

INTRODUCTION TO MICROECONOMICS

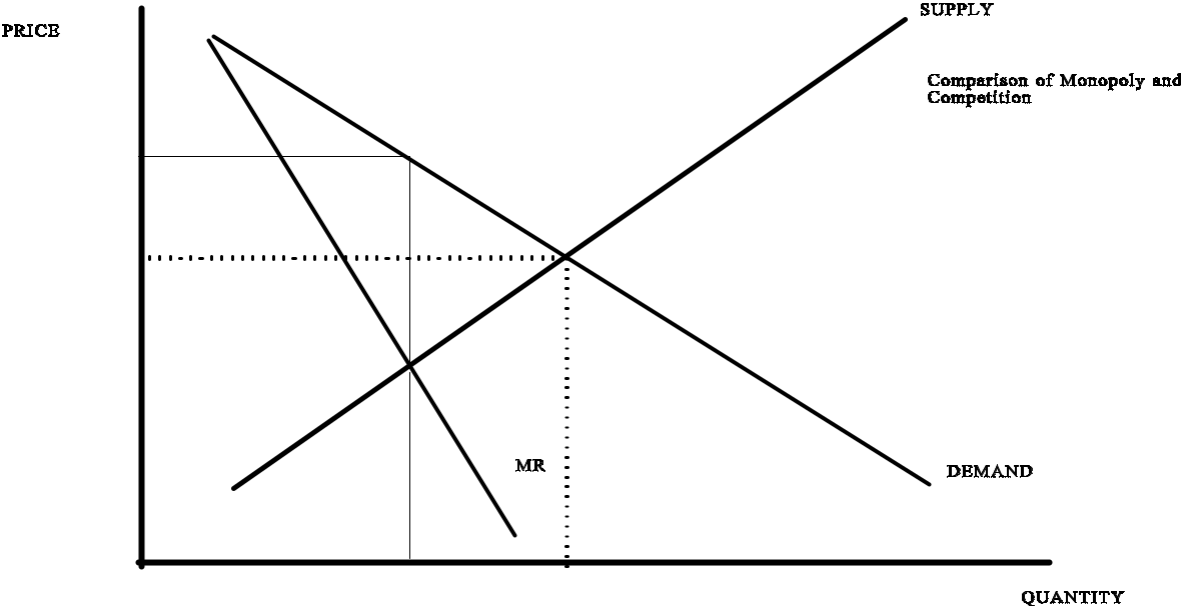


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PREFACE

This Course Guide was developed in part because of the high cost of college textbooks, and in part, to help organize students= studying by providing lecture notes. This Guide was made possible because the administration of IPFW had the foresight to make the campus= printing services available to duplicate these sorts of materials, and provide them at cost through the auspices of the University Bookstore in Kettler Hall. Without the active participation of both the campus duplicating services, and its most cooperative staff, and the bookstore this would not be available.

The department, school nor the professor make anything whatsoever from this Guide. In fact, the department=s budget and the professor=s own resources are used in the writing of the Guide, and the numerous draft copies that are produced in the revisions of this document. Like the sign in the Mom and Pop bait shop on Big Barbee Lake says, “This is a non-profit organization, wasn’t planned to be **B** it just sorta worked out that way.” Well, actually it was planned to be a non-profit enterprise in this particular case.

The professor also wishes to acknowledge the fact that several students have proposed changes, improvements, caught errors, and helped to make this document more useful as a learning tool. Naturally, any errors of omission or commission are those of the professor alone.

Introduction & Use of Guide

This Course Guide is provided to assist students in mastering the subject matter presented E201, Introduction to Microeconomics. The commercially available student guides and workbooks are notoriously inadequate and are simply of little value. At several institutions, prepared course materials are made available to students to assist their learning. What research has been done concerning these course specific materials, suggests that students' performances are enhanced by having access to these types of materials. Because microeconomics is such an important foundation for business, engineering, and the social sciences this Guide has been prepared.

The purpose of this Course Guide is fourfold. First, the course syllabus is included in the Guide. Second, the Guide provides the student a listing of the key concepts covered in the lectures. Third, the Guide provides students with problems and study-guides to aid each individual in the retaining the materials presented by the text and lecture. Fourth, sample exams are offered as self-test exercises and to give students an idea of the level of mastery expected in this course.

Organization

The Guide is divided into eleven units, following the organization of the Tentative Course Outline found in the syllabus. At the end of each chapters in the reading assignments there is a section containing the key concepts developed in the chapter, sample exam questions and a brief study guide. Also in the Guide is the course syllabus included before the eleven sections covering the substantive portions of the course. Following the reading assignments are the lecture notes for each chapter. The final section of the Guide contains sample examinations, including answers.

Note to Students

There is no substitute for doing the reading assignments, attending class, and working through the material. A teacher cannot cause a student to learn, all a teacher can do is to organize and present the material, grades can provide a small extrinsic reward for accomplishment, but it is the student's ability, effort, and desire that determine how much and how well they will learn. It is hoped this Guide will help in the learning effort.

SYLLABUS
E201, Introduction to Microeconomics

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COURSE POLICIES

1. In all respects, the policies of the School, Department, IPFW and the University shall be applied in this course.
2. Office hours will be posted on the professor's door, appointments may also be arranged. The Professor's office is Neff 340D.
3. The following grade scale will be applied in this course for determination of final grades:

A100 - 90 percent
B89 - 80 percent
C79 - 70 percent
D69 - 60 percent
Fbelow 60 percent

All final grade calculations shall be rounded up. In other words, 69.01 and 69.99 percent are both considered 70 percent and will earn the student a grade of C.

4. The majority of undergraduate economics courses this professor has taught have had average final grades that fall within the range centered on 2.0 on a 4.0 scale.
5. Course requirements:

The mid-term examination is worth 40% of the final grade, the final examination is worth 50% of the final grade, and there will be at least three quizzes, the best two scores on these quizzes will be worth 10% of the final grade.

A. Examinations will consist of objective items. Examinations will be worth 100 points, and will consist of twenty multiple-choice questions (worth four points each), and twenty true-false questions (worth one point each).

B. Quizzes are worth twenty points each, and will consist

three multiple choice questions (four points each) and four true false questions (worth two points each)

- C. If there is a 10-point improvement on the final exam over what was earned on the midterm, then the weights will be change to the midterm being worth only 30 percent and the final exam being worth 60 percent of the final grade.
6. The final examination will be given at the time and place scheduled by the university. No exception is possible.
 7. No make-up exams will be permitted. If you cannot attend class at exam time, you must make prior arrangements to take an equivalent examination before your classmates. Exceptions may be granted for cases where there was no possibility for an earlier examination, i.e., injuries or illnesses, etc **B** things clearly beyond the student=s control.
 8. Academic dishonesty in any form will result in a course grade of F and other sanctions as may be authorized by the university. The over whelming preponderance of students do not engage in dishonesty, and the professor owes it to these students to strictly police this policy.
 9. The provisions of these policies and the course objectives are subject to testing. These policies are also subject to change at the discretion of the professor and do not constitute a binding contract.

COURSE OBJECTIVES

This is an introductory principles of economics course that covers topics in microeconomics. The breath of topical coverage limits the course objectives to subject matter mastery. The course will present factual material concerning the operation of the firm and household as well as the development of rudimentary understanding of economic decision-making.

REQUIRED TEXT

David A. Dilts, *Introduction to Microeconomics, E201*. Fort Wayne: 2004, memo.

SUPPLEMENTAL TEXT

Campbell R. McConnell and Stanley L. Bruce, *Economics, twelfth edition*. New York: McGraw-Hill. [M&B in the outline]

TENTATIVE COURSE OUTLINE

1. Introduction to Course and Economics

Dilts, Chapter 1
M & B Chapter 1

2. Economic Problems

Dilts, Chapter 2
M & B Chapter 2

3. Circular Flow

Dilts, Chapter 3
M & B Chapter 3

4. The Basics of Supply and Demand

Dilts, Chapter 4
M & B Chapter 4

5. Supply and Demand: Elasticities

Dilts, Chapter 5
M & B Chapter 20

6. Consumer Behavior

Dilts, Chapter 6
M & B Chapter 21

MIDTERM EXAMINATION

7. Costs of Production

Dilts, Chapter 7
M & B Chapter 22

8. Pure Competition

Dilts, Chapter 8
M & B Chapter 23

9. Monopoly

Dilts, Chapter 9
M & B Chapter 24

10. Introduction to Resource Markets

Dilts, Chapter 10
M & B Chapter 27

11. Wage Determination

Dilts, Chapter 11
M & B Chapter 28

12. Epilogue

Dilts, Chapter 12

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 **B 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 - **A**after this, because of this@ **B** 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

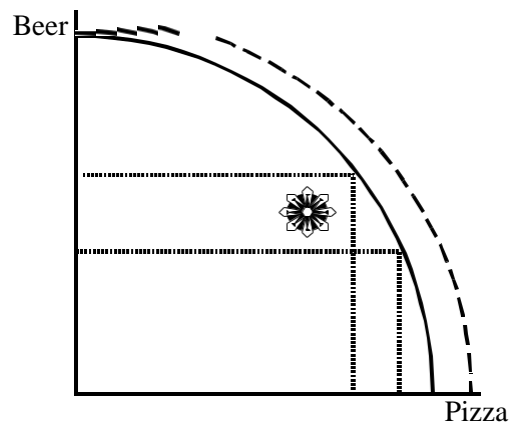
 - f. labor - is the skills, abilities, knowledge (called human capital) and the effort exerted by people in production.
 3. labor is paid wages

 - 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 **B** 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 **B** 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.

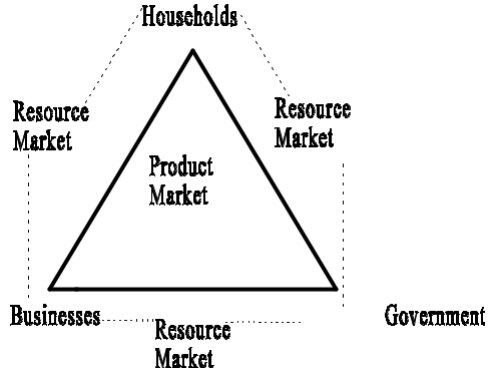
- b. absolute advantage for one trading partner results in no advantage to trade.
 1. LDCs often have no comparative advantage and hence the developed countries, possessing absolute advantage have no incentive to trade (. . .)
 2. LDC **B** Less Developed Country - Low-income countries **B** 60 **B** (per capita GDP of \$800), middle-income countries **B** 75 **B** (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 15th century
 - 2. Genghis Kahn in the 12th century in Asia **B** paper money
6. Foreign exchange **B** value of one currency versus another
- a. Hard currency **B** U.S. dollar, British Pound, Canadian dollar, Japanese Yen, and the Euro **B** 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 **B** 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:



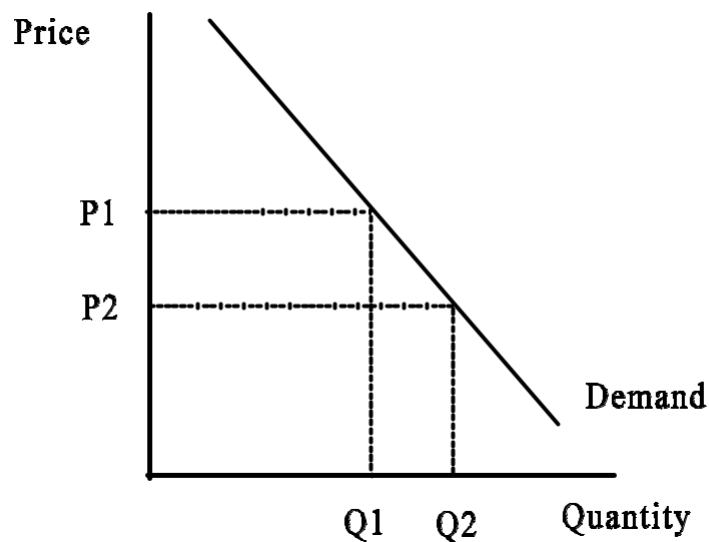
FOREIGN SECTOR

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 **AFOREIGN 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.

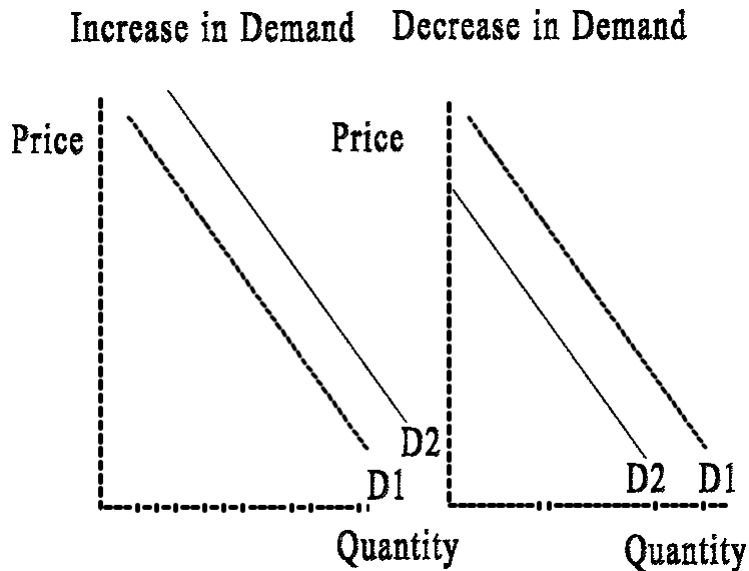
1. utility (use, pleasure, jollies) from the consumption of commodities.

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.

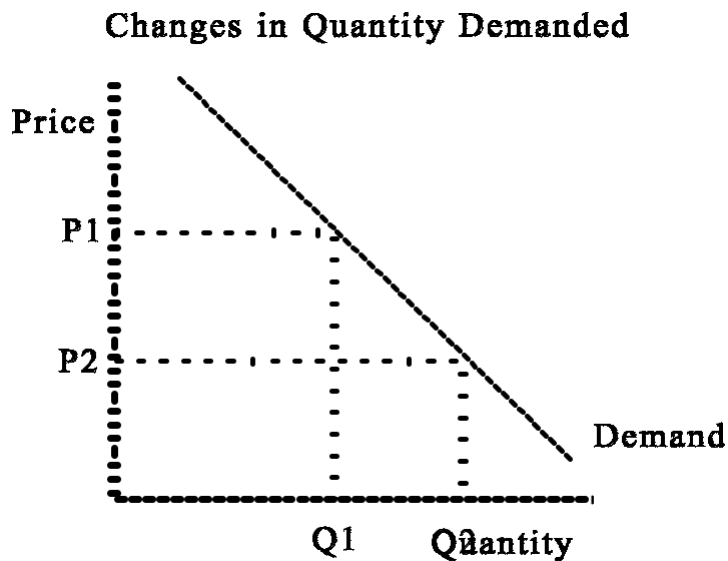
3. Demand Curve

- 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).

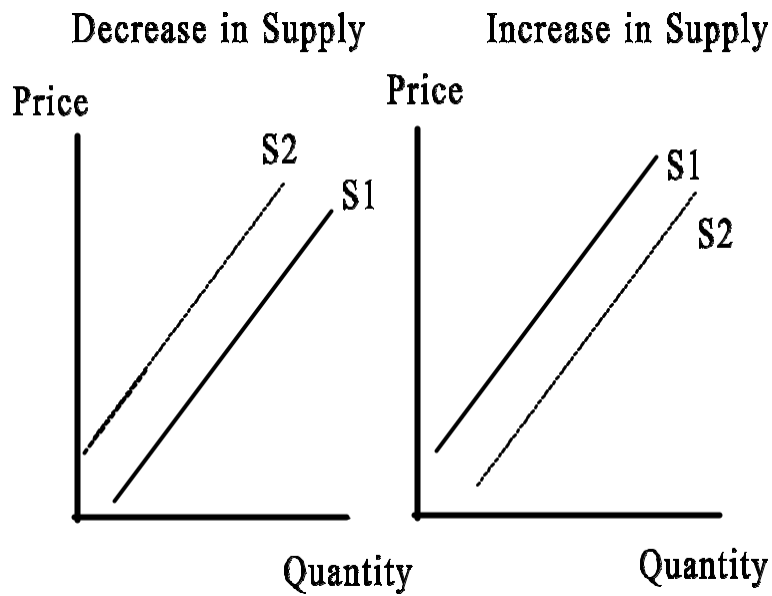


Movement along a demand curve is called a change in the quantity demanded. Changes in quantities demanded are caused by changes in price. When price decreases from P_1 to P_2 , the quantity demanded increases from Q_1 to Q_2 ; when price increases from P_2 to P_1 the quantity demanded decreases from Q_2 to Q_1 .

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.

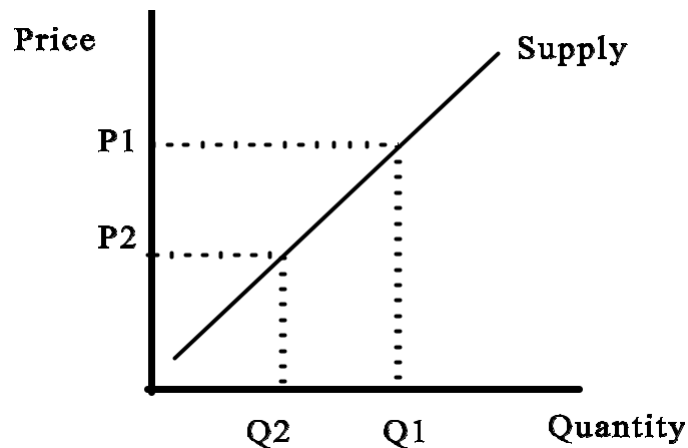
5. Supply curve - is nothing more than a schedule of the quantities at each and every price.
 - a. There is a positive relation between price and quantity on a supply curve.

 - 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



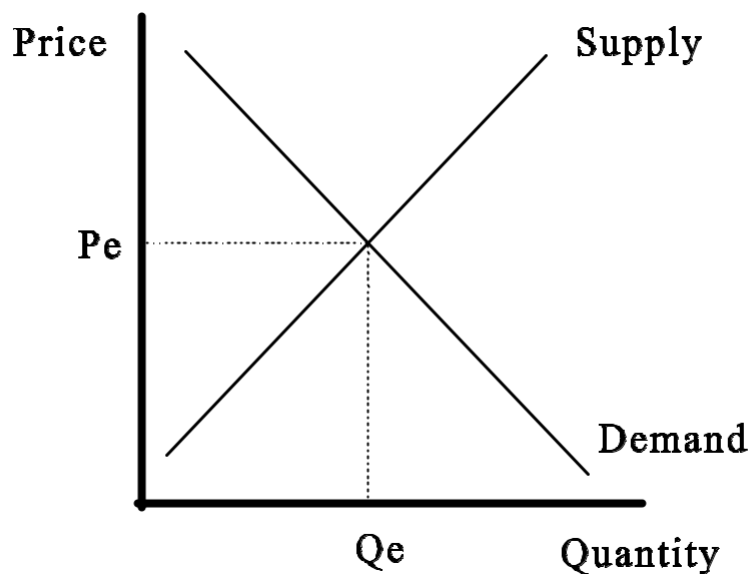
Changes in price cause changes in quantity supplied, an increase in price from P2 to P1 causes an increase in the quantity supplied from Q2 to Q1; a decrease in price from P1

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:

$$22 = 10 + 2P$$

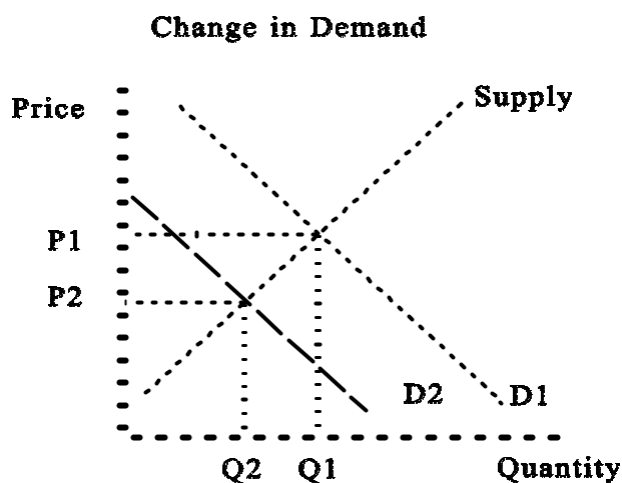
subtracting 10 from both sides of the equation yields:

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

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

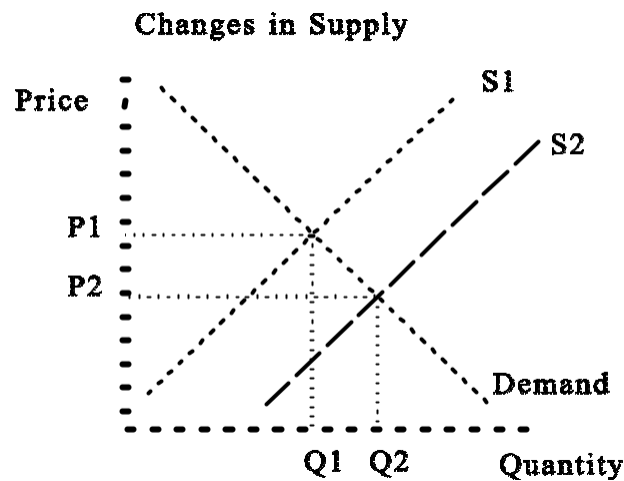
$$22 - 6 = 16 \text{ (Demand side) \& } 10 + 6 = 16 \text{ (Supply side)}$$

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.



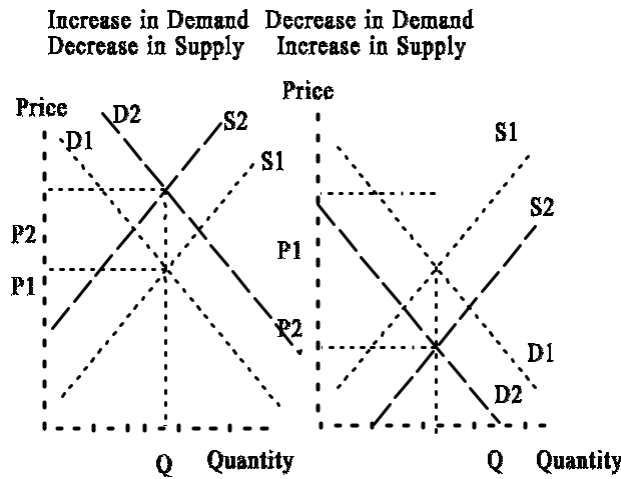
Movement of the demand curve from D1 (solid line) to D2 (dashed line) is a decrease in demand (as demonstrated in the above graph). Such decreases are caused by a change in a nonprice determinant of demand (for example, the number of consumers in the market declined or the price of a substitute declined). 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).



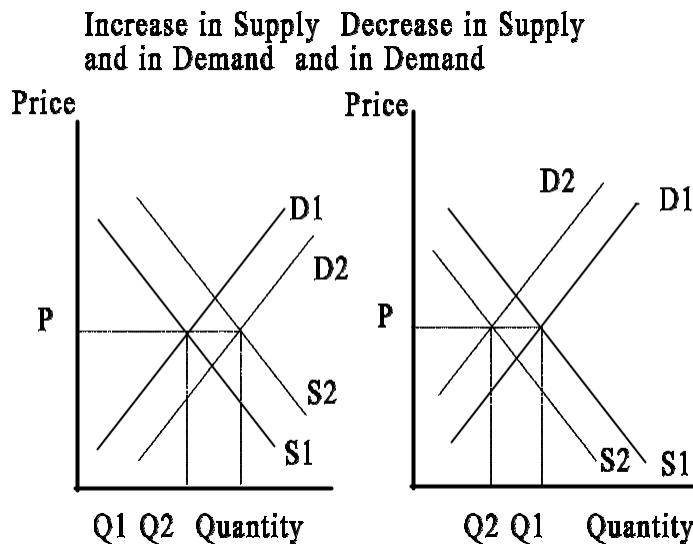
If both the demand curve and supply curve change at the same time the analysis becomes more complicated.

Consider the following graphs:



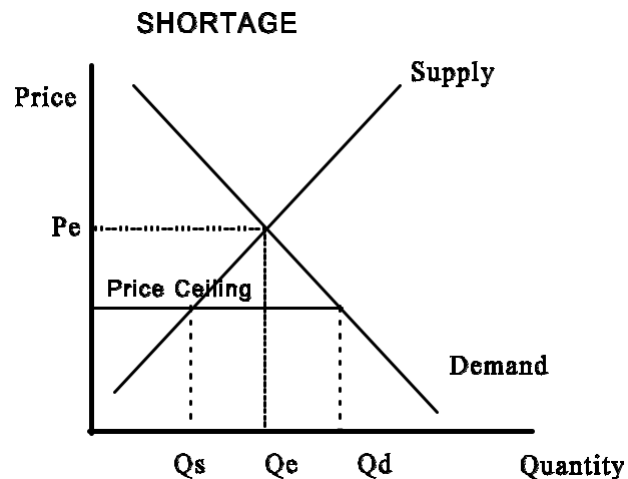
Notice that the quantity remains the same in both graphs. Therefore, the change in the equilibrium quantity is indeterminate and its direction and size depends on the relative strength of the changes between supply and demand. In both cases, the equilibrium price changes. In the first case where demand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



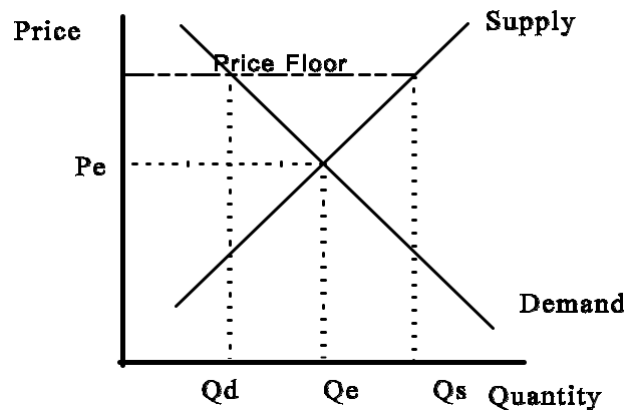
The graphs show that price remains the same (is indeterminate) but when supply and demand both increase quantity increases to Q_2 . When both supply and demand decrease quantity decreases to Q_2 .

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:

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

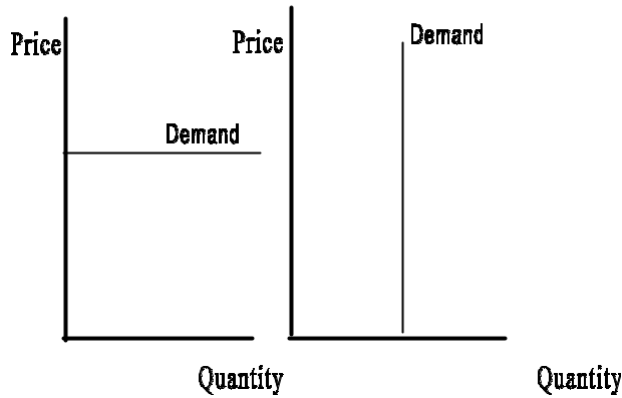
b. Elastic demand means that the quantities demanded respond more than proportionately to changes in price; with elastic demand the coefficient is more than one.

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

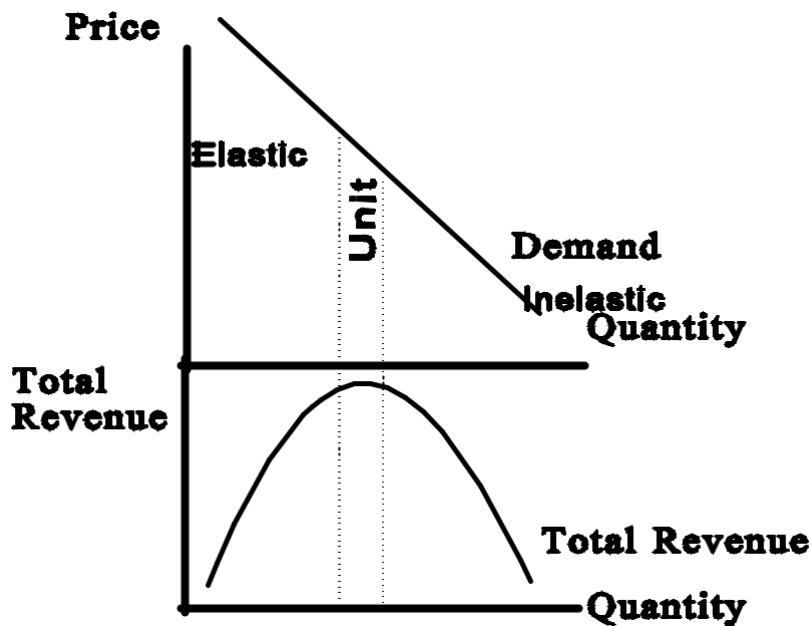
Perfectly elastic demand Perfectly inelastic demand



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		
2	8	16	>+7	Elastic
3	7	21	>+5	Elastic
4	6	24	>+3	Elastic
5	5	25	>+ 1	Elastic
6	4	24	> - 1	Inelastic
7	3	21	> - 3	Inelastic
8	2	16	> - 5	Inelastic
9	1	9	> - 7	Inelastic

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:

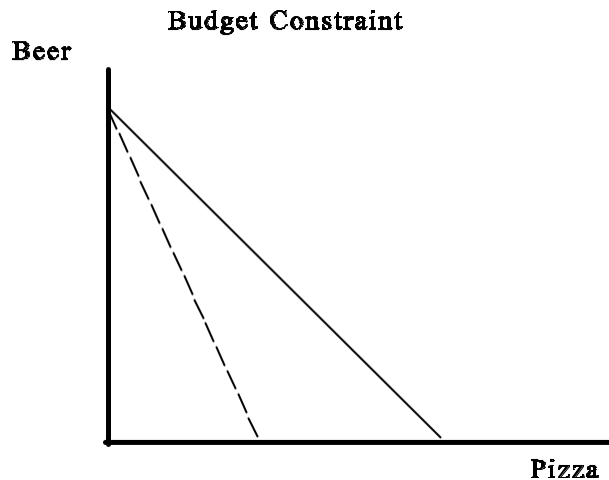
- a. substitutability

- 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.

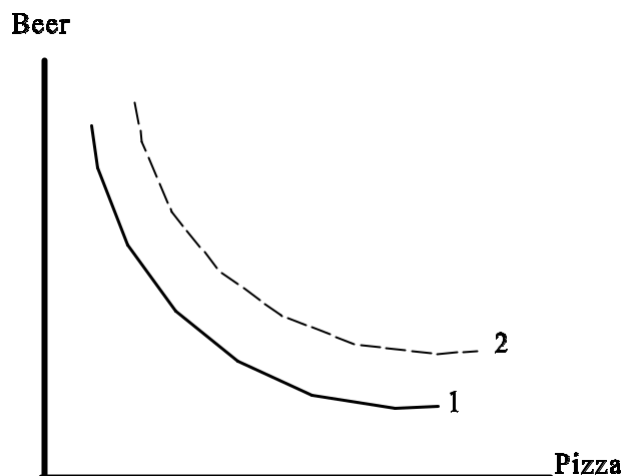


The consumer is assumed to spend their resources on only beer and pizza. If all resources are spent on beer then the intercept on the beer axis is the amount of beer the consumer can purchase; on the other hand, if all resources are spent on pizza then the intercept on that axis is the amount of pizza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

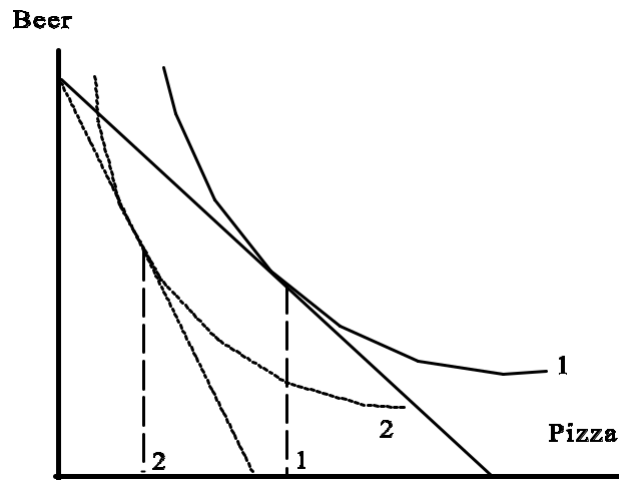
b. The indifference curve shows the consumer's preferences:

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



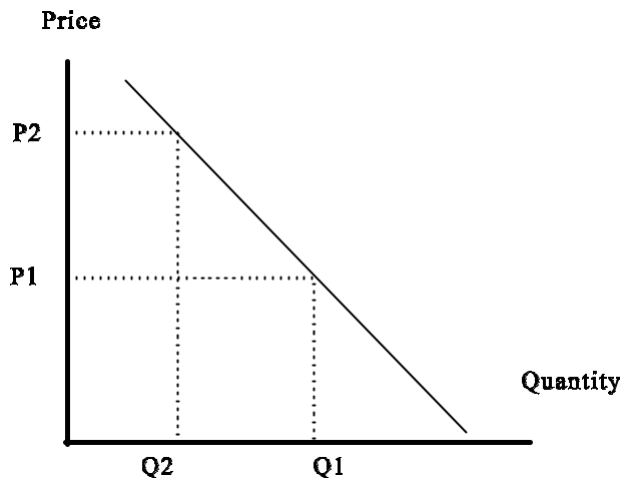
The dashed line (2) shows a higher level of total satisfaction than does the solid line (1). Along each indifference curve is the mix of beer and pizza that gives the consumer equal total utility.

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 Q2 and P2 are associated with indifference curve 2 and budget constraint 2, and that Q1 and P1 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 - $MU_a/P_a = MU_b/P_b = \dots = MU_z/P_z = 1$

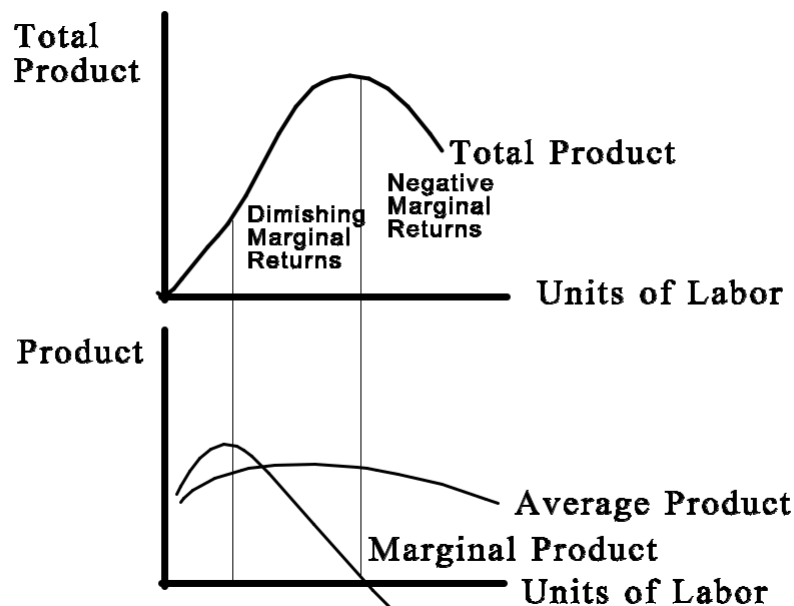
7. Costs of Production

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

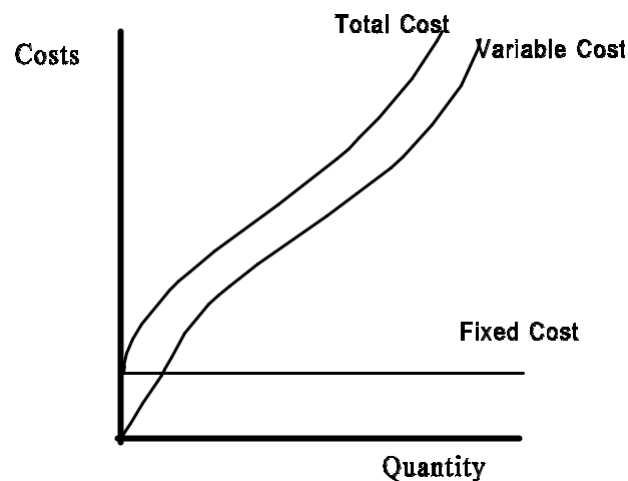
1. graphical presentation:



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:

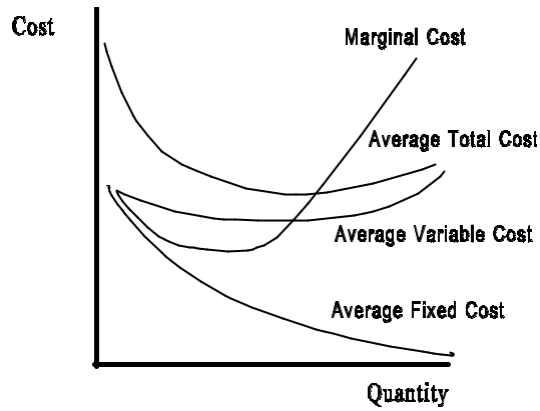
- a. total costs = $VC + FC$
- b. variable costs are those items that can be varied in the short-run, i.e., labor
- c. fixed costs are those items that cannot be varied in the short-run, i.e., plant and equipment



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.

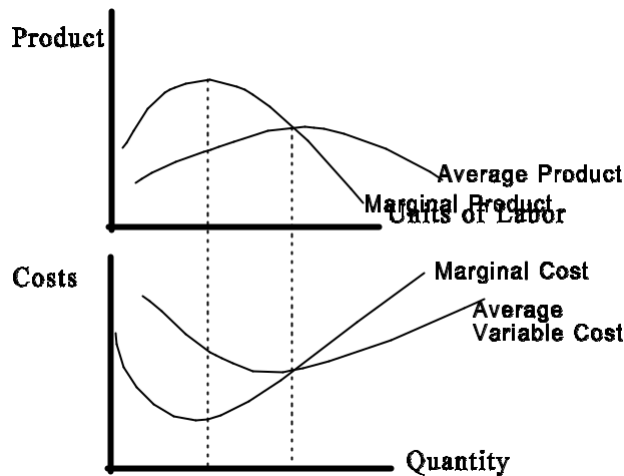
- d. average total costs = TC/Q
- e. average variable cost = VC/Q
- f. average fixed cost = FC/Q
- g. marginal cost = $\hat{I}TC/\hat{I}Q$; where \hat{I} stands for change in.

1. 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.

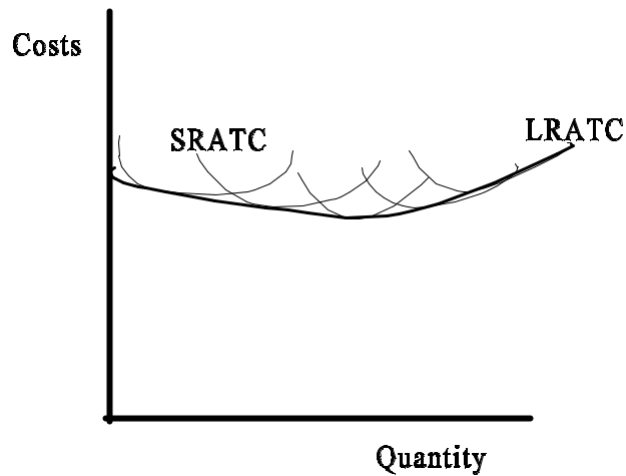
The following graph relates average and marginal product to average variable and marginal cost.



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.

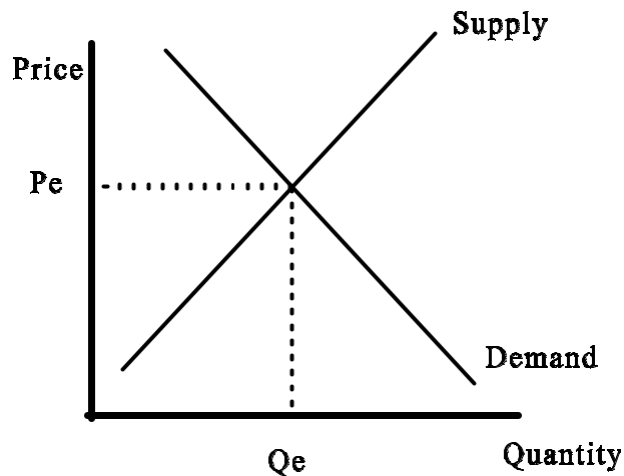
- c. Constant returns to scale are large ranges of operations where the firm's size matters little.
- d. Minimum efficient scale is the smallest size of operations where the firm can minimize its long-run average costs.
- e. Natural monopoly is a market situation where per unit costs are minimized by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

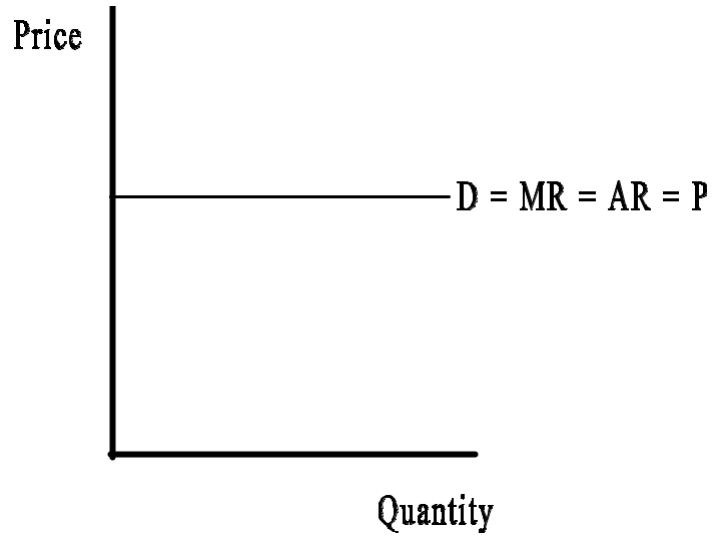
- e. price taker
3. Revenue with a price taking firm:
- a. average revenue and marginal revenue are equal for the purely competitive firm because price does not change with quantity.
 - b. total revenue is $P \times Q$ which is the total area under the demand curve (up to where $MR = MC$) for the purely 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.

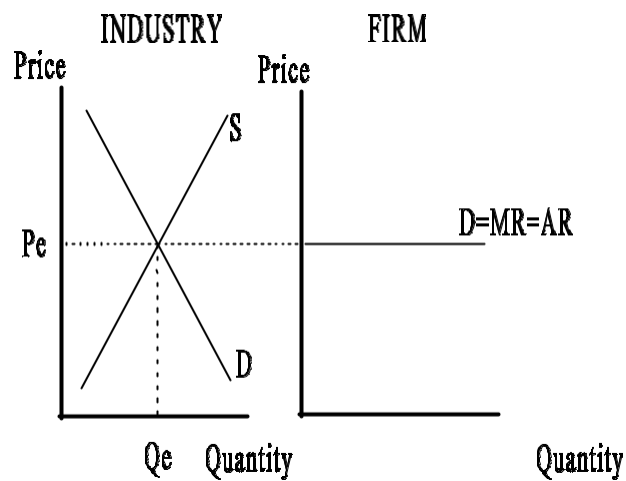
6. Firm in Perfect Competition

a. perfectly elastic demand curve

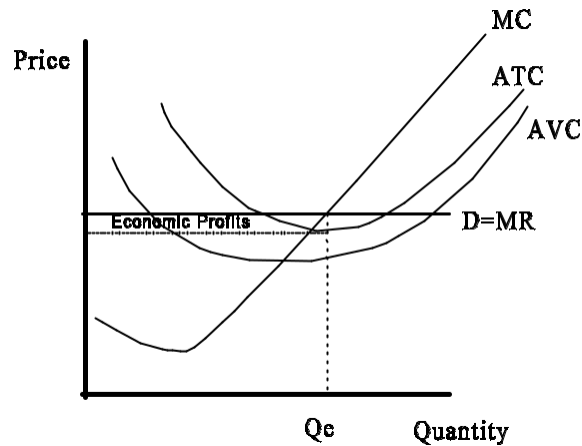


b. Because the firm is a price taker, meaning that it charges the same price across all quantities of output, marginal revenue is always equal to price, and average revenue will always be equal to price. Therefore the demand curve intersects the price axis and is horizontal (perfectly elastic).

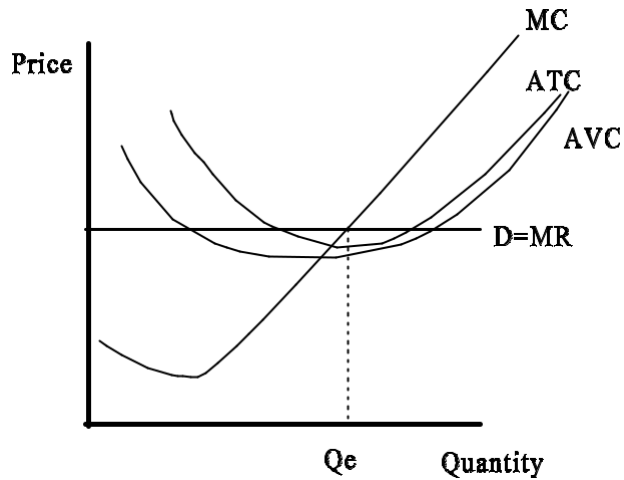
c. Establishing price in the industry and the firm:



- 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:

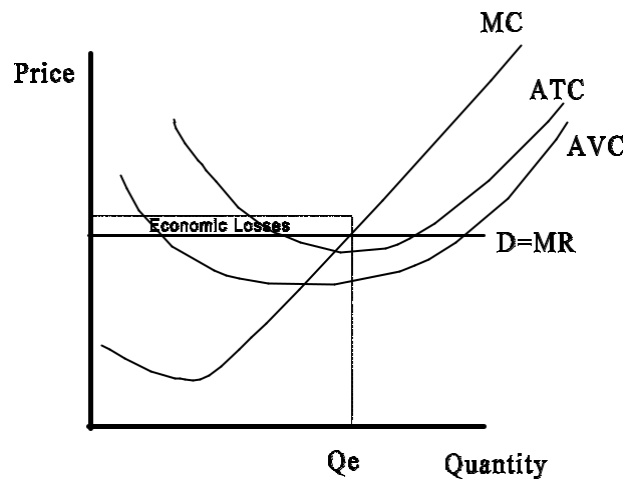


- f. The firm produces at where $MC = MR$, this establishes Q_e . At the point where $MC = MR$ the average total cost (ATC) is below the demand curve (AR) and therefore costs are less than revenue, and an economic profit is made. The reason for this is that the opportunity cost of the next best allocation 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:



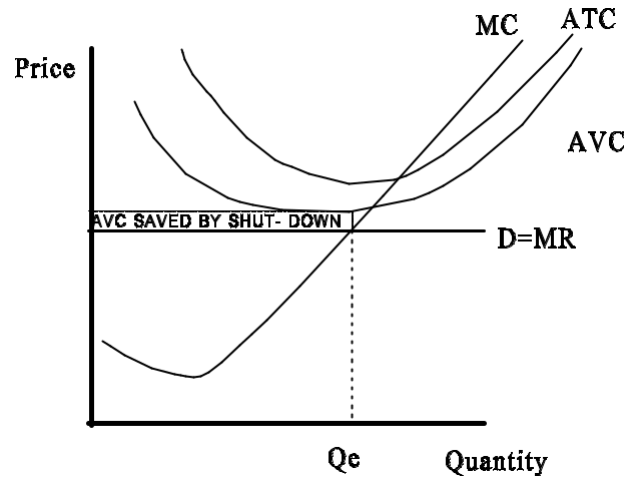
1. The case where a firm is making a normal profit is illustrated above. Where $MC = MR$ is where the firm produces, and at that point ATC is exactly tangent to the demand curve. Because the ATC includes the profits from the next best alternative allocation of resources this firm is making a normal profit.

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

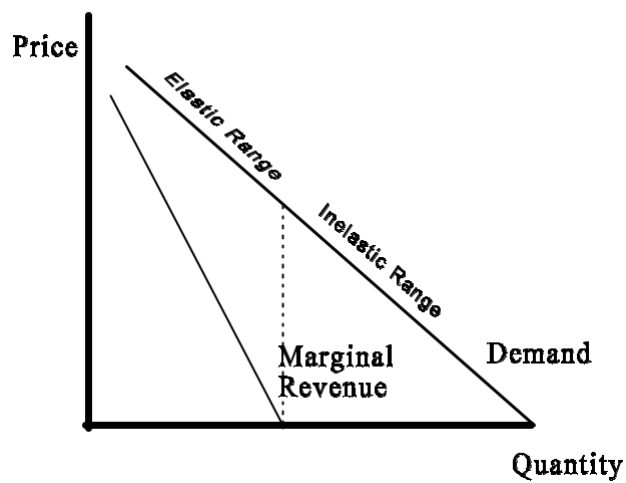
Lecture Notes

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.

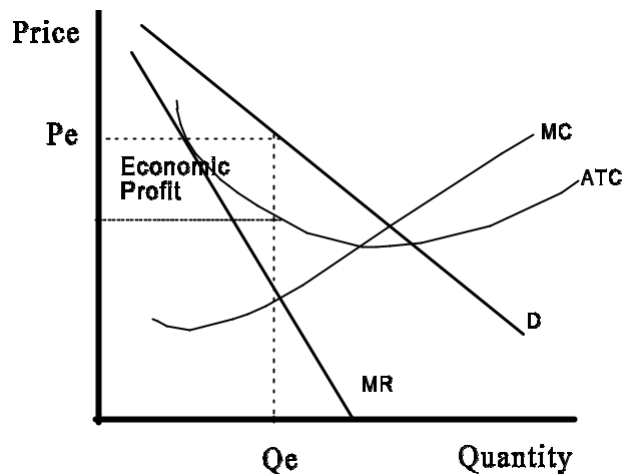


1. The point where the marginal revenue curve intersects the quantity axis is of significance; this point is where total revenue is maximized. Further, the point on the demand curve associated with where $MR = Q$ is unit price elastic demand; to the left along the demand curve is the elastic range, and 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 $MC = MR$

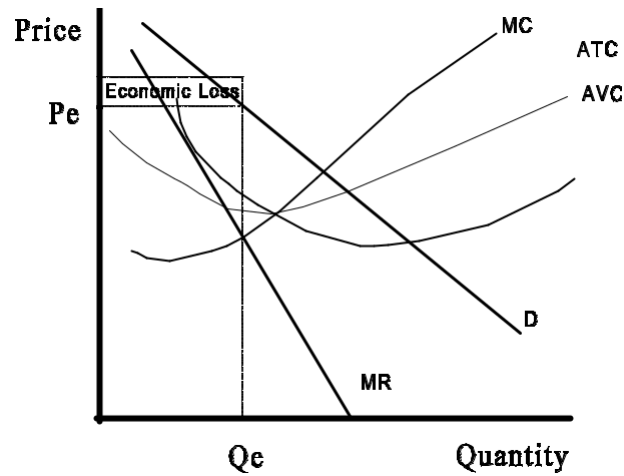
4. Monopolized Market

- 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 $MC = MR$.

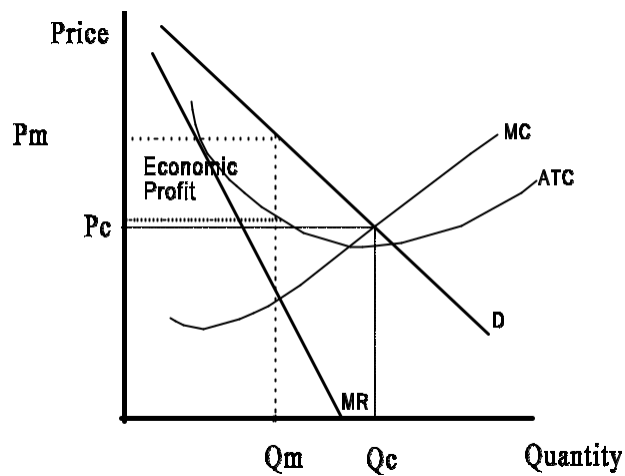
c. Economic losses



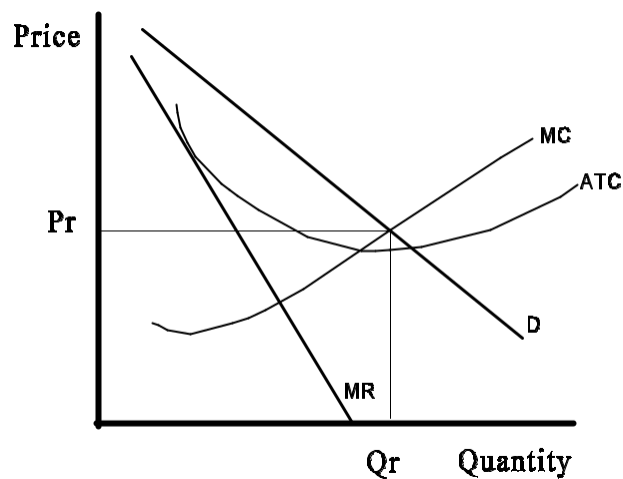
1. This monopolist is making an economic loss. The ATC is above the demand curve (AR) at where $MC = MR$ (the loss is the labeled rectangle). However, because AVC is below the demand curve at where $MC = MR$ the firm will not shut down so as to minimize its losses.

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:

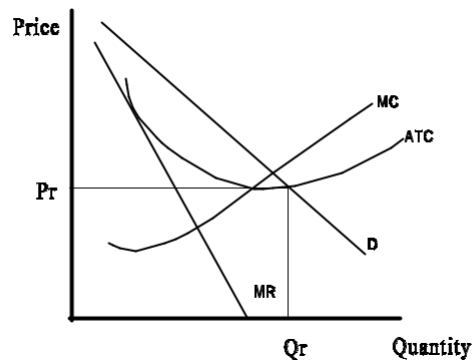


1. The above graph shows the profit maximizing monopolist, P_m is the price in the monopoly and Q_m is the quantity exchanged in this market. However, where $MC = D$ is where a perfectly competitive industry produces and this is associated with P_c and Q_c . The monopolist therefore produces less and 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 **B** 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

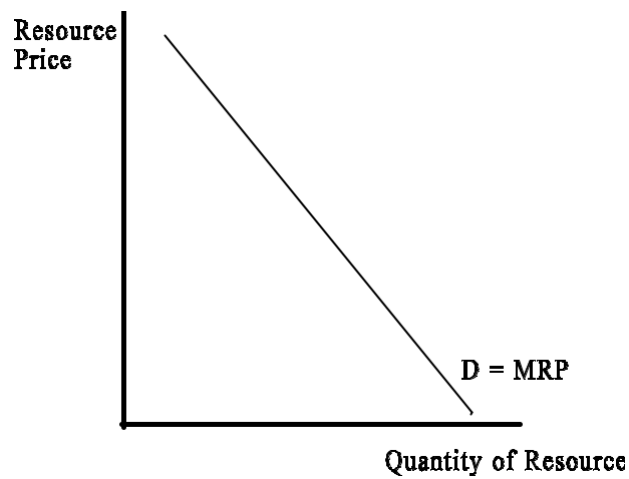
1. Resource Market Complications:

- 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.

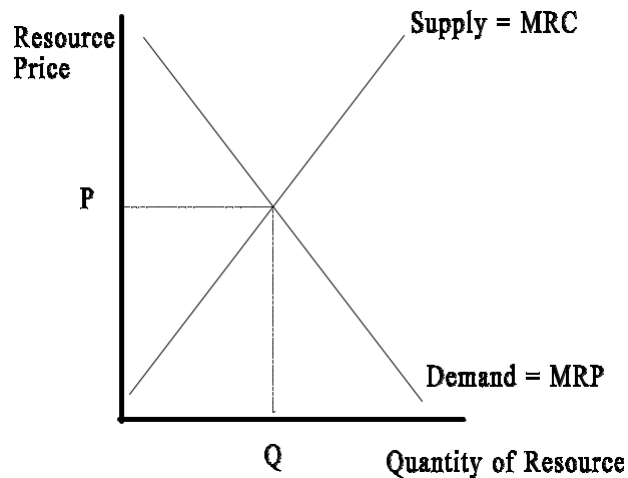
- a. marginal product is $MP = \hat{I}TP/\hat{I}L$ where L is units of labor, (or K for capital, etc).
- b. marginal revenue product is $MRP = \hat{I}TR/\hat{I}L$

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. $MRC = \hat{\Delta}TRC / \hat{\Delta}L$
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. $MRP_{\text{labor}}/MRC_{\text{labor}} = MRP_{\text{capital}}/MRC_{\text{capital}} = \dots = MRP_{\text{land}}/MRC_{\text{land}} = 1$

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.

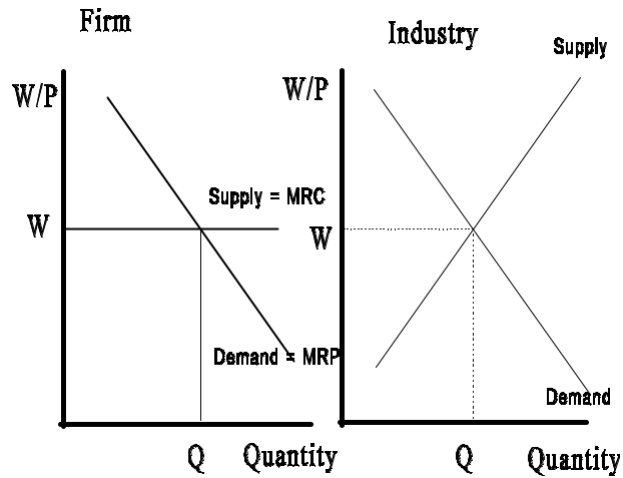
11. Wage Determination

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.

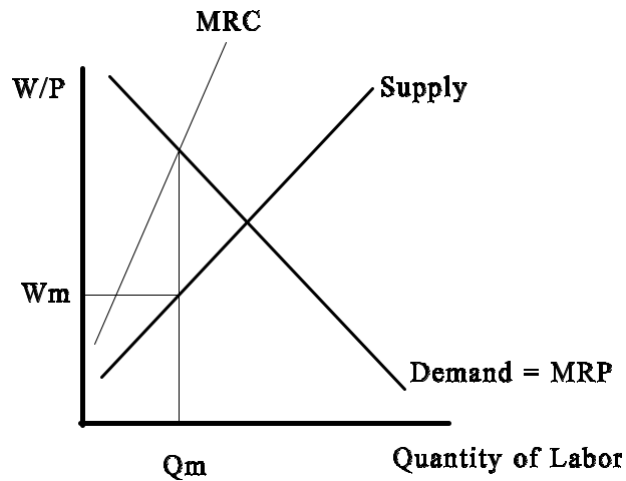
2. Earnings and Productivity
 - a. In theory an employee should be paid what she earns for the company, MRP, however, this theory has serious flaws in practice.
 - b. Market imperfections, i.e., monopsony results in the earnings of workers being paid to other factors of production.
 - c. Problems with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

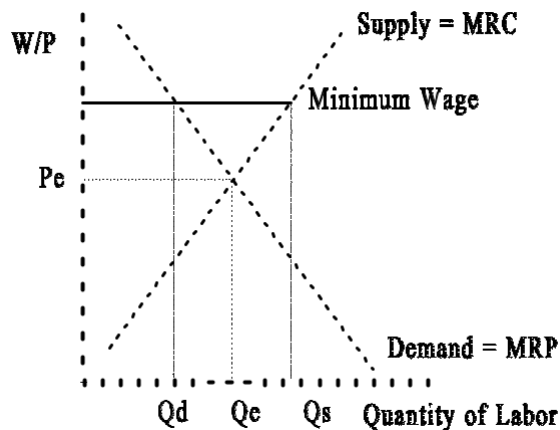


1. Notice that MRC breaks out to the right of the supply curve and is much steeper; this is due to the pricing policy the monopolist can employ. Also the wage and employment levels in the monopsony are much lower than in a competitive labor market.

4. Control of Monopsony:

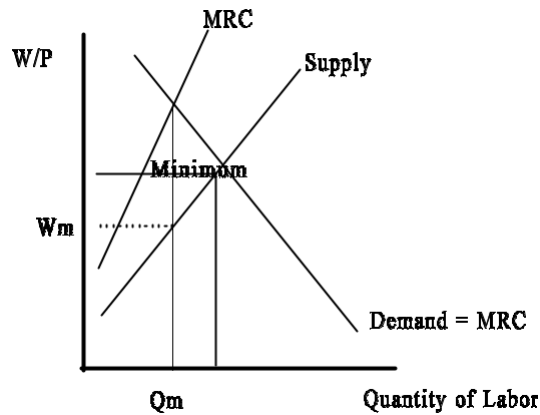
- a. minimum wages has been one approach to the control of monopsony.

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

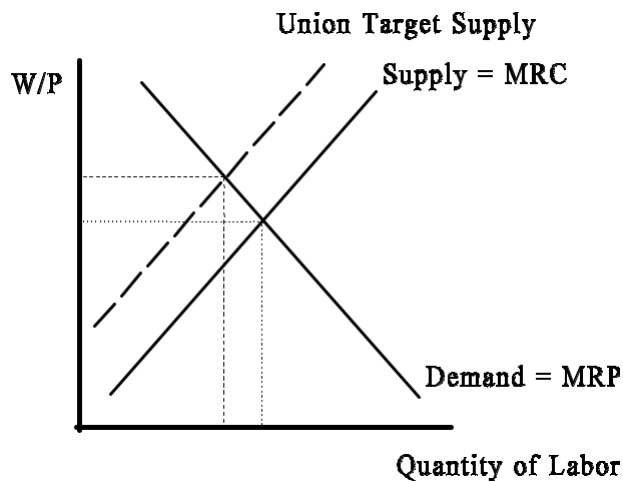


2. In a monopsony the wage increases with the establishment of a minimum wage, but if the employer is rationale so too does the employment level.
3. If the monopsony model is accurate then the conservative argument does not hold water. Recent research results seem to suggest the monopsony predictions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

5. Unions have also be an effective response to

monopsony: a. craft union (exclusive union):

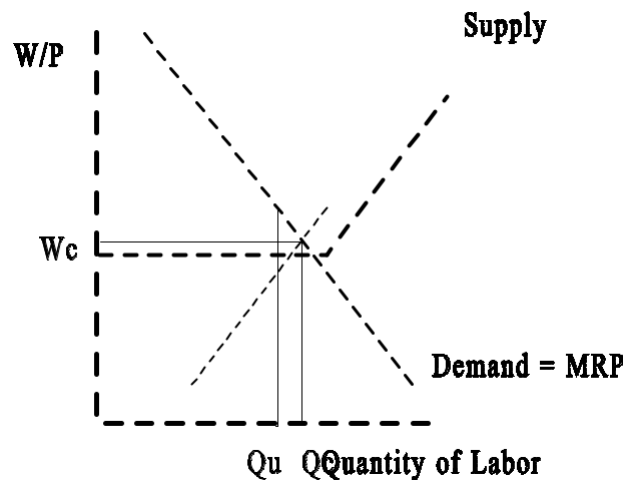
1. AFL Affiliated, organizes one skill class of employees (i.e., IBEW)



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

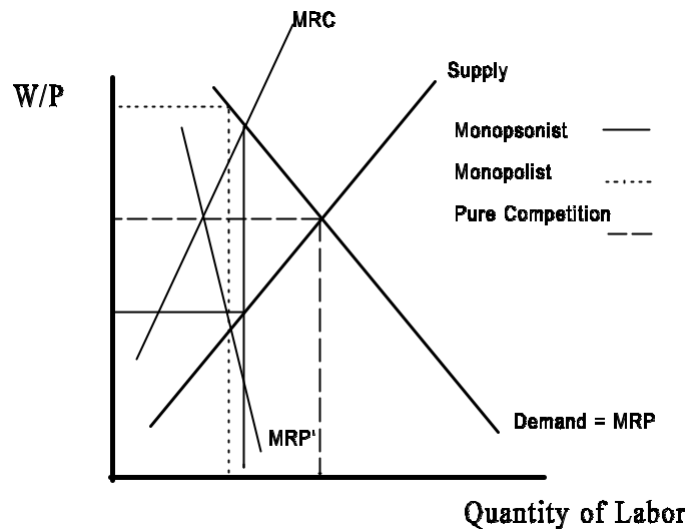
1. CIO affiliate, organizes all skill classes within a firm (i.e., UAW)



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 **B** 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 **B** 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

rather poor **B** 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 **B** sending work out of the firm for cost cutting reasons
B generally to save labor costs.

- 1. Consumer incomes and production costs

- 2. Say=s Law **B** accounting identity **B** 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.

READING ASSIGNMENTS

INTRODUCTION TO MICROECONOMICS

E201

CHAPTER 1

Introduction to Economics

This is an introductory course in economics. As with most introductory courses there are certain foundations that must be laid before the structure of the discipline may be meaningfully examined. This chapter and the following two chapters will lay those foundations -- the rudimentary definitions, and basic concepts upon which the following ideas will be built are discussed. Further, there is a general discussion of the methods used by economists in their analyses.

Specifically, this chapter will focus on specific definitions, policy, and objective thinking. A discussion of the role of assumptions in model building will also be offered as a basis for understanding the economic models that will be built in the following chapters.

Definitions

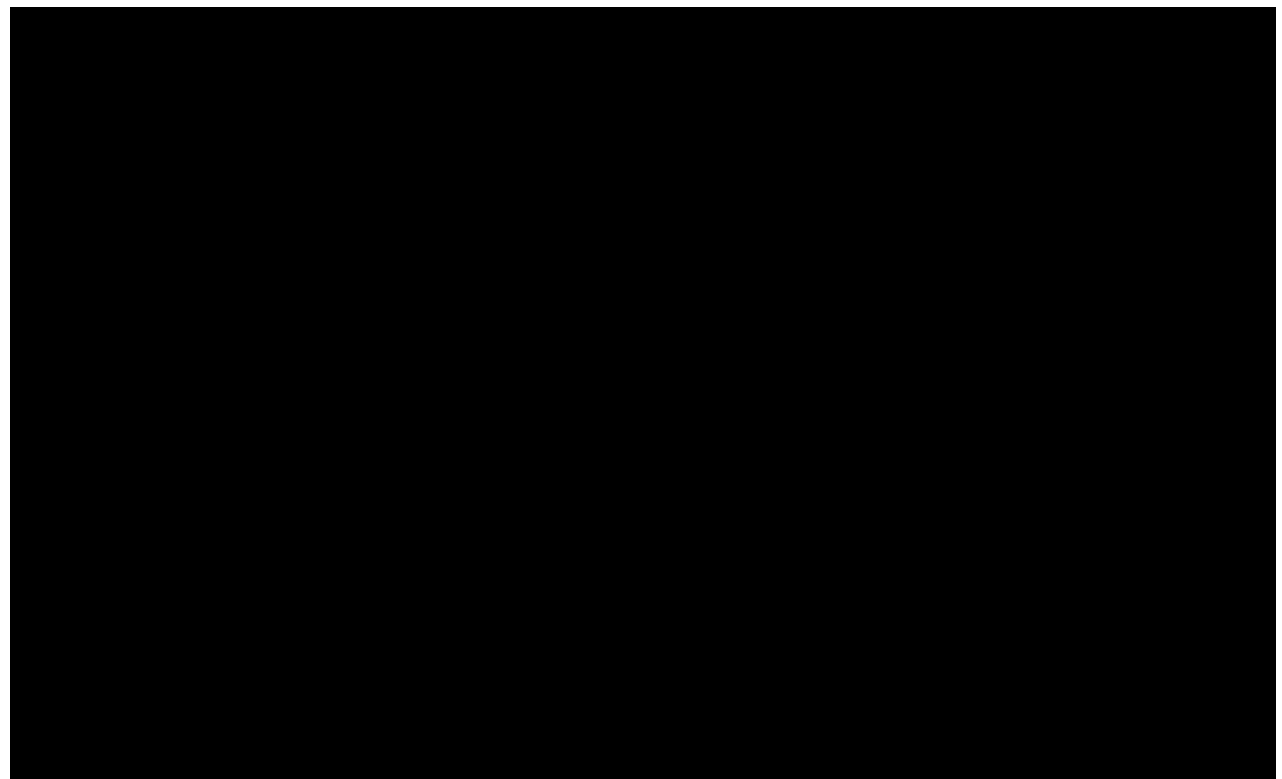
Economics is a social science. In other words, it is a systematic examination of human behavior, based on the scientific method, and reliant upon rigorous analysis of that behavior. Economics is the mother discipline from which most of the business disciplines arose. Most people have a vague idea of what the word economics means, but precise definitions generally require some academic exposure to the subject.

Economics is the study of the ALLOCATION of SCARCE resources to meet UNLIMITED human wants. In other words, economics is the study of human behavior as it pertains to material well-being. The key words in this definition are in all capital letters. Because there are a finite number of resources available, the fact that human want exceed that (are unlimited) then the resources are scare relative to the want for them. Because there are fewer resources than wants there must be allocation mechanism of some sort – markets, government, law of the jungle, etc.

Robert Heilbroner describes economics as the "Worldly Philosophy." A "Worldly Philosophy" is concerned with matters of how our material or worldly well-being is best served. In fact, economics is the organized examination of how, why and for what purposes people conduct their day-to-day activities, particularly as it relates to the accumulation of wealth, earning an income, spending their resources, and other matters concerning material well-being. This worldly philosophy has been used to explain most rational human behavior. (Irrational behavior being the domain of specialties in sociology, psychology, history, and anthropology.) Underlying all of economics is the

base assumption that people act in their own perceived best interest (at least most of the time and in the aggregate). Without the assumption of rational behavior, economics would be incapable of explaining the preponderance of observed economic activity. As limiting as this assumption may seem, it appears to be an accurate description of reality.

In 1776 Adam Smith penned *An Inquiry into the Nature and Causes of the Wealth of Nations*. With its publication, capitalism was born, from the ashes of the mercantilist system that preceded it. Smith described an economic system of cottage industries and relatively unfettered pursuit of self-interest, and how that unfettered pursuit of self-interest could result in a system that distributed its limited resources in an efficient fashion.



Experimental economics, using rats in mazes, suggests that rats will act in their own best interest (incidentally, Kahneman won a Noble Prize for this sort of research – it is serious business, not just fun and games like it sounds). Rats, it was discovered, prefer root beer to water. The result is that rats will pay a greater price (longer mazes and electric shocks) to obtain root beer than they will to obtain water. Therefore it appears to be a reasonable assumption that humans are no less rational – as Adam Smith postulates in his view of how we might best obtain our dinner.

Most academic disciplines have evolved over the years to become collections of

closely associated scholarly endeavors of a specialized nature. Economics is no exception. An examination of one of the scholarly journals published by the American Economics Association, *The Journal of Economic Literature*, reveals a classification scheme for the professional literature in economics. Several dozen specialties are identified in that classification scheme, everything from national income accounting, to labor economics, to international economics. In other words, the realm of economics has expanded over the centuries that it is nearly impossible for anyone to be an expert in all aspects of the discipline, so each economist generally specializes in some narrow portion of the discipline. The decline of the generalist is a function of the explosion of knowledge in most disciplines.

In general, economics is bifurcated by the focus of the analysis – that is, there are two bundles of issues that are examined by economists. These bundles of issues are considered together, by the level of the activity upon which the analysis is focused. Economics is generally classified into two general categories of inquiry, these two categories are: (1) microeconomics and (2) macroeconomics.

Microeconomics is concerned with decision- making by individual economic agents such as firms and consumers. In other words, microeconomics is concerned with the behavior of individuals or groups organized into firms, industries, unions, and other identifiable agents. The focus of microeconomics is on decision-making, and hence markets. Microeconomics is the subject matter of this course (E201).

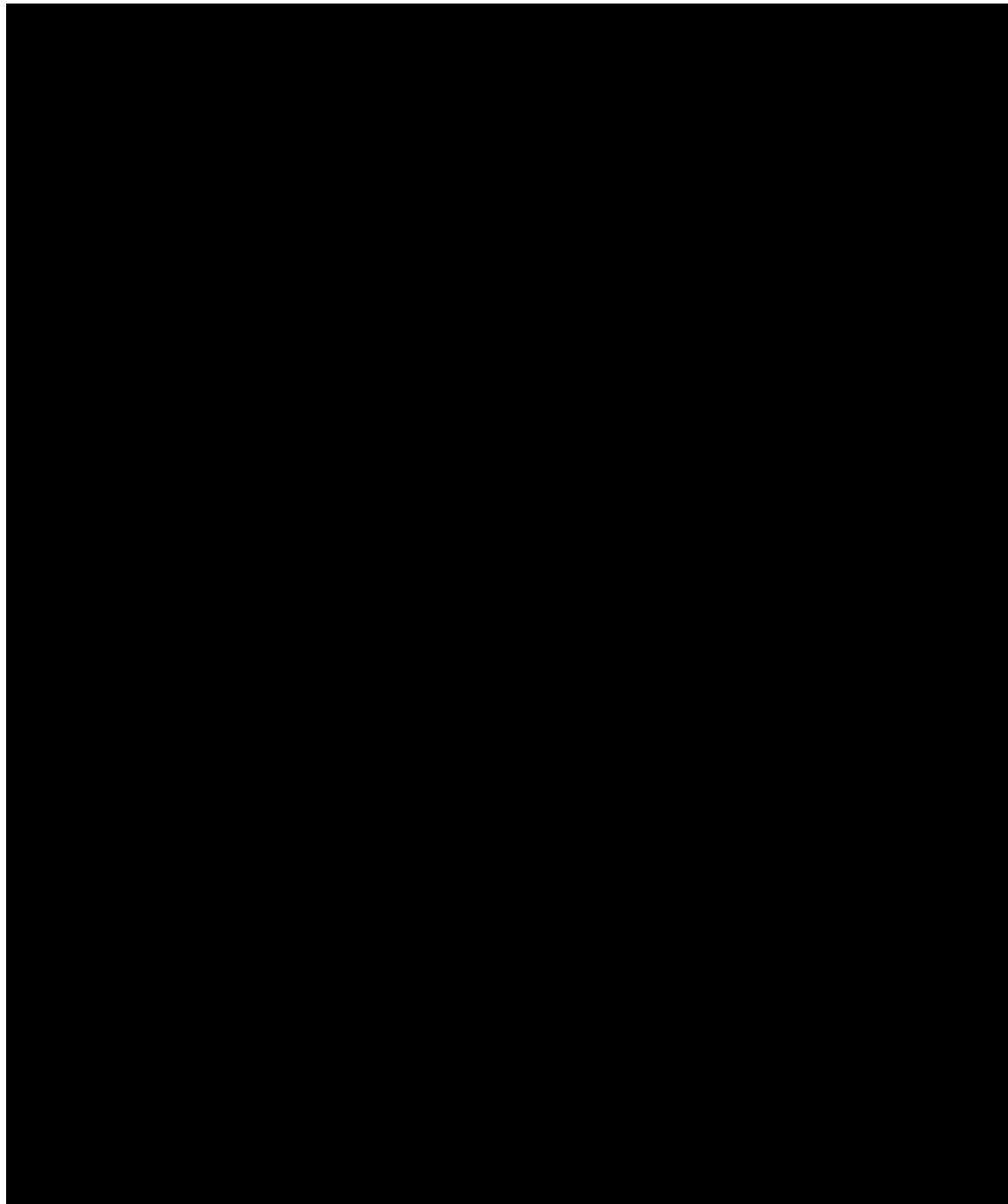
Macroeconomics is concerned with the aggregate performance of the entire economic system. That is, the performance of the U.S. economy or, in a more modern sense, the global economy. The issues of unemployment, inflation, economic development and growth, the balance of trade, and business cycles are the topics that occupy most of the attention of students of macroeconomics. These matters are the topics to be examined the course that follows this one (E202).

Methods in Economics

Economists seek to understand the behavior of people and economic systems using scientific methods. These scientific endeavors can be classified into two categories of activities, these are: (1) economic theory and (2) empirical economics. Theoretical and empirical economics are very much related activities, even though distinguished here for simplicity of presentation.

Economic theory relies upon principles to analyze behavior of economic agents. These theories are typically rigorous, mathematical representations of human behavior with respect to the production or distribution of goods and services in

microeconomics – and the aggregate economy in macroeconomics. A good theory is one that accurately predicts future human behavior and can be supported with evidence.



Economic theory tends to be a very abstract area of the discipline. Mathematical modeling was introduced into the discipline early in the eighteenth century by such scholars as Mill and Ricardo. In the middle of the twentieth century, an economist, Paul

Samuelson, from M.I.T., published his book, *Mathematical Foundations of Economic Analysis*, and from that point forward, economic theory was to become heavily mathematical – gone were the days of the institutionalists from the mainstream of economic theory. (Incidentally Paul Samuelson won the Nobel Prize for *Foundations*, and he is a Hoosier, Stiglitz is also from Indiana, and both are from Gary, Indiana).

The above table presents a list of those who have won Nobel Prizes in Economic Science. Notice that the overwhelming majority of these persons are Americans – two of whom are from Indiana, and several are from the University of Chicago. It is also interesting to note that one must be living to receive the Nobel Prize; so many famous economists who met their end before receiving the prize will not be listed. Further, it is also interesting to note that the Nobel Prize in Economic Sciences is the newest of the prizes, beginning with Tinbergen's award in 1969.

Empirical economics relies upon facts to present a description of economic activity. Empirical economics is used to test and refine theoretical economics, based on tests of economic theory.

The area referred to as **econometrics** is the arena in economics in which empirical tests of economic theory occurs. The area is founded in mathematical statistics and is critical to our ability to test the veracity of economic theories.

Theory concerning human behavior is generally constructed using one of two forms of logic – inductive logic or deductive logic. Most of the social studies, i.e., sociology, psychology and anthropology typically rely on inductive logic to create theory.

Inductive logic creates principles from observation. In other words, the scientist will observe evidence and attempt to create a principle or a theory based on any consistencies that may be observed in the evidence.

Economics relies primarily on deductive logic to create theory. **Deductive logic involves formulating and testing hypotheses.** In other words, the theory is created, and then data is applied in a statistical test to see if the theory can be rejected.

Often the theory that will be tested comes from inductive logic or sometimes informed guess-work. The development of rigorous models expressed as equations typically lend themselves to rigorous statistical methods to determine whether the models are consistent with evidence from reality. The tests of hypotheses can only serve to reject or fail to reject a hypothesis. Therefore, empirical methods are focused on rejecting hypotheses and those that fail to be rejected over large numbers of tests generally attain the status of principle.

However, examples of both types of logic can be found in each of the social sciences and in most of the business disciplines. In each of the social sciences it is common to find that the basic theory is developed using inductive logic. With increasing

regularity standard statistical methods are being employed across all of the social sciences and business disciplines to test the validity and the predictability of theories developed using these logical constructs.

The usefulness of economics depends on how accurate economic theory predicts human behavior. In other words, a good theory is one that is an accurate description of reality. Economics provides an objective mode of analysis, with rigorous models that permit the discounting of the substantial bias that is usually present with discussions of economic issues. The internal consistency brought to economic theory by mathematical models of economic behavior provides for this consistency. However, no model is any better than the assumptions that underpin that model. If the assumptions are unrealistic, so too will be the models' predictions.

The objective mode of analysis is an attempt to make a social study more scientific. That is, a systematic analysis of rational human behavior. "Rational" is a necessary component of this attempt. It is the rationality that makes behavior predictable, and what most economists don't like to admit is without this underlying premise, economics quickly falls into a quagmire of irreproducible results and disjointed theories.

The purpose of economic theory is to describe behavior, but behavior is described using models. **Models are abstractions from reality** - the best model is the one that best describes reality and is the simplest (***the simplest requirement is called Occam's Razor***). Economic models of human behavior are built upon assumptions; or simplifications that allow rigorous analysis of real world events, without irrelevant complications. Often (as will be pointed-out in this course) the assumptions underlying a model are not accurate descriptions of reality. When the model's assumptions are inaccurate then the model will provide results that are consistently wrong (known as bias).

One assumption frequently used in economics is **ceteris paribus** which means all other things equal (notice that economists, like lawyers and doctors will use Latin for simple ideas). This assumption is used to eliminate all sources of variation in the model except those sources under examination (not very realistic!).

Economic Goals, Policy, and Reality

Most people and organizations do, at least, rudimentary planning, the purpose of planning is the establishment of an organized effort to accomplish some economic goals. Planning to finish your education is an economic goal. Goals are, in a sense, an idea of what should be (what we would like to accomplish). However, goals must be realistic and within our means to accomplish, if they are to be effective guides to action. This brings another classification scheme to bear on economic thought. Economics can be again classified into positive and normative economics. **Positive economics is concerned with what is; and normative economics is concerned with what should be.** Economic goals are examples of normative economics. Evidence concerning economic performance or achievement of goals falls within the domain of positive economics.

The normative versus positive economics arguments begs the question of whether economics is truly a value free science. In fact, economics contains numerous value judgments. Rational behavior assumes that people will always behave in their own self-interest. Self-interest is therefore presented as a positive element of behavior. In fact, it is a value judgment. Self-interest is probably descriptive of the majority of Americans' behaviors over the majority of time, however, each of us can think of instances where self-less behavior is observed, and is frequently encouraged.

Efficiency is a measurable concept, and is taken as a desirable outcome. However, efficiency is not always desirable. Equity or fairness is also something prized by most people. The efficiency criterion in economics is not always consistent with equity; in fact, these two ideas are often in conflict.

Economics also generally assumes that more is preferred to less by all consumers and firms. However, there are disposal problems, distributional effects, and other problems where more may not be such a good thing. Obesity is a result of more, but a bad result. Pollution, poverty, and crime may also be examined as more begetting problems.

Most nations have established broad social goals that involve economic issues. The types of goals a society adopts depends very much on the stage of economic development, system of government, and societal norms. Most societies will adopt one or more of the following goals:

- (1) economic efficiency,
- (2) economic growth,
- (3) economic freedom,

- (4) economic security,
- (5) an equitable distribution of income,
- (6) full employment,
- (7) price level stability, and
- (8) a reasonable balance of trade.

Each goal (listed above) has obvious merit. However, goals are little more than value statements in this broad context. For example, it is easy for the very wealthy to cite as their primary goal, economic freedom, but it is doubtful that anybody living in poverty is going to get very excited about economic freedom; but equitable distributions of income, full employment and economic security will probably find rather wide support among the poor. Notice, if you will, goals will also differ within a society, based on socio-political views of the individuals that comprise that society.

Economics can hardly be separated from politics because the establishment of national goals occurs through the political arena. Government policies, regulations, law, and public opinion will all effect goals and how goals are interpreted and whether they have been achieved. A word of warning, e**CON**omics can be, and has often been used, to further particular political agendas.

The assumptions underlying a model used to analyze a particular set of circumstances will often reflect the political agenda of the economist doing the analysis. An example liberals are fond of is, Ronald Reagan argued that government deficits were inexcusable, and that the way to reduce the deficit was to lower peoples' taxes -- thereby spurring economic growth, therefore more income that could be taxed at a lower rate and yet produce more revenue. Mr. Reagan is often accused, by his detractors, of having a specific political agenda that was well-hidden in this analysis. His alleged goal was to cut taxes for the very wealthy and the rest was just rhetoric to make his tax cuts for rich acceptable to most of the voters. (Who really knows?) Conservatives are fonder of criticizing the Clinton administration's assertions that the way to reduce the deficit was to spend money where it was likely to be respent, and hence grow the economy and the result was more tax revenues, hence eliminate the deficit. Most political commentators, both left and right, have mastered the use of assumptions and high sounding goals to advance a specific agenda. This adds to the lack of objectivity that seems to increasingly dominate discourse on economic problems.

On the other hand, goals can be public spirited and accomplish a substantial amount of good. President Lincoln was convinced that the working classes should have access to higher education. The Morrill Act was passed 1861 and created Land Grant institutions for educating the working masses (Purdue, Michigan State, Iowa State, and

Kansas State (the first land grant school) are all examples of these types of schools). By educating the working class, it was believed that several economic goals could be achieved, including growth, a more equitable distribution of income, economic security and freedom. In other words, economic goals that are complementary are consistent and can often be accomplished together. Therefore, conflict need not be the centerpiece of establishing economic goals.

Because any society's resources are limited there must be decisions about which goals should be most actively pursued. The process by which such decisions are made is called prioritizing. Prioritizing is the rank ordering of goals, from the most important to the least important. Prioritizing of goals also involve value judgments, concerning which goals are the most important. In the public policy arena prioritizing of economic goals is the subject of politics.

Policy

Policy can be generally classified into two categories, public and private policy. The formulation of public and private policy is the creation of guidelines, regulations, or law designed to effect the accomplishment of specific economic (or other) goals. Public policy is how economic goals are pursued. Therefore, to understand goals one needs to understand something of the process of formulating policy.

Business students will have an in depth treatment of policy making in Administrative Policy (J401) and the School of Public and Environmental Affairs requires a similar course in some of its degree programs. For students in other programs the brief treatment here will suffice for present purposes.

The steps in formulating policy are:

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

Both the public and private policy formulation process is a dynamic one. Economic goals change with public opinion and with achievement. Step 1 involves the value statement of setting goals. Step 2 involves selecting the appropriate model and the options associated with that model to accomplish the specified goal. The final step involves gathering evidence and the appropriate analysis to determine whether the policy needs revision. The process of formulating policy is therefore a loop, and requires continuous monitoring and revising.

The major difference between public policy and private policy is that private policy is not subject to democratic processes. The Board of Directors or management of a company will decide what goals are to be accomplished and what policy options are best used to do so. Often private policy is made behind closed-doors without public accountability, even though there are often public costs imposed. The strength of public policy is created in the open, with public debate, and often has the force of law (and not just company rules and regulations).

Objective Thinking

Most people bring many misconceptions and biases to economics. After all, economics deals with people's material well-being – a very serious matter to most. Because of political beliefs and other value system components rational, objective thinking concerning various economic issues fail. Rational and objective thought requires approaching a subject with an open-mind and a willingness to accept what ever answer the evidence suggests is correct. In turn, such objectivity requires the shedding of the most basic preconceptions and biases -- not an easy assignment.

What conclusions an individual draws from an objective analysis using economic principles, are not necessarily cast in stone. The appropriate decision based on economic principles may be inconsistent with other values. The respective evaluation of the economic and "other values" (i.e., ethics) may result in a conflict. If an inconsistency between economics and ethics is discovered in a particular application, a rational person will normally select the option that is the least costly (i.e., the majority view their integrity as priceless). An individual with a low value for ethics or morals may find that a criminal act, such as theft, as involving minimal costs. In other words, economics does not provide all of the answers; it provides only those answers capable of being analyzed within the framework of the discipline.

There are several common pitfalls to objective thinking in economics. Among the most common of these pitfalls, which affect economic thought, are: (1) the fallacy of composition, and (2) post hoc, ergo prompter hoc. Each of these will be reviewed, in turn in the following paragraphs.

The fallacy of composition is the mistaken belief that what is true for the

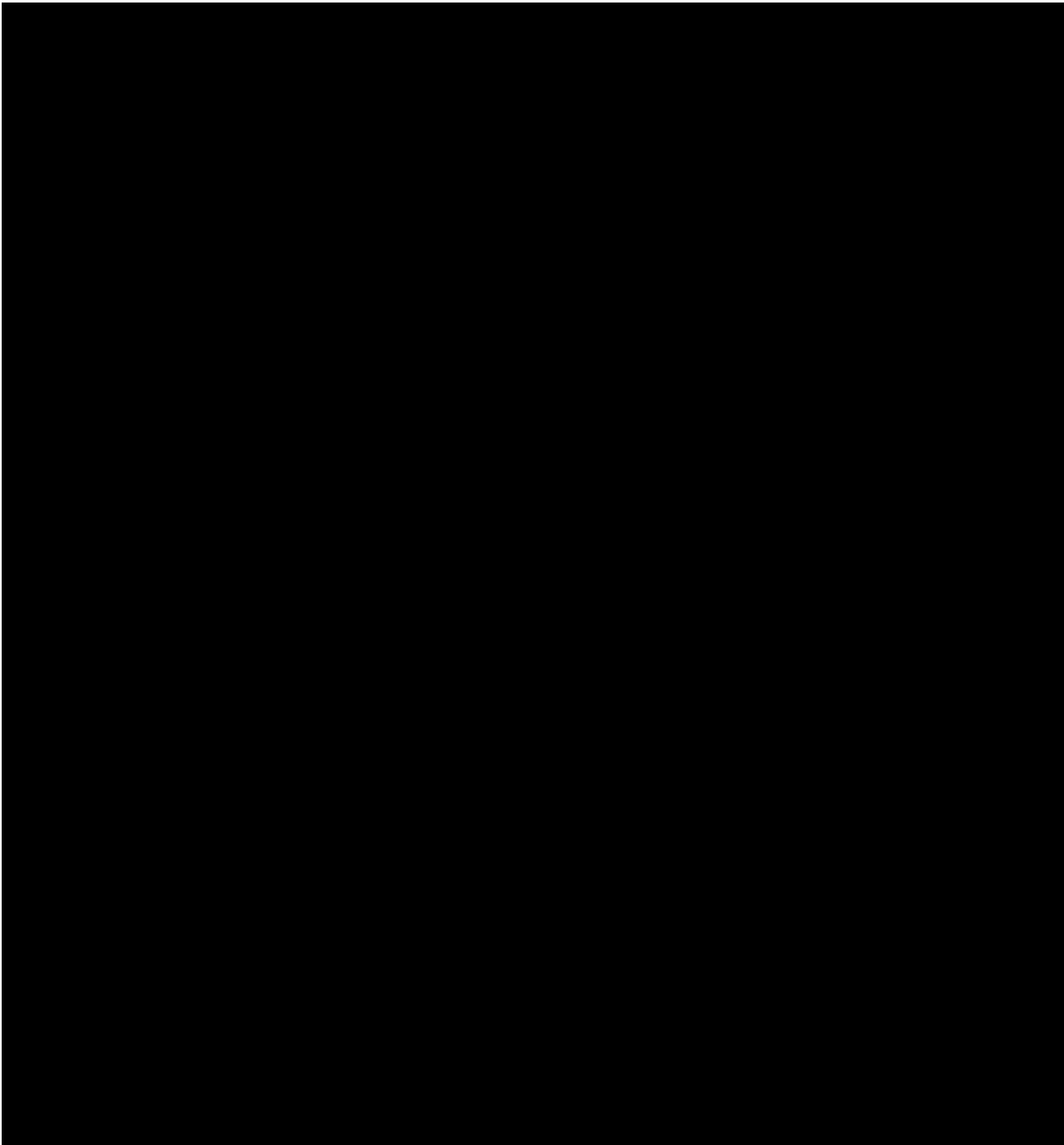
individual must be true for the group. An individual or small group of individuals may exhibit behavior that is not common to an entire population. For example, if one individual in this class is a I.U. fan then everyone in this class must be an I.U. fan is an obvious fallacy of composition. Statistical inference can be drawn from a sample of individuals, but only within confidence intervals that provide information concerning the likelihood of making an erroneous conclusion (E270, Introduction to Statistics provides a more in depth discussion of confidence intervals and inference).

Post hoc, ergo prompter hoc means after this, hence because of this, and is a fallacy in reasoning. Simply because one event follows another does not necessarily imply there is a causal relation. One event can follow another and be completely unrelated, this is simple coincidence. One event can follow another, but there may be something other than direct causal relation that accounts for the timing of the two events. For example, during the thirteenth century people noticed that the black plague occurred in a location when the population of cats increased. Unfortunately, some concluded that the plague was caused by cats so they killed the cats. In fact, the plague was carried by fleas on rats. When the rat population increased, cats were attracted to the area because of the food supply. The rat populations increased, and so did the population of fleas that carried the disease. This increase in the rat population also happened to attract cats, but cats did not cause the plague, if left alone they may have gotten rid of the real carriers (the rats, therefore the fleas).

Perhaps it is interesting to note that in any scientific endeavor there is a basic truth. **Simple answers to complex problems are appealing, abundant, and often wrong.** This twist on Occam's razor is true. Too often the desire to have a simple solution will blind individuals, and public opinion to the more complex and often more harsh realities. One must take great care to assure that this simple trap does not befall one in their search for truth, because not all truth is simple.

Policy is fraught with danger. Failure to anticipated the consequences of certain aspects of policy may cause results that were neither intended nor anticipated by the policy-makers; this is referred to as the law of **unintended consequences.**

The following box presents an excellent historical example of the law of unintended consequences.



Statistical Methods in Economics

The use of statistical methods in empirical economics can result in errors in inference. Most of the statistical methods used in econometrics (statistical examination of economic data) rely on correlation. **Correlation is the statistical association of two or more variables.** This statistical association means that the two variables move predictably with or against each other. To infer that there is a causal relation between two variables that are correlated is an error. For example, a graduate student once found that Pete Rose's batting average was highly correlated with movement in GNP during several baseball seasons. This spurious correlation cannot reasonably be considered path-breaking economic research.

On the other hand, we can test for causation (where one variable actually causes another). **Granger causality states that the thing that causes another must occur first, that the explainer must add to the correlation, and must be sensible.** As with most statistical methods Granger causality models permit testing for the purpose of rejecting that a causal relation does not exist, it cannot be used to prove causality exists. These types of statistical methods are rather sophisticated and are generally examined in upper division or graduate courses in statistics.

As is true with economics, statistics are simply a tool for analyzing evidence. Statistical models are also based on assumptions, and too often, statistical methods are used for purposes for which they were not intended. Caution is required in accepting statistical evidence. One must be satisfied that the data is properly gathered, and appropriate methods were applied before accepting statistical evidence. Statistics do not lie, but sometimes statisticians do!

Objectivity and Rationality

Objective thinking in economics also includes rational behavior. The underlying assumptions with each of the concepts examined in this course assumes that people will act in their perceived best interest. Acting in one's best interests is how rationality is defined. The only way this can be done, logically and rigorously, is with the use of marginal analysis. This economic perspective involves weighing the costs against the benefits of each additional action. In other words, if benefits of an additional action will be greater than the costs, it is rational to do that thing, otherwise it is not. Too often people permit the costs already paid to influence their decision-making, and hence they are lead astray by not focusing on the margin.

The problem with rationality is perception. Often what people believe is in their own self-interest may not be. (Remember the Pig Iron example). Education and the gathering of information helps to make perceptions more accurate views of reality. In

other words, the more we can eliminate our biases and faulty perceptions, the more likely we are to act in our own interest. However, there are costs associated with information gathering and with education, therefore rationality may be costly.

KEY CONCEPTS

Economics

Microeconomics

Macroeconomics

Economic Theory v. Empirical Economics

Inductive v. Deductive Logic

Usefulness of Economics

Occam's Razor

Rationality

Assumptions in Economics

Ceteris Paribus

Simplification for rigor's sake

Positive v. Normative Economics

Economic Goals

Policy Formulation

Objective Thinking

Fallacy of Composition

Post hoc, ergo propter hoc fallacy

Causation v. Correlation

Granger Causality Tests

Cost-Benefit Perspective

STUDY GUIDE

Food for Thought:

Most people have their own opinions about things. How might opinions be of value? Explain.

Compare and contrast deductive logic with inductive logic.

What evidence can statistical analysis provide? Critically evaluate this evidence and explain the role of empirical economics in developing economic theory.

Sample Questions:

Multiple Choice:

Which of the following is not an economic goal?

- A. Price Stability
- B. Full Employment
- C. Economic Security
- D. All of the above are economic goals**

If we provide school lunches for children from households with incomes below the poverty level, and finance the school lunch program with an increase in taxes on incomes in excess of \$100,000, these actions are likely to:

- A. Promote stability but reduce growth
- B. Promote equality but reduce freedom**
- C. Promote efficiency but reduce equality
- D. Promote efficiency but reduce security

True/ False:

Non-economists are no less or more likely to be biased about economics than they are about physics or chemistry. {FALSE}

Assumptions are used to simplify the real world so that it may be rigorously analyzed. {TRUE}

CHAPTER 2

Economic Problems

The purpose of this chapter is to introduce you to several basic economic principles that will be useful in understanding the costs, markets, and the materials to follow in subsequent chapters. This chapter will examine scarcity, factors of production, economic efficiency, opportunity costs, and economic systems. In this chapter the first economic model will also be developed, the production possibilities frontier (or curve).

The Economizing Problem

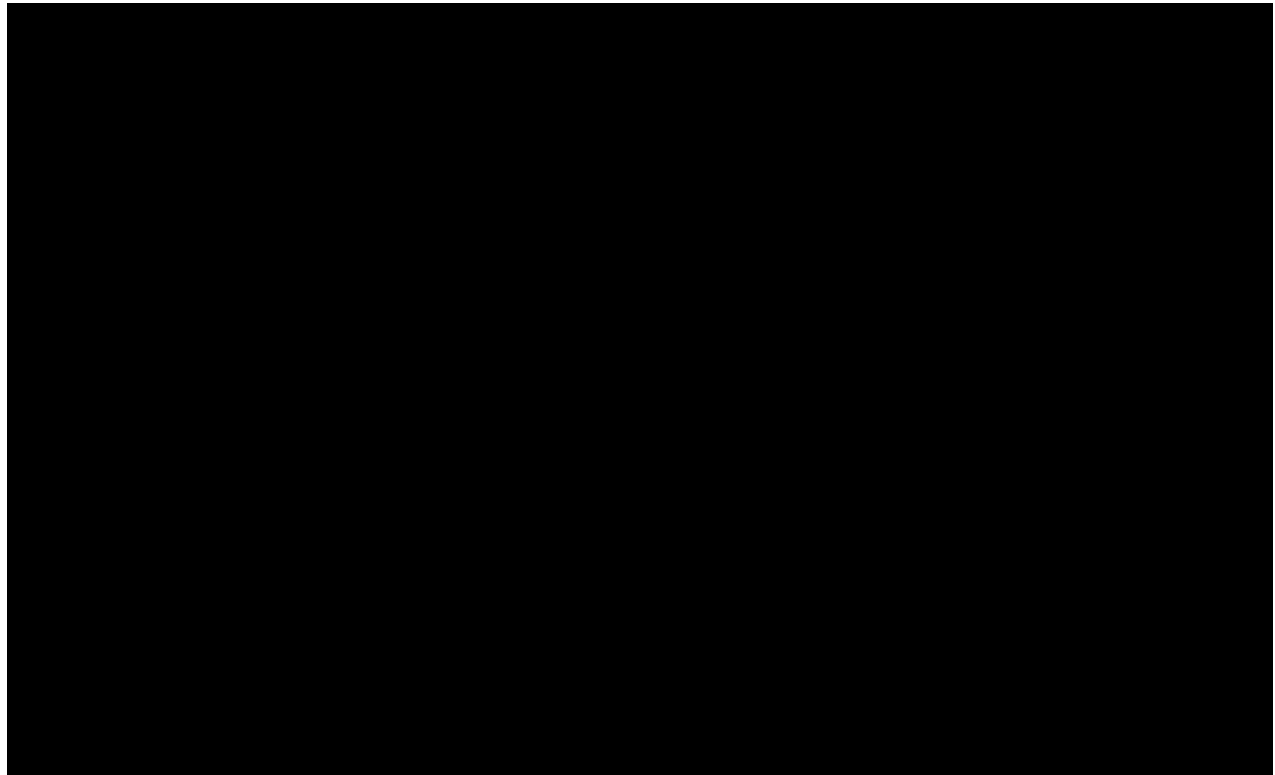
Economics is concerned with decision-making. An economic decision is one that allocates resources, time, money, or something else of use or value. The fundamental question in economics is called the economizing problem. The economizing problem follows directly from the definition of economics offered in Chapter 1. **The economizing problem involves the allocation of resources among competing wants.** The economizing problem exists because there is **scarcity**. Scarcity arises because of two facts; (1) there are unlimited human wants, but (2) there are limited resources available to meet those wants. In other words, scarcity exists because we do not have sufficient resources to produce everything we want. Perhaps at some date in the future, a utopian world may be obtained where everyone's desires can be fully satisfied -- most economists probably hope that will not happen in their lifetimes because of their own self-interest.

Economists do not differentiate between wants and needs in examining scarcity. Unfortunately, the want of a millionaire for a new Porsche is not differentiated from the need of a starving child for food in the aggregate. However, in a realistic sense, social welfare and the implications of needs versus wants are partially addressed later in this chapter in the discussions offered for allocative efficiency and economic systems.

The concept of scarcity is embedded in virtually every analysis found in economics. Because there is scarcity there is always the question of how resources are allocated and the effects of allocations on various economic agents. Each decision allocating resources to one use or economic agent is also, by necessity, a decision not to allocate resources to an alternative use.

To fully understand the idea of scarcity, each of its components must be mastered. The following section of this chapter examines resources. The next sections will examine economic efficiency, opportunity costs and allocations, before proceeding

to the production possibilities model and economic systems.



Resources and factor payments

The resources used to produce economic goods and services (also called commodities) are called **factors of production**. These resources are the physical assets needed to produce commodities. The way that these resources are combined to produce is called **technology**. For example, a man with a shovel digging a ditch is one technology from which ditches can be obtained. Another technology that can produce the same commodity as a man with a shovel is a backhoe and an operator -- the former is more labor intensive, and the latter is more capital intensive.

Land is a factor of production. **Land includes space, natural resources, and what is commonly thought of as land.** A building lot, farm land, or a parking space is what people normally think of when they think of land. However, iron ore, water resources, oil, and other natural resources obtained from land are also one dimension of this factor of production. Another, perhaps equally important dimension, is space. The location of a building site for a business is an important consideration. For example, a retail establishment may succeed or fail because of location, therefore location is another important aspect of the resource called land. **The factor payment that accrues to land for producing is rent.**

Capital includes the physical assets (i.e., plant and equipment) used in the production of commodities. Often accountants refer to capital as money balances that are earmarked for the purchase of plant or equipment. The accounting view of capital is not the physical asset envisioned by economists (in reality the difference is one of a future claim (the accountant's view) and a present stock of capital (the economist's view) and is not trivial). **Capital receives interest for its contributions to production.**

There is one important variation on capital. Economists also called the skills, abilities, and knowledge of human beings as **human capital**. Human capital is a characteristic of labor. Human capital can be acquired (i.e., education) or may be something inherent in a specific individual (i.e., size, beauty, etc.). This subject will be examined in more depth in Chapters 10 and 11.

Labor includes the broad range of services (and their characteristics) exerted in the production process. Labor is a rather unique factor of production because it cannot be separated from the human being who provides it. Human beings also play other roles in the economic system, such as consumer that complicates the analysis of labor as a productive factor. The amount of human capital possessed by labor varies widely from the totally unskilled to highly trained professionals and highly skilled journeymen. Labor also includes hired management, and the lowest paid janitor. **Labor is paid wages for its contribution to the production of commodities.**

Entrepreneur (risk taker) is the economic agent who creates the enterprise. Entrepreneurial talent not only assumes the risk of starting a business, but is generally responsible for innovations in products and production processes. The vibrancy of the U.S. economy is, in large measure, due to a wealth of entrepreneurial talent. **This factor of production receives profits for its contribution to output.**

To obtain the maximum amount of output from the available productive resources an economic system should have full employment. **Full employment is the utilization of all resources that is consistent with normal job search and maintenance of productive capacity.** Full employment includes the natural rate of unemployment, which economists estimate to be between four and six percent (unemployment due to job search and normal structural changes in the economy). Empirical evidence suggests that about 80% capacity utilization is consistent with the natural rate of unemployment. When the economy is operating at rates consistent with the natural rate of unemployment it is producing the potential total output. However, full production, 100% capacity utilization involves greater than full employment and cannot be maintained for a prolonged period without labor and capital breaking-down.

Underemployment has been a persistent problem in most developed economies. Underemployment results from the utilization of a resource that is less than what is consistent with full employment. There are two ways that underemployment manifests itself. First, individuals can be employed full time, but not making use of the human

capital they possess. For example, in many European countries it is not uncommon for an M.D. to be employed as a practical nurse. The second way that underemployment is typically observed is when someone is involuntarily a part-time employee rather than employed full-time in an appropriate position.

Economic Efficiency

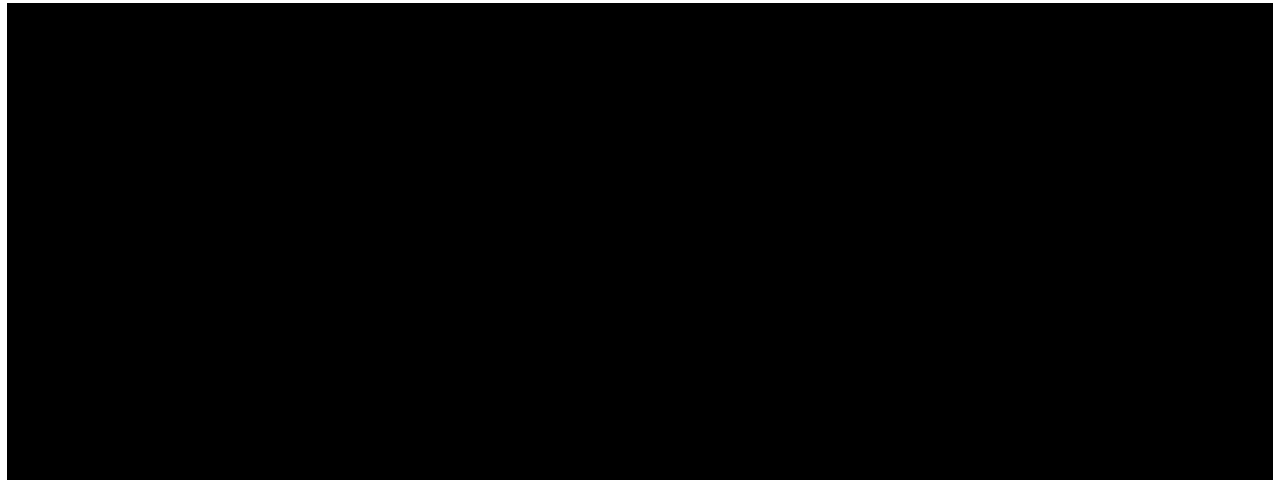
Economic efficiency consists of three components; these are: (1) allocative efficiency, (2) technical or productive efficiency, and (3) full employment. For an economy to be economically efficient all three conditions must be fulfilled.

Allocative efficiency is concerned with how resources are allocated. In a perfectly competitive economy, without institutional impediments, monopoly power, or cartels the markets will allocate resources in an allocatively efficient manner. Allocative efficiency is measured using a concept known as Pareto Optimality (or Superiority in an imperfect world).

Pareto Optimality is that allocation where no person could be made better-off without inflicting harm on another. A Pareto Optimal allocation of resources can exist, theoretically, only in the case of a purely competitive economy (which has never existed in reality). What is of practical significance is a Pareto Superior allocation of resources. A Pareto Superior allocation is that allocation where the benefit received by one person is more than the harm inflicted on another. [cost - benefit approach]

Technical or productive efficiency is a somewhat easier concept. **Technical efficiency is defined as the minimization of cost for a given level of output or (alternatively) for a given level of cost you maximize output.** In other words, for an economic system to be efficient, each firm in each industry must be technically efficient. Again, a technically efficient operation is difficult to find in the real world. However, most profit-maximizing firms (as well as government agencies and non-profit organizations) will at least have technical efficiency as one of its operational goals.

For an economic system to be economically efficient then full employment is also required. Due primarily to the business cycles, no economic system can consistently achieve full employment. The U.S. economy typically has one (during recoveries) to four percent (during recessions) unemployment above that associated with the natural rate of unemployment. We will return to this topic in the discussions of market structures in Chapters 8 and 9.



Pigou states the basic proposition of Pareto Superiority in the real world; an application of income re-distribution. The “transference of income from a relatively rich man to a relatively poor man of similar temperament” making one less poor, and the other less rich, results in an application of the principle of diminishing marginal utility and, hence, allocative efficiency. In other words, the cost-benefit approach on the margin. We take the last dollar from those with less value for that dollar and add that to those more desperate for an additional dollar of income. Not only is this allocatively efficient, but there are those who would argue that this is also fair.

Economic Cost

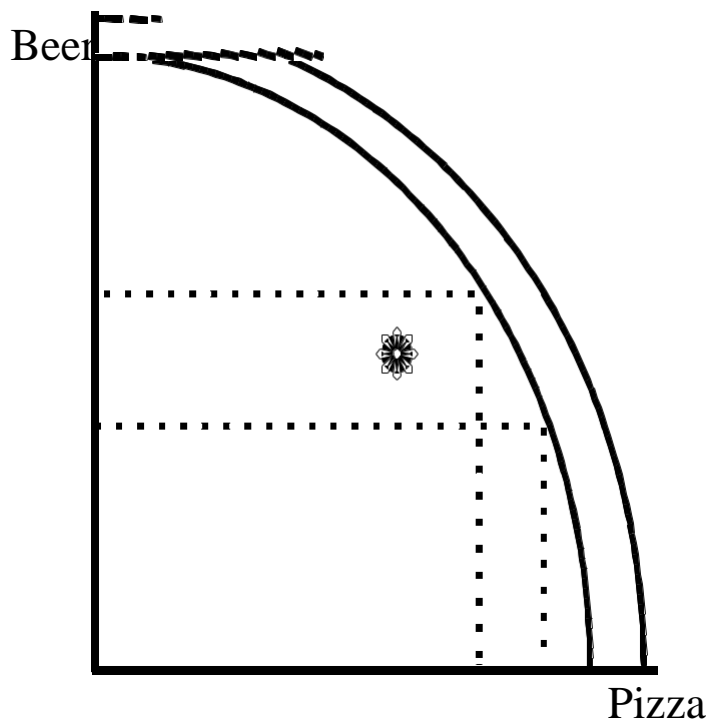
Economic cost consists of two distinct types of costs: (1) explicit (accounting) costs, and (2) opportunity (implicit) costs. Explicit costs are direct expenditures in the production process. These are the items of cost with which accountants are concerned. **An opportunity cost is the next best alternative that must be foregone as a result of a particular decision.** Rather than a direct expenditure, an opportunity cost is the implicit loss of an alternative because of a decision. For example, reading this chapter is costly, you have implicitly decided not to watch T.V. or spend time doing something else by deciding to read this chapter. Every choice is costly; that is, there is an opportunity cost. Economic costs are dealt with in greater detail in Chapter 7.

Production Possibilities

The production possibilities frontier (or curve) is a simple model that can be used to illustrate what a very simple economic system can produce under some restrictive assumptions. The production possibilities model is used to illustrate the concepts of opportunity cost, productive factors and their scarcity, economic efficiency (unemployment etc.) and the economic choices an economy must make with respect to what will be produced.

There are four assumptions necessary to represent the production possibilities in a simple economic system. The assumption which underpin the production possibilities curve model are: (1) the economy is economically efficient, (2) there are a fixed number of productive resources, (3) the technology available to this economy is fixed, and (4) in this economy we are going to produce only two commodities. With these four assumption we can represent all the combinations of two commodities that can be produced given the technology and resources available are efficiently used.

Consider the following diagram:



Along the vertical axis we measure the number of units of beer we can produce and along the horizontal axis we measure the number of units of pizza we can produce. Where the solid line intersects the beer axis shows the amount of beer we can produce

if all of our resources are allocated to beer production. Where the solid line intersects the pizza axis indicates the amount of pizza we can produce if all of our resources are allocated to pizza production. Along the solid line between the beer axis and the pizza axis are the intermediate solutions where we have both beer and pizza being produced.

The reason the line is curved, rather than straight, is that the resources used to produce beer are not perfectly useful in producing pizza and vice versa. The dashed line represents a second production possibilities curve that is possible with additional resources or an advancement in available technology.

Increasing Opportunity Costs is illustrated in the above production possibilities curve. Notice as we obtain more pizza (move to the right along the pizza axis) we have to give up large amounts of beer (downward move along beer axis). In other words, the slope of the production possibilities curve is the marginal opportunity cost of the production of one additional unit of one commodity, in terms of the other commodity.

Inefficiency, unemployment, and underemployment are illustrated by a point inside the production possibilities curve, as shown above. A point consistent with inefficiency, unemployment, or underemployment is identified by the symbol to the inside of the curve.



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 curve. The only way this can happen is for there to be more resources or better technology and this is called economic growth. It is also possible that the curve could shift to the left (back toward the origin -- the intersection of the beer axis with the pizza axis), this could result from being forced to use less efficient technology (pollution controls) or the loss of resources (racism or sexism).

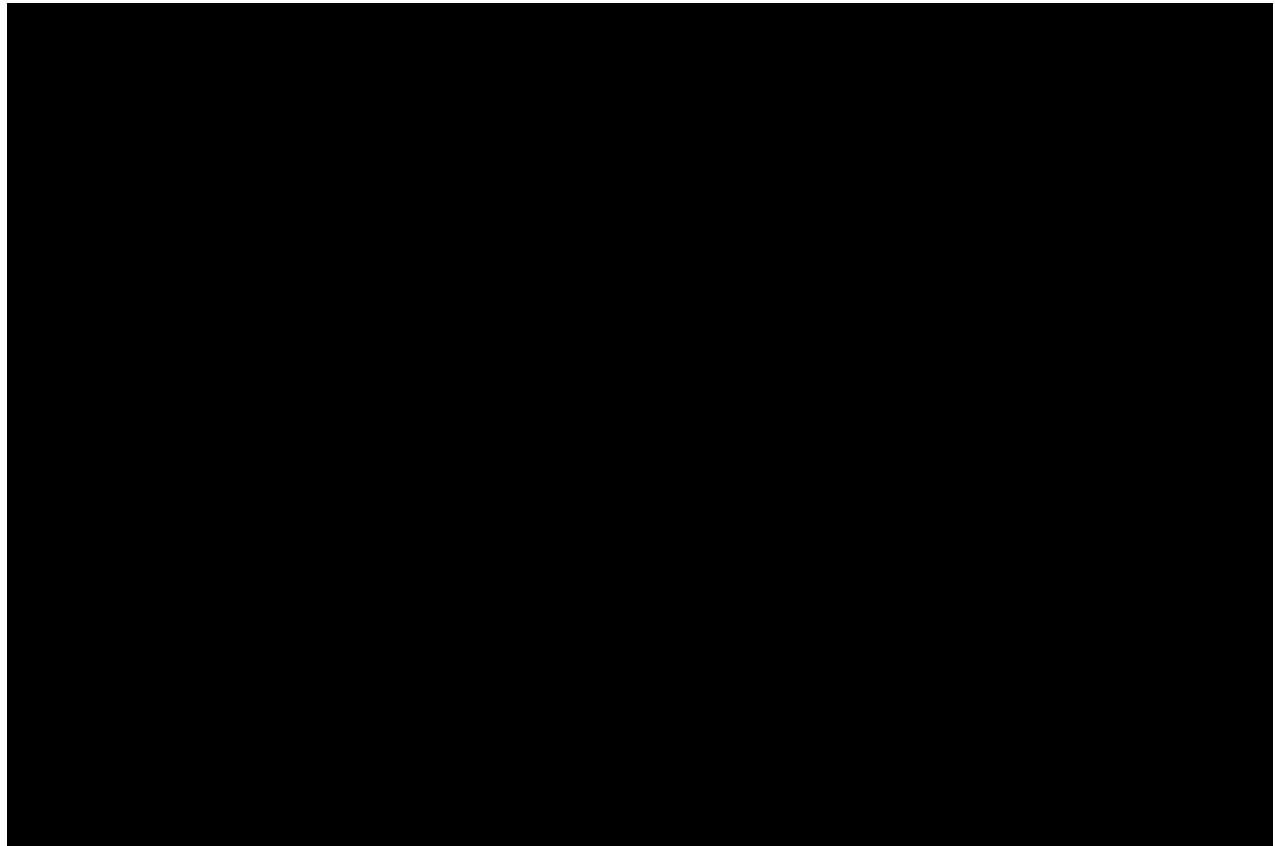
Economic Systems

Production and the allocation of resources occur within economic systems. Economic systems rarely exist in a pure form and the pure forms are assumed simply for ease of illustration. The following classification of systems is based on the dominant characteristics of those systems.

Pure capitalism is characterized by private ownership of productive capacity, very limited government, and motivated by self-interest. Laissez faire means that government keeps their hands-off and markets perform the allocative functions within the economy. This type of system has the benefit of producing allocative efficiency if there is no monopoly power, but this type of system tends towards heavy market concentration left unregulated. There are substantial costs associated with pure capitalism. These costs include significant losses of freedom, poverty, income inequity

and several social ills associated with the lack of protections afforded by stronger government. What is perhaps the saving grace, is that pure capitalism does not exist in the course of economic history. Pure capitalism exists only in the tortured minds of economists, and pages of the *Wealth of Nations*.

In the following box, Thorstein Veblen discusses his view of capitalism and the “struggle” associated with the pursuit of self-interest in a system marked with private interests.



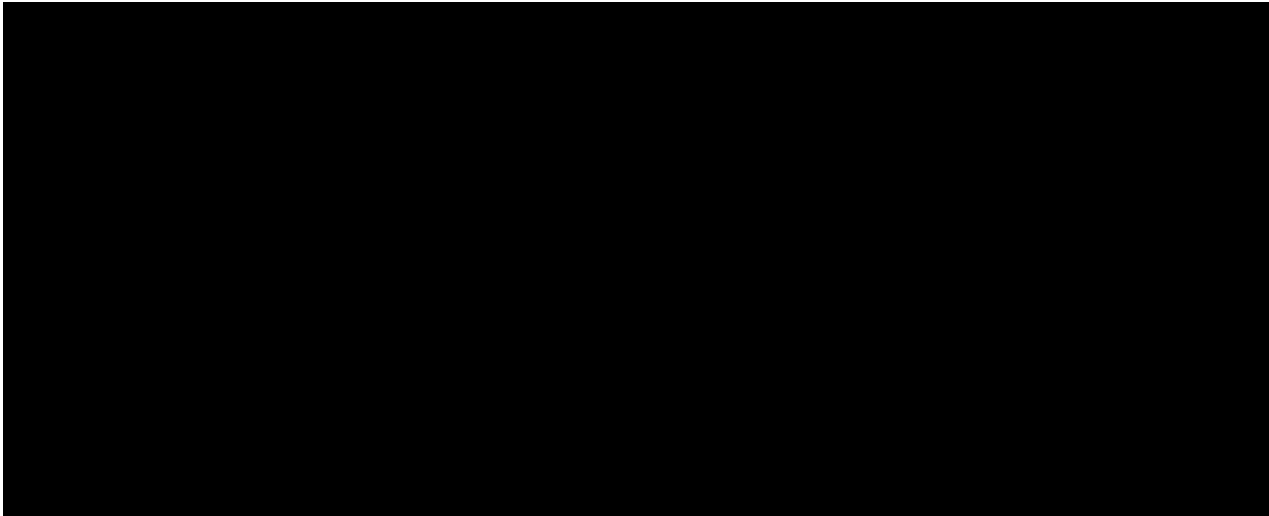
In command economies the government makes the allocative decisions. These decisions are backed with the force of law (and sometimes martial force). Political freedom is the antitheses of a command economy. Even though political and economic freedom could result in a reasonable allocation, but rarely will command economies be associated with democratic forms of government. Examples, of these types of systems abound, Nazi Germany, Chile, the former Soviet Union are but a few examples.

Traditional economies base allocations on social mores or ethics or other non-market, non-legislative bases. For example, Iran is an Islamic Republic and the allocation of resources is heavily influenced by religious precepts. The purest forms of traditional economies are typically observed in tribal societies. In the South Pacific and certain South American Indian tribes, the allocation of resources is determined by

traditions, only some of which are based in their religion. Many of these traditions developed because of economic constraints. For example, the tradition that some native tribes in the Arctic had of putting their elderly out of the community to starve or freeze may seem barbaric, but because of the difficulty in obtaining the basic requirements of life, those that could not contribute, could not be supported. Hence a tradition that arose from economic constraints.

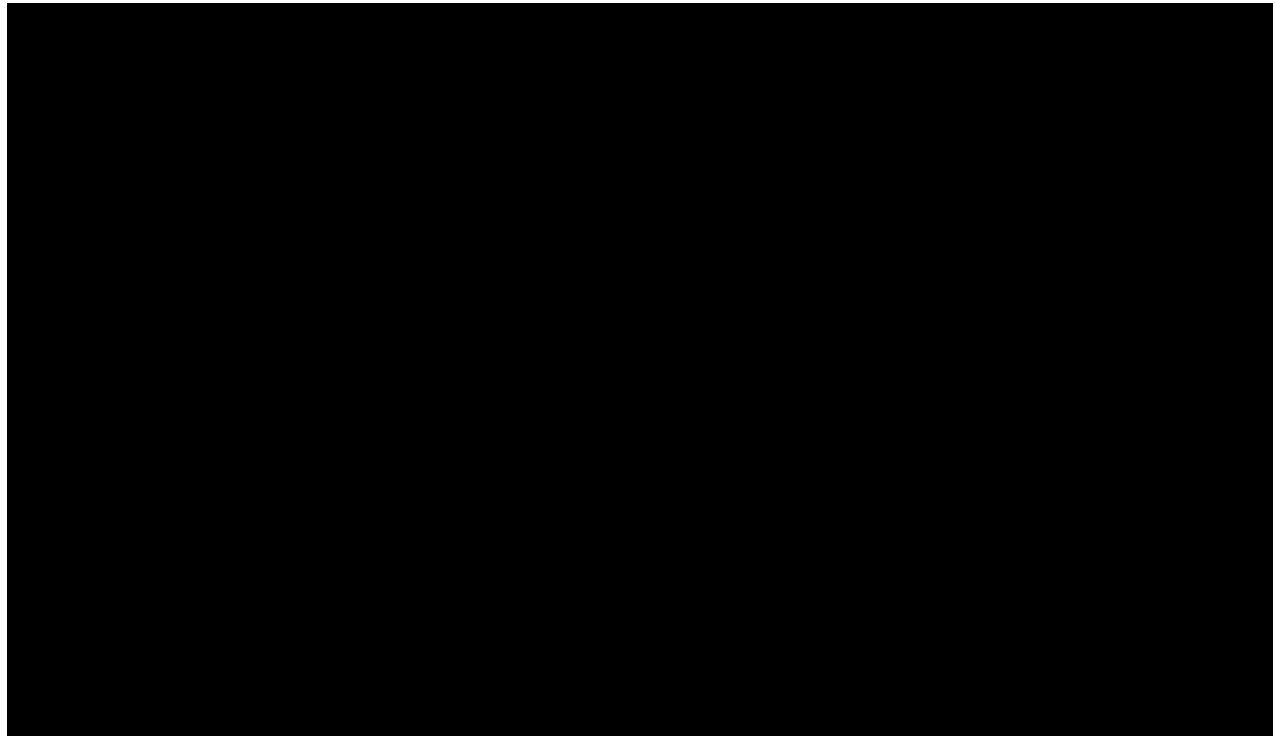
Socialism generally focuses on maximizing individual welfare for all persons based on perceived needs, not necessarily on contributions. Socialist systems are generally concerned more with perceived equity rather than efficiency. The basic idea here is that when there is assurance of economic security then society in general is better-off. Sweden, Denmark, Norway and Iceland have systems that have large elements of socialism. Each of these three countries have been reasonably successful in maintaining relatively high levels of productivity and standards of living.

Communism is a system where everyone shares equally in the output of society (according to their needs), at least theoretically. Generally, there is no private holdings of productive resources, and government is a trustee until such time as what is called "Socialist Man" fully develops (where the individual is more concerned with aggregate welfare than individual gain). The former Soviet Union was not a communist society as perceived by Karl Marx in *Das Kapital*. However, examples of communist societies exist on small community levels. Both New Harmony, Indiana and Amana, Iowa were utopian communist systems that were probably more in keeping with Marxist ideals, but without the political implications and in very limited scope.



Virtually all economic systems are mixed systems. A mixed system is one that contains elements of more than one of the above pure systems. The U.S. economy is a mixed system, with significant amounts of capitalism, command, and socialism. The U.S. economy also has some very limited amounts of communism and tradition that have helped shape our system. Much of the political controversies concerning the budget deficit, social security, and the environment focuses on the what the appropriate mix of systems should exist in our economic system.

Most developed economies are mixed systems. As a society grows and becomes more complex, simple pure examples of economic systems are incapable of handling the demands placed on them. Complexity generally requires elements of command, socialism and capitalism to properly allocate resources and produce commodities. This is no more evident in the troubles being experienced in the former Soviet Union and in China. As these economies attempt to modernize and develop, the policy makers have discovered the utility of market systems for many economic decisions.



Developed economies are generally high income economies, because the production processes tend to be capital intensive, and focused on high value-added products. An economy that has a per capita GDP of \$8000 or more is a high income economy. Less developed economies fall into two categories, middle income \$8000 to \$800, and low income economies or those below \$800. Low income economies are concentrated in South Asia, and Africa South of the Sahara. Middle income economies are in the Middle East, Eastern Europe and Latin America. The majority of the world's

population, over half, live in low income economies.

Perhaps the greatest economic issue facing the current generation is what can be done to bring the low income economies into meaningful participation in the global economy. The poverty of the low income economies is a serious matter without any other issue. AIDS, malaria, and a host of other health problems are associated with the poverty in these nations. Perhaps more importantly, with rising incomes in these parts of the world come several benefits globally. As income rise in low income countries, cheap labor is no longer a cause for outsourcing from the high income, industrialized parts of the world. Further, as income rise, so too does the demand for goods and services. The often used cliché “a rise tide makes all boats float higher” is exactly the case in these nations emergence into full participation in the global economy. More concerning these issues will be offered later in this book.

KEY CONCEPTS

Economizing problem

- Scarce Resources
- Unlimited Wants

Resources and Factors Payments

- Land - rent
- Labor - wages
- Capital - interest
- Entrepreneurial Talent - profits

Full Employment

- Underemployment

Economic Efficiency

- Allocative Efficiency
- Technological Efficiency
- Full Employment

Opportunity Cost

- Implicit vs. Explicit Costs

Production Possibilities Frontier (or Curve)

- Growth
- Inefficiency
- Law of Increasing Opportunity Costs

Economic Systems

- Pure capitalism
- Command
- Tradition
- Socialism
- Communism
- Mixed Systems

Developed vs. Less Developed Economies

- High Income
- Middle Income
- Low Income

Globalization

STUDY GUIDE

Food for Thought:

What is the economizing problem? What, precisely does scarcity have to do with this? Explain.

Draw a production possibilities curve that illustrates a one-to-one trade-off between the two goods, what would cause such a production possibilities curve? Explain.

Compare and contrast the various economic systems? Is a mixed system best? Explain.

Differentiate between explicit and implicit costs. Is this differentiation important in economic decisions? Explain.

Sample Questions:

Multiple Choice:

Which of the following factors of production are not properly matched with their factor payments?

- A. **Land - profits**
- B. Labor - wages
- C. Capital - interest
- D. All are properly matched

Unemployment can be illustrated with a production possibilities curve. Which of the following illustrates unemployment?

- A. A shift to the left of the curve
- B. A shift to the right of the curve
- C. **A point on the inside of the curve**
- D. A point on the outside of the curve

Which of the following is an implicit cost of your obtaining a college education if you go to school exclusively?

- A. Tuition
- B. Books and supplies
- C. **Income lost from a job you didn't take**
- D. All of the above

The U.S. economy is closest to which of the following economic systems?

- A. **Mixed**
- B. Pure Capitalism
- C. Pure Command
- D. None of the above

TRUE-FALSE

A laissez faire, purely capitalistic economy will always result in economically efficient distributions of resources. {FALSE}

If the assumption of a fixed technology is relaxed in the production possibilities curve model, then the exact position and shape of the curve will be impossible to show using a single line. {TRUE}

The former Soviet Union was an example of pure Communism and the Swedish economy an example of pure socialism. {FALSE}

Opportunity cost is an example of an implicit cost. {TRUE}

CHAPTER 3

Interdependence and the Global Economy

This chapter begins with a discussion of the interdependence of nations in the modern global economy before proceeding to a discussion of capitalist ideology. The characteristics of a market based economic system, and the motivation for international trade will then be presented before offering a discussion of the role of money in a global economic system. The final section of this chapter develops the circular flow diagram that illustrates interdependence within a global economy.

Open Economic System

The modern economy of most nations is no longer a closed-localized system. Virtually every nation on earth has some sort of relations with other nations. The extent to which an economic system is involved in economic relations with other countries is the degree to which that economy is **open**. Foreign economic relations involves the importation and exportation of goods and services. When you buy a Toyota you are having economic relations with Japan. When you work for Philips (Aero-Quip etc.) you are having economic relations with Holland (Philips is a Dutch company). Over the past three decades our reliance on foreign produced goods has become increasingly important to our standard of living. On the other hand, foreigners have become increasingly reliant on American goods. Without trade among nations then everyone would suffer the loss of goods they desire that must be imported.

Foreign investment in the United States has been and continues to be an important component of our economic development. From the very beginnings of the United States European countries, i.e., France, Britain and Germany have heavily invested in the United States. In the Nineteenth Century the motivation was that the U.S. was far from the turmoil of the repeated European wars (Napoleon etc.) and investment here was protected by the expanse of the two Oceans on our east and west. As our institutions developed and became more secure, investment was attracted by the safety offered by our financial institutions and government regulations. At the same time, American industry sought to move into markets they presently served only by exportation.

Controversy abounds concerning international economic relations. The outsourcing of jobs abroad has real costs for the affected households and is a source of discontent among workers who have lost their jobs to foreign competition (more concerning this will be discussed in chapter 12). In many cases these job losses are simply

employers taking advantage of very low income populations in poor countries – with all of the social and political ills associated with economic exploitation. Over the next several decades these issues will take a more central place in political debate, and concerns over the social responsibility of business.

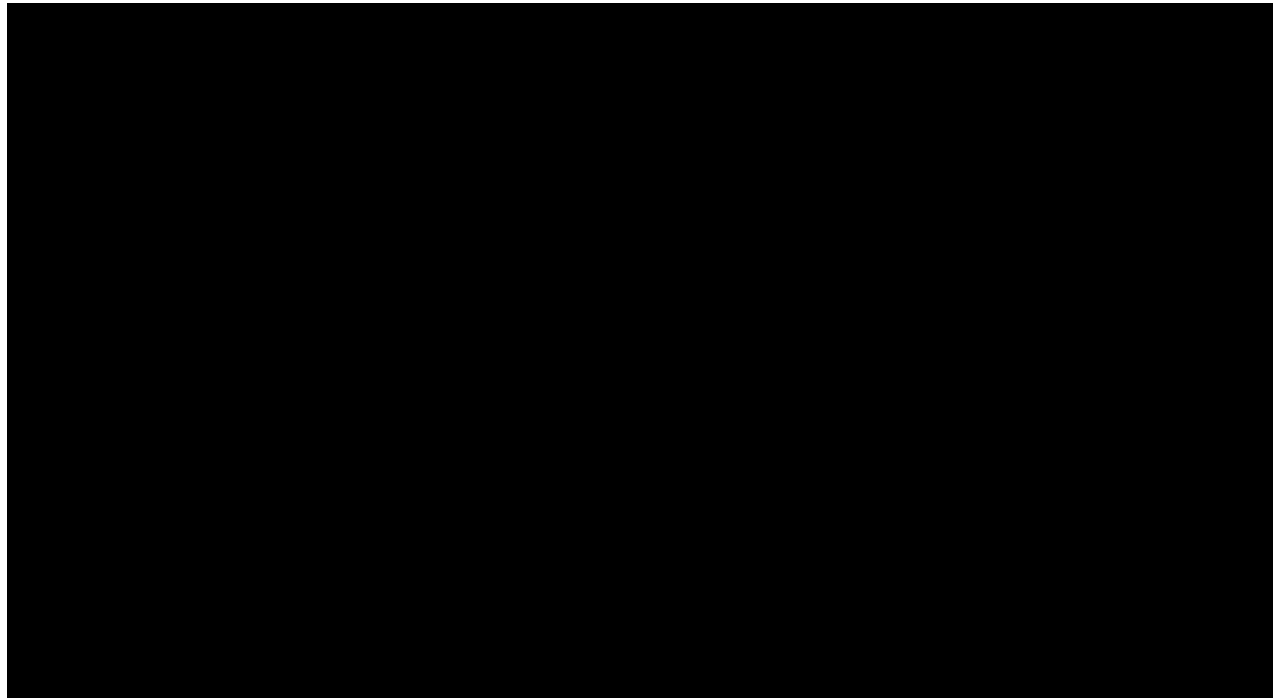
Technology transfers are also controversial. There are currently bands on the transfer of certain technologies that have implications for national defense. However, in general, technology transfers is the exportation of ideas, knowledge and equipment that may permit less fortunate nations to more adequately participate in the global economic system.

The United States is presently experiencing large deficits in our balance of payments. The **balance of payments** is the net investment abroad (capital accounts) plus the net exports (current accounts) of the United States. If the balance of payments is positive, ignoring investment (capital accounts) for the moment, that means we are exporting more than we are importing. With the capital accounts that means we invest more abroad, than foreigners invest in the U.S. Together, if the balance of payment is negative, that means the net of the capital and current accounts is a negative number (i.e., we invest less abroad than foreigners invest here, and we import more than we export).

Capitalist Ideology

Ideology is defined by Webster's Dictionary as: ***that system of mental philosophy which exclusively derives our knowledge from sensation.*** Webster's also appropriately defines capitalism as: ***An economic system characterized by private ownership of natural resources and means of production.*** However, what our system is, and what ideology has grown up around the system are two different things. We have a mixed system, which includes a significant amount of market allocation mechanisms, but it is not a pure capitalist system. Further, what Adam Smith envisioned for capitalism is in many respects very much different from the more radical proponents of capitalism would have us believe is the ideal system. One should remember that a mixed system evolved for a reason, and that the ideology ought not taint the wonders of that system and the standard of living it provides.

The following box is an excerpt from Adam Smith's *Wealth of Nations* which clearly and unambiguously examines the idea of social welfare, with respect to the pursuit of individual welfare. Bear in mind Adam Smith was the father of capitalism as you read this excerpt.



Capitalist ideology is therefore what we wish to perceive it to be, rather a dispassionate observation of some characteristics of a our economic system. The characteristics of a market system are dispassionate observations about markets and their operation. Therefore capitalist ideology is different than the characteristics of a market system.

The characteristics of a capitalist economy are familiar to anyone who has grown up in western industrialized countries. The elements of a capitalist ideology are: **(1) freedom of enterprise, (2) self-interest, (3) competition, (4) markets and prices, and (5) a limited role for government.**

Freedom of enterprise, self-interest and a limited role for government are related characteristics of capitalist ideology. By limiting government participation in the economy it is thought that economic freedom to pursue one's self-interest increases – hence government participation is often called “interference.” To the extent that government limits the freedom of enterprise, there is merit to this argument. However, there are often problems associated with the pursuit of self-interest. One of the primary problems with this aspect of the ideology is it is based on the assumption that the power to limit people's self-interest comes only from government. There is also a significant amount of potential to limit economic freedom by predatory behaviors from the private sector. For example, large businesses running small ones out of business to obtain a monopoly to permit prices to increase.

Again, assuming that monopoly power is not exerted over otherwise competitive markets, the competition among producers in a market economy will approximate a

Pareto Optimal (see Chapter 2) allocation of resources. Competition does provide for alternate sources of supply that generally increases quality and keeps prices in check. The market system is largely responsible for our high standard of living and the ability to effectively respond to changes in the global economy.

Maybe the best example of the benefits that arise from a capitalist economy is the U.S. automobile industry. In the 1970s the U.S. car producers did not have effective competition, and their prices increased as the quality of U.S. built cars declined. The Japanese entered the U.S. markets and successfully competed with the U.S. manufacturers. This caused the U.S. manufacturers to significantly increase the quality of their products and keep their prices in check. By 2004 many of the top ten vehicles in quality according to consumer reports are U.S. automobiles. ***Consumer Guide's Recommended List for 2004:***

<http://auto.consumerguide.com/auto/new/index.cfm>

lists fifteen foreign built vehicles (14 of which are Japanese name plates) and eighteen American vehicles as best buys for 2003. This is a significant benefit from competition that is fundamental to capitalism.

However, capitalism has its drawbacks. Poverty, high rates of litigation, pollution, crime and several other social problems are associated with freedom and limiting government's role. There is a broad range of legitimate roles for government in a capitalist economy. As social responsibility by producers and consumers declines, the legitimate roles of government generally expand.

Worse still, over the past three or four years, businesses in the U.S. have been rocked by scandals. The accounting and analyst frauds at Enron, WorldCom, Health South, and an array of brokerage firms and investment banks, have illustrated that the ethic of self-interest is hardly a reasonable basis for an economic system – without some countervailing forces. Self-interest, without government, or at least effective government regulation, may produce results that are extremely harsh for those without the resources to defend themselves. Therefore there is a strong need not only for a strong ethic of honest and forthright dealings, but also governmental regulation to proscribe the worst abuses.

For the tendency of capitalism toward monopoly and market power to be held in proper balance government must have a significant role. The exact magnitude of the role of government in a free economy has always been controversial, but there is little doubt of its potential for positive outcomes. President Bush, during his first election campaign argued that he envisioned American society becoming "kinder and gentler" society. This reference was for the need for certain elements of socialism to provide limited assurance for the disabled, the elderly, and children freedom from poverty. In the years since George Bush, it seems that neither Democrats nor Republicans shared the first President Bush's vision. Mixed economic systems are the response to the

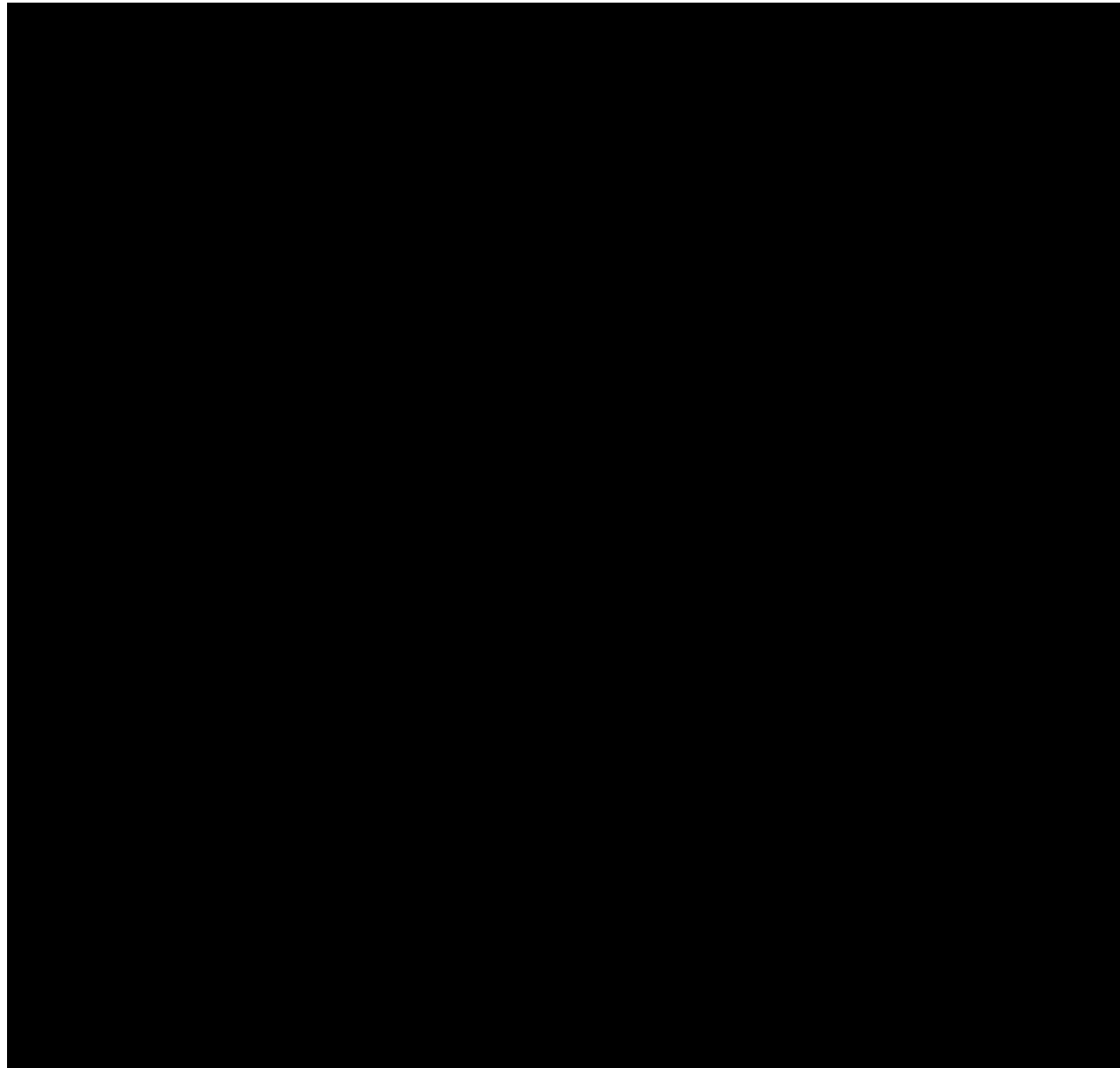
drawbacks of capitalism.

Not all people accept our view of the proportions of market activity that should be in evidence in a mixed economy. The Europeans and major Asian economies have far more socialism than we do. On the other hand, many of the Less Developed Countries permit far more free enterprise than we do. Whatever the proportions, two things are certain. First, no two societies are alike in their mix of allocative mechanisms, and second the mix evolves and changes over time with the societies the system serves.

Market System Characteristics

The characteristics of the market system is both practically and intellectually different than capitalist ideology. The characteristics of the market system are those things upon which the operationalization of markets depend to decide what is produced and how it will be allocated. The characteristics of a typical of market system are: **(1) the division of labor & specialization, (2) significant reliance on capital goods, and (3) reliance on comparative advantage.** These characteristics have significant interactions and together are responsible for the competitive well-being of most market system economies.

In market economies the competition among producers requires high levels of technical efficiency, which, in turn, requires labor to become specialized and focused on narrow aspects of a particular production process. By dividing tasks into small components people become better at repetitive movements and therefore their efficiency increases. As efficiency increases, cost per unit declines.

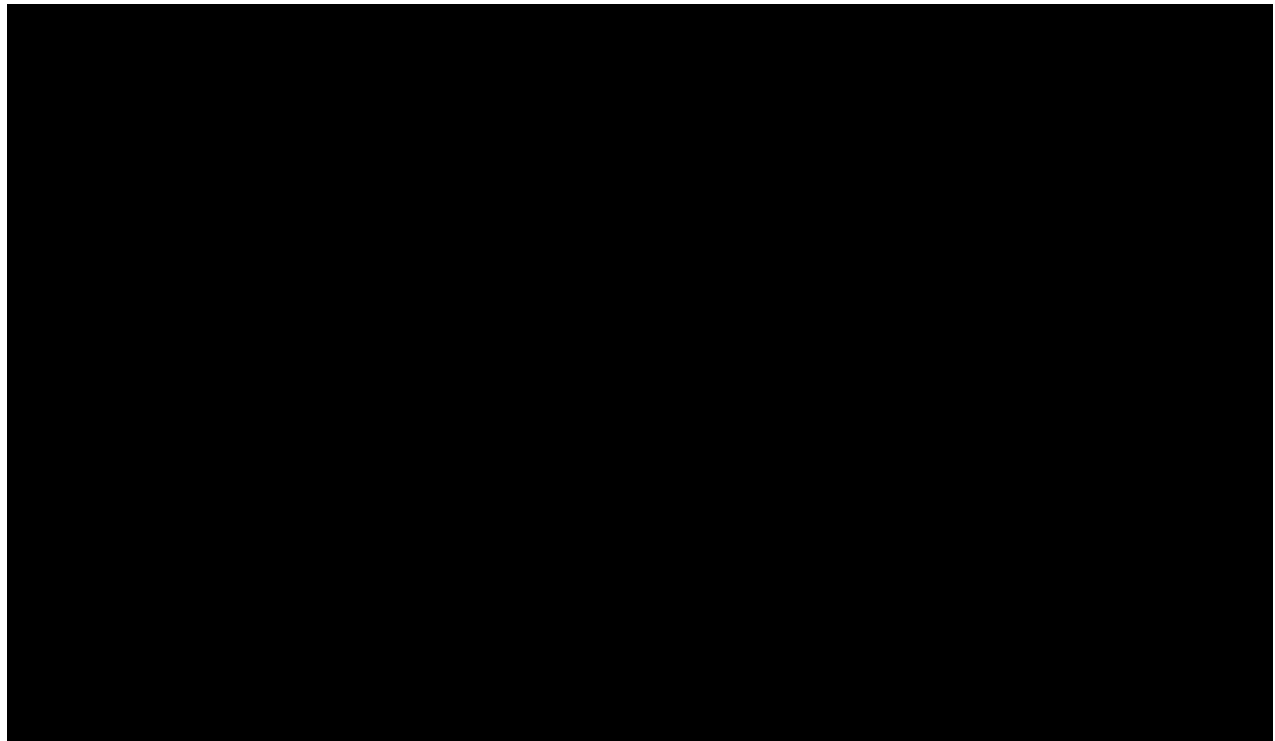


Because of the need to compete, capital is typically used where it is less costly. Capital can be substituted for labor in many production processes and significantly reduce per unit costs of production.

Comparative Advantage and Trade

However, comparative advantage is somewhat more complicated. Comparative advantage is the motivation for trade among people (and nations). Terms of trade are

those upon which the parties may agree and depends on the relative cost advantages of trading partners and their respective bargaining power.



Consider the following illustration:

	Texas	Florida
Cows	1000	100
Oranges	100	1000

The data above show what each state could produce if all of their resources were put into each commodity. For example, if Texas put all their resources in cattle production they could produce 1000 cows but no oranges. Assuming the data give the rate at which the commodities can be substituted, if both states equally divided their resources between the two commodities, Texas can produce 500 cows and 50 oranges and Florida can produce 50 cows and 500 oranges (for a total of 550 units of each commodity produced by the two states together). If Texas produced nothing but cows it would produce 1000, and if Florida produced nothing but oranges it would produce 1000). If the countries traded on terms where one orange was worth one cow then both states would have 500 units of each commodity and obviously benefit from specialization and trade. In this example notice that oranges are relatively expensive.

Trade between industries and individuals also arises from comparative

advantage. However, **barter (direct trading of commodities)** becomes increasingly difficult as an economic system becomes more complex. Barter requires a **coincidence of wants**, it does no good to have apples if you want oranges and the only people who have oranges hate apples. No transaction will occur under this scenario unless a third-party can be found that has a commodity that both original trading parties value and who accept both apples and oranges. Therefore, as complexity rises, so does the need for the ability to conduct business without reliance on barter, therefore the need for money.

TRADE SUMMARY - U.S. Department of Commerce, International Trade Administration			
(billions of dollars)			
Year	Total Exports	Total Imports	Balance of Trade
2000	\$1064.2	\$1442.9	-\$378.7
2001	998.0	1356.3	- 358.3
2002	971.7	1407.3	- 435.7
2003 (est)	988.8	1489.2	- 501.4

Money in an Economic System

Money facilitates market activities and is necessary in complex market systems. With money people can avoid the problems associated with coincidence of wants. Among, these problems is the pricing of commodities. Prices stated in the terms of all possible trading goods makes it difficult to determine what anything costs. In barter economies hours are spent in negotiating for even simple transactions, these hours are resources that could have been spent on other activities (therefore the hours of negotiations are the opportunity cost of a money economy).

The functions of money include; (1) **medium of exchange**, (2) **store of value**, and (3) **a measure of worth**. Because money is acceptable as a form of payment for all commodities, barter is no longer needed. Money can be easily stored in a tin can or bank account, so commodities need not be stored and can be purchased when needed. Because money is acceptable in virtually all transactions, prices can be stated in terms of dollars or yen thereby simplifying transactions substantially. In other words, money is the grease that lubricates any complex economic system.

Fiat money is what is common in modern economic systems. **Fiat money is money that is defined as legal tender by either a government or some organization with the authority to define legal tender.** In the United States the Federal Reserve System issues Federal Reserve Notes, which serve as the legal tender for the United States. The currency used here is backed by nothing except the faith of the general public that this money will be acceptable by everyone else with whom you could have an economic transaction.

President Nixon in 1971 took the United States off of the gold standard. Up to that point of time the value of the dollar was expressed in some fixed ratio to the commodity – gold. The end result was the dollar had become seriously over-valued, and something had to be done so that American exports could resume to our trading partners. When the U.S. abandoned the gold standard gold went from less than forty dollars an ounce, to over \$1000 an ounce in a matter of weeks. Thus illustrating the folly of pegging one's currency to the value of some commodity.

Fiat money is not a new idea. Some European historians identify the first use of fiat money in Europe resulting from gold and silver smiths issuing their customers receipts for gold or silver left in their care. The receipts were commands over that gold and silver, and began to trade as easily as the commodity itself, to the extent that the parties to the transaction knew of the smith and the note bearer. This trade in receipts dates back to the mid-fifteenth century. Hence, in this case the value of money is based on some mutual trust between the principles to these transactions.

The first recorded use of fiat money, however, dates to three hundred years earlier in Asia. Because of the shortage of gold and silver to run the Mongol Empire, Genghis Kahn began to issue orders, in writing, that the written order was to be given deference as a specific amount of gold or silver. Genghis was known to a be no-nonsense sort of guy, and the violation of his decrees were clearly unhealthy acts, therefore these orders were the first fiat money recorded in history, and not backed by anything save the martial might of the Mongol Army. Perhaps, in retrospect, it is better that currency be acceptable on economic grounds, than under threat of violence from a government.

Foreign Exchange

International economic relations also depend, in large measure, on monetary issues. You are unlikely to accept the Turkish Lire in payment for your wages in this country, simply because you can't easily use that money to buy anything. You want U.S. dollars in payment for your services, because you can easily spend the dollar. Countries act the same way you do. There are currencies that virtually everyone accepts as payment, and those widely accepted currencies are called **hard currency**.

The currency of the big, developed, high income economies are the hard currencies – U.S. dollar, Japanese Yen, Canadian dollar, British pound and the E.E.U.s' Euro.

Prior to the Euro, there were seven countries whose currencies were considered hard currencies. In addition to the U.S., Japan, Canada, and the United Kingdom, the French Franc, German Mark, and Italian Lire were also considered hard currencies. These seven nations are called the G-7 countries because the size and strength of their economies made them the leading economic forces on the planet, and their currencies the most accepted.

The relative value of currency is called the **exchange rate**. For example, one U.S. dollar may buy 109 Japanese Yen but only .85 Euros. It is these currency exchange rates that, in large measure, determine net exports and foreign investment in the U.S.

As the dollar gains strength, i.e., goes from 109 Yen to the dollar to 120 Yen to the dollar, then imports are cheaper. If at 110 Yen to the dollar a particular Japanese car costs \$20,000 that is also 2.2 million Yen. If the dollar gains strength, and it can now purchase 125 Yen per dollar, then that 2.2 million Yen car is only \$17,600. As can be readily seen the strong dollar give the American consumer an advantage in buying imports. If the dollar becomes weak then that advantage turns to disadvantage. Going back to the example above, if the 2.2 million Yen vehicle was available at \$17,600 at 125 Yen per dollar, the additional cost of \$2400 would be observed if the dollar could only purchase 110 Yen.

The same sort of analysis applies to American exports. With an expensive dollar it is hard to sell American goods abroad. If the Mexican Peso will buy 10 cents we may be able to sell some goods in Mexico, however if the dollar becomes stronger and Mexicans can only get 5 cents per peso, we will observe a marked decline in exports to Mexico.

Currency also impacts foreign investment. If our Mexican friends invest 2 million pesos in the U.S. when the peso buys 10 cents (\$200,000), and then suddenly the peso becomes worth 25 cents (\$500,000) the foreign investor just made 250% on his investment simply because the U.S. dollar weakened with respect to the Mexican peso. On the other hand, if the Mexican investor bought dollars at 25 cents per peso and over a year the dollar fell to 10 cents per peso, his investment went from \$500,000 to only 40% of his original investment. In other words, foreign investment becomes more attractive with strength in the host countries' currency.

A strong dollar policy means that the government will undertake policies that will increase the value of the dollar with respect to other currencies. Contractionary fiscal and monetary policies are typically associated with strong dollar policy and is properly the subject of the next course (macroeconomics). Strength a nation's currency is typically a reflection of its strong economy and institutions. The relative supply and

demand for a currency will also impact the currency exchange rates.

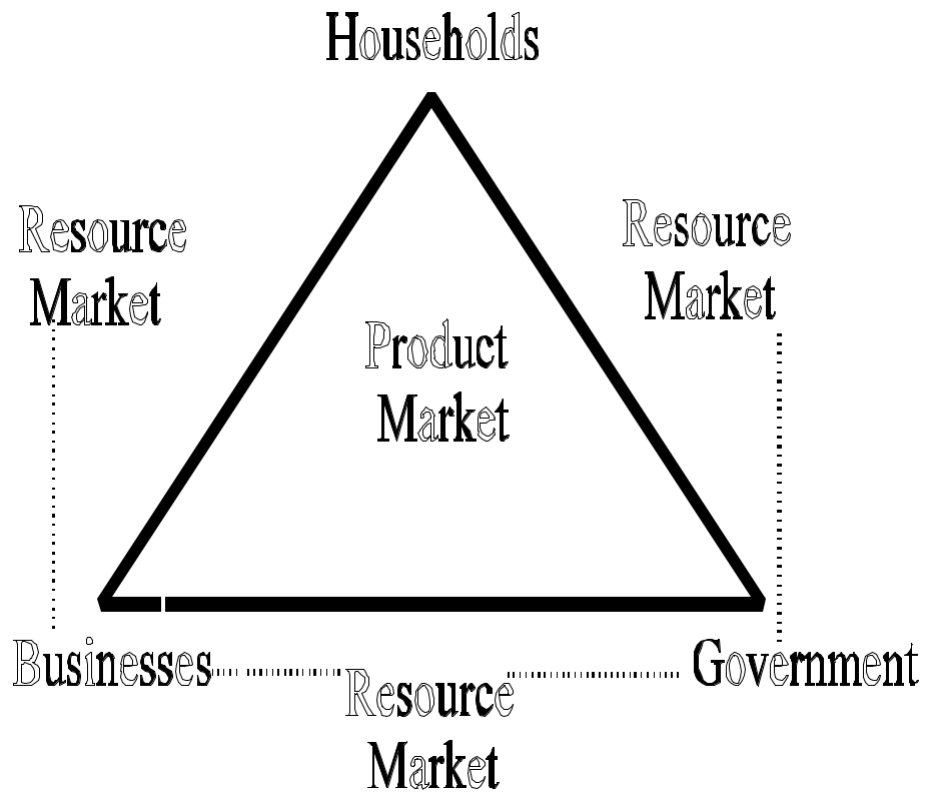
Strong dollar policies promote the importation of goods and services from abroad, and foreign investment in our domestic enterprises. On the other hand, a weak dollar policy promotes the exportation of goods and services abroad, and U.S. investment overseas. Often, the international aspects of domestic monetary and fiscal policies are less important than political consideration in the U.S. or policy consideration concerning unemployment or inflation. However, one must always remember that lobbyists and special interest groups are quick to point-out to policy makers the advantages and disadvantage of either policy for their constituents back home.

The Circular Flow Diagram

The circular flow diagram is used to show the interdependence that exists among sectors of the economy. The diagram illustrates that there are several collections of similar economic agents, called sectors. Households provide resources to government and business and consume the outputs of these other sectors. The markets in which land, labor, capital, and entrepreneurial talent are sold are called resource markets. The markets in which the output of business and in some cases government is sold are called product markets.

To this point, the circular flow diagram is relatively simple. However, when a foreign sector or substantial governmental sector is added it becomes more complicated. It is not unusual for a modern economy to have substantial participation in both the product and resource markets from both foreigners and governments (sometimes even foreign governments).

Consider a relatively simple open-economy, trade and foreign investment occurs. The following diagram illustrates this relatively simple economic system. The interdependence in the sectors is represented by the flows in both the resource and factor markets. Resources flow from household to both the government and businesses. Private goods and services flow from the businesses to households and government, and public goods and services flow from the government to both households and businesses. The triangle representing these domestic sectors rests on a foundation called the foreign sector. Foreign households, business, and even governments (in limited ways) participate in the flows that would otherwise have been purely domestic if the economy was a closed economy.



FOREIGN SECTOR

As can be easily observed the government provides public goods and services to both businesses and households and receives resources and private goods and services in return; the business sector sells commodities to households and households provide resources to businesses. This is the nature of interdependence.

KEY CONCEPTS

Capitalist Ideology

- Freedom of Enterprise
- Self-Interest
- Competition
- Markets and Prices
- Limited Role for Government

Market System Characteristics

- Division and Specialization of Labor
- Capital Goods
- Comparative Advantage

Barter

- Coincidence of Wants

Functions of Money

- Medium of exchange
- Store of Value
- Measure of Worth

Foreign Exchange

- Balance of Payment
- Current Account
- Capital Account
- Exchange Rates
- Imports and Exports
- Foreign Investment

Circular Flow Diagram

- Interdependence
- Sectors
- Foreign Sector

STUDY GUIDE

Critically evaluate capitalist ideology? How does this differ from market characteristics? Explain.

Explain the role of money in a modern economic system. Does this simplify or complicate matters? Explain.

Develop the traditional circular flow diagram and illustrate the interdependence between the sectors. Add the government and the foreign sectors, how does this complicate matters? Explain.

The following two commodities are produced by Tennessee and Kentucky:

	Sour Mash Whiskey	Bourbon
Tennessee	5,000	500
Kentucky	500	10,000

Assuming free trade and that each state wishes to consume as much of each commodity as possible, what will each state produce? What will the terms of trade be?

Explain the role of currency exchange rates in international trade. What cause these exchange rates to change?

Sample Questions:

Multiple Choice:

Which of the following is not a function of money?

- A. Store of value
- B. Measure of worth
- C. Medium of exchange
- D. **All of the above are functions of money**

Barter is a system that historically existed since the beginnings of time. Why has barter been displaced by more modern systems?

- A. **Coincidence of wants makes exchange complicated**
- B. Coincidence of wants no longer exists in the world's economy
- C. Gold and silver are now in plentiful supply so that money can be used
- D. None of the above

If the dollar gains value with respect to the Euro what would we expect to observe?

- A. **U.S. imports increase, foreign investment in the U.S. increases**
- B. U.S. exports decrease, foreign investment in the U.S. decreases
- C. U.S. imports decrease, U.S. investment abroad increases
- D. None of the above

True - False

The circular flow model demonstrates that there is interdependence between the sectors but does not identify how the sectors are interdependent. {FALSE}

Comparative advantage derives from having an ability to produce some commodity at a lower cost than a potential trading partner. {TRUE}

The majority of the countries in the world are high income, developed countries. {FALSE}

CHAPTER 4

The Basics of Supply and Demand

The purpose of this chapter is to develop one of the most powerful methods of analysis in the economist's tool kit. In this chapter we will develop the model of a simple market – supply and demand (the industry in pure competition – discussed further in Chapter 8). The demand schedule and supply schedule will be developed and put together to form the analysis of a market. The market presented here is the starting point for the analysis of all market structures.

Markets

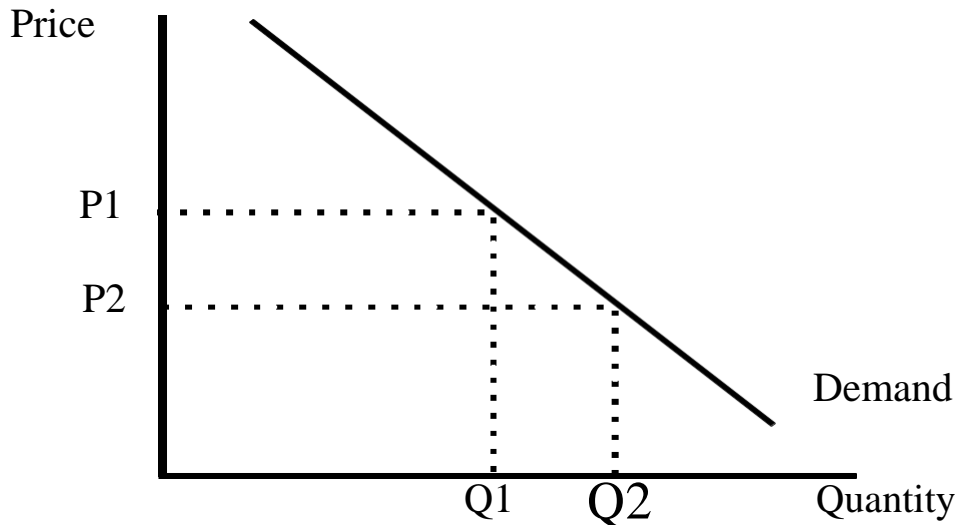
A market is nothing more or less than the locus of exchange, it is not necessarily a place, but simply buyers and sellers coming together for transactions. Transactions occur because consumers and suppliers are able to purchase and sell at a price that is determined through the free interaction of demand and supply.

Adam Smith, in the *Wealth of Nations*, described markets as almost mystical things. He wrote that the interaction of supply and demand "as though moved by an invisible hand" would determine the price and the quantity of a good exchanged. In fact, there is nothing mystical about markets. If competitive, a market will always satisfy those consumers willing and able to pay the market price and provide suppliers with the opportunity to sell their wares at the market price. To understand the market, one need only understand the ideas of supply and demand and how they interact.

Demand

The law of demand is a principle of economics because it has been consistently observed and predicts consumers' behavior accurately. **The law of demand states that as price increases (decreases) consumers will purchase less (more) of the specific commodity, ceteris paribus.** In other words, there is an inverse relationship between the quantity demanded and the price of a particular commodity. This law of demand is a general rule. Most people behave this way, they buy more the lower the price. However, everyone knows of a specific individual who may not behave as predicted by the law of demand, but remember the fallacy of composition -- because an individual or small group behaves contrary to the law of demand does not negate it.

The demand schedule (demand curve) reflects the law of demand. The demand curve is a downward sloping function (reflecting the inverse relationship of price to quantity demanded) 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.

Consumers obtain utility (use, pleasure, jollies) from the consumption of commodities. Economists have long recognized that past some point, the consumption of additional units of a commodity bring consumers less and less utility. The change in utility derived from the consumption of one more unit of a commodity is called **marginal utility**. The idea that utility with the amount added to total utility will decline when additional units are consumed past some point has also the status of principle. This principle is called **diminishing marginal utility**.

Because consumers make rational choices, that is they act in their own self interest, there are two effects that follow from their attempts to maximize their well-being when the price of a commodity changes. These two effects are called the; (1) income effect, and (2) the substitution effect. Together these effects guarantee a downward sloping demand curve.

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. The income effect suggest that as income goes down (price increases) then less of the commodity will be purchased.

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. In other words, a consumer will attempt to substitute other goods for the commodity that became more expensive. The substitution effect simply reinforces the idea of a downward sloping demand curve.

The demand schedule can be expressed as a table of price and quantity data, a series of equations, or in a downward sloping graph. To this point, our discussion has focused on individuals and their behavior. Assuming that at least a significant majority of consumers are rational, it is a simple matter to obtain a market demand curve. One needs only to sum all of the quantities demanded by individuals at each price to obtain the market demand curve.

Changes in the price of a commodity causes movements along the demand curve; such movements are called **changes in the quantity demanded**. If price decreases, then we move down and to the right along the demand curve; this is an increase in the quantity demanded. If price increases, then we move upward and to left along the demand curve, this is a decrease in the quantity demanded. Remember, (it is important) such changes are called changes in the quantity demanded because the demand curve is a schedule of the quantities demanded at each price.

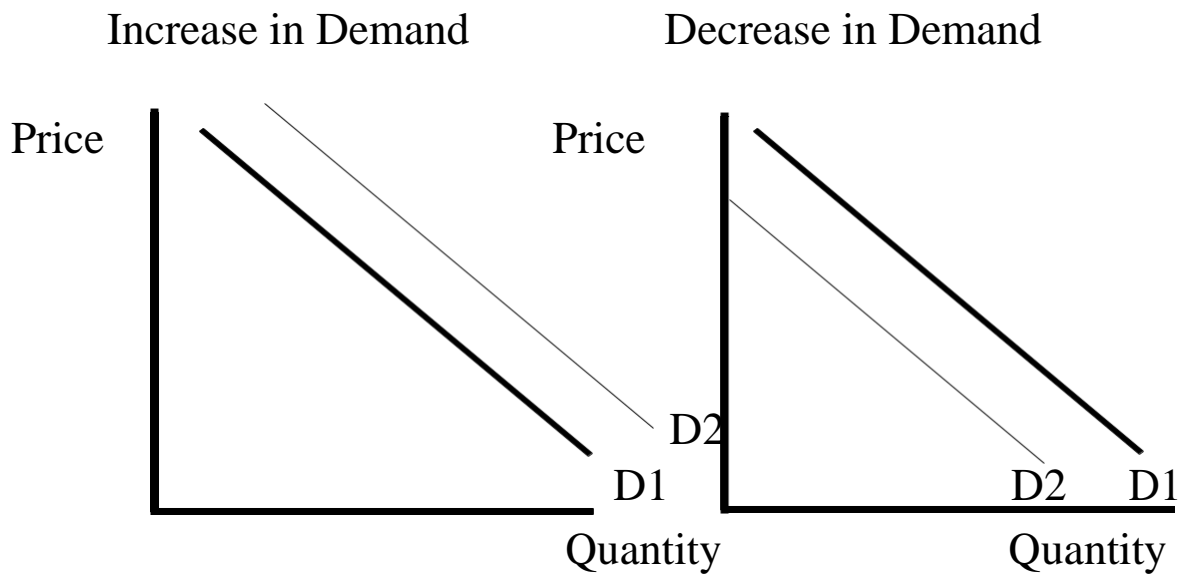
Movements of the demand curve itself, either to the left or right are called **changes in demand**. A change in demand is caused by a change in one or more of the nonprice determinants of demand. A shift to the right of the demand curve is called an increase in demand; and a shift to the left of the demand curve is called a decrease 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.

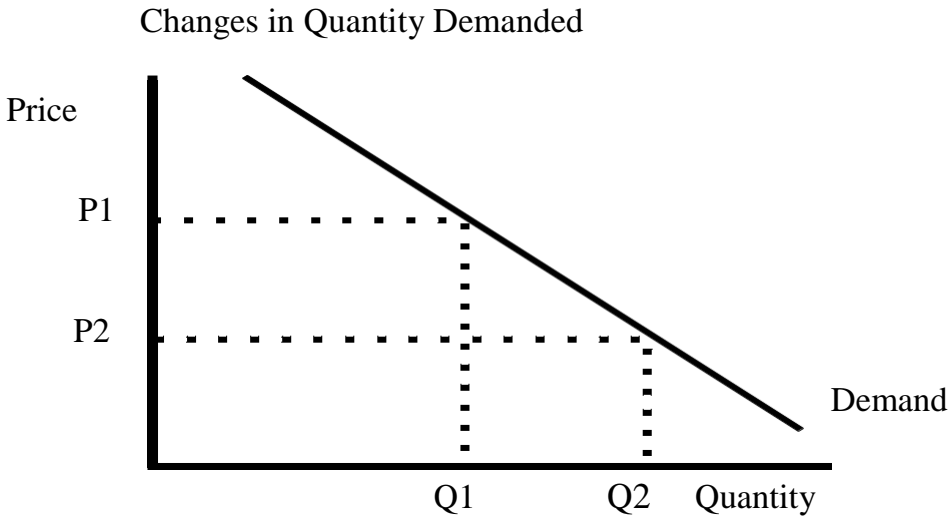
If the tastes and preferences of consumers change they will shift the demand curve. If consumers find a commodity more desirable, *ceteris paribus*, then an increase in demand will be observed. If consumer tastes wane for a particular product then there will be a shift to the left of the demand (a decrease in demand).

An increase in the number of consumers or their money income will result in a shift to the right of the demand curve (an increase in demand). A decrease in the number of consumers or their income will result in a shift of the demand curve toward the origin (a decrease in demand). Consumers will also react to expectations concerning future prices and availability. If consumers expect future prices to increase, their present demand curve will shift to the right; if consumers expect prices to fall then we will observe a decrease in current demand.

The prices of related commodities also effect the demand curve. There are two classes of related commodities of importance in determining the position of the demand curve, these are (1) substitutes, and (2) complements. A substitute is something that is alternative commodity, i.e., Pepsi is a substitute for Coca-Cola. A complement is something that is required to enjoy the commodity, i.e., gasoline and automobiles. If the price of a substitute increases, then the demand for our commodity will increase. If the price of a substitute decreases, so too will the demand for our commodity. In other words, the price of a substitute and the demand for our commodity move in the same direction. For complements, the price of the complement and the demand for our commodity move in opposite directions. If the price of a complement increases, the demand for our commodity will decrease. If the price of a complement decreases, the demand for our commodity will increase.



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).



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.

Supply

The law of supply is that producers will supply more the higher the price of the commodity. The supply curve is an upward sloping function showing a direct relationship between prices and the quantity supplied. In other words, the supply curve has a positive slope that shows that as price increase (decreases) so too does quantity supplied.

As with the demand curve a change in the price will result in a **change in the quantity supplied**. An increase in price will result in an increase in the quantity supplied, and a decrease in price will result in a decrease in the quantity supplied. Again, this is because the supply curve is a schedule of the quantities supplied at each price.

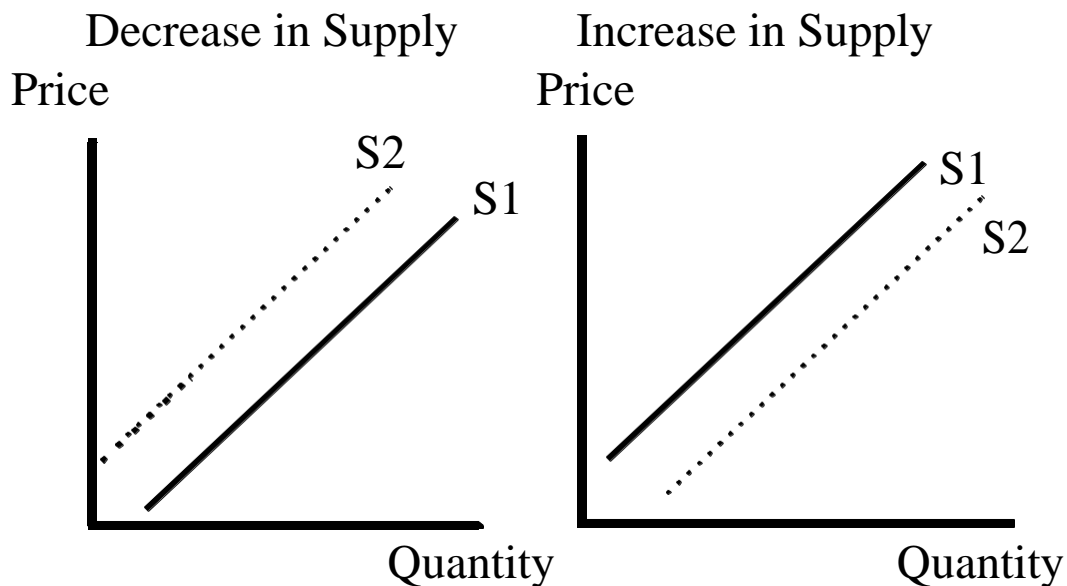
Changes in one or more of the nonprice determinants of supply cause the supply curve to shift. A shift to the left of the supply curve is called a decrease in supply; a shift to the right is called an increase in supply. The nonprice determinants of supply are; (1) resource prices, (2) technology, (3) taxes and subsidies, (4) prices of other goods, (5) expectations concerning future prices, and (6) the number of sellers.

When resource prices increase, supply decreases (shifts left); and when

resource prices decrease, supply increases (shifts right). If a more cost effective technology is discovered then supply increases, increases in taxes cause the supply curve to shift left (decrease). An increase in a subsidy effects the supply curve in the same way as a cut in taxes, an increase in supply.

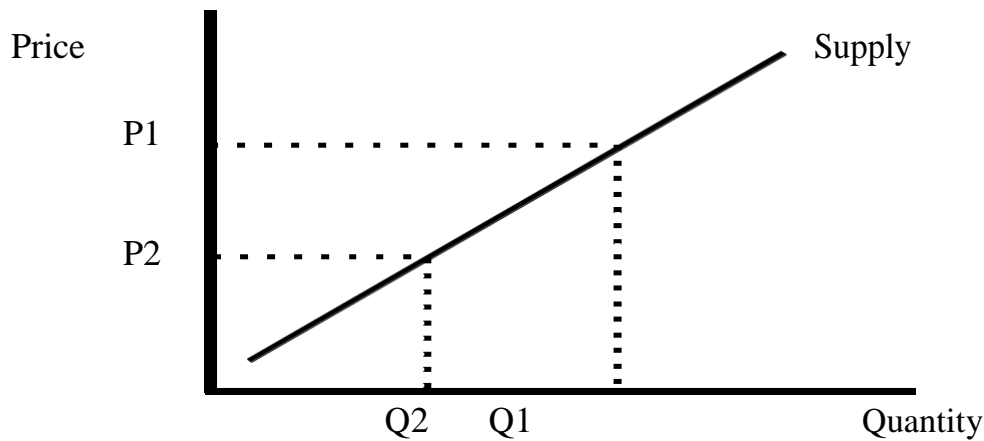
If the price of other goods a producer can supply increases, the producer will reallocate resources away from current production (decrease in supply) and to the goods with a higher market price. For example, if the price of corn drops, a farmer will supply more beans.

If producers expect future prices to increase, current supply will decline in favor of selling inventories at higher prices later. In other words, supply will decrease (a shift to the left, and exactly the opposite response will occur if producer expect future prices to be lower. If the number of suppliers increases, so too will supply, but if the number of producers declines, so too will supply.



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).

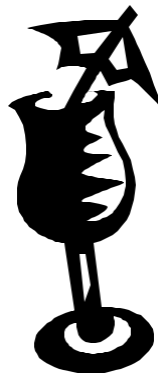
Changes in Quantity Supplied

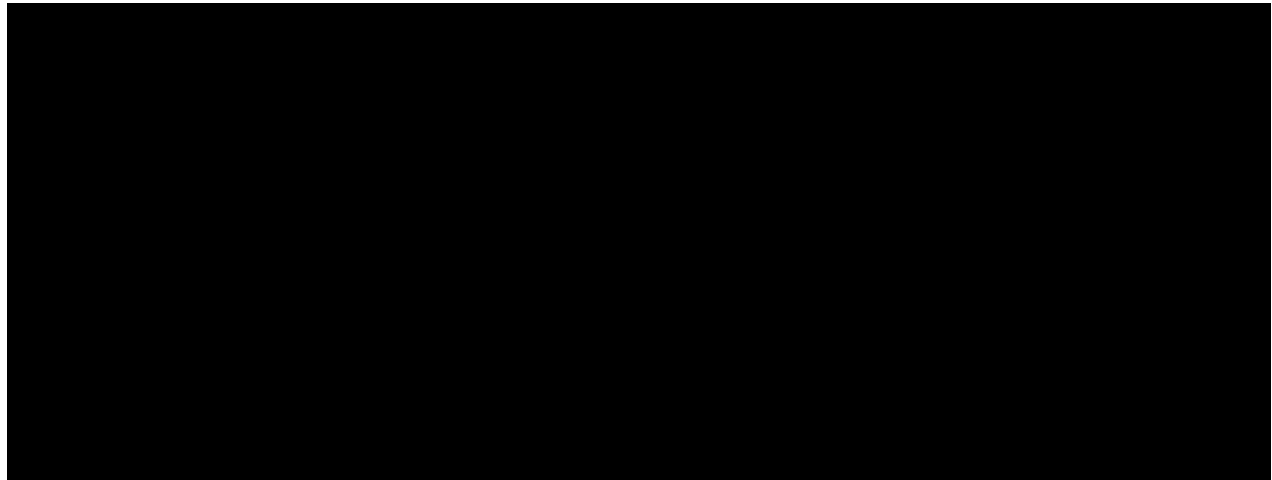


Changes in price cause changes in quantity supplied, an increase in price from P2 to P1 causes an increase in the quantity supplied from Q2 to Q1; a decrease in price from P1 to P2 causes a decrease in the quantity supplied from Q1 to Q2.

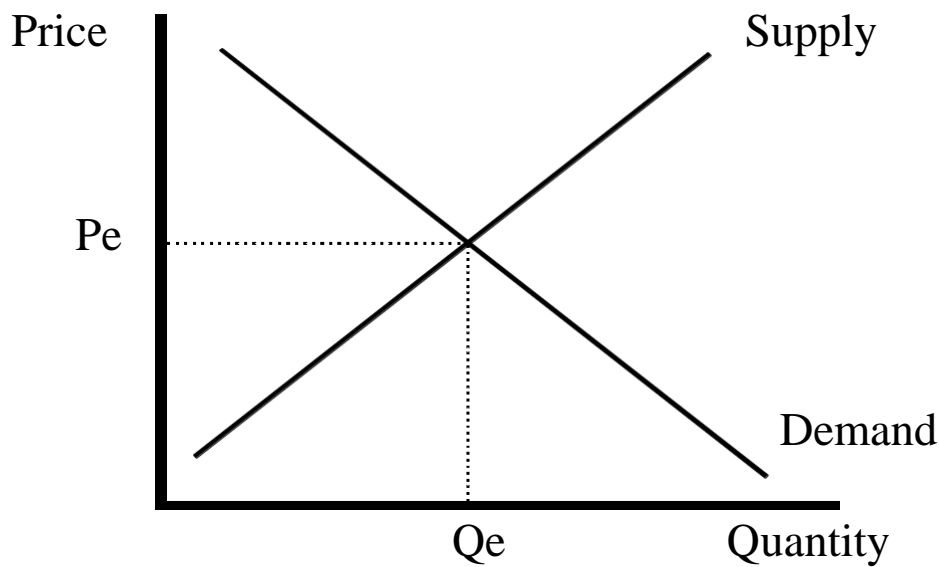
Market Equilibrium

Market equilibrium occurs where supply equals demand (supply curve intersects demand curve). 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)



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 $Q_d = 22 - P$

(Notice the negative sign in front the price variable, indicating a downward sloping function)

Supply Curve is $Q_s = 10 + P$

(Notice the positive sign in front of the price variable, indicating an upward sloping function)

The equilibrium condition is $Q_d = Q_s$

(For this market to obtain equilibrium, the quantity demanded must equal the quantity supplied in this market)

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:

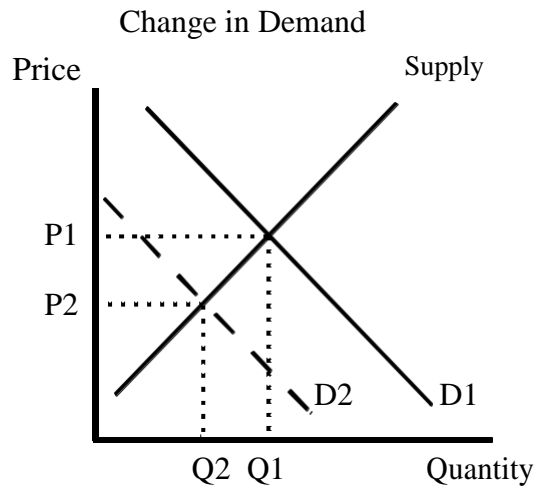
$$12 = 2P \text{ or } P = 6$$

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

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

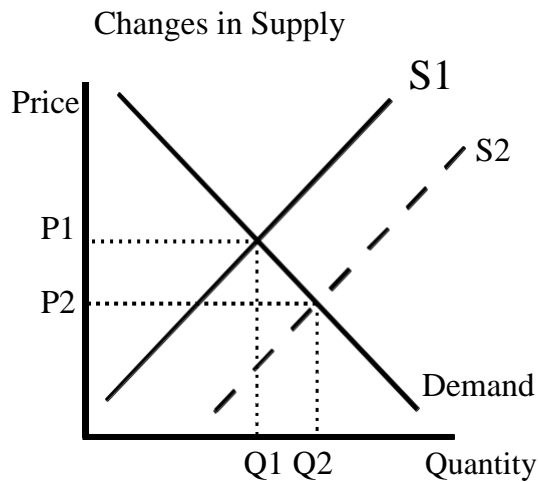
The system of equations approach to solving for equilibrium gives a specific number for price and for quantity. Unless the numbers are specified along the price axis and the quantity axis, the graph does not yield a specific number for price and quantity. However, the graph provides a visual demonstration of equilibrium which may aid learning.

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.

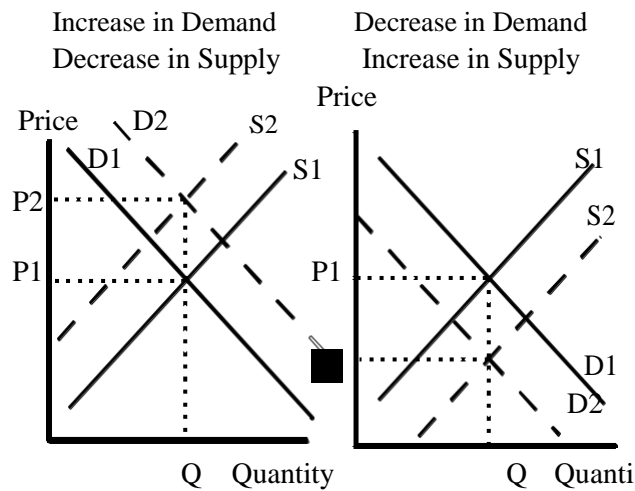


Movement of the demand curve from D1 (solid line) to D2 (dashed line) is a decrease in demand (as demonstrated in the above graph). Such decreases are caused by a change in a nonprice determinant of demand (for example, the number of consumers in the market declined or the price of a substitute declined). 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 an 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).



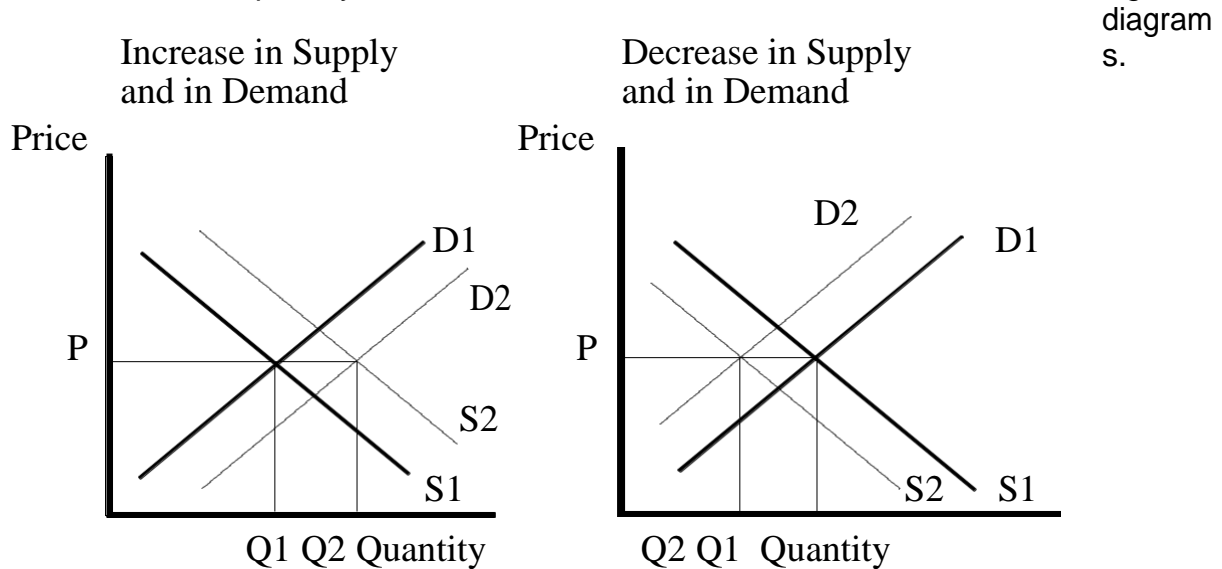
If both the demand curve and supply curve change at the same time the analysis becomes more complicated. Consider the following graphs:



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



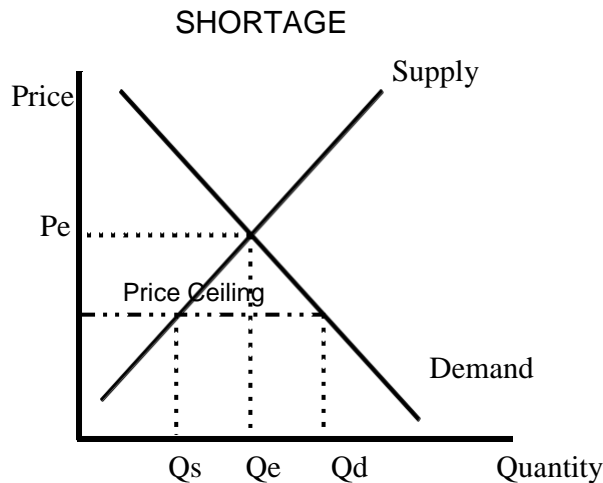
The graphs show that price remains the same (is indeterminate) but when supply and demand both increase quantity increases to Q2. When both supply and demand decrease quantity decreases to Q2.

Shortages and Surpluses

There is some rationale for limited government intervention in a free market economy. Perhaps the most powerful rationale for limited government arises from the effects of price controls in competitive markets. Shortages and surpluses can only result because by having some sort of price controls in the market.

For example, the Former Soviet Union had a centrally planned economy and the government decided what would be produced and for what price that production would be sold. The government also was the sole employer and paid very low wages, therefore prices were also controlled at below market equilibrium levels. The result was that whenever any commodity was available in the market, there were long lines observed at any store with anything to sell, prices were low but there was nothing to buy (shortages). The popular Russian immigrant comedian, Yakov Simirnov, summed-up the plight of the working class consumer in Russia prior to break-up of the Soviet Union. He said, "In Russia we used to pretend to work, but that was alright, the government only used to pretend to pay us!"

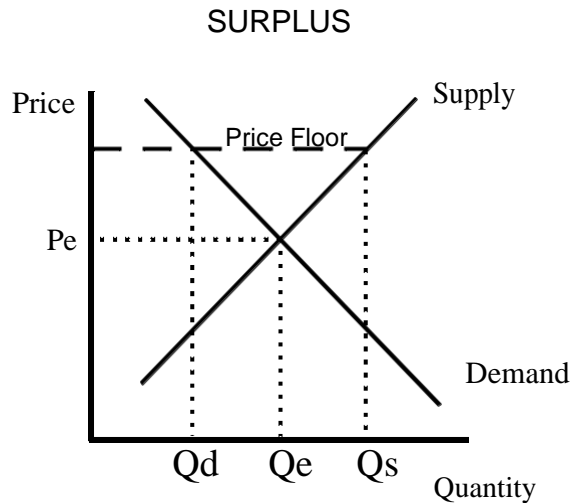
Shortage is caused by an effective price ceiling (the maximum price you can charge for the product). Effective, in this sense, means that the government can and does actively enforce the price ceiling. With the exception of the Second World War, there is little evidence that the government can effectively enforce price ceilings. Consider the following diagram that demonstrates the effect of a price ceiling in an otherwise purely competitive industry.



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.

It is interesting to consider the last time that wage and price controls were attempted during the Carter administration. These short-lived price ceilings resulted in producers technically complying with the price restrictions, but they frequently changed the product. For example, warranties were no longer included in the sales price, service was extra, delivery was extra, and where possible, the product was reduced in size. For example, in the previous administration's failed wage and price controls (Nixon) candy bars were made smaller and they put fewer M & Ms in the package and the price for these treats was not changed – effectively cutting costs, but not price, hence increasing the profit margin without raising the price of the candy. The lesson is simple, if government is going to control prices, they must be prepared to control virtually all other aspects of doing business.

Surplus is caused by an effective price floor (minimum you can charge):



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.

Implicit in these analyses is the fact that without government we could have neither shortage or surplus. In large measure, the suspicion of government is because it has the power to create these sorts of peculiar market situations. Even with the power of government to enforce law, the only way that a shortage or surplus could occur is if the price ceiling or the price floor were effective.

Markets and Reality

As intuitively pleasing as these analyses are, they are only models, and these models are based on assumptions that are not very good approximations of reality. In Chapter 8 the analysis of a purely competitive market is offered. What this chapter presents is the *industry* in pure competition, which is based on assumptions that do not exist in reality. The assumptions are (1) perfect information about all past, and future prices, (2) no barriers to entry or exit from the market, (3) no non-price competition (advertising etc.), (4) atomized competition (so many suppliers and consumers that none can appreciably affect price or quantity), and (5) there is a standardized product (corn is corn is corn). If all of these assumptions accurately represent reality, then the firm must sell at whatever price is established in the industry. To sell at a lower price denies the firm revenue it could have otherwise earned, and to sell at a higher price would mean the firm could sell nothing. In other words, the competitive industry impose price discipline on all of the firms that together comprise that competitive industry.

Part of the controversy in almost any discussion of microeconomic activity is whether the results of policy can be predicted by the simple supply and demand model. Often the results of the simple supply and demand diagram are not bad rough approximations of reality – but remember that it is only a rough approximation – based on assumptions that are not very accurate depictions of reality. However, more often imperfect market models are more accurate approximations of reality – because one or more the assumptions underpinning those models more accurately reflects reality. One must be careful in applying these models, and in policy debates concerning these models. To the extent that the assumptions are not fulfilled, then the results may not be accurate.

The real value of the simple supply and demand model is to provide a beginning point for coming to understand how markets really work. In most respects the simple supply and demand model is little more than the beginning point for constructing one of the more realistic market models. Pure monopoly, monopolistic competition and oligopoly are, in some important respects, refinements from the purely competitive market model.

KEY CONCEPTS

Market

- Equilibrium

Law of Demand

- Demand schedule

- Utility

- Marginal Utility

- Diminishing Marginal Utility

Income Effect

Substitution Effect

Demand Curve

- Determinants of Demand

- Tastes & Preferences

- Number of Consumers

- Money Income of Consumers

- Prices of Related Goods

 - Substitutes

 - Complements

- Expectations

Change in Demand v. Change in Quantity Demanded
Price changes v. Non-price determinant changes

Law of Supply
Supply Schedule

Supply Curve
Determinants
Resource prices
Technology
Taxes & Subsidies
Prices of other goods
Number of Sellers
Expectations

Change in Supply v. Change in Quantity Supplied
Price changes v. Non-price determinant changes

Shortage and Surplus

Price Floor and Price Ceiling

STUDY GUIDE

Food for Thought:

Demonstrate what happens to a market equilibrium when: (1) demand increases, supply increases, (2) demand decreases, supply decreases, (3) demand increases, supply decreases, and (4) demand decreases, and supply increases. Do the same exercise showing only the demand curve increasing and decreasing and only the supply curve increasing or decreasing.

Demonstrate the effects of a price floor: (1) above the competitive equilibrium, and (2) below the competitive equilibrium.

Repeat exercise 2, using a price ceiling.

Using the system:

$$Q_d = Q_s, \text{ where } Q_d = 124 - 4P \text{ and } Q_s = -16 + 3P$$

What is the equilibrium price and quantity exchanged in this market? What would happen if there were a price floor of 6 imposed in this market? If 6 was a price ceiling would that change your answer? If so, how and why?

Sample Questions:

Multiple Choice:

If a minimum wage were imposed below the competitive equilibrium what would we expect to observe in the effected labor markets?

- A. An excess demand for labor
- B. People being attracted by the higher wage cannot find jobs and some who were employed will lose their jobs, but those remaining employed will have a higher wage
- C. There will be unemployment created by people losing jobs, but there will be no new employees attracted to this labor market.
- D. **Nothing will be caused by the introduction of this minimum wage**

If there is an increase in demand and an increase in the quantity supplied in a product market what should be observed?

- A. Price increases, quantity exchanged is indeterminant
- B. Price decreases, quantity exchanged is indeterminant
- C. Price decreases, quantity exchanged decreases
- D. **Price increases, quantity exchanged increases**

True - False

If the price of Pepsi-Cola increases we should expect the demand for Coca-Cola increase, ceteris paribus. {TRUE}

If consumers expect the price of computers to increase in the near future there should be an increase in the quantity demanded observed. {FALSE}

CHAPTER 5

Supply & Demand: Elasticities

The purpose of this chapter is to extend the supply and demand analysis presented in the previous chapter. Specifically, this chapter will develop the methods employed by economists to measure consumer responsiveness to price changes -- the price elasticity of demand. Other topics examined in this chapter are the price elasticity of supply, cross-elasticities, the income elasticity of demand and the interest elasticity of demand.

Price Elasticity of Demand

The price elasticity of demand is how economists measure the responsiveness of consumers to changes in prices for a commodity. In other words, as price increases (decreases), the quantity demanded by consumers will decrease (increase). The relative proportions of the changes in price and the respective quantities demanded are the responses of consumers and are referred to as the price elasticity of demand. It is this consumer responsiveness that is the subject of this chapter.

Business decisions concerning prices are not always a simple matter of adding some margin to the cost of production of the commodity (cost-plus pricing). Suppliers will wish to obtain the most revenue the market will bear from the sales of their products – in other words, maximize their profits. It is therefore necessary for business to have some idea of what the market will bear, and that is where the price elasticity of demand enters the picture in business decision-making.

There are three methods that are used to measure the price elasticity of demand, these are; (1) the price elasticity coefficient (midpoints formula), (2) the total revenue test, and (3) a simple examination of the demand curve. Each of these will be examined in turn, in the following paragraphs.

Elasticity Coefficient

The **elasticity coefficient** is a number calculated using price and quantity data to determine how responsive consumers are to changes in the price of a commodity. The elasticity coefficient may be calculated in two distinct ways. Point elasticity is

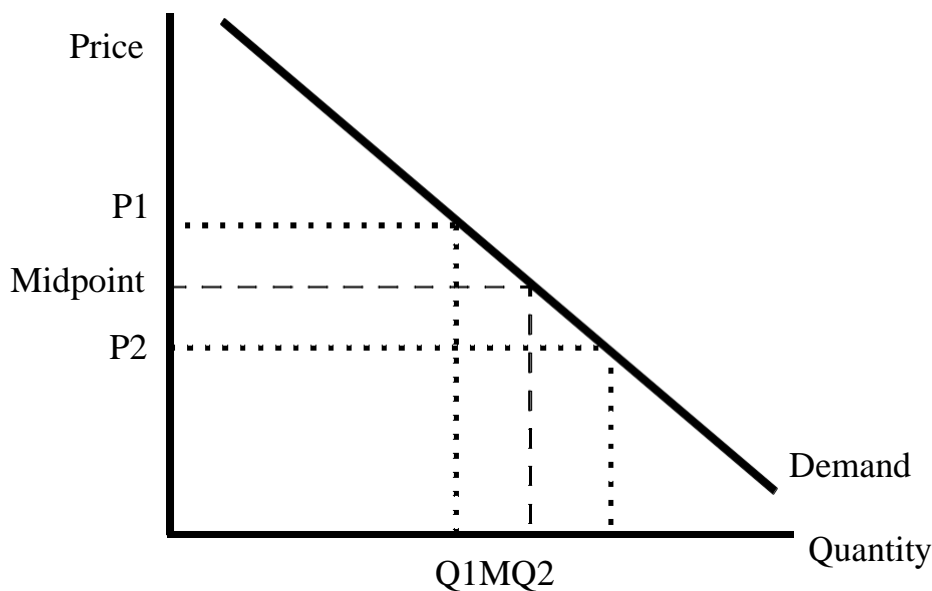
measuring responsiveness at a specific point along a demand curve. The other method is using the mid-point of the difference in the price and the mid-point in the difference of the quantity numbers. Because the midpoints formula cuts down on the confusion of which prices and quantities are to be used, it is the only coefficient we will use in this course.

The **price elasticity coefficient (midpoints)** is calculated using the midpoints formula:

$$E_d = \frac{\text{Change in Qty}}{(Q_1 + Q_2)/2} \div \frac{\text{Change in price}}{(P_1 + P_2)/2}$$

Calculating the elasticity coefficient will yield a specific number. The value of that number provides the answer as to whether demand is price elastic or price inelastic. Elastic demand means that the consumers' quantities demanded respond (more than proportionately) to changes in price; **with elastic demand the coefficient is more than one**. Inelastic demand means that the consumers' quantities demanded do not respond very much to changes in price; **with inelastic demand the coefficient is less than one**. Unit elastic demand means that the consumers' quantity demanded respond proportionately to change in price; **with unit elastic demand the coefficient is exactly one**.

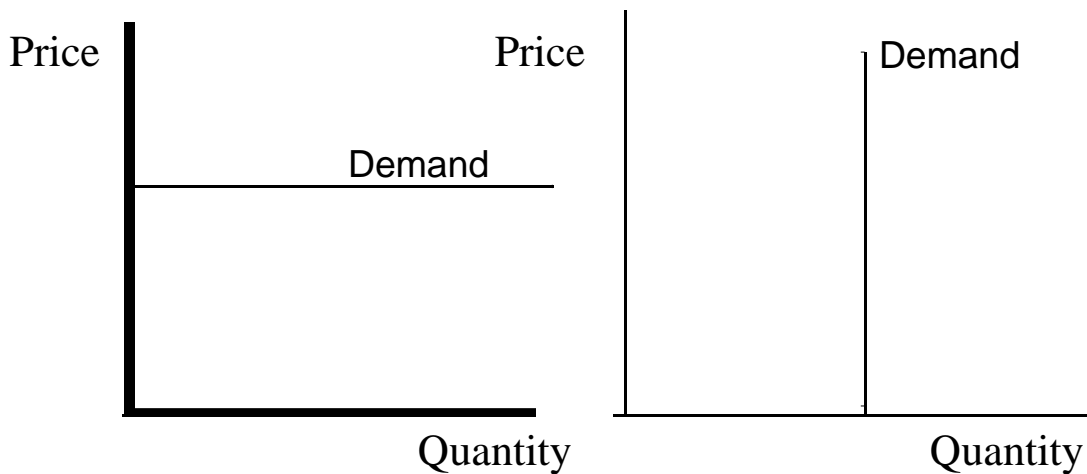
What this equation states is illustrated in the graph below. The midpoint between price one (P1) and price two (P2) is labeled Midpoint along the price axis and M on the quantity axis.



On the graph this number is the difference between Q1 and Q2 divided by the distance between the origin and the point labeled M on the quantity axis for the numerator and the difference between P1 and P2 divided the distance between the origin and the point labeled midpoint on the price axis for denominator. The ratio of the numerator to the denominator on this graph is the same number yielded by the equation.

Examining the demand curve can also provide clues concerning the price elasticity of demand. A perfectly vertical demand curve indicates that the quantity demanded will be exactly the same, regardless of price. This type of demand curve is called a perfectly inelastic demand curve. A perfectly horizontal demand curve indicates that consumers will have almost any quantity demanded, but only at that price. This is called a perfectly elastic demand curve. Perfectly unit elastic demand curves are not linear, they have slopes that vary across ranges.

Perfectly elastic demand Perfectly inelastic demand



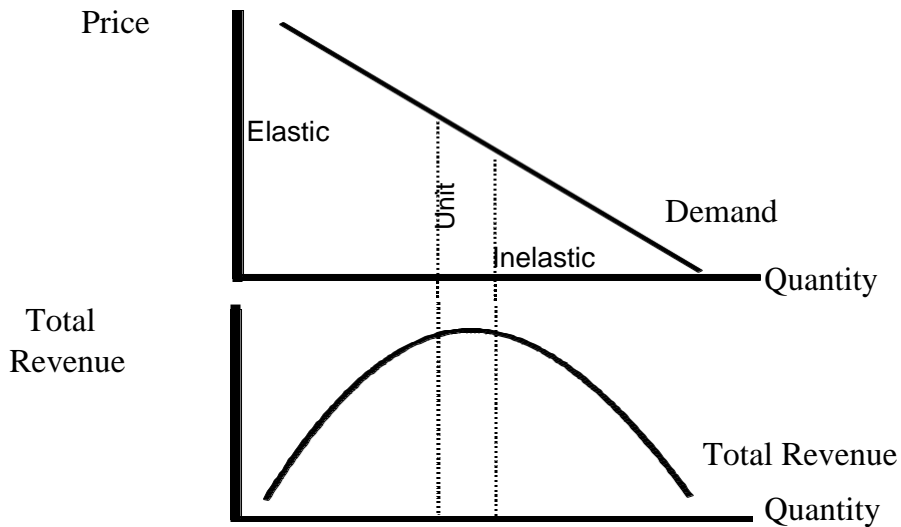
Perfectly Elastic and Perfectly Inelastic Demand Curves

There is a trick to remembering inelastic and elastic demand. Notice in the above graphs 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). The perfectly inelastic demand curve is vertical (looks like an I). If you have problems remembering the concept of inelastic or elastic demand you need only draw the curves above and observe what happens to the quantity demanded when the price changes. In the case of perfectly inelastic demand consumers will buy exactly the same quantity of a product without regard for its price. In the case of a perfectly elastic demand curve, if producers raise the price of the product, then they will sell nothing.

Slope and elasticity are two different concepts. With linear demand curves, elasticity changes along the demand curve, however its slope does not. Elasticity is

concerned with responses in one variable to changes in the other variable. The slope of the curve is concerned with values of the respective variables at each position along the curve (i.e., its' shape and direction).

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



The total revenue curve in the bottom graph is plotted by multiplying price and quantity to obtain total revenue and then plotting total revenue against quantity. 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. In other words, moving from left to right on the demand curve, as price and total revenue move in the opposite direction demand is price elastic, and when price and total revenue move in the same direction demand is price inelastic.

The total revenue test uses the relation between the total revenue curve and the demand curve to determine the price elasticity of demand. In general, price and total revenue will move in the same direction of the demand is price inelastic (hence consumers are unresponsive in quantity purchased when price changes) and move in opposite directions if price elastic (consumers' quantities being responsive to price changes).

Consider the following numerical example:

Table 1: Total Revenue Test

Total Quantity	Price per unit	Total Revenue		Elasticity
1	7	7		
2	6	12	>+5	Elastic
3	5	15	>+3	Elastic
4	4	16	>+1	Elastic
5	3	15	> - 1	Inelastic
6	2	12	> - 3	Inelastic
7	1	7	> - 5	Inelastic

Marginal revenue is the change in total revenue due to the a change in quantity demanded. The total revenue test relies on changes in total revenue (marginal revenue) to determine elasticity. **If the change in total revenue (marginal revenue) is positive the 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.**

The following determinants of the price elasticity of demand will determine how responsive the quantity demanded by consumers is to changes in price. The determinants of the price elasticity of demand are; **(1) substitutability of other commodities, (2) the proportion of income spent on the commodity, (3) whether the commodity is a luxury or a necessity, and (4) the amount of time that a consumer can postpone the purchase.**

If there are no close substitutes then the demand for the commodity will be price inelastic, ceteris paribus. If there are substitutes then consumers can switch their purchasing habits in the case of a price increase, but if there are no substitutes then

consumers are more likely to buy even if price goes up. For example, if the price of Pepsi goes up, then certain consumers will buy Coke, if the price of Coke has not increased, hence the demand for Pepsi is likely to be elastic.

All other things equal, the higher the proportion of income spent for the commodity more price elastic will be the demand. Most home owners are familiar with how this determinant works. The demand for single family dwellings is likely to be more elastic than the demand for apartments, because a higher proportion of your income will be spent on housing when you own your home.

Commodities that are viewed as luxuries typically have price elastic demand, and commodities that are necessities have price inelastic demand. There is simply no substitute for insulin, if you are an insulin dependent diabetic. Because insulin is a necessity for which there is no substitute, the demand will be price inelastic.

Time is an important determinant of price elasticity. If a price changes, it may take consumers a certain amount of time to discover alternative lifestyles or commodities to account for the price change. For example, if the price of cars increases, a family that planned to buy a car may wait for their income or wealth to increase to make buying a new car viable alternative to continuing to drive an older vehicle. In other words, the longer the time frame for the decision to purchase the more price elastic the demand for the commodity.

Price Elasticity of Supply

The price elasticity of supply measures the responsiveness of suppliers to changes in price. The price elasticity of supply is determined by the following time frames; (1) market period, (2) short-run, and (3) long-run. **The more time a producer has to adjust output the more elastic is supply.**

The time frames for producers will be discussed in more detail in Chapter 7 as they pertain to a firm's cost structure. However, it is important to understand the basic idea behind this classification of time as it relates to price elasticity. The market period is defined to be that period in which the producer can vary nothing, therefore the supply is perfectly inelastic. The long-run is the period in which the producer can vary everything, therefore the supply is perfectly elastic. The short-run is the period in which plant and equipment cannot be varied, but most other factors' usage can be varied, therefore it depends on a producers capital - intensity as to how elastic supply is at any particular point.

Other Elasticities

There are three other standard applications of the elasticity of demand. The cross elasticity of demand, the income elasticity of demand, and the interest rate elasticity of demand. Each of these will be examined, in turn, in the remaining paragraphs of this chapter.

The 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. Cross elasticity of demand gives an indication of how close a substitute or complement one commodity is for another. This concept has substantial practical value in formulating marketing strategies for most products.

For example, as the price of coke increases, then consumers may purchase proportionately more Pepsi products. In such a case, the cross elasticity of demand of Pepsi to the price of coke would be termed elastic. The equation for the cross elasticity of demand described here is presented below.

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

The income elasticity of demand measures the responsiveness of the quantity demanded of a commodity to changes in consumers' incomes. This is typically measured by replacing the price variable with income (economists use the letter Y to denote income) in the midpoints formula. Again, in business planning the responsiveness of consumers to changes in their income may be very important. Housing and automobiles, as well as, several big ticket luxury items have demand that is sensitive to changes in income. The income elasticity formula is presented below.

$$E_d = \frac{\text{Change in Qty}}{(Q1 + Q2)/2} \div \frac{\text{Change in income}}{(Y1 + Y2)/2}$$

Often interest rates will also present a limitation on a consumer's quantity of demand for a particular commodity. As with income, often big ticket items are very sensitive to interest rates on the loans necessary to make those purchases. With the record low mortgage rates in the Spring of 2003 the quantity demanded for housing, both new and existing homes, witnessed dramatic increases.

The automobile companies rarely reduce prices for their vehicles, but rather, GM, Ford and Chrysler will offer incentives. Rebates, which are temporary reductions in price, and attractive financing rates are the hooks offered to get the consumer in the showroom and into the new car. In May of 2003 all of the American producers were offering zero percent financing on all but a very few of their vehicles, and even some of the European and Japanese producers were following suite with either very low rates, or zero percent financing. The interest rate elasticity formula is (where interest rate is “r”):

$$E_d = \frac{\text{Change in Qty}}{(Q1 + Q2)/2} \div \frac{\text{Change in interest rate}}{(r1 + r2)/2}$$

These analyses are important to businesses in determining what issues are important to the successful sales of their products. There are industries that have not been particularly good at understanding the notions of cross elasticity or price elasticity – the airlines in particular, and many of these firms have suffered as a result. The bankruptcies of United Airlines and US Air being excellent examples. The automobile companies have been, in some measure, forced into the financing business because of the interest rate sensitivity of consumers. By offering financing the car companies are, essentially, maintaining some modicum of control over one important aspect of their business.

Interest rate sensitivity can also be understood from another perspective. The total cost of a commodity is not just its price, but also what must be paid to borrow money to purchase that item. With modern views of instant gratification, it is rare for someone to save to purchase a house, or any other big ticket item, what is more common is to borrow the money, buy the item, and make installment payments. Therefore the interest charges are a part of the total cost of acquiring that big ticket item – hence consumer sensitivity to interest rates when buying a house or a car.

It is also noteworthy, that purely competitive firms are price takers, and it is the imperfectly competitive firm that has a pricing policy. What is often referred to as “pricing power” in the business press, means the ability to take advantage of the price elasticity of demand or one of the other elasticities examined here – hence implying some market structure, hence market power not otherwise identified in the model of pure competition.

KEY CONCEPTS

Price Elasticity of Demand
Elasticity coefficient

Elastic Demand
Perfectly Elastic Demand

Inelastic Demand
Perfectly Inelastic Demand

Unitary Elasticity

Total Revenue Test
Price and Total Revenue
Marginal Revenue

Determinants of Price Elasticity
Substitutability
Proportion of Income
Luxuries v. Necessities
Time

Elasticity of Supply
Time periods
Market period
Short-run
Long-run

Cross Elasticity of Demand

Income Elasticity

Interest Rate Sensitivity

Pricing Power

STUDY GUIDE

Food for Thought:

List and explain the determinants of the price elasticity of demand and of supply.

What are the income and cross elasticities of demand? Why might they be useful? Explain.

3. Consider the following data:

Price	Quantity	Total Revenue	Marginal Revenue
1	2000	2000	
2	1900	3800	
3	1750	5250	
4	1550	6200	
5	1250	6250	
6	900	5400	
7	400	2800	
8	100	800	

Calculate the marginal revenue for each change in price. Perform a total revenue test and determine the ranges of price elastic and price inelastic demand. Draw the demand curve and the total revenue curve and show these ranges thereon.

Using the data in question 3 above calculate the price elasticity coefficient moving from price of 3 to a price of 4; from a price of 5 to a price of 6.

Explain what the price elasticity of demand is and why it is of interest in examining markets. Might it be useful in the airline industry? Why?

Sample Questions:

Multiple Choice:

Which of the following is a determinant of the price elasticity of demand?

- A. **Proportion of income spent on commodity**
- B. Price of complements
- C. Number of consumers
- D. None of the above

Where is the range of unit price elasticity of demand for the following demand curve?

Price Quantity

8	3
7	4
6	5
5	6
4	7
3	8

- A. From price 8 to price 6
- B. **From price 6 to price 5**
- C. From price 5 to price 3
- D. From price 7 to price 4

Calculate the elasticity coefficient from the data above for the interval where price changes from 8 to 7. That coefficient is:

- A. 0.47
- B. 1.00
- C. **2.14**
- D. None of the above

True - False:

The longer the period the more suppliers can adjust to price changes, hence the greater the price elasticity of supply. {TRUE}

The income elasticity of demand shows whether a product has a close substitute or complement. {FALSE}

The maximum point on the total revenue curve correlates with the elastic range of the demand curve. {FALSE}

CHAPTER 6

Consumer Behavior

The purpose of this chapter is to refine the income and substitution effects introduced in Chapter 4. This chapter will also introduce the idea of Giffin's Paradox, consumer equilibrium, and the utility maximization rule. The appendix to this chapter also introduces you to indifference curves and budget constraints to analyze consumer behavior.

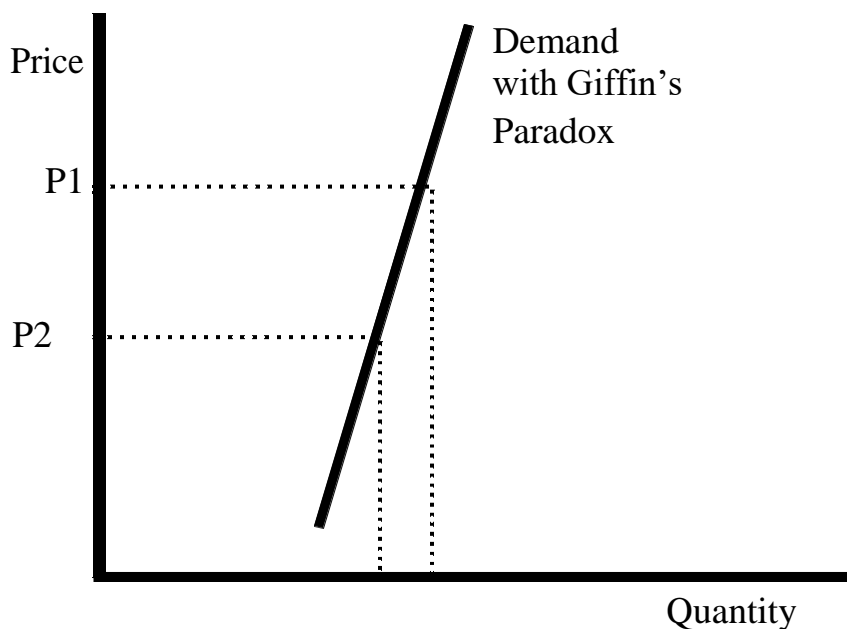
Income and Substitution Effects Revisited

The income and substitution effects combine to cause the demand curve to slope downwards as was discussed earlier in Chapter 4. In fact, an individual consumer's demand curve can be rigorously derived using concepts from intermediate microeconomics (E321) called indifference curves which illustrate, graphically, the income and substitution effects. For students who are interested, it is recommended that you take E321, Intermediate Microeconomics; or at a minimum go through the appendix to this chapter.

The results of the indifference curve analysis (presented in the appendix to this chapter) can be described in words. The income effect results from the price of a commodity going down having the effect of a consumer having to spend less on that commodity, hence the same as having more resources. However, as price increases, the consumer will purchase less of that commodity and buy more of a substitute, this is the substitution effect. It is the combination of the income and substitution effects, and their relative strength, that causes an individual (hence generally a market) demand curve to slope downward. However, there is an interesting exception to this general rule -- Giffin's Paradox.

Giffin's Paradox is the fact that some commodities may have an upward sloping demand curve. Such commodities are called inferior products. (Not necessarily because of quality problems with the product, but because the analysis is inferior -- not generalizable to all commodities). This happens because the income effect results in a lesser demand for a product. (In other words, the income effect overwhelms the substitution effect).

There are at least two types of goods that often exhibit an upward sloping demand curve. One is necessity for very poor people and the other is one for which a high price creates a snob effect. Each case will be reviewed, in turn, in the following paragraphs.

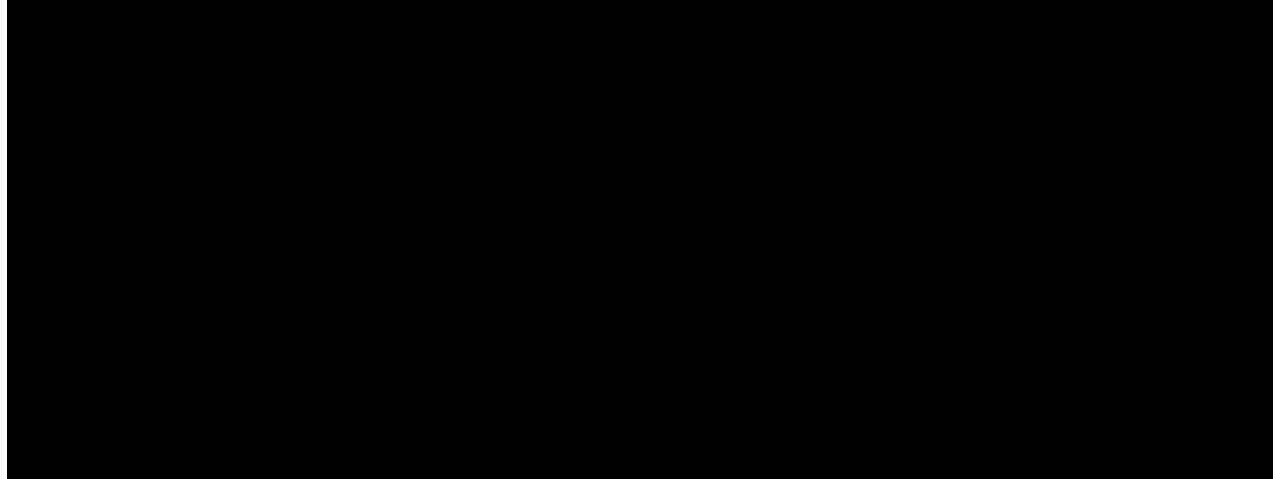


In the diagram above notice that as price is decreased from P1 to P2 the quantity demanded decreases, hence snob appeal may go down from the loss of a prestigiously high price – consumers who value the product simply because it is high priced leave the market as the price falls. As price increases from P2 to P1 poor people can't afford other more luxurious items therefore they have to buy more of the very commodity whose price wrecked their budgets.

In the case of poor people who experienced the price of necessity increasing, their limited resources may result in their buying more of the commodity when its price increases. For example, if the price of rice increases in a less developed country, people may buy more of it because of the pressure placed on their budget prevents them from buying beans or fish to go with their rice. To maintain their caloric intake rice will be substituted for the still more expensive beans and fish.

The other situation is where a luxury is involved. There is the snob appeal possibility where the higher the price, the more desired the commodity it. Often people will drive expensive cars, simply because of the image it creates. If the car is extremely expensive, i.e., Rolls Royce, the snob effect may be the primary motivation for the purchase. This also works with less expensive commodities. For example, Joy Perfume advertised itself as the world's most expensive to attract consumers that their marketing surveys indicated would respond to the snob effect.

Consumer Equilibrium



Rational behavior was defined as economic agents acting in their self interest. It is the idea of rational behavior that permits the rigorous examination of economic activity. Without rationality, our analyses fail to conform with the basic underlying assumption upon which most of economics is based.

Consumers (when acting in their own self interest) will generally attempt to maximize their utility, given some fixed level of available resources and income with which to purchase goods and services. The utility maximizing rule is that consumers will balance the utility they receive from the consumption of each good or service against the cost of each commodity they purchase, to arrive at how much of each good they need to maximize their total utility.

The algebraic restatement of the rule:

$$\mathbf{MU_a/P_a = MU_b/P_b = \dots = MU_z/P_z}$$

When the consumer reaches equilibrium each of the ratios of marginal utility to price will be equal to one. If any single ratio is greater than one, the marginal utility received from the consumption of the good is greater than the price, and this means the consumer has not purchased enough of that good. Therefore the consumer must purchase more of that good (causing price to increase and marginal utility to go down to the point they are equal), where $MU > P$. If the ratio is less than one, where $MU < P$, then the consumer has purchased too much of the commodity (price is larger than the marginal utility received from the commodity) and needs to cut back.

Whether consciously or not, rationality requires each individual consumer to allocate their resources in such a manner as to meet the restrictions of the above

equation that is when the consumer is said to be in equilibrium. In reality, a consumer is always seeking those levels, but because of changing prices and changing preferences, it is understood that the consumer is always seeking, but never quite at equilibrium.

APPENDIX TO CHAPTER 6

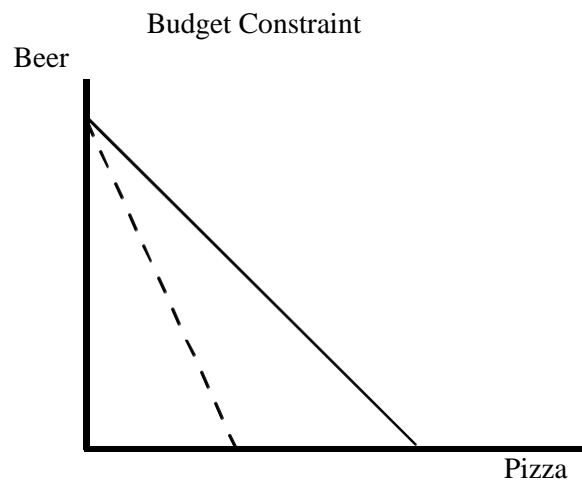
Utility and Demand Curves

The material in this appendix is not subject to testing and will not be included on any of the examinations or quizzes. It is provided simply to demonstrate how an individual demand can be derived.

The demand curve is dependent on the individual consumer's tastes and preferences, as was shown in Chapter 5. Therefore we can derive an individual demand curve using what we have learned about utility in this chapter.

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 consumer's budget constraint is a mapping of the ability to purchase goods and services. We assume that there are two goods and that the budget constraint is linear. The following budget constraint shows the consumer's ability to purchase goods, beer and pizza.

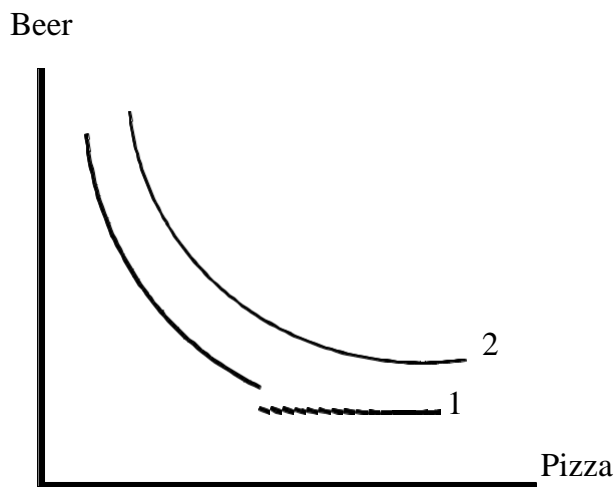


The consumer is assumed to spend their resources on only beer and pizza. If all resources are spent on beer then the intercept on the beer axis is the amount of beer the consumer can purchase; on the other hand, if all resources are spent on pizza then the intercept on that axis is the amount of pizza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

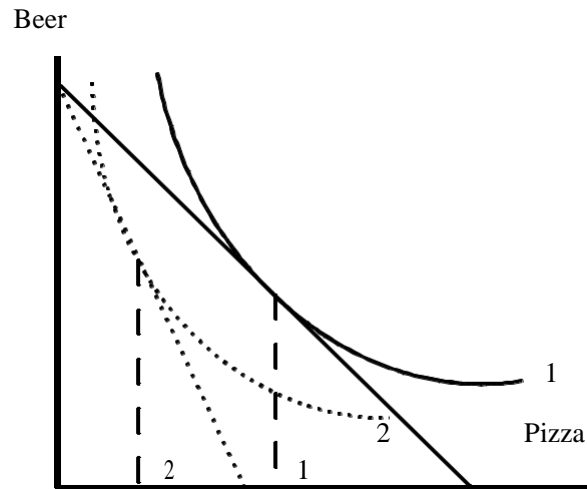
An indifference curve is a mapping of a consumer's utility derived from the consumption of two goods, in this case beer and pizza. There are three assumptions necessary to show a consumer's utility with an indifference mapping. These three assumptions are: (1) every point in the positive/positive quadrant is associated with exactly one indifference curve (every place thick), (2) indifference curves do not intersect (an indifference above another shows greater utility unequivocally), and (3) indifference curves are strictly convex toward the origin (bow toward the origin).

The following indifference curve shows the consumer's preferences:



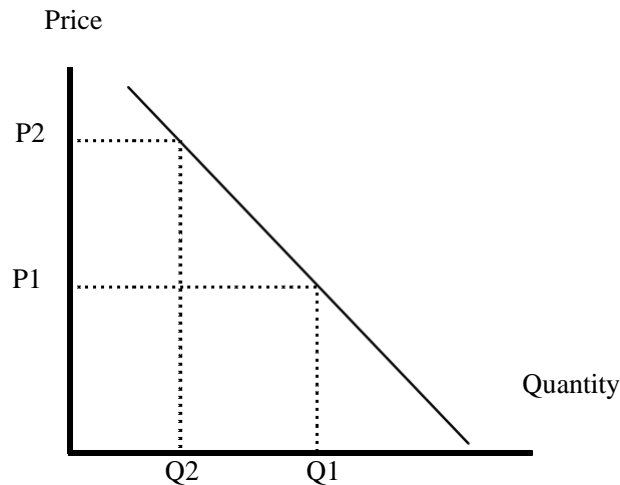
The dashed line (2) shows a higher level of total satisfaction than does the solid line (1). Along each indifference curve is the mix of beer and pizza that gives the consumer equal total utility.

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 Q2 and P2 are associated with indifference curve 2 and budget constraint 2, and that Q1 and P1 result from indifference curve 1 and budget constraint 1. The above model shows this individual consumer's demand for pizza.

KEY CONCEPTS

Revealed preference

Utility

Budget Constraint

Indifference Curves

Income Effect

Substitution Effect

Giffin's Paradox, Inferior goods

Consumer Equilibrium

STUDY GUIDE

Food for Thought:

What is utility and diminishing marginal utility? Explain.

In detail, explain the utility maximization rule? Critically evaluate this concept.

How is a market demand curve derived? What does this have to do with indifference curves and budget constraints?

Sample Questions:

Multiple Choice:

Which of the following describes the utility maximization rule? (where MU is marginal utility and P is price)

- A. **$MU_a/P_a = MU_b/P_b = \dots = MU_z/P_z$**
- B. Total MU = Total P
- C. $MU_a = MU_b = \dots = MU_z$
- D. None of the above describe the rule

True - False:

The law of diminishing marginal utility states that total utility will become negative as more units of a commodity are consumed. {FALSE}

Typically, the income and substitution effects combine to cause a downward sloping demand curve. {TRUE}

CHAPTER 7

Costs of Production

The purpose of this chapter is to examine the production costs of a firm. The first section develops the economic concepts of production necessary for understanding the cost structure of a firm. The second section presents the models of short-run costs. The final section develops the long-run average total cost curve and discusses its implications for the strategic management of a business.

Production and Costs

The reason that an entrepreneur assumes the risk of starting a business is to earn profits. The fundamental assumption in the theory of production is that a rational owner of a business will seek to maximize the profits (or minimize the losses) from the operation of his business. However, before anything can be said about profits we must first understand costs and revenues. This chapter will develop the basic concepts of production costs.

An economist's view of costs includes both explicit and implicit costs. Explicit costs are accounting costs, and implicit costs are the opportunity costs of an allocation of resources (i.e., business decisions). Accountants subtract total cost from total revenue and arrive at a total accounting profit. An economist, however, would include in the total costs of the firm the profits that could have been made in the next best business opportunity (e.g., the opportunity cost). Therefore, there is a significant difference in how accountants' and economists' view profits **B** economic profits versus accounting profits.

For the purposes of economic analysis, a normal profit includes the cost of the lost opportunity of the next best alternative allocation of the firm's resources. In a purely competitive world, a business should be able to cover their costs of production and the opportunity cost of the next best alternative (and nothing more in the long-run). In an accounting sense there is no benchmark to determine whether the resource allocation was wise. Instead various financial ratios are used to determine how the firm has done with respect to similarly situated companies.

Time Periods Revisited

As was discussed briefly in the section of elasticity of supply in Chapter 5, time periods for economic analysis are defined by the types of costs observed. These time periods differ from industry to industry, and will differ by the technology employed between firms. Again, these time periods are; (1) the market period, (2) the short-run, and (3) the long-run.

In the market period, all costs are fixed costs (nothing can be varied). In the short-run, there are both fixed and variable costs observed. Generally, plant, equipment, and technology are fixed, and things like labor, electricity, and materials can still be varied. In the long-run everything is variable. That is, the plant, equipment, and even the business into which you put productive assets can all be changed. In the long-run, even the country in which the business is located can be changed. Because everything is fixed in the market period, this period is of little interest in economic analysis. Therefore, economists typically begin their analysis of costs with the short-run and proceed to examine the operation of the firm and the industry. The long-run is of interest because it is also the planning horizon for the business.

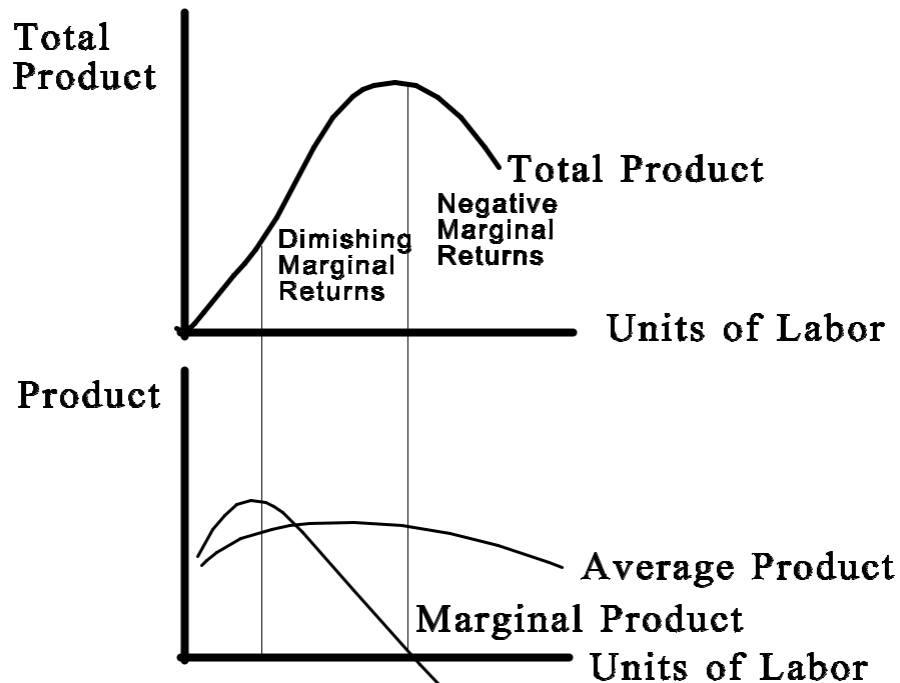
Production

Another view of the short-run cost structure is that fixed costs are those that must be paid whether the firm produces anything or not. Variable costs are called variable because they increase or decrease with the level of production. Therefore to understand short-run costs, you must first understand production.

Total product or total output is the total number of units of production obtained from the productive resources employed. Average product is total product divided by the number of units of the variable factor employed. Marginal product is the change in total product associated with a change in units of a variable factor of production.

As a firm increases its output it normally makes more efficient use of its available capital. However, with a fixed level of available capital as variable factors are added to the production process, there is a point where the increases in total output begin to diminish. **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 begin to become smaller.** In fact, it is possible, at some point, that further additions in the units variable factors to a fixed level of capital could actually reduce the total output of the firm. This is called the uneconomic range of production. In reality, most firms come to realize that their total additions to total output diminish, long before they begin to experience negative returns to additions to their workforce or other variable factors.

The following diagram provides a graphical presentation of total, average, and marginal products for a hypothetical firm.



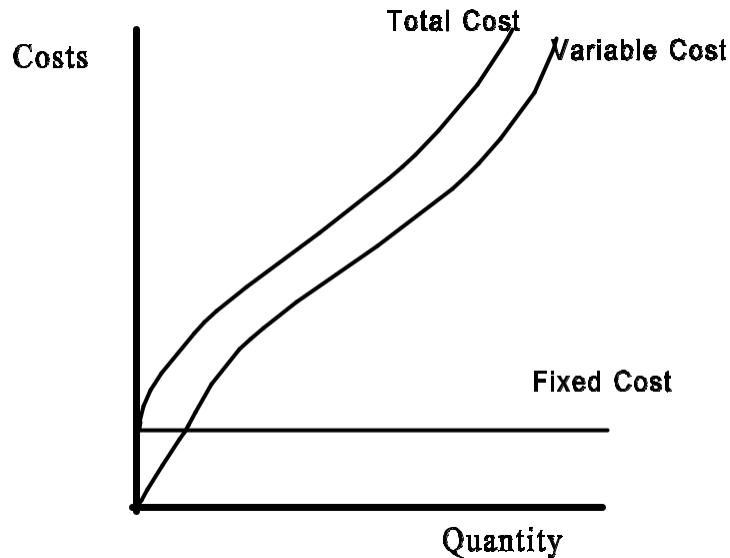
The top graph shows total product. After total product reaches its maximum marginal product where marginal product changes from positive to negative (first derivative is zero, second derivative is negative). When the total product curve reaches its maximum, increased output results in negative marginal product. The maximum on the marginal product curve is also associated with the first inflection point (the acceleration or where the curve becomes steeper) on the total product curve. The ranges of marginal returns are identified on the above graphs.

The beginning point in developing the cost structure of a firm is to examine total costs in the short run. Total costs (TC) are equal to variable costs (VC) plus fixed costs (FC).

$$TC=VC+FC$$

Variable costs are those costs that can be varied in the short-run, i.e., the cost of hiring labor. Fixed costs are those costs that cannot be varied in the short-run, i.e., plant (interest). Therefore, total costs consist of a fixed component and a variable component.

These relations are presented in a graphical form in the following diagram:



The fixed cost curve is a horizontal line. These costs are illustrated with a horizontal line because they do not vary with quantity of output. The variable cost curve has a positive slope because it varies 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. This is because we added fixed cost (the horizontal line) to variable cost (the positively sloped line).

From the total, variable and fixed cost curves we can obtain other relations. These are the marginal cost, and the total, variable, and fixed costs relation to various levels of output (averages).

Average total cost (ATC) is total cost (TC) divided by quantity of output (Q), average variable cost (AVC) is variable cost (VC) divided by quantity of output (Q), and average fixed cost (AFC) is fixed cost (FC) divided by quantity of output (Q). Marginal cost (MC) is the change (denoted by the Greek symbol delta), in total cost (TC) divided by the change in the quantity of output (Q).

These relations are presented in equation form below:

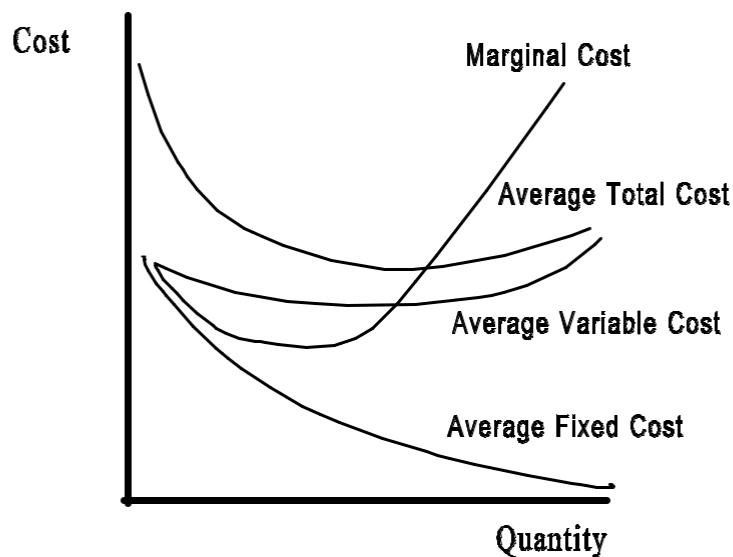
$$ATC = TC/Q$$

$$AVC = VC/Q$$

$$AFC = FC/Q$$

$$MC = \hat{I}TC/\hat{I}Q; \text{ where } \hat{I} \text{ stands for change in.}$$

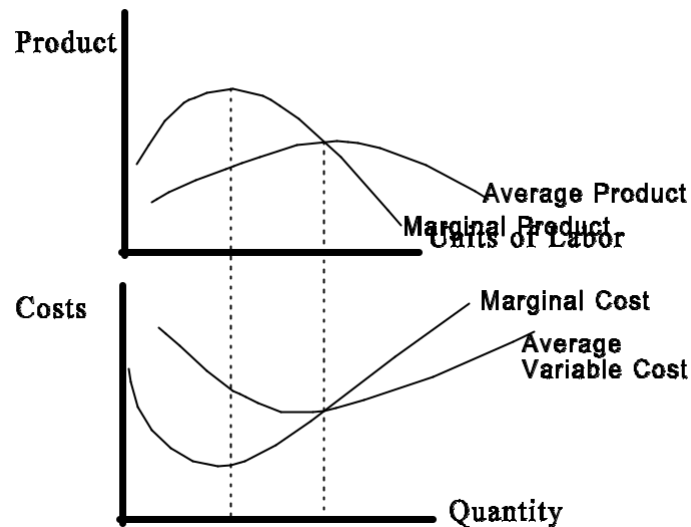
The following diagram presents the average costs and marginal cost curve in graphical form.



Please notice that the average fixed cost approaches zero as quantity increases. This occurs because a constant is being divided by increasingly large numbers. Average total cost is the summation of the average fixed and average variable cost curves. Because average fixed cost approaches zero, the difference between average variable cost and average total cost also approaches zero (the difference between ATC and AVC is AFC). The marginal cost curve intersects both the average total cost and average variable cost curves at their respective minimums. In other words, as marginal cost is below average total (and average variable) cost the average function is falling to meet marginal cost. As marginal cost is rising above the average function then average

total (and average variable) cost are increasing.

The following graph relates average and marginal product to average variable



and marginal cost.

Notice that at the maximum point on the marginal product curve, marginal cost reaches a minimum. Where marginal cost equals average variable cost, the marginal product curve intersects the average product curve. In other words, the cost structure of the firm mirrors the engineering principles giving rise to the firm's production, hence its costs.

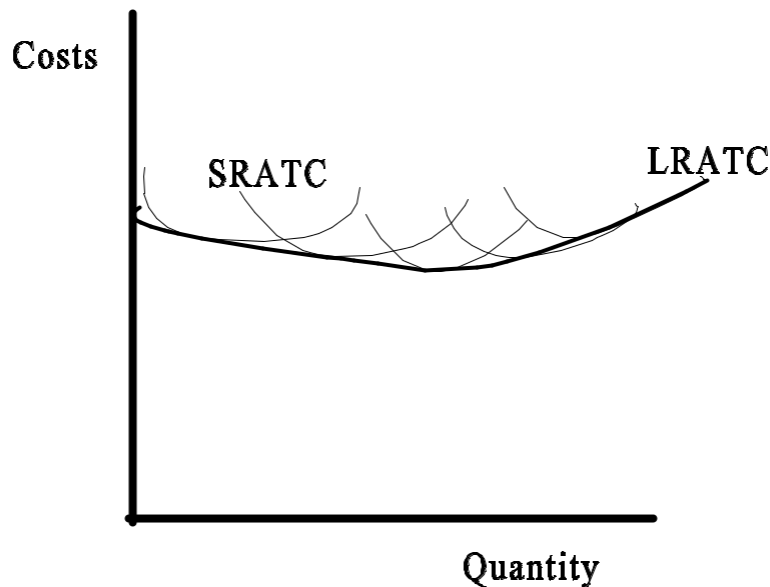
This presents some interesting disconnects from how business is presently evolving. The high compensation levels of executives seems to not reflect the actual output of their labors. In other words, the costs of production seemingly fail to account for the history of the 21st century thus far. As it turns out, these issues can be explained by neo-classical economics, and will be in Chapters 10 and 11.

The Long Run Average Total Cost Curve

In the long-run all costs are variable. In other words, a firm can vary its plant, equipment, technology and any of the factors that were either fixed or variable in the short-run. Therefore, anything that is technologically feasible is available to this firm in the long-run. Further, any short-run average total cost curve (consistent with any size of operation) could be selected for use in the long-run.

The long-run average total cost curve (LRATC) is therefore a mapping of all minimum points of all possible short-run average total cost curves (allowing technology and all factors of production (i.e., costs) to vary). The enveloping of these short-run total cost curves map all potential scales of operation in the long-run. Therefore, the LRATC is also called the planning horizon for the firm.

The following diagram illustrates a LRATC:



The shape of the LRATC is dependent upon the available resources and technology that a firm can utilize to produce a given commodity. The downward sloping range of the LRATC is due to economies of scale, the upward sloping range of the LRATC is due to diseconomies of scale, and if there is a flat range at the minimum point of the LRATC this is called a range of constant returns to scale.

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. The causes of economies of scale are that as a firm becomes larger it may be able to utilize labor and managerial specialization more effectively, capital more effectively, and may be able to profitably use by-products from its operations. Diseconomies of scale result from the organization becoming too large to effectively manage and inefficiencies developing.

Constant returns to scale are large ranges of operations where the firm's size matters little. In very capital intensive operations that must cover some peak demand, the size of the firm may matter very little. Several public utilities, such as electric generating companies, telephone company, and water and sewer service have

relatively large ranges of constant returns to scale.

Where the LRATC curve reaches its minimum, this is called the minimum efficient scale (size of operation). Minimum efficient scale is the smallest size of operations where the firm can minimize its long-run average costs. Minimum efficient scale varies significantly by commodity produced and technology. For example, the minimum efficient scale in agriculture in the Great Lakes area for dairy operations is relatively small (in the \$200,000 range). Minimum efficient scale for wheat farmers in the Great Plains may be as large as \$1,000,000.

There is an interesting implication of the LRATC analysis. There are instances where competition may be an unrealistic waste of resources. A natural monopoly is a market situation where per unit costs are minimized by having only one firm serve the market.

Minimum efficient scale is the point on the LRATC where it reaches its minimum. If that happens to be at the beginning of a long range of constant costs, it is the first point (on the left of the range) where costs are at their minimum. Remember, that technical efficiency requires that a firm produce at where it has attained minimum total long-run costs.

Where minimum efficient scale is very large for capital intensive operations, it may be more cost effective to permit one company to spread its fixed costs over a very large number of consumers, rather than have several competing firms suffer the fixed costs of a minimum efficient scale and have to share a customer base. There are several industries that are very capital intensive and require large initial investments to operate. These types of firms are frequently natural monopolies. Railroads, electric generating companies, and air lines requires tens of millions of dollars in fixed costs.

KEY CONCEPTS

Explicit v. Implicit Costs
Opportunity Costs

Economic v. Accounting Costs

Normal Profit
Next Best Alternative

Time Periods of Analysis
Market Period
Short-run

Long-run

Law of Diminishing Returns

Total, average, and marginal product

Short-run Costs

Total costs

Average Total

Average Fixed

Average Variable

Marginal

Long-run average total cost

Economies of Scale

Diseconomies of Scale

Minimum efficient scale

Planning Horizon

Natural Monopoly

STUDY GUIDE

Food for Thought:

Complete the following table then draw the relevant curves from the data (fixed cost is \$200).

Total Product	Total Variable Costs	Total Costs	Average Fixed Cost	Average Variable Cost	Average Total Cost	Marginal Cost
0	0	—	—	—	—	
1	20	—	—	—	—	>
2	38	—	—	—	—	>
3	58	—	—	—	—	>
4	64	—	—	—	—	>
5	76	—	—	—	—	>
6	93	—	—	—	—	>
7	114	—	—	—	—	>
8	139	—	—	—	—	>

Give the algebraic expression of each of the short run average cost curves and explain (in words) what each means and what its relation is to total product.

Explain, in detail, why normal profit is included in average total costs?

Draw a LRATC demonstrating diseconomies, economies and constant returns to scale. Explain why each range of the LRATC curve is observed. What does this have to do with planning? Explain.

Sample Questions:

Multiple Choice:

Which of the following does the marginal cost curve NOT intersect at its minimum?

- A. Average variable cost
- B. Average total cost
- C. **Average fixed cost**
- D. Average fixed cost plus average variable cost

Which of the following is not a potential cause of economies of scale?

- A. Ability to use by-products
- B. Specialization of labor
- C. Efficient use of capital
- D. **All of the above are potential causes of economies of scale**

True - False

When marginal cost is below average variable cost, average variable cost must be rising. {FALSE}

Long Range Average Total Cost reaches its minimum where short run marginal cost is equal to LRATC. {FALSE}

Economic costs include implicit costs, whereas accounting costs do not. {TRUE}

Marginal costs are the change in costs associated with the addition of one more unit of output. {TRUE}

CHAPTER 8

Pure Competition

Chapter 4 developed the supply and demand diagram. The simple supply and demand diagram is the model of a perfectly competitive industry. That model will be revisited and extended in this chapter.

The purpose of this chapter is to introduce models of the firm that are not purely competitive. After a brief introduction to imperfectly competitive models we will turn our attention to the purely competitive industry and firm. In particular, this chapter will develop the model of the perfectly competitive firm, examine its relation to the industry, and then offer some critical evaluation of this important paradigm.

Firms and Market Structure

There are several models of market structure. In the product market, the two extremes are perfect competition and pure monopoly. This chapter will examine pure competition and the following chapter examines monopoly. However, there are intermediate market structures. These intermediate market structures are oligopoly and monopolistic competition.

The assumptions in pure competition are:

- (1) there is atomized competition (a large number of very small suppliers and buyers relative to the market),
- (2) there is complete freedom of entry and exit into and from this market,
- (3) there is no nonprice competition,
- (4) suppliers offer a standardized product, and
- (5) firms in this industry must accept the price determined in the industry.

Purely competitive firms and industries do not exist in reality. Probably as close as the real world comes to the competitive ideal is agriculture, during the period in which this industry was dominated by the relatively small family farms prior to World War II.

The assumptions in pure monopoly are:

- (1) there is one seller that supplies a large number of independent buyers,
- (2) entry and exit into this market is completely blocked,
- (3) the firm offers unique product,
- (4) there is nonprice competition (mostly public information advertising),
and
- (5) this firm is a constrained price dictator.

Pure monopolies abound in reality, including public utilities and manufacturing firms producing products protected from competition by patents or copyrights. A monopolist will produce less than a competitive industry and charge a higher price, *ceteris paribus*.

The assumptions underlying the model of a monopolistically competitive industry are:

- (1) a relatively small number of sellers compared to pure competition, but this number can still be large, in some cases a few hundred independent sellers,
- (2) pricing policies exist in these firms,
- (3) entry into this market is generally somewhat difficult,
- (4) there is substantial nonprice competition, mostly designed to create product differentiation, at least some of which is spurious.

Numerous industries are properly characterized as monopolistic competition. These industries include computer manufacturers, software manufacturers, most retail industries, and liquor distillers. In general, monopolistic competitors produce less than pure competitors but more than pure monopolists, and charge prices that also fall between competition and monopoly. In general, the graphical analysis of a monopolistic competitive industry is identical to a monopoly, except the demand curve is somewhat more elastic than the monopolists'.

The assumptions upon which the model of oligopoly are founded are:

- (1) that there are few sellers (generally a dozen or less), these firms often collude or implicitly cooperate through such practices as price leadership,
- (2) entry into this market is generally difficult,
- (3) there is normally very intensive non price competition in an attempt to create product differentiation, often spurious.

Examples of oligopolies abound, the U.S. automobile industry, the soft-drink industry, the brewing industry, segments of the fast-food industry, and airplane manufacturers. Oligopoly will generally produce less than monopolistic competitors and charge higher prices, if price leadership or other collusive arrangements exist an oligopoly may be a close approximation to a pure monopoly.

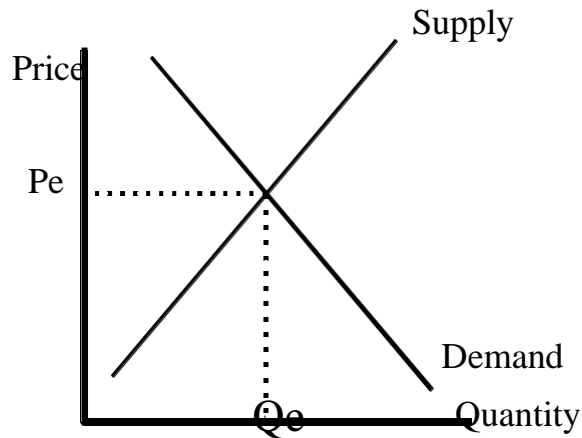
All of these market structures also assume perfect knowledge concerning present and future prices (by both producers and consumers) and all other information relative to the operation of the market, i.e., product availability, quality etc. This perfect knowledge assumption is not realistic, however, it does little violence to the models because people typically learn very quickly in aggregate, and hence their expectations approximate perfect knowledge over large numbers of persons.

The Purely Competitive Firm

Total, average and marginal product were developed with the various cost curves in Chapter 7. The missing piece of the puzzle is revenue. Because a purely competitive firm sells its output at the one price determined in the industry, price does not change as the quantity sold increases. In other words, the demand curve is horizontal, or perfectly elastic. The result is that average revenue is equal marginal revenue, and both of these are equal to price. Further, total revenue is $P \times Q$ which is the total area under the demand curve for the purely competitive firm.

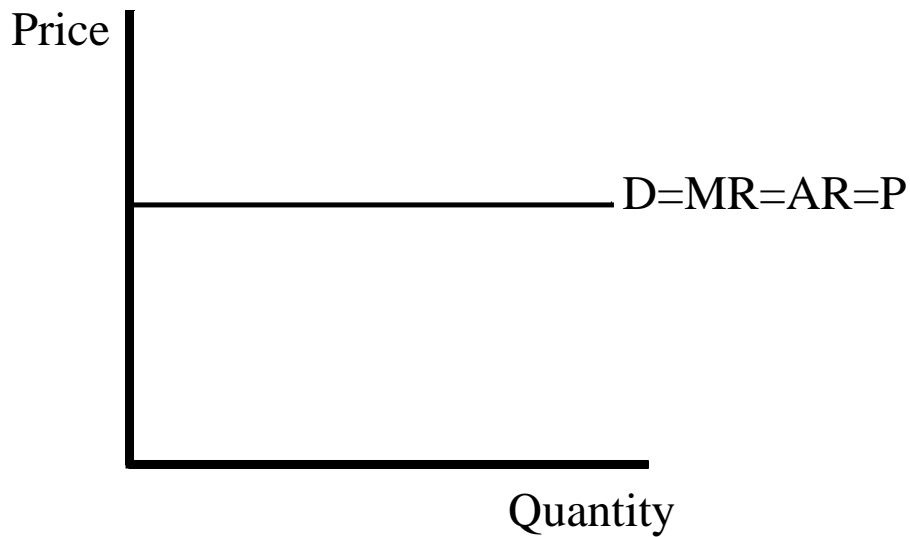
A firm is assumed to be rationally managed and therefore it will attempt to maximize its profits. The profit maximizing rule is that a firm will maximize profits where marginal cost (MC) is equal to marginal revenue (MR). The reason for this is relatively simple. There is still a positive amount of revenue that can be had in excess of costs of the firm produces at a quantity less than where $MC = MR$. If a firm produces at a quantity in excess of where $MC = MR$, the firm adds more to its costs than it receives in revenues. Therefore the optimal, or profit maximizing level of output is exactly where $MC = MR$.

The model of the purely competitive industry is the simple supply and demand diagram you mastered in Chapter 4. The simple supply and demand diagram is a representation of the aggregation of a large number of independent firms and consumers. This model is revisited below:



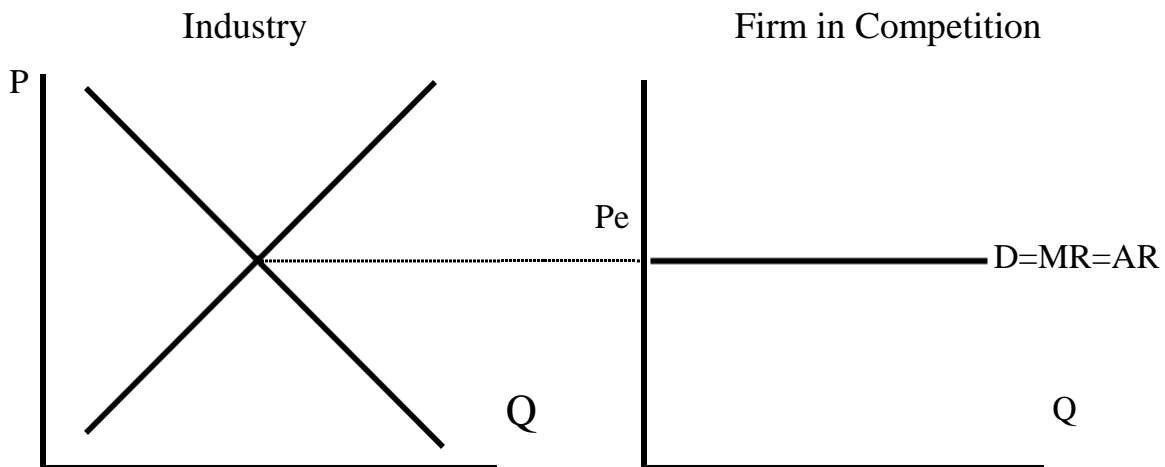
The firm in perfect competition is just one of thousands that are summed to arrive at the industry levels of output and price. Because of the atomized competition, if a firm charges a higher price than the industry it will sell nothing because consumers can obtain exactly the same commodity at a lower price elsewhere. If the firm charges a price lower than the price established in the industry it is irrational and will lose revenue it could have otherwise had. Therefore, a firm operating in a perfectly competitive industry has no choice save to sell its output at the industry established price. Because the firm sells at the single price established in the industry it has a perfectly elastic demand curve. (In other words, it is horizontal and not downward sloping).

The demand curve for the perfectly competitive firm is illustrated below:



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) at the price determined in the industry.

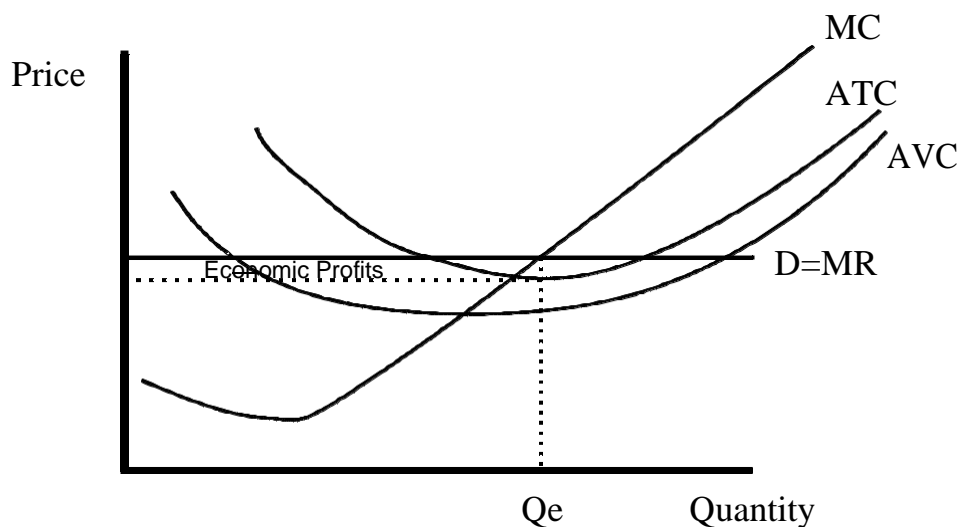
Establishing the price in the industry is simply setting the equilibrium in the familiar supply and demand diagram, and that is the price at which the firm is obliged to sell its output. The following diagram illustrates how this is done:



Again, 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. However, this yields little information save what price will be charged and what quantity the industry produce. To determine what each firm will produce and what profits each firm will earn, we must add the cost structure (developed in the previous chapter).

Economic profits are total revenues in excess of total costs. Remember from Chapter 7, that profits from the next best alternative allocation of resources is included in the total costs of the firm. In this short-run it plausible that some firms in pure competition can exact an economic profit from consumers, but because of freedom of entry, the economic profit will attract new firms to the industry, hence increasing supply, and thereby lowering price and wiping out the short-run economic profits.

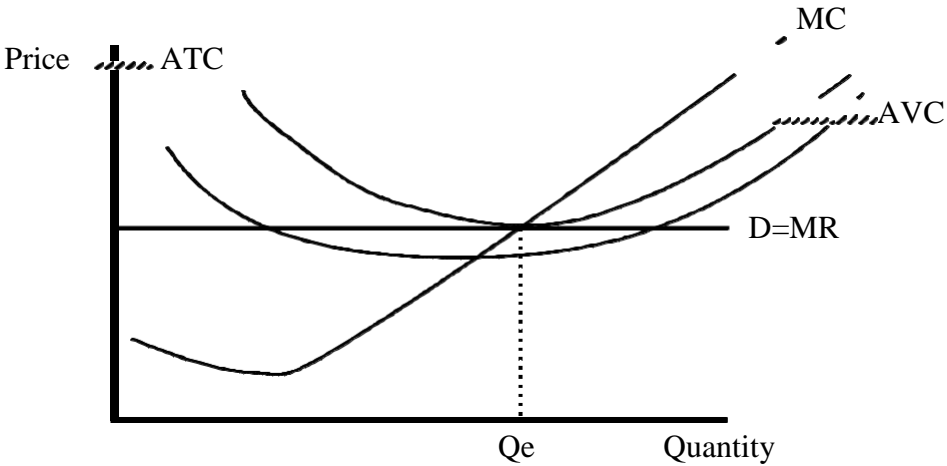
The following diagram adds the costs structure to the purely competitive firm's demand curve and with this information it is possible to determine the profits that this firm makes:



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.

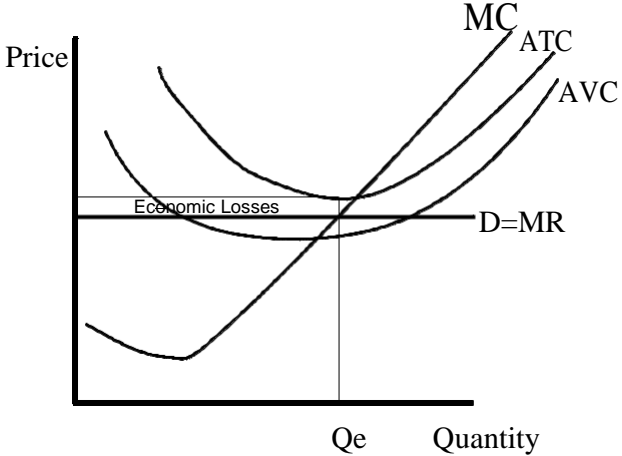
However, the firm cannot continue to operate at an economic profit because those profits are a signal to other firms to enter the market (free entry). As firms enter the market, the industry supply curve shifts to the right reducing price and thereby eliminating economic profits. Because of the atomized competition assumption, the number of firms that must enter the market to increase industry supply must be

substantial. The following diagram illustrates the purely competitive firm making a normal profit:



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.

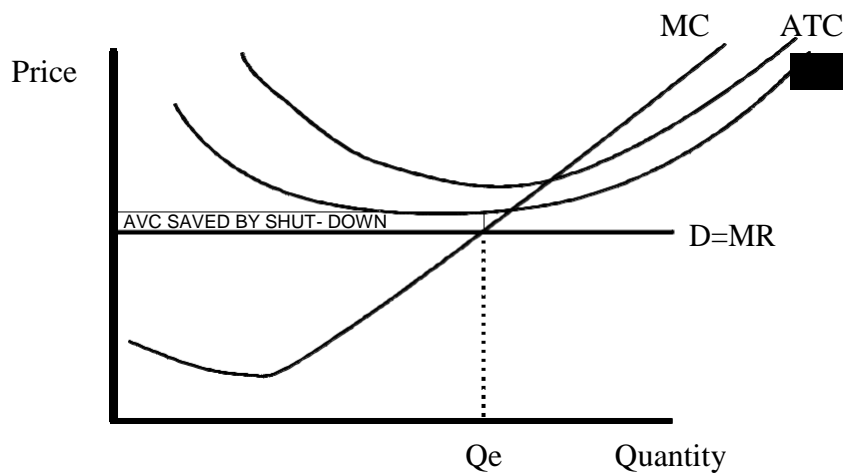
A firm in pure competition can also make an economic loss. The following diagram shows a firm in pure competition that is making an economic loss:



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.

Even though the firm is making a loss it may still operate. The relation of average total cost with average revenue determines the amount of profit or loss, but we to know what relation average revenue has with average variable cost to determine whether the firm will continue in business. In the above case, the firm continues to operate because it can cover all of its variable costs and have something left to pay at least a part of its fixed costs. If it shuts down it would lose all of its fixed costs, therefore the rational approach is to continue to operate to minimize losses. Therefore, the profit maximizing rule of producing at where $MC = MR$ is also the rule to determine where a firm can minimize any losses it may suffer.

In sum, to determine whether a firm is making a loss or profit we must consider the relation of average total cost with average revenue. To determine whether a firm that is making a loss should continue in business we must consider the relation between average variable cost and average revenue. The following diagram illustrates the shut-down case for the firm making a loss:



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. If the firm continues to operate it cannot cover its variable costs and will accrue losses in excess of the fixed costs. If the firm shuts-down, all that is lost is the fixed costs. Therefore the firm should shut-down in order to minimize its losses.

What may not be intuitively obvious is that this analysis determines the industry supply curve. Because firms cannot operate along the marginal cost curve below the average variable cost curve, the firm's supply curve is its marginal cost curve above average variable cost. To obtain the industry's supply curve one needs only sum all of the firms' marginal cost curves about their average variable cost curves.

Pure Competition and Efficiency

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. This is because the cost of production for the last unit of production is what determines supply, and that cost of production includes only the engineering costs. However, this result is obtained only if all industries in that economic system are purely competitive. This is the contribution of the models of distribution created by economists working in the marginalists traditions. The problem is that this is economic theory that is not necessarily supported by empirical evidence.

Additionally, the technical or productive efficiency criteria are also satisfied by the competitive model because price is equal to the minimum average total cost. In the real world the ideal of technical efficiency is rarely attained. However, this criteria provides a useful benchmark to use in measuring how well a firm is doing with respect to minimizing costs for a specified level of total output.

As you may recall from the definition of economic efficiency, allocative and technical efficiency are only two of the three necessary and sufficient conditions for economic efficiency. The third condition necessary for economic efficiency is full employment. If full employment is also in evidence then a purely competitive world is economically efficient.

A few economists writing about economic problems through the past three decades have focused their analyses narrowly on the competitive models. Conclusions from the competitive models are straightforward and fairly simple, hence accessible to the population in general. These models suggest that economic utopia is found only by returning to a purely competitive world. However, as Adam Smith himself, notes there was never a point at which competition was observed, let alone, was the general rule.

This illustrates a very important point about economics. While it is true that there is a Nobel Prize in Economic Science, economics is not a science in the same vein that physics or chemistry is. Economics relies on assumptions upon which to build models to analyze material goods and their production and distribution. However, the assumptions may reflect value judgments (biases) more than what the analyst believes reflects the state of nature in the real world. Therefore, economics is not value free, as many would posit.

Criticism of Pure Competition as a Mode of Analysis for the Real World.

In theory, the purely competitive world is utopia. There are several problems that are not excluded by meeting the assumptions behind the competitive models. As wealth increases, predation could easily develop and monopoly power could be gained by the occasional ruthless businessman, especially in cases where government has been significantly limited. Public goods and other commodities may not be available through competitive industries because of the lack of a profit potential. The competitive economic models are motivated by the suppliers seeking to maximize profits, and without the profit motive, there can be no market.

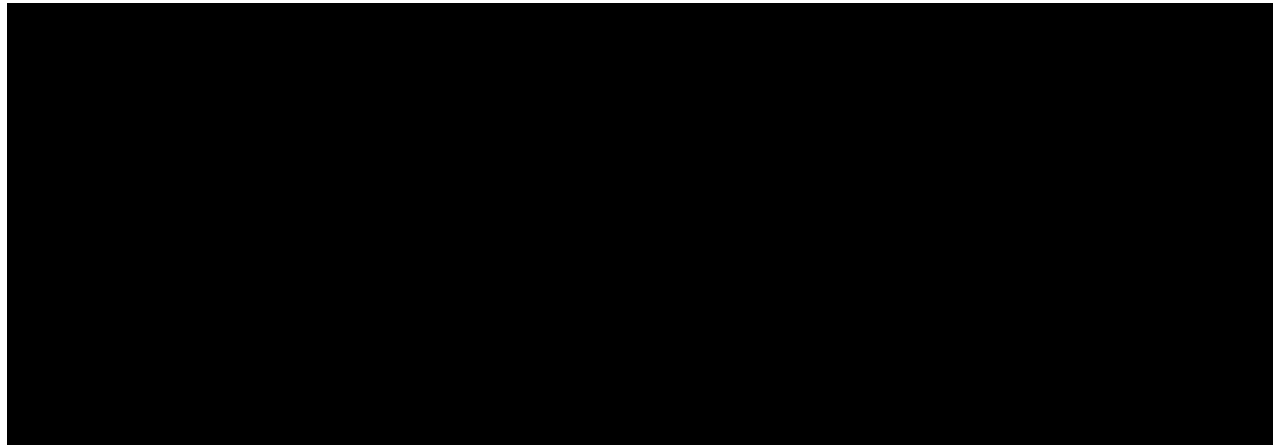
Further because of technical efficiency requirements, externalities such as pollution, work environment safety, and other such problems are likely to arise because of the constraint imposed on the firms by the price being determined by the industry. Without strong government and appropriate regulations to protect the environment or workplace, it is unlikely that any private incentive system could impose sufficient discipline upon producers to properly internalize the costs of production that can be allowed to flow to the public in general.

The distribution of income may lack equity or even technical efficiency. In a purely competitive world, workers will be paid the value of what they contribute to the total output of the firm. If the product they produce is not highly valued then some workers could be paid very low wages, even though the human capital and effort requirements are substantial. For example, a mathematician or a physicist may be paid less than a baseball player or musician – even though the value of what the mathematician or physicist is far greater than the athlete's contribution. This type of result often creates substantial social problems, i.e., alienation, occasionally resulting in alienation, crime, drug abuse, and in the developing world even political instability.

If all industries are purely competitive there be consumer dissatisfaction because each firm offers a standardized product. This standardization might very well result in a substantial loss of consumer choice. For example, if the soft drink industry was purely competitive, the product offered might well be a single cola, someplace between Coca-Cola and Pepsi-Cola, and might very well suite nobody's tastes and preferences.

The present state of technology simply requires the existence of many natural monopolies. The problems with natural monopolies are that under-production occurs at too high of a market price for the product. This misallocation of resources results in an insufficient amount of some commodities, with an excess of resources available to other products, and prices that are not specifically determined by the actual costs of production. Even so, if the natural monopolies are properly regulated at something near a competitive price, then the damage to the economy may be minimized. This issue will be discussed in greater detail in the following chapter (Chapter 9, Monopoly).

It is frequently mused that if you teach a parrot to say “supply and demand” you have created a feathered economist. Perhaps the simplicity of this is appealing, however, supply and demand reflects, at best, a very superficial understanding of a modern economic system. One must be very careful in critically evaluating the assumptions that underpin an economic model, and the agenda of those who propose a particular mode of analysis. Economics, is not pure science, and it is not value free as many would lead you to believe.



As one can see, Thorstein Veblen was very suspicious of economic theories of the time as being little more than an apology for self-interest of the rich and powerful posing as markets. However, Adam Smith was also suspicious of the real world solutions of his time, to wit:



Adam Smith suspicious of the motivations of businessmen, and craftsmen in the pursuit of their own self-interest. He witnessed the monopolization of many markets in Scotland and in England, and he had also been the Director of the world's largest monopoly of the time the East India Company. Adam Smith, therefore, had first hand experience with the early beginnings of monopoly and knew their potential for evil. Smith was not only an advocate of competition, but knew that competition is what provided the consumer with alternatives in the marketplace, and hence an ability to choose among various suppliers. It is this consumer ability to choose, that motivated Smith's view that capitalism would produce socially beneficial results – and monopoly power is a threat to those results. (Hence the invisible hand)

KEY CONCEPTS

Market Structures

- Pure Competition
- Pure Monopoly
- Oligopoly
- Monopolistic Competition

Industry v. Firm

- Profit Maximizing Rule
- $MC=MR$

Economic v. Normal profits

Shut down analysis

Problems with competition
income equity
market failures
limitations on choice

Smith's Invisible Hand
Consumer choice

STUDY GUIDE

Food for Thought:

Outline and critically evaluate the assumptions underpinning the purely competitive model.

Why is the profit maximizing (loss minimizing) point where Marginal Cost equals Marginal Revenue? Explain, fully.

Draw each of the following cases of the firm in pure competition: (1) long-run profit maximizing, (2) short-run, economic profit, (3) short-run, economic loss, and (4) shut down point.

Sample Questions:

Multiple Choice:

A purely competitive firm's short-run supply curve is its marginal cost curve, for all:

- A. Quantities of output
- B. Output where marginal cost exceeds minimum average total cost
- C. Output where marginal cost exceeds minimum average fixed cost
- D. **Output where marginal cost exceeds minimum average total cost**

If all of the firms producing a commodity in a purely competitive market are required to adopt antipollution devices that increase their costs of production (even though it cleans up the air), one would expect:

- A. The demand for the product to decrease
- B. **The market supply curve to shift to the left**
- C. The long-run economic profits of the individual firms to decrease
- D. The short-run economic profits of the individual firms to decrease

True - False

If all industries within an economy were pure competitors, the economy would be economically efficient. {TRUE}

Oligopoly is an industry with a large number of suppliers, but few buyers. {FALSE}

CHAPTER 9

Pure Monopoly

The purpose of this chapter is to examine the pure monopoly model in the product market. Because monopolies are price givers, there are significant differences between monopolies and competitive firms, these differences will be examined in details in this chapter. Once the monopoly model is mastered, it will be critically evaluated. Further, the rate regulation of monopolies will be examined and critically evaluated.

The Assumptions of Monopoly Revisited

The assumptions upon which the monopoly model is based were presented in Chapter 8. However, a quick review of those assumptions is worthwhile here. The assumptions of the monopoly model are:

- (1) there is a single seller (or a few sellers who collude, hence a cartel),
- (2) the single seller offers a unique product,
- (3) entry and generally exit are blocked,
- (4) there is non-price competition, and
- (5) the monopolist dictates price in the market.

As will become quickly apparent, the differences in the assumptions that underpin the monopoly and purely competitive models make for very different analyses. Further, the difference in assumptions also creates substantially different results in price and output between the two models.

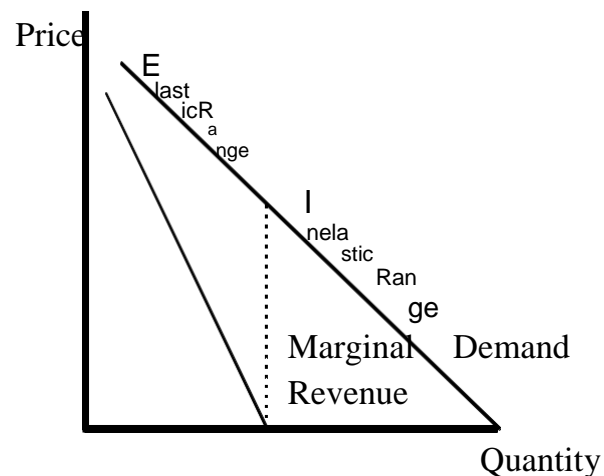
The Monopoly Model

In the purely competitive analysis, there were two different models, one model for the industry, in which the interaction of supply and demand established the market price and quantity. The second model was that of the firm, the firm faced a perfectly elastic demand curve, in which demand, price, average revenue and marginal revenue were all the same. However, in the analysis of a monopoly there is but one model. **The firm, in monopoly, is the industry (by definition).** Because the firm is the industry it therefore

faces a downward sloping demand curve, which is also the average revenue curve for the firm (hence the industry).

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. Remember when you lower price the average revenue falls, but not as fast as the marginal, and if the average revenue is a linear (as it is here, which is smooth, and continuously differentiable) then there is a necessary relationship between the slope of the average and marginal functions.

Consider the following diagram:



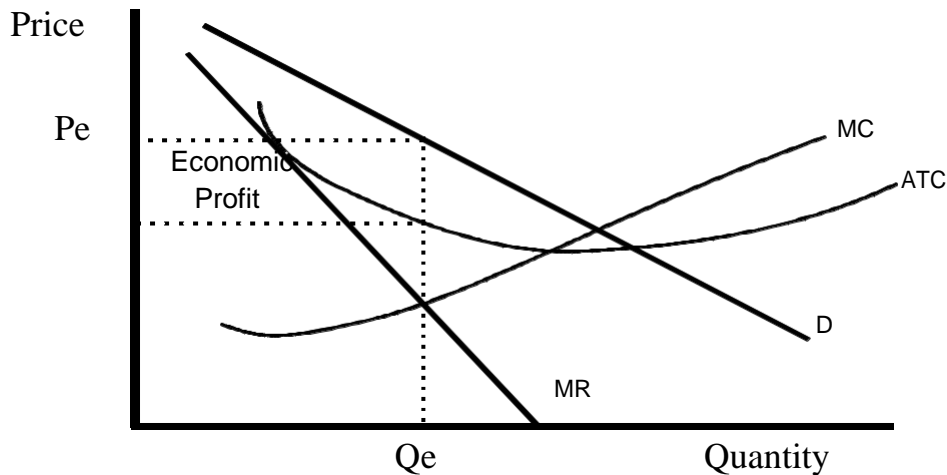
The point where the marginal revenue curve intersects the quantity axis is of significance; this point is where total revenue is maximized. Further, the point on the demand curve associated with where $MR = Q$ is the point on the demand curve of unit price elastic demand; to the left along the demand curve is the elastic range, and to the right is the inelastic range (see Chapter 5 for a review of the relation between marginal revenue and price elasticity of demand).

Unlike the purely competitive model here is no supply curve in an industry which is a monopoly. The monopolist decides how much to produce using the **profit maximizing rule; or where $MC = MR$** . In this sense, the monopolist is a price dictator, in that it is the cost structure, together with the change in total revenue with respect to change in quantity sold that directs the monopolist's pricing behavior, rather than the interaction of the monopolist's supply schedule, with the demand schedule of consumers (demand curve). With this information we can discover more about the monopoly model.

A monopolist can make an economic profit. **An economic profit is that margin above average cost which is in excess of that necessary to cover the next best alternative allocation of the firm's assets.** As you recall from Chapter 8, in pure

competition if there is an economic profit, that profit is a signal to other assets to enter the market. Because there are no barriers to entry into a purely competitive industry, the supply curve increase (shifts right) as these newly attracted resources enter the market – hence driving down the market price in the industry, and eliminating the economic profit.

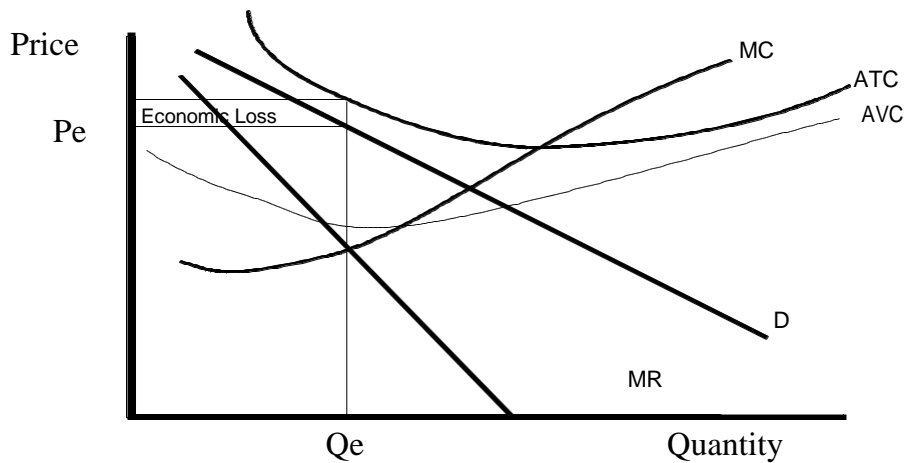
One of the objections to pure monopoly is that there is closed entry. A monopolist making an economic profit can do so as long as the cost and revenue structure permit, perhaps permanently. The self-correcting advantages from pure competition are lost because of these barriers to entry.



The above diagram shows the economic profits that can be maintained in the long run because of the barriers to entry into this industry. The monopolist produces where $MC = MR$ (where MC intersects MR), but the price charged is all the market will bear, that is, the price on the demand curve that is immediately above the intersection of $MC = MR$. The rectangle mapped out by the ATC , the indicator over the price index, the origin, and Q_m are the total costs, the rectangle mapped out by the demand curve, Q_m , the origin, and P_m is the total revenue, and the difference between these rectangles is economic profits.

On the other hand, there is nothing in the analysis that requires any given monopolist will be profitable. In fact, a monopolist can operate at an economic loss, the same as a competitive firm can.

The following diagram shows a monopolist that is unfortunate enough to be operating at an economic loss.

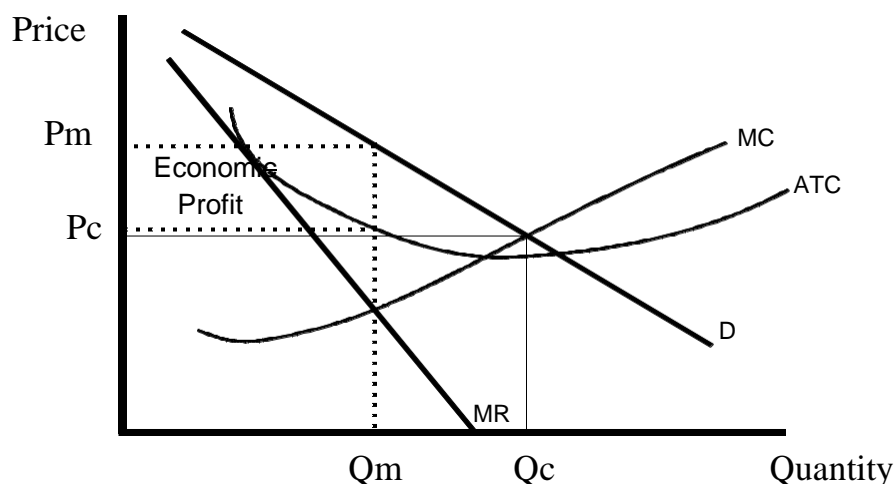


This monopolist is making an economic loss. The ATC is above the demand curve (AR) at where $MC = MR$ (the loss is the labeled rectangle). However, because AVC is below the demand curve at where $MC = MR$ the firm will not shut down so as to minimize its losses. The firm can pay back a portion of its fixed costs by continuing to operate at this level because the AVC is still below the demand curve. As you will remember from the discussion in Chapter 8, when AVC is above the demand curve the firm should shut down to prevent throwing good money after bad.

The Effects of Monopoly

There are several implications of the monopoly model; many of which lead to criticisms of monopoly on issues of both technical and allocative efficiency. The prices and output determined in the monopoly are not consistent with allocative efficiency criteria. In monopoly there are too many resources allocated to production of this product, for which we receive too little output as illustrated by comparison with the competitive solution, the dotted line (discussed below). Consequently, because of the barriers to entry, the price for this product is too high – hence allocatively inefficient.

Consider the following diagram of a pure monopoly making an economic profit, in this case:



The above graph shows the profit maximizing monopolist, P_m is the price the monopoly commands in this market 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.

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. This practice enhances the allocative inefficiency. When a consumer must pay more for a product, simply because of the monopoly power in the market, less of the consumers' incomes are available to purchase other commodities. The end result is even more resources flow into the monopolist's coffers, and out of other industries – hence even more inefficient allocations of productive resources.

This does not mean that monopolists are pure evil – in an economic sense. 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 (i.e., pharmaceutical firms). If these types of firms were forced to permit free use of their technological developments (hence no monopoly power) then the economic incentive to develop new technology and products would be eliminated – hence economic irrationality would have to prevail for the technological progress we have come to expect in the beginning of the twenty-first century.

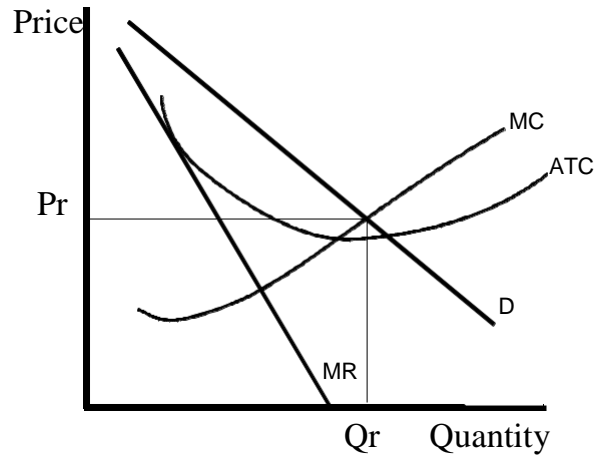
Regulated Monopoly

Because there are natural monopoly market situations it is in the public interest to permit monopolies, but traditionally in the United States they are regulated with respect to price. The purpose of the rate regulation was to ensure that the public would not suffer price gouging as a result of the monopoly position of the firms. Examples of regulated natural monopolies are electric utilities, cable TV companies, and telephone companies (local).

Throughout the 1980s and 1990s, up through 2002, there was substantial deregulation of the power industry, cable TV industry, and telecom. In the 1980s ATT was broken-up into several local telecom companies, i.e., Verizon, Southwestern Bell, Ameritech, and US West, among other, the long lines company (ATT) and Bell Labs (Lucent). The idea was to permit competition in long distance and local service. What happened was far different. The local providers had much invested in microwave towers, switches, and telephone lines – there would be charges permitted for the use of these assets by competitors, and what resulted was poorer service, at higher prices in most areas. In the summer of 2001, California consumers got a taste of what Enron could do in selling power to local public utilities. Consumers were victims of unscrupulous business practices that resulted in billions of dollars in overcharges that cannot be recovered.

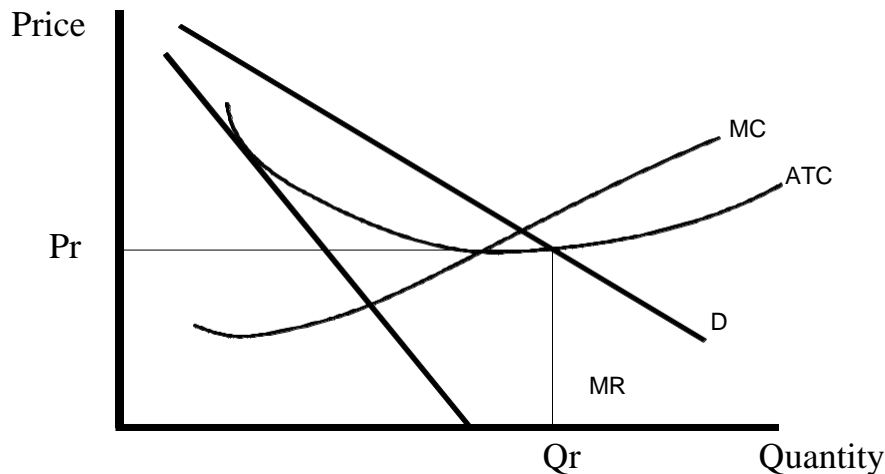
The problem with regulating the prices that monopolists can charge is that there are several competing goals that can be accomplished through rate regulation. If allocative efficiency is the goal, then the monopolist should be constrained to charge a **price where $MC = D$ or the social optimum**. If technical efficiency is the goal then some argue that the monopolist's minimum total cost should be the basis for the rate regulation. If we are concerned about consistently and reliably having the product of the monopolist available, at a reasonable price, then it might be more sensible to regulate the monopolist to charge a **price at where $ATC = D$, or the fair rate of return**. So regulatory agencies have alternatives as to where to regulate any monopolists within their jurisdiction. **The potential prices at which a monopolist could be regulated, and the potential results of those price levels, is called the dilemma or regulation.** This dilemma has presented the opportunity for considerable debate about whether rate regulation is appropriate, and if so, what sorts of regulation should occur.

Consider the following diagram, this is a monopolist that is being regulated at the social optimum ($MC = D$):



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).

Consider the following diagram of a monopolist that is being regulated at the fair rate of return:



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. Virtually every

state public utility commission relies on this model to regulate their electric companies and other public utilities.

Regulation and It's Problems

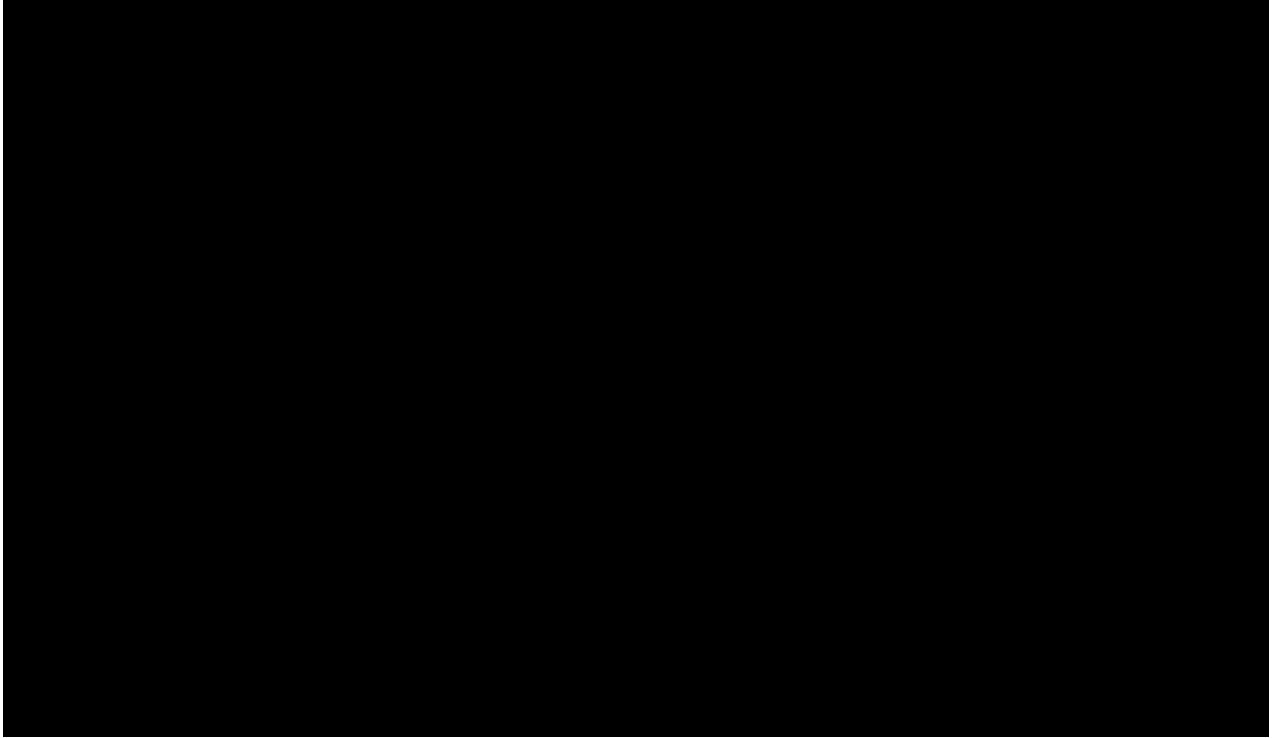
Regulation is not a panacea. There are problems with rate regulation. In our litigious society, the legal proceedings involved in rate regulation are not inexpensive for any of the parties involved, the state, public interest groups, and the firm. Because of the closeness of the legal advocates, economists, and others involved in the litigation of rate cases, there has been accusations that the public utility commissions have been over-taken by the industries they regulate. **The capture theory of regulation is that the retired executives, and economists and lawyers who have made their mark defending utilities have been appointed to public utility commissions, thereby allowing the utilities to regulate themselves.** While there have been instances where conflicts of interest have been noted, this “capture theory of regulation” probably overstates the relations between the industries regulated and the public utility commissions in most jurisdictions.

Rate regulation using invested capital as the rate base cause an incentive for firms to over-capitalize and not to be sensitive to variable costs of production. This is called the Averch-Johnson Effect. Electric companies, and other utilities are permitted to earn a rate of return only on invested capital. Therefore, given a choice, the utilities will invest in expensive (sometimes overly-expensive) capital to maximize the base upon which they can earn a rate of return. By using too much capital and not enough variable factors, there firms are generally technologically inefficient, and thereby also allocatively inefficient.

In the management literature there is come discussion of “organizational slack.” Organization slack is simply excess capacity in the organization, and it is often touted as giving management flexibility. However, economists have observed the same inefficiencies, with different conclusions. **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 of this type of planned inefficiency. However, there is another issue with public utilities and x-efficiency. Electricity is not something that is easily stored, and therefore the relevant demand for electricity is the peak demand on the system.

Because public utilities must plan for peak load demands on the system, most of the time electric companies are operating at some fraction of total capacity. To smooth this peak out and make more consistent use of “slack” electric utilities, particularly in Europe, price their power at different rates taking into consideration the peaks and troughs in demand – higher rates in the peak times, lower rates in the troughs. This is

referred to as peak load pricing.



APPENDIX TO CHAPTER 9

STATUTORY PROVISIONS AND GUIDELINES OF THE ANTITRUST DIVISION¹

Sherman Antitrust Act, 15 U.S.C. §§ 1-7

§ 1 Sherman Act, 15 U.S.C. § 1

Trusts, etc., in restraint of trade illegal; penalty

Every contract, combination in the form of trust or otherwise, or conspiracy, in restraint of trade or commerce among the several States, or with foreign nations, is declared to be illegal. Every person who shall make any contract or engage in any combination or conspiracy hereby declared to be illegal shall be deemed guilty of a felony, and, on conviction thereof, shall be punished by fine not exceeding \$10,000,000 if a corporation, or, if any other person, \$350,000, or by imprisonment not exceeding three years, or by both said punishments, in the discretion of the court.

§ 2 Sherman Act, 15 U.S.C. § 2

Monopolizing trade a felony; penalty

Every person who shall monopolize, or attempt to monopolize, or combine or conspire with any other person or persons, to monopolize any part of the trade or commerce among the several States, or with foreign nations, shall be deemed guilty of a felony, and, on conviction thereof, shall be punished by fine not exceeding \$10,000,000 if a corporation, or, if any other person, \$350,000, or by imprisonment not exceeding three years, or by both said punishments, in the discretion of the court.

§ 3 Sherman Act, 15 U.S.C. § 3

Trusts in Territories or District of Columbia illegal; combination a felony

Every contract, combination in form of trust or otherwise, or conspiracy, in restraint of trade or commerce in any Territory of the United States or of the District of Columbia, or in restraint of trade or commerce between any such Territory and another, or between any such Territory or Territories and any State or States or the District of Columbia, or with foreign nations, or between the District of Columbia and any State or States or foreign nations, is declared illegal. Every person who shall make any such contract or engage in any such combination or conspiracy, shall be deemed guilty of a felony, and, on conviction thereof, shall be punished by fine not exceeding \$10,000,000

¹ Statutory material is current as of January 1997.

if a corporation, or, if any other person, \$350,000, or by imprisonment not exceeding three years, or by both said punishments, in the discretion of the court.

§ 4 Sherman Act, 15 U.S.C. § 4

Jurisdiction of courts; duty of United States attorneys; procedure

The several district courts of the United States are invested with jurisdiction to prevent and restrain violations of sections 1 to 7 of this title; and it shall be the duty of the several United States attorneys, in their respective districts, under the direction of the Attorney General, to institute proceedings in equity to prevent and restrain such violations. Such proceedings may be by way of petition setting forth the case and praying that such violation shall be enjoined or otherwise prohibited. When the parties complained of shall have been duly notified of such petition the court shall proceed, as soon as may be, to the hearing and determination of the case; and pending such petition and before final decree, the court may at any time make such temporary restraining order or prohibition as shall be deemed just in the premises.

§ 5 Sherman Act, 15 U.S.C. §

5 Bringing in additional parties

Whenever it shall appear to the court before which any proceeding under section 4 of this title may be pending, that the ends of justice require that other parties should be brought before the court, the court may cause them to be summoned, whether they reside in the district in which the court is held or not; and subpoenas to that end may be served in any district by the marshal thereof.

§ 6 Sherman Act, 15 U.S.C. § 6

Forfeiture of property in transit

Any property owned under any contract or by any combination, or pursuant to any conspiracy (and being the subject thereof) mentioned in section 1 of this title, and being in the course of transportation from one State to another, or to a foreign country, shall be forfeited to the United States, and may be seized and condemned by like proceedings as those provided by law for the forfeiture, seizure, and condemnation of property imported into the United States contrary to law.

§ 7 Sherman Act, 15 U.S.C. § 6a (Foreign Trade Antitrust Improvements Act of

1982) Conduct involving trade or commerce with foreign nations

Sections 1 to 7 of this title shall not apply to conduct involving trade or commerce (other than import trade or import commerce) with foreign nations unless--

(1) such conduct has a direct, substantial, and reasonably foreseeable effect--

(A) on trade or commerce which is not trade or commerce with foreign nations, or on import trade or import commerce with foreign nations; or

(B) on export trade or export commerce with foreign nations, of a person engaged in such trade or commerce in the United States; and

(2) such effect gives rise to a claim under the provisions of sections 1 to 7 of this title, other than this section.

If sections 1 to 7 of this title apply to such conduct only because of the operation of paragraph (1) (B), then sections 1 to 7 of this title shall apply to such conduct only for injury to export business in the United States.

§ 8 Sherman Act, 15 U.S.C. §

7 "Person" or "persons" defined

The word "person", or "persons", wherever used in sections 1 to 7 of this title shall be deemed to include corporations and associations existing under or authorized by the laws of either the United States, the laws of any of the Territories, the laws of any State, or the laws of any foreign country.

KEY CONCEPTS

Monopoly

Economic Profits

Comparisons with pure competition

Economic efficiency induced by monopoly

Rate Regulation

Social Optimum

Fair Rate of Return

Price Discrimination

Averch-Johnson Effect

Dilemma of Regulation

X-efficiency

Sherman Antitrust Act

Study Guide

Food for Thought:

Compare and contrast the monopoly model with the purely competitive model.

Critically evaluate the social optimum and fair rate of return theories of rate regulation of monopolies.

Develop and explain the monopoly model, showing an economic profit, a normal profit, and an economic loss. Can there be maintained in the long-run? Explain.

Sample Questions:

Multiple Choice:

An unregulated monopolist when compared with a purely competitive industry will:

- A. Produce more, and charge more
- B. Produce more, and charge less
- C. **Produce less, and charge more**
- D. Produce less, and charge less

Which of the following statements is true of an unregulated monopolist?

- A. Price is less than marginal cost
- B. Price is more than average revenue
- C. **Price is more than marginal revenue**
- D. Price is set where the monopolist chooses regardless of cost

True - False

Society would be unambiguously better-off without monopolists. {FALSE}

A monopolist can maintain an economic profits in the long-run, because there are substantial barriers to entry into its markets. {TRUE}

Chapter 10

Resource Markets

To this point the discussion of markets has focused on product markets. The purpose of this chapter is to examine the other set of markets identified in the circular flow diagram – factor markets. The markets to be examined in this chapter are those where firms purchase productive resources (in other words, factors of production).

Resource Market Complications

Over the course of modern American economic history there have been market failures, serious social problems, and other difficulties that have resulted in certain resource markets becoming heavily regulated. In particular, capital and labor markets have been the focus of substantial regulation.

2001 was the beginning of one series of accounting and brokerage scandals after another. Many of these scandals were from conflicts of interest, resulting in 2003 beginning to witness the regulation of financial markets in the U.S. The late 1990s witnessed the abuse of managerial trust by high ranking executives in awarding themselves very high compensation levels, while laying-off productive employees, and cutting wages and benefits for those who performed the work of the organizations. By 2003 these abuses have not yet been addressed by re-regulation, but as these becoming increasing problematic re-regulation will occur.

The United States seems to go through cycles where regulation and de-regulation ebb and flow. Resultant depressions and recessions, give way to more active government involvement in factor markets, and as things seemingly progress political pressure for de-regulation and the results of that political pressure set the stage for another round of economic difficulties. If history is instructive then market ups and downs are the natural order of things in a mixed economy.

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 than is true of normal product markets. However, this controversy also serves to make resource market extremely interesting.

Derived Demand

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 by its employer.** In other words, the demand for any factor of production is the schedule of the value of its marginal productivity.

The marginal product (MP) of a productive resource is the change in total output where ΔTP (Δ means change) attributable to the employment of one more unit of that productive resource ΔL , in this case change in labor.

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

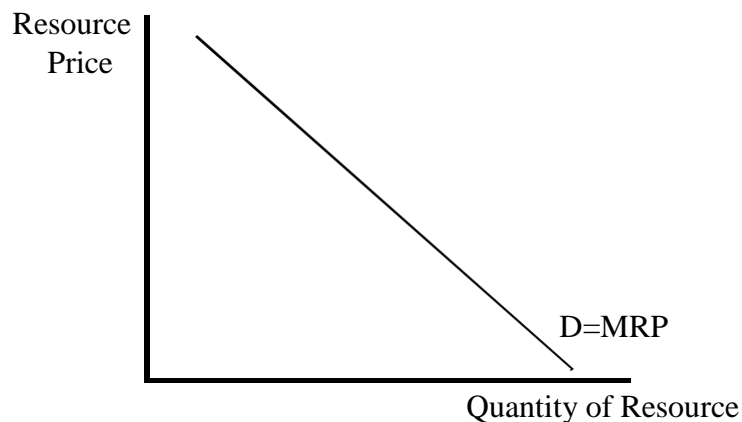
The marginal revenue product of labor (MRP_{labor}) is $MRP_{\text{labor}} = \Delta TR / \Delta L$
where ΔTR is the change in total revenue attributable to the employment of one more

unit of that resource:

$$\text{MRP} = \Delta \text{TR} / \Delta \text{L}$$

The demand for a productive resource comes from the business sector and the supply of that productive resource comes from the households (see Chapter 3). This is exactly the opposite of what happens in the product market, where consumers are from the households and the suppliers are from the business sector.

Because the demand for a productive resource is a derived demand, the demand schedule for that productive resource is simply the MRP schedule for that resource by the firm. The following diagram presents a demand curve (MRP schedule) for a productive resource. Notice, if you will, this demand schedule is downward sloping and is therefore for an industry is pure competition.



The determinants of resource demand are:

- (1) productivity of that specific resource,
- (2) quality of resource (i.e., education, etc.), and
- (3) the technology in which the resource will be employed.

As with product markets as the price of the resource changes so does the quantity demanded, that is, that causes shifts along the demand curve. If, on the other hand, a change in one of the non-price determinants of demand occurs then the demand curve will shift either left (decrease) or right (increase). If the productivity of a resource increases so too will its demand. Likewise if the quality of the resource declines, so too will its demand. If a change in technology occurs that requires less of a particular resource, the demand for that resource will also decline.

The non-price determinants of supply are pretty much factor of production specific. The supply of labor depends on several issues, but is basically the willingness and ability of persons to work, these issues are among the topics of labor economics (E340). The supply of capital depends on several issues, such as investor expectations and the life of plant and equipment, capital supply is dealt with in greater detail in finance (F301).

The determinants of resource price elasticity are:

- (1) the rate of decline of MRP,
- (2) the ease of resource substitutability,
- (3) elasticity of product demand, and
- (4) capital-labor ratios for the specific firm.

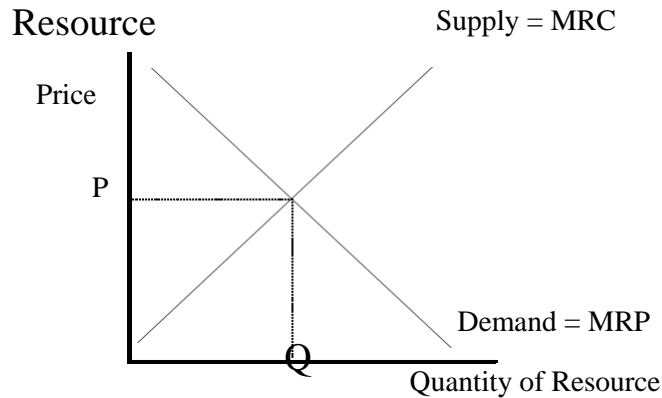
The greater the rate of decline of the MRP schedule the more inelastic the demand for the factor production, and the lesser the rate of the decline in MRP the more elastic the demand for the factor. If it is difficult to substitute one factor for another the demand will be relatively inelastic for the factor with few substitutes. The more price elastic the demand for the product, the more elastic will be the demand for the factor of production, and the more inelastic the demand for the product, the more inelastic will be the demand for the factor of production. Capital-labor ratios concern the technology used by the firm. The more intensely a factor is used the more inelastic its demand, all other things equal, and the less intensely the factor is used in a given technology the more elastic the demand for the factor.

The supply side of the market is the marginal resource cost side of the market. Marginal resource cost (MRC) is the amount that the addition of one more unit of a productive resource (ΔL) adds to total resource costs (ΔTC), which is:

$$MRC = \Delta TRC / \Delta L$$

The supply curve of a factor production in a purely competitive market is simply the MRC curve for that factor. In general, the industry supply curve for a factor of production is upward sloping just like the supply curve in a purely competitive product market.

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 and MRP is the demand curve for a purely competitive resource market. Consider the following diagram:



The equilibrium resource price and the quantity of the resource employed is determined by the intersection of the supply curve (MRC) and the demand curve (MRP). This equilibrium is similar to that found in the product market. Unless one of the non-price determinants of demand or supply change neither the supply nor demand curves will shift. Further, if there is a change in price, then all that happens is a movement along the curve, i.e., a change in the quantity demanded or a change in the quantity supplied of this factor of production.

Least Cost Combination of Resources and Technology

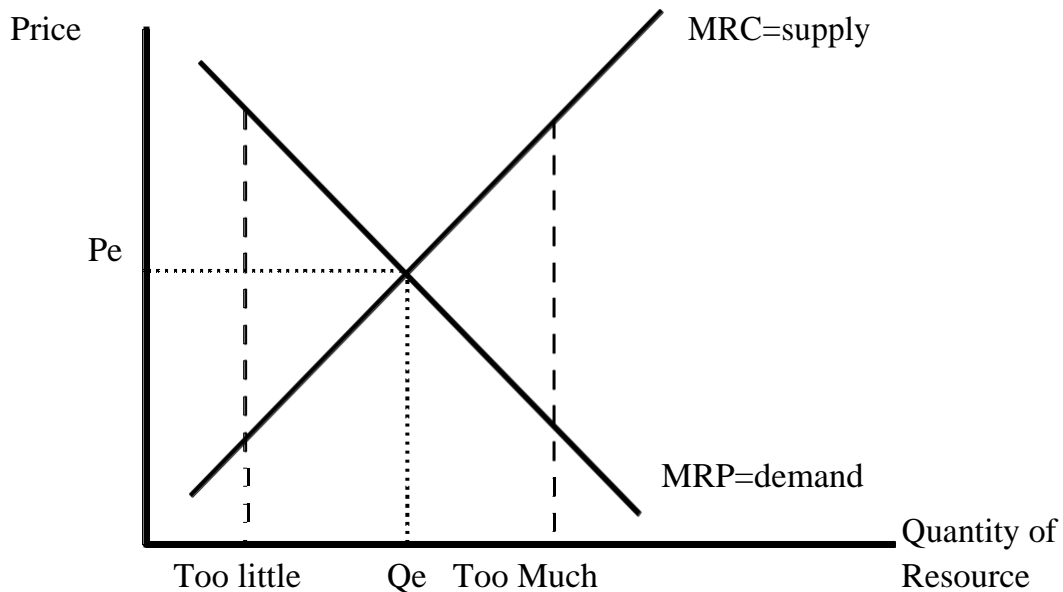
Marginal analysis also lends insight into the best technology that can be employed. Best, in this case, being judged by the most technologically efficient. The least cost combination of all productive resources is determined by hiring resources to the point where the ratio of MRP to MRC is equal to one for all resources.

$$\text{MRP}_{\text{labor}} / \text{MRC}_{\text{labor}} = \text{MRP}_{\text{capital}} / \text{MRC}_{\text{capital}} = \dots = \text{MRP}_{\text{land}} / \text{MRC}_{\text{land}} = 1$$

If the ratio of MRP to MRC for a productive resource is greater than one, then you have hired too little of that productive factor. Hiring more of that factor results in moving down the MRP curve and up the MRC curve until you reach the equilibrium level of employment. If the MRP to MRC ratio is less than one, then you have hired too much of that productive factor. Hiring less of that factor results in moving down the MRP curve and up the MRC curve until you reach the equilibrium level of employment. See the following diagram:

The equilibrium level employment is identified as Q_e and the equilibrium price level is P_e in the above diagram. The dashed line to the left of the equilibrium identifies the “too little level of employment” and the need to move up the MRP and down the MRC to arrive at an equilibrium price for this factor. The dashed line to the right identifies the “too much level of employment” and the need to move down the MRP and up the MRC to arrive at an equilibrium price for this factor or production.

Marginal Productivity Theory of Income Distribution



Economic freedom (see Chapter 1, economic goals) has both positive and negative implications. During the 1980s and most of the 1990s, the average worker in the United States has experienced a decline in real wages, which results in a lowering

of the standard of living. At the same time executive salaries and entertainers' incomes have enjoyed historically high levels. The distribution of income in this country critically depends on the factor markets and when those factor markets are encumbered by serious market imperfections there is inefficiency that results in people losing what they earn (exploitation in the factor market) and people obtaining income they did not earn (economic rents in the form of stock options, salaries, etc.)

The marginal productivity of resource markets has important implications for economic welfare. In a world of purely competitive markets any observed inequality in income arises simply because of differences in the productivity of different resources and the value of the product that resource produces. However, in a world with both purely competitive markets and monopoly power in some product and factor markets we will observe misallocations of resources as discussed in the monopoly chapter, and in the following chapter. The monopolist charges too much and produces too little, resulting in higher consumer prices and depressed wages in the factor markets for other businesses. Both results have negative implications for allocative efficiency and for workers who may be disadvantaged by such markets.

Employers can exercise substantial monopoly power in the factor markets, and often do. Where there is one employer or a small number of employers, especially when they collude to depress wages, this has the effect of giving the employer an exploitable market imperfection that has negative implications for allocative efficiency and any workers caught in such a market. This market power resulting from the described imperfection is called monopsony. **Monopsony is one buyer of a resource (or product) and cause factor payments (or prices) to be below the competitive equilibrium.**

Monopoly power in the product market will also impact the factor markets. Remember that the derived demand for a factor of production arises because the MRP schedule facing an employer is the demand curve for a factor of production. MRP is the change in total revenue due to the employment of one more unit of a resource. If the product is over-priced because it is sold in a monopolized market, then the MRP for that factor is too high. This results in some goods and services being over-valued and the factors that produce them being paid too much.

Professional athletes are a prime example of this exercise of monopoly power. Professional sports franchises are exempted from the anti-trust laws in the United States, but they are textbook examples of monopolies. The end result is that their products have become very much Over-priced and because their industry is highly labor intensive, the professional athletes are paid a large multiple of their true MRPs. Worse yet, this misallocation of resources results in consumers paying too much for tickets to sporting events, and too much for the products the athletes endorse in advertising. The allocation of resources to this industry also has a depressing effect on wages in other industries (after all there are limited resources).

KEY CONCEPTS

Derived Demand

Marginal Product, Marginal Physical Product

Marginal Revenue Product, Resource Demand

Determinants

Productivity

Quality of Resource

Technology

Elasticity Determinants

Rate of Decline of MRP

Ease of Resource Substitutability

Elasticity of Product Demand

K/L Ratios

Marginal Resource Cost, Resource Supply

Least Cost Combination of Resources

Technology

Marginal Productivity Theory of Income Distribution

Monopoly power

Monopsony in the resource market

STUDY GUIDE

Food for Thought:

Fully explain the profit maximizing rule for employing resources and the least cost combination of resources rule.

Using the following data complete the following table and derive a demand curve for labor (price of output is \$2 per unit):

Workers	Total Product	Marginal Product	MRP
1	22		
2	42		
3	60		
4	76		
5	90		
6	102		
7	112		
8	120		
9	126		

Fully explain the concept of derived demand.

Illustrate a resource market and compare and contrast it with a product market.

Sample Questions:

Multiple Choice:

Which of the following is the decision rule to determine the optimal combination of productive factors?

- A. $MRP_{labor} = MRP_{capital} = \dots = MRP_{land} = 0$
- B. $MRP_{labor} = MRP_{capital} = \dots = MRP_{land} = 1$
- C. $MRP_{labor}/MRC_{labor} = MRP_{capital}/MRC_{capital} = \dots = MRP_{land}/MRC_{land} = 0$
- D. **$MRP_{labor}/MRC_{labor} = MRP_{capital}/MRC_{capital} = \dots = MRP_{land}/MRC_{land} = 1$**

An increase in the productivity of a factor of production will typically increase the demand for that factor. Which of the following is associated with an increase in the demand for a factor of production?

- A. **A person's acquisition of human capital**
- B. An increase in the price of a complementary factor
- C. A decrease in the price of a factor of production that is a substitute for the factor under consideration
- D. All of the above will cause an increase in the demand for a factor of production

True-False:

Monopsony is one buyer of a commodity in the market. {TRUE}

The MRP slopes downward in an imperfectly competitive (resource) market serving an imperfectly competitive product market because the MP diminishes and the price of the output must be lowered to sell more. {TRUE}

CHAPTER 11

Wage Determination

This chapter is focused on the labor market. The model of the purely competitive firm's labor market will be developed. Once the competitive model has been completed, the model of a monopsony in the labor market will be developed. These models will be used to analyze minimum wages and unionization.

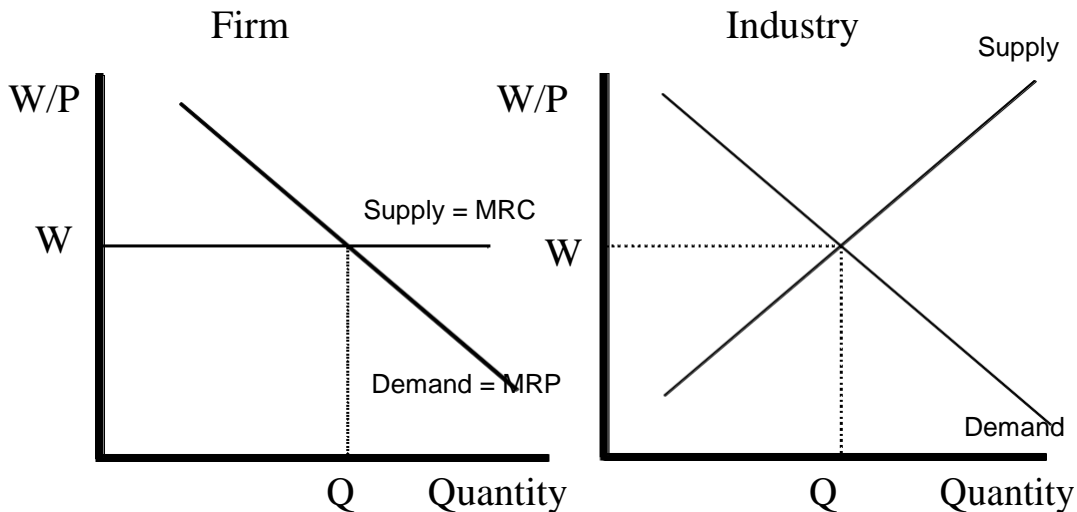
Wages and Labor Supply

Labor cannot be separated from the human being who provides it. The result of the inseparability of labor from the people who provide it, is that the wage for the last hour worked must be equal to the utility lost from the use of that hour for leisure activities (all other activities except work.) Further, because labor is provided by people who are also consumers, the wage variable (the price of labor in a labor market) is somewhat more complicated than prices in product markets.

Workers offer their services in the labor market for the standard of living that their wages will provide for them and their households. Therefore, the nominal wage (money wage) unadjusted for the cost of living; or W , means very little in determining the quantity of labor supplied in a factor market. The relevant wage variable is the real wage rate, which is the money wage (W) adjusted for the cost of living or price level (P); or W/P .

In theory (in the competitive labor market) an employee should be paid what she earns for the company. What the employee contributes to the revenues of the firm is the marginal revenue product, MRP (the marginal physical product (MPP) times the price of the product produced (P) – $MRP = MPP \times P$). In a perfectly competitive world this is what is supposed to happen. In a competitive labor market the wage is determined in the industry. The firm faces a perfectly elastic supply of labor curve. The equilibrium wage and level of employment is then determined by the intersection of the factor's MRP with the factor's marginal resource cost, MRC .

Consider the following diagram:

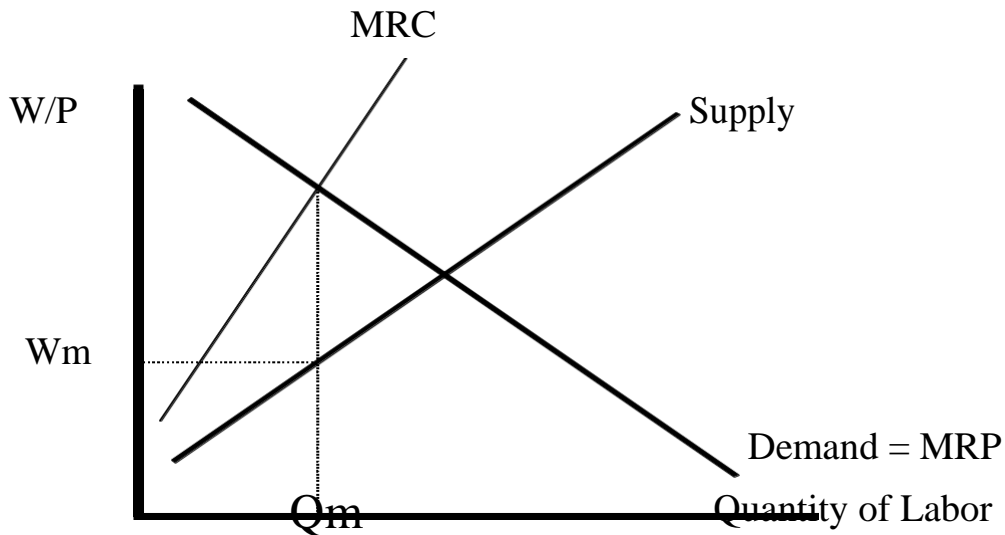


In this analysis of a firm in a perfectly competitive market, the supply and demand curves for the industry are summations of the individual firms' respective demand and supply curves. Notice that the firm faces a perfectly elastic supply of labor curve, while the supply curve for the industry is upward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

Monopsony in the Labor Market (one buyer of labor)

Unfortunately, the real world is not one of perfectly competitive labor markets. Factor markets are generally imperfect, and labor markets are generally monopsonies or contain elements of monopsony power in the hands of employers. **A monopsony is one buyer of something.** The monopsony model is based on the assumption that there is one employer, or a group of employers that collude, they purchase standardized labor, and the supply side of the market is competitive. Therefore, the monopsonist is a price giver in this labor market. The result is that the employer has a pricing policy. If the employer wishes to hire more labor he must raise the wage to attract the labor necessary to obtain the labor required. Therefore the monopsonist faces an MRC that is to the left of the supply curve and has twice the slope of the supply curve.

Consider the following diagram:



Notice, however, that the monopsonist does not have to pay the wage associated with the MRC 's intersection with the demand curve. The employer equates MRC with MRP to determine the least cost level of employment and then imposes the lowest wage the market will bear, that being the point on the supply curve associated with the intersection of MRP and MRC . Also notice that the wage and employment levels in the monopsony are much lower than that in a competitive labor market.

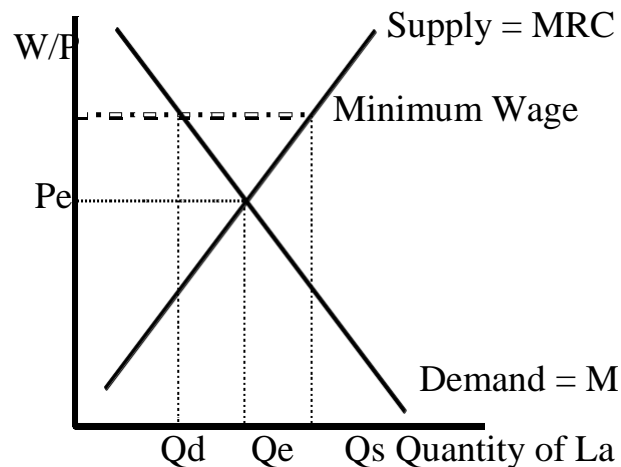
Control of Monopsony

It is clear that monopsony in the labor market is not consistent with allocative efficiency and has the effect of withholding significant amounts the employees' MRP from them, that becomes profits, advertising, charitable expenditures, or payments to other factors that did not earn those payments. It is clear that such reallocations are inconsistent with both equity and efficiency and have been the focus of numerous public policies attempting to thwart such misallocations based purely on market power.

One approach to the control of monopsony has been the imposition of minimum

wages. This approach is focused on controlling the worst effects of monopsony in the sense of inequitable redistributions from the working poor to the firms. A minimum wage does little to correct monopsony inefficiencies in all by the lowest paying occupations.

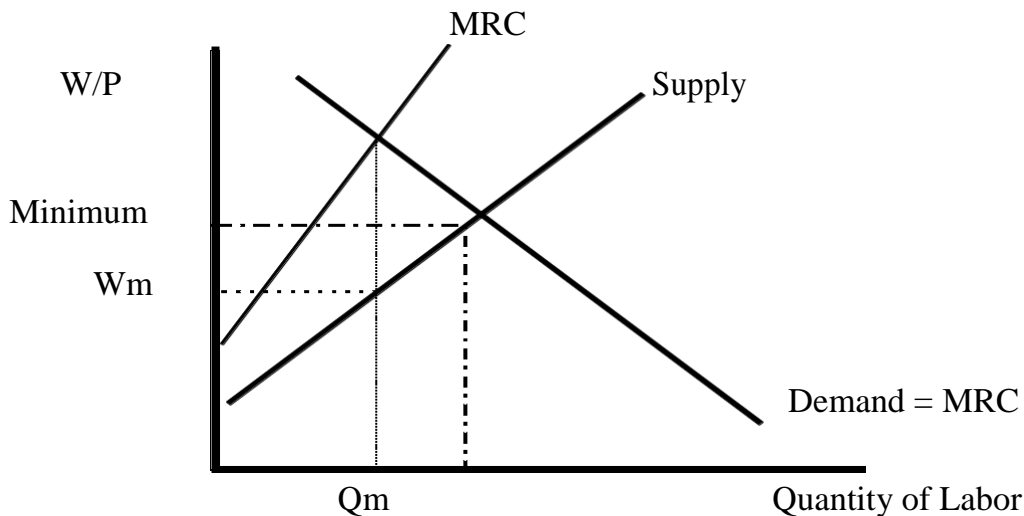
What is interesting is that some economists argue that the minimum wage is a source of unemployment and inefficiency. To prove their point they argue the minimum wages' effects under the assumptions of a purely competitive labor market. Consider the following diagram.



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. This analysis is exactly correct under these assumptions. However, remember the minimum wage was established to offset market power possessed by employers whose wage policies worked to the detriment of the working poor -- i.e., the monopsonist. To the extent that there may be some labor markets that approximate a competitive labor markets, the minimum wage creates unemployment. However, purely competitive markets, either product or factor, exist only in the pages of textbooks.

If minimum wages are analyzed in the context of the monopsony model for which the policy was intended the results obtained are far different than those of the competitive model. This is an example of how an analysis that has been passed-off as positive economics is really a normative model. If we assume competitive labor markets, we are making a normative statement, because only imperfectly competitive markets can be described in the real world.

Consider the following diagram:



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 as the employer slide back up the supply curve towards the competitive equilibrium. In the monopsony model there are no negative employment effects of the minimum wage unless it is established above the intersection of MRC with MRP.

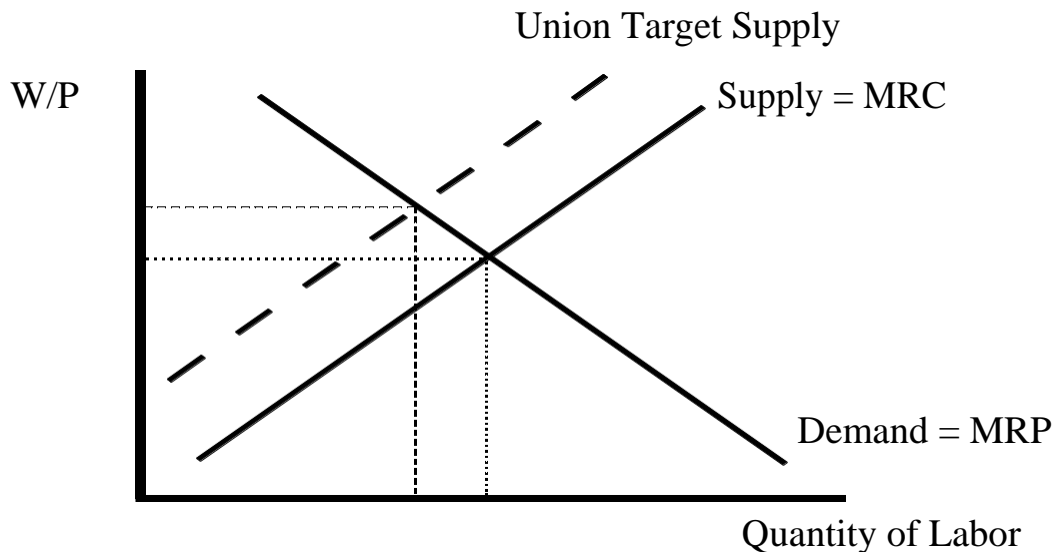
What the employment effects of the minimum wage are is an empirical question. Most of the research done concerning minimum wage effects have focused on the hospitality industry, in particular fast-food restaurants. This is one of the lowest paying industries in the U.S. economy and most recent research findings suggest either no employment effects or marginal positive gains in employment associated with the minimum wage. However, most of this research suffers from significant data problems. Earlier studies in a broader range of industries have generally found no employment effects, and the few studies where the data were competently gathered tend to confirm the monopsony power that requires market intervention.

In most industrialized countries the approach to controlling monopsony power has been to establish collective bargaining or co-determination as a matter of public policy and to provide legislation protecting organizational and collective bargaining rights for workers. Unions have the potential of being an effective response to restore allocative efficiency in the case of monopsony in the labor market. The Harvard Business School studies published recently indicate that unions effects in the U.S. have been to restore much of the efficiency lost due to monopsony.

Unions in a Competitive Market

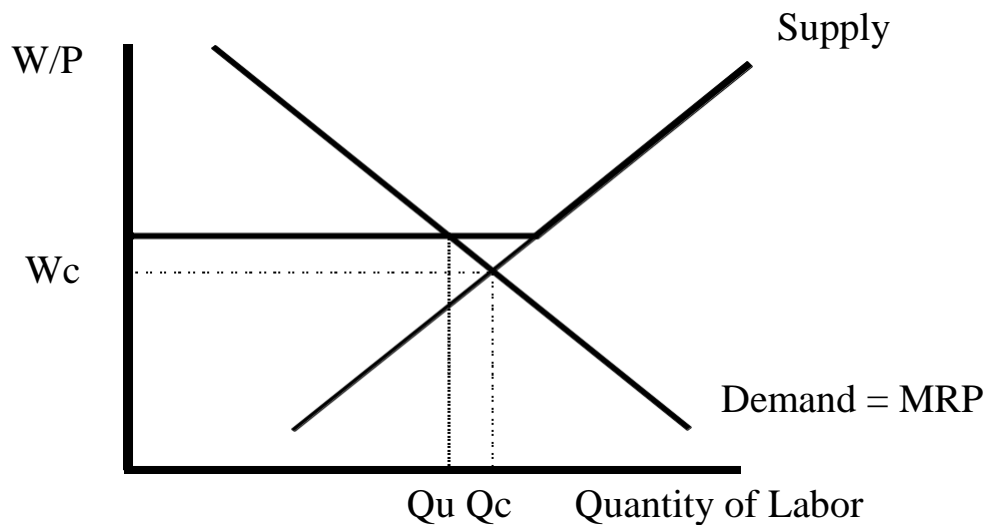
Again, there a group of economists who will rely on the use of the competitive model to illustrate the evils of unionization. The most common analyses are to subdivide unions into two classes, craft and industrial unions and show their effects in an otherwise competitive industry.

A craft union is one that was AFL affiliated (before the AFL-CIO merger in 1956), organizes one skill class of employees (i.e., IBEW) and is termed an exclusive union. Consider the following diagram.



Craft unions could control the supply of labor somewhat because of the fact that they represented primarily skilled employees and had control of the apprentice programs and the standards for achieving journeyman status. Because unions are the ones that train the skilled labor it is presumed that they can restrict the supply of labor within their craft and drive up wages. This is true, if we are willing to assume that unions could organize perfectly competitive industries.

An industrial union is one that was a CIO affiliate (before the AFL-CIO merger in 1956), organizes all skill classes within a firm (i.e., UAW), and is called an inclusive union. An industrial union's bargaining power arises from what is called solidarity, its ability to strike and withhold all labor from an employer (bearing in mind that a strike is also a costly venture for a union). Again, consider the following model of an industrial union in an otherwise competitive labor market.

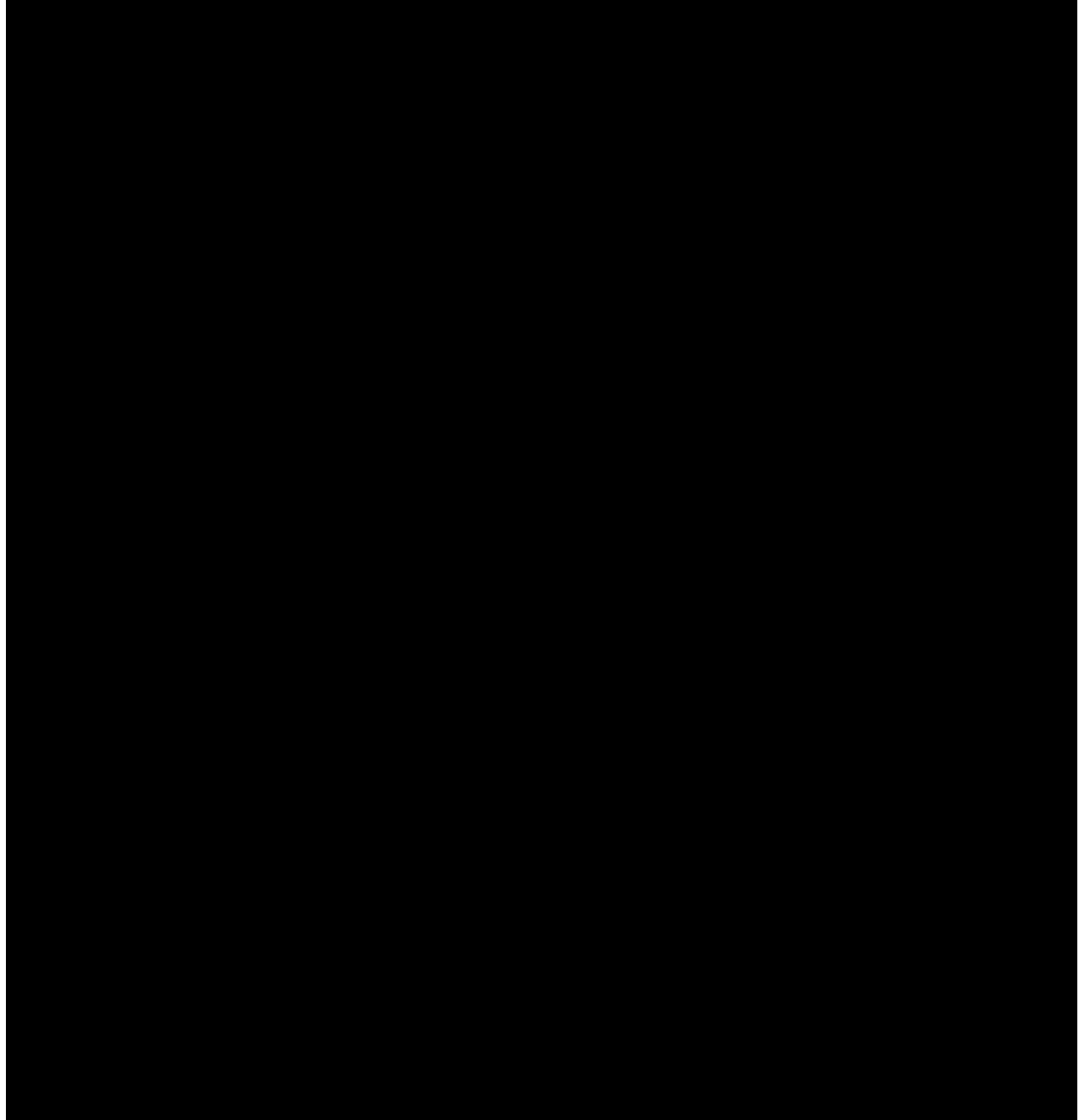


The industrial union establishes the minimum acceptable wage to the workers it represents, below which they will strike rather than work. This approach depends upon solidarity among the work force to make the threat of a strike effective. Assuming, that a strike can be effective within the legal and economic environments in which the union and management operate.

The serious flaw in this analysis is the market model used to analyze unions makes little sense. 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.

Further, it is interesting to note that the pure craft and pure industrial unions virtually no longer exist. Originally, the International Brotherhood of Teamsters represented primarily drivers and warehouse workers. Today, the Teamsters represent a wide range of employees working in most occupations and industries in the U.S. economy. Since the American Federation of Labor (AFL) and Congress of Industrial Organizations (CIO) merged in the mid-1950s, the distinction between the pure craft union has all but disappeared -- the exception are some locals of the traditionally skilled-trades unions in the building trades (i.e., International Brotherhood of Carpenters, International Brotherhood of Electrical Workers, the Bricklayers, the Glaziers, and the Laborers International Union). Most unions today are more consistent with the old model of industrial unions.

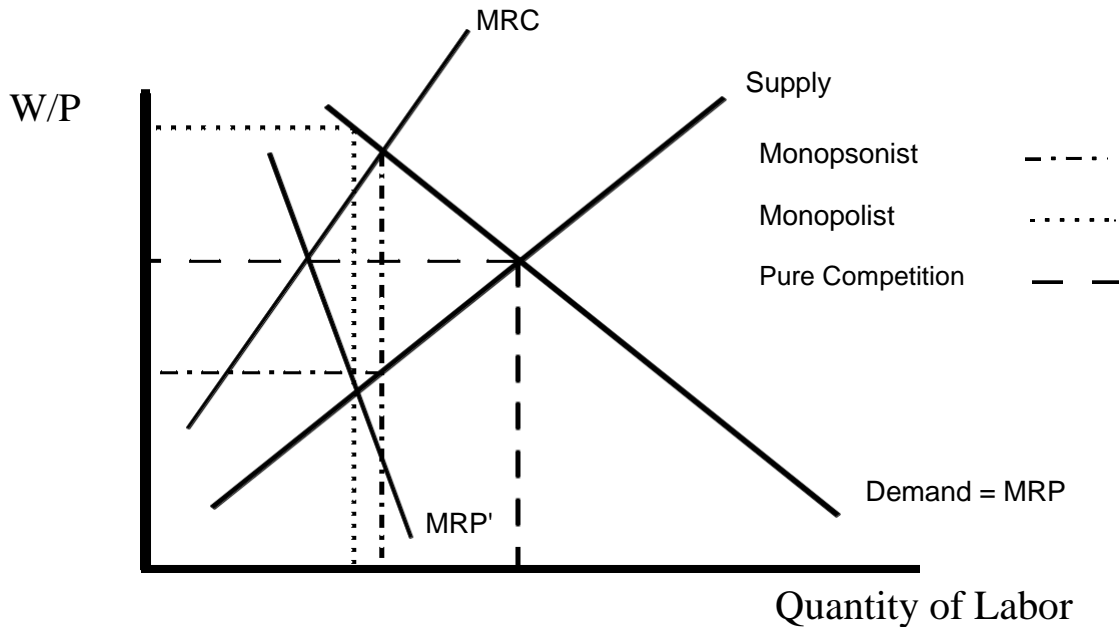
Unions and Monopsony



As with the minimum wage, the appropriate analysis is where there is a problem, in the imperfect labor markets. If we assume a monopsony, rather than a perfectly competitive market, we again arrive at a far different set of results. When a monopsony exists, working conditions and compensation levels are allocatively inefficient resulting in an employee's desire for a voice in their working conditions and a method to offset the monopsony power that binds them to wages below the competitive equilibrium.

These are the types of conditions that result in employees attempting to form unions for purposes of collective bargaining. Not only in this country, but in Europe and Asia too, where the industrialized nations have higher proportions of union organization.

The most common approach to monopsony control is to attempt to offset the monopsony power of the employer by creating a countervailing power on the supply side of the market. To offset monopsony power, unions attempt to approximate a monopoly, which theoretically should neutralize the monopsony. This addition of a monopoly on the supply side to a monopsony is called bilateral monopoly. The

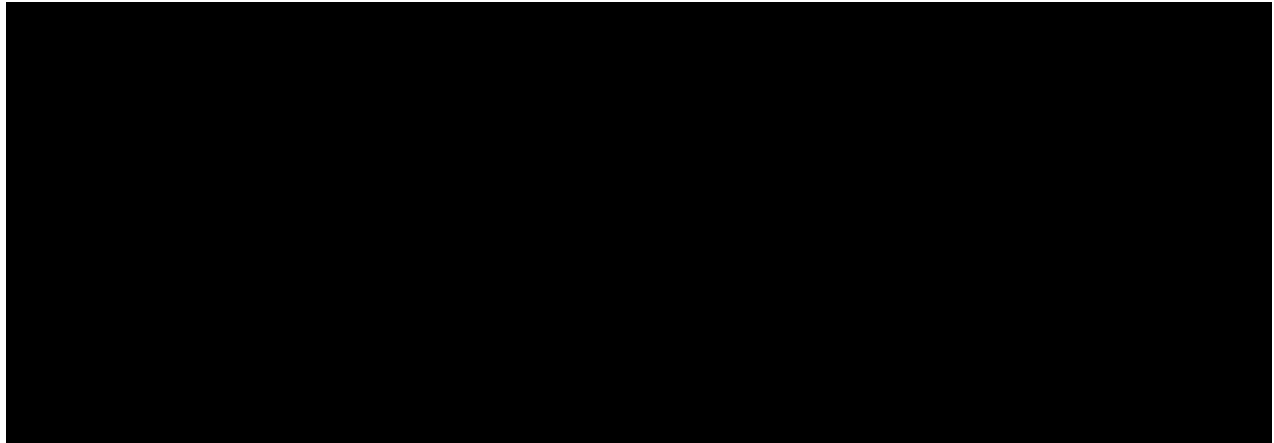


following diagram shows a monopsony that has been confronted by a monopoly. The bilateral monopoly model is rather complex. The employer (monopsonist) will equate MRC with demand and attempt to pay a wage associated with that point on the supply curve. The monopolist (union) will equate MRP' (MRP' occurs because now the union also has a pricing policy and must lower price to sell more labor) with supply and attempt 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 half-way between what the union and what the 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 indeterminant. The theory is that if the union and employer have equal bargaining power, the results of their collective bargaining should approximate the competitive labor market solution and restore allocative efficiency in these markets.

The academic significance of the indeterminant nature of this model is the lack of an ability to predict wages and employment levels is why industrial relations developed as a separate field from economics (in large measure). In fact, marginal analysis has

not yet evolved to such an extent that it can successfully explain collective bargaining results. Therefore, the mix of social sciences, jurisprudence, and marginal analysis that marks modern industrial relations is because of the need to have greater explanatory power than marginal analysis alone can provide.

The following box provides the language of Section 7 of the National Labor Relations Act, which is commonly called the Employee Bill of Rights. This statute applies to preponderance of private sector employees in the United States:



Labor History

The United States has a labor history that is not a particularly bright spot in our democratic traditions. Up to 1932 the U.S. government actively persecuted unions and their members. The first labor law case in the U.S. involved cordwainers, and the application of the criminal conspiracy doctrine to skilled workers *Philadelphia Cordwainers (1806)*. This British common law doctrine was applied to unions until 1842, when three things happened. First, the House of Commons outlawed the use of this doctrine against unions in England. Second, in the United States a judicial decision made it difficult to apply the doctrine to unions. In the *Commonwealth v. Hunt (Mass. Sup. Ct.)* decision Chief Justice Shaw ruled that unions were not criminal organizations, per se. He reasoned that if unionists were to be convicted of a criminal conspiracy there would be evidence required to prove that the purposes of the union were to violate some established criminal proscription. Third, employers discovered a preventative, rather than curative measure. The use of an injunction prevented, rather than prosecuted unions after they were already established and operating. Prevention was to the employers advantage because remedies for unionization often occurred long after the fact of a successful organizing campaign.

Injunctions are court orders that require someone to do something or to refrain from doing something. An injunction can be issued only in the case where irreparable

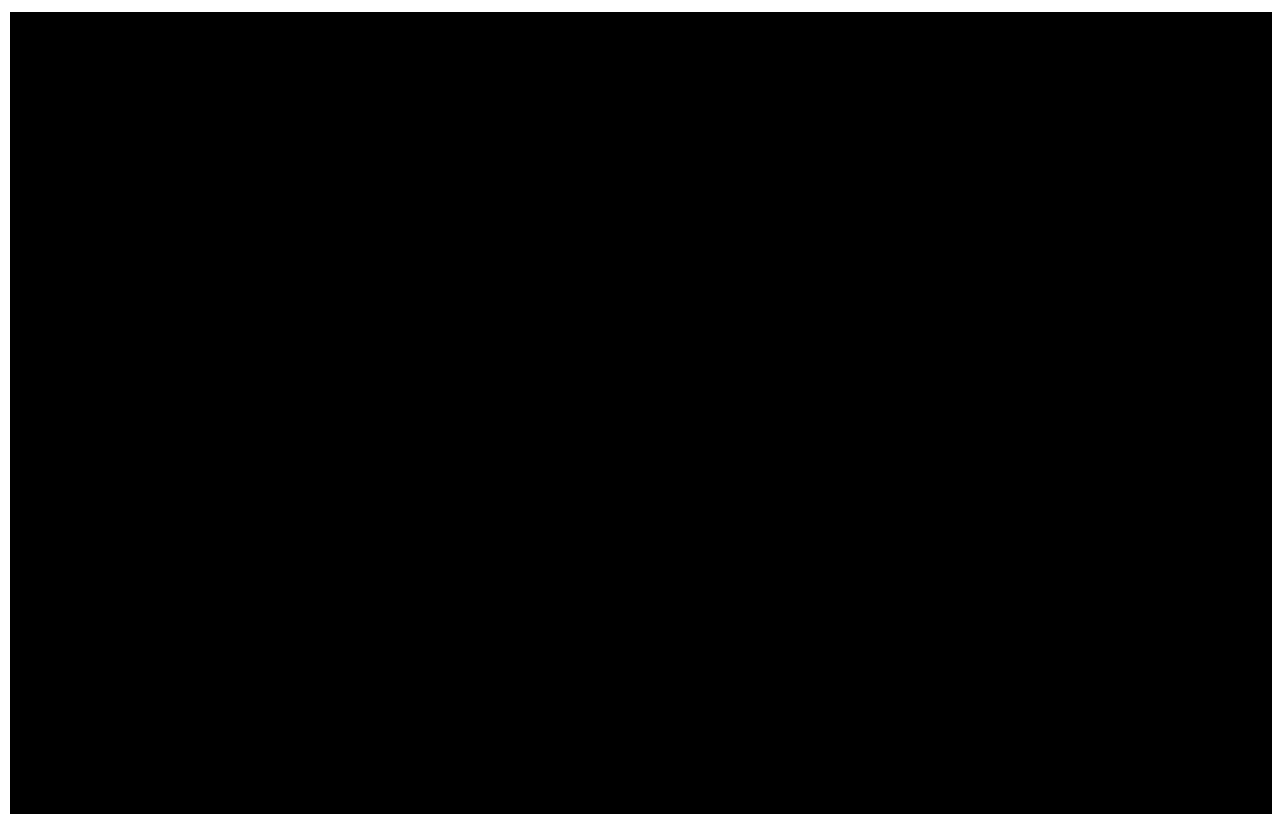
damage will occur in its absence. The violation of an injunction is punishable as contempt of court. The use of labor injunctions has a long, and sorted history in the United States. Because jurists came from the propertied class they often permitted their biases to interfere in the proper exercise of their obligations.

There are literally hundreds of examples of courts issuing injunctions interfering with union activities without evidence in support of the employer's request, or where evidence was clearly not competent, or where the injunction prohibited any and all union activities (blanket injunctions). Frequently, unions and their representatives were not given an opportunity to even be present in court when the petition for the injunction was first heard (a temporary restraining order) and the restraining order was converted to a permanent injunction without a hearing.

Perhaps, worse still, workers in the coal fields (and elsewhere) were often required to sign "Yellow-dog" contracts before they were hired. The "Yellow-dog" contract was an instrument where an employee agreed that they would neither join nor associate themselves with unions (and if they did they by so doing resigned their position with the company). Courts, particularly in southern and Midwestern states, enforced these so-called contracts with injunctions. The Congress finally banded the use of labor injunctions and made "Yellow-dog" contracts unenforceable in 1932 with the passage of the Norris-LaGuardia Act.

In 1890, the American economy was being overrun by massive monopolies that had become fairly anti-social. The Sherman Act was passed in 1890 to break the power of these giant businesses or trusts. Unfortunately, the anti-trust laws were not brought to bear against monopolies unless their conduct was totally unreasonable (i.e., Standard Oil, Amstar, American Tobacco). However, these anti-trust laws were routinely used against organized labor to prevent or punish labor unions. In 1914, the Congress passed amendment to the Sherman Act (Clayton Act) to remove judicial interpretations that union could fall under the provisions of the Sherman Act. Again, the courts ignored the law, and finally in 1932 these issues were not made subject to judicial inquiry, unless a product market was effected or there was clear evidence of union misconduct.

In 1932, the Congress enacted the first of the federal statutes designed to bring reason to labor-management relations in the United States. The first law passed was the Norris-LaGuardia Act and President Hoover (a conservative Republican) signed it into law. This act outlawed the use of injunctions against unions, the requirement that an employee sign a Yellow-Dog contract, and limited the use of the anti-trust laws



against unions. 1932-1935 was the only period in U.S. history that the government was neutral towards unions.

In 1935, the National Labor Relations Act (N.L.R.A.) was passed making collective bargaining the public policy of the United States. The N.L.R.A. was amended several times. The major amendments occurred in 1947 (Taft-Hartley), 1959 (Landrum-Griffin), and the health care amendments of 1974. Until 1981, the federal government fostered peaceful labor-management relations and enforced the provisions of the N.L.R.A. in a more or less neutral way. Beginning in 1981 we returned to pre-1932 days, without the violence.

The purposes of the N.L.R.A. was to foster peaceful labor-management relations and to maintain a reasonable balance between the power of unions and management so that society benefits. Yet, the politics involved in these matters have resulted in a rather unpredictable body of labor law that seems to change with changes in U.S. administrations. This is called the pendulum theory, Democrats seem to support collective bargaining and pro-worker legislation, Republicans seem to support management and government non-involvement (and there are notably exceptions to political party or individual candidate association with one side or the other).

To foster peaceful labor-management relations there must be a balance of bargaining power between unions and management. The theory behind the N.L.R.A.

was to permit free and equal negotiations to solve the monopsony problem in the nation's labor markets. Because atomized competition could not be enforced without substantial disruption to the economic system, the equalization of bargaining power was thought to approximate the competitive solution in a manner similar to that demonstrated by the bilateral monopoly model's results.

Of the world's industrialized nations, the United States has among the most peaceful labor relations. Nations such as England, Italy, and France have far more strikes and lost work time due to strikes than does the United States. Even Germany and Japan generally experience more lost time due to strikes than does the United States. However, compensation levels, and the extent of worker rights in the United States, lags far behind most of the rest of the industrialized world. This situation seems to be worsening over time. As Lester Thurow observes in his book, *Head to Head*, (pp. 204-06) the standard of living in the United States has steadily fallen since 1980. By 1988 the United States was eighth in the world in per capita purchasing power in the global economy. As of the summer of 1995 the purchasing power of American family's dollars had dropped out of the top ten among the world's industrialized nations (this is strikingly similar to the 1920s).

Public sector employees have fared no better than private sector employees. After a series of Federal Executive Orders extending collective bargaining rights to employees and the Postal Reorganization Act extending the N.L.R.A. to postal employees, the Congress passed the Civil Service Reform Act of 1974 which extending bargaining right by statute. However, much of this was negated for several classifications of Federal employees with the passage of the Homeland Security Act, which once again placed certain Federal Employees in a position where they have no statutory protection to organize and bargain.

State and local employee bargaining rights have some piece-meal. Thirty-eight states have collective bargaining laws protecting state employees. Only the old Confederate, and some poor western states, and Indiana do not have such statutes to protect these bargaining rights.

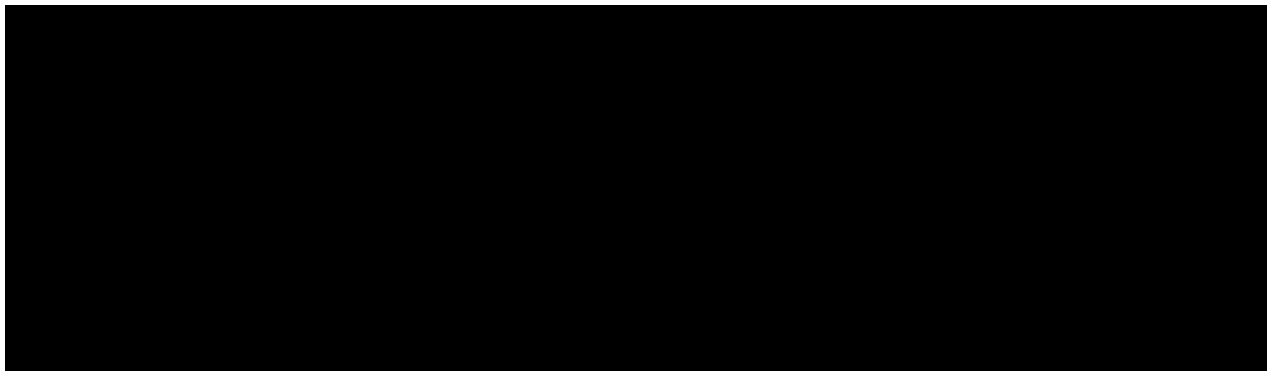
Wage Differentials

Market structure alone does not account for all of the variations in wages and employment. Market wage differentials arise from several other sources, including, (1) the variations in geographic immobility within segments of the U.S. labor force,. (2) the continuing racial and gender discrimination evident in the U.S. social fabric, and (3) differences in productivity that arise from abilities of workers.

The abilities, skills, and characteristics of workers that add to their productivity is called human capital. Abilities, personality, and other personal characteristics are a

portion of human capital -- many of these items are genetic, environmental, or a matter of experience. Education, training, and the acquisition of skills are human capital that is either developed or obtained. In general, it is hard to separate the sources of human capital, however, most is probably acquired.

There are significant wage differentials to be observed by sector of the economy. While some of this is explainable by human capital, and geographic region of the country, much of this differential has to do with the value of the products the labor is producing. Consider the following table:



The average weekly hours in the U.S. economy for calendar year 2002 was just over 34 hours per week. These data do not include fringe benefits provided such as health insurance, etc.

KEY CONCEPTS

Nominal v. Real Wages

Competitive Labor Market

Industry

Firm

Monopsony

Minimum Wages

In competition

In monopsony

Craft Unions

Industrial Unions

Bilateral Monopoly

Wage Differentials

Geographic immobility

Discrimination

Productivity Differences

Human Capital

STUDY GUIDE

Food for Thought:

Compare and contrast the real with the nominal wage. Do these distinctions have any bearing on motivation? Explain.

Develop the monopsony model and build in the union response to monopsony.

Develop the two models of unions in otherwise competitive labor markets. Critically evaluate these models.

Outline and explain the theory of human capital and how it relates to labor earnings.

Sample Questions:

Multiple Choice:

A monopolist in an otherwise competitive labor market will cause (as compared with the competitive labor market):

- A. Employment to increase, wages to decrease
- B. Employment to decrease, wages to decrease
- C. **Employment to increase, wages to increase**
- D. Employment to decrease, wages to increase

Which of the following best describes a union that organizes only a specific skill group, relies on apprentice programs to influence the supply of labor and is often called an exclusive union?

- A. An industrial union
- B. A CIO affiliate
- C. **A craft union**
- D. None of the above

True -False:

Bilateral monopoly is an indeterminant model, which gave rise to a need for better models to explain labor-management relations. {TRUE}

Human capital is concerned with the characteristics of labor that contribute to its productivity. {TRUE}

CHAPTER 12

Epilogue to Principles of Microeconomics

Changing World

Throughout this course, the focus has been on standard microeconomic analysis. However, the subject matter has been primarily focused on ideas that are, in the main, at least vaguely familiar. With the controversies about outsourcing and about corporate corruption, it should be clear that the world is changing rapidly. A stroll through almost any retail establishment will also make clear that the U.S. economy is rapidly becoming very internationalized. Before closing this course, it is necessary to make a few points about this changing economic world.

Outsourcing

There are several issues involved in the outsourcing of production in the U.S. economy. Outsourcing is an activity designed to cut the costs of production. This has two significant implications. First, the costs of production decline, which normally results in higher profit margins to the firm, with few implications for the pricing of the output. Normally, when something is outsourced it is a method used to cut *labor* costs. Perhaps one of the best examples of this outsourcing has been the movement to India of much of the computer software industry and a significant part of customer services for computer purveyors. This action was taken to cut costs, but that same cost cutting has implications for consumer incomes.

Consumers, for the most part, in this country have the resources to consume because they are also workers who earn a wage. In the principles of macroeconomics, you will study something called *Say=s Law*. *Say=s Law* says that the value of output produced is generally equal to the incomes earned in that production **B** hence just enough to buy that output in a closed system. When outsourcing results in the loss of income to workers, they consume less, in turn, reducing other people=s income, which has the effect of further depressing incomes, and hence demand.

Clearly, and unambiguous, the interdependence (circular flow) that exists in a modern economic system means that consumption and production costs are the opposites sides of the same coin. What may be a good idea in terms of technical efficiency may actually harm allocative efficiency and / or full employment.

Economics and Ethics

Morality and ethics are strong motivations to behavior. However, economists assume that rationality is a function of demonstrable self-interest. That means, material well-being **B** greed if you will. The acceleration of corporate scandals through the early part of this century seems to suggest a disregard for issues other than material well-being by many people who were in positions of authority in several major companies (Enron, Worldcom, Tyco etc.) Self-interest when measured purely in dollars and cents will often give rise to unethical, immoral, and perhaps even illegal conduct.

Ethics and morality are self-imposed (or societal) constraints without the binding authority of law. People may very well do what is right, because it is the proper thing to do. However, the proper thing is too often less binding than what is the most personally profitable. Faced with these decisions, it should come as no surprise that a society will have crises in ethics and morals when faced with decisions concerning their economic well-being. CEOs stealing from the companies they direct are clearly wrong, but there are also many shades of gray. A CEO making tens of millions of dollars, when his contributions to the firm=s productivity are a small fraction is not as clear as stealing directly, but perhaps the difference is in gradient only.

Clarence Updegraff (*Arbitration and Labor Relations*, Washington, D.C.: Bureau of National Affairs, Inc., 1972) describes the relationship of ethics with public opinion and law:

In all systems of primitive law, three elements of social control invariably seem to make early appearances. In the Roman law, these social controls were designated as *fas*, *boni mores*, and *lex*. The weakest of these in the beginning of the historical period was *lex*, or law. In all legal systems that truly develop to maturity it comes to be the dominate factor, but *fas*, the ethical or religious teaching, and *boni mores*, public opinion (or literally good morals) always remain important factors. The judge comes to deal almost entirely with law. At any rate, it dominates his technique of decision. . . .

Notice that economic self-interest is not mentioned. However, look around you and see how economic self-interest is the dominate factor in ruling a person=s conduct. It is the *fas*, *boni mores*, and *lex* that are the constraints on a person=s pursuit of their economic self-interest. Personal embarrassment may restrain greed, but the probability of being caught, and doing jail time is a far greater restrain on unbridled greed for most people.

One ought not to become confused. Microeconomics provides decisional tools in making efficient decisions. Microeconomics, however, cannot substitute for what is ethical, moral or legal. As a scientific approach to resource allocation, economics has much to offer, but as a philosophy of what is right, moral, or decent, it falls far short.

Internationalization

It is clear that the days of the United States remaining safe, secure and isolated by two oceans is long gone. The United States is part of a global economic system, and there is much that can be gained or lost by how we conduct our role on the world economic stage. The United States has a current dominate role, militarily and economically, but as any student of history knows, such dominate roles are never permanent. Egypt, Greece, Rome, Persia, the Mongol Empire, and the British Empire all rose and most had economic sources of their failing.

Free trade, tolerance, and a continuing development and reliance on comparative advantage are what provide for economic success. Technological innovation, natural resources, and human capital can provide significant comparative advantages in the production of commodities for trade internationally. It is upon these issues that the fate of the U.S. depends.

As cultural barriers to economic activity, tolerance and understanding become evident; Americans will have to learn what values dominate in other cultures, and what constraints exist. Americans will also find that they will need to learn other languages to be able to work and trade in foreign lands. With the advances in communications, transportation, and the increased demands on natural resources, it is clear this economy will become increasingly internationalized. It is how we learn to deal with this internationalization, and how well we prepare for it that will determine our economic success, as both individuals and as a society.

The work-world in the future of most college students today is far different from what confronted their parents. Immigration of workers into the United States, and significant foreign investment assures that greater cultural diversity will be in evidence. Greater understanding of the world=s religion, ethnic diversity, and cultural backgrounds will be absolutely essential if one never leaves the State of Indiana.

Much of the conflict in the Middle East today can be traced to failures to understand cultural differences. Because of this country= s inability to be independent and self-sufficient in energy, this critical area of the world will continue to be very important to our economic well-being.

American interests abroad generally mean business interests, and generally multi-national firms. The love that most people had for the United States, outside of this

country has been seriously mitigated over the past couple decades. Whatever the reason, just as business becomes more focused on the global economy, the global economy is becoming a more challenging place. The great generosity (i.e., Peace Corps, the Marshall Plan etc.) endeared us to a large portion of the world. It will be a challenge to regain this sort of love and respect from countries that are now mistrustful.

Finally, the economic environment in the U.S. is uncertain. The de-industrialization of the U.S. economy portends potentially hard economic times. Lower incomes, less economic security, and requirements on the work force to be far more adaptive may result the loss of comparative advantage in many markets, if we don't rise to the task. Education, investment, and determination will undoubtedly make our future bright, but there is competition, and we must not become complacent.

Parting Words

The principles of economics provide a rudimentary guide to decision-making on the margin. One of the hallmarks of sound economic reasoning is marginal analysis. While most people find it difficult to ignore **sunk** costs, it is often these very same sunk costs that lead people astray in deciding what to do next. It is hoped that this course will help make you think more like an economist, and act more rationally in your decision-making.

Economics is also the mother-discipline for the academic areas, roughly referred to as business administration. A solid foundation microeconomics is going to make marketing, production management, and finance far easier to master and apply. Price elasticity of demand (and other elasticities) is much of the subject matter in marketing, marginal analysis will again become central in the methods you use in production management, and finance is concerned primarily with capital **markets**. Therefore, microeconomics will follow throughout your academic career if you are a business major and throughout your real world career if you make decisions.

Appendix A

Sample Examinations

1. Sample Midterm Examination
2. Sample Final Examination

Sample Midterm Examination

Answers are found at the end of this section.

Multiple Choice (4 points each):

1. Which of the following factors of production are **NOT** properly matched with their factor payments?
 - A. Capital - interest
 - B. Land - profits
 - C. Labor - wages
 - D. All are properly matched
2. Which of the following terms means "all other things equal"?
 - A. Post Hoc, Ergo Propter Hoc
 - B. Fallacy of Composition
 - C. Ceteris Paribus
 - D. None of the above
3. Economic growth can be illustrated with the use of a production possibilities curve:
 - A. By a shift to the left of the curve
 - B. By a shift to the right of the curve
 - C. By a point on the inside of the curve
 - D. By a point on the outside of the curve
4. A small developing country in Central America has an economy that exhibits the following characteristics: (1) exchange occurs through markets, (2) private property is permitted, but there is also a large public sector, (3) what will be produced is decided by the government and the operation of markets, and (4) there is also a strong social desire to maintain the status quo.
 - A. This is definitely a capitalist system
 - B. This is definitely a command system
 - C. The economy is most likely a mixed system
 - D. It is impossible to tell what type of economic system this is from the information given

5. If Kansas can produce either 400 tons of wheat or 100 tons of corn and Nebraska can produce 300 tons of corn or 200 tons of wheat then it makes sense for the two states to specialize and trade. Which of the following accurately states the amount of grain that will be produced (assuming corn and wheat can be produced in constant ratios) and the terms of trade?
- A. Kansas will produce 0 wheat and 100 tons of corn, Nebraska will produce 300 tons of wheat and 0 corn, the terms of trade will be between 1.5 and 4 tons of corn per ton of wheat.
 - B. Kansas and Nebraska will produce the amounts shown in the stem of the question and the terms of trade will 4 tons of corn for 6 tons of wheat.
 - C. Kansas will produce nothing but 400 tons of wheat and Nebraska will produce nothing but 300 tons of corn, the terms of trade, assuming equal bargaining power, will be probably be 4 tons of wheat for 3 tons of corn.
 - D. We cannot tell what the terms of trade will be from the information, but there is no advantage to trade between Nebraska and Kansas.
6. Which of the following is a characteristic of a market economy?
- A. Limited role for government
 - B. Competition
 - C. Freedom of Choice
 - D. Specialization of Labor
7. If there were a decrease in demand and a decrease in supply, what would we expect to observe in a purely competitive market?
- A. price will increase, quantity exchanged is indeterminate
 - B. price will decrease, quantity exchanged is indeterminate
 - C. price is indeterminate, and quantity exchanged will increase
 - D. price is indeterminate, and quantity exchanged will decrease
8. The recent flooding in the upper Midwest destroyed a significant proportion of the corn crop. However, it has been discovered that corn oil is far better in keeping cholesterol within acceptable limits than was once believed. What would we expect to observe in the market for corn?
- A. price is indeterminate, and quantity exchanged will increase
 - B. price is indeterminate, and quantity exchanged will decrease
 - C. price will increase, quantity exchanged is indeterminate
 - D. price will decrease, quantity exchanged is indeterminate

9. If the supply curve shifts left and there is also an increase in demand what happens to equilibrium price and quantity?
- A. Price increases, quantity is indeterminate
 - B. Price decreases, quantity is indeterminate
 - C. Price is indeterminate, quantity increases
 - D. Price is indeterminate, quantity decreases
10. The term "scarcity" in economics refers to the fact that:
- A. No country can yet produce enough to satisfy completely everybody's wants for everything
 - B. It is impossible to produce too much of any particular good
 - C. Even in the richest country some people go hungry
 - D. Everything costs money
11. A city government regulates taxi fares. It also limits the number of taxicabs (through licensing), and has not changed the limit on cabs for many years. At one time vacant taxis were scarce and hard to find; but when the city increased the allowable fares 25 percent, vacant taxis suddenly became plentiful. The result is BEST explained by the economic principle of:
- A. A negatively sloped, downward sloping demand curve
 - B. Specialization & division of labor
 - C. Increasing marginal cost
 - D. Public goods
12. "The compact disk player has literally revolutionized the recording industry with its state-of-the-art sound, clarity, durability, and the fact that it costs less than cassette tape players." Assuming that compact disks and cassette tapes are substitutes, how will the equilibrium price and equilibrium quantity of cassette tapes be affected?
- A. Equilibrium price increases, quantity decreases
 - B. Equilibrium price decreases, quantity increases
 - C. Equilibrium price and quantity will both increase
 - D. Equilibrium price and quantity will both decrease

13. Which of the following is a function of money?
- A. Investment
 - B. Store of value
 - C. Bartering for goods
 - D. All of the above are functions of money
14. If the quantity demanded of Pepsi Cola goes up, and its supply increases what will happen in the market for Pepsi?
- A. Price is indeterminate, quantity increases
 - B. Price goes up, quantity is indeterminate
 - C. Price goes down, quantity goes up
 - D. None of the above
15. Which of the following describes the utility maximization rule? (where MU is marginal utility and P is price)
- A. $MU_a/P_a = MU_b/P_b = \dots = MU_z/P_z = 1$
 - B. Total MU = Total P
 - C. $MU_a = MU_b = \dots = MU_z$
 - D. None of the above describe the rule
16. A local airline charges \$500 to fly (round-trip) to Louisville, Kentucky. Over the past three months, while the \$500 fare has been in effect each of the two daily flights have averaged 10 passengers. During last summer, the carrier ran a sale and charged \$300 for a round-trip to Louisville; during the six weeks of the sale, the airline averaged 20 passengers per flight. What is the coefficient of price elasticity?
- A. 0.76
 - B. 1.00
 - C. 1.20
 - D. 1.33
17. Which of the following is a determinant of the price elasticity of demand?
- A. Whether a luxury or necessity
 - B. Price of complements
 - C. Number of consumers
 - D. All of the above are

18. Where is the range of unit elasticity for the following demand curve?

Price	Quantity
8	3
7	4
6	5
5	6
4	7
3	8

- A. From price 8 to price 6
- B. From price 6 to price 5
- C. From price 5 to price 3
- D. From price 7 to price 5

19. With perfectly inelastic demand, then if supply increases:

- A. Price remains the same, quantity increases
- B. Price remains the same, quantity decreases
- C. Price increases, quantity remains the same
- D. Price decreases, quantity remains the same

20. The price of Pepsi decreased from .50 to .40 and the quantity demanded increased from 100 million to 150 million. Which of the following statements are true?

- A. Quantity demanded decreased
- B. Demand is elastic
- C. Demand increased
- D. None of the above is true

True/False (1 point each)

1. A laissez faire economy will always result in economic efficiency.
2. Business sell to households in the resource markets, but households sell to businesses in the product markets.
3. If the prices of Fords decrease, we should expect the demand for Chevrolet to

decrease, *ceteris paribus*.

4. If the price of MacDonald's Cheeseburgers increases, we would expect the demand for Coca-Cola to decrease, *ceteris paribus*.
5. Correlation can only test whether two variables are statistically associated, it cannot test for causation.
6. The circular flow diagram illustrates that there is interdependence in modern industrialized economic systems.
7. Giffin's paradox states that a demand curve can only be downward sloping if consumers have a limited income.
8. An increase in the quantity demanded of a good can occur because consumers expect the price of that good to increase in the near future.
9. A price ceiling imposed above the competitive equilibrium will result in a shortage.
10. The demand curve slopes downward because of the income and substitution effects.
11. The United States is the example of a *laissez faire*, capitalist economy.
12. Microeconomics is concerned with decision-making within the firm, household or on the individual level, but macroeconomics is concerned with the behavior of the entire economic system.
13. Economic goals are complementary with one another, but may be conflicting with other social goals.
14. The quantity supplied of a commodity will increase if we increase an *ad valorem* tax on the commodity.
15. A price floor established above a competitive equilibrium will cause a surplus.
16. The income effect results from consumers having more resources available to purchase everything, if the price of one good decreases.
17. The maximum point (where it is goes flat or from increasing to decreasing) in the total revenue curve is associated with the unitary range in the demand curve.
18. The price elasticity of demand is the slope of the demand curve.

19. The law of diminishing marginal utility states that some consumers experience less utility from the consumption of a commodity than do other consumers.

21. When total revenue and price move in the same direction, demand is price inelastic; when they move in opposite directions demand is price elastic.

Answers:

Multiple Choice:

- 1. B
- 2. C
- 3. B
- 4. C
- 5. C
- 6. D
- 7. D
- 8. C
- 9. A
- 10. A
- 11. A
- 12. D
- 13. B
- 14. C
- 15. A
- 16. D
- 17. A
- 18. B
- 19. D
- 20. B

True/False:

- 1. F
- 2. F
- 3. T
- 4. T
- 5. T
- 6. T
- 7. F
- 8. F
- 9. F
- 10. T
- 11. F
- 12. T
- 13. F
- 14. F
- 15. T
- 16. T
- 17. T
- 18. F
- 19. F
- 20. T

Sample Final Examination

Answers are given at the end of the section

Multiple Choice (4 points each)

1. In a purely competitive market, the firm will take the price established in the industry. The question that the firm must answer is what quantity it will offer in the market. The firm makes this decision based on which of the following criteria?
 - A. Where average total cost is equal to average revenue
 - B. Where the marginal cost is equal to marginal revenue
 - C. Where the industry supply curve is equal to the demand curve
 - D. The firm cannot "decide" where to produce, this is imposed by the industry equilibrium
2. A perfectly competitive firm's short-run supply curve is its marginal cost curve:
 - A. For all output where marginal cost exceeds minimum average variable cost
 - B. For all output where marginal cost exceeds minimum average total cost
 - C. For all output where marginal cost exceeds minimum average fixed cost
 - D. For all quantities of output
3. A newspaper reports, "COFFEE GROWERS' MONOPOLY BROKEN INTO SEVERAL COMPETING FIRMS." If this is true, we would expect the coffee-growing industry to:
 - A. decrease output and increase price
 - B. increase output and decrease price
 - C. use more capital goods and hire fewer workers
 - D. use fewer capital goods and hire more workers
4. To regulate a monopolist at the social optimum implies:
 - A. We risk forcing the monopolist to make a loss
 - B. We will approximate a purely competitive market solution
 - C. The point where the social optimum is obtained is where $P = D = MC$
 - D. All of the above are true

5. An unregulated monopolist when compared with a purely competitive industry will:
- Produce more, and charge more
 - Produce more, but charge less
 - Produce less, but charge more
 - Produce less, and charge less
6. Which of the following is the decision rule to determine the optimal combination of productive factors?
- $MRP_{labor}/MRC_{labor} = MRP_{capital}/MRC_{capital} = \dots = MRP_{land}/MRC_{land} = 0$
 - $MRP_{labor}/MRC_{labor} = MRP_{capital}/MRC_{capital} = \dots = MRP_{land}/MRC_{land} = 1$
 - $MRP_{labor} = MRP_{capital} = \dots = MRP_{land} = 0$
 - $MRP_{labor} = MRP_{capital} = \dots = MRP_{land} = 1$
7. Which of the following is a nonprice determinant of the demand for a factor of production?
- Product Demand
 - Resource productivity
 - Quality of the Resource
 - All of the above are nonprice determinants of the demand for a factor
8. The demand for capital for a firm that can easily automate its production operations (all other things equal) can be characterized as:
- Price elastic
 - Price inelastic
 - Demand is increasing
 - Demand is decreasing
9. Which of the following is true of the minimum wage?
- If we assume a monopsony in the labor market, then there are likely no employment effects of the minimum wage as long as it's imposed below the monopsonist's desired wage rate.
 - If it is imposed above the competitive equilibrium, there will be unemployment as a result of the minimum wage.
 - If it is imposed below the competitive equilibrium, it will not be a binding constraint on the market.
 - All of the above are true.

10. A monopsonist in an otherwise competitive labor market will cause (as compared with the competitive labor market):
- A. Employment to increase, wages to decrease
 - B. Employment to decrease, wages to decrease
 - C. Employment to increase, wages to increase
 - D. Employment to decrease, wages to increase
11. A craft union is characterized by all but which of the following?
- A. Changes supply by manipulation of apprentice programs
 - B. Cause a kink in the supply curve at the minimum acceptable wage
 - C. Organizes only one skill group of employees and was associated with the AFL
 - D. All of the above are true
12. In a small Ohio community, we have only five employers who pay wages within a narrow range that is basically acceptable to each of the employers. The employees believed that the wage they received was below the competitive equilibrium so they unionized. The effects of this unionization in the small community was:
- A. A higher wage, but with increased employment
 - B. A higher wage, but with decreased employment
 - C. The wage didn't change, but there was increased employment
 - D. We simply do not know because the underlying economic model is indeterminant
13. If we have a monopolist that provides electrical service to a community and it is observed that the monopolist charges, what is viewed by most people as excessive rates, we may wish to regulate the monopolist. If we were to regulate the monopolist at competitive equilibrium we have regulated the monopolist at:
- A. The social optimum (allocatively optimal)
 - B. At where marginal cost is equal to average revenue
 - C. At a point where there is a greater quantity than would be observed at the monopoly rate
 - D. All of the above are true
14. Which of the following is not an assumption of the pure competition model?
- A. There is only public relations type non-price competition
 - B. There are no barriers to entry or exit
 - C. There is a standardized product
 - D. All of the above are

15. Because of the underlying assumptions of the purely competitive model, all of the following are true, but one, which of the following is not true of competition?
- A. Economic profits are a signal for new firms to enter the market
 - B. Purely competitive industries are economically efficient
 - C. Competitive firms= are guaranteed a profit at where $MC=MR$
 - D. All of the above are true
16. Which of the following does the marginal revenue curve intersect at their minimum?
- A. Short run average total cost
 - B. Total cost in the short run
 - C. Long Run Average Total Cost
 - D. None of the above
17. What are the causes of economies of scale?
- A. Ability to use by-products
 - B. Ability to use specialized management
 - C. Use of specialized capital goods in production
 - D. All of the above
18. Which of the following is an implicit cost to a business?
- A. The costs that are associated with factors of production that can be varied in the short-run
 - B. The forgone opportunity for the business to engage in the current activity
 - C. Any and all costs to the firm that are termed accounting costs
 - D. None of the above
19. Which of the following is true?
- A. $TC-MC=VC$
 - B. $AVC+TC=FC$
 - C. $AFC + AVC = ATC$
 - D. $MC + MR = \text{profits}$
20. Fixed costs:
- A. Exist only in the long run
 - B. Exist only in the market period
 - C. Are the difference between variable cost and total cost
 - D. Are only opportunity costs in the long run, but implicit costs in the short run

True/False (1 point each)

1. Other things equal, a monopolist will produce less, at a higher price than a competitive *firm will*.
2. Oligopoly is an industry with a large number of suppliers, but few buyers.
3. Society would be unequivocally better off without monopolists.
4. X-inefficiency occurs when a firm's actual costs of producing any output are greater than the minimum possible costs.
5. Price discrimination occurs when a firm can segment the market and charge different prices, which do not necessarily reflect the costs of production.
6. The MRP slopes downward in an imperfectly competitive (resource) market serving an imperfectly competitive product market because the MP diminishes and the price of the output must be lowered to sell more.
7. The demand for a factor of production in a competitive factor market is the MRP schedule for that factor, and this is why we refer to the demand as being a derived demand.
8. Human capital is concerned with the characteristics of labor that contribute to its productivity.
9. Labor offers its services for the nominal wage and the determinants of demand for labor are basically utility maximizing decisions within the household.
10. The marginal revenue curve in a monopoly model has exactly half the slope as the demand curve.
11. The supply curve in a monopoly is the marginal cost curve above average fixed costs.
12. The lower the value of the commodity produced, the lower the wage earned by labor, *ceteris paribus*.
13. In a purely competitive industry, supply is the summation of all the firms' marginal cost curves above average variable cost.
14. The shut down point is where the firm cannot cover its fixed costs of operation.

15. A firm in pure competition has a horizontal demand curve, which is also equal to the marginal revenue, and average revenue curves.
16. Long run average total cost curve is also referred to commonly as a planning horizon.
17. An economic profit cannot be maintained in the long run in monopoly, but can be in pure competition.
18. In the market period, all costs are variable, in the short-run there are both fixed and variable costs and in the long run all costs are fixed.
19. The cost structure of the firm is unrelated to the theory of production in pure competition.
20. The average fixed cost increases as the marginal cost curve is above it.

Answers:

Multiple Choice:

- | | |
|-------|-------|
| 1. B | 11. D |
| 2. A | 12. D |
| 3. B | 13. D |
| 4. D | 14. A |
| 5. C | 15. C |
| 6. B | 16. A |
| 7. C | 17. A |
| 8. A | 18. B |
| 9. D | 19. C |
| 10. B | 20. C |

True/False:

- | | |
|-------|-------|
| 1. T | 11. F |
| 2. F | 12. T |
| 3. F | 13. T |
| 4. F | 14. F |
| 5. T | 15. T |
| 6. T | 16. T |
| 7. T | 17. F |
| 8. T | 18. T |
| 9. F | 19. F |
| 10. F | 20. F |

APPENDIX B

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* denotes classic, must read sometime while you are still in school