



## **Introduction to Microeconomics, E201**

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# ***LECTURE NOTES***

**INTRODUCTION TO MICROECONOMICS**

**E201**

# 1. Introduction to Course and Economics

## Lecture Notes

1. Economics Defined - Economics is the study of the ALLOCATION of SCARCE resources to meet UNLIMITED human wants.
  - a. Microeconomics - is concerned with decision-making by individual economic agents such as firms and consumers. (Subject matter of this course)
  - b. Macroeconomics - is concerned with the aggregate performance of the entire economic system. (Subject matter of the following course)
  - c. Empirical economics - relies upon facts to present a description of economic activity.
  - d. Economic theory - relies upon principles to analyze behavior of economic agents.
  - e. Inductive logic - creates principles from observation.
  - f. Deductive logic - hypothesis is formulated and tested.
2. Usefulness of economics - economics provides an objective mode of analysis, with rigorous models that are predictive of human behavior.
  - a. Scientific approach
  - b. Rational choice

3. Assumptions in Economics - economic models of human behavior are built upon assumptions; or simplifications that permit rigorous analysis of real world events, without irrelevant complications.

a. model building - models are abstractions from reality - the best model is the one that best describes reality and is the simplest – Occam’s Razor.

b. simplifications:

1. ceteris paribus - means all other things equal.

2. There are problems with abstractions, based on assumptions. Too often, the models built are inconsistent with observed reality - therefore they are faulty and require modification. When a model is so complex that it cannot be easily communicated or its implications easily understood - it is less useful.

4. Goals and their Relations -

a. POSITIVE economics is concerned with what is;

b. NORMATIVE economics is concerned with what should be.

1. Economic goals are value statements, hence normative.

c. Economics is not value free, there are judgments made concerning what is important:

1. Individual utility maximization versus social betterment

2. Efficiency versus fairness

3. More is preferred to less

d. Most societies have one or more of the following goals, depending on historical context, public opinion, and socially accepted values :

1. Economic efficiency,
2. Economic growth,
3. Economic freedom,
4. Economic security,
5. Equitable distribution of income,
6. Full employment,
7. Price level stability, and
8. Reasonable balance of trade.

5. Goals are subject to:

- a. interpretation - precise meanings and measurements will often become the subject of different points of view, often caused by politics.
- b. goals that are complementary are consistent and can often be accomplished together.
- c. conflicting - where one goal precludes, or is inconsistent with another.
- d. priorities - rank ordering from most important to least important; again involving value judgments.

6. The Formulation of Public and Private Policy - Policy is the creation of guidelines, regulations or law designed to affect the accomplishment of specific economic goals.

a. Steps in formulating policy:

1. stating goals - must be measurable with specific stated objectives to be accomplished.
2. options - identify the various actions that will accomplish the stated goals & select one, and
3. evaluation - gathers and analyzes evidence to determine whether policy was effective in accomplishing goal, if not re-examine options and select option most likely to be effective.

7. Objective Thinking:

a. bias - most people bring many misconceptions and biases to economics.

1. Because of political beliefs and other value system components rational, objective thinking concerning various issues requires the shedding of these preconceptions and biases.

b. fallacy of composition - is simply the mistaken belief that what is true for the individual, must be true for the group.

c. cause and effect - post hoc, ergo propter hoc - "after this, because of this" - fallacy.

1. correlation - statistical association of two or more variables.

2. causation - where one variable actually causes another.

- a. Granger causality states that the thing that causes another must occur first, that the explainer must add to the correlation, and must be sensible.

- d. cost-benefit or economic perspective - marginal decision-making - if benefits of an action will reap more benefits than costs it is rational to do that thing.
  - 1. Focus on the addition to benefit, and the addition to cost as the basis for decision-making.
    - a. Sunk costs have nothing to do with rational decision-making.



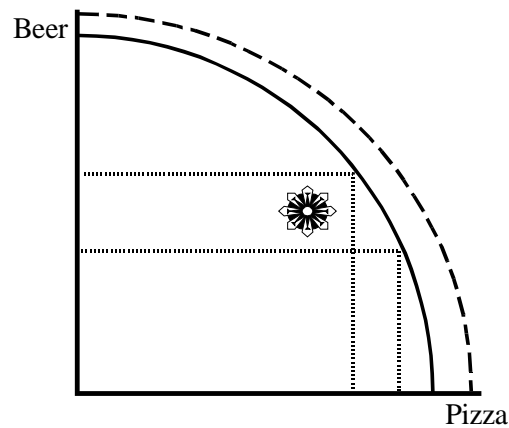
## 2. Economic Problems

### Lecture Notes

1. The economizing problem involves the allocation of resources among competing wants. There is an economizing problem because there are:
  - d. unlimited wants
  - e. limited resources
  
2. Resources and factor payments:
  - d. land - includes space (i.e., location), natural resources, and what is commonly thought of as land.
    1. land is paid rent
  
  - e. capital - are the physical assets used in production - i.e., plant and equipment.
    2. capital is paid interest
  
  - f. labor - is the skills, abilities, knowledge (called human capital) and the effort exerted by people in production.
    3. labor is paid wages
  
  - d. entrepreneurial talent - (risk taker) the economic agent who creates the enterprise.
    4. entrepreneurial talent is paid profits
  
3. Full employment includes the natural rate of unemployment and down time for normal maintenance (both capital & labor). However, full production or 100% capacity utilization cannot be maintained for a prolonged period without labor and capital breaking-down:

- a. underemployment - utilization of a resource in a manner, which is less than what is consistent with full employment - using an M.D. as a practical nurse.
4. Economic Efficiency consists of the following three components:
- a. **allocative efficiency** - is measured using a concept known as Pareto Superiority (or Optimality)
    - 1. Pareto Optimal - is that allocation where no person could be made better off without inflicting harm on another.
    - 2. Pareto Superior - is that allocation where the benefit received by one person is more than the harm inflicted on another. [cost - benefit approach]
  - b. **technical efficiency** - for a given level of output, you minimize cost or (alternatively) for a given level of cost you maximize output.
  - c. **full employment** - for a system to be economically efficient then full employment is also required.
5. Allocations of resources imply that decisions must be made, which in turn involves choice. Every choice is costly; there is always the lost alternative -- the opportunity cost:
- a. opportunity cost - the next best alternative that must be foregone as a result of a particular decision.
6. The production possibilities curve is a simple model that can be used to show choices:
- a. assumptions necessary to represent production possibilities in a simple production possibilities curve model:

1. efficiency
2. fixed resources
3. fixed technology
4. two products



7. Law of Increasing Opportunity Costs is illustrated in the above production possibilities curve. Notice - as we obtain more pizza (shift to the right along the pizza axis) we have to give up large amounts of beer (downward shift along beer axis).

8. Inefficiency, unemployment and underemployment are illustrated by a point inside the production possibilities curve, as shown above. (identified by this symbol):



a. Inefficiency is a violation of the assumptions behind the model, but do not change the potential output of the system.

9. Economic Growth can also be illustrated with a production possibilities curve. The dashed line in the above model shows a shift to the right of the of the curve which is called economic growth.

- a. The only way this can happen is for there to be more resources or better technology.
- b. Growth will change the potential output of the economy, hence the shift of the entire curve.

10. Economic Systems rarely exist in a pure form. The following classification of systems is based on the dominant characteristics of those systems:

- a. pure capitalism - private ownership of productive capacity, very limited government, and motivated by self-interest.
  - 1. laissez faire - government hands-off; markets relied-upon to perform allocations.
  - 2. costs of freedom - poverty, inequity and several social ills are associated with the lack of protection afforded by government.
- b. command - government makes the decisions - with force of law (and sometimes martial force)
  - 1. Often associated with dictatorships
- c. traditional - based on social mores or ethics or other non-market, non-legislative bases
  - 1. Christmas gift giving is tradition
- d. socialism - maximizes individual welfare based on perceived needs, not contributions; generally concerned more with perceived equity than efficiency.
- e. communism - everyone shares equally in the output of society (according to their needs), generally no private holdings of productive resources
  - 1. The former Soviet Union espoused communism, but also was mostly

command

2. Utopian movement in the U.S.

f. mixed system - contains elements of more than one system - U.S. economy is a mixed system (capitalism, command, and socialism are the major elements, with some communism and tradition)

1. All of the high income, industrialized economies are mixed economies

e. Even with mixed systems there are substantial variations in the amounts of socialism, capitalism, tradition, and command exist in each example.

### 3. Interdependence and the Global Economy

#### Lecture Notes

1. The modern economic system is no longer the closed (i.e., U.S. only) system upon which the debates surrounding isolationism occurred prior to World War II.
  - a. Imports and Exports are increasingly important
  - b. Foreign investment versus U.S. investment abroad
    1. Outsourcing
    2. Technological transfers
  - c. Balance of trade issues.
    1. Current accounts (import v. exports)
    2. Capital accounts (foreign investment)
2. Capitalist Ideology - The characteristics of a capitalist economy and the ideology that has developed concerning this paradigm are not necessarily the same thing. The elements of a capitalist ideology are:
  - a. freedom of enterprise
  - b. self-interest
  - c. competition
  - d. markets and prices

- e. a very limited role for government
  - f. different countries with different views of these matters – i.e., equity v. efficiency again.
3. Market System Characteristics - the following characteristics are typical of a system that relies substantially on markets for allocation of resources. These characteristics are:
- a. division of labor & specialization
  - b. capital goods
  - c. comparative advantage - is concerned with cost advantages.
    - 1. Comparative advantage is the motivation for trade among nations and persons.
    - 2. Terms of trade are those upon which the parties may agree and depends on the respective cost advantages and bargaining power.

4. Trade among nations

- a. the reliance upon comparative advantage to motivate trade – assuming barter:

	Belgium	Holland
Tulips	400	4000
Wine	4000	400

The data above show what each country could produce if all of their resources were put into each commodity. For example, if Holland put all

their resources in tulip production they could produce 4000 tons of tulips but no wine. Assuming the data give the rate at which the commodities can be substituted, if both countries equally divided their resources between the two commodities, Belgium can produce 200 tons of tulips and 2000 barrels of wine and Holland can produce 200 barrels of wine and 2000 tons of tulips (for a total of 2200 units of each commodity produced by the two countries by splitting their resources among the two commodities). If Belgium produced nothing but wine it would produce 4000, and if Holland produced nothing but tulips it would produce 4000 tons). If the countries traded on terms where one barrel of wine was worth one ton of tulips then both countries would have 2000 units of each commodity and obviously benefit from specialization and trade.

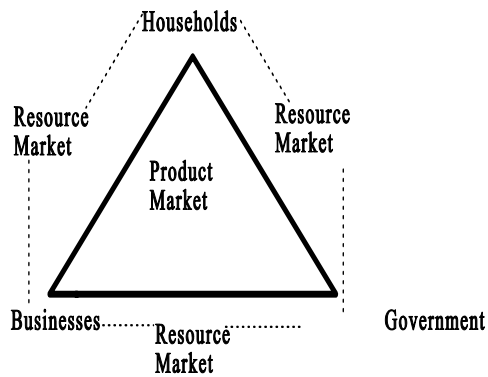
- b. absolute advantage for one trading partner results in no advantage to trade.
  1. LDCs often have no comparative advantage and hence the developed countries, possessing absolute advantage have no incentive to trade (.)
  2. LDC- Less Developed Country - Low-income countries - 60 - (per capita GDP of \$800), middle-income countries - 75 - (per capital GDP of \$8000).
  3. High income countries and developed countries (19 countries)
  4. High income countries without economic development (Hong Kong, Israel, Kuwait, Singapore, and UAE)
5. Money facilitates market activities and is necessary in complex market systems:
  - a. barter economy - is where commodities are directly traded without the use of money.
    1. Direct trade requires a coincidence of wants.
    2. Prices become complicated by not having a method to easily measure worth.



- b. functions of money:
    - 1. medium of exchange
    - 2. store of value
    - 3. measure of worth
  - c. Fiat money
    - 1. European Gold & Silver smith receipts 15<sup>th</sup> century
    - 2. Genghis Kahn in the 12<sup>th</sup> century in Asia – paper money
6. Foreign exchange – value of one currency versus another
- a. Hard currency – U.S. dollar, British Pound, Canadian dollar, Japanese Yen, and the Euro – general acceptability of the currency and it being demanded as reserves by central banks
    - 1. G-7 nations, hard currency nations; Euro predecessors France, Germany, Italy
  - b. Exchange rates affect both imports and exports; and foreign investment here, U.S. investment abroad.
    - 1. Dollar gains strength, Imports cheaper here, exports more expensive abroad
    - 2. Dollar gains strength, foreign investment in U.S. more attractive

because dollar buys more foreigners' home currency when investment repatriated

- c. Strong dollar policy in exchange – based on interest rates, growth, and relative strength of economy and stability of political system etc.
  - 1. Debt and supply of currency an important factor in economic development
  
- 7. The Circular Flow Diagram is used to show the interdependence that exists among sectors of the economy:
  - a. sectors [private-domestic]
    - 1. households
    - 2. resource markets
    - 3. businesses
    - 4. product markets
  - b. complications
    - 1. government
    - 2. foreign sector
  - c. Model of interdependence:



## FOREIGN SECTOR

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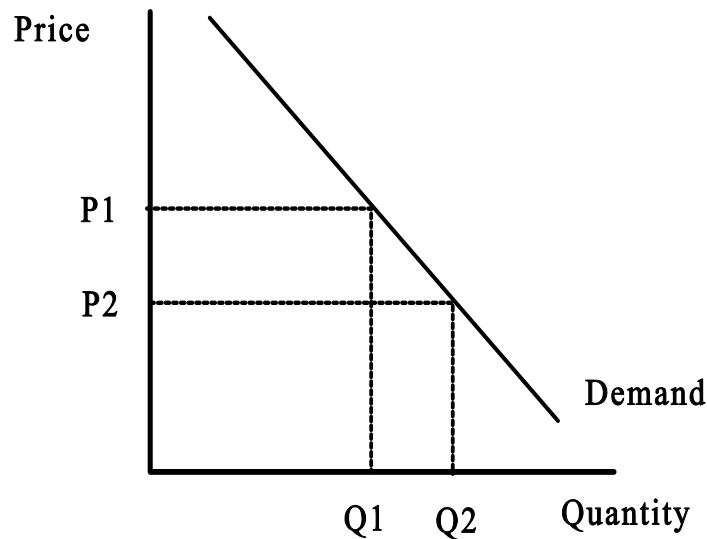
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Product markets are where the domestic parties obtain and sell commodities [inside the pyramid], and the factor markets [shown with the dotted lines] are where the domestic parties obtain and supply productive resources. The base reads “FOREIGN SECTOR”, which indicates that the same buying and selling of commodities and resources is not limited to just domestic parties, but can include foreign businesses and resources as well. The circular flow diagram shows that each of the sectors relies on the others for resources and supplies the others commodities and resources.

## 4. Basics of Supply and Demand

### Lecture Notes

1. A market is nothing more or less than the locus of exchange; it is not necessarily a place, but simply buyers and sellers coming together for transactions.
2. The law of demand states that as price increases (decreases) consumers will purchase less (more) of the specific commodity.
  - a. The demand schedule (demand curve) reflects the law of demand it is a downward sloping function and is a schedule of the quantity demanded at each and every price.



As price falls from P1 to P2 the quantity demanded increases from Q1 to Q2. This is a negative relation between price and quantity, hence the negative slope of the demand schedule; as predicted by the law of demand.

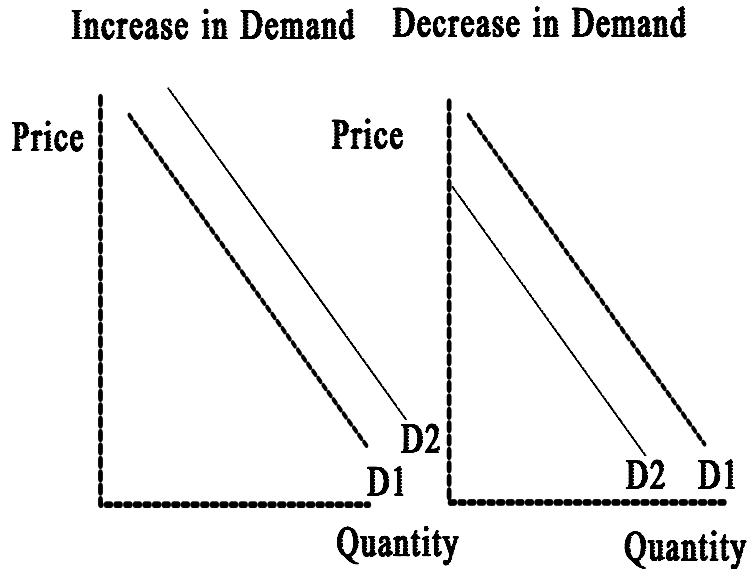
1. utility (use, pleasure, jollies) from the consumption of commodities.

2. The change in utility derived from the consumption of one more unit of a commodity is called marginal utility.
  3. Diminishing marginal utility is the fact that at some point further consumption of a commodity adds smaller and smaller increments to the total utility received from the consumption of that commodity.
- b. The income effect is the fact that as a person's income increases (or the price of item goes down [which effectively increases command over goods] more of everything will be demanded.
  - c. The substitution effect is the fact that as the price of a commodity increases, consumers will buy less of it and more of other commodities.

### 3. Demand Curve

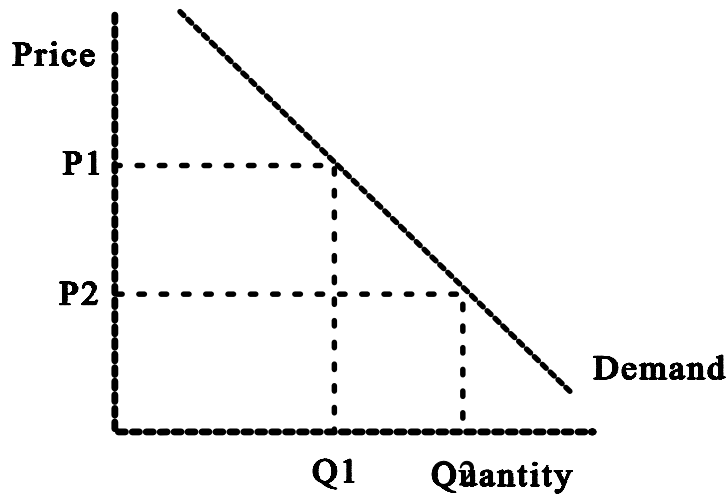
- a. Price and quantity - again the demand curve shows the negative relation between price and quantity.
- b. Individual versus market demand - a market demand curve is simply an aggregation of all individual demand curves for a particular commodity.
- c. Nonprice determinants of demand; and a shift to the left (right) of the demand curve is called a decrease (increase) in demand. The nonprice determinants of demand are:
  1. tastes and preferences of consumers,
  2. the number of consumers,
  3. the money incomes of consumers,
  4. the prices of related goods, and
  5. consumers' expectations concerning future availability or prices of the commodity.

d. Changes in demand versus in quantity demanded



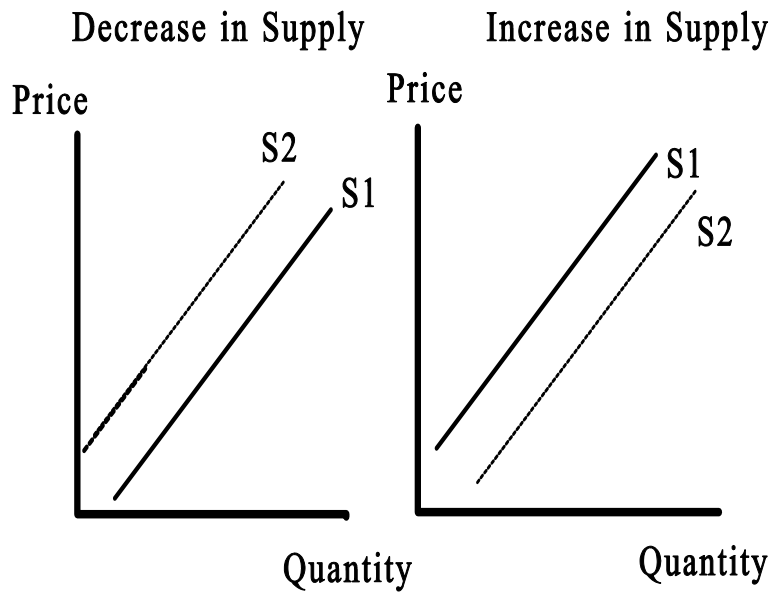
An increase in demand is shown in the first panel, notice that at each price there is a greater quantity demanded along D2 (the dotted line) than was demanded with D1 (the solid line). The second panel shows a decrease in demand, notice that there is a lower quantity demanded at each price along D2 (the dotted line) than was demanded with D1 (the solid line).

**Changes in Quantity Demanded**



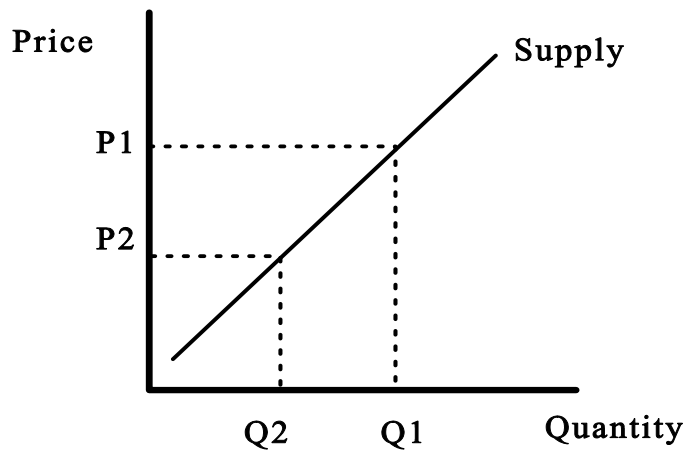
Movement along a demand curve is called a change in the quantity demanded. Changes in quantities demanded are caused by changes in price. When price decreases from P1 to P2, the quantity demanded increases from Q1 to Q2; when price increases from P2 to P1 the quantity demanded decreases from Q2 to Q1.

4. The law of supply is that producers will supply more the higher the price of the commodity.
  - a. Supply schedule - are the quantities supplied at each and every price.
  
5. Supply curve - is nothing more than a schedule of the quantities at each and every price.
  - a. There is a positive relation between price and quantity on a supply curve.
  
  - b. Changes in one or more of the nonprice determinants of supply cause the supply curve to shift. A shift to the left of the supply curve is called a decrease in supply; a shift to the right is called an increase in supply. The nonprice determinants of supply are:
    1. resource prices,
    2. technology,
    3. taxes and subsidies,
    4. prices of other goods,
    5. expectations concerning future prices, and
    6. the number of sellers.



A decrease in supply is shown in the first panel, notice that there is a lower quantity supplied at each price with S2 (dotted line) than with S1 (solid line). The second panel shows an increase in supply, notice that there is a larger quantity supplied at each price with S2 (dotted line) than with S1 (solid line).

### Changes in Quantity Supplied



Changes in price cause changes in quantity supplied, an increase in price from P2 to P1 causes an increase in the quantity supplied from Q2 to Q1; a decrease in price from P1

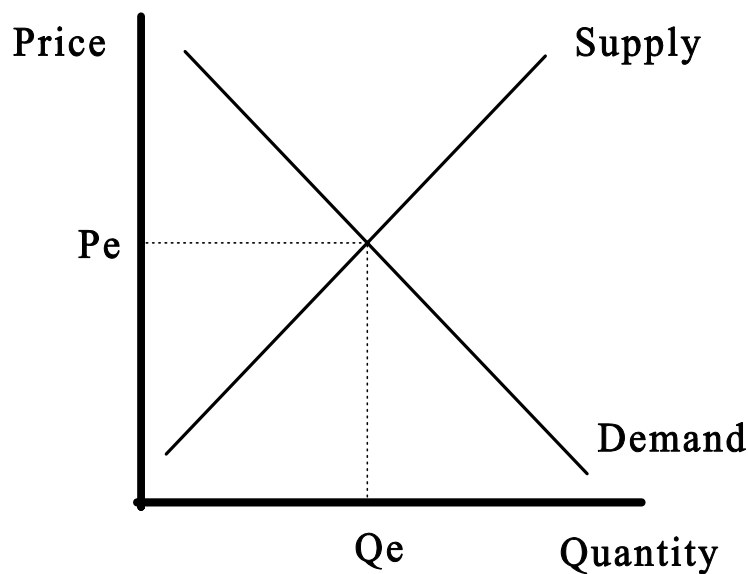


to  $P_2$  causes a decrease in the quantity supplied from  $Q_1$  to  $Q_2$ .

6. Market equilibrium occurs where supply equals demand (supply curve intersects demand curve).
  - a. An equilibrium implies that there is no force that will cause further changes in price, hence quantity exchanged in the market. This is analogous to a cherry rolling down the side of a glass; the cherry falls due to gravity and rolls past the bottom because of momentum, and continues rolling back and forth past the bottom until all of its' energy is expended and it comes to rest at the bottom - this is equilibrium [a rotten cherry in the bottom of a glass].



The following graphical analysis portrays a market in equilibrium. Where the supply and demand curves intersect, equilibrium price is determined ( $P_e$ ) and equilibrium quantity is determined ( $Q_e$ )



- a. The graph of a market in equilibrium can also be expressed using a series of equations. Both the demand and supply curve can be expressed as equations.

Demand Curve is  $Q_d = 22 - P$

Supply Curve is  $Q_s = 10 + P$

The equilibrium condition is  $Q_d = Q_s$

Therefore:

$$22 - P = 10 + P$$

adding  $P$  to both sides of the equation yields:

$$22 = 10 + 2P$$

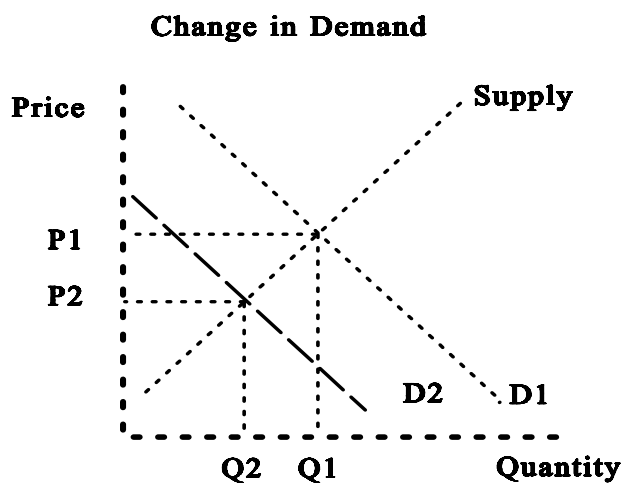
subtracting 10 from both sides of the equation yields:

$$12 = 2P \text{ or } P = 6$$

To find the equilibrium quantity, we plug 6 (for  $P$ ) into either the supply or the demand curve and get:

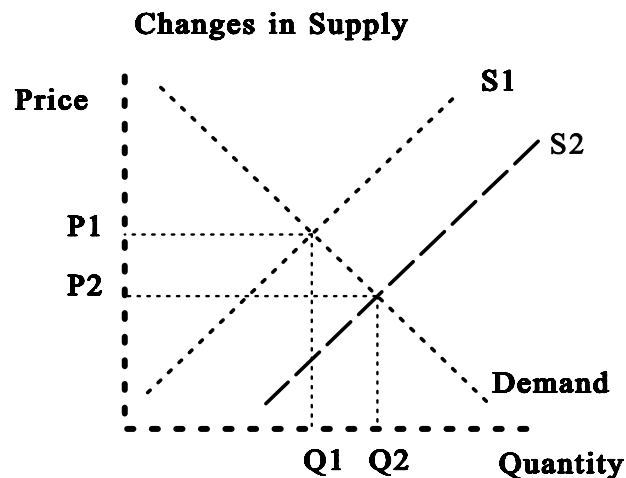
$$22 - 6 = 16 \text{ (Demand side) \& } 10 + 6 = 16 \text{ (Supply side)}$$

7. Changes in supply and demand in a market result in new equilibria. The following graphs demonstrate what happens in a market when there are changes in nonprice determinants of supply and demand.



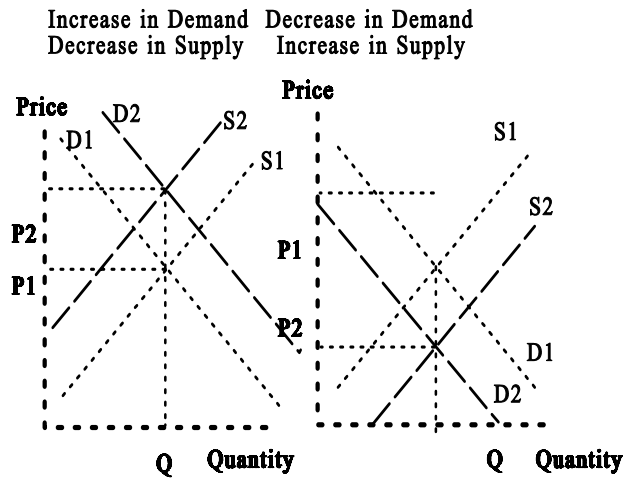
Movement of the demand curve from D1 (solid line) to D2 (dashed line) is a decrease in demand (as demonstrated in the above graph). Such decreases are caused by a change in a nonprice determinant of demand (for example, the number of consumers in the market declined or the price of a substitute declined). With a decrease in demand there is a shift of the demand curve to the left along the supply curve, therefore both equilibrium price and quantity decline. If we move from D2 to D1 that is called an increase in demand, possibly due to an increase in the price of a substitute good or an increase in the number of consumers in the market. When demand increases both equilibrium price and quantity increase as a result.

Considering the following graph, movement of the supply curve from S1 (solid line) to S2 (dashed line) is an increase in supply. Such increases are caused by a change in a nonprice determinant (for example, the number of suppliers in the market increased or the cost of capital decreased). With an increase in supply there is a shift of the supply curve to the right along the demand curve, therefore equilibrium price and quantity move in opposite directions (price decreases, quantity increases). If we move from S2 to S1 that is called a decrease in supply, possibly due to an increase in the price of a productive resource (capital) or the number of suppliers decreased. When supply decreases, equilibrium price increases and the quantity decreases as a result. That is the result of the supply curve moving up along the negatively sloped demand curve (which remains unchanged).



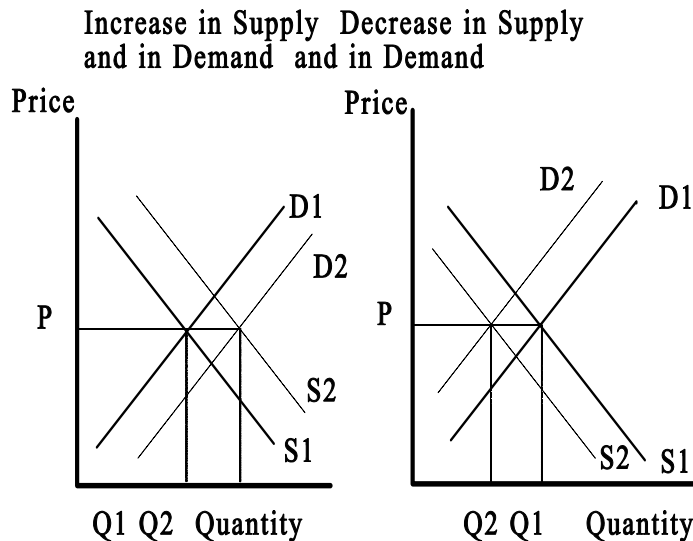
If both the demand curve and supply curve change at the same time the analysis becomes more complicated.

Consider the following graphs:



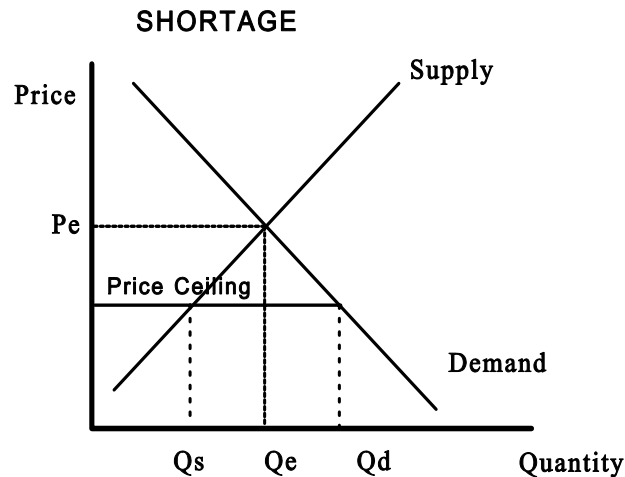
Notice that the quantity remains the same in both graphs. Therefore, the change in the equilibrium quantity is indeterminate and its direction and size depends on the relative strength of the changes between supply and demand. In both cases, the equilibrium price changes. In the first case where demand increases, but supply decreases the equilibrium price increases. In the second panel where demand decreases and supply increases, the equilibrium price decreases.

In the event that demand and supply both increase then price remains the same (is indeterminate) and quantity increases, and if both decrease then price is indeterminate and quantity decreases. These results are illustrated in the following diagrams.



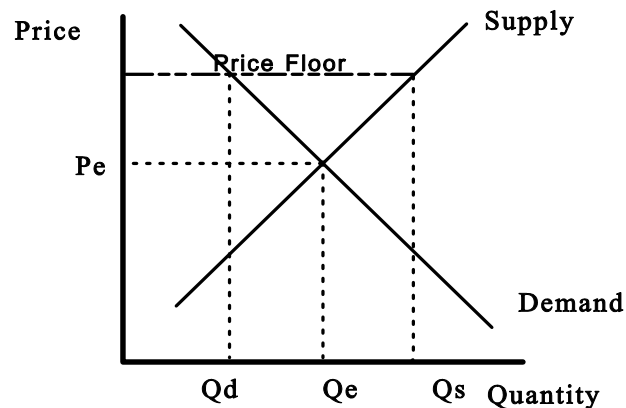
The graphs show that price remains the same (is indeterminate) but when supply and demand both increase quantity increases to  $Q_2$ . When both supply and demand decrease quantity decreases to  $Q_2$ .

8. Shortages and surpluses occur because of effective government intervention in the market.
  - a. Shortage is caused by an effective price ceiling (the maximum price you can charge for the product). Consider the following diagram that demonstrates the effect of a price ceiling in an otherwise purely competitive industry.



1. For a price ceiling to be effective it must be imposed below the competitive equilibrium price. Note that the  $Q_s$  is below the  $Q_d$ , which means that there is an excess demand for this commodity that is not being satisfied by suppliers at this artificially low price. The distance between  $Q_s$  and  $Q_d$  is called a shortage.
- 
- b. Surplus is caused by an effective price floor (i.e., the minimum you can charge):

## SURPLUS



For a price floor to be effective, it must be above the competitive equilibrium price. Notice that at the floor price  $Q_d$  is less than  $Q_s$ , the distance between  $Q_d$  and  $Q_s$  is the amount of the surplus. Minimum wages are the best-known examples of price floors and will be discussed in greater detail in Chapter 11.

9. Supply and Demand is rudimentary, and does not exist in the real world. In most respects the supply and demand model is the beginning point for understanding markets. Monopoly, monopolistic competition and oligopoly are, in some important respects, refinements from the purely competitive market. Therefore, the basic supply and demand model may accurately be thought of as the beginning point from which we will explore more realistic market structures.

## 5. Supply & Demand: Elasticities

### Lecture Notes

1. Price Elasticity of Demand is how economists measure the responsiveness of quantities demanded to changes in prices.

a. The elasticity coefficient is calculated using the midpoints formula presented below:

$$1. E_d = \frac{\text{Change in Qty}}{(Q1 + Q2)/2} \div \frac{\text{Change in price}}{(P1 + P2)/2}$$

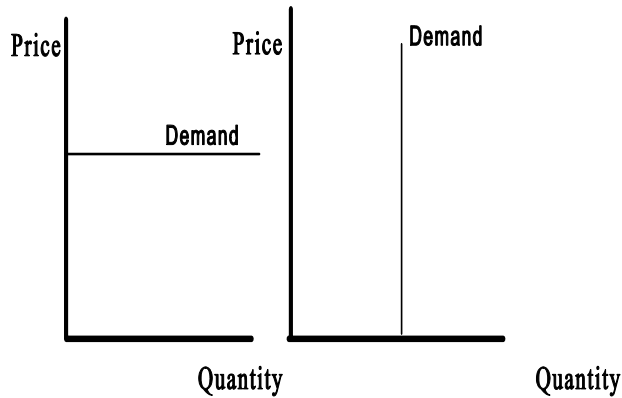
b. Elastic demand means that the quantities demanded respond more than proportionately to changes in price; with elastic demand the coefficient is more than one.

c. Inelastic demand means that the quantities demanded respond less than proportionately to changes in price; with inelastic demand the coefficient is less than one.

d. Unit elastic demand means that the quantity demanded respond proportionately to change in prices; with unit elastic demand the coefficient is exactly one.

2. Perfectly Elastic and Perfectly Inelastic Demand Curves

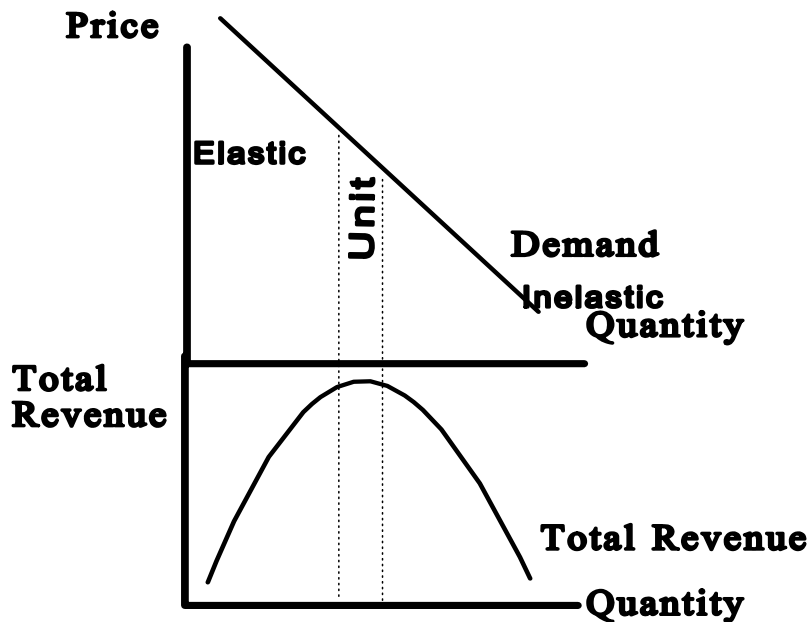
Perfectly elastic demand    Perfectly inelastic demand



Notice that the perfectly elastic demand curve is horizontal, (add one more horizontal line at the top of the price axis and it will look like an E) and the inelastic demand curve is vertical (looks like an I).

- a. Elasticity changes along the demand curve, however slope does not. Elasticity is concerned with changes along the curve rather than the shape or position of the curve.

3. Demand Curve and Total Revenue (total revenue =  $P \times Q$ ) Curve





In examining the above graphs, notice that as total revenue is increasing, demand is elastic. When the total revenue curve flattens-out at the top then demand becomes unit elastic, and when total revenue falls demand is inelastic.

4. Total Revenue Test uses the relation between the total revenue curve and the demand curve to determine elasticity.

Consider the following numerical example:

Total Quantity	Price per unit	Total Revenue		Elasticity
1	9	9	>+7	Elastic
2	8	16	>+5	Elastic
3	7	21	>+3	Elastic
4	6	24	>+ 1	Elastic
5	5	25	> - 1	Inelastic
6	4	24	> - 3	Inelastic
7	3	21	> - 5	Inelastic
8	2	16	> - 7	Inelastic
9	1	9		

The total revenue test is simply the inspection of the data to see what happens to total revenue. If the change in total revenue (marginal revenue) is positive then demand is price elastic, if the change in total revenue is negative the demand is price inelastic. If the marginal revenue is exactly zero then demand is unit elastic.

5. The following determinants of the price elasticity of demand will determine how responsive the quantity demanded is to changes in price. These determinants are:

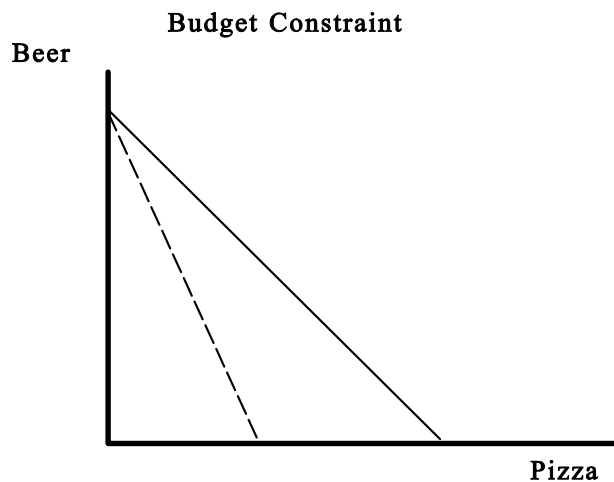
- a. substitutability

- b. proportion of income
  - c. luxuries versus necessities
  - d. time
6. Price Elasticity of Supply is determined by the following time frames. The more time a producer has to adjust output the more elastic is supply.
- a. market period
  - b. short run
  - c. long run
7. Cross elasticity of demand measures the responsiveness of the quantity demanded of one product to changes in the price of another product. For example, the quantity demanded of Coca-Cola to changes in the price of Pepsi.
8. Income elasticity of demand measures the responsiveness of the quantity demanded of a commodity to changes in consumers' incomes.
9. Interest rate sensitivity.

## 6. Consumer Behavior

### Lecture Notes

1. Individual demand curves can be constructed from observing consumer purchasing behaviors as we change price.
  - a. This is called REVEALED PREFERENCE
  - b. Market demand curves are constructed by aggregating individual demand curves for specific commodities.
2. Individual preferences can be modeled using a model called indifference curve - budget constraint and from this model we can derive an individual demand curve.
  - a. The budget constraint shows the consumer's ability to purchase goods.

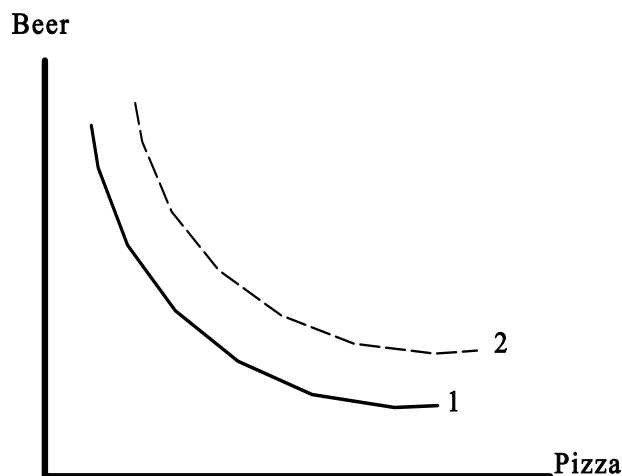


The consumer is assumed to spend their resources on only beer and pizza. If all resources are spent on beer then the intercept on the beer axis is the amount of beer the consumer can purchase; on the other hand, if all resources are spent on pizza then the intercept on that axis is the amount of pizza that can be had.

If the price of pizza doubles then the new budget constraint becomes the dashed line. The slope of the budget constraint is the negative of the relative prices of beer and pizza.

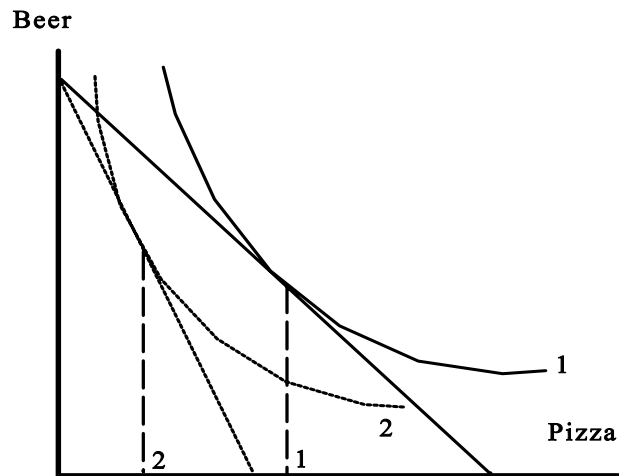
b. The indifference curve shows the consumer's preferences:

1. There are three assumptions that underpin the indifference curve, these are:
  - 1) Indifference curves are everywhere thick
  - 2) Indifference curves do not intersect one another
  - 3) Indifference curves are strictly convex to the origin



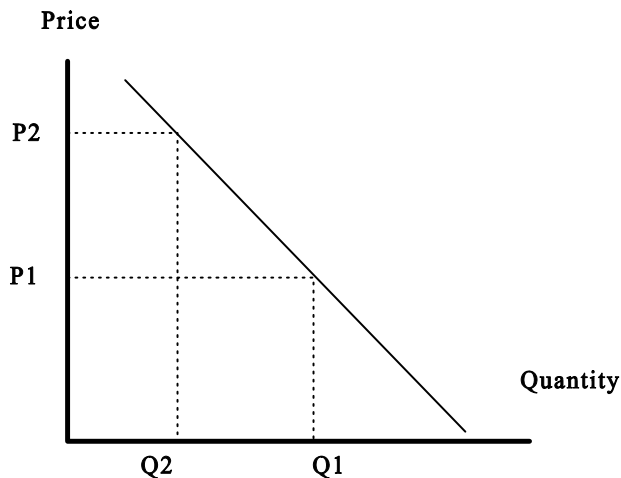
The dashed line (2) shows a higher level of total satisfaction than does the solid line (1). Along each indifference curve is the mix of beer and pizza that gives the consumer equal total utility.

Consumer equilibrium is where the highest indifference curve they can reach is exactly tangent to their budget constraint. Therefore if the price of pizza increases we can identify the price from the slope of the budget constraint and the quantities purchased from the values along the pizza axis and derive an individual demand curve for pizza:



When the price of pizza doubled the budget constraint rotated from the solid line to the dotted line and instead of the highest indifference curve being curve 1, the best the consumer can do is the indifference curve labeled 2.

Deriving the individual demand curve is relatively simple. The price of pizza (with respect to beer) is given by the (-1) times slope of the budget constraint. The lower price with the solid line budget constraint results in the level the higher level of pizza being purchased (labeled 1 for the indifference curve - not the units of pizza). When the price increased the quantity demanded of pizza fell to the levels associated with budget constraint 2.



Notice that  $Q_2$  and  $P_2$  are associated with indifference curve 2 and budget constraint 2, and that  $Q_1$  and  $P_1$  result from indifference curve 1 and budget constraint 1. The above model shows this individual consumer's demand for pizza.

3. Income and substitution effects combine to cause the demand curve to slope downwards.
  - a. the income effect results from the price of a commodity going down permitting consumers to spend less on that commodity, hence the same as having more resources.
  - b. As a price increases, the consumer will purchase less of that commodity and buy more of a substitute, this is the substitution effect.
  - c. The combination of the income and substitution effects is that an individual (hence a market) demand curve will generally slope downward.
  - d. Giffin's Paradox is the fact that some commodities may have an upward sloping demand curve. This happens because the income effect results in less of a quantity demanded for a product the lower the price.
    1. There is also the snob appeal possibility where the higher the price the more desired the commodity is - Joy Perfume advertised itself as the world's most expensive.
  
3. Utility maximizing rule - consumers will balance the utility they receive against the cost of each commodity to arrive at the level of each commodity they should consume to maximize their total utility.
  - a. algebraic restatement -  $MU_a/P_a = MU_b/P_b = \dots = MU_z/P_z = 1$

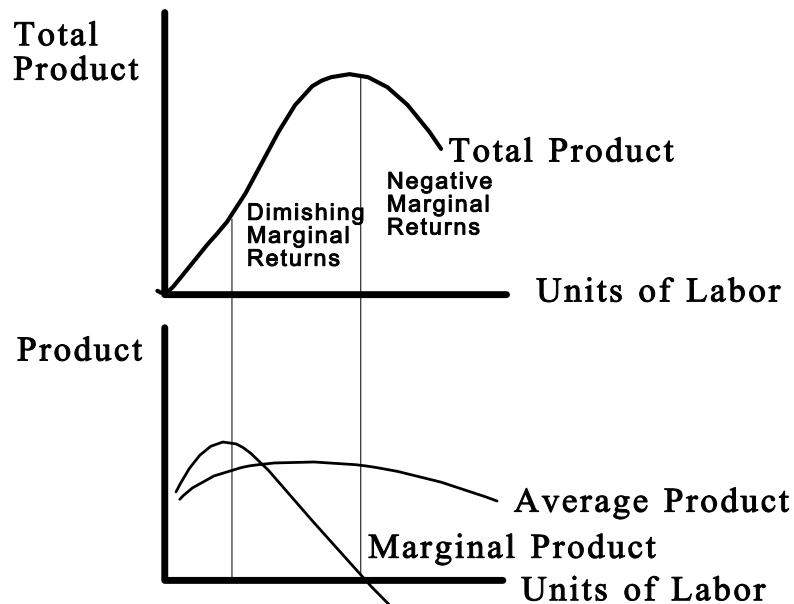
## 7. Costs of Production

### Lecture Notes

1. Explicit are accounting costs, however, Implicit Costs are the opportunity costs of business decisions.
  - a. normal profit includes an opportunity cost - the profit that could have been made in the next best alternative allocation of productive resources.
  3. In other words, there is a difference between economic and accounting cost; accountants are unconcerned with opportunity costs.
2. Time Periods are defined by the types of costs observed. These time periods differ from industry to industry.
  - a. market period - everything is fixed
  - b. short run - there are both fixed and variable costs
  - c. long run - everything is variable
3. Prelude to Production Costs in Short Run - include both fixed and variable costs:
  - a. the law of diminishing returns is the fact that as you add variable factors of production to a fixed factor at some point, the increases in total output become smaller.
  - b. total product is the total units of production obtained from the productive resources employed.

- c. average product is total product divided by the number of units of the variable factor employed
- d. marginal product is the change in total product associated with a change in units of a variable factor

1. graphical presentation:

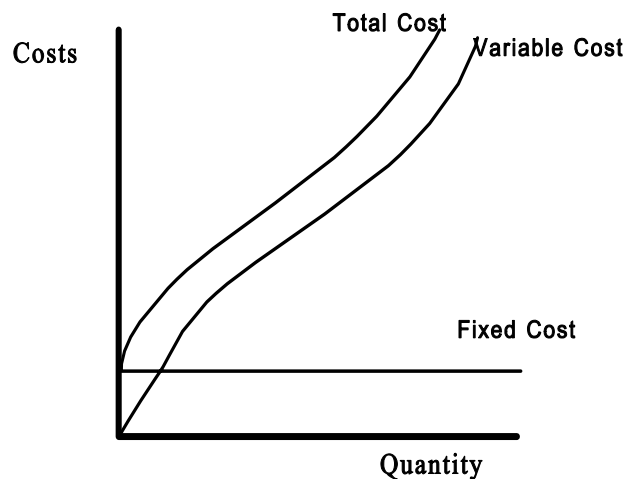


The top graph shows total product (total output). As total product reaches its maximum marginal product becomes zero and then negative as total product declines. When marginal product reaches its maximum, the total product curve becomes flatter. As marginal product is above average product in the bottom diagram, average product is increasing. When marginal product is below average product, then average product is decreasing. The ranges of marginal returns are identified on the above graphs.



4. Short-run costs:

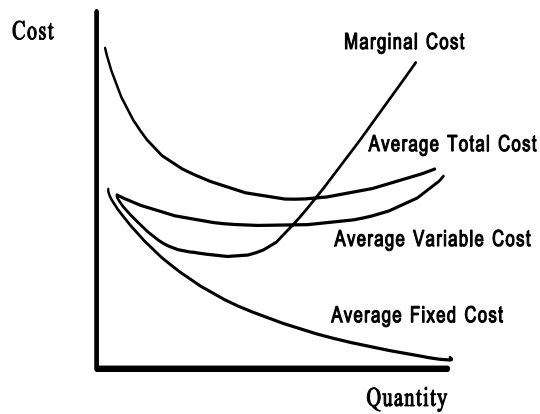
- a. total costs =  $VC + FC$
- b. variable costs are those items that can be varied in the short-run, i.e., labor
- c. fixed costs are those items that cannot be varied in the short-run, i.e., plant and equipment



The fixed cost curve is a horizontal line because they do not vary with quantity of output. Variable cost has a positive slope because it vary with output. Notice that the total cost curve has the same shape as the variable cost curve, but is above the variable cost curve by a distance equal to the amount of the fixed cost.

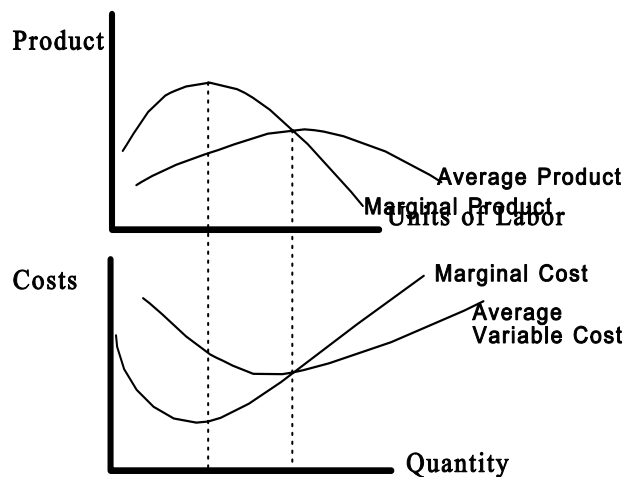
- d. average total costs =  $TC/Q$
- e. average variable cost =  $VC/Q$
- f. average fixed cost =  $FC/Q$
- g. marginal cost =  $\Delta TC/\Delta Q$ ; where  $\Delta$  stands for change in.

- The following diagram presents the average costs and marginal cost curve in graphical form.



Notice that the average fixed cost approaches zero as quantity increases. Average total cost is the summation of the average fixed and average variable cost curves. The marginal cost curve intersects both the average total cost and average variable cost curves at their respective minimums.

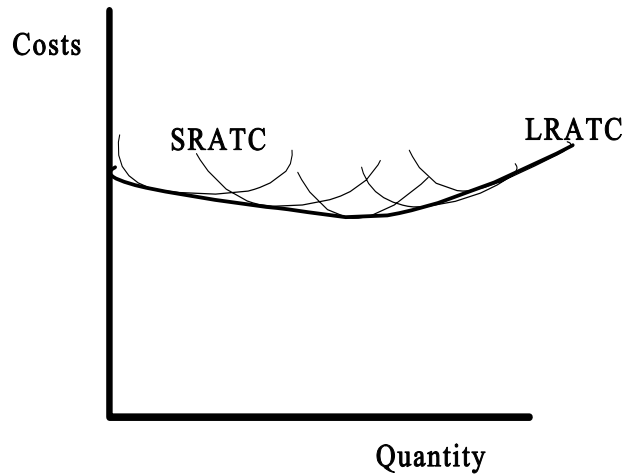
The following graph relates average and marginal product to average variable and marginal cost.



Notice that at the maximum point on the average product curve, marginal cost reaches a minimum. Where marginal cost equals average variable cost, the marginal product curve intersects the average product curve.

## 5. Long Run Average Total Cost Curve

- a. Is often called an envelope curve because it is the minimum points of all possible short-run average total cost curves (allowing technology and fixed cost to vary).



## 6. Economies of Scale are benefits obtained from a company becoming large and Diseconomies of Scale are additional costs inflicted because a firm has become too large.

- a. The causes of economies of scale are:

1. labor specialization
2. managerial specialization
3. more efficient capital
4. ability to profitably use by-products

- b. Diseconomies of scale are due to the fact that management loses control of the firm beyond some size.

- c. Constant returns to scale are large ranges of operations where the firm's size matters little.
- d. Minimum efficient scale is the smallest size of operations where the firm can minimize its long-run average costs.
- e. Natural monopoly is a market situation where per unit costs are minimized by having only one firm serve the market -- i.e., electric companies.

## 8. Pure Competition

### Lecture Notes

1. There are several models of market structure, these include:
  - a. pure competition (atomized competition, price taker, freedom of entry & exit, no nonprice competition, standardized product)
  - b. pure monopoly (one seller, price giver, entry & exit blocked, unique product, nonprice competition)
  - c. monopolistic competition (large number of independent sellers, pricing policies, entry difficult, nonprice competition, product differentiation)
  - d. oligopoly (very few number of sellers, often collude, often price leadership, entry difficult, nonprice competition, product differentiation)
1. all assume perfect knowledge
2. Assumptions of Pure Competition:
  - a. large number of agents
  - b. standardized product
  - c. no non-price competition
  - d. freedom of entry & exit

e. price taker

3. Revenue with a price taking firm:

a. average revenue and marginal revenue are equal for the purely competitive firm because price does not change with quantity.

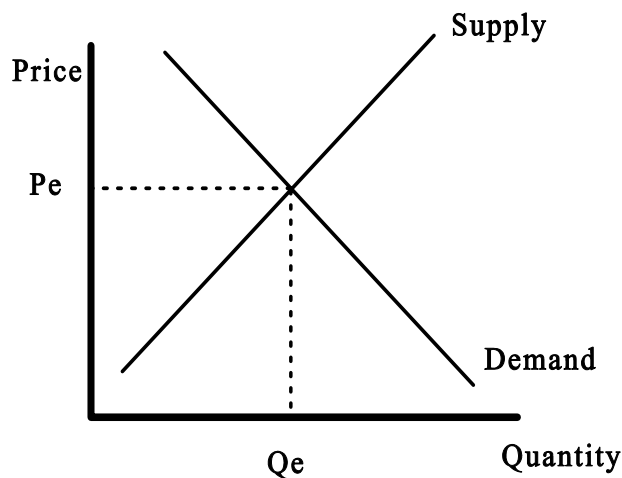
b. total revenue is  $P \times Q$  which is the total area under the demand curve (up to where  $MR = MC$ ) for the purely competitive firm.

4. The profit-maximizing rule is that a firm will maximize profits where Marginal Cost is equal to Marginal Revenue.

a.  $MC = MR$

b. Where  $MC = MR$ ; revenue is at its maximum and costs are at their minimum.

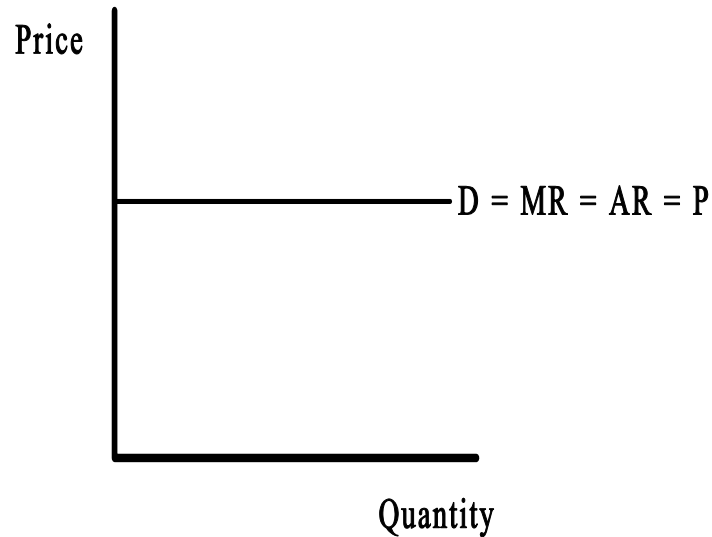
5. Model of the purely competitive industry:



The purely competitive industry is the supply and demand diagram presented in chapter 4.

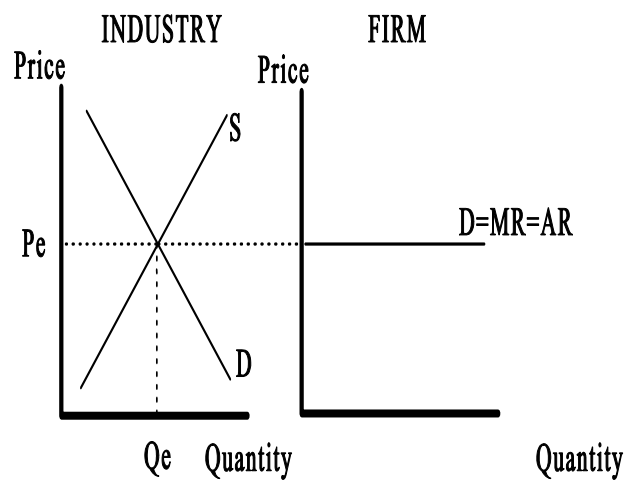
## 6. Firm in Perfect Competition

- a. perfectly elastic demand curve

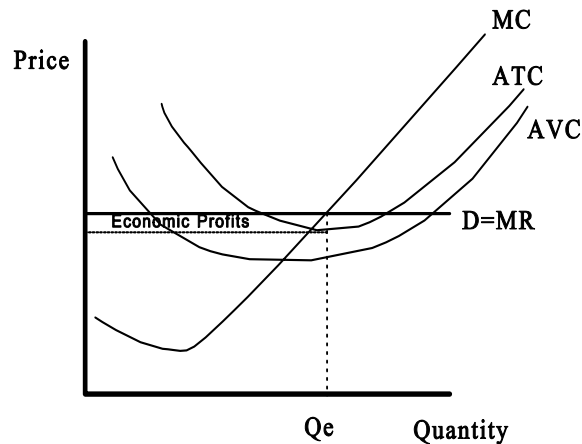


- b. Because the firm is a price taker, meaning that it charges the same price across all quantities of output, marginal revenue is always equal to price, and average revenue will always be equal to price. Therefore the demand curve intersects the price axis and is horizontal (perfectly elastic).

- c. Establishing price in the industry and the firm:

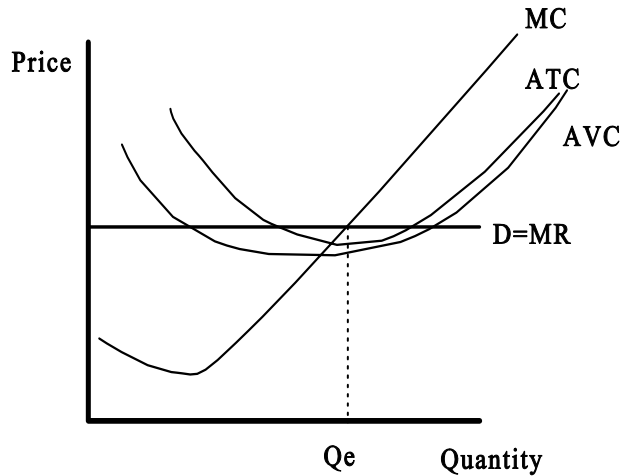


- d. The price is established by the interaction of supply and demand in the industry ( $P_e$ ) and the quantity exchanged in the industry is the summation of all of the quantities sold by the firms in the industry.
- e. Economic profit for the competitive firm is shown by the rectangle labeled “Economic Profit” in the following diagram:



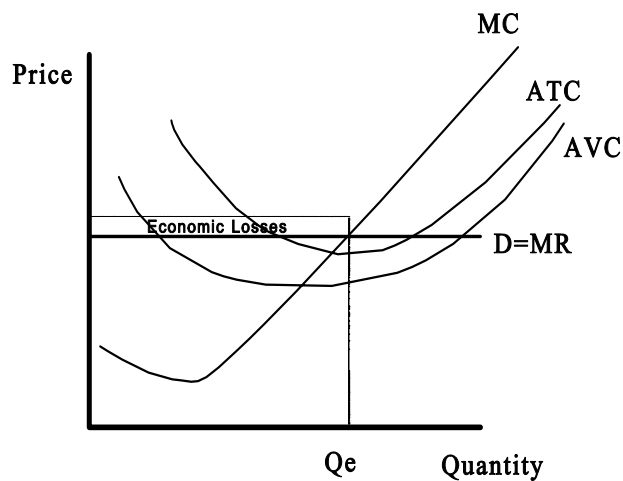
- f. The firm produces at where  $MC = MR$ , this establishes  $Q_e$ . At the point where  $MC = MR$  the average total cost (ATC) is below the demand curve (AR) and therefore costs are less than revenue, and an economic profit is made. The reason for this is that the opportunity cost of the next best allocation of the firm's productive resources is already added into the firm's ATC.
1. However, the firm cannot continue to operate at an economic profit because those profits are a signal to other firms to enter the market (free entry). As firms enter the market, the industry supply curve shifts to the right reducing price and thereby eliminating economic profits. Because of the atomized competition assumption, the number of firms that must enter the market to increase industry supply must be substantial.
- g. A normal profit for the competitive firm is shown in the following diagram:





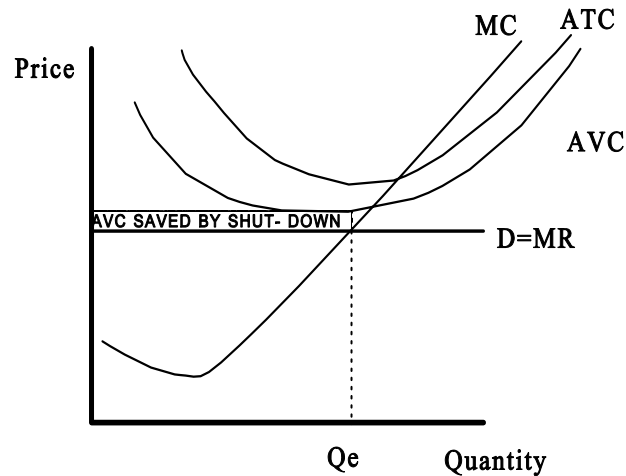
1. The case where a firm is making a normal profit is illustrated above. Where  $MC = MR$  is where the firm produces, and at that point ATC is exactly tangent to the demand curve. Because the ATC includes the profits from the next best alternative allocation of resources this firm is making a normal profit.

h. economic loss for a firm in pure competition:



- i. The case of an economic loss is illustrated above. The firm produces where  $MC = MR$ , however, at that level of production the ATC is above the demand curve, in other words, costs exceed revenues and the firm is making a loss.

j. shut-down case



1. The firm will continue to operate in the case presented in (d.) above because the firm can cover all of its variable costs and have something left to pay on its fixed costs - this is loss minimization. However, in the case above you can see that the AVC is above the demand curve at where  $MC=MR$ , therefore the firm cannot even cover its variable costs and will shut down to minimize its losses.

## 7. Pure Competition and Efficiency

- a. Allocative efficiency criteria are satisfied by the competitive model. Because  $P = MC$ , in every market in the economy there is no over- or under- allocation of resources in this economy.
- b. Technical or Productive efficiency criteria are also satisfied by the competitive model because price is equal to the minimum Average Total Cost.
- c. This, however, does not mean a purely competitive world is utopia. There are several problems including which are typically associated with a purely competitive market:
  1. Market failures and externalities.

2. Income distribution may lack fairness.
3. There may be a limited range of consumer choice.
4. Many natural monopolies are in evidence in the real world.

## 9. Pure Monopoly

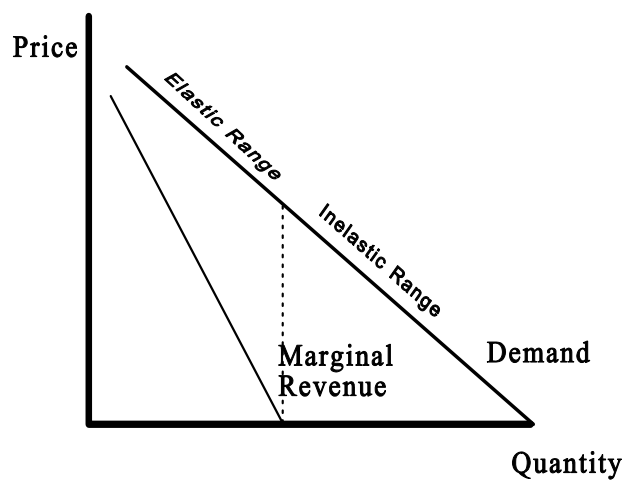
### Lecture Notes

#### 1. Assumptions of Monopoly Model

- a. single seller
- b. no close substitutes
- c. price giver
- d. blocked entry
- e. non-price competition

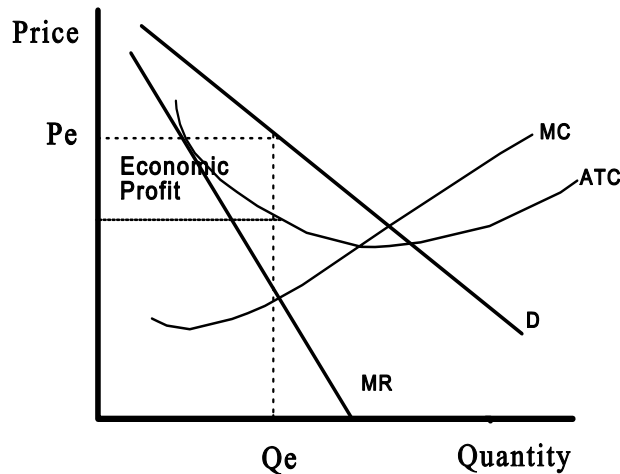
#### 2. The Firm is the Industry and therefore faces a downward sloping demand curve, which is also the average revenue curve..

- a. If the firm wants to sell more it must lower its price therefore marginal revenue is also downward sloping, but has twice the slope of the demand curve.



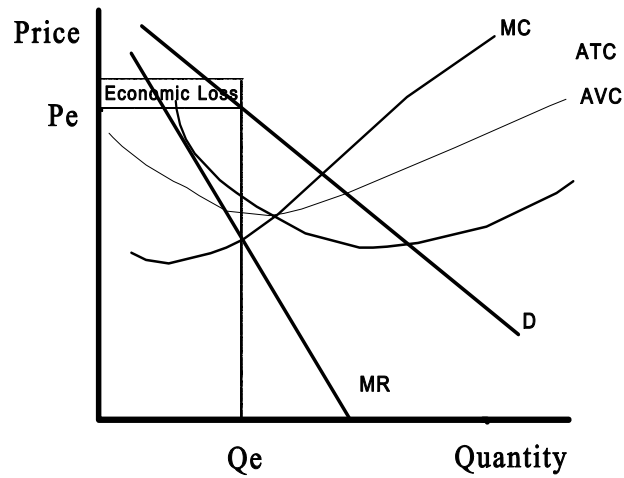
1. The point where the marginal revenue curve intersects the quantity axis is of significance; this point is where total revenue is maximized. Further, the point on the demand curve associated with where  $MR = Q$  is unit price elastic demand; to the left along the demand curve is the elastic range, and to the right is the inelastic range.
  
3. There is no supply curve in an industry which is a monopoly.
  - a. The monopoly decides how much to produce using the profit maximizing rule; or where  $MC = MR$
  
4. Monopolized Market

- a. Economic Profit:



- b. Because entry is blocked into this industry the economic profits shown above can be maintained in the long run. The monopolist produces where  $MC = MR$ , but the price charged is all the market will bear, that is, where the demand curve is above the intersection of  $MC = MR$ .

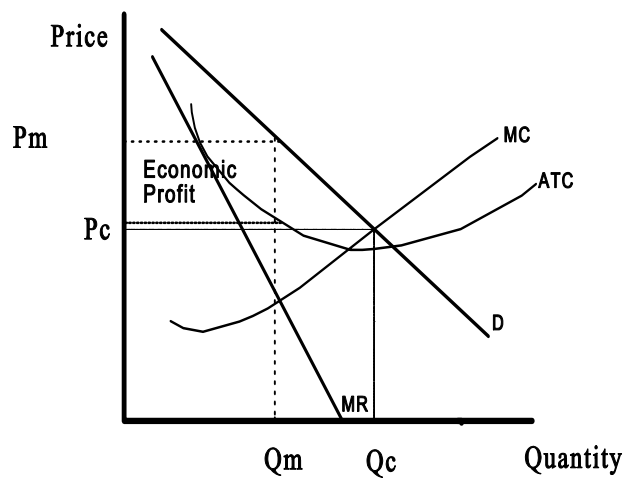
c. Economic losses



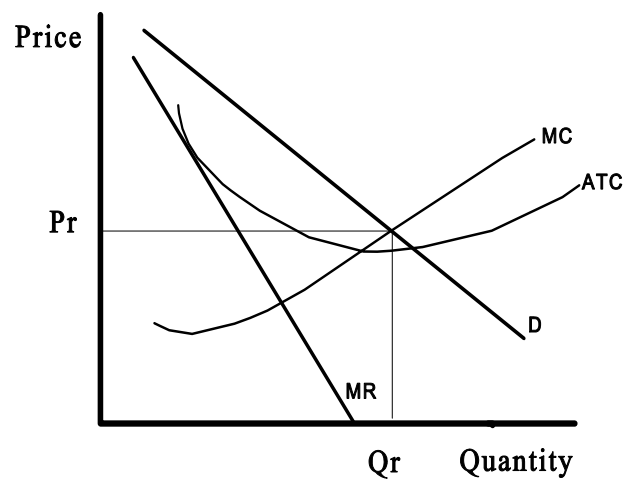
1. This monopolist is making an economic loss. The ATC is above the demand curve (AR) at where  $MC = MR$  (the loss is the labeled rectangle). However, because AVC is below the demand curve at where  $MC = MR$  the firm will not shut down so as to minimize its losses.

5. Economic Effects of Monopoly:

- a. prices, output & resource allocations are not consistent with allocative and maybe not technical efficiency criteria. With allocative efficiency consider the following graph:

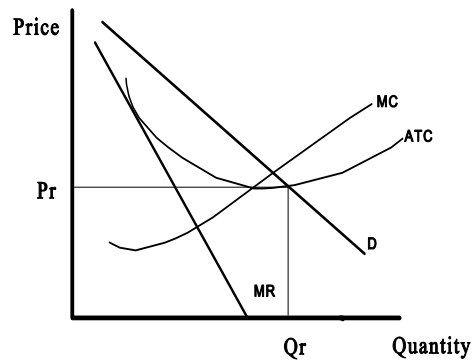


1. The above graph shows the profit maximizing monopolist,  $P_m$  is the price in the monopoly and  $Q_m$  is the quantity exchanged in this market. However, where  $MC = D$  is where a perfectly competitive industry produces and this is associated with  $P_c$  and  $Q_c$ . The monopolist therefore produces less and charges more than a purely competitive industry.
  - b. A monopolist can also segment a market and engage in price discrimination. Price discrimination is where you charge a different price to different customers depending on their price elasticity of demand. Because the consumer has no alternative source of supply price discrimination can be effective.
  - c. Sometimes a monopolist is in the best interests of society (besides the natural monopoly situation). Often a company must expend substantial resources on research and development. If these types of firms were forced to permit free use of their technological developments (hence no monopoly power) then the incentive to develop new technology and products would be eliminated.
6. Regulated Monopoly - Because there are natural monopoly market situations it is in the public interest to permit monopolies, but they are generally regulated. Examples of regulated monopolies are electric utilities, cable TV companies, and telephone companies (local).
  - a. A monopoly regulated at social optimum  $P = D = MC$



1. This firm is being regulated at the social optimum, in other words, what the industry would produce if it were a purely competitive industry. The price it is required to charge is also the competitive solution. However, notice the ATC is below the demand curve at the social optimum which means this firm is making an economic profit. It is also possible with this solution that the firm could be making an economic loss (if ATC is above demand) or even shut down (if AVC is above demand).

- b. A monopolist regulated at the fair return  $P = D = AC$



1. The fair rate of return enforces a normal profit because the firm must price its output and produce where ATC is equal to demand. This eliminates economic profits and the risk of loss or of even putting the monopolist out of business.
- c. The dilemma of regulation is knowing where to regulate, at the social optimal or at the fair return. In reality regulated monopolies are permitted to earn a rate of return only on invested capital and all other costs are simply passed on to the consumer.
    1. Rate regulation using, invested capital as the rate base, causes an incentive for firms to over-capitalize and not be sensitive to variable costs. This is called the Averch-Johnson Effect.
  - d. X-efficiency is where the firm's costs are more than the minimum possible costs for producing the output. Electric companies over-capitalize and use excess capital to avoid labor and fuel expenditures (which are generally



much cheaper than the additional capital) - nuclear generating plants are a good example of this.

9. Sherman Antitrust Act – monopolize or restraint trade or conspire to monopolize a market.

a. Interstate Commerce

b. Criminal Provisions

1. Felony

c. Civil Provisions

1. Private civil suit, not criminal

2. Treble damages

## 10. Resource Markets

### Lecture Notes

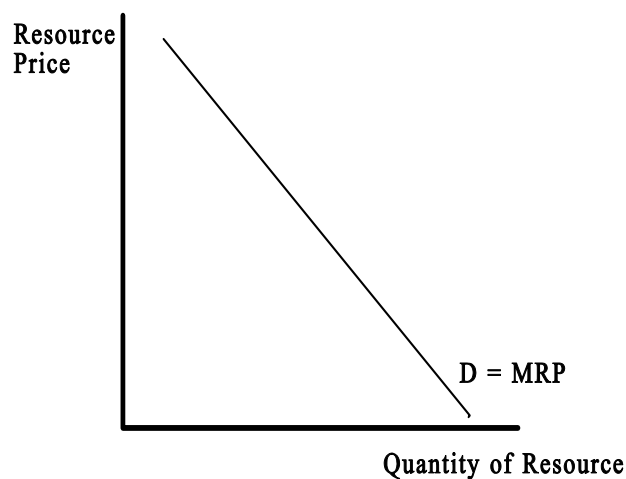
#### 1. Resource Market Complications:

- a. Resource markets are often heavily regulated, particularly capital and labor markets.
- b. Because labor (human beings as a factor of production) and private property are involved in resource markets there tends to be more controversy concerning these markets.

#### 2. The demand for all productive resources is a derived demand. By derived demand it is meant that it is the output of the resource and not the resource itself for which there is a demand.

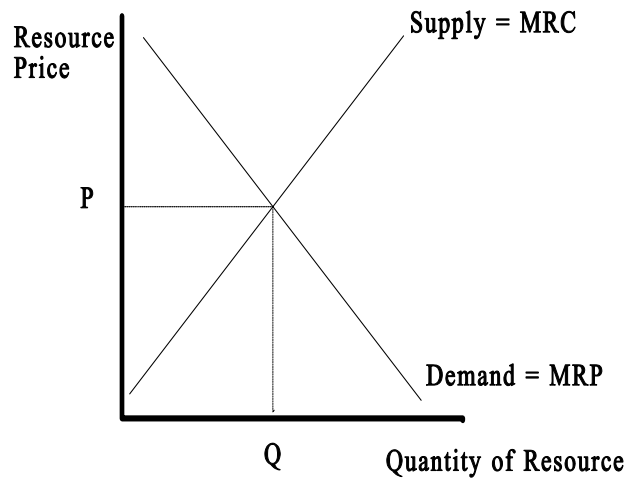
- a. marginal product is  $MP = \Delta TP / \Delta L$  where L is units of labor, (or K for capital, etc).
- b. marginal revenue product is  $MRP = \Delta TR / \Delta L$

#### 3. Demand Curve:



- a. Because the demand for a productive resource is a derived demand, the demand schedule for that productive resource is simply the MRP schedule of that resource.
4. Determinants of Resource Demand:
- a. productivity
  - b. quality of resource
  - c. technology
5. Determinants of Resource Price Elasticity:
- a. rate of decline of MRP
  - b. ease of resource substitutability
  - c. elasticity of product demand
  - d. K/L ratios
6. Marginal resource cost is the amount that the addition of one more unit of a productive resource adds to total resource costs.
- a.  $MRC = \Delta TRC / \Delta L$
7. The profit maximizing employment of resources is where  $MRP = MRC$ , where MRC is the supply curve of the resource in a purely competitive resource market.

a. resource market equilibrium



8. Least Cost Combination of all productive resources is determined by hiring resources where the ratio of MRP to MRC is equal to one for all resources.

a.  $MRP_{labor}/MRC_{labor} = MRP_{capital}/MRC_{capital} = \dots = MRP_{land}/MRC_{land} = 1$

b. The quantities of the resource to the left (right) of the equilibrium point is under-utilization (over-utilization) where  $MRP / MRC > 1$  ( $MRP / MRC < 1$ )

9. Marginal Productivity Theory of Income Distribution

a. inequality under this theory arises because of differences in the productivity of different resources and the value of the product it produces.

b. One serious flaw in the theory is that of imperfect competition in the product and resource markets.

1. monopsony is one buyer of a resource (or product) and causes factor payments below the competitive equilibrium.
2. monopoly power can also cause some goods and services to be over-valued.

# 11. Wage Determination

## Lecture Notes

### 1. Nominal versus Real Wages:

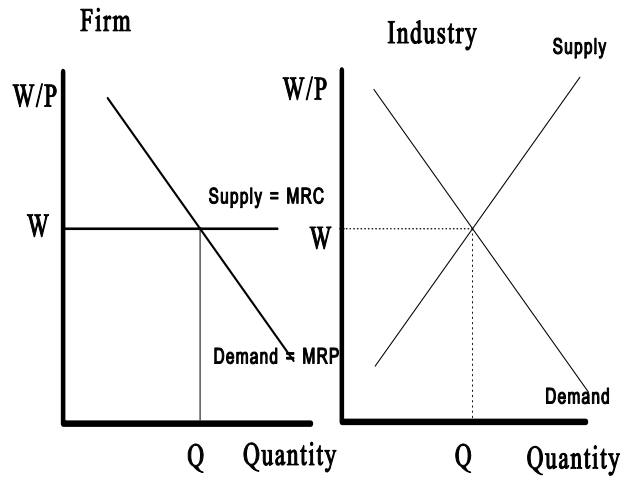
- a. Nominal wages ( $W$ ) are money wages, unadjusted for the cost of living.
- b. Real wages ( $W/P$ ) are money wages adjusted for the cost of living ( $P$ ) in other words, what you can buy.

### 2. Earnings and Productivity

- a. In theory an employee should be paid what she earns for the company, MRP, however, this theory has serious flaws in practice.
- b. Market imperfections, i.e., monopsony results in the earnings of workers being paid to other factors of production.
- c. Problems with measuring MRP, because of engineering complications of technology.

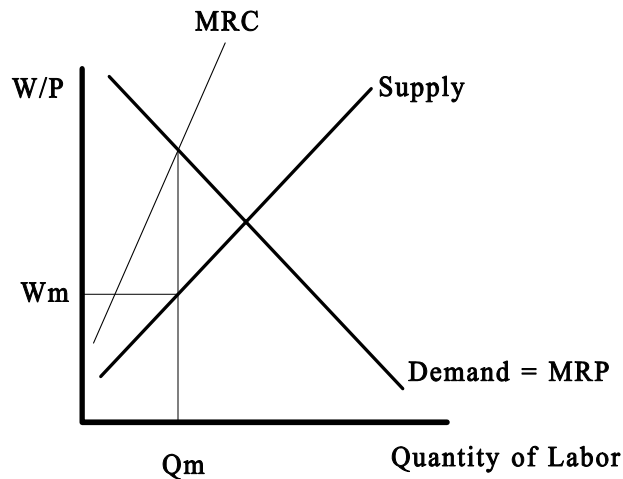
### 3. Supply and Demand for Labor:

- a. competitive labor market



1. The supply and demand curves for the industry are summations of the individual firms' respective demand and supply curves. Notice that the firm faces a perfectly elastic supply of labor curve, while the supply curve for the industry is upward sloping just like we observed in the product markets.

b. monopsony labor market (one buyer of labor)

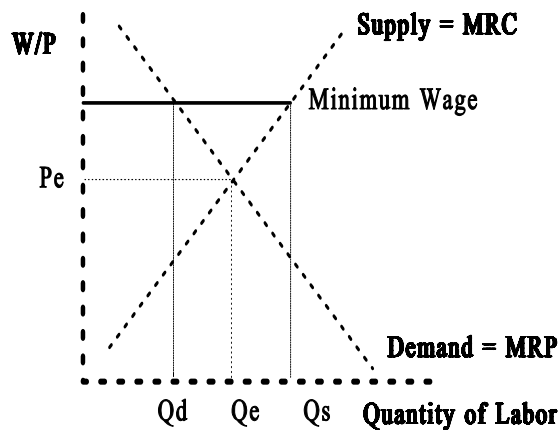


1. Notice that MRC breaks out to the right of the supply curve and is much steeper; this is due to the pricing policy the monopolist can employ. Also the wage and employment levels in the monopsony are much lower than in a competitive labor market.

4. Control of Monopsony:

- a. minimum wages has been one approach to the control of monopsony.

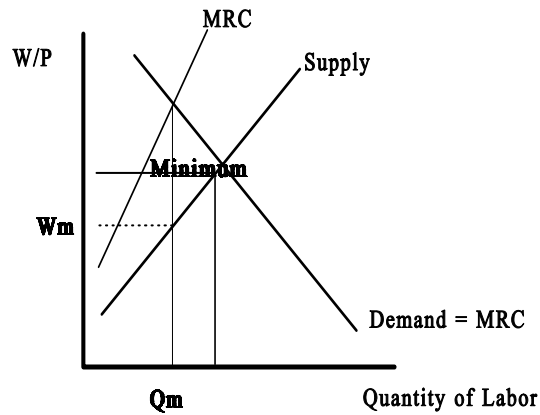
1. minimum wages under competition



2. The minimum wage acts the same as an effective price floor in that it creates a surplus of labor -- unemployment. The distance between  $Q_d$  and  $Q_e$  is the number of workers who lost jobs, and the distance between  $Q_e$  and  $Q_s$  is the number of workers attracted to this market that cannot find employment.
3. Minimum wage opponents argue that the minimum wage does two things that are bad for the economy (and these arguments are based on the competitive model)
  - b. The working poor can very easily become the unemployed poor if the competitive model's predictions are correct.
  - c. Again, the government interferes with the freedom of management to operate its firm -- thereby reducing economic freedom and increasing costs of doing business.



1. minimum wages in a monopsony

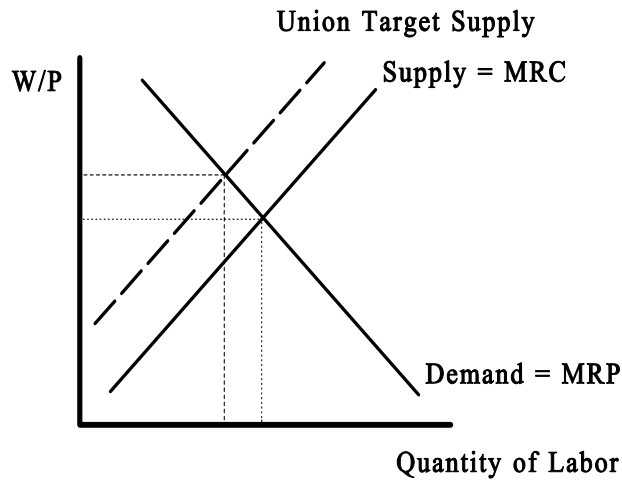


2. In a monopsony the wage increases with the establishment of a minimum wage, but if the employer is rational so too does the employment level.
3. If the monopsony model is accurate then the conservative argument does not hold water. Recent research results seem to suggest the monopsony predictions are correct.

5. Unions have also be an effective response to monopsony:

a. craft union (exclusive union):

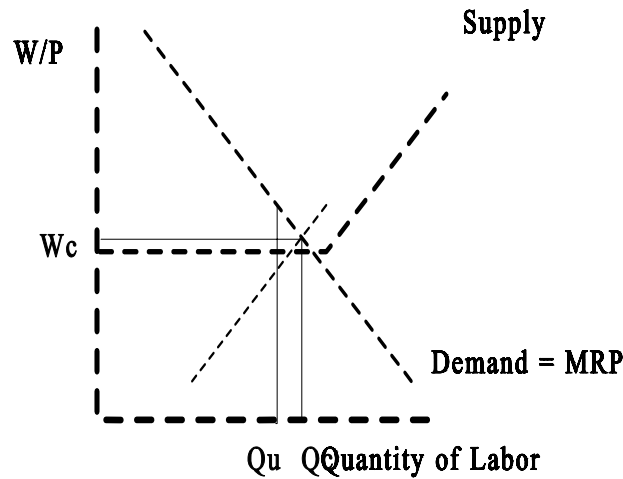
1. AFL Affiliated, organizes one skill class of employees (i.e., IBEW)



2. Craft unions can control the supply of labor somewhat because of the fact that they represent primarily skilled employees and have control of the apprentice programs and the standards for achieving journeyman status.

b. industrial union

1. CIO affiliate, organizes all skill classes within a firm (i.e., UAW)



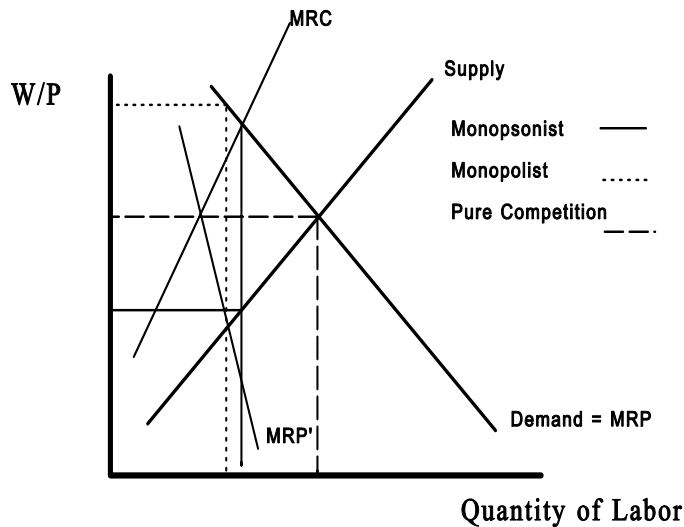
2. The industrial union establishes the minimum acceptable wage, below which they will strike rather than work. This approach depends upon solidarity among the work force to make the threat

of a strike effective.

c. There is a flaw in this analysis. Perfectly competitive labor markets are used to illustrate the effects of two different types of unions. If labor markets were competitive and there were not market imperfections unions would likely not be an economic priority for workers. However, unions are necessary in imperfectly competitive labor markets.

1. The pure craft and pure industrial union virtually no longer exist. The AFL and CIO merged in the mid-1950s and the distinction between the two types of unions had all but disappeared by this time -- the exception is some of the building trades unions.

6. Bilateral Monopoly is where there is a monopsonist that is organized by a union that attempts to offset the monopsony power with monopoly power.



a. The bilateral monopoly model is rather complex. The employer (monopsonist) will equate MRC with demand and attempt to pay a wage associated with that point on the supply curve. The monopolist (union) will equate MRP' with supply and attempt to extract a wage associated with that point on the demand curve. The situation shown in this graph shows that the competitive wage is just about halfway between what the union and employer would impose. The wage and employment levels established in this type of situation is a function of the relative bargaining power of the employer and union, therefore this model is indeterminate.

- b. The indeterminant nature of this model is why industrial relations developed as a separate field from economics (in large measure).
  - c. Industrial relations in the United States has been a function of the legal environment as much as market forces.
7. Private sector labor history is a sorted affair, with distinct periods.
- a. The first years (until 1932) the law in the U.S. was extremely anti-worker and anti-union, Injunctions, anti-trust prosecution etc.
  - b. 1932-1935 was the Norris-LaGuardia Act and Railway Labor Act period, and the government was neutral towards workers and unions.
  - c. 1935-47 Government was pro-union, pro-worker – the Wagner Act period.
  - d. 1947-1982 The Taft-Hartley Act period less pro-union, more balanced.
  - e. The post-PATCO; post-Requist activist court 1982 on, anti-union, anti-worker – almost back to the pre-1932 period
8. Public Sector industrial relations more problematic.
- a. Civil Service Reform Act of 1974 governs Federal Employees
    - 1. Homeland Security Act contains negation of bargaining rights for tens of thousands of Federal Employees
  - b. State employees covered by state statutes; most states have protective legislation
    - 1. States without protective legislation are typically southern and

rather poor – Indiana has no protective legislation

9. Market Wage Differentials arise from several sources:

- a. Geographic immobility
- b. Discrimination
- c. Differences in productivity

1. Ability

2. Difference in price of final product

10. Human Capital refers to the various aspects of a person that makes them productive. Gary Becker's book in the 1950s *Human Capital* earned him the Nobel Prize, but also brought greater attention to skills and knowledge as a determinant of income.

- a. Abilities, personality, and other personal characteristics are a portion of human capital -- many of these items are genetic, environmental, or a matter of experience.
- b. Education, training, and the acquisition of skills are human capital that is either developed or obtained.

1. In general it is hard to separate the sources of human capital; however, most is probably acquired.

2. In general, the higher the levels of human capital, the more productive an employee.

## 12. Epilogue to Principles of Economics

### Lecture Notes

#### 1. Changing World - Economically

- a. Outsourcing – sending work out of the firm for cost cutting reasons – generally to save labor costs.

- 1. Consumer incomes and production costs

- 2. Say's Law – accounting identity – cost of product is factor incomes

- b. Economics and Ethics

- 1. Fas – ethics

- 2. Boni Mores - public opinion or morals

- 3. Lex - law

- a. Law becomes dominate, but law is a constraint on the pursuit of self-interest (same as ethics and morals)

- b. Self-interest - rationality

- c. Internationalization

- 1. Comparative advantage is the basis for trade among nations as well as people.

- a. Natural resources
  - b. Technological innovation
  - c. Human capital
- 2. Language and cultural diversity important to individual and societal success
  - a. The middle east and different value systems and perceptions
- 2. American interests and foreign policy
  - a. Anti-American perspectives abroad
  - b. Reliance on foreign sources of energy
  - c. Perception of imperialism versus American generosity
    - 1. Peace Corps
    - 2. Marshall Plan
- 3. Globalization and domestic changes
  - a. Increasingly the U.S. is a service economy
    - 1. Goods producing comparative advantage being lost
    - 2. Multi-national corporations
  - b. De-industrialization

1. Lower incomes
2. More rapid changes

4. Parting words

- a. Principles of microeconomics is a scientific framework for decision-making.

1. Mother discipline of the business disciplines

- a. Marketing, finance, production management

- b. Useful in career, brings rational standards to decision-making.