

Week 1

# Introduction to Economics

# Economics

## Definition

-refers to an area of study under social science. It deals with human behavioral attitudes and perceptions towards material resources

# Basic concepts economics

**Scarcity** - the available resources are insufficient to satisfy people's wants - is universal.

**Choice** - Because goods and services are scarce, choices must be made.

**Opportunity cost** - The opportunity cost of an action is the highest valued alternative forgone.

# Economic System

# Types of Economic Systems

- **Traditional Economy** – Traditions and rituals answer the basic questions. Answers are often based on cultural or religious practices and ideals that have been passed down for generations.
- **Market Economy** – In a pure market economy there is no government involvement in economic decisions.
- **Command Economy** – A system in which the government controls the factors of production and makes all decisions about their use.
- **Mixed Economies** – All economies in the world today (including the Free Enterprise System in the U.S.) are mixed with varying degrees of government regulation

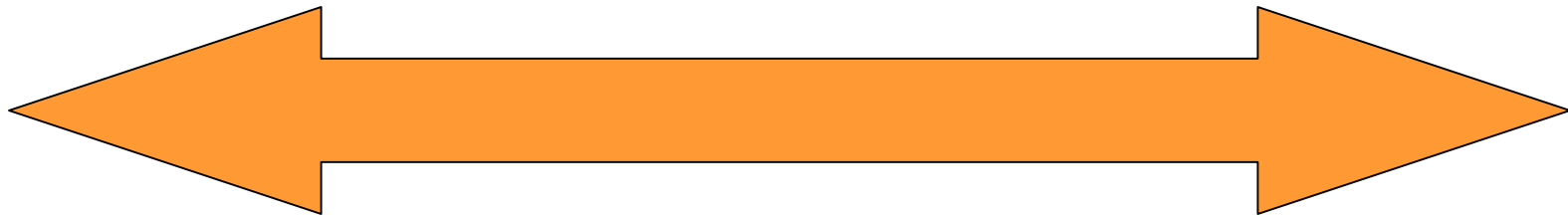
# Types of Mixed Economies

- **Capitalism** -- Characterized by private ownership of businesses and marketplace competition.
- **Socialism** – there is increased government involvement in people’s lives and the economy.
  - Tend to have more social services to ensure a certain standard of living for everyone
  - Government runs key industries and makes economic decisions
- **Communism** – Countries have a **totalitarian** form of government, which means that the government runs everything.
  - All who are able to work are assigned jobs
  - Housing and schooling are decided by the government

# Conclusion

Command Economy

Market Economy



Communism

Socialism

Capitalism

Week 2

Production, Distribution and  
Consumption

# Factors of Production

## Resources used in the production of goods and services

Four traditional factors of production:

1. Natural Resources
2. Labor
3. Capital
4. Entrepreneurs

Newer perspectives include:

5. Physical Resources
6. Information Resources

# Production possibilities Frontier

- The three basic concepts like scarcity, choices and opportunity cost can be further illustrated by a device called Production Possibility Frontier.
- Assumptions:
  - a) Two Products
  - b) Efficiency
  - c) Fixed Resources
  - d) Fixed Technology

A numerical example can be shown below:

Production Alternative	Rice (tonne)	Butter (tonne)
A	10	0
B	9	4
C	7	7
D	4	9
E	0	10

# Production Possibilities Frontier

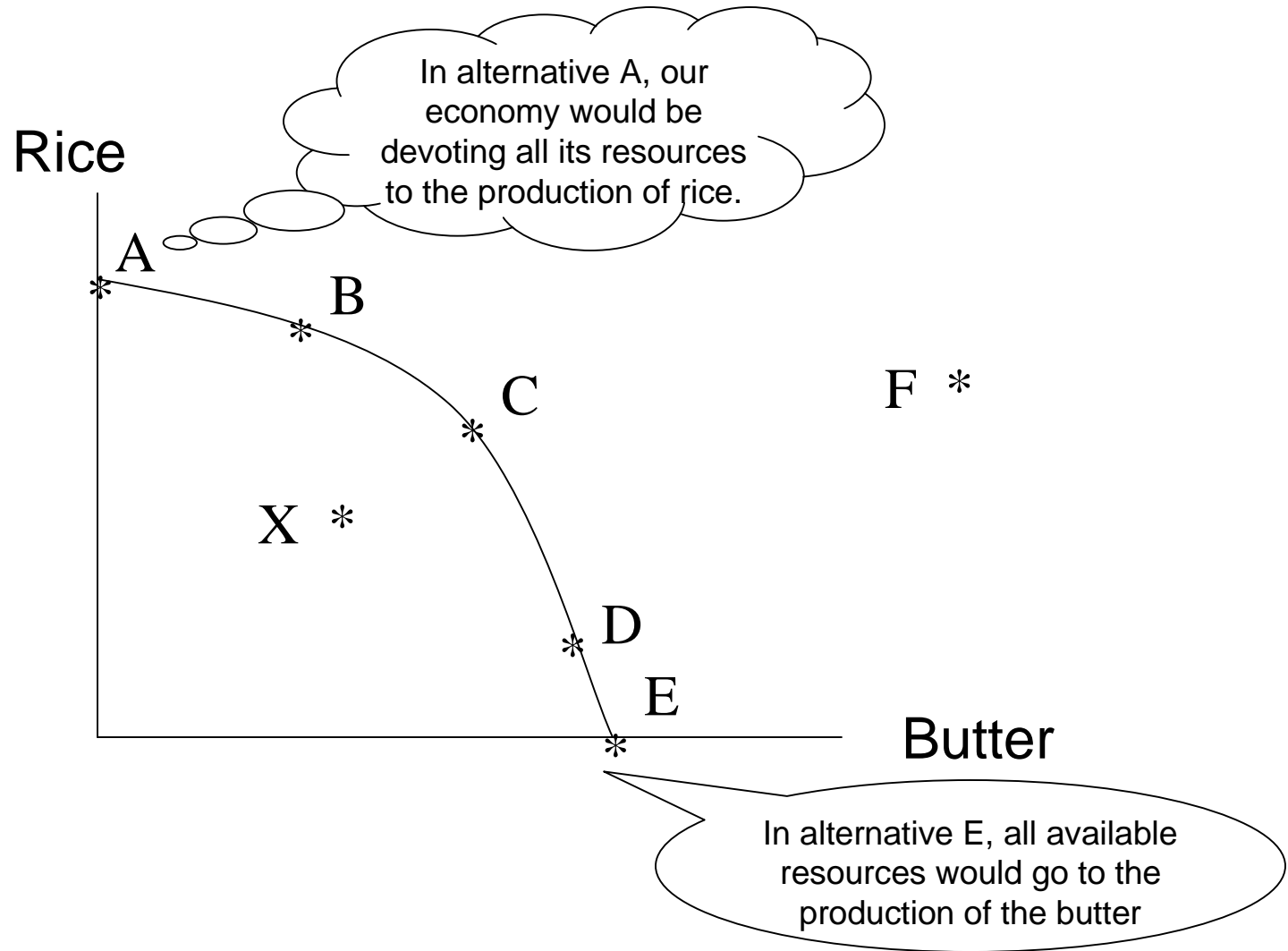


Figure 1

# Production Efficiency

- **Production efficiency** means that more of one good cannot be produced without decreasing the production of another good. Production efficiency occurs only when production takes place on the frontier line. Because another good must be given up, there is a **tradeoff**.
- If we are at a **point inside the PPF**, such as point X in Fig. 1, production is inefficient because there are unused or misallocated resources.
- Combination F, **point is outside the PPF** – Not Sufficient of resources to produce at point F.

# Fundamental Economic Problems

- What to produce
- How much to produce
- How to produce
- For whom to produce

Week 3

Theory of Demand and Supply

# Markets

- In a market economy, the price of a good is determined by the interaction of demand and supply

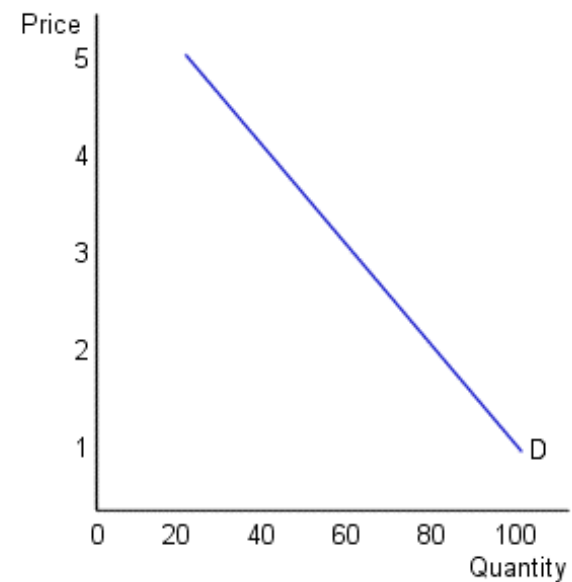
# Demand

- A relationship between price and quantity demanded in a given time period, *ceteris paribus*.

## Demand schedule

<u>Price</u>	<u>Quantity Demanded</u>
1	100
2	80
3	60
4	40
5	20

## Demand curve

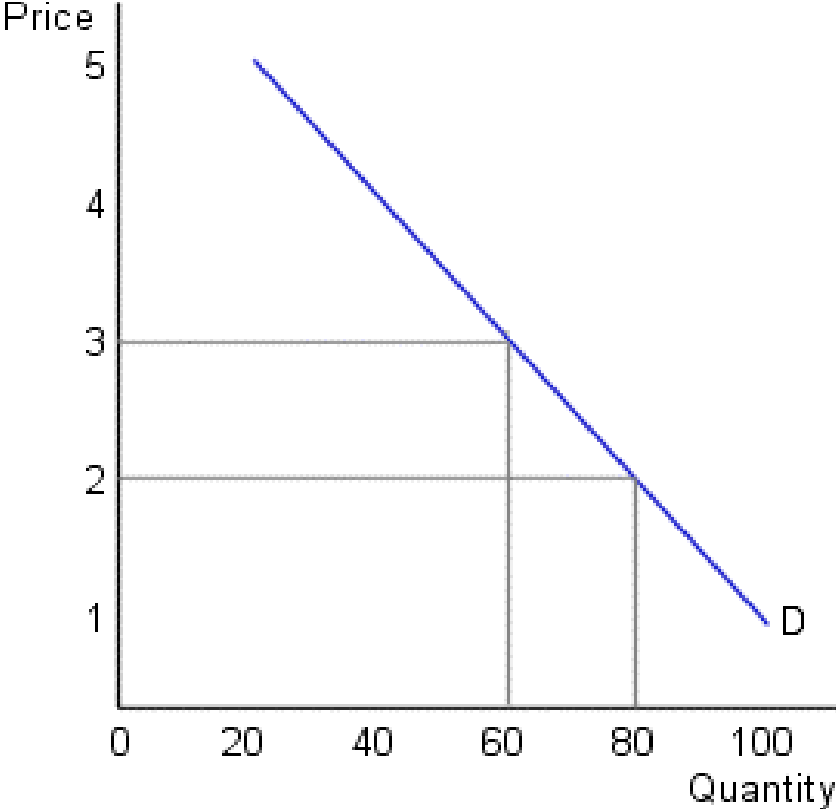


# Law of demand

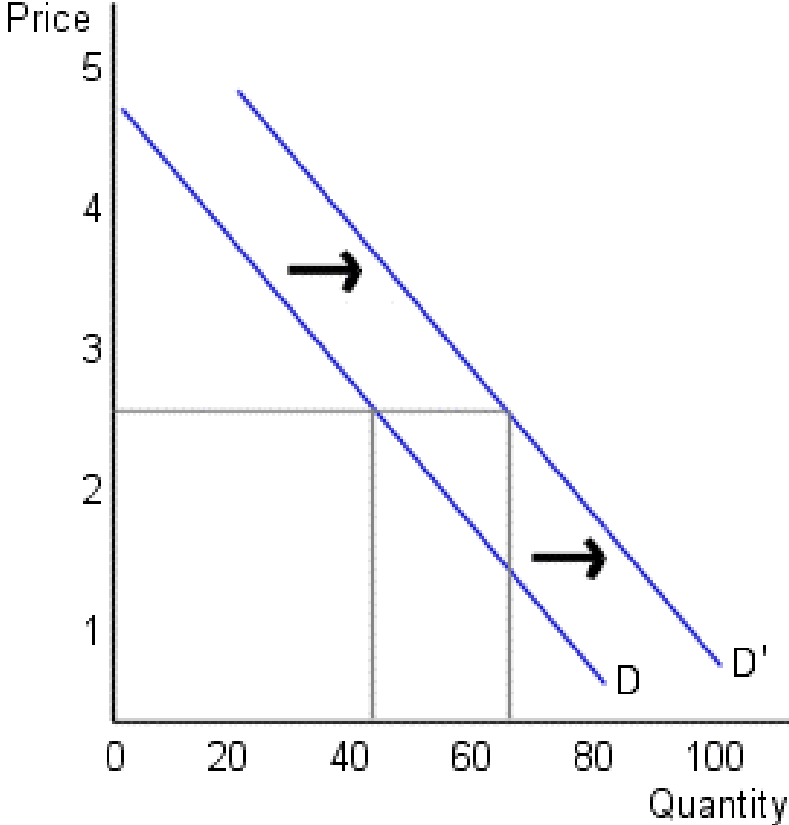
- An inverse relationship exists between the price of a good and the quantity demanded in a given time period, *ceteris paribus*.
- Reasons:
  - substitution effect
  - income effect

# Change in quantity demanded vs. change in demand

**Change in quantity demanded**

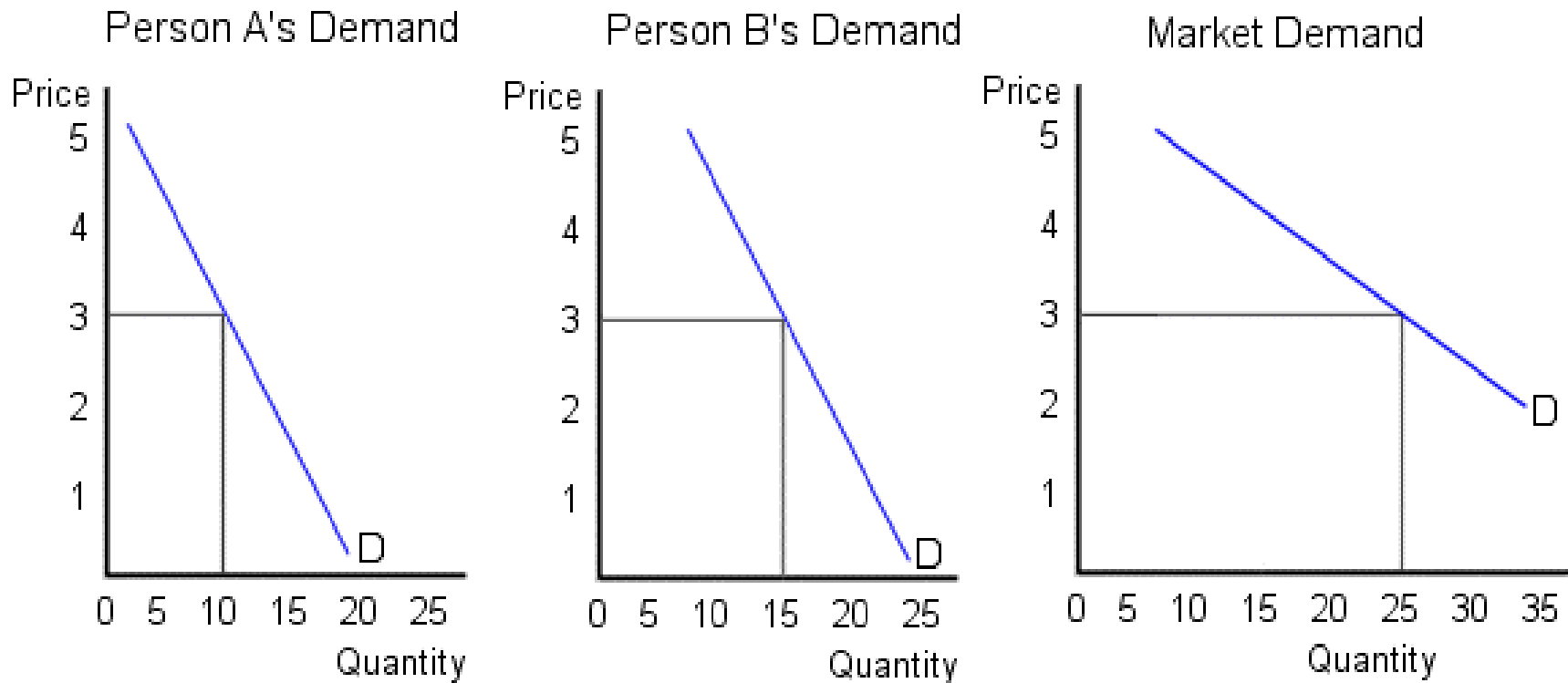


**Change in demand**



# Market demand curve

- Market demand is the horizontal summation of individual consumer demand curves

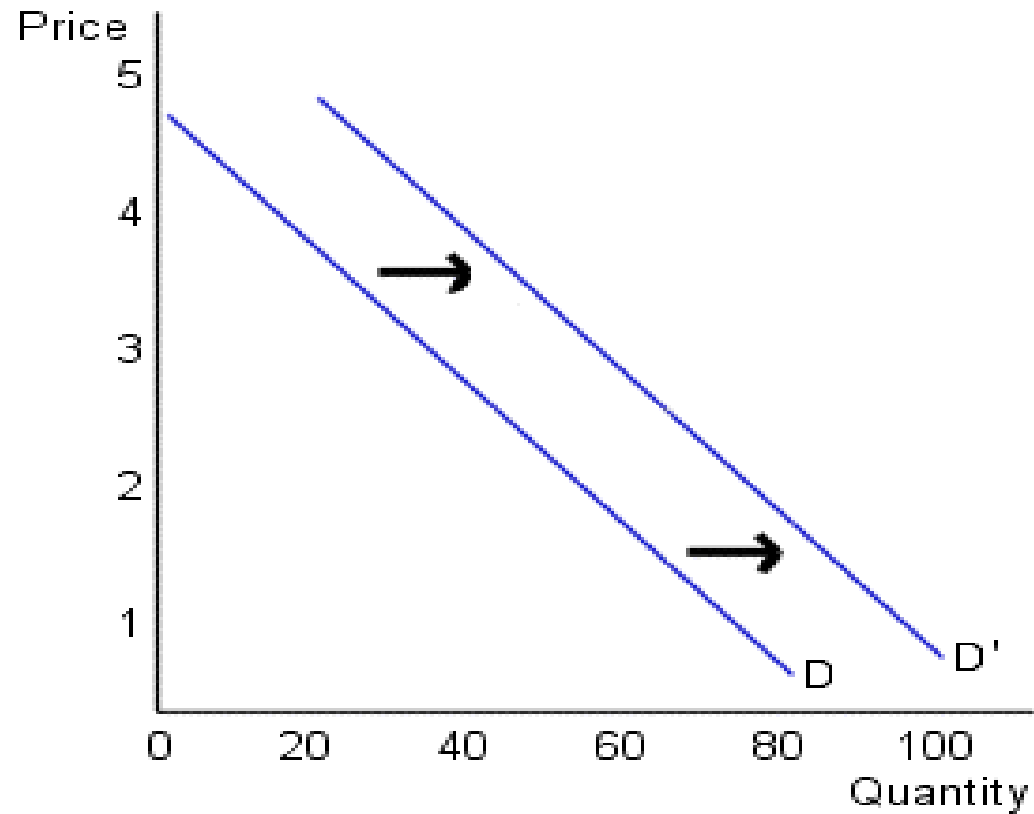


# Determinants of demand

- tastes and preferences
- prices of related goods and services
- income
- number of consumers
- expectations of future prices and income

# Tastes and preferences

- Effect of fads:

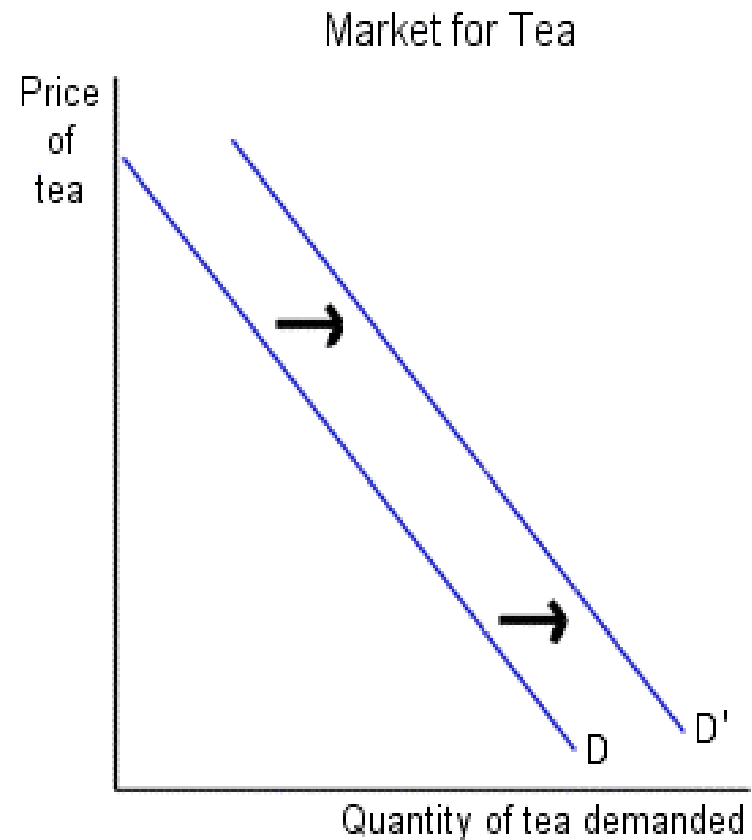
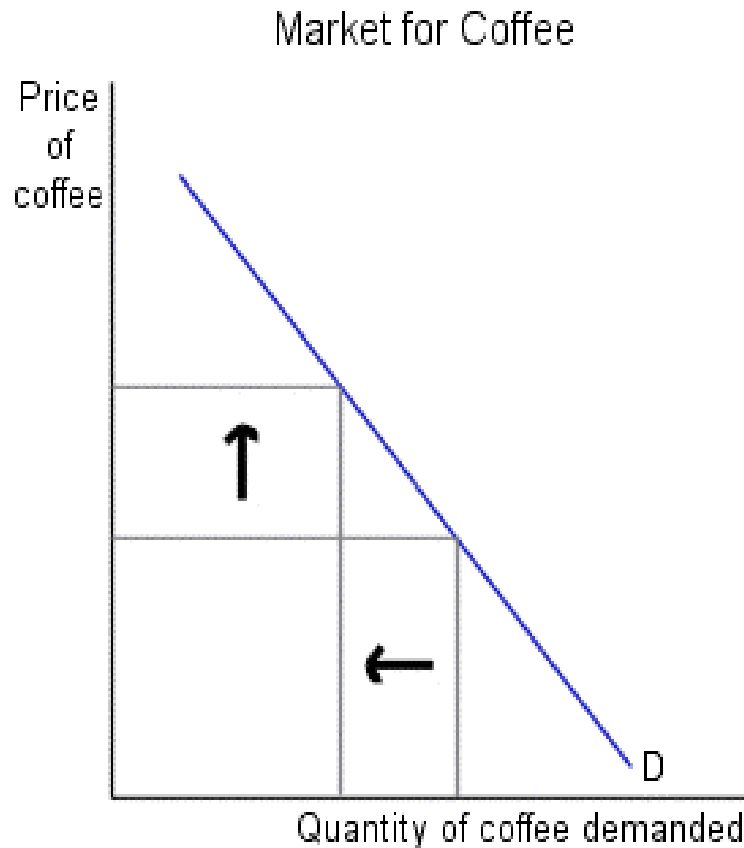


# Prices of related goods

- substitute goods – an increase in the price of one results in an increase in the demand for the other.
- complementary goods – an increase in the price of one results in a decrease in the demand for the other.

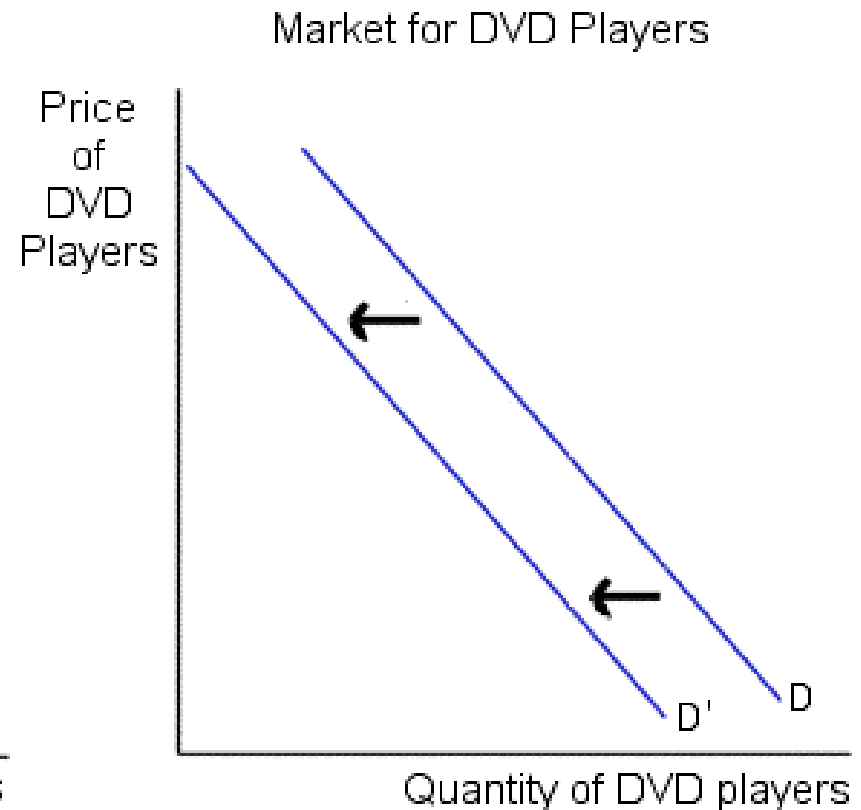
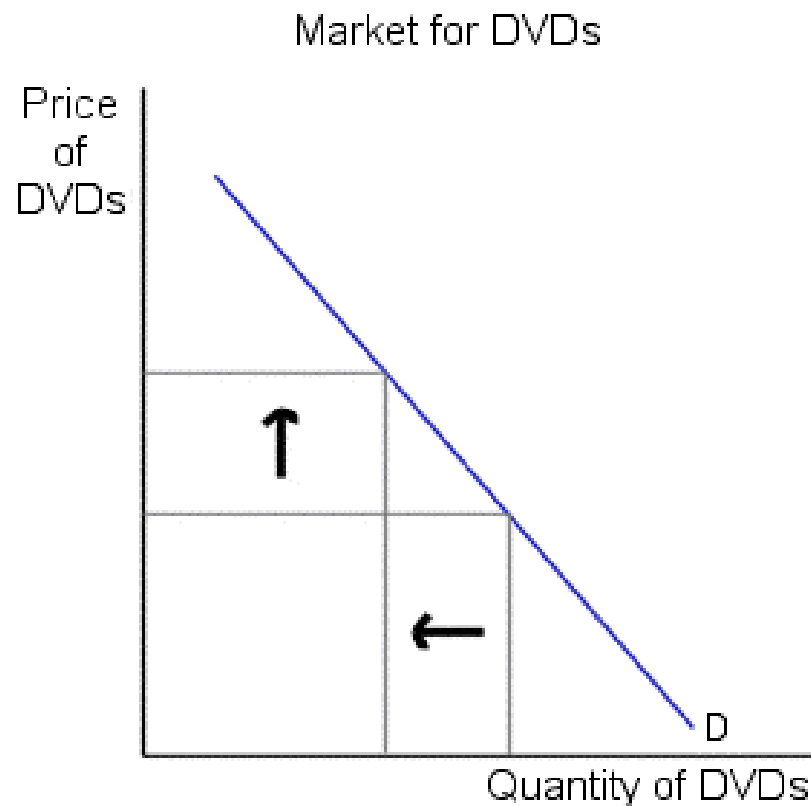
# Change in the price of a substitute good

- Price of coffee rises:



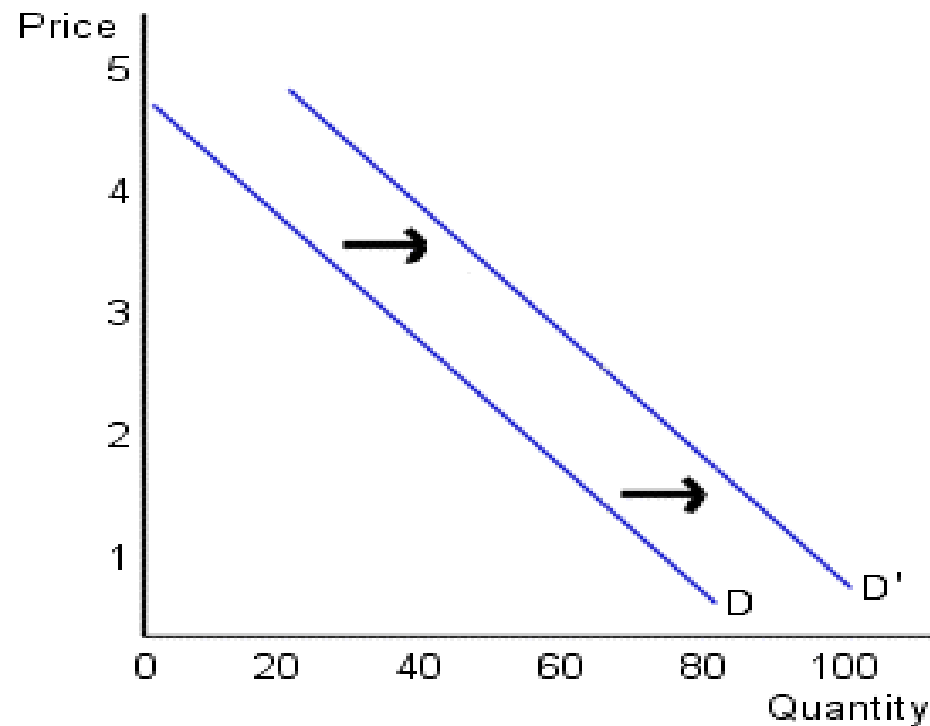
# Change in the price of a complementary good

- Price of DVDs rises:



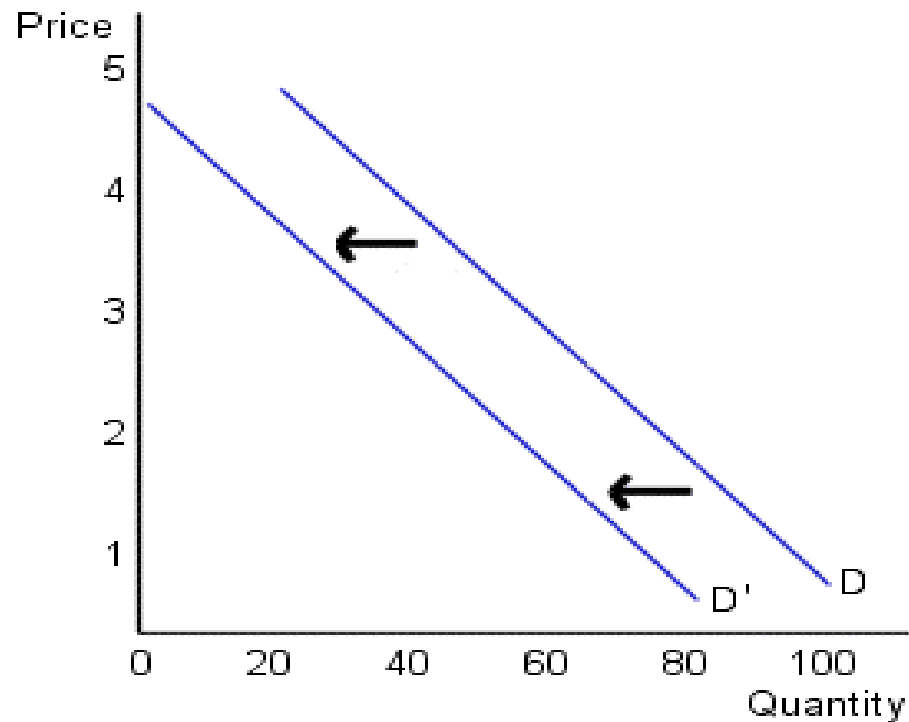
## Income and demand: normal goods

- A good is a **normal good** if an increase in income results in an increase in the demand for the good.



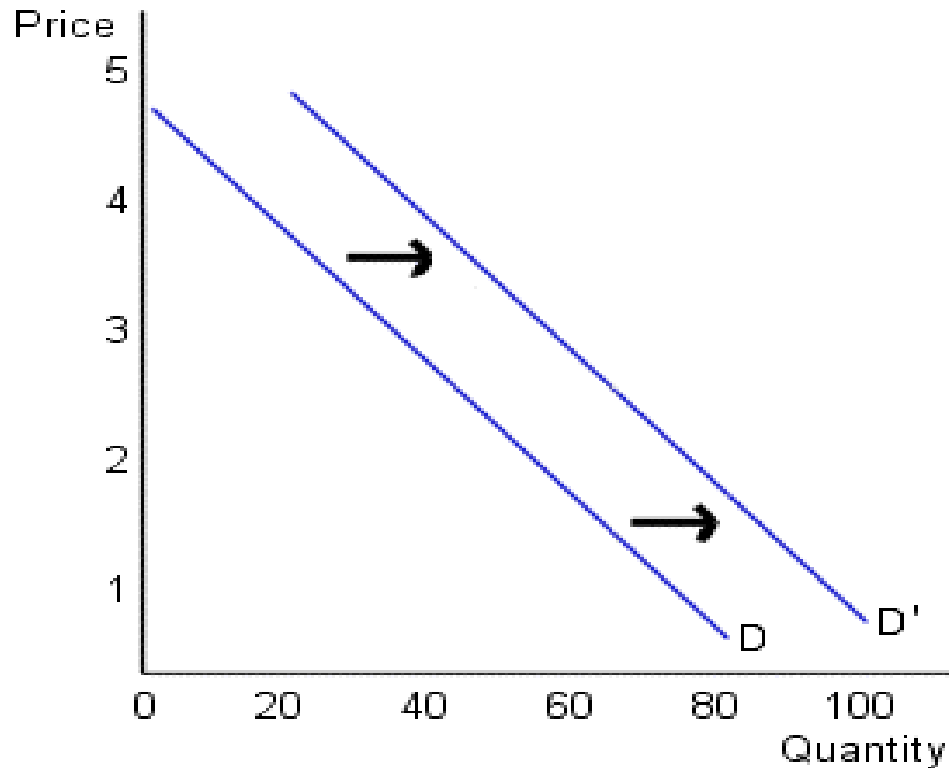
# Income and demand: inferior goods

- A good is an **inferior good** if an increase in income results in a reduction in the demand for the good.



# Demand and the number of buyers

- An increase in the number of buyers results in an increase in demand.



# Expectations

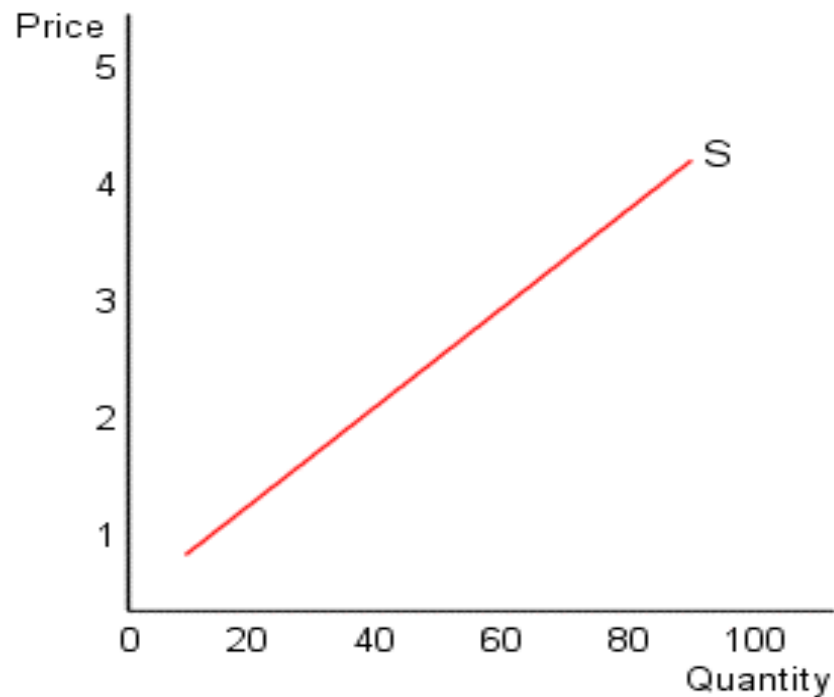
- A higher expected future price will increase current demand.
- A lower expected future price will decrease current demand.
- A higher expected future income will increase the demand for all normal goods.
- A lower expected future income will reduce the demand for all normal goods.

# International effects

- exchange rate – the rate at which one currency is exchanged for another.
- currency appreciation – an increase in the value of a currency relative to other currencies.
- currency depreciation – a decrease in the value of a currency relative to other currencies.
- Domestic currency appreciation causes domestically produced goods and services to become more expensive in foreign countries.
- An increase in the exchange value of the U.S. dollar results in a reduction in the demand for U.S. goods and services.
- The demand for U.S. goods and services will rise if the U.S. dollar depreciates.

# Supply

- the relationship that exists between the price of a good and the quantity supplied in a given time period, *ceteris paribus*.



# Supply schedule

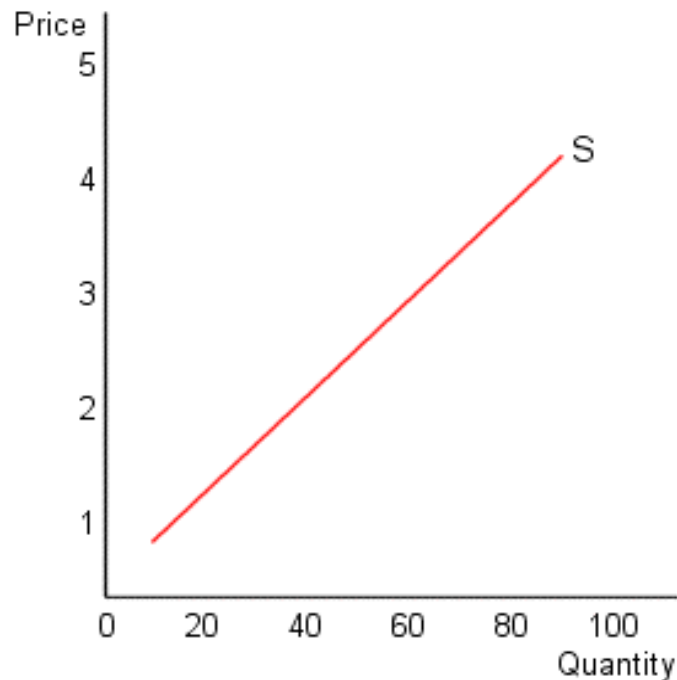
<u>Price</u>	<u>Quantity Supplied</u>
1	16
2	39
3	62
4	85

# Law of supply

- A direct relationship exists between the price of a good and the quantity supplied in a given time period, *ceteris paribus*.

# Reason for law of supply

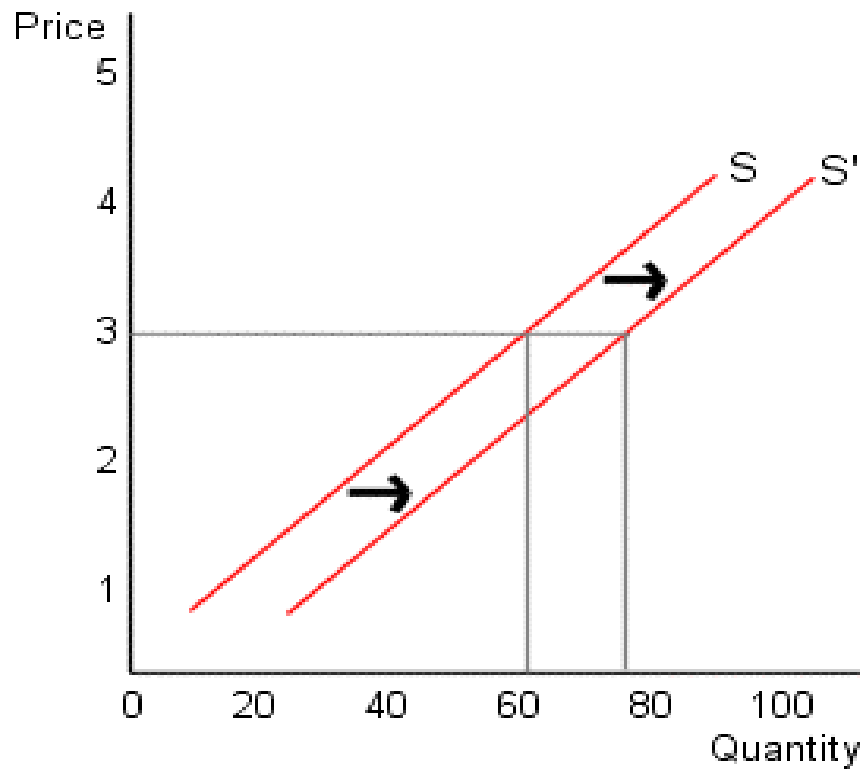
- The **law of supply** is the result of the **law of increasing cost**.



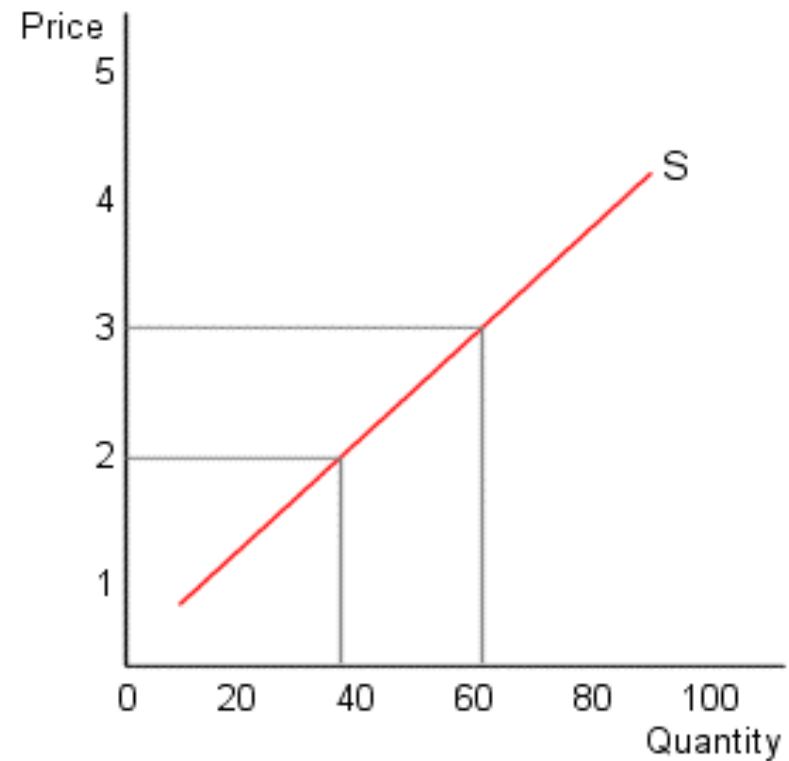
- As the quantity of a good produced rises, the marginal opportunity cost rises.
- Sellers will only produce and sell an additional unit of a good if the price rises above the marginal opportunity cost of producing the additional unit.

# Change in supply vs. change in quantity supplied

## Change in supply



## Change in quantity supplied



# Individual firm and market supply curves

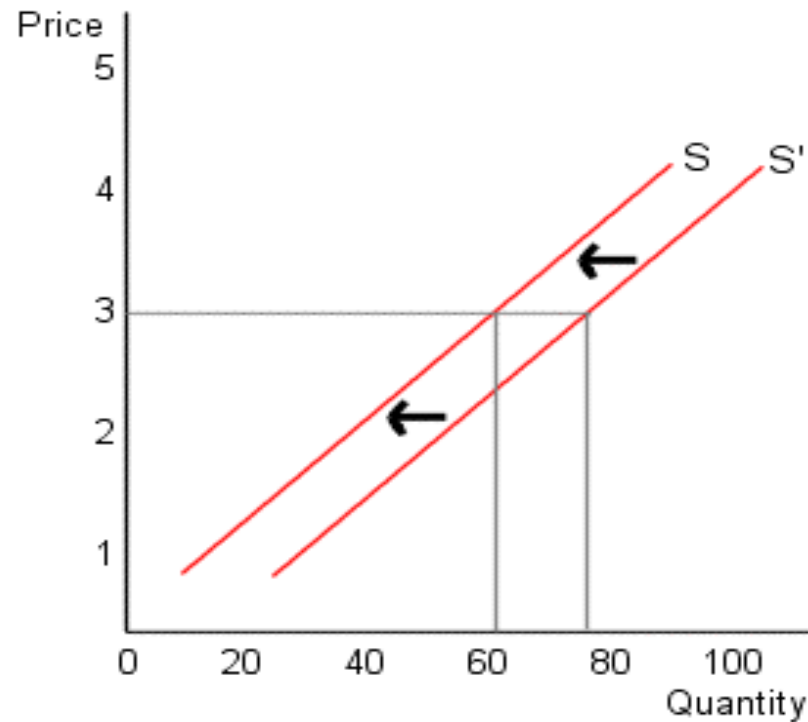
- The market supply curve is the horizontal summation of the supply curves of individual firms. (This is equivalent to the relationship between individual and market demand curves.)

# Determinants of supply

- the price of resources,
- technology and productivity,
- the expectations of producers,
- the number of producers, and
- the prices of related goods and services
  - note that this involves a relationship in production, not in consumption

# Price of resources

- As the price of a resource rises, profitability declines, leading to a reduction in the quantity supplied  $\varepsilon$



# Technological improvements

- Technological improvements (and any changes that raise the productivity of labor) lower production costs and increase profitability.



# Expectations and supply

- An increase in the expected future price of a good or service results in a reduction in current supply.

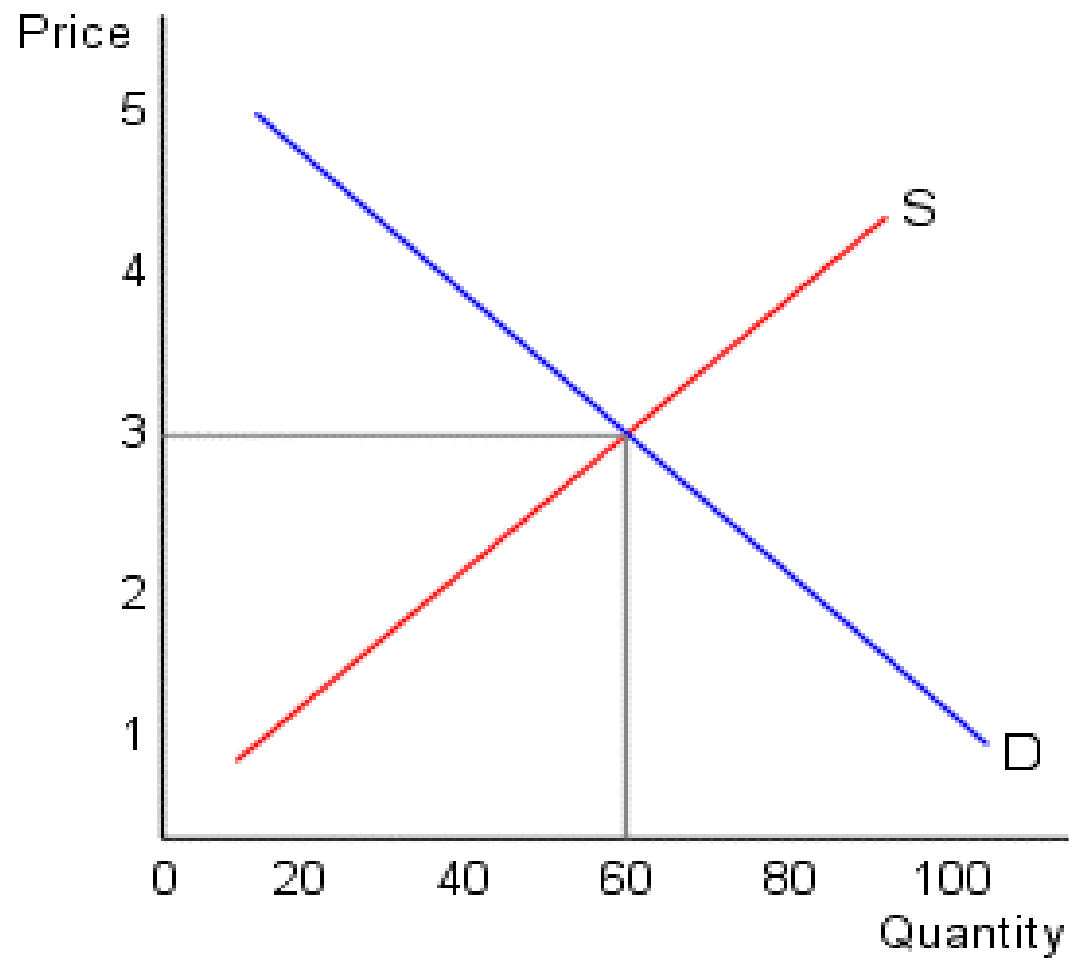
# Prices of other goods

- Firms produce and sell more than one commodity.
- Firms respond to the relative profitability of the different items that they sell.
- The supply decision for a particular good is affected not only by the good's own price but also by the prices of other goods and services the firm may produce.

# International effects

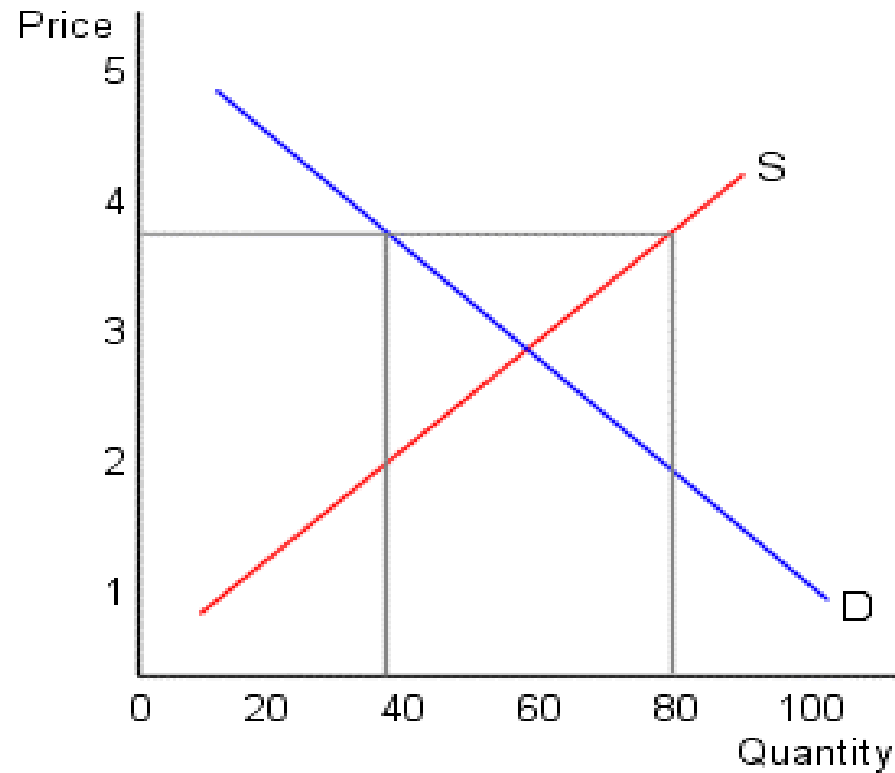
- Firms import raw materials (and often the final product) from foreign countries. The cost of these imports varies with the exchange rate.
- When the exchange value of a dollar rises, the domestic price of imported inputs will fall and the domestic supply of the final commodity will increase.
- A decline in the exchange value of the dollar raises the price of imported inputs and reduce the supply of domestic products that rely on these inputs.

# Market equilibrium



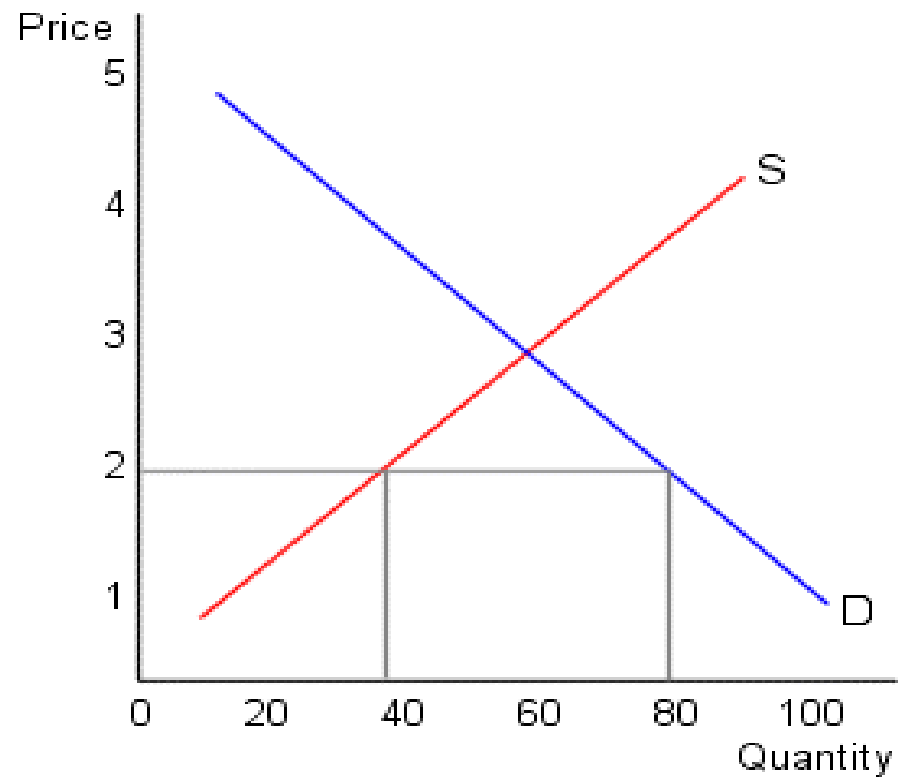
# Price above equilibrium

- If the price exceeds the equilibrium price, a surplus occurs:

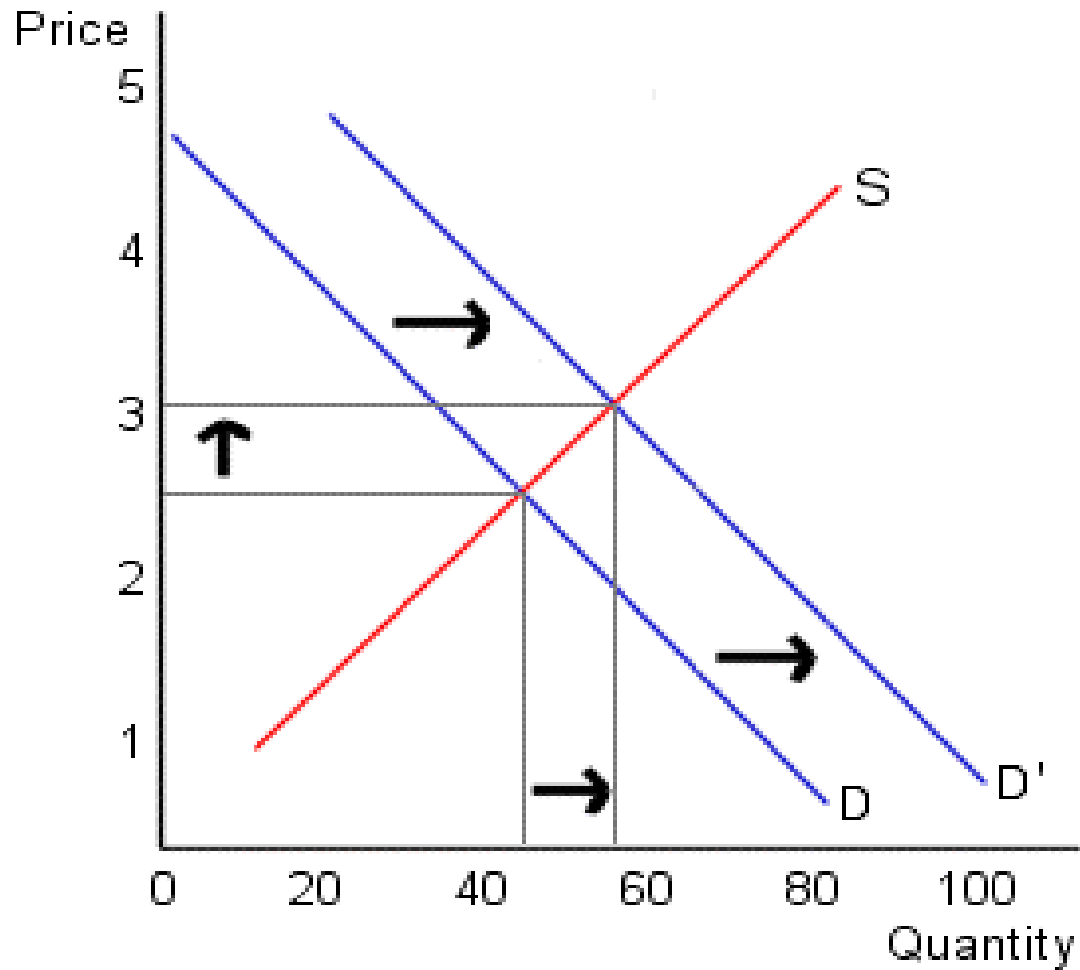


# Price below equilibrium

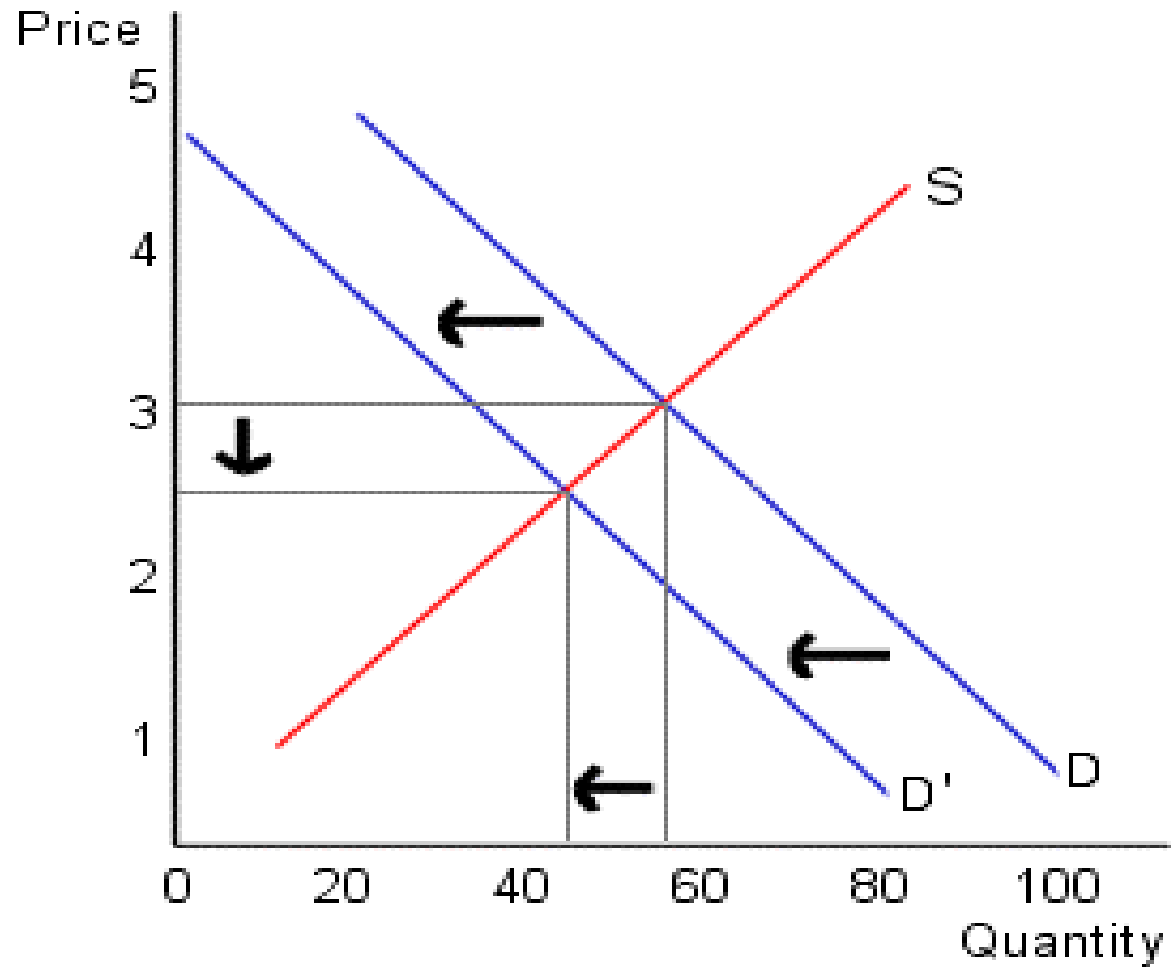
- If the price is below the equilibrium a shortage occurs:



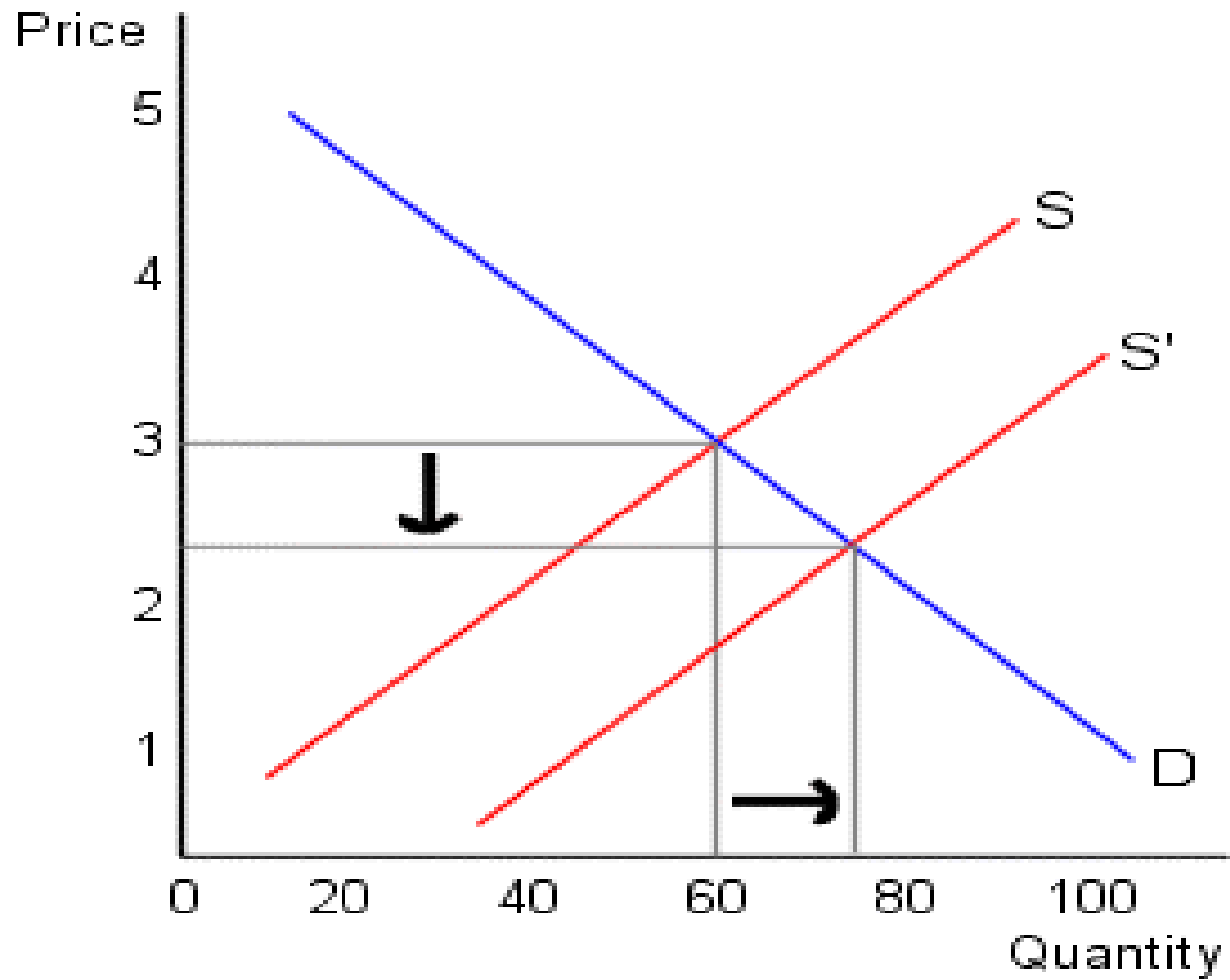
# Demand rises



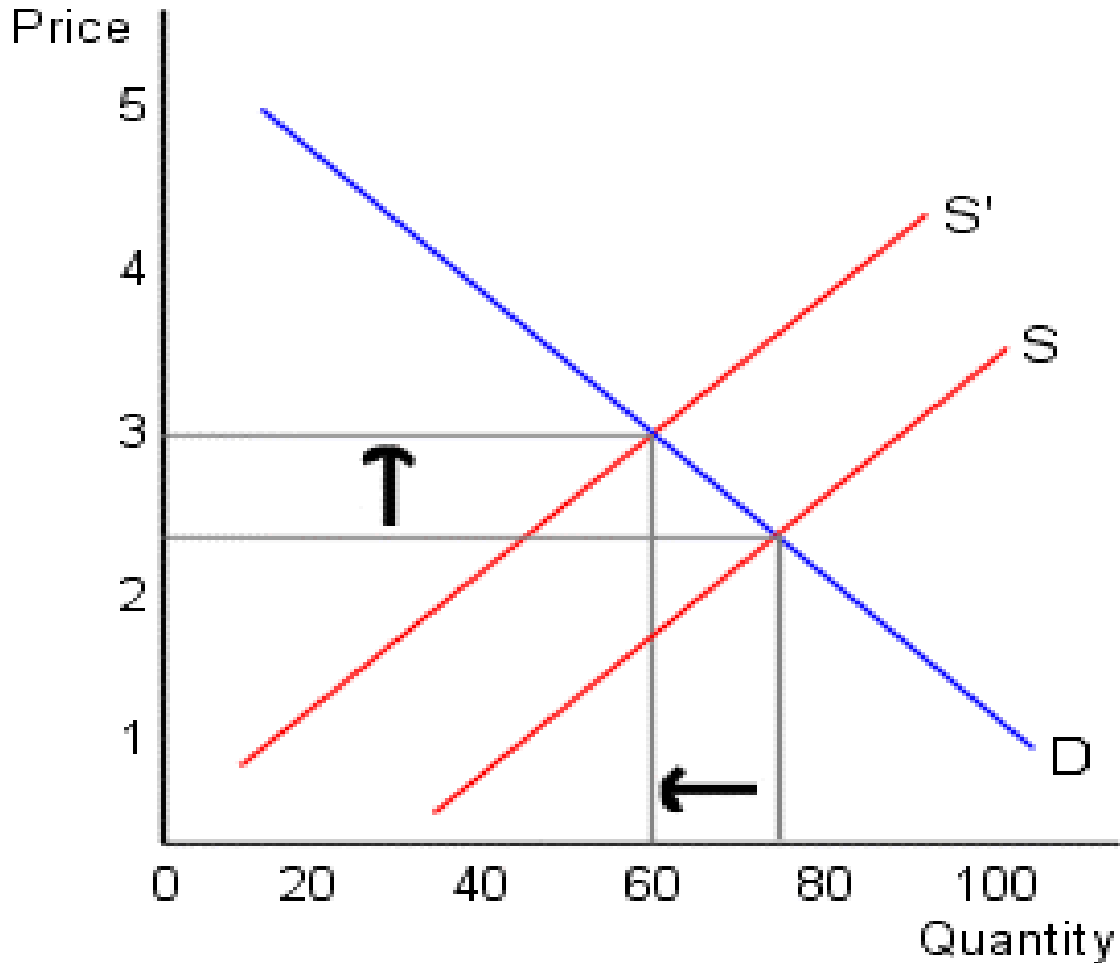
# Demand falls



# Supply rises

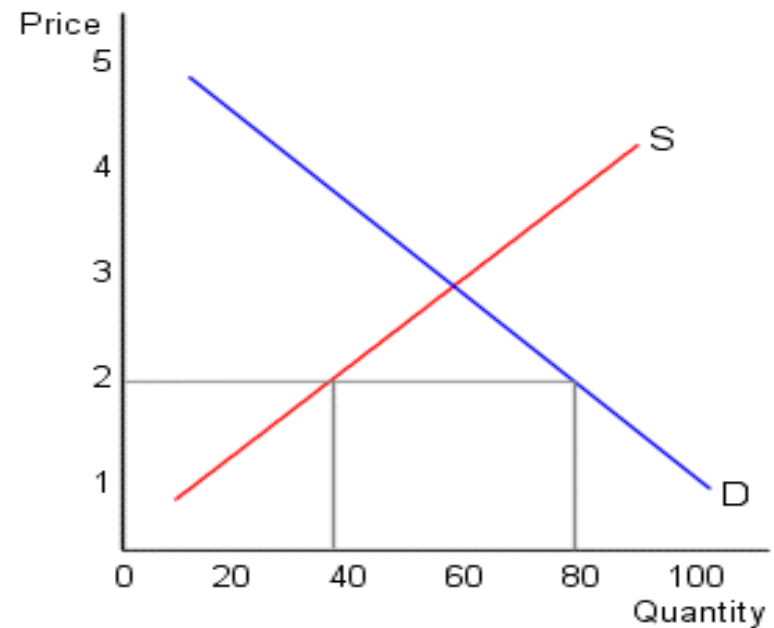


# Supply falls



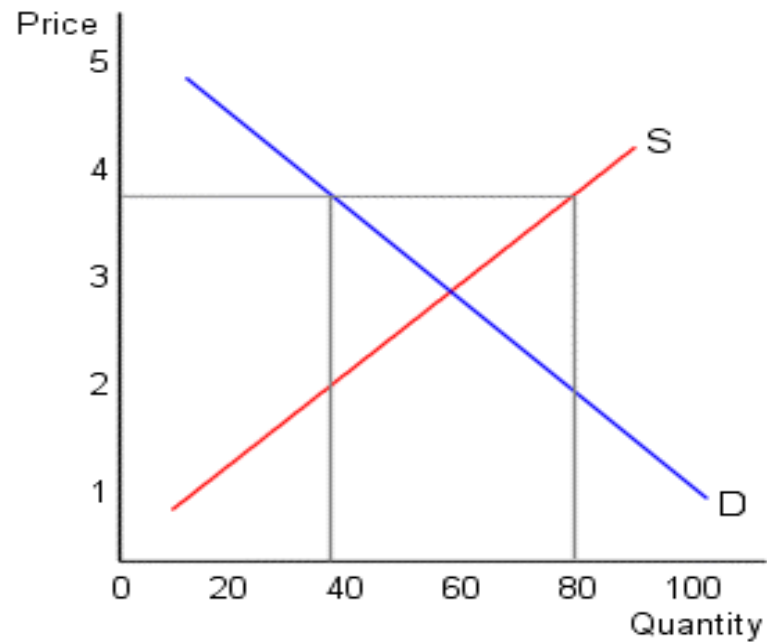
# Price ceiling

- Price ceiling - legally mandated maximum price
- Purpose: keep price below the market equilibrium price
- Examples:
  - rent controls
  - price controls during wartime
  - gas price rationing in 1970s



# Price floor

- price floor - legally mandated minimum price
- designed to maintain a price above the equilibrium level
- examples:
  - agricultural price supports
  - minimum wage laws



Week 4

**Elasticity**

# Elasticity

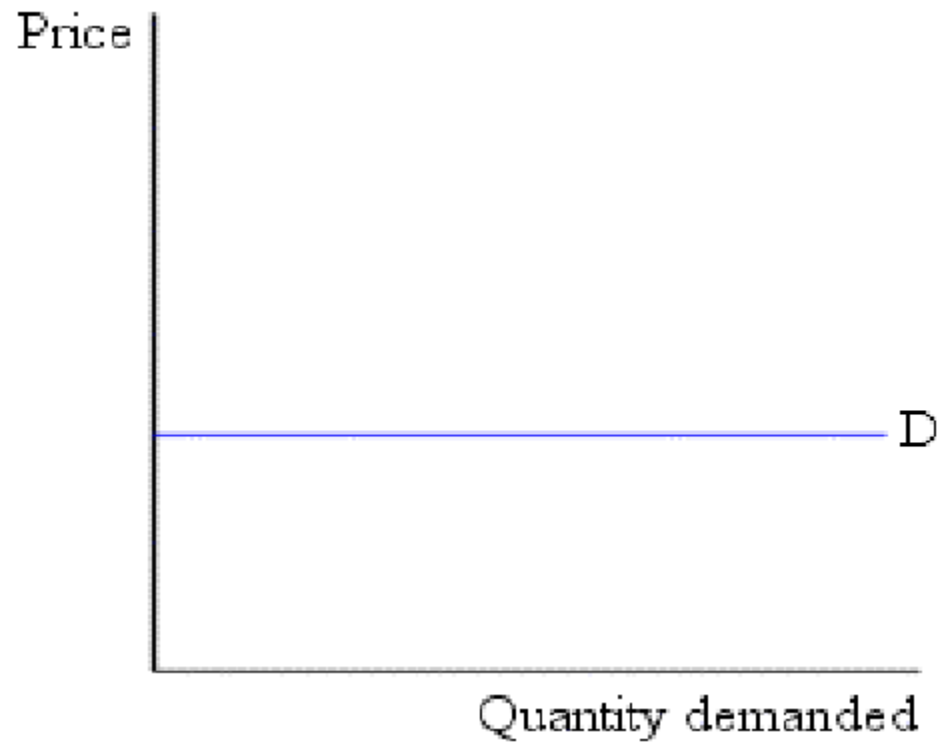
- A measure of the responsiveness of one variable (usually quantity demanded or supplied) to a change in another variable
- Most commonly used elasticity: price elasticity of demand, defined as:

$$\text{Price elasticity of demand} = \left| \frac{\% \text{ change in quantity demanded}}{\% \text{ change in price}} \right|$$

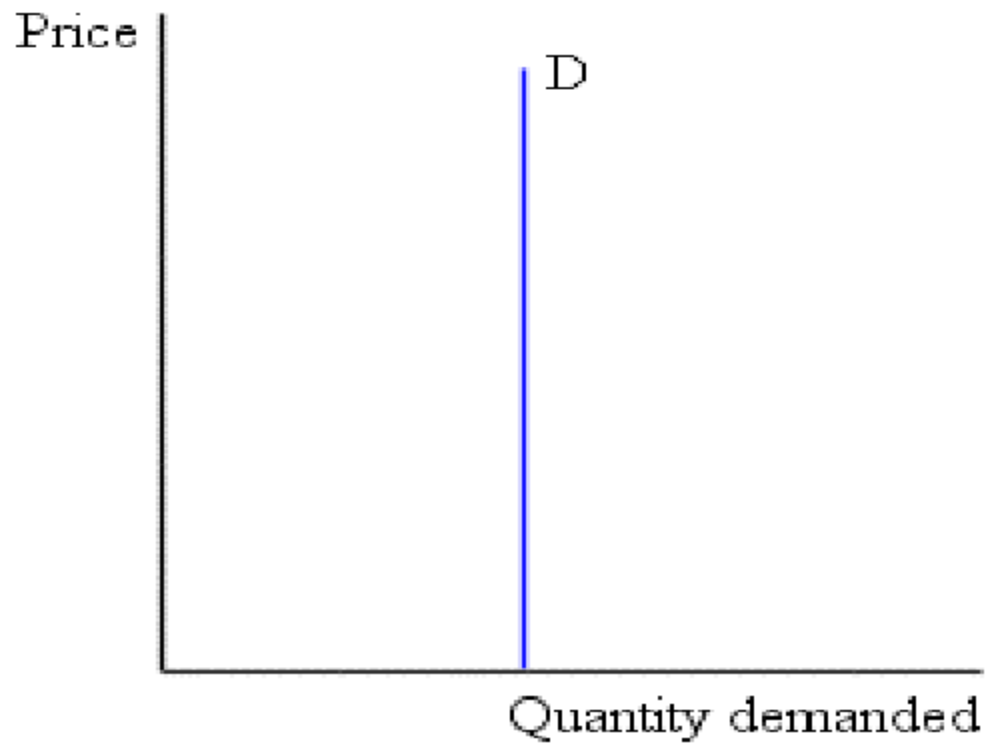
# Price elasticity of demand

- Demand is said to be:
  - elastic when  $E_d > 1$ ,
  - unit elastic when  $E_d = 1$ , and
  - inelastic when  $E_d < 1$ .

# Perfectly elastic demand



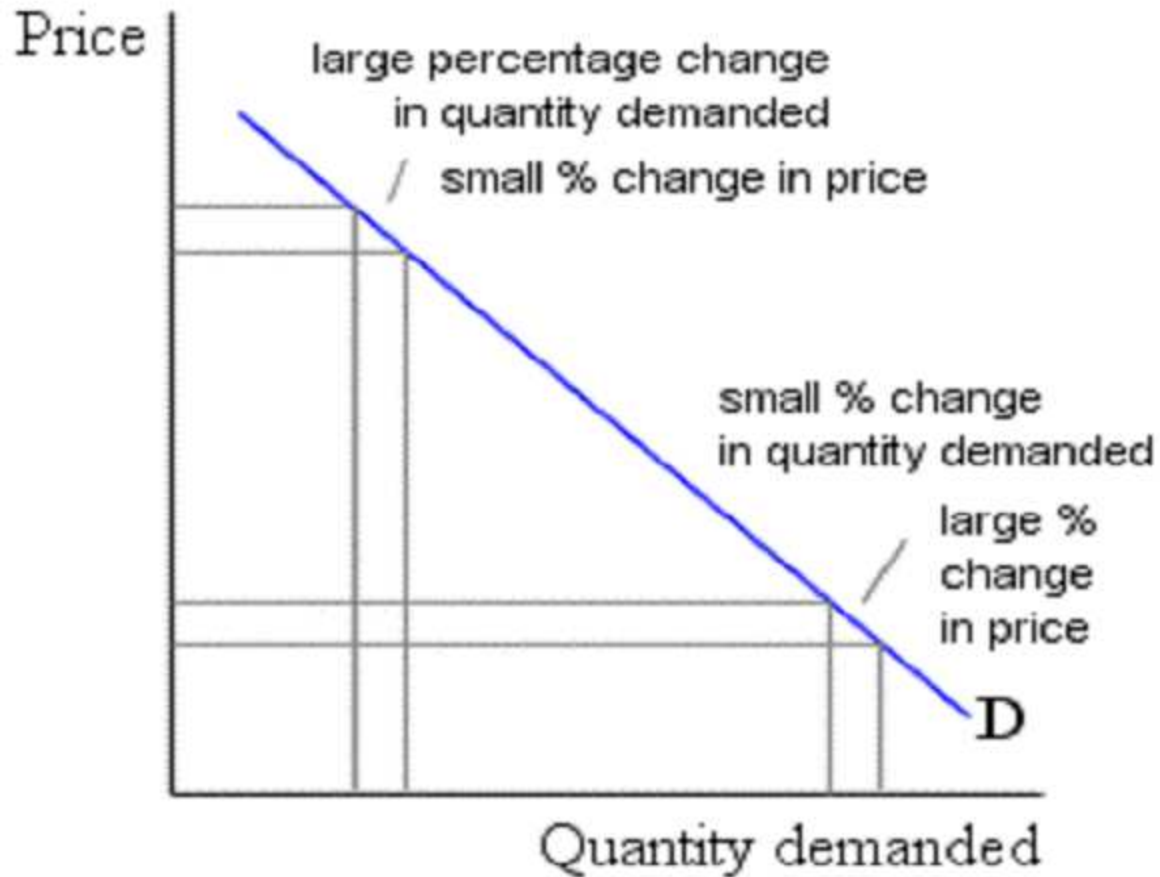
# Perfectly inelastic demand



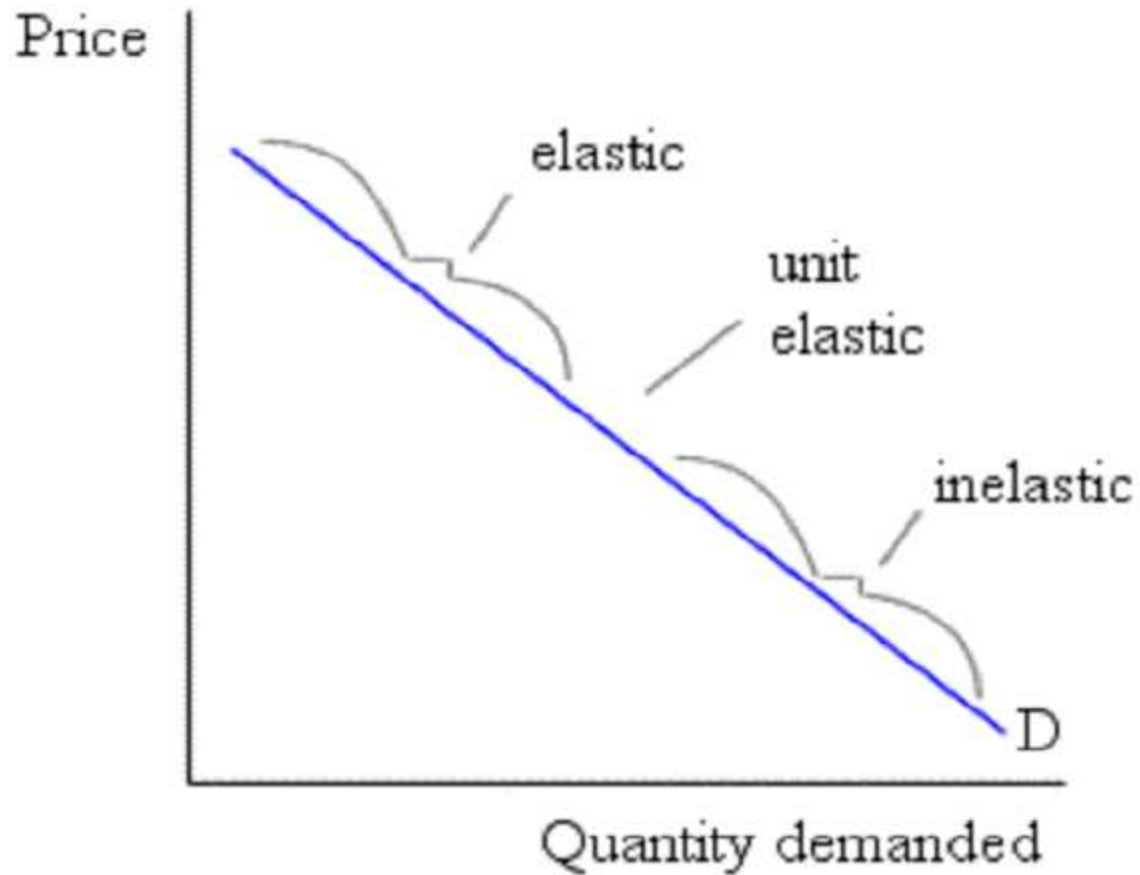
# Elasticity & slope

- a price increase from \$1 to \$2 represents a 100% increase in price,
- a price increase from \$2 to \$3 represents a 50% increase in price,
- a price increase from \$3 to \$4 represents a 33% increase in price, and
- a price increase from \$10 to \$11 represents a 10% increase in price.
- Notice that, even though the price increases by \$1 in each case, the percentage change in price becomes smaller when the starting value is larger.

# Elasticity along a linear demand curve



# Elasticity along a linear demand curve



# Price elasticity measure

$$\text{price elasticity of demand} = \left| \frac{\frac{\Delta Q}{Q_m}}{\frac{\Delta P}{P_m}} \right|$$

where:  $Q_m = \frac{Q_1 + Q_2}{2}$ , and

$$P_m = \frac{P_1 + P_2}{2}$$

# Example

- Suppose that quantity demanded falls from 60 to 40 when the price rises from \$3 to \$5. The arc elasticity measure is given by:

$$\begin{aligned} \text{price elasticity of demand} &= \left| \frac{\frac{60-40}{50}}{\frac{3-5}{4}} \right| = \left| \frac{\frac{20}{50}}{\frac{-2}{4}} \right| \\ &= (2/5) / (2/4) \\ &= 4/5 \end{aligned}$$

In this interval, demand is inelastic (since elasticity < 1).

# Elasticity and total revenue

- Total revenue = price x quantity
- What happens to total revenue if the price rises?

$$\text{Price elasticity of demand} = \left| \frac{\% \text{ change in quantity demanded}}{\% \text{ change in price}} \right|$$

# Elasticity and TR (cont.)

$$\text{Price elasticity of demand} = \left| \frac{\% \text{ change in quantity demanded}}{\% \text{ change in price}} \right|$$

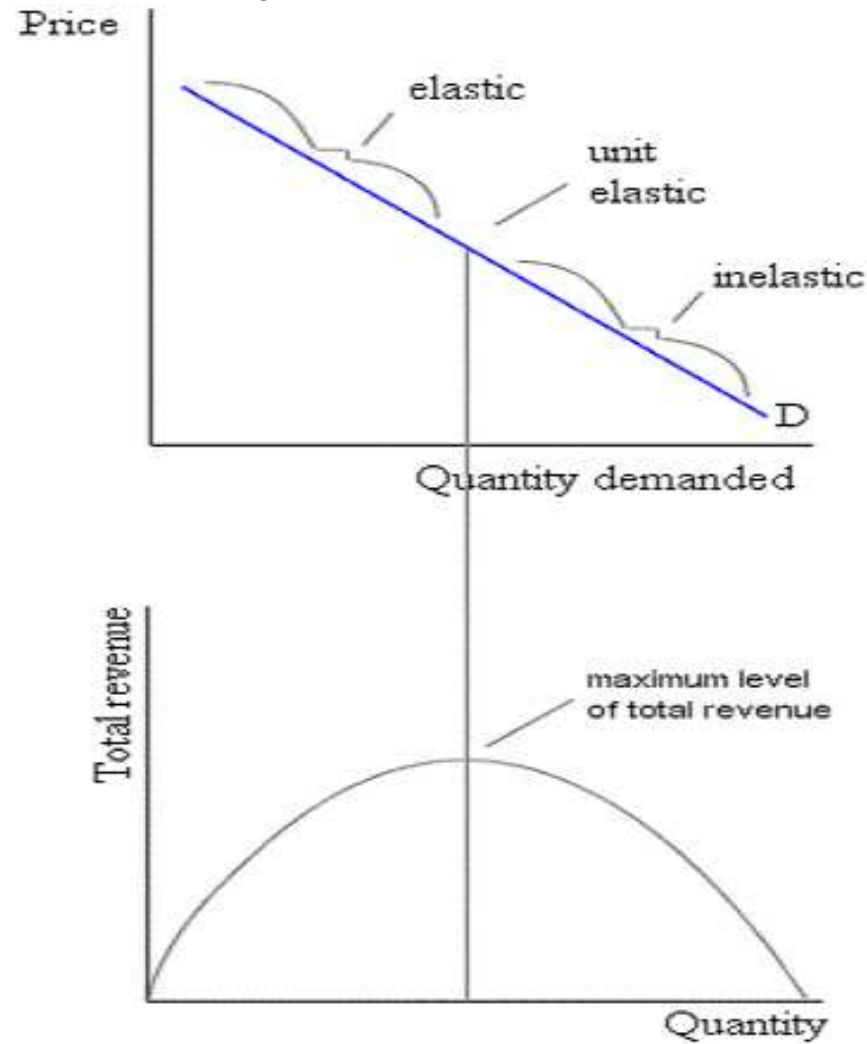
- A reduction in price will lead to:
  - an increase in TR when demand is elastic.
  - a decrease in TR when demand is inelastic.
  - an unchanged level of total revenue when demand is unit elastic.

# Elasticity and TR (cont.)

$$\text{Price elasticity of demand} = \left| \frac{\% \text{ change in quantity demanded}}{\% \text{ change in price}} \right|$$

- In a similar manner, an increase in price will lead to:
  - a decrease in TR when demand is elastic.
  - an increase in TR when demand is inelastic.
  - an unchanged level of total revenue when demand is unit elastic.

# Elasticity and TR (cont.)



# Price discrimination

- different customers are charged different prices for the same product, due to differences in price elasticity of demand
- higher prices for those customers who have the most inelastic demand
- lower prices for those customers who have a more elastic demand.

## Price discrimination (cont.)

- customers who are willing to pay the highest prices are charged a high price, and
- customers who are more sensitive to price differentials are charged a low price.

# Determinants of price elasticity

Price elasticity is relatively high when:

- close substitutes are available,
- the good or service is a large share of the consumer's budget, and
- a longer time period is considered.

# Cross-price elasticity of demand

- The cross-price elasticity of demand between two goods  $j$  and  $k$  is defined as:

$$\begin{array}{l} \text{Cross-price} \\ \text{elasticity} \\ \text{of demand} \end{array} = \frac{\% \text{ change in the quantity demanded for good } j}{\% \text{ change in the price of good } k}$$

# Cross-price elasticity (cont.)

$$\begin{array}{l} \text{Cross-price} \\ \text{elasticity} \\ \text{of demand} \end{array} = \frac{\% \text{ change in the quantity demanded for good } j}{\% \text{ change in the price of good } k}$$

- cross-price elasticity is positive if and only if the goods are substitutes
- cross-price elasticity is negative if and only if the goods are complements.

# Income elasticity of demand

$$\begin{array}{l} \text{Income} \\ \text{elasticity} \\ \text{of demand} \end{array} = \frac{\% \text{ change in the quantity demanded for good } j}{\% \text{ change in income}}$$

- A good is a normal good if income elasticity  $> 0$ .
- A good is an inferior good if income elasticity  $< 0$ .

# Income elasticity of demand

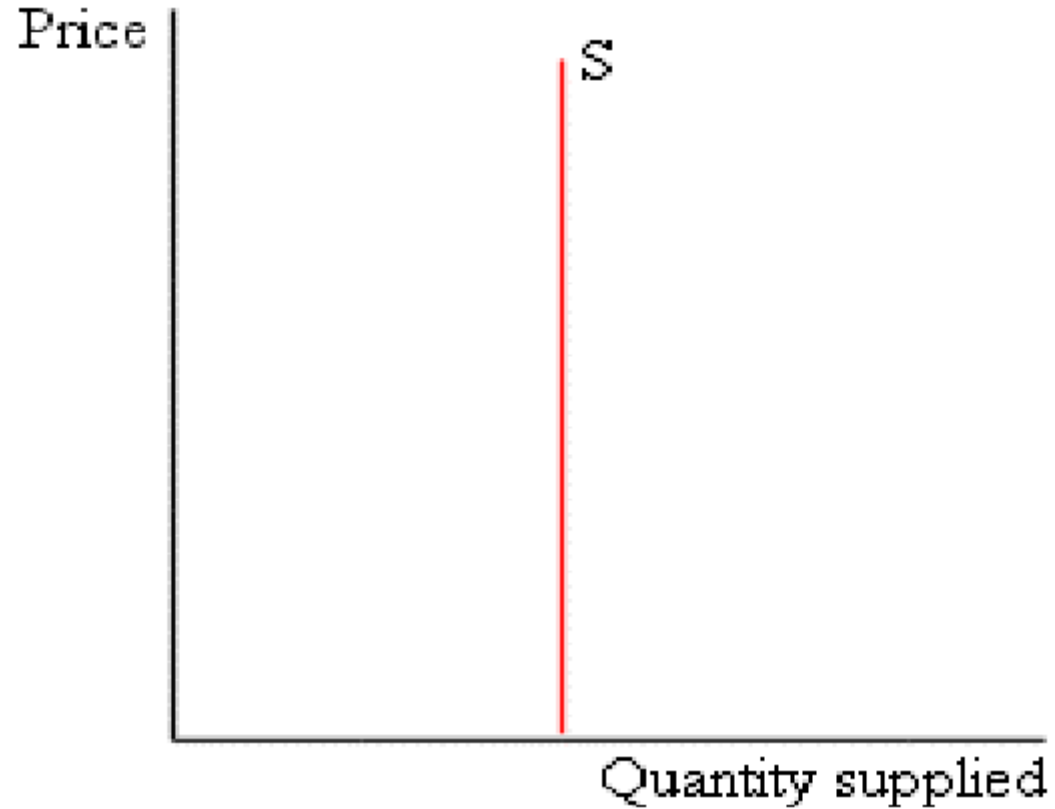
$$\text{Income elasticity of demand} = \frac{\% \text{ change in the quantity demanded for good } j}{\% \text{ change in income}}$$

- A good is a luxury good if income elasticity  $> 1$ .
- A good is a necessity good if income elasticity  $< 1$ .

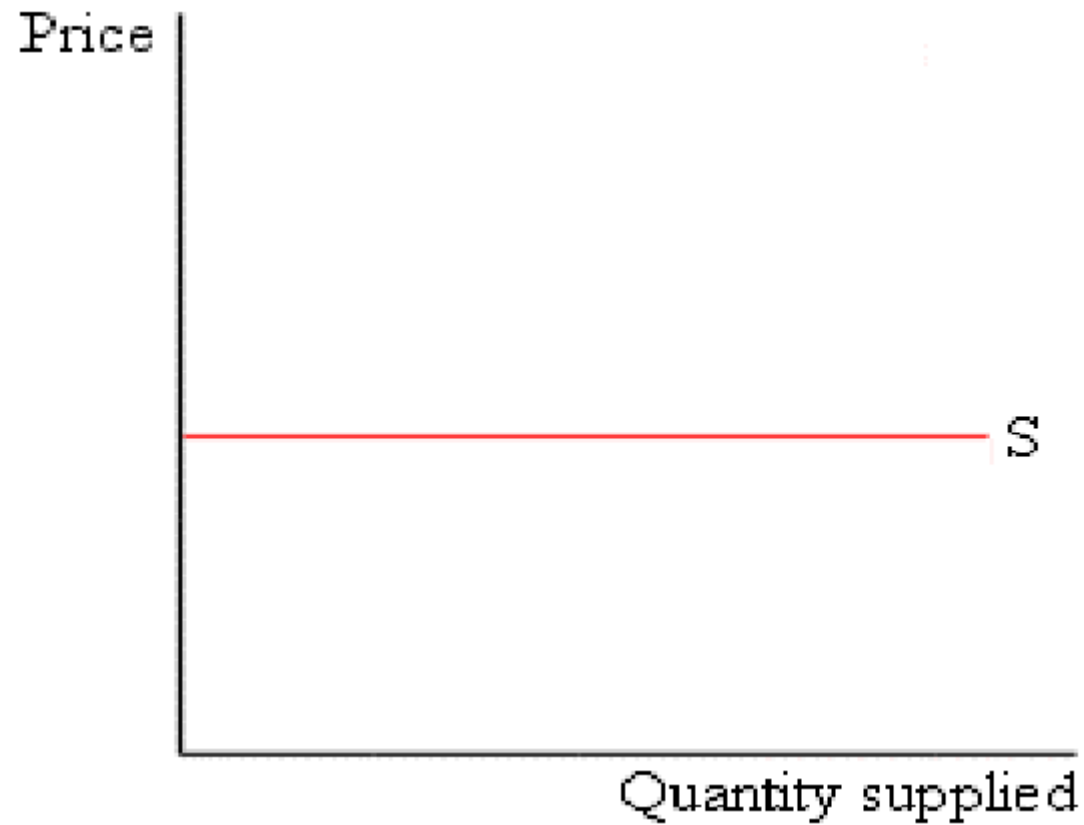
# Price elasticity of supply

$$\text{Price elasticity of supply} = \frac{\% \text{ change in the quantity supplied}}{\% \text{ change in the price}}$$

# Perfectly inelastic supply



# Perfectly elastic supply



# Determinants of supply elasticity

- **short run** - period of time in which capital is fixed
- all inputs are variable in the **long run**
- supply will be more elastic in the long run than in the short run since firms can expand or contract their capital in the long run.

# Theory of Consumer choice

# Utility

- Utility = level of happiness or satisfaction associated with alternative choices
- utility maximization

## Total and marginal utility

- total utility (TU) - the level of happiness derived from consuming the good
- marginal utility (MU) - the additional utility that is received when an additional unit of a good is consumed

# Marginal utility (MU)

$$\text{Marginal utility} = \frac{\text{change in total utility}}{\text{change in quantity}}$$

<b>Number of pizzas</b>	<b>total utility</b>	<b>marginal utility</b>
0	0	-
1	70	70
2	110	40
3	130	20
4	140	10
5	145	5
6	140	-5

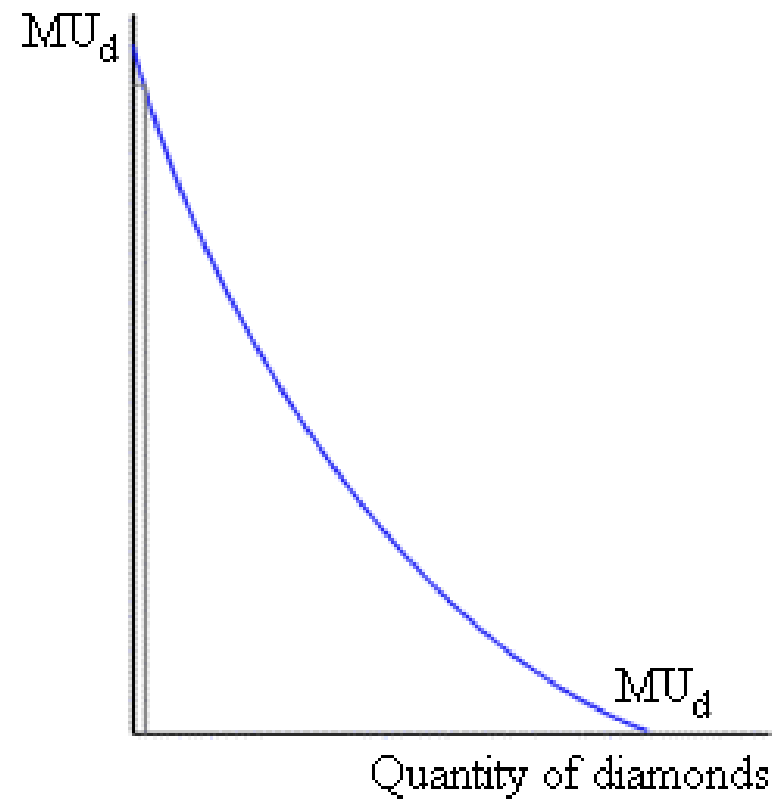
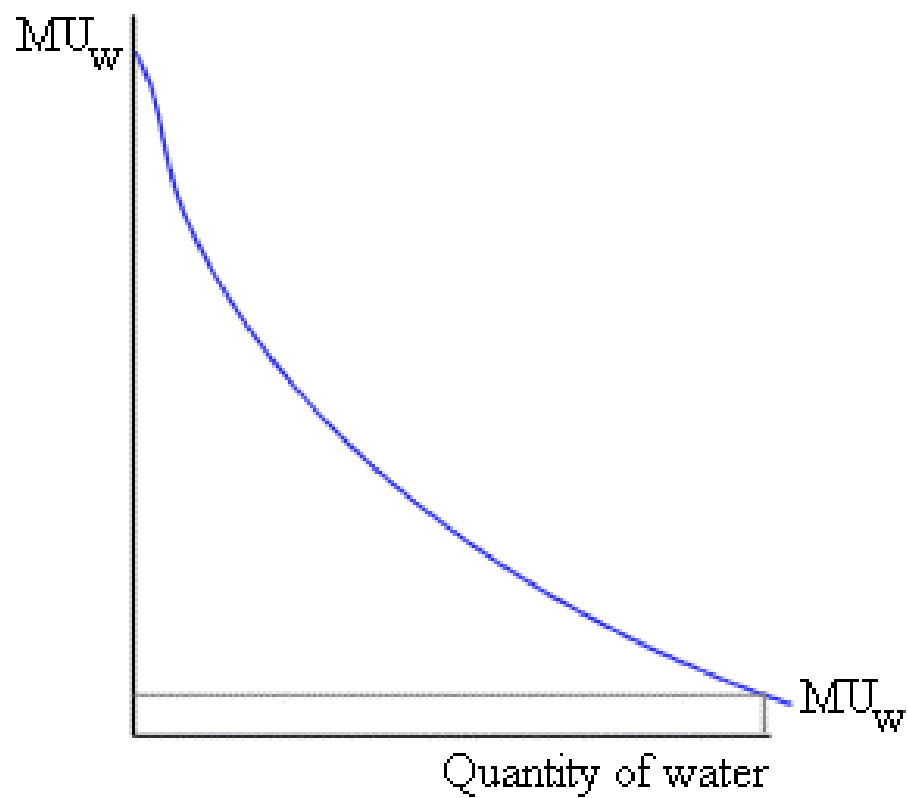
# Law of diminishing MU

- **law of diminishing marginal utility** - marginal utility declines as more of a particular good is consumed in a given time period, *ceteris paribus*
- even though marginal utility declines, total utility still increases as long as marginal utility is positive. Total utility will decline only if marginal utility is negative

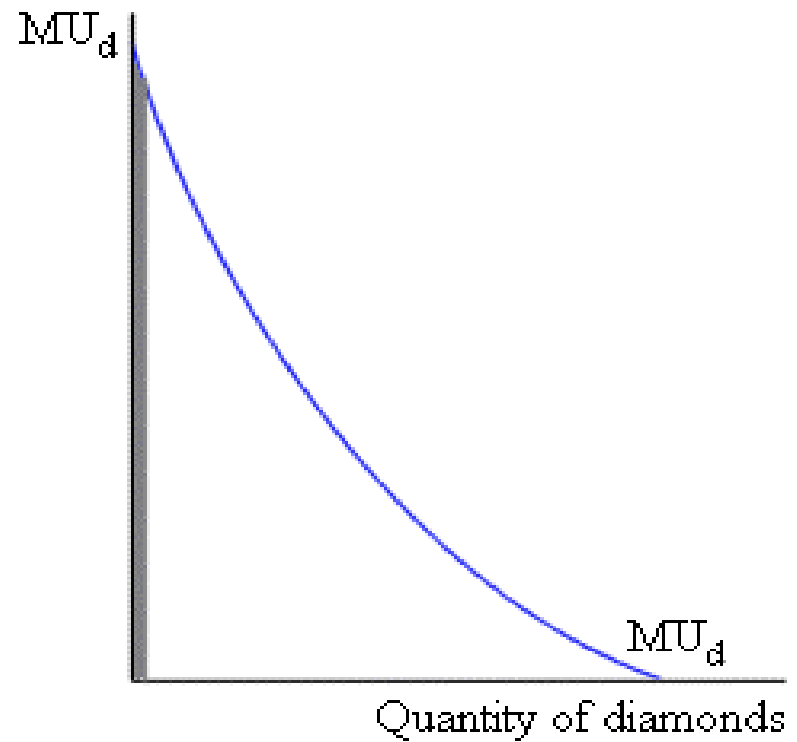
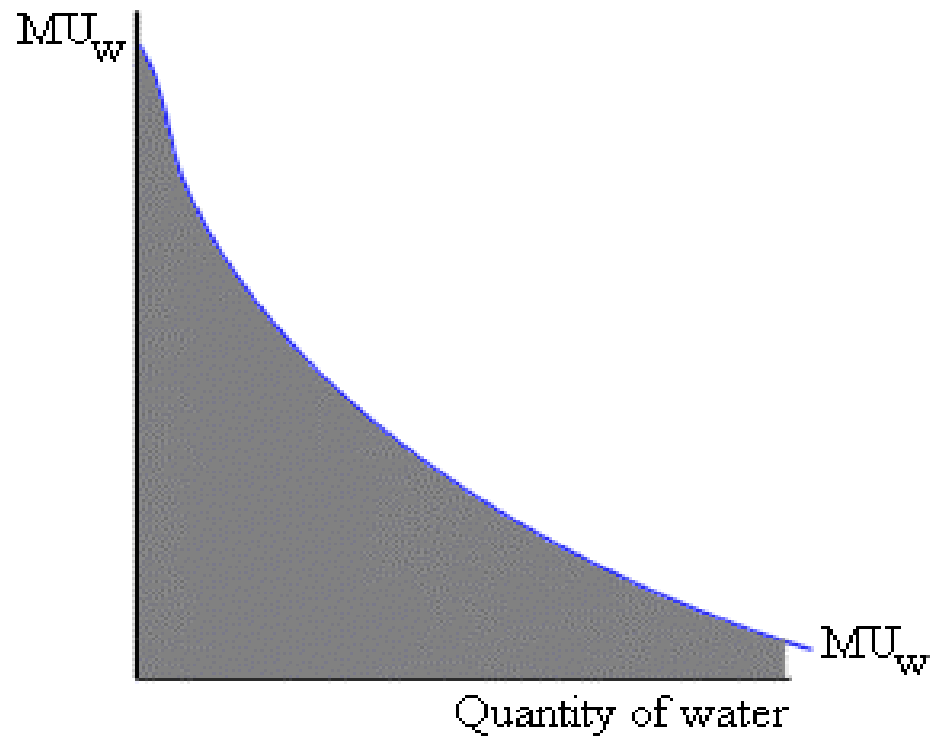
# Diamond-water paradox

- As noted by Adam Smith, water is essential for life and has a low market price (often a price of zero) while diamonds are not as essential yet have a very high market price.
- Smith's explanation: "value in use" vs. "value in exchange"
- value in exchange: labor theory of value

# MU of water and diamonds



# TU of water and diamonds



# Value in use and value in exchange

- value in use = total utility
- value in exchange is related to marginal utility

Week 5

Theory of Consumer Choice

# Consumer equilibrium

1. 
$$\frac{MU_A}{P_A} = \frac{MU_B}{P_B} = \frac{MU_C}{P_C} = \dots$$

2. All income is spent.

The first condition listed above is sometimes referred to as the "equimarginal principle."

# Consumer equilibrium and demand

$$\frac{MU_X}{P_X} = \frac{MU_Y}{P_Y}$$

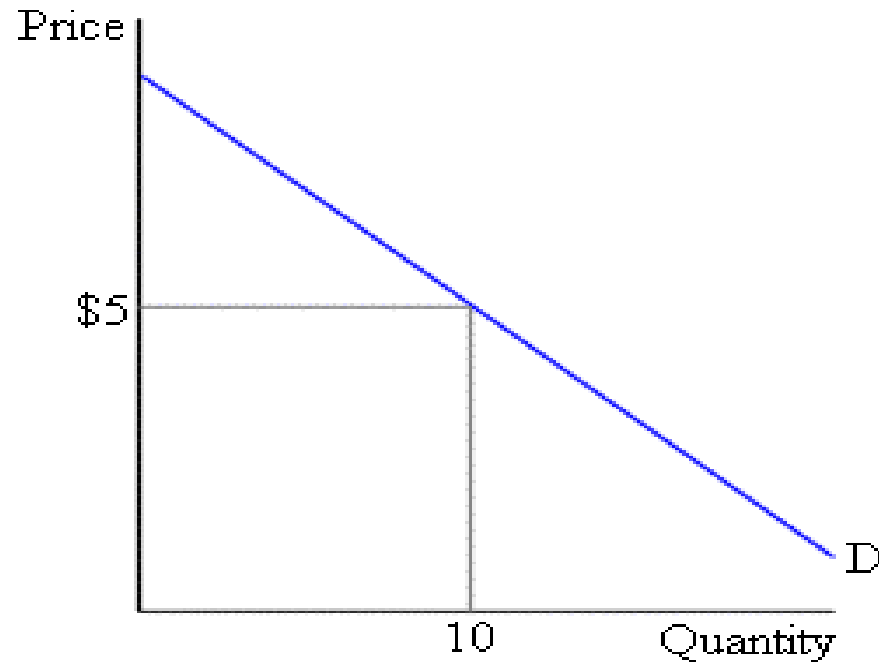
- Suppose that the price of good X rises.
- Two effects:
  - substitution effect
  - income effect

# Consumer surplus

- Individuals buy an item only if they receive a net gain from the purchase (*i.e.*, total benefit exceeds opportunity cost).
- This net gain is called “consumer surplus.”

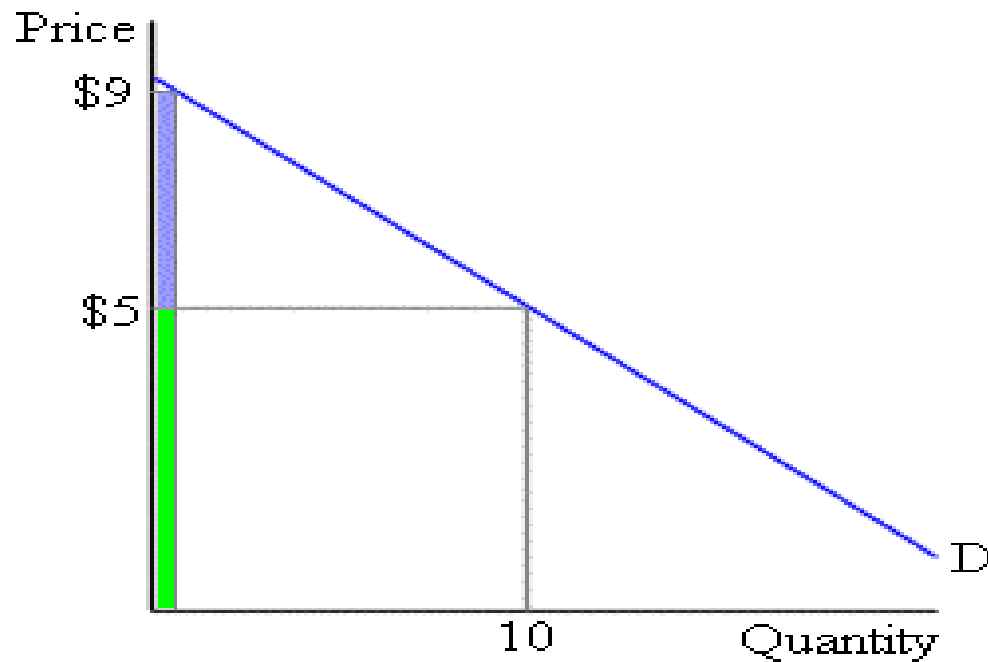
# Example

- Suppose that an individual buys 10 units of a good when t

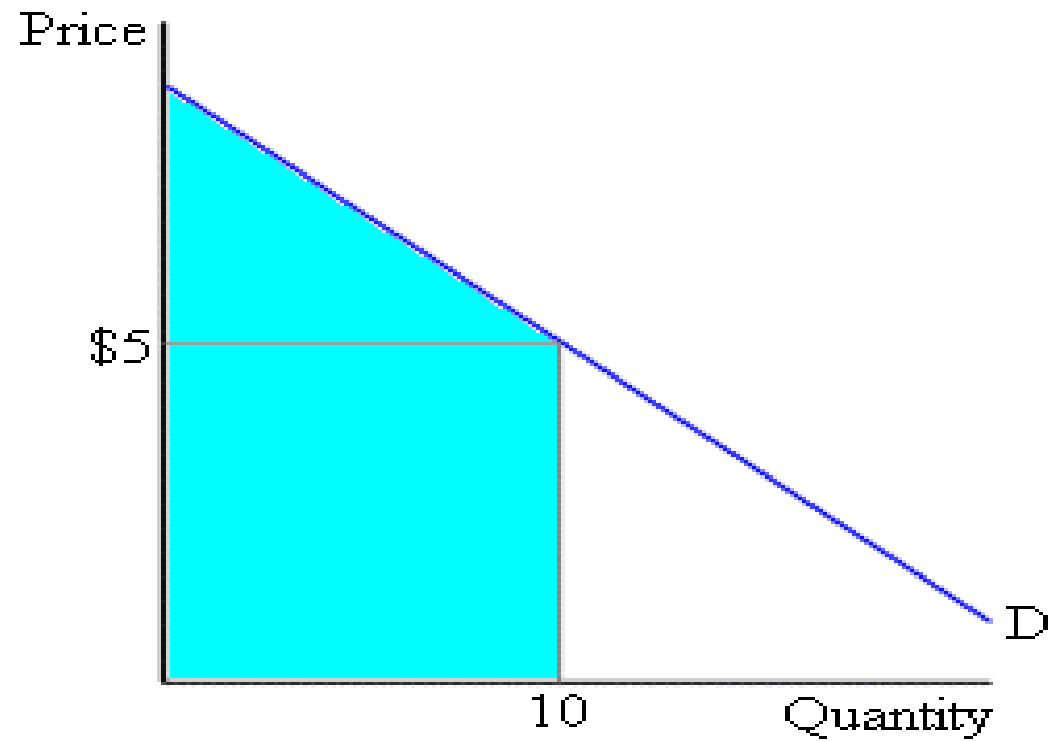


# Benefits and cost of first unit

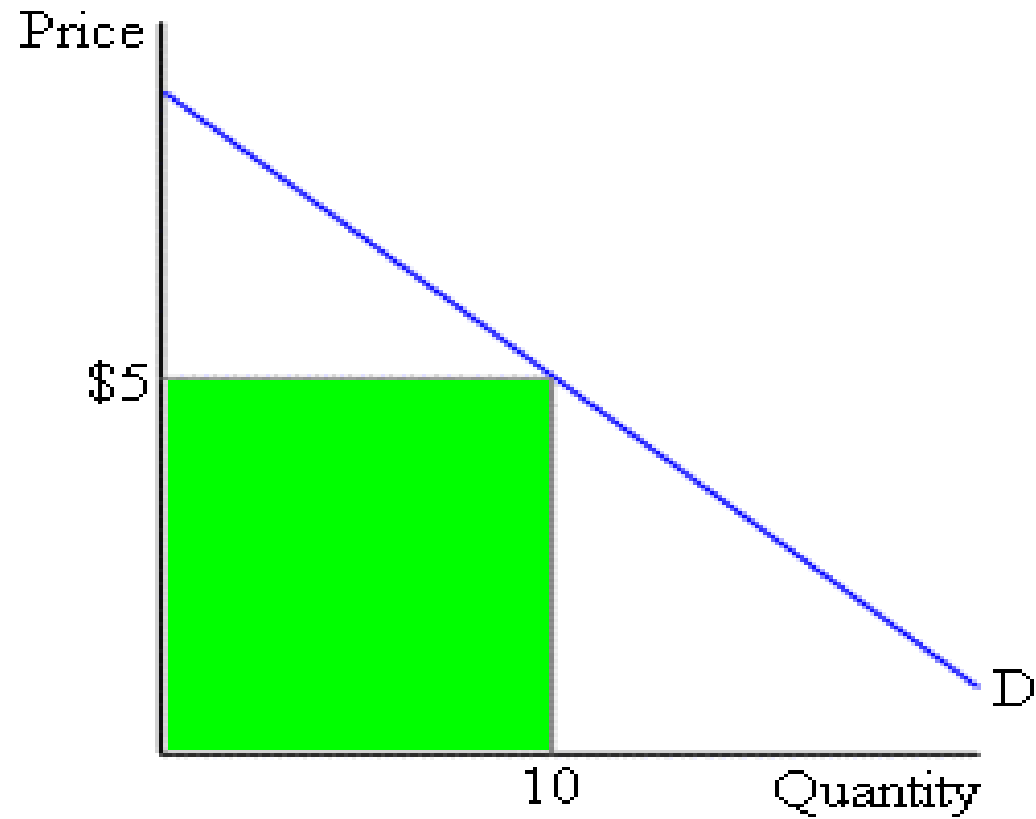
- Benefit = blue + green rectangles (=\$9)
- Cost = green rectangle (=\$5)
- Consumer surplus = blue rectangle (=\$4)



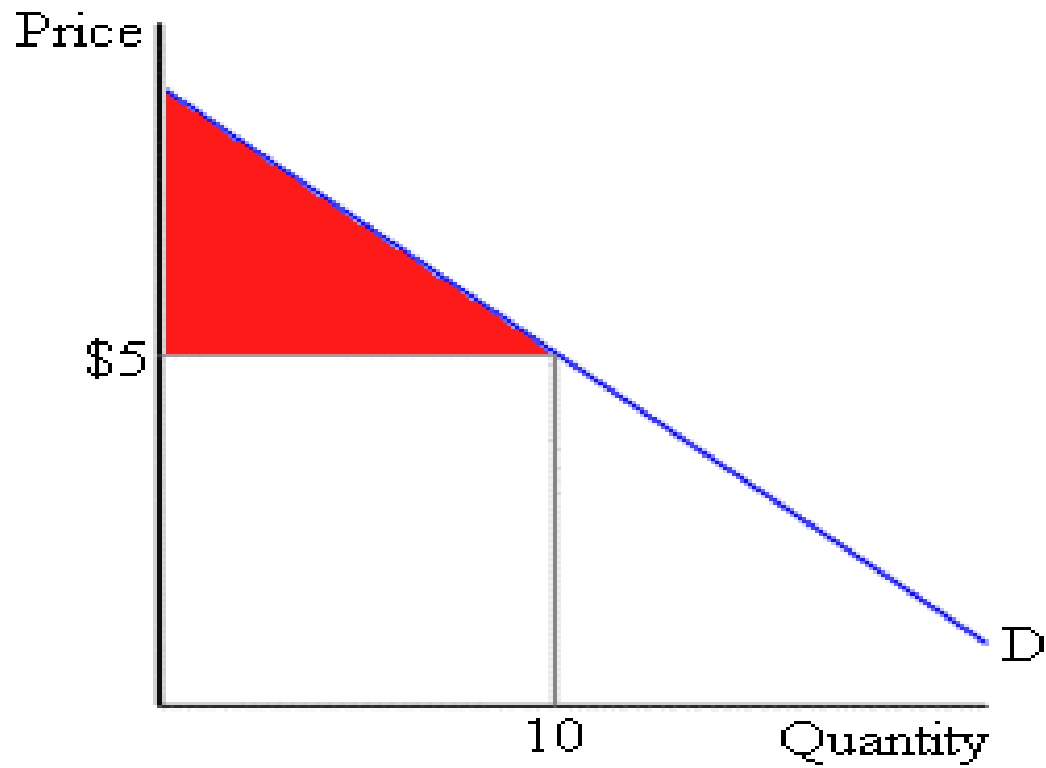
# Total benefit to consumer



# Total cost to consumer

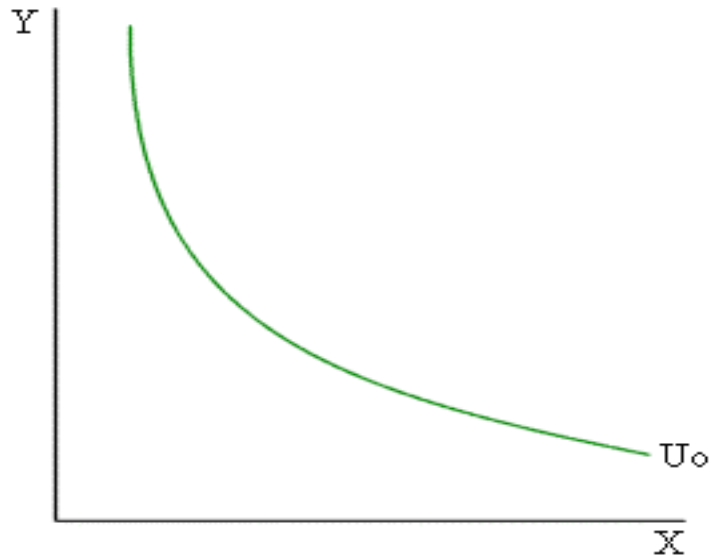


# Consumer surplus

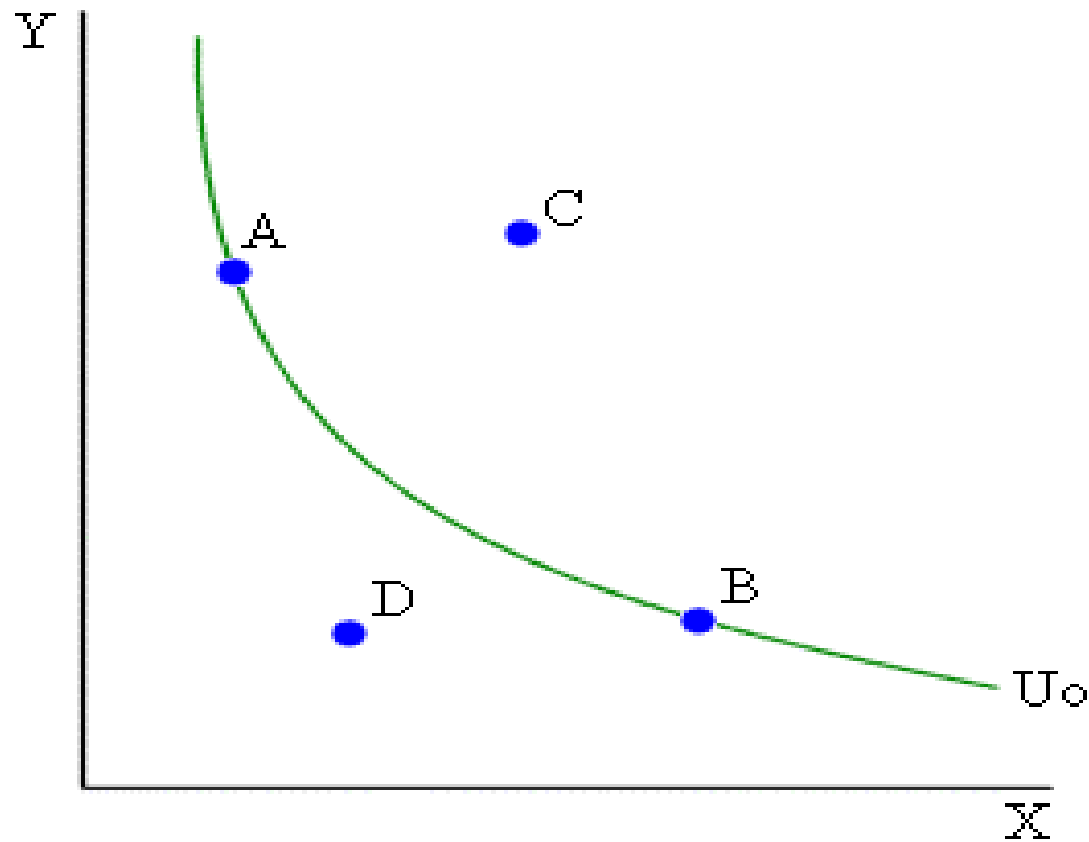


# Indifference curves

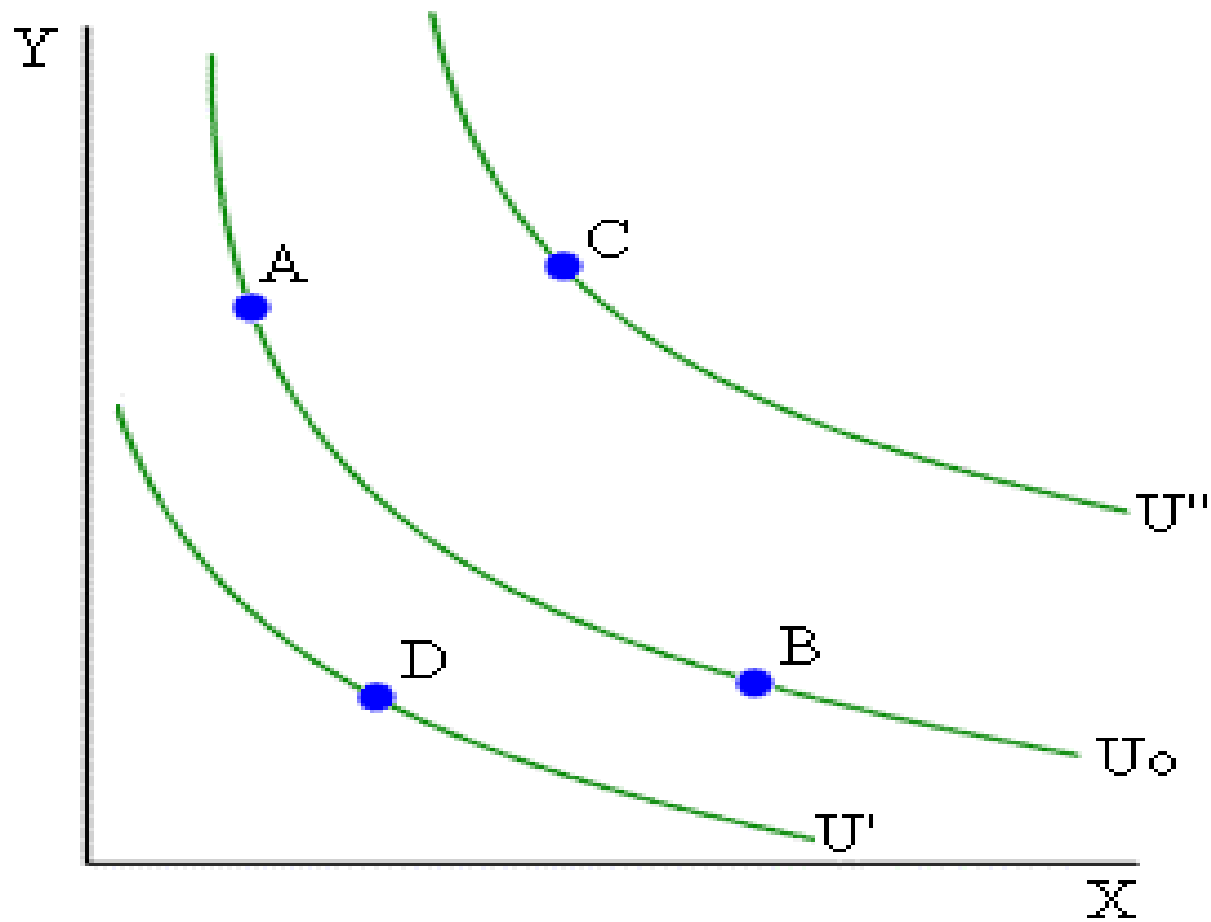
- Indifference curve – a graph of all of the combinations of goods that provide a given level of utility
- Any two points on an indifference curve provide the same level of utility



# Points on and off an indifference curve

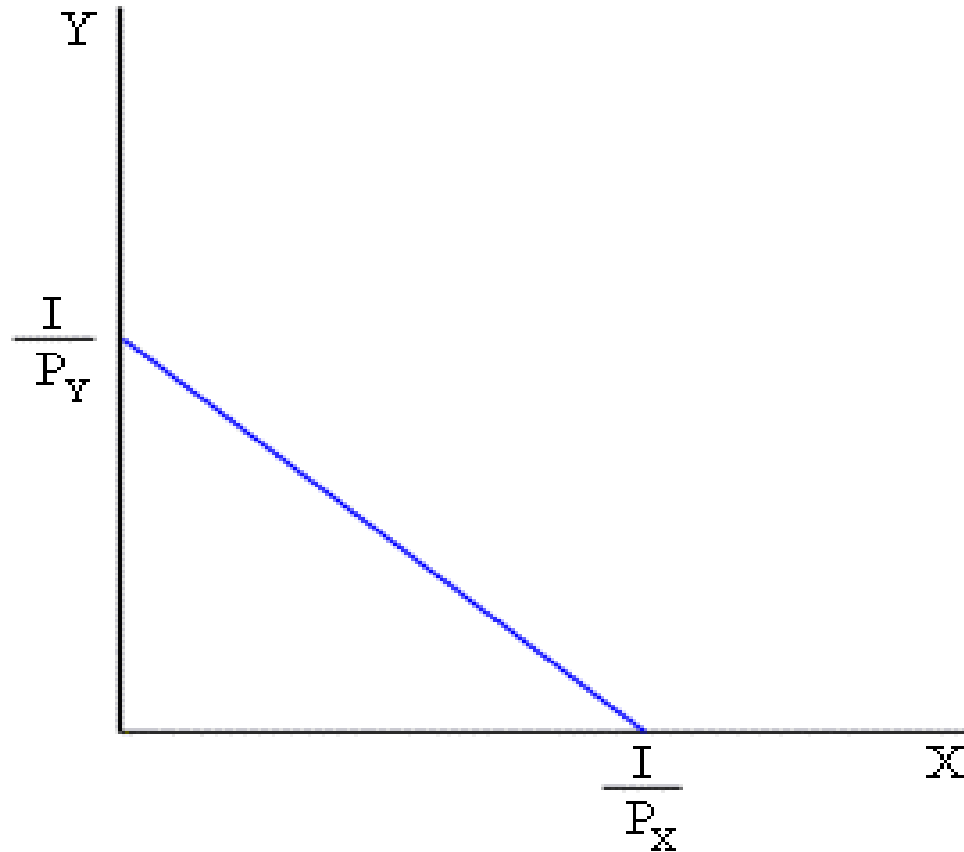


# Alternative levels of utility

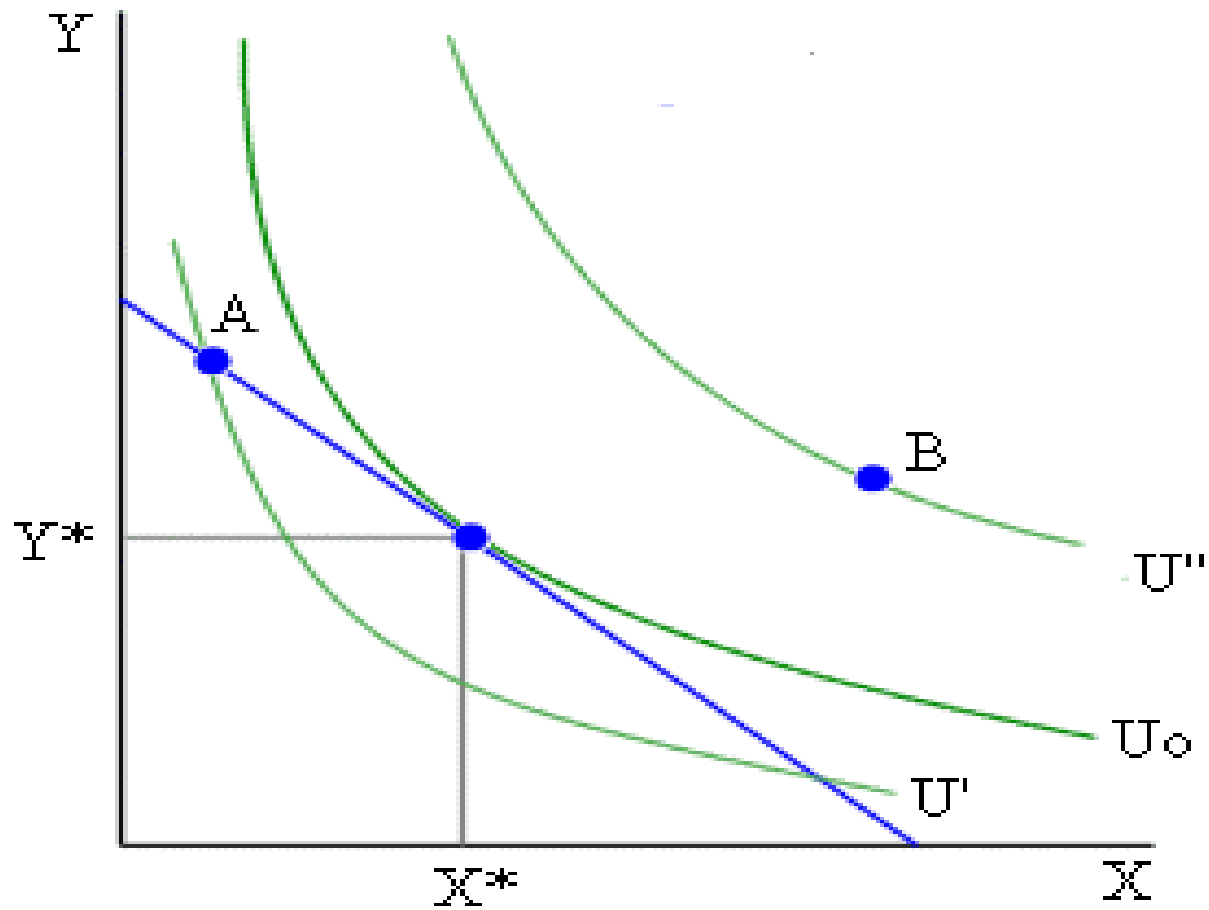


# Budget constraint

$$P_X X + P_Y Y = I$$



# Optimum consumption bundle



# Week 6

## Theory of production and cost of production

# Production

- The total amount of output produced by a firm is a function of the levels of input usage by the firm
- Total Physical Product (TPP) function - a short-run relationship between the amount of labor and the level of output, *ceteris paribus*.

# Total physical product (TPP)

Quantity of Labor	TPP
0	0
5	50
10	120
15	180
20	220
25	250
30	270
35	275
40	275
45	270

# Law of diminishing returns

- as the level of a variable input rises in a production process in which other inputs are fixed, output ultimately increases by progressively smaller increments.

# Average physical product (APP)

- $APP = TPP / \text{amount of input}$

Quantity of labor	TPP	APP
0	0	-
5	50	10
10	120	12
15	180	12
20	220	11
25	250	10
30	270	9
35	275	7.86
40	275	6.88
45	270	6

# Marginal physical product (MPP)

- the additional output that results from the use of an additional unit of a variable input, holding other inputs constant
- measured as the ratio of the change in output (TPP) to the change in the quantity of labor (or other input) used

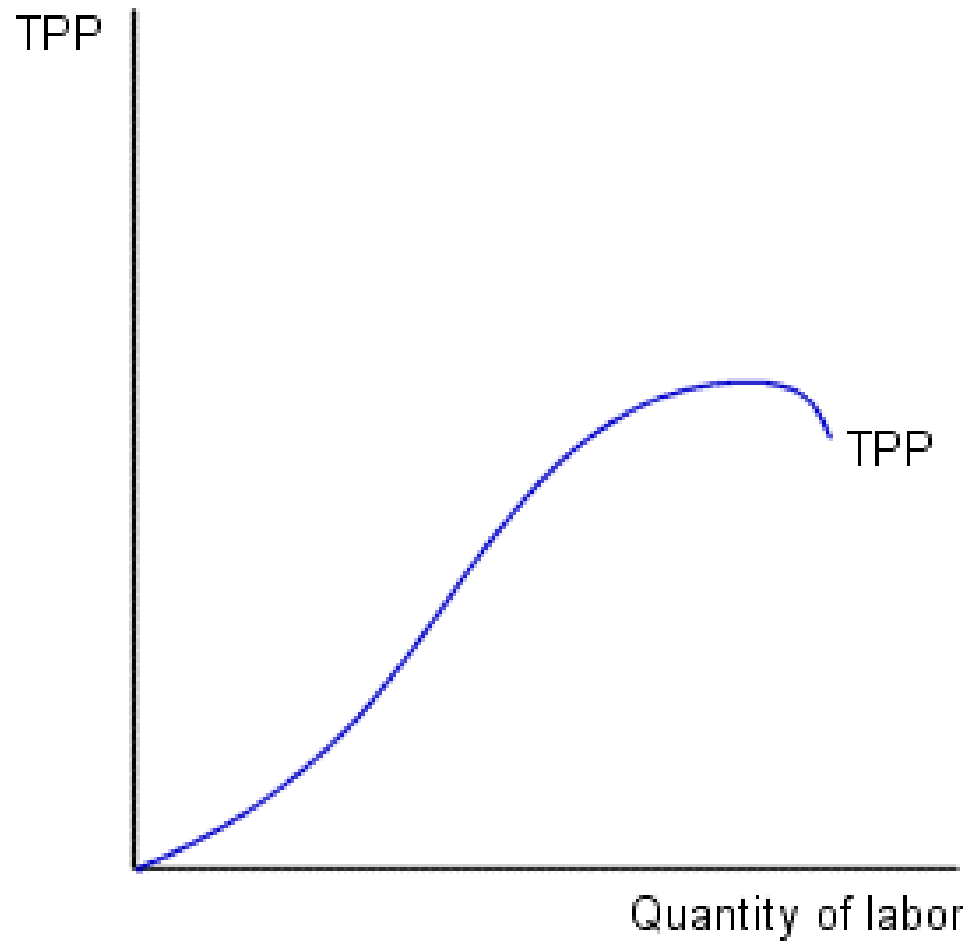
$$\text{MPP} = \frac{\Delta \text{ in TPP}}{\Delta \text{ in L}}$$

# Computation of MPP and APP

Quantity of labor	TPP	APP	MPP
0	0	-	
5	50	10	10
10	120	12	14
15	180	12	12
20	220	11	8
25	250	10	6
30	270	9	4
35	275	7.86	1
40	275	6.88	0
45	270	6	-1

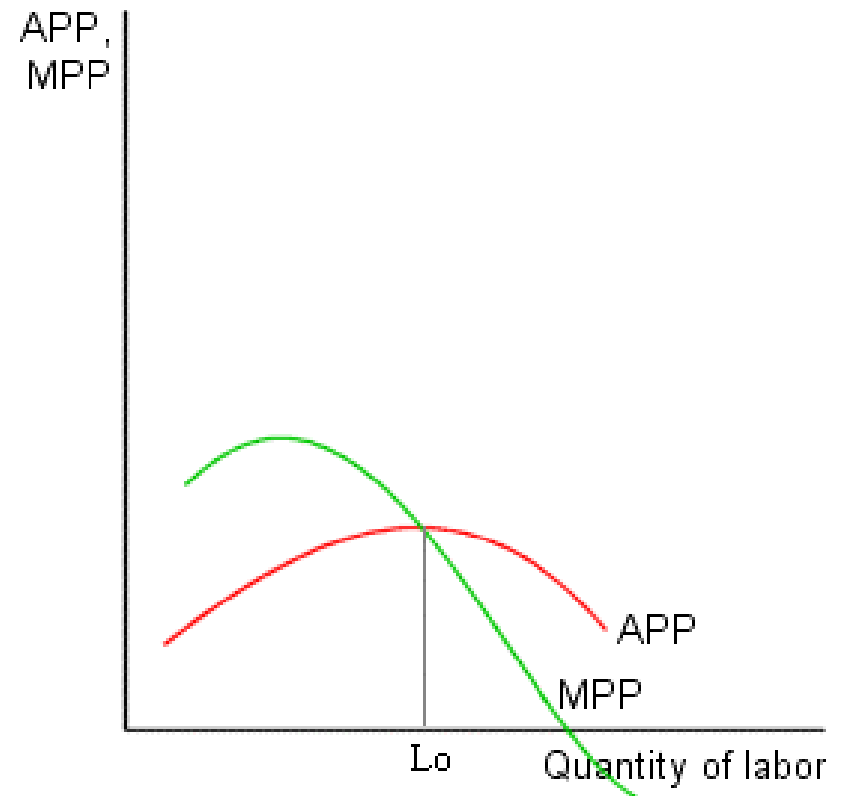
- Note that the MPP is positive when an increase in labor results in an increase in output; a negative MPP occurs when output falls when additional labor is used.

# TPP



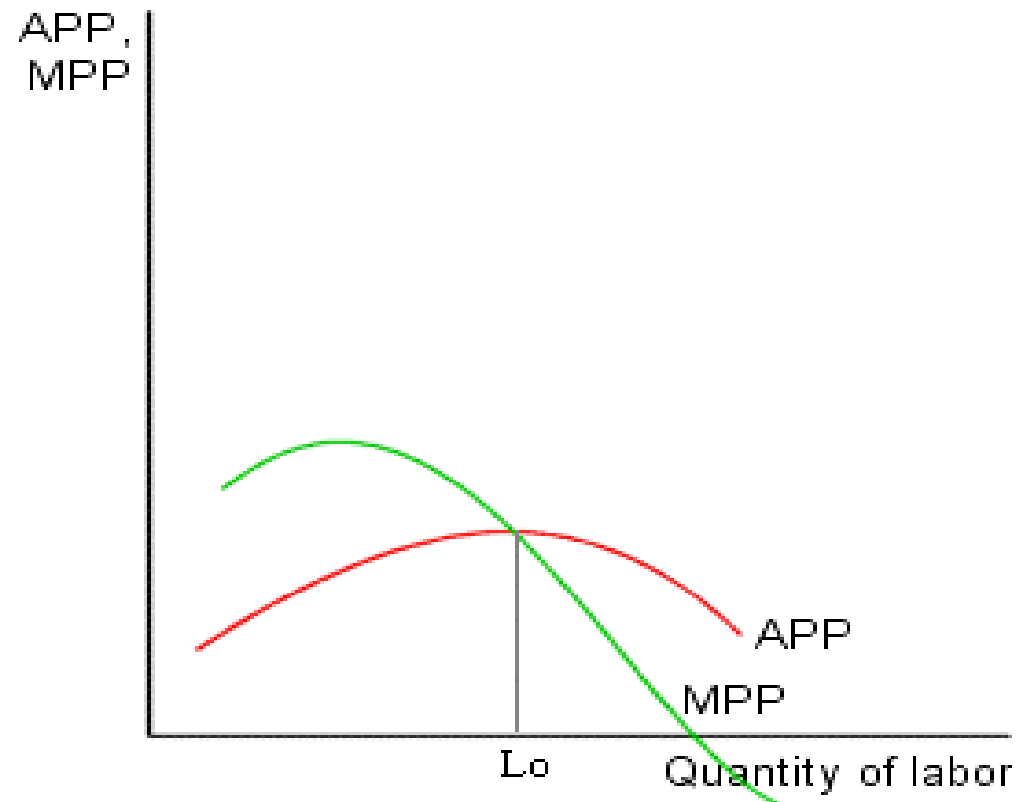
# Shape of MPP curve

- MPP rises when TPP increases at an increasing rate, and declines when TPP increases at a decreasing rate.
- MPP is negative if TPP declines when labor use rises



# Relationship of APP and MPP

- APP rises when  $MPP > APP$
- APP falls when  $MPP < APP$
- APP is maximized when  $MPP = APP$



# Total costs

- Short run
- Long run
- Short run costs:
  - fixed costs – costs that do not vary with the level of output. Fixed costs are the same at all levels of output (even when output equals zero).
  - variable costs – costs that vary with the level of output (= 0 when output is zero)

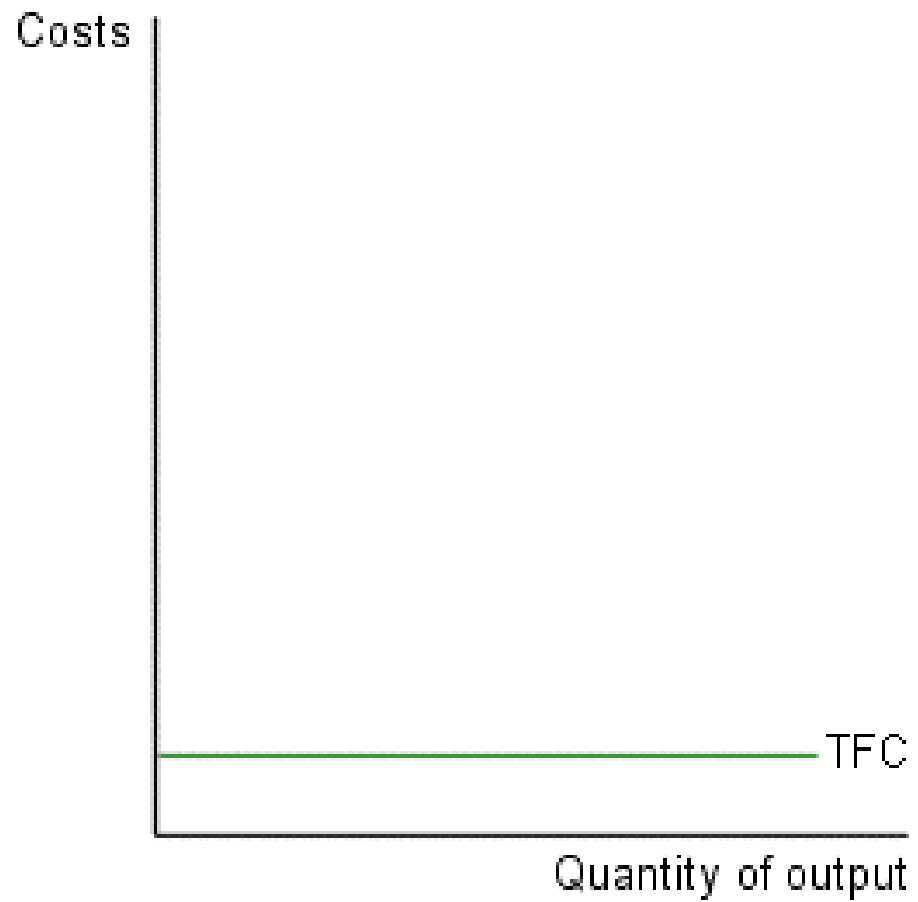
# Example

Q	TFC	TVC
0	10	0
10	10	30
20	10	50
30	10	80
40	10	120
50	10	190
60	10	290

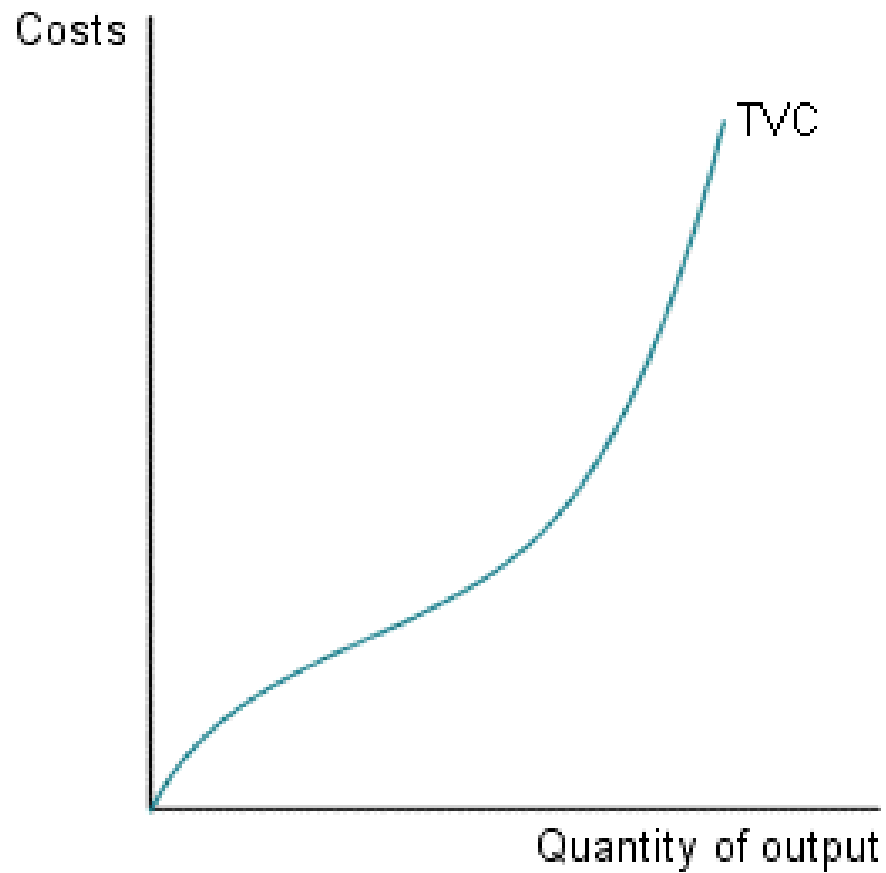
## Example (cont.)

Q	TFC	TVC	TC
0	10	0	10
10	10	30	40
20	10	50	60
30	10	80	90
40	10	120	130
50	10	190	200
60	10	290	300

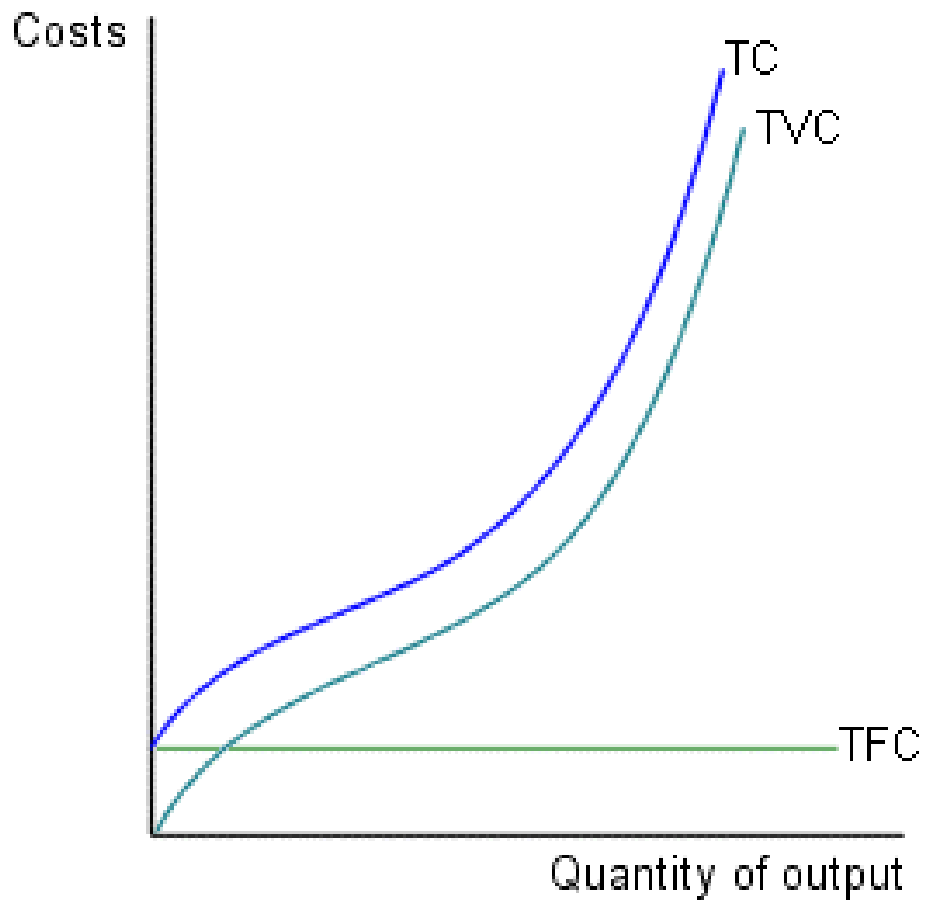
# Fixed costs (FC)



# Variable costs (VC)



# TC, TVC, and TFC



# Average fixed cost (AFC)

- Average fixed cost (AFC) =  $TFC / Q$

Q	TFC	TVC	TC	AFC
0	10	0	10	-
10	10	30	40	1.0
20	10	50	60	0.5
30	10	80	90	0.33
40	10	120	130	0.25
50	10	190	200	0.2
60	10	290	300	0.167

# Average variable cost (AVC)

- Average variable cost (AVC) =  $TVC / Q$

Q	TFC	TVC	TC	AFC	AVC
0	10	0	10	-	-
10	10	30	40	1.0	3.0
20	10	50	60	0.5	2.5
30	10	80	90	0.33	2.67
40	10	120	130	0.25	3.0
50	10	190	200	0.2	3.8
60	10	290	300	0.167	4.83

# Average total cost (ATC)

- Average total cost (ATC) =  $TC / Q$
- $ATC = AFC + AVC$  (since  $TFC + TVC = TC$ )

Q	TFC	TVC	TC	AFC	AVC	ATC
0	10	0	10	-	-	-
10	10	30	40	1.0	3.0	4.0
20	10	50	60	0.5	2.5	3.0
30	10	80	90	0.33	2.67	3.0
40	10	120	130	0.25	3.0	3.25
50	10	190	200	0.2	3.8	4.0
60	10	290	300	0.167	4.83	5.0

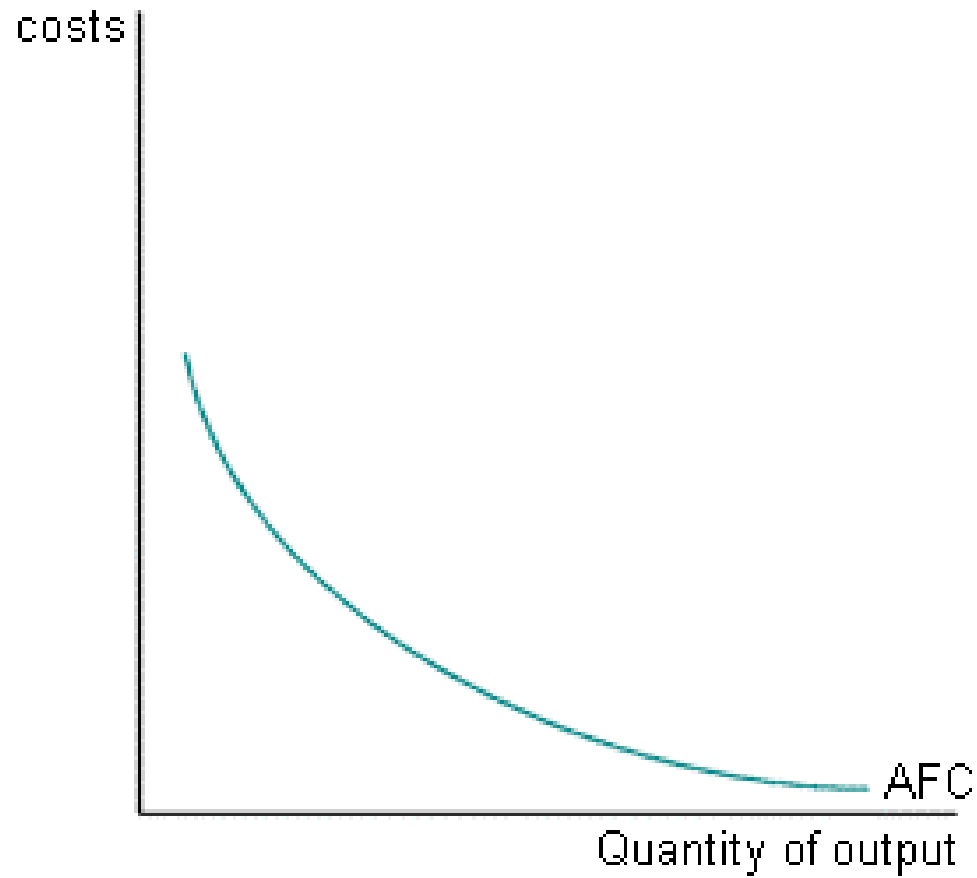
# Marginal cost (MC)

- Marginal cost (MC) = cost of an additional unit of output

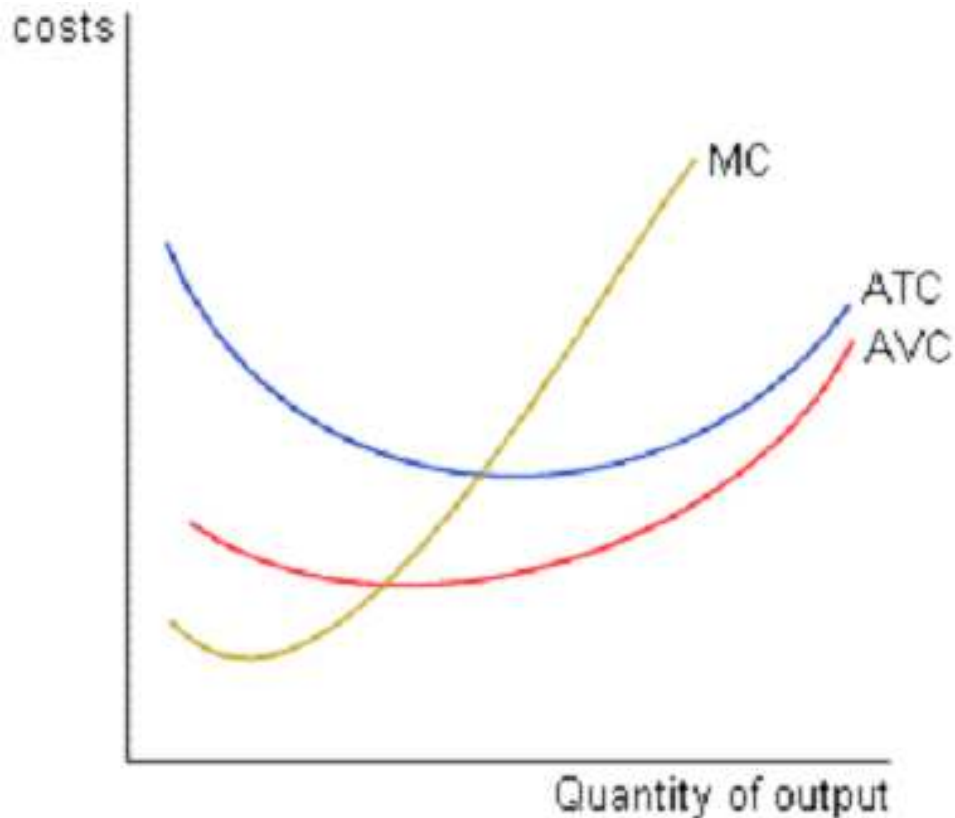
$$MC = \frac{\Delta \text{ in TC}}{\Delta \text{ in Q}}$$

Q	TFC	TVC	TC	MC
0	10	0	10	3
10	10	30	40	2
20	10	50	60	3
30	10	80	90	4
40	10	120	130	7
50	10	190	200	10
60	10	290	300	

# Average fixed cost



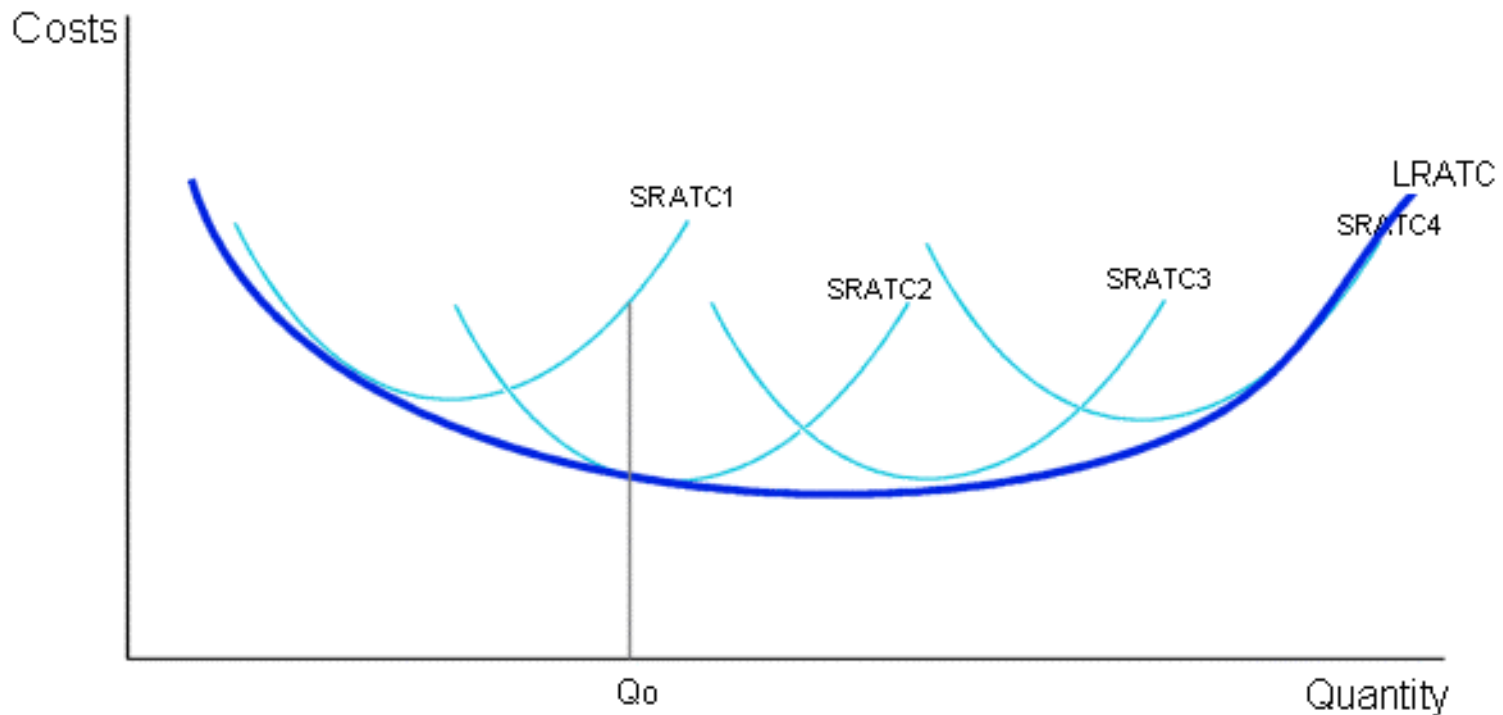
# AVC, ATC, and MC



- Note that the MC curve intersects the AVC and ATC at their respective minimum points

# Long-run costs

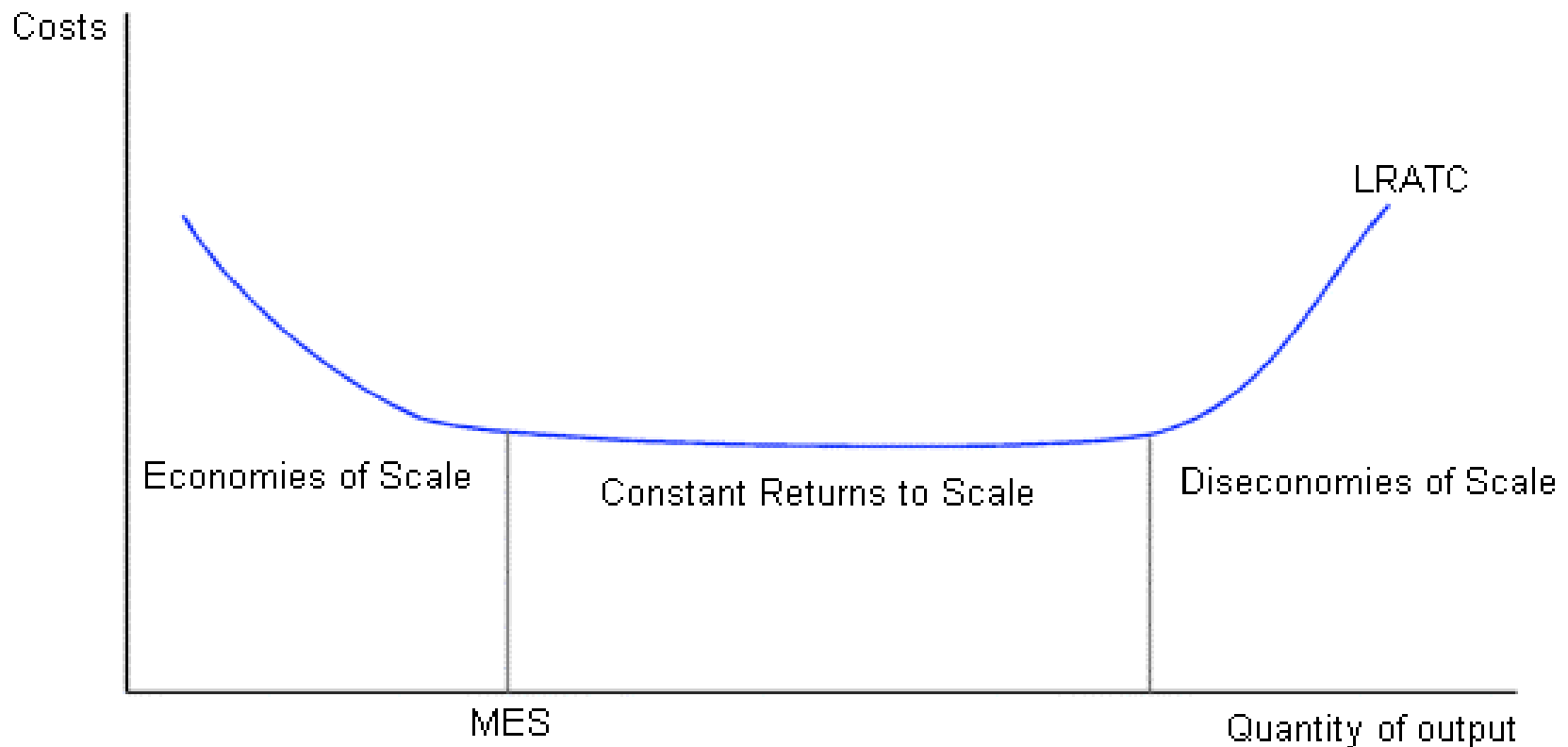
- In the long run, a firm may choose its level of capital, and will select a size of firm that provides the lowest level of ATC.



# Economies and diseconomies of scale

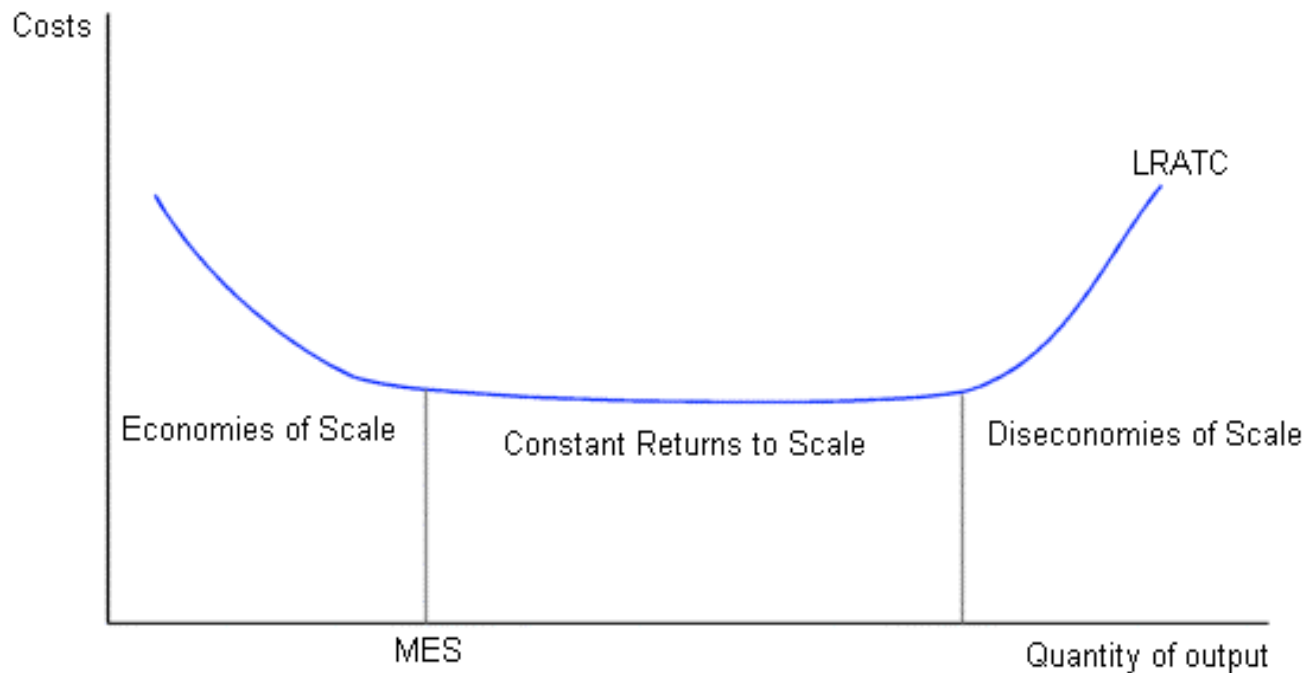
- Economies of scale – factors that lower average cost as the size of the firm rises in the long run
  - Sources: specialization and division of labor, indivisibilities of capital, etc.
- Diseconomies of scale – factors that raise average cost as the size of the firm rises in the long run
  - Sources: increased cost of managing and coordination as firm size rises
- Constant returns to scale – average costs do not change as firm size changes

# Long-run average total cost (LRATC)



# Minimum efficient scale

- Minimum efficient scale = lowest level of output at which LRATC is minimized



Week 7

Types of Business units

# Two Sectors

The economy can be divided into two sectors:

- The Private Sector
- The Public Sector

# The Private Sector

- Private individuals and firms that are owned by private individuals
- Firms in the private sector include:
  - Sole Traders
  - Private Limited Companies (Ltd)
  - Partnerships
  - Public Limited Companies (PLC)

# The Public Sector

- Made up of central government, local government, and businesses that are owned by government

# Private Sector Firms

One of the key differences is between:

- Sole traders and partnerships whose liability is unlimited
- And
- Private Limited and Public Limited Companies, who have 'limited liability'

# Other Business Types

- Co-operatives are owned by their staff, who are 'members' of the firm
- Profits are shared amongst the members
- Losses too must be shared

# Franchises

- Many businesses today are franchises
- A business idea is licensed to a franchisee
- The owners of the brand receive a license fee
- The franchisee gains the right to use the business brand

# Not For Profit Businesses

- Many charity-based business organisations are run as 'not for profit' operations
- They typically receive donations or funds from groups or government
- Any financial surplus is ploughed back into the business
- The organisation does not aim to generate profits

Week 8

Market structure

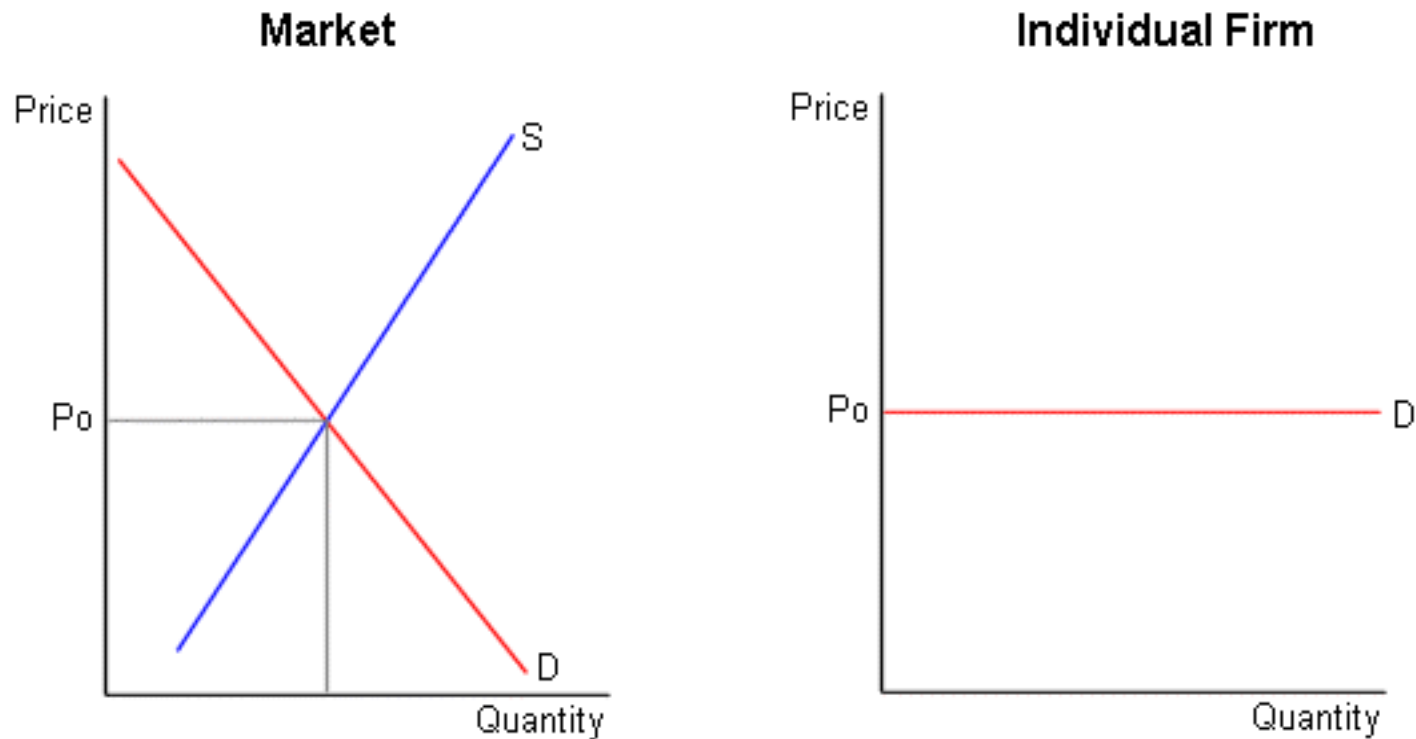
Perfect competition

# Perfectly competitive market

- many buyers and sellers,
- identical (also known as homogeneous) products,
- no barriers to either entry or exit, and
- buyers and sellers have perfect information.

# Demand curve facing a single firm

- no individual firm can affect the market price
- demand curve facing each firm is perfectly elastic



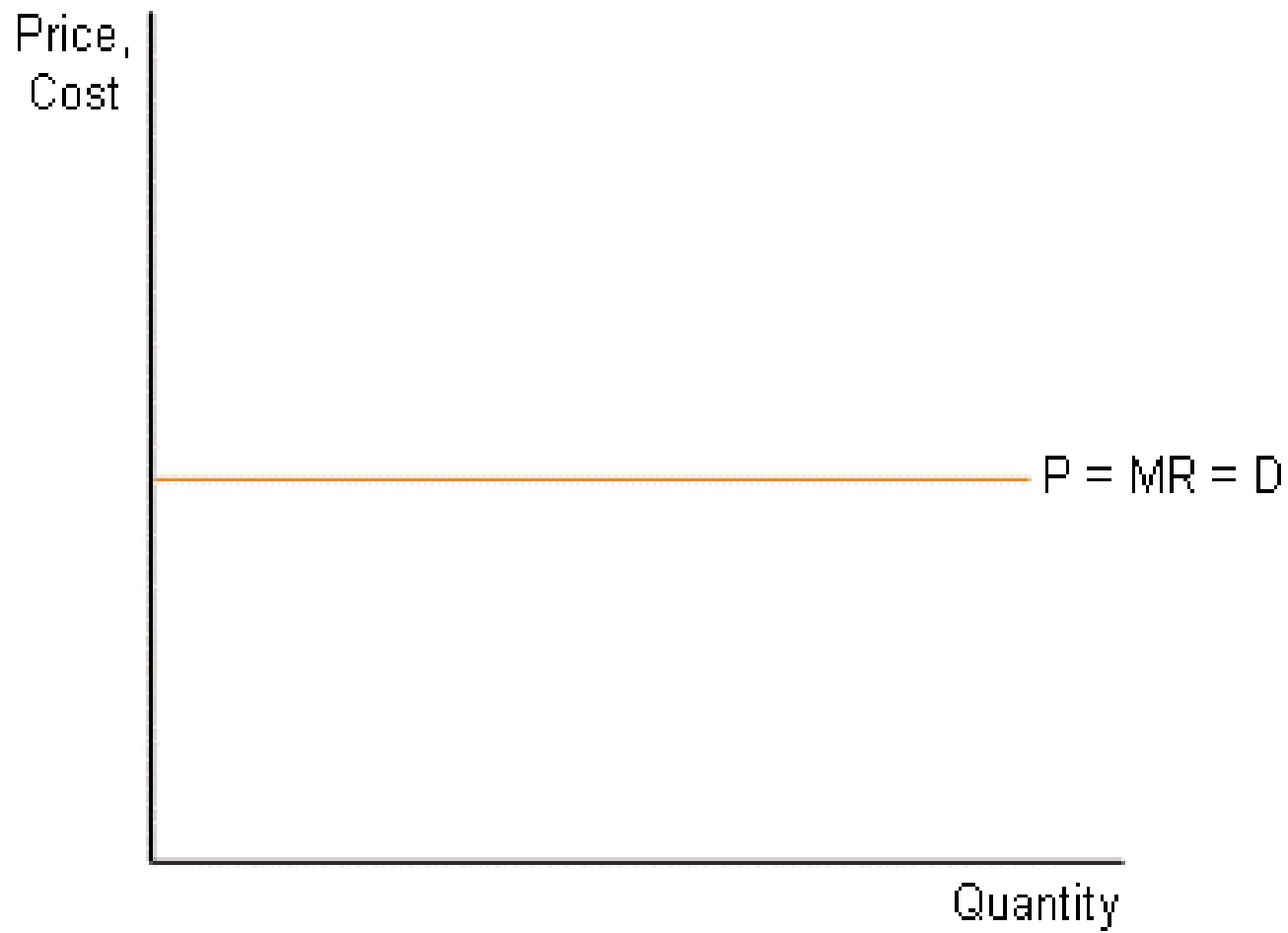
# Profit maximization

- produce where  $MR = MC$

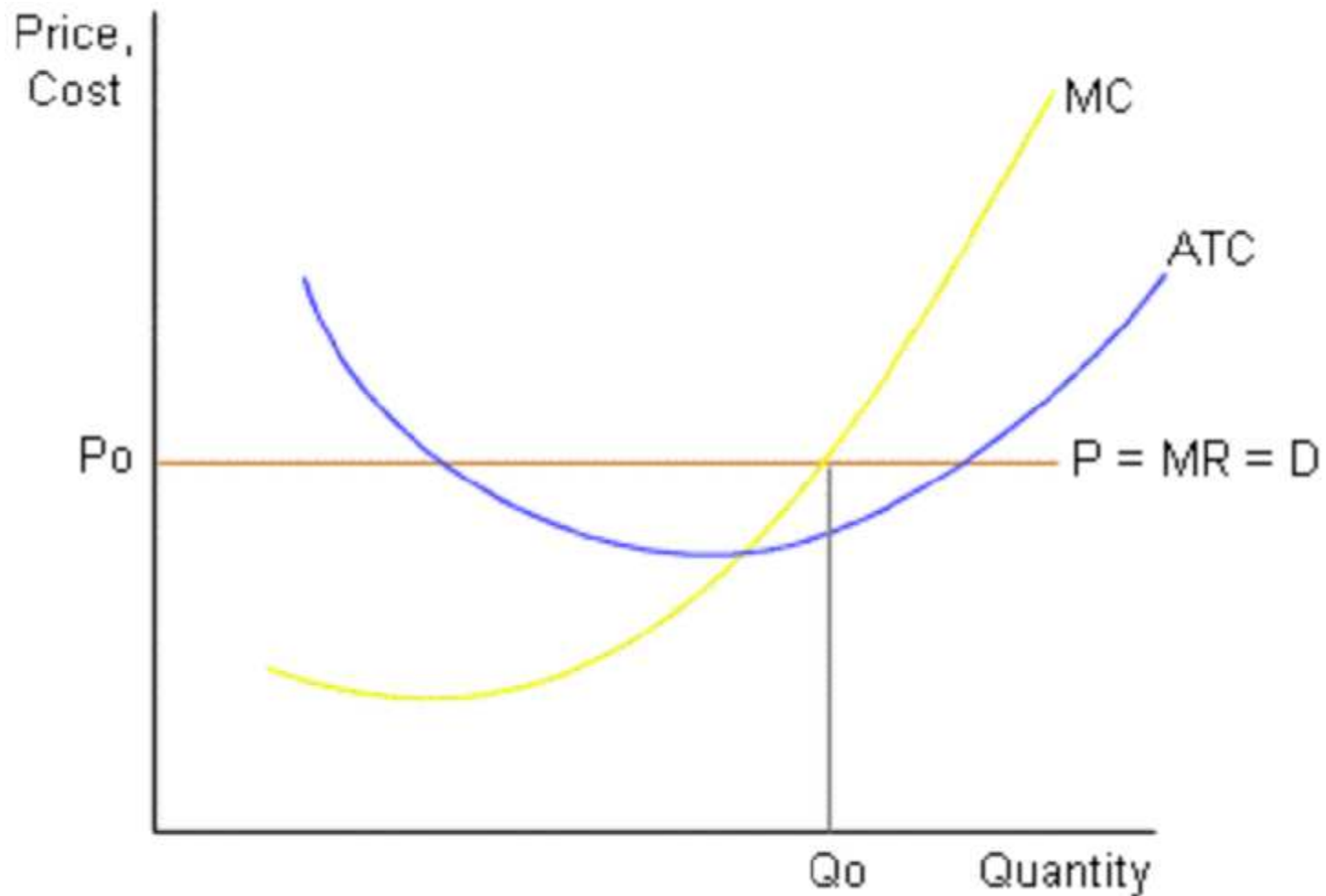
$$\text{Marginal revenue} = \frac{\Delta TR}{\Delta Q}$$

$$\text{Marginal cost} = \frac{\Delta TC}{\Delta Q}$$

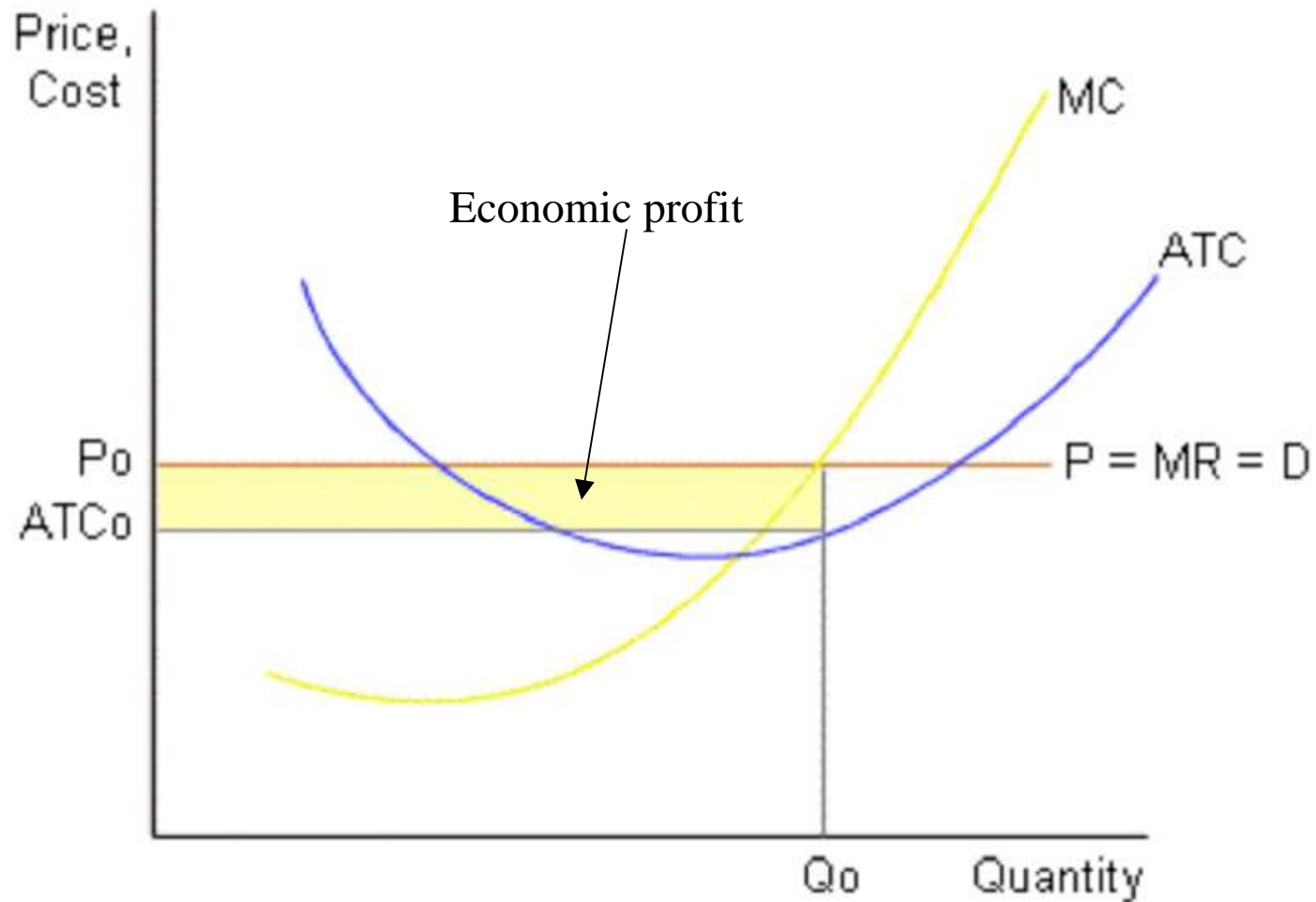
$$P = MR$$



# Profit-maximizing level of output



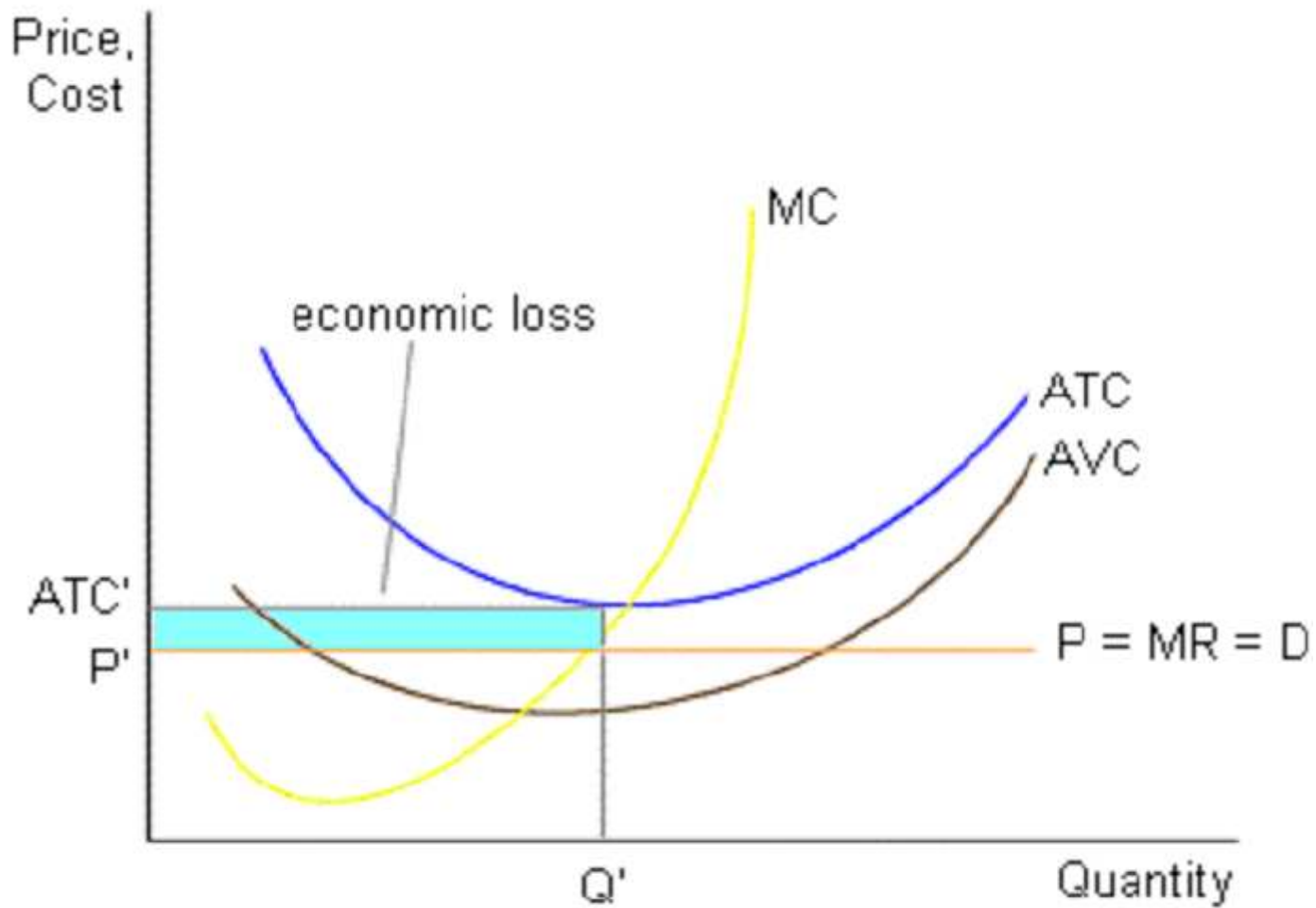
# Economic Profits $> 0$



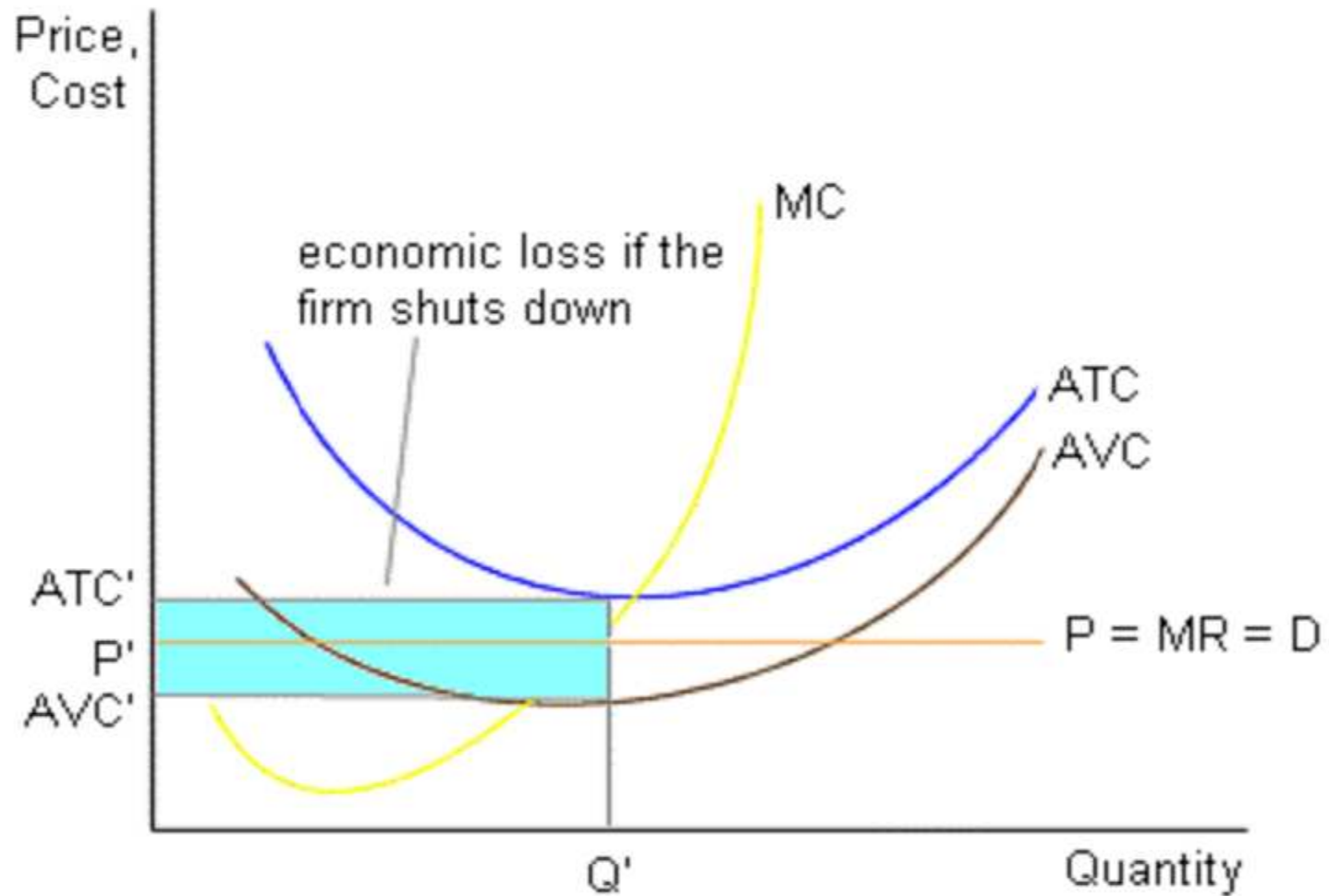
# Loss minimization and the shut-down rule

- Suppose that  $P < ATC$ . Since the firm is experiencing a loss, should it shut down?
- Loss if shut down = fixed costs
- Shut down in the short run only if the loss that occurs where  $MR = MC$  exceeds the loss that would occur if the firm shuts down (= fixed cost)
- Stay in business if  $TR > VC$ . This implies that  $P > AVC$ . Shut down if  $P < AVC$ .

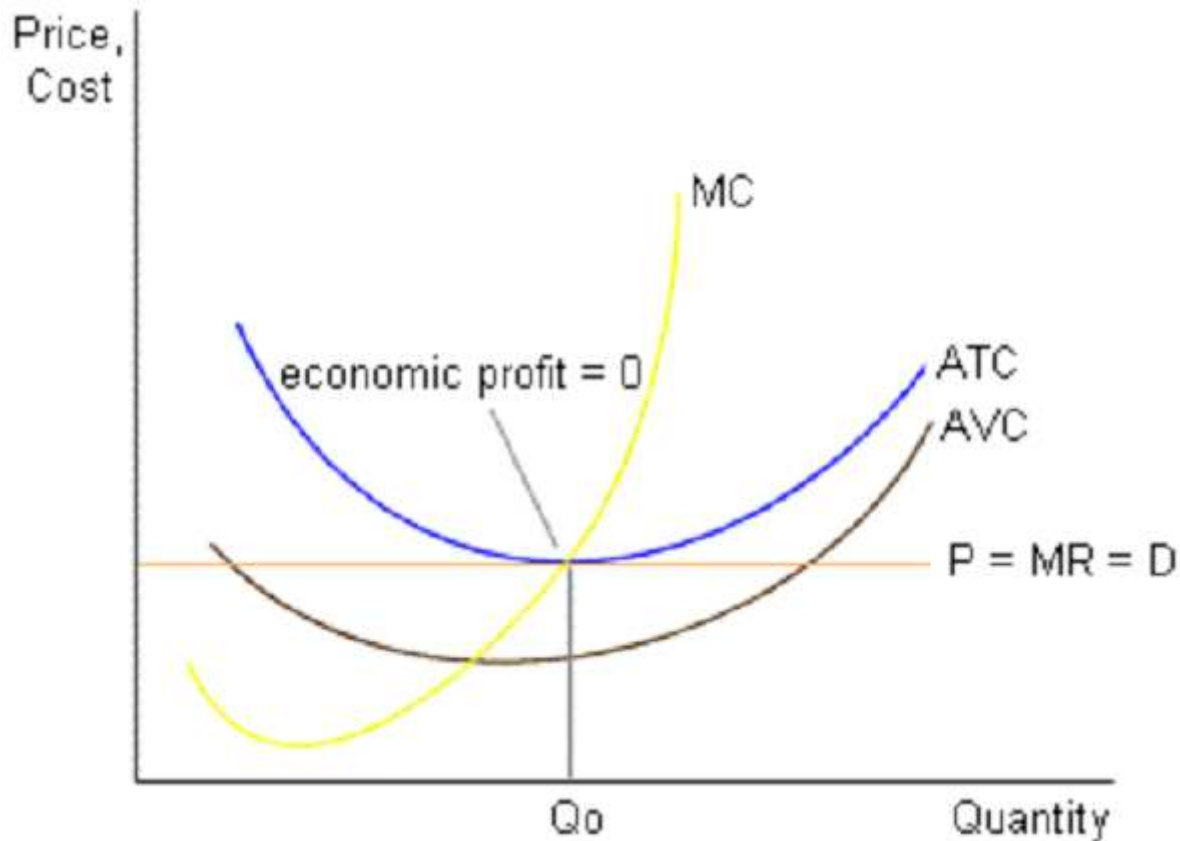
# Economic loss ( $AVC < P < ATC$ )



# Loss if shut down

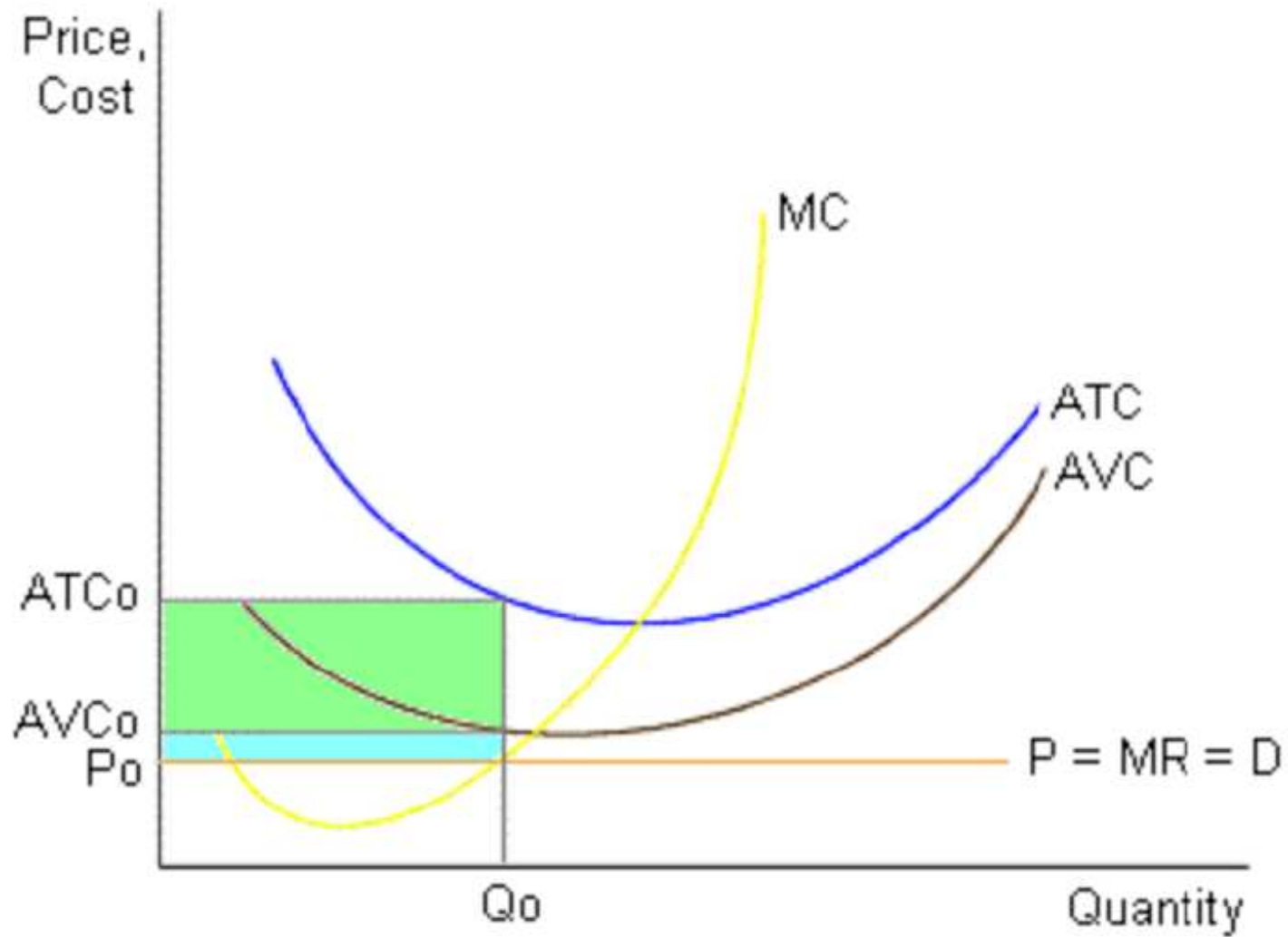


# Break-even price

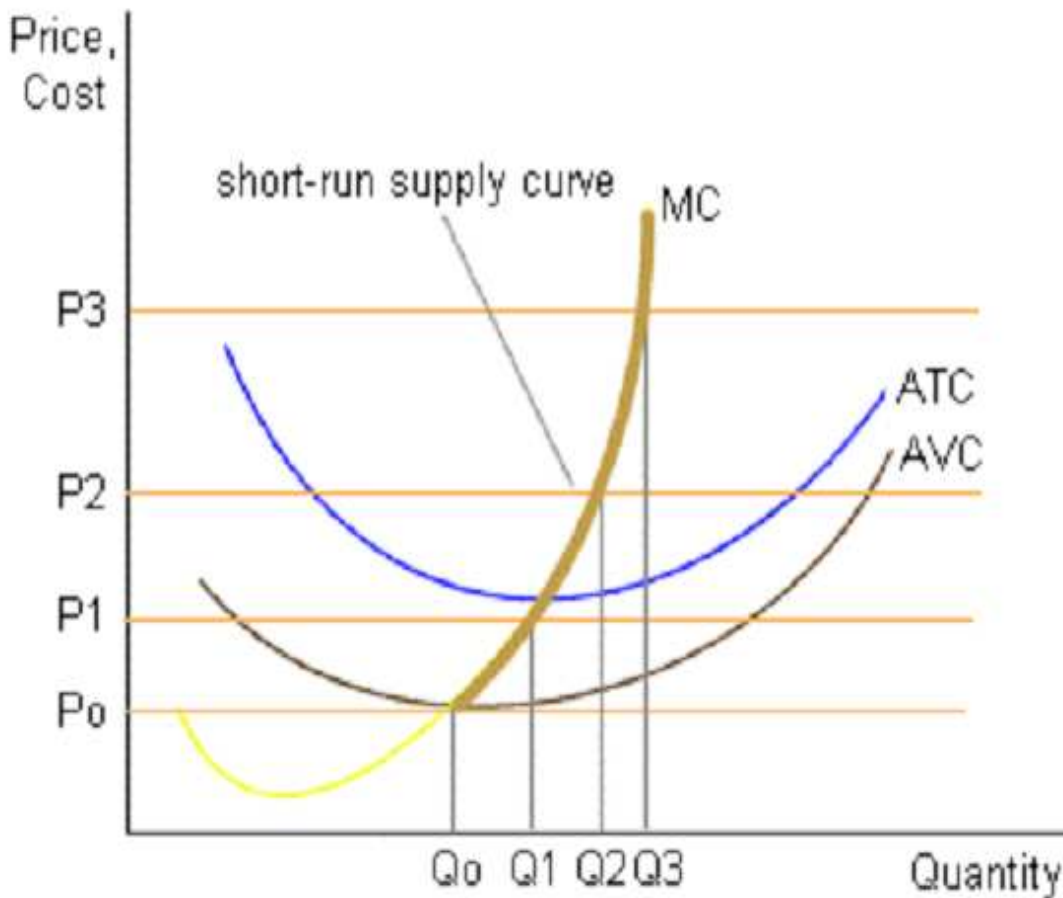


- If price = minimum point on ATC curve, economic profit = 0. Owners receive normal profit. No incentive for firms to either enter or leave the market.

$$P < AVC$$



# Short-run supply curve



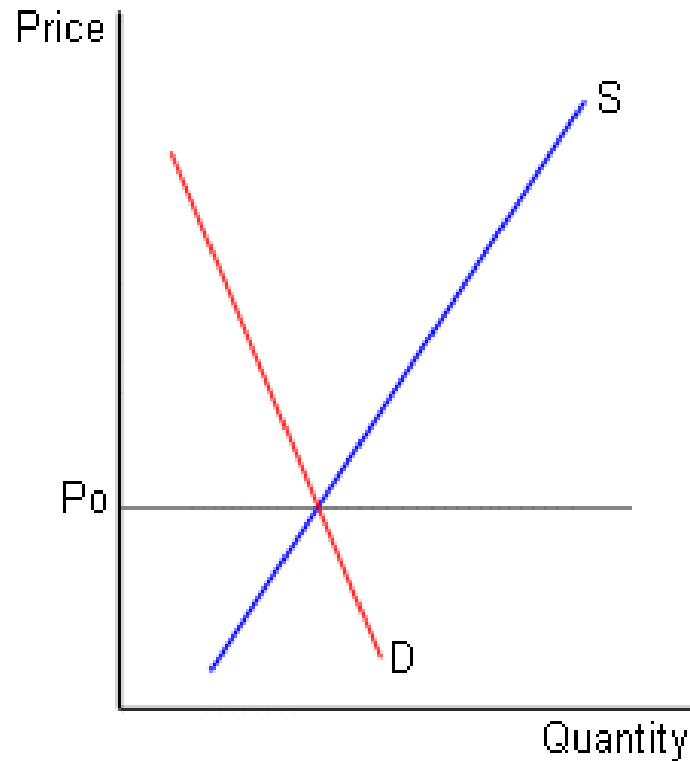
A perfectly competitive firm will produce at the level of output at which  $P = MC$ , as long as  $P > AVC$ .

# Long run

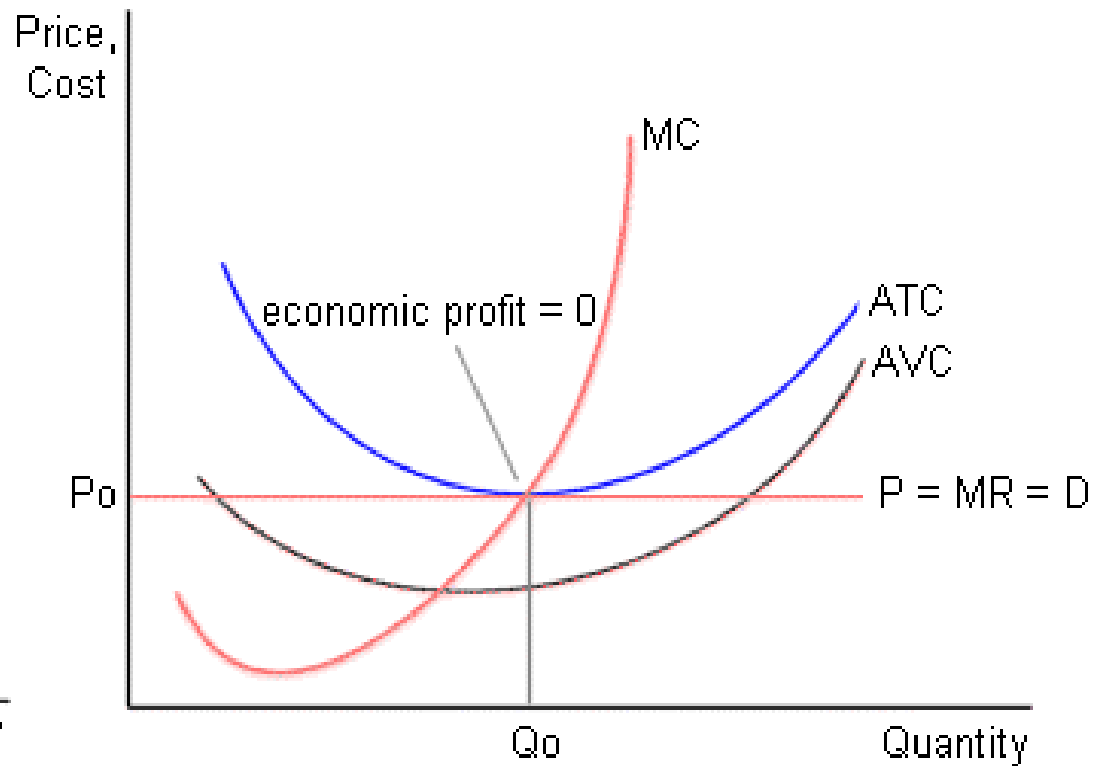
- Firms enter if economic profits  $> 0$ 
  - market supply increases
  - price declines
  - profit declines until economic profit equals zero (and entry stops)
- Firms exit if economic losses occur
  - market supply decreases
  - price rises
  - losses decline until economic profit equals zero

# Long-run equilibrium

Market



Individual Firm



# Long-run equilibrium and economic efficiency

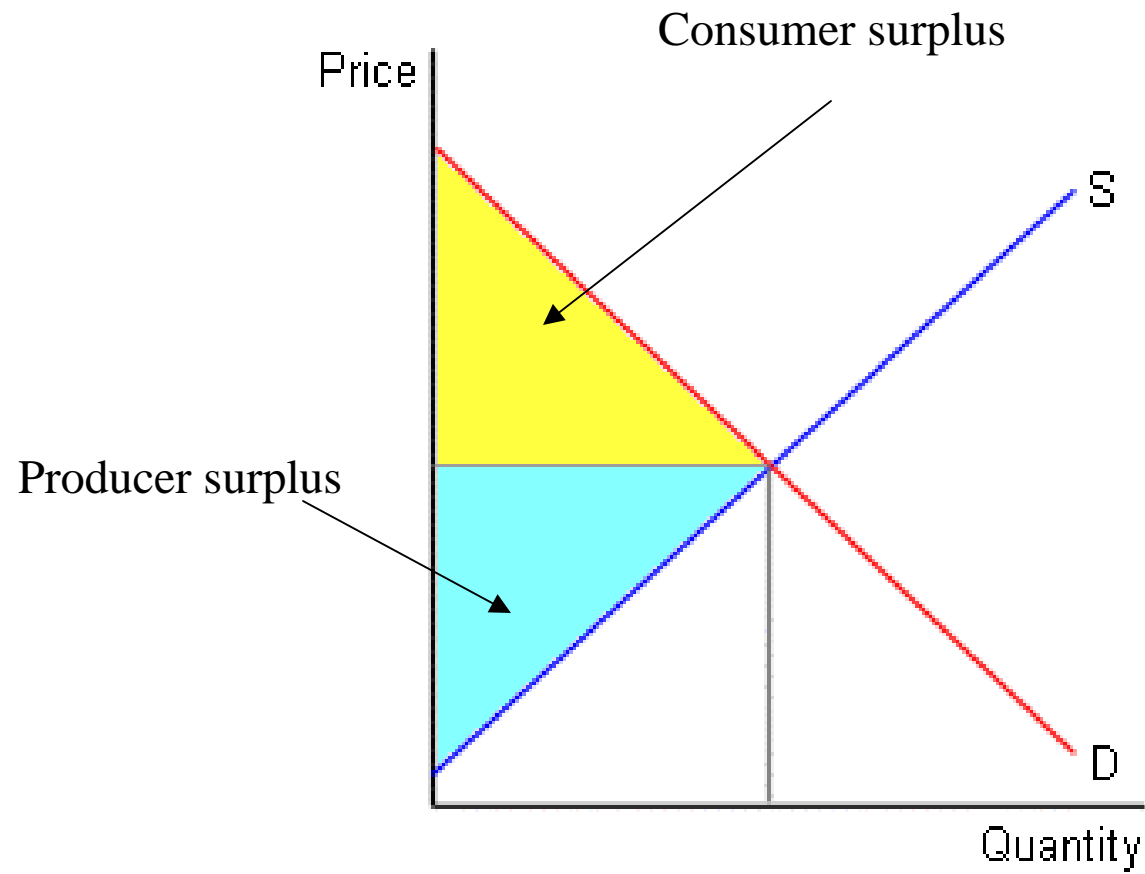
- Two desirable efficiency properties (assuming no market failure)
  - $P = MC$  (Social marginal benefit = social marginal cost)
  - $P = \text{minimum ATC}$

# Consumer and producer surplus

- Consumer surplus = net gain from trade received by consumers ( $MB > P$  for consumers up to the last unit consumed)
- Producer surplus = net gain received by producers ( $P > MC$  up to the last unit sold)

# Consumer and producer surplus

- Gains from trade = consumer surplus + producer surplus



Week 9 & 10  
Monopoly & Private and  
Government Monopolies

# Main Characteristics of Monopoly

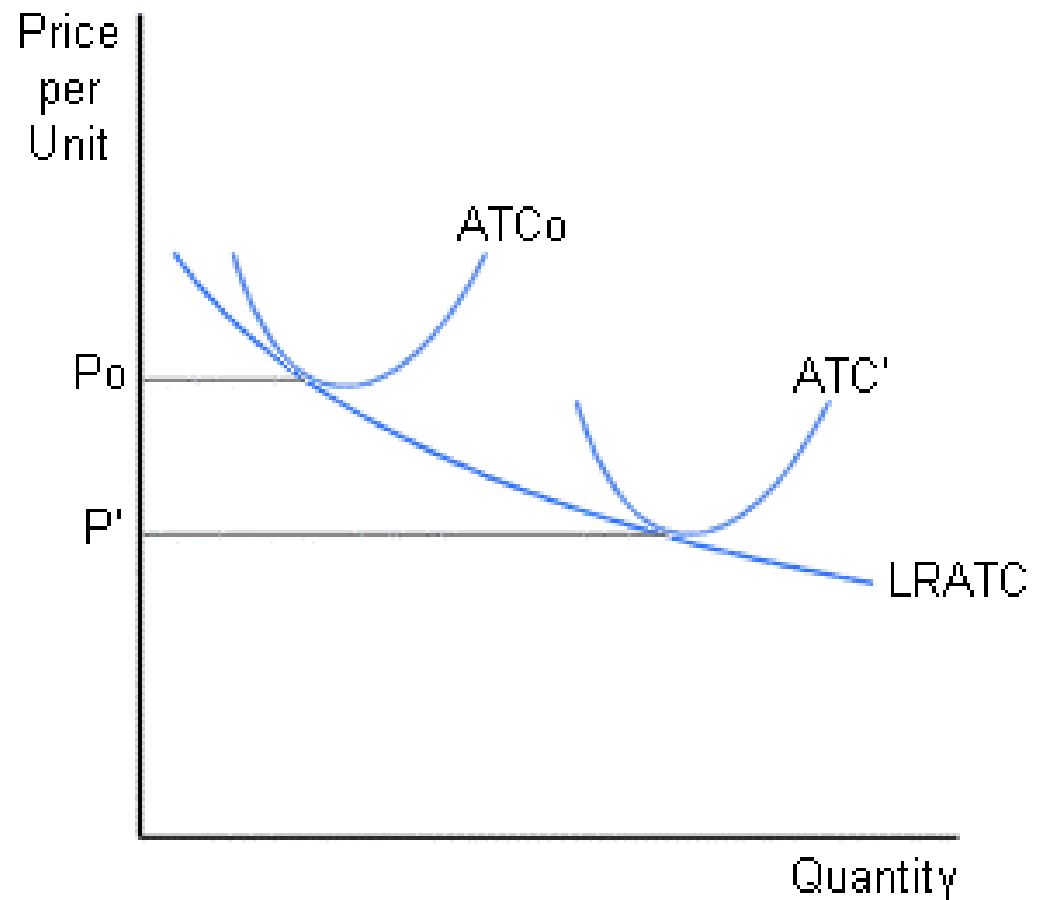
- single seller for a product
- many buyers are available
- barriers to entry
- no close substitutes
- Monopolist can only control price or quantity but not both

# Barriers to entry

- economies of scale
- actions by firms
- actions by government

# Economies of scale – natural monopolies

- Natural monopolies are often regulated monopolies



# Actions by firms to create and protect monopoly power

- patents and copyrights,
- high advertising expenditures result in high sunk costs (costs that are not recoverable on exit), and
- illegal actions designed to restrict competition.

# Monopolies created by government action

- patents and copyrights,
- government created franchises, and
- licensing.

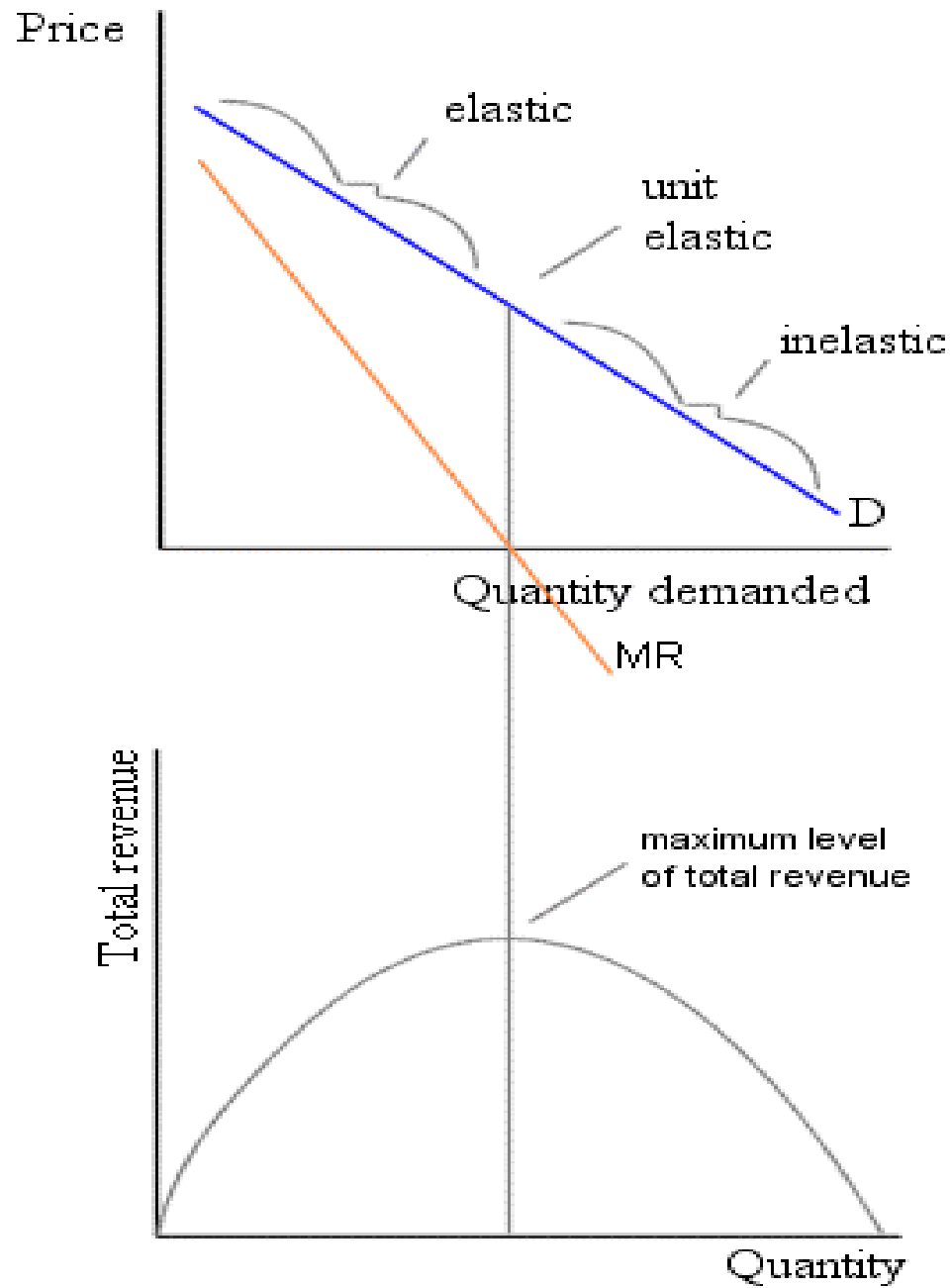
# Local monopoly

- Local monopoly – a monopoly that exists in a local geographical area (*e.g.*, local newspapers)

# Price elasticity and MR

- As noted earlier, since the demand curve facing a monopoly firm is downward sloping,  $MR < P$
- $MR > 0$  when demand is elastic
- $MR = 0$  when demand is unit elastic
- $MR < 0$  when demand is inelastic

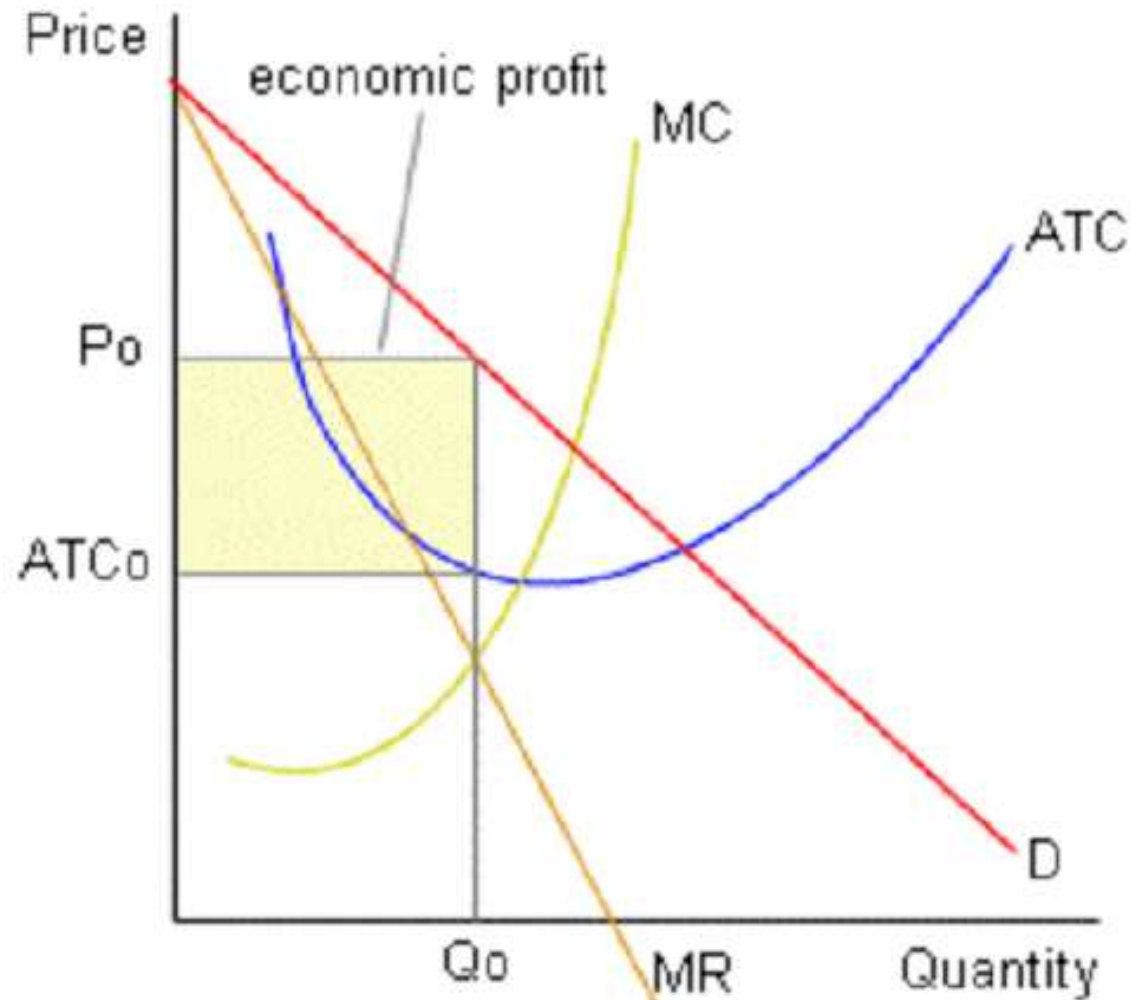
# Elasticity and total revenue



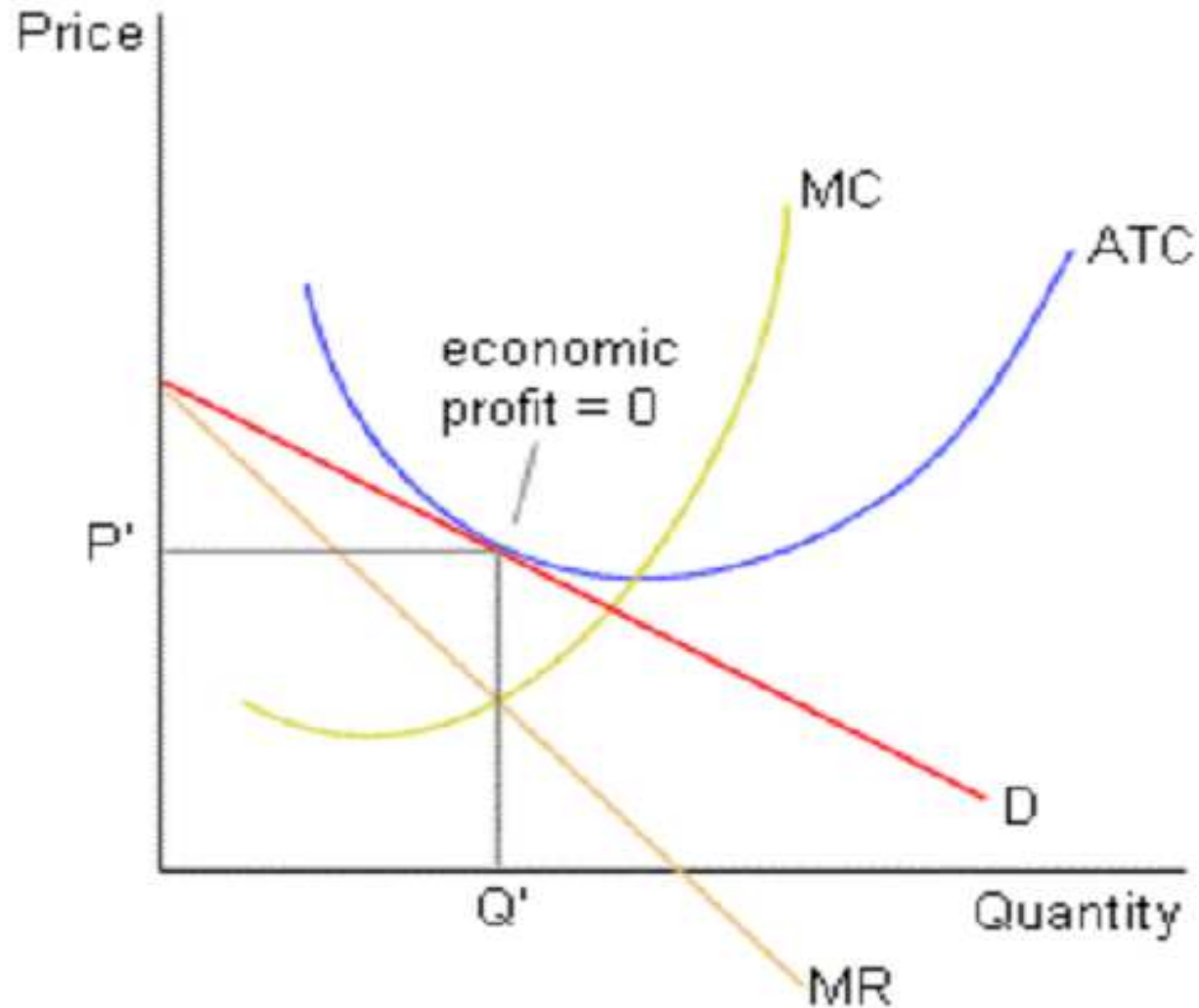
# Average revenue

- As in all other market structures,  $AR=P$   
(note that  $AR = TR/Q = (P \times Q) / Q = P$ )
- The price given by the demand curve is the average revenue that the firm receives at each level of output.

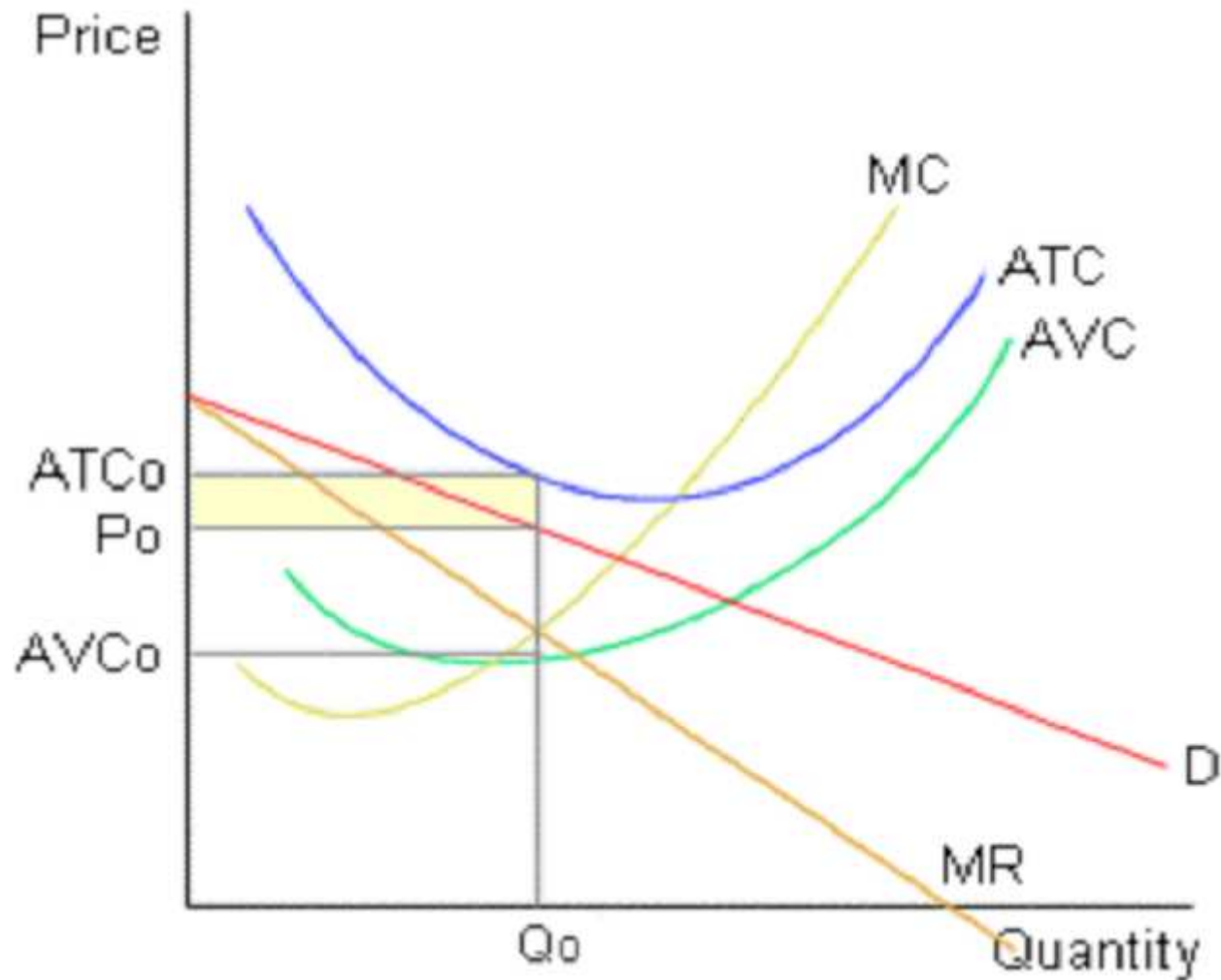
# Monopoly receiving supernormal profits



# Monopoly receiving normal profits



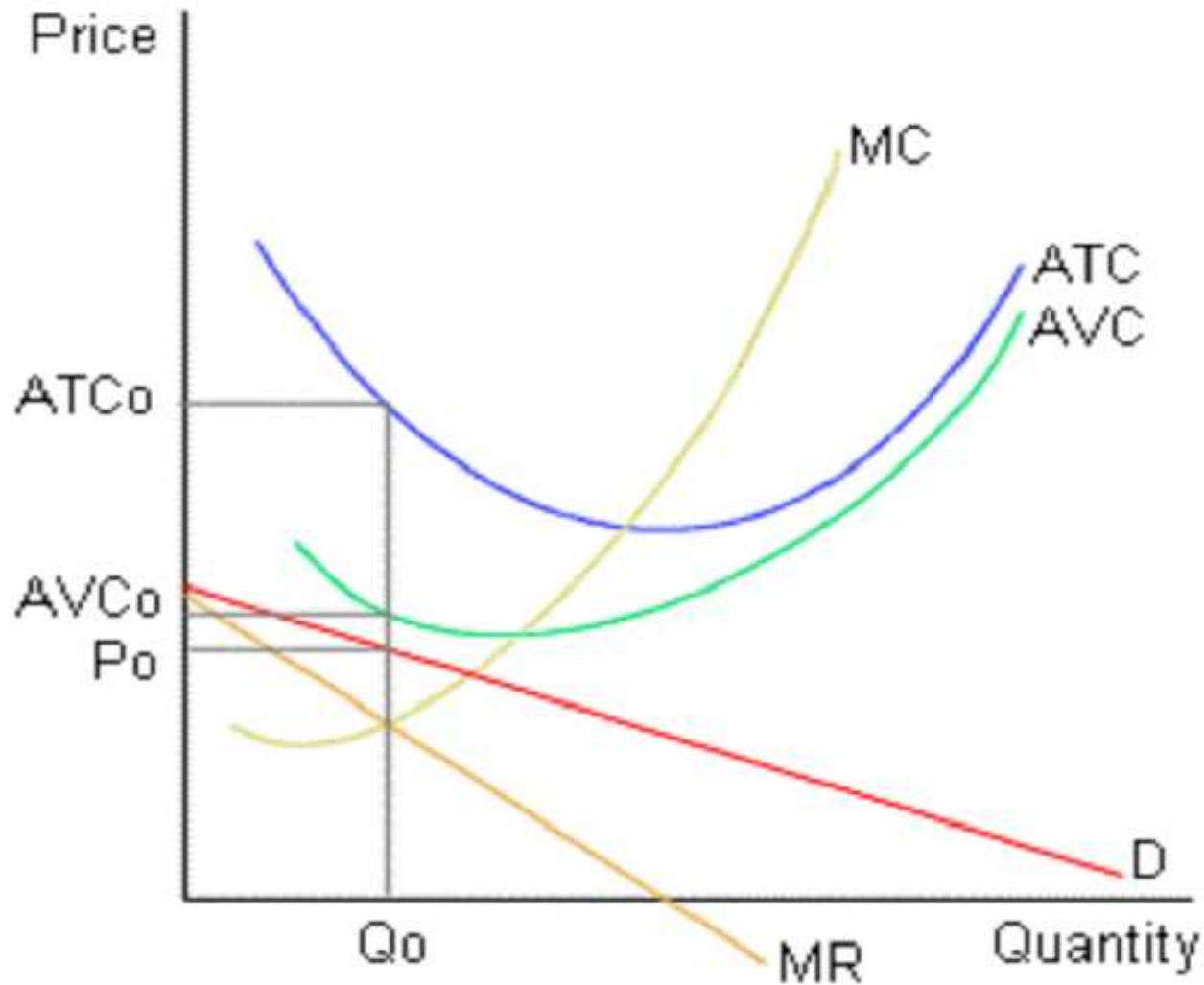
# Monopoly receiving subnormal profits - loss



# Conclusion

- In both long run and short run, the monopoly firm will be earning supernormal profits because there is no competition and barriers to entry.

# Monopolist that shuts down in the short run



# Monopoly price setting

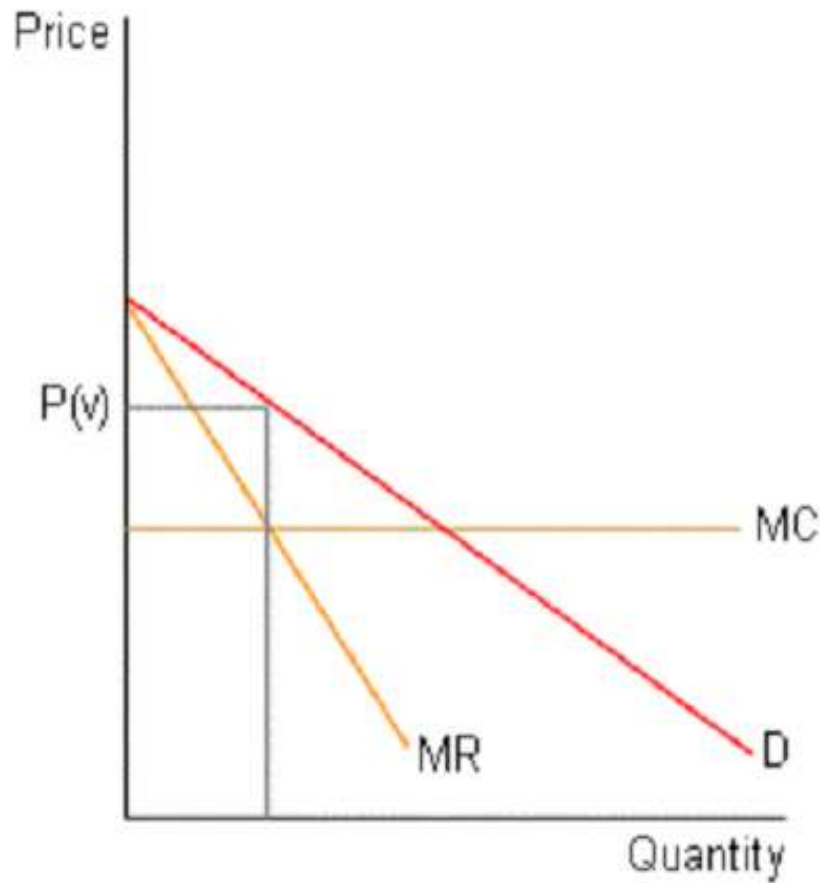
- There is a unique profit-maximizing price and output level for a monopoly firm.
- It is optimal to produce at the level of output at which  $MR = MC$  and to charge the price given by the demand curve at this output level.
- Charging a higher (or lower) price results in lower profits.

# Price discrimination

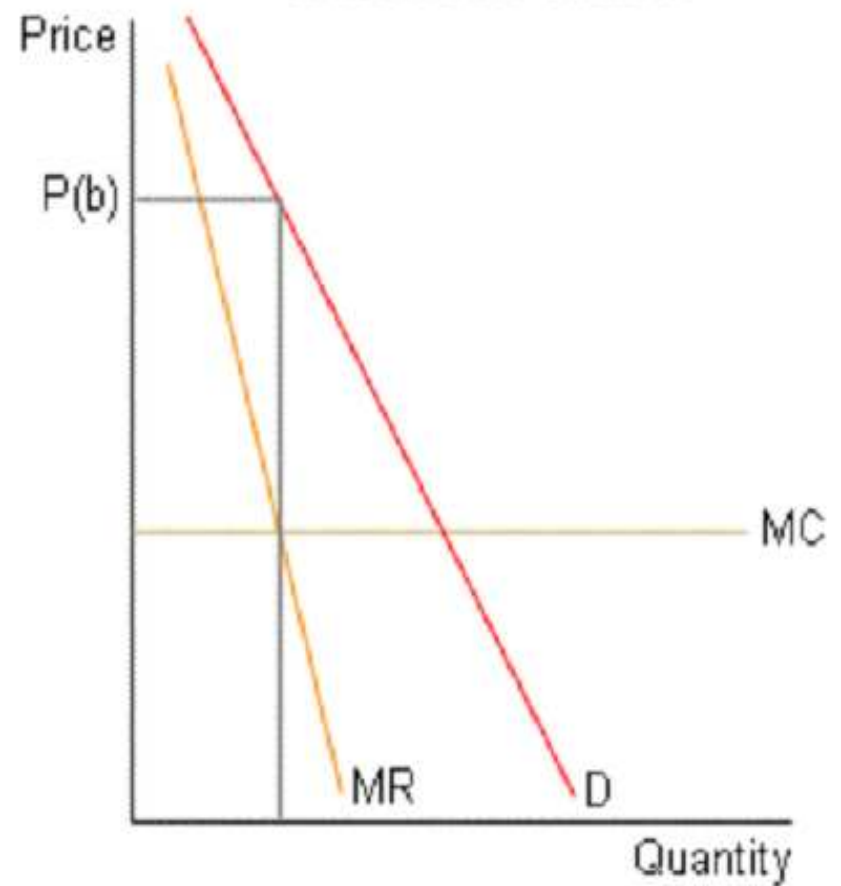
- In imperfectly competitive markets, firms may increase their profits by engaging in **price discrimination** (charging higher prices to those customers with the most inelastic demand for the product).
- Necessary conditions for price discrimination:
  - the firm must not be a price-taker
  - firms must be able to sort customers by their elasticity of demand
  - resale must not be feasible

# Example: air travel

## Vacation Travel



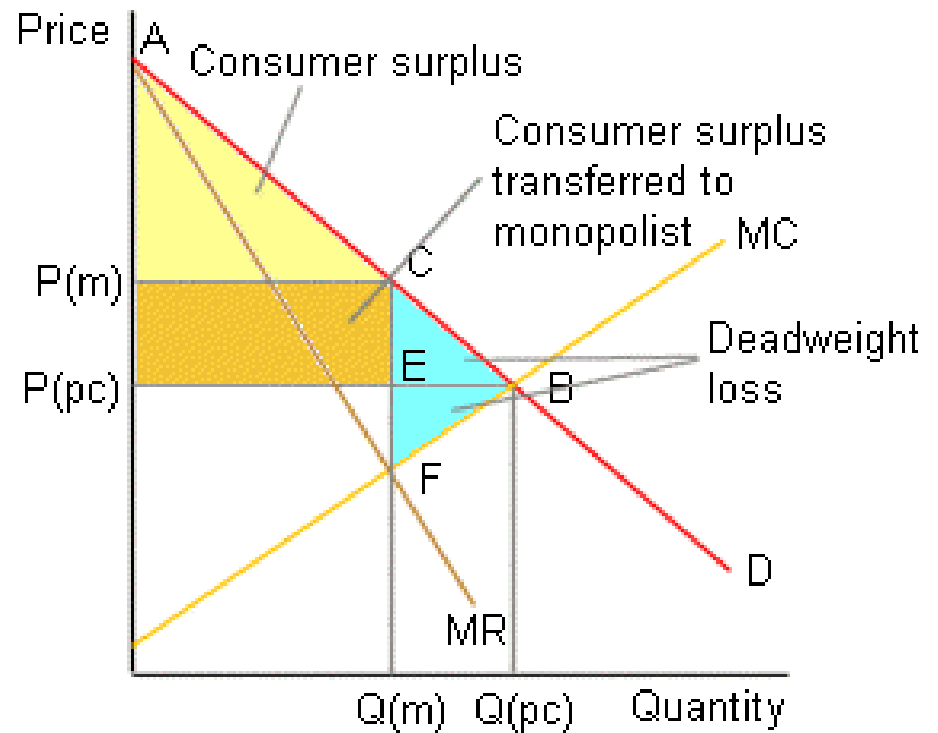
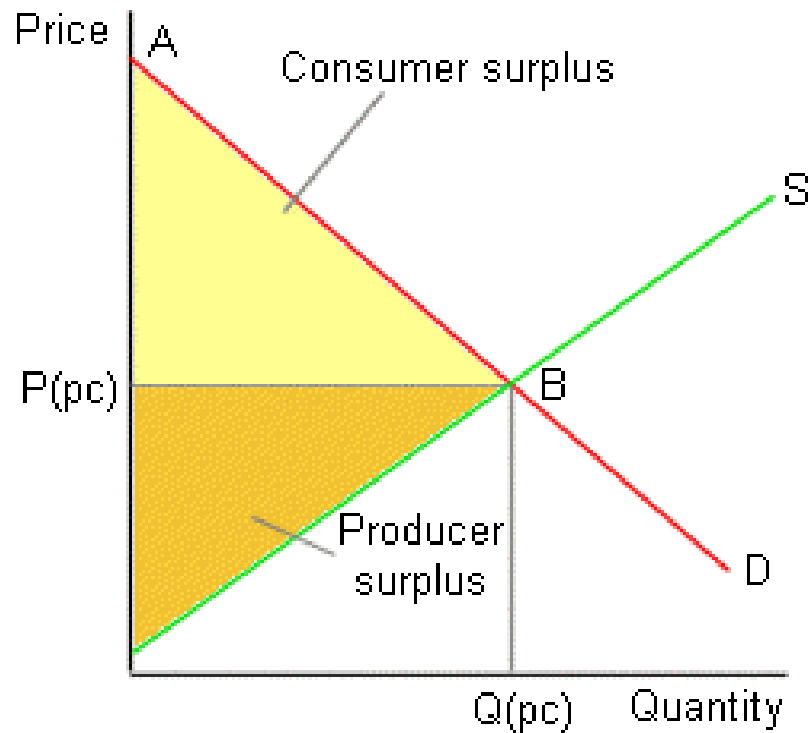
## Business Travel



# Dumping

- If firms practice price discrimination by charging different prices in different countries, they are often accused of dumping in the low-price country.
- **Predatory** dumping occurs if a country charges a low price initially in an attempt to drive out domestic competitors and then raises prices once the domestic industry is destroyed.
- There is little evidence of the existence of predatory dumping.

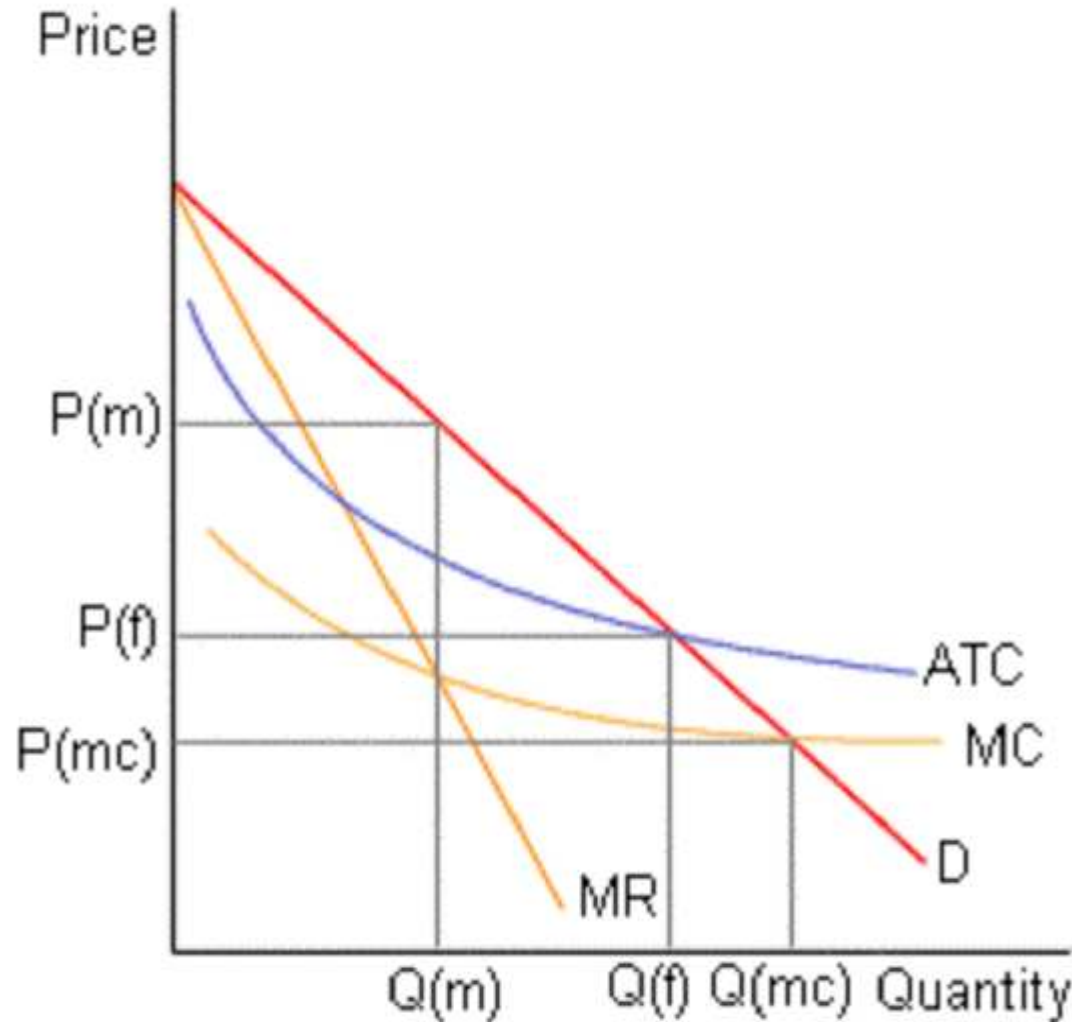
# Deadweight loss due to monopoly



# Other costs associated with monopoly

- X-inefficiency – occurs if firms do not have an incentive to engage in least-cost production (since they are not faced with competitive pressure).
- Rent-seeking behavior – the cost of using resources (such as lawyers, lobbyists, etc.) in an attempt to acquire monopoly power. This behavior does not benefit society and diverts resources away from productive activities.

# Regulation of natural monopoly



- monopoly outcome:  $P(m)$ ,  $Q(m)$
- marginal-cost pricing:  $P(mc)$ ,  $Q(mc)$
- “fair-rate of return” pricing system:  $P(f)$ ,  $Q(f)$

Week 11

Monopolistic Competition

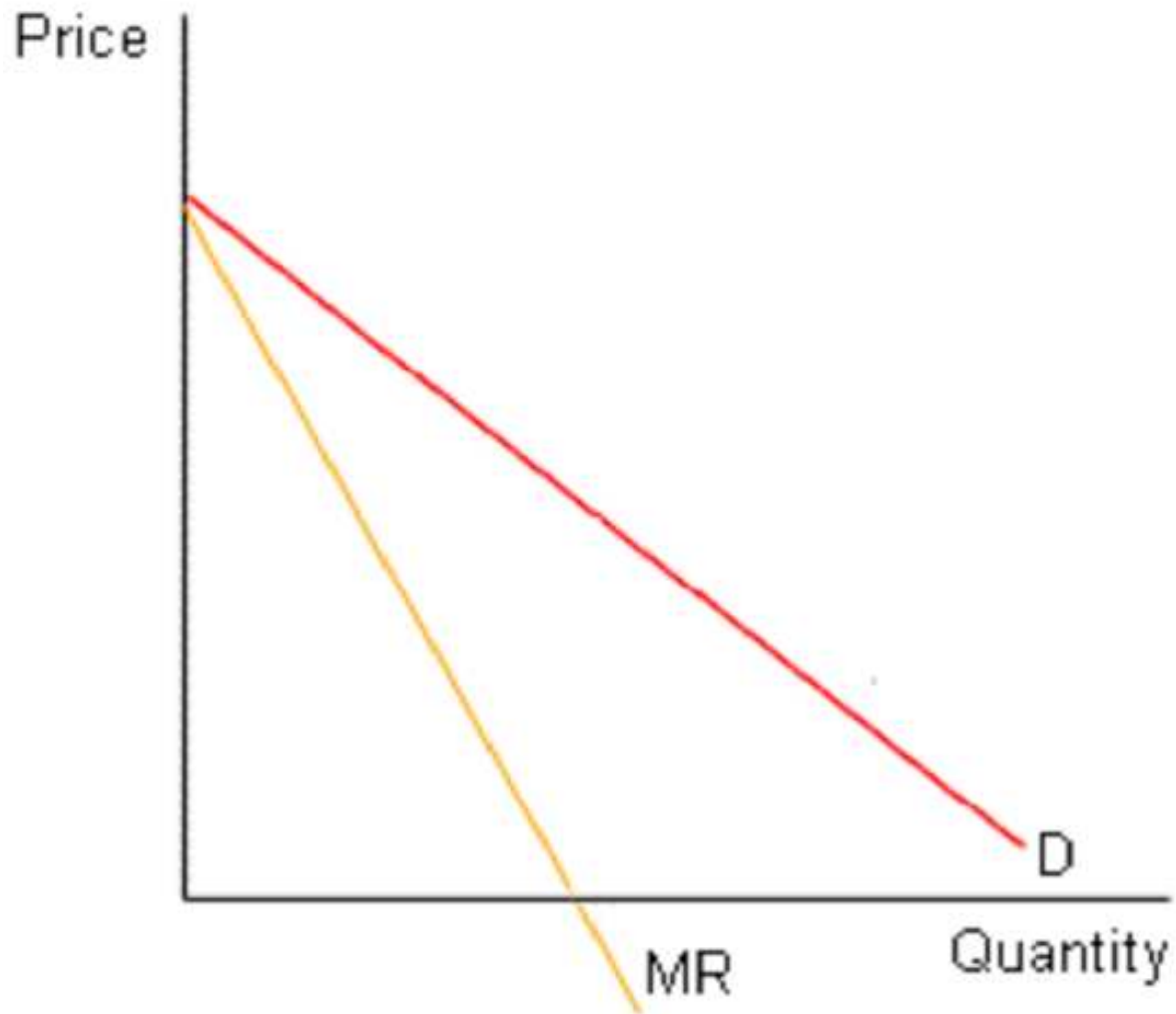
# Characteristics of a monopolistically competitive market

- Many buyers and sellers
- Differentiated products
- Easy entry and exit

# Relationship to other market models

- Monopolistic competition is similar to perfect competition in that:
  - There are many buyers and sellers
  - There are no barriers to entry or exit
- Monopolistic competition is similar to monopoly in that:
  - Each firm is the sole producer of a particular product (although there are close substitutes)
  - The firm faces a downward sloping demand curve for its product

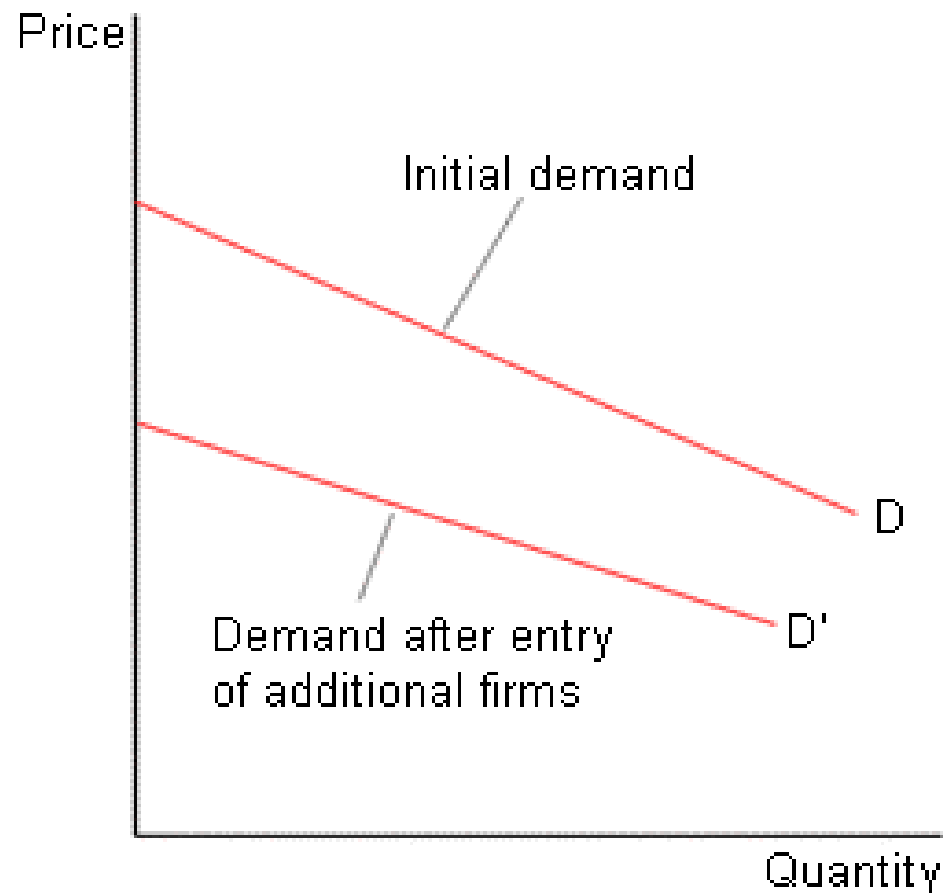
# Demand curve facing a monopolistically competitive firm



# The firm's demand curve and entry and exit

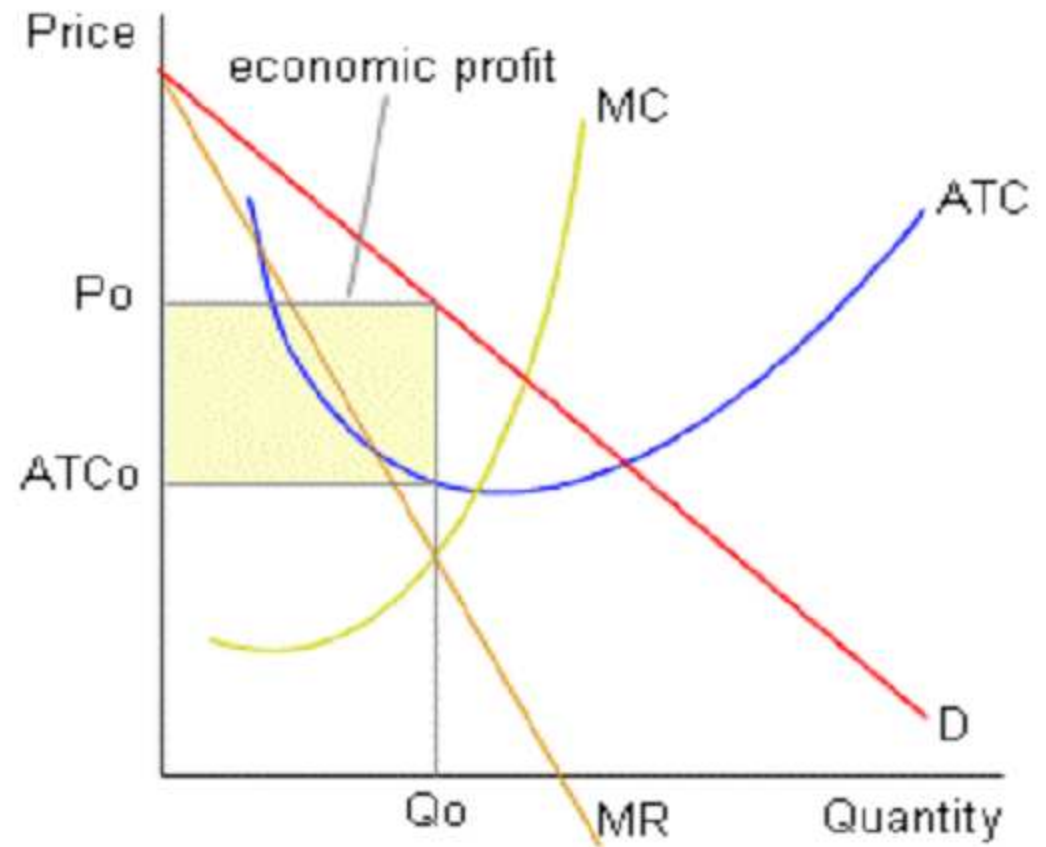
Typical firm in an oligopoly market

- As firms enter a monopolistically competitive market, the demand facing a typical firm declines and becomes more elastic.



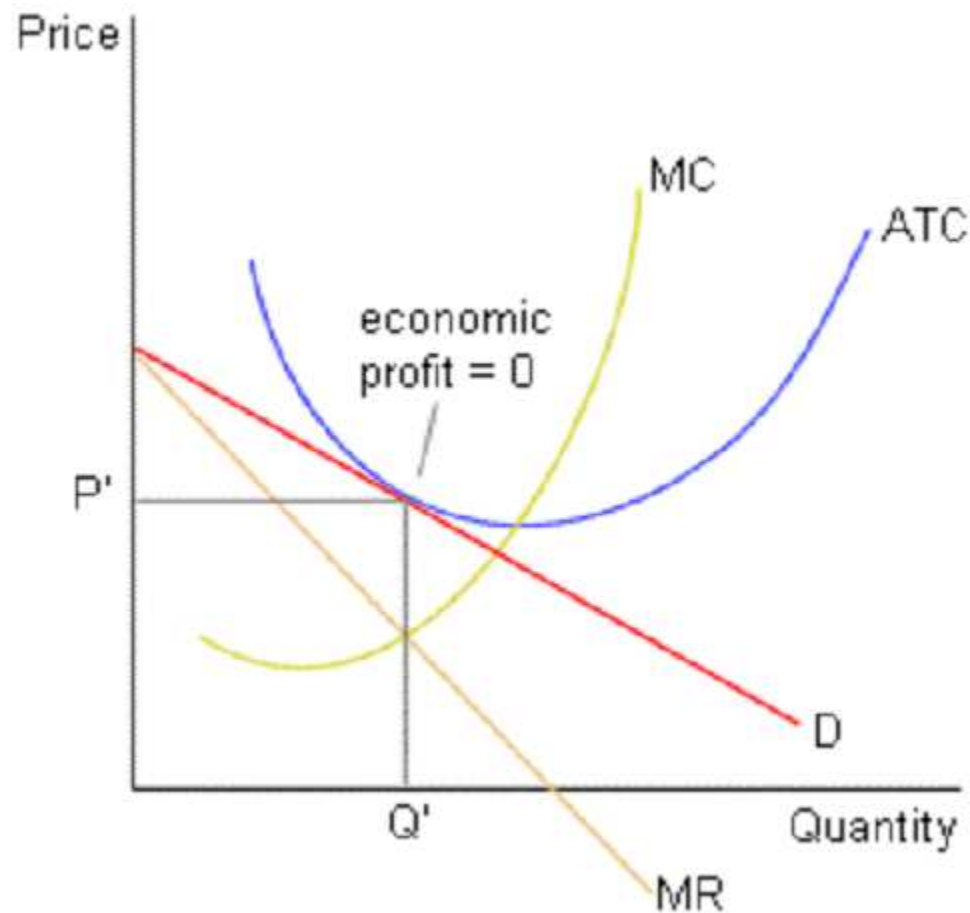
## Short-run equilibrium in a monopolistically competitive industry

- Economic profits lead to entry and a reduction in the demand facing a typical firm.

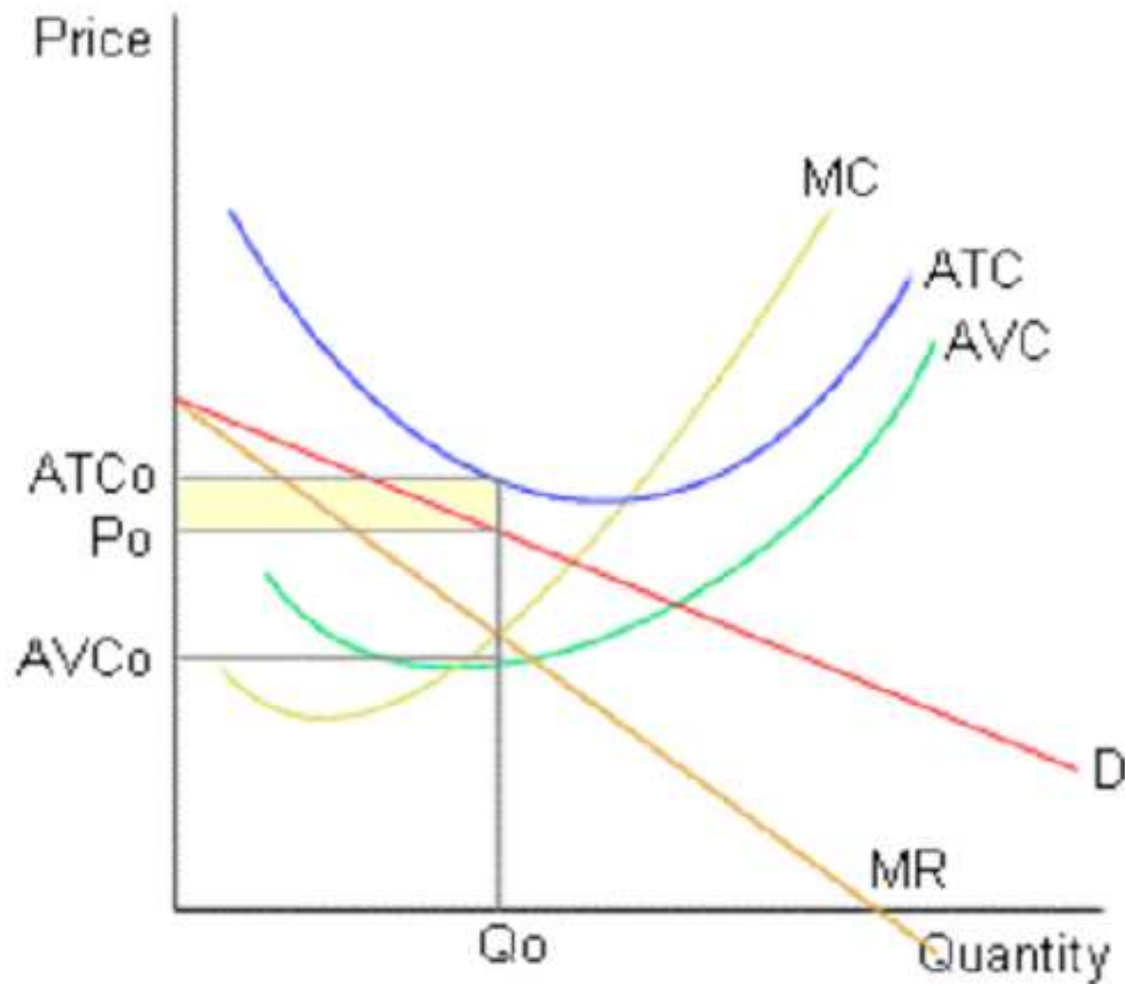


# Long-run equilibrium in a monopolistically competitive industry

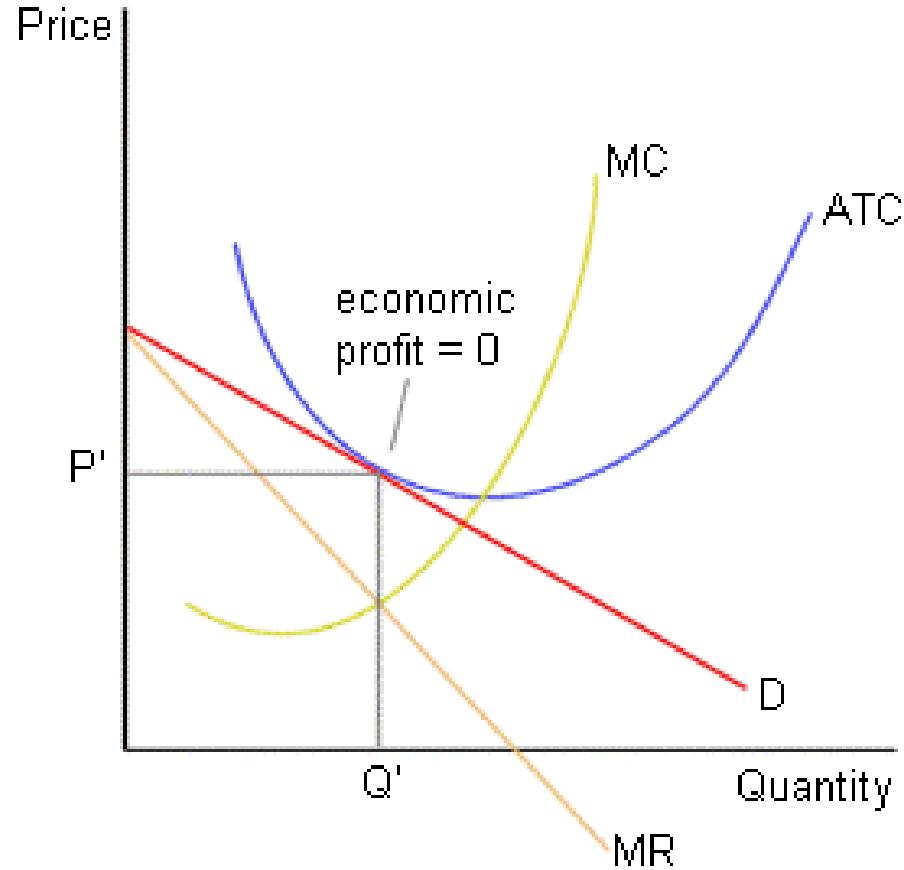
- Entry continues until economic profit equals zero for a typical firm.
- This equilibrium is often referred to as a “tangency equilibrium.”



# Short-run equilibrium with economic losses

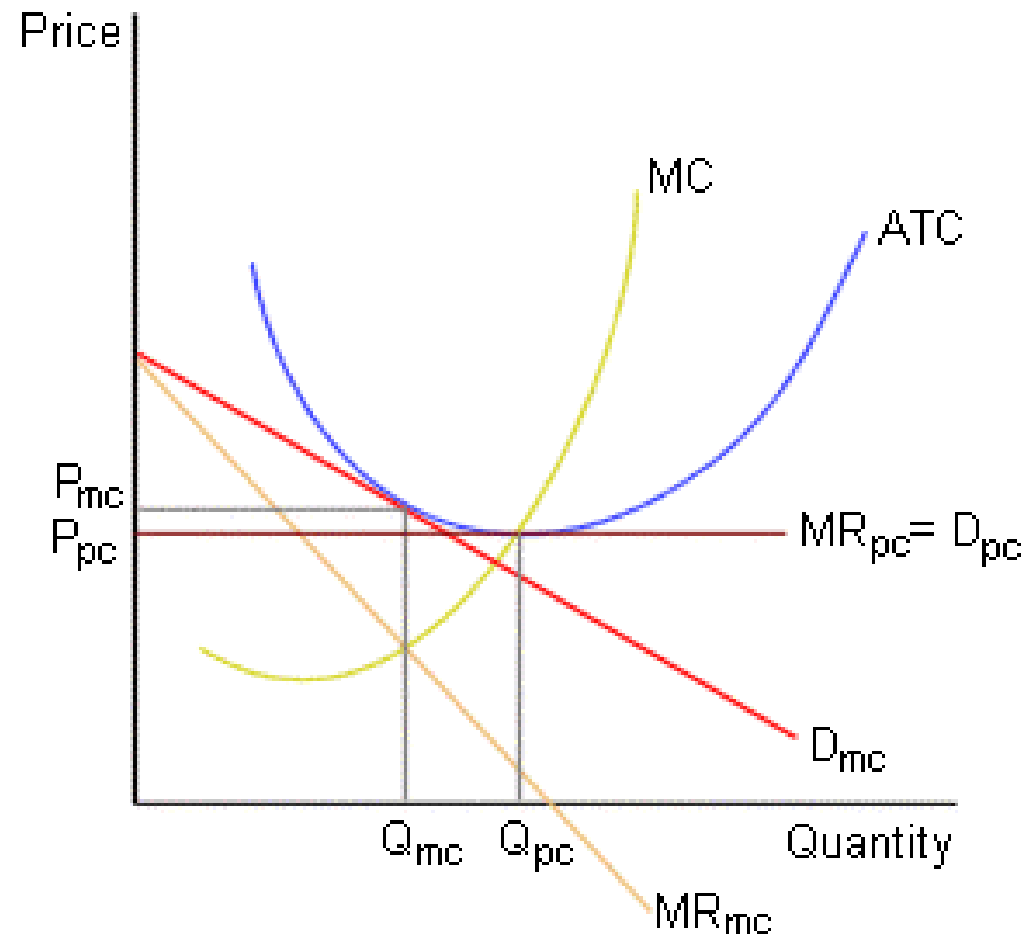


# Long-run equilibrium



# Monopolistic competition vs. perfect competition

- A monopolistically competitive firm, in the long run, has “excess capacity” – (*i.e.*, it produces a level of output that is below the least-cost level).
- This is a cost of product variety.



# Monopolistic competition and efficiency

- As the number of firms rises, a monopolistically competitive firm's demand curve becomes more elastic.
- As the number of firms in a market expands, the market approaches a perfectly competitive market.
- Thus, economic inefficiency may be smaller when there is a large number of firms in a monopolistically competitive market.

# Product Differentiation, Advertising and Social Welfare

- *Product differentiation* is a strategy that firms use to achieve market power.
- Accomplished by producing products that have distinct positive identities in consumers' minds.
- This differentiation is often accomplished through advertising

# Product Differentiation and Advertising

- The advocates of free and open competition believe that differentiated products and advertising give the market system its vitality and are the basis of its power.
- Product differentiation helps to ensure high quality and efficient production.

# Product Differentiation and Advertising

- Advertising provides consumers with the valuable information on product availability, quality, and price that they need to make efficient choices in the marketplace.

# Product Differentiation and Advertising

- Critics of product differentiation and advertising argue that they amount to nothing more than waste and inefficiency.
- Enormous sums are spent to create minute, meaningless, and possibly nonexistent differences among products.

# Product Differentiation and Advertising

- Advertising raises the cost of products and frequently contains very little information. Often, it is merely an annoyance.
- People exist to satisfy the needs of the economy, not vice versa.
- Advertising can lead to unproductive warfare and may serve as a barrier to entry, thus reducing real competition.

# Location decisions

- Monopolistically competitive firms often locate near each other to appeal to the “median” customer in a geographical region. (*e.g.*, fast food restaurants and car dealerships)

Week 12  
Oligopoly

# Oligopoly

- a small number of firms produce most output
- a standardized or differentiated product
- recognized mutual interdependence, and
- difficult entry.

# Strategic behavior

- Strategic behavior occurs when the best outcome for one party depends upon the actions and reactions of other parties.

# Kinked demand curve model

- Other firms are assumed to match price decreases, but not price increases.
- There is little evidence suggesting that this model describes the behavior of oligopoly firms.
- Game theory models are more commonly used.

# The Collusion Model

- A group of firms that get together and makes price and output decision to maximize joint profits is called a cartel
- Collusion occurs when price- and quantity-fixing agreements are explicit.
- *Tacit collusion* occurs when firms end up fixing price without a specific agreement, or when such agreements are implicit.

# The Price- Leadership Model

- *Price leadership* is a form of oligopoly in which one dominant firm sets prices and all the smaller firms in the industry follow its pricing policy.

# The Price- Leadership Model

- The price-leadership model outcome:
  - The quantity demanded in the industry is split between the dominant firm and the group of smaller firms.
  - This division of output is determined by the amount of market power of the dominant firm.
  - The dominant firm has an incentive to push smaller firms out of the industry in order to establish a monopoly.

# Predatory Pricing

- The practice of a large, powerful firm driving smaller firms out of the market by temporarily selling at an artificially low price is called *predatory pricing*.
- Such behavior became illegal in the United States with the passage of antimonopoly legislation around the turn of the century.

# Game Theory

- *Game theory* analyzes oligopolies behavior as a complex series of strategic moves and reactive countermoves among rival firms.
- In game theory, firms are assumed to anticipate rival reactions.

# Payoff Matrix for Advertising

		B's Strategy	
		Do not advertise	Advertise
A's Strategy	Do not advertise	A's profit = \$50,000 B's profit = \$50,000	A's loss = \$25,000 B's profit = \$75,000
	Advertise	A's profit = \$75,000 B's loss = \$25,000	A's profit = \$10,000 B's profit = \$10,000

- The strategy that firm A will actually choose depends on the information available about B's likely strategy.

# Game Theory

- Regardless of what B does, it pays for A to advertise. This is the *dominant strategy*, or the strategy that is best no matter what the opposition does.

# Game Theory

- The *Prisoners' Dilemma* is a game in which:
  - The players are prevented from cooperating with each other;
  - Each player in isolation has a dominant strategy;
  - The dominant strategy makes each player worse off than in the case in which they could cooperate.

# Repeated Games

- Game theory has been used to help understand many phenomena – from the provision of local public goods and services to nuclear war

# Contestable Markets

- A market is *perfectly contestable* if entry to it *and* exit from it are costless.
- In contestable markets, even large oligopolies firms end up behaving like perfectly competitive firms. Prices are pushed to long-run average cost by competition, and positive profits do not persist.

# Contestable Markets

- The only necessary condition of oligopoly is that firms are large enough to have some control over price.

# Contestable Markets

- Oligopolies are concentrated industries. At one extreme is the cartel, in essence, acting as a monopolist. At the other extreme, firms compete for small contestable markets in response to observed profits. In between are a number of alternative models, all of which stress the interdependence of oligopolies firms.

# Price Cartels

- Price cartels are legal in some countries
- A cartel arrangement can maximize industry profits
- Each firm can increase its profits by violating the agreement
- Cartel agreements have generally been unstable.

# Imperfect information

- Brand name identification – serves as a signal of product quality. Customers are willing to pay a higher price for products produced by firms that they recognize.
- Product guarantees also serve as a signal of product quality

Week 13 & 14

Market Success and Market  
Failures

# The Source of Market Failures

- *Market failure* occurs when resources are misallocated, or allocated inefficiently. The result is waste or lost value. Evidence of market failure is revealed by the existence of:
  - Imperfect market structure
  - Public goods
  - External costs and benefits
  - Imperfect information

# Imperfect Markets

- *Imperfect competition* is an industry in which single firms have some control over price and competition. Imperfectly competitive industries give rise to an inefficient allocation of resources.

# Imperfect Markets

- *Monopoly* is an industry composed of only one firm that produces a product for which there are no close substitutes and in which significant barriers exist to prevent new firms from entering the industry.

# Imperfect Markets

- In all imperfectly competitive industries, output is lower—the product is under produced—and price is higher than it would be under perfect competition.
  - The equilibrium condition  $P = MC$  does not hold, and the system does not produce the most efficient product mix.

# Public Goods

- *Public goods*, or *social goods* are goods and services that bestow collective benefits on members of society.
  - Generally, no one can be excluded from enjoying their benefits. The classic example is national defense

# Public Goods

- *Private goods* are products produced by firms for sale to individual households.
  - Private provision of public goods fails. A completely laissez-faire market will not produce everything that all members of a society might want. Citizens must band together to ensure that desired public goods are produced, and this is generally accomplished through government spending financed by taxes.

# Externalities

- An *externality* is a cost or benefit resulting from some activity or transaction that is imposed or bestowed on parties outside the activity or transaction.
  - The market does not always force consideration of all the costs and benefits of decisions. Yet for an economy to achieve an efficient allocation of resources, all costs and benefits must be weighed.

# Imperfect Information

- *Imperfect information* is the absence of full knowledge concerning product characteristics, available prices, and so forth.
  - The absence of full information can lead to transactions that are ultimately disadvantageous.

# Markets Solutions

- *Imperfect information* is the absence of full knowledge concerning product characteristics, available prices, and so forth.
  - The absence of full information can lead to transactions that are ultimately disadvantageous.

# Government Inefficiency

- Government officials are assumed to maximize their own utility, not the social good.
- To understand the way government functions, we need to look less at the preferences of individual members of society and more at the incentive structures that exist around public officials.

# Government Inefficiency

- Like voters, public officials suffer from a lack of incentive to become fully informed and to make tough choices.
- This is the viewpoint of what is called the *public choice* field in economics that builds heavily on the work of Nobel Laureate James Buchanan.

# Rent Seeking

- There are reasons to believe that government attempts to produce the right goods and services in the right quantities efficiently may fail.
- The existence of an “optimal” level of public-goods production does not guarantee that governments will achieve it.

# Government Solutions

- Information is non-rival in consumption.
- When information is very costly for individuals to collect and disperse, it may be cheaper for government to produce it once for everybody.

# Government and The Market

- Governments can fail to produce an efficient allocation of resources for a number of reasons:
  - Measurement of social damages and benefits is difficult and imprecise.
  - There is no precise mechanism for determining citizens' preferences for public goods.
  - Government agencies are not subject to the discipline of the market.
  - It is naïve to expect elected and appointed officials to act selflessly for the good of society.