Exclusive Control over Important Inputs**
2. **Economies of Scale**
3. **Patents**
4. **Network Economies**
5. **Government Licenses or Franchises**

Natural Monopoly



Give examples

11-2

1

2

PROFIT MAXIMIZATION AND REVENUE OR THE MONOPOLIST

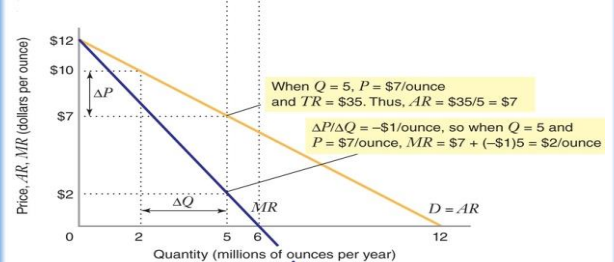
- The monopolist's goal is to maximize economic profit.
 - In the short run this means to choose the level of output for which the difference between total revenue and short-run total cost is greatest.
- As price falls, total revenue for the monopolist does not rise linearly with output.
 - Instead, it reaches a maximum value at the quantity corresponding to the midpoint of the demand curve after which it again begins to fall.
 - Total revenue reaches its maximum value when the price elasticity of demand is unity.

11-3

3

THE DEMAND CURVE AND CORRESPONDING MARGINAL REVENUE CURVE

$$P = a - bQ \text{ then } TR = aQ - bQ^2 \quad MR = \frac{dTR}{dQ} = a - 2bQ$$



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PROFIT MAXIMIZATION

The goal of the firm is to find the level of output (Q) which maximizes profit (π)

$$\text{Max } \pi(Q) = PQ - TC(Q)$$

F.O.C. $\pi = TR - TC$ $\frac{d\pi}{dQ} = P + Q \frac{dP}{dQ} - \frac{dTC}{dQ} = 0$ $MR - MC = 0$
 or $MR = MC$

S.O.C. $\frac{d^2\pi}{dQ^2} = \frac{dMR}{dQ} - \frac{dMC}{dQ} < 0$

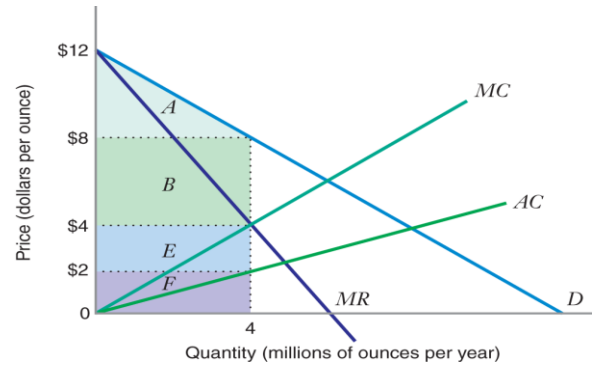
If $\frac{dMC}{dQ} > 0$ and $\frac{dMR}{dQ} < 0$ suff.

If $\frac{dMC}{dQ} < 0$, $\left| \frac{dMR}{dQ} \right|$ must be $> \left| \frac{dMC}{dQ} \right|$

11-5

5

THE PROFIT-MAXIMIZING PRICE AND QUANTITY FOR A MONOPOLIST



11-6

6

CALCULATING MONOPOLY OUTPUT

- Suppose that the market for cell phones has a linear demand curve of the form

$$Q = 2,000 - 20P$$

or $P = 100 - \frac{1}{20}Q$

- The total costs of the cell phone producer are given by

$$TC = C(Q) = 0.05Q^2 + 10,000$$

11-7

7

CALCULATING MONOPOLY OUTPUT

- To maximize profits, the monopolist chooses the output for which $MR = MC$

- We need to find total revenue

$$TR = P * Q = 100Q - \frac{Q^2}{20}$$

- Therefore, marginal revenue is

$$MR = \frac{dTR}{dQ} = 100 - \frac{Q}{10}$$

- while marginal cost is

$$MC = \frac{dTC}{dQ} = 0.1Q$$

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CHAPTER 11 LECTURE – MONOPOLY AND MONOPSONY

CALCULATING MONOPOLY OUTPUT

- Thus, $MR = MC$ where

$$100 - \frac{Q}{10} = 0.1Q$$

$$Q^* = 500 \quad P^* = 75$$

- At the profit-maximizing output,

$$TC = C(Q) = (0.05)(500)^2 + 10,000 = 22,500$$

$$AC = \frac{TC}{Q} = \frac{22,500}{500} = 45$$

$$\pi = (P - AC)Q = (75 - 45)500 = 15,000$$

11-9

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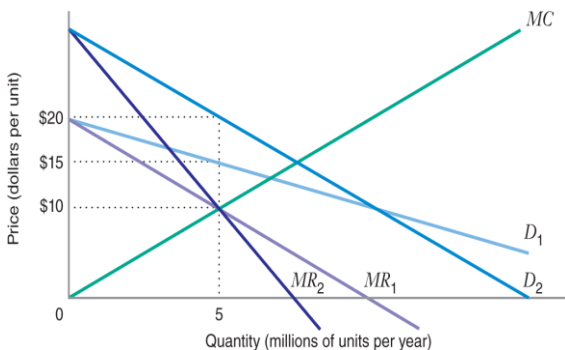
A MONOPOLIST HAS NO SUPPLY CURVE

- The monopolist is a price maker.
 - When demand shifts rightward elasticity at a given price may either increase or decrease, and vice-versa.
 - So there can be no unique correspondence between the price a monopolist charges and the amount she chooses to produce.
- Monopoly has a *supply rule*, which is to equate marginal revenue and marginal cost.

11-10

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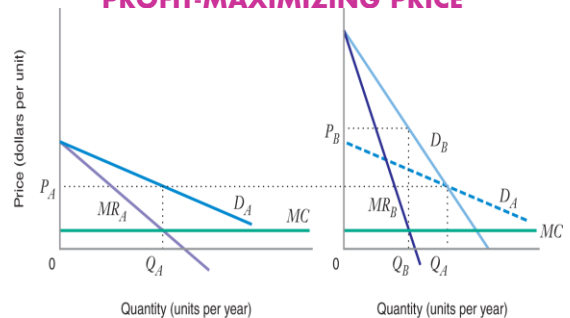
A MONOPOLIST DOES NOT HAVE A SUPPLY CURVE



11-11

11

PRICE ELASTICITY OF DEMAND AND THE PROFIT-MAXIMIZING PRICE



(a) Market A

(b) Market B

In market A, the profit-maximizing price is P_A . In market B, where demand is less price elastic at the price P_A , the profit-maximizing monopoly price is P_B . The difference between the profit-maximizing price and the marginal cost MC is smaller when demand is more price elastic. 11-12

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CHAPTER 11 LECTURE – MONOPOLY AND MONOPSONY

THE PROFIT-MAXIMIZING MONOPOLIST

- If a monopolist's goal is to maximize profits, she will never produce an output level on the inelastic portion of her demand curve.
- The profit-maximizing level of output must lie on the elastic portion of the demand curve.
- *Shutdown condition for a monopolist:* he or she should cease production whenever average revenue is less than average variable cost at every level of output.

11-13

13

MARGINAL COST AND PRICE ELASTICITY OF DEMAND: THE INVERSE ELASTICITY PRICING RULE

We define marginal revenue as:

$$MR = \frac{dTR}{dQ} = P \left(1 + \frac{1}{E_{Q,P}} \right)$$

Monopolist maximizes profit by producing where $MR=MC$ or:

$$MC = P \left(1 + \frac{1}{E_{Q,P}} \right)$$

Rearranging yields:

$$\frac{P - MC}{P} = - \frac{1}{E_{Q,P}}$$

11-14

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MARGINAL COST AND PRICE ELASTICITY OF DEMAND: THE INVERSE ELASTICITY PRICING RULE

$$\frac{P - MC}{P} = - \frac{1}{E_{Q,P}}$$

- The left-hand side of equation is the monopolist's optimal markup of price over marginal cost, expressed as a percentage of the price.
- The right-hand side is the negative of the inverse of the price elasticity of demand.
- For this reason, equation is called the **inverse elasticity pricing rule (IEPR)**.
- The **IEPR** states that the difference between the profit-maximizing price, and marginal cost, expressed as a percentage of price, is equal to minus the inverse of the price elasticity of demand.
- The more price elastic the monopolist's demand, the smaller will be the optimal markup. **inverse elasticity pricing rule (IEPR)**

11-15

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SAMPLE PROBLEM

Assume that a monopolist sells a product with a total cost function $TC = 1,200 + 0.5Q^2$ and a corresponding marginal cost function $MC = Q$. The market demand curve is given by the equation $P = 300 - Q$.

a) Find the profit-maximizing output and price for this monopolist. Is the monopolist profitable?

If demand is given by $P=300-Q$, then $TR = 300Q - Q^2$. Thus, $MR=300-2Q$. To find the optimum output set $MR=MC$.

$$300 - 2Q = Q \quad \text{or} \quad Q = 100.$$

At $Q=100$ price will be $P=300-100=200$. At this price and quantity total revenue will be $TR=200(100)=20,000$ and total cost will be $TC=1200+.5(100)^2=6,200$. Therefore, the firm will earn a profit of $\pi=TR-TC=13,800$.

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CHAPTER 11 LECTURE – MONOPOLY AND MONOPSONY

SAMPLE PROBLEM CONTINUED

- b) Calculate the price elasticity of demand at the monopolist's profit-maximizing price. Also calculate the marginal cost at the monopolist's profit-maximizing output. Verify that the IEPR holds.
 b) The price elasticity at the profit-maximizing price is

$$E_{Q,P} = \frac{dQ}{dP} \frac{P}{Q}$$

With the demand curve $Q=300-P$, $dQ/dP=-1$. Therefore, at the profit-maximizing price and quantity.

$$E_{Q,P} = -1 \frac{200}{100} = -2$$

The marginal cost at the profit-maximizing output is $MC = Q = 100$. The inverse elasticity pricing rule states that at the profit-maximizing price is

$$\frac{P - MC}{P} = -\frac{1}{E_{Q,P}}$$

In this case we have

$$\frac{200 - 100}{200} = -\frac{1}{-2} \text{ or } \frac{1}{2} = \frac{1}{2}$$

IEPR HOLDS

11-17

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QUANTIFYING MARKET POWER: THE LERNER INDEX

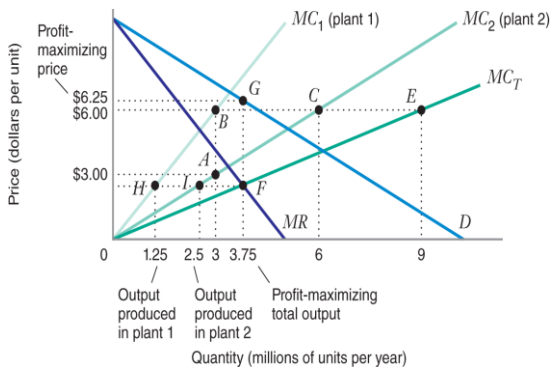
- When a firm faces a downward-sloping demand curve, either because it is a monopolist or it produces a differentiated product, the firm will have some control over the market price it sets.
- For a monopoly, the ability to set the market price is constrained by competition from substitute products.
- In the case of differentiated products, a firm's direct competitors constrain its pricing freedom.
- When a firm can exercise some degree of control over its price in the market, we say that it has market power.
- Thus, monopolists or producers of differentiated products will, in general, charge prices that exceed marginal cost.
- A natural measure of market power is the percentage markup of price over marginal cost, or the **LERNER INDEX**

$$\text{LERNER INDEX} = \frac{P - MC}{P}$$

11-18

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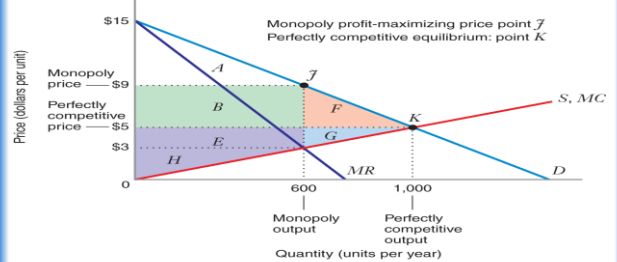
MONOPOLY WITH MULTIPLE PLANTS AND MARKETS



11-19

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THE WELFARE ECONOMICS OF MONOPOLY



	Perfect Competition	Monopoly	Impact of Monopoly
Consumer surplus	$A + B + F$	A	$-B - F$
Producer surplus	$E + G + H$	$B + E + H$	$B - G$
Net economic benefit	$A + B + E + F + G + H$	$A + B + E + H$	$-F - G$

11-20

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CHAPTER 11 LECTURE – MONOPOLY AND MONOPSONY

MONOPSONY

- A monopsony market is a market consisting of a single buyer that can purchase from many sellers.
- We call this single buyer a monopsonist.
- This single buyer can be a buyer of outputs or inputs

Examples of Monopsony Power

- Electricity generators can negotiate lower prices for coal and gas supply contracts
- Food retailers have power when purchasing supplies from farmers, milk producers, wine growers and other suppliers
- A car-rental firm seeking a contract to a manufacturer to supply new cars for their fleet
- Low-cost airlines getting a favourable price when purchasing a new fleet of aircraft
- British Sugar buys almost the entire sugar beet crop produced in the UK year
- Amazon's buying power in the retail book market
- The government is a major buyer e.g. in military procurement
- The National Health Service is another example of a dominant buyer of prescription drugs from the pharmaceutical companies.

11-21

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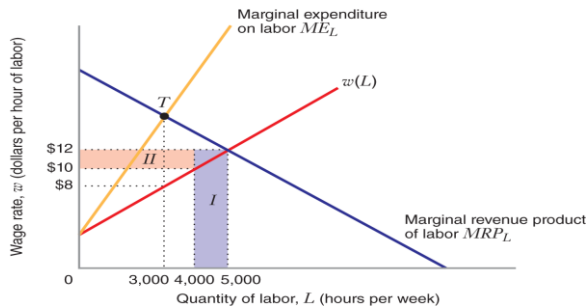
THE MONOPSONIST'S PROFIT-MAXIMIZATION CONDITION

- Let's imagine a firm whose production function depends on a single input L .
- The firm's total output is $Q = f(L)$.
- Imagine that this firm is a perfect competitor in the market and the market price P as given.
- The company's total revenue is thus $Pf(L)$.
- The marginal revenue product of labor—denoted by MRP_L —is the additional revenue that the firm gets when it employs an additional unit of labor.
- Since the firm is a price taker in its output market, and **Marginal Revenue Product** is the market price times the marginal product of labor: $MRP_L = P \times MP_L = P(\Delta Q/\Delta L)$.

11-22

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PROFIT MAXIMIZATION BY A MONOPSONIST

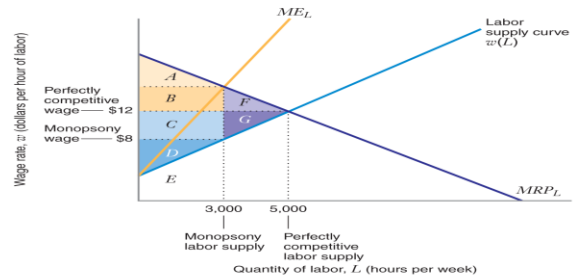


The monopsonist maximizes profit when its marginal revenue product of labor equals its marginal expenditure on labor, at the intersection of MRP_L and ME_L —by employing a quantity of labor $L = 3,000$ hours per week. To elicit this supply of labor, the firm must pay a wage rate $w = \$8$ per hour.

11-23

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MONOPSONY DEADWEIGHT LOSS



	Perfect Competition	Monopsony	Impact of Monopsony
Consumer surplus	$A + B + F$	$A + B + C$	$C - F$
Producer surplus	$C + D + G$	D	$-C - G$
Net economic benefit	$A + B + C + D + F + G$	$A + B + C + D$	$-F - G$

11-24

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