

# INTERMEDIATE MICROECONOMICS

Reynolds – January 2006

## Chapter 1

### *Introduction*

Economics is the study of providing the means of living for individuals who live in social groups. The nature and scope of the study is determined by what is meant by the “means of living” and the nature of “social groups.”

#### **Economic Goods**

Clearly there are material requirements for life. A minimum level of food, shelter and clothing is necessary to meet physiological requirements. In addition to the material goods to meet physiological requirements, other material goods and services make life more enjoyable and meaningful. Automobiles, art, hot showers, television sets, computers and a myriad of other goods are not necessarily “necessary.” In some cases, they improve the quality of life but are not required to sustain life. In other instances, these things may be socially necessary or perceived as necessary in certain circumstances. Mainstream economists dislike the concept of “needs” and prefer the discussion of “wants.” There may be a dispute about what you need as opposed to what you think you need. Rather than debate what a person really needs, mainstream economists concern themselves with what individuals want. In neoclassical microeconomics, these “wants” are usually expressed as a “willingness-to-pay.” Economic goods are often described as those goods that have a positive price that individuals are willing (and able) to pay.

Most of neoclassical economics involves the analysis of market prices. Neoclassical microeconomics is sometimes called “price theory.” What neoclassical economics often ignores are the philosophical foundations, social setting and historical evolution of market processes.

#### **Noneconomic Goods**

However, as the cliché suggests, “Humans do not live by bread alone.” Humans want and expect more than the minimum means of subsistence. There are also nonmaterial activities that are important in individuals lives. People value a beautiful sunset or a walk on a crisp fall morning. Fresh air to breath and living in a community that is safe, friendly and stable is desired by most people. Relationships with pleasant, friendly individuals add much to one’s pleasure. Membership in groups who have similar values is desired by most. Respect, trust, compassion are fundamental components of social life.

#### **Interaction of Economic and Noneconomic Goods**

Individuals often trade economic goods for noneconomic goods and vice versa. Economic analysis must consider the interaction of economic goods and prices with the other aspects of human lives that are “valued.” The real price of any choice is the value of the alternative(s) that is (are) sacrificed. Economists call this opportunity cost. Ideally, the monetary, market price may be an indicator of the opportunity cost. Often it is not.

Because time, knowledge (technology), goods and resources are finite at any given point in time, it is impossible to have everything that humans want. There is some debate as to whether it is possible for all humans to have what they need. This argument is usually framed as a distributional issue and turns on what the analyst thinks that others “need.” Because of this relative scarcity economics is about choices that humans make about satisfying their wants (and needs).

Economics is the study of how individuals interact with the natural and built environments provide their means of living. A fundamental aspect of economics is and analysis of the processes by which individual behavior within a social context is coordinated. Each individual has information and incentives that may lead to behavior that is inconsistent with

the values and behavior of others in the group. It is necessary that all societies have some process(es) by which individuals' behavioral patterns can be coordinated.

Neoclassical microeconomics is focused primarily on the material goods and services that are produced, distributed and consumed through market processes. The purpose of this text is to broaden the scope to include other allocative mechanisms and nonmaterial values.

Warren Samuels argues that the *"economy is a process of valuation.... That to behave and to choose is to engage in valuation and thereby to participate in the social, or socioeconomic, valuation process."* (Samuels p ix) He goes on to point out that, *"the economy encompasses more than the market..."* and *"that other nonmarket valuational processes exist."* [ibid p 16] Some of the other valuation processes are effort, desire and tradition.

Valuation is the process by which individuals assign worth, merit or importance to a phenomenon (good or event). Relative value implies that individuals can rank the value or importance of a set of phenomena Economics then is the study of processes by which individuals and societies value resources, goods, alternatives, choices, and behavior.

## Scarcity

The behavior of individuals takes place in the context of natural and built environments. Individuals and organizations may seek to alter their environments to achieve objectives. Technology is the knowledge that enables humans to alter their environments and to use various environmental features to achieve their objectives. Incorrect or incomplete knowledge about the effects of interaction with the environments can have positive or adverse effects.

### NATURAL ENVIRONMENT

The natural environment consists of the features of the natural world. It is often considered composed of "gifts of nature." It includes what we call "natural resources." Natural resources include such things as: the topology of land, soil quality, climate (precipitation, temperatures, sunlight), water (quantity, quality, timing, location), rivers, harbors, flora, fauna, deposits of fossil fuels and minerals. The state and nature of knowledge, technology, determines which things we perceive as "resources." These elements of the natural environment can be classified in a number of ways. One possible taxonomy is

- Exhaustible resources - those resources whose quantity is initially fixed and are "used up." Deposits of minerals or fossil fuels are possible examples. Changes in information and technology may alter the ability to access sources that were previously too costly. A rise in the relative price of a resource due to depletion or additional use may also encourage the use of resources that were previously too expensive.
- Renewable resources- those resources that are capable of reproducing or being renewed through cyclical processes. Fish, deer, buffalo, whales and trees are a few examples of renewable resources. It is possible for human behavior to encourage or disrupt the reproduction or natural cycle.
- Flow resources - are those resources that are not diminished by their use. Wind and solar power are the most common examples.

In practice, it is not always easy to categorize specific resources. In some cases, a resource may have characteristics of more than one classification. The time period selected for analysis may alter the classification. In a short run period a resource such as a stand of old growth timber may be regarded as an exhaustible resource. If the period is lengthened, it may be regarded as renewable.

Technology and human behavior may alter those things that are perceived as natural resources. At one point in history, obsidian was considered an important resource while uranium was not. Changes in technology alter what humans perceive as "resources."

#### BUILT ENVIRONMENT

The built environment has two components; the physical infrastructure and the social infrastructure. The physical infrastructure is composed of the physical things that have been built. Roads, dams, buildings, irrigation systems, cleared land are a few examples of the physical infrastructure that is part of the built environment. The social infrastructure includes both implicit and explicit organizations and the body of knowledge or technology.

#### PHYSICAL INFRASTRUCTURE

Capital is defined as those things that are made by humans and used for the further production of goods and services. In this sense, much of the physical infrastructure can be regarded as capital. In some cases, the capital is owned by individuals or organizations. In other cases it may be held in common or owned by a governmental entity. The physical infrastructure is a function of the knowledge base and is

Knowledge how elements of the environment can be used or how the environments can be manipulated to achieve human objectives will be referred to as technology. The state of technology determines which of the elements in the natural environment will be regarded as "economic resources." Technology is a cumulative process. New technology is the result of combinations and permutations of "old technology." What we know and do today is a function of the knowledge we have acquired from the past. James Burke (*The Axemaker's Gift*) argues that every new technology not only increases our ability to do things but it also changes us.

Joel Mokyr attributes the growth of knowledge as one of the central themes of economic change. He gives us a taxonomy of knowledge. At the foundation, there is propositional knowledge that supports prescriptive knowledge.

*One is knowledge "what" or propositional knowledge (that is to say, beliefs) about natural phenomena and regularities. Such knowledge can then be applied to create knowledge "how," that is instructional or prescriptive knowledge, which we may call techniques. . . . I refer to propositional knowledge as  $\Omega$ -knowledge and to prescriptive knowledge as  $\lambda$ -knowledge. If  $\Omega$  is episteme,  $\lambda$  is techne. This distinction differs in important respects from the standard distinctions between science and technology that have produced a vast literature but has increasingly come under scrutiny. It is also different from the distinction between "theory" and "empirical knowledge."*

*. . . Knowledge resides either in people's minds or in storage devices (external memory) from which it can be retrieved. From the point of view of a single agent, another's mind is a storage device as well. The "aggregate" propositional knowledge in a society can then be defined simply as the union of all the statements of such knowledge contained in living person's minds or storage devices. I call this knowledge set  $\Omega$ . A discovery then is simply the addition of a piece of knowledge hitherto not in that set. Society "knows" something if at least one individual does. In this kind of model the social nature of knowledge is central: learning or diffusion would be defined as the transmission of existing knowledge from one individual to another. Similarly, I will refer to the union of all techniques known to members of society or in*

accessible storage devices as  $\lambda$ .

. . .

*What is propositional knowledge? It takes two forms; one is the observation, classification, measurement, and cataloging of natural phenomena. The other is the establishment of regularities, principles and "natural laws" that govern these phenomena and allow us to make sense of them. . . .*

*Science, as John Ziman (1978) has emphasized, is the quintessential form of public knowledge, but propositional knowledge includes a great deal more: practical informal knowledge about nature such as the properties of materials, heat, motion, plants, and animals; an intuitive grasp of basic mechanics; regularities of ocean currents and the weather; folk wisdoms in the "an-apple-a-day-keeps-the-doctor-away" tradition. (Mokyr, The Gifts of Athena, Princeton University Press, 2002, pp 4-6)*

Mokyr goes on to include geography, technological or engineering science and the like. He points out that  $\Omega$  can contain elements of knowledge that is mutually inconsistent. Propositional knowledge is described by its "tightness" which considers confidence and consensus of the knowledge. Mokyr points out that the collective knowledge is of greater importance than individual knowledge. He also points out that " $\Omega$  is self-referential: a great deal of knowledge consists of knowing that something is known and knowing how to find it." (ibid, p 9). Knowledge added to  $\Omega$  is discovery while knowledge added to  $\lambda$  is invention.

#### SOCIAL INFRASTRUCTURE

It is possible for groups to accomplish objective that cannot be achieved by individuals. Behavior in social groups may be guided by implicit or explicit forces. Custom, tradition and mores have evolved over time and are sometimes useful in solving problems. Organization may be more explicit. Alliances, firms, governments (including a system of law), churches and the like may be explicitly created through reason and contract.

Social institutions are also a component of the built environment. Habitual patterns of behavior are the embedded solutions that the members of society have worked out over time. Typically, these social institutions or embedded habitual patterns of behavior have evolved over time. If they are successful, they may be unchanged. If they are less successful or fail, individuals will adapt and social institutions will evolve. Because it takes time to recognize the degree of success of a set of institutions and for them to adapt, social institutions often lag behind change in technology and the environment. Individuals, groups and organizations that have power in the current state may also have a vested interest in preventing the change in institutions.

Social organizations may be used to coordinate the activities of individuals. These organizations may evolve "organically." Anthropologists sometimes argue that the family evolved as a way of procreating and rearing children. The tribe, clan and ultimately the state may be natural extensions. Aristotle argued that there was an organic foundation to the city-state. In other cases, groups explicitly organize and rationally create constitutions, charters or other rules of conduct.

#### SPECIALIZATION

Specialization and the division of labour are two important forms of social interaction that allow two or more individuals to do what an isolated individual cannot do. Both are means to increase the production of goods and services.

Specialization is the case where an individual (firm, organization or country)

focuses on the production of a specific good (or group of goods). It can increase the amount of goods that can be produced. It also requires some form of social institution to coordinate the process. If one individual produces food and the other clothing, the two individuals must interact if both are to have food and clothing. This interaction may be facilitated through an institution such as the market or a transfer based on kinship, marriage, religion or government authority. Plato suggests that the city-state is a social construct that is used to facilitate specialization and to improve the welfare of the members of that state.

In *The Republic*, Plato [427-347 B.C.] suggests specialization as an explanation of the origins of the city-state. Plato describes a conversation between Socrates and a group of students. They are pondering the nature of justice. They conclude that justice is each person doing that which they are best suited to do. The person best suited to be a baker should be a baker; the person best suited to be a shepherd should be a shepherd. Once individuals specialize, the city-state arises to facilitate the transfer of goods and the necessary interactions among the individuals. [*The Republic*, Book II]

Plato tries to identify the characteristics of the ideal society. One of the focal points is justice that is achieved by "each person doing what they are best suited to do." Social interaction is required because each person depends on the other members of the community. He devises a meritocracy that is led by philosopher kings. To prevent nepotism and greed from influencing these philosopher kings, Plato does not allow the philosopher kings to hold private property rights, all of their property is held in common.

David Ricardo (1772-1823), a classical economist formalized the concept of comparative advantage as an argument for specialization and free trade (and against the Corn Laws). He used an example of England and Portugal producing wine and cloth. With equal amounts of labour Portugal can produce more wine and cloth than can be produced in England. This may be due to land (soil types, climate), tools (capital) or other factors. However, Portugal can produce relatively more wine than cloth than England. When England specializes in the production of cloth and Portugal the production of wine, the same amounts of wine and cloth can be produced by the two countries with less labour. The labour that is saved can be used to produce more wine, cloth or other goods. Depending on how the additional goods are distributed among the citizens of England and Portugal, some individuals will be "better off" (have more goods) Ricardo did not address the issue of how the gains from comparative advantage would be distributed. However, if the countries specialize, social interaction is necessary. Free trade was the way in which Ricardo anticipated the benefits from specialization would be distributed.

#### DIVISION OF LABOUR

The division of labour is another form of social interaction that allows individuals to do what the isolated person cannot. In the division of labour, the production of a good is broken down into individual steps. One person then performs one step in the process. No single person produces the good alone. The actions of each individual in the production process must be coordinated. In modern industrial societies, production often takes place in a business firm.

"Management" is the process of coordinating the activities of the individuals within the production process. A specific application of microeconomics to the process of production within a firm is called "managerial economics."

Adam Smith [1723-1790] in the *Wealth of Nations* proposes that the division of labour is one of the major elements that contribute to economic growth (the increased ability to produce goods and services) [*The Wealth of Nations*, page 1]. The division of labour is the process of dividing a task (work) into its component

parts. Smith argues that the division of labour increases production through improved dexterity, saving time in moving from one task to another and improvements in tools.

Smith cautions about the effects of unrestrained use of the division of labour,

*"In the progress of the division of labour, the employment of the far greater part of those who live by labour, that is, of the great body of the people, comes to be confined to a few very simple operations, frequently to one or two. But the understandings of the greater part of men are necessarily formed by their ordinary employments. The man whose whole life is spent in performing a few simple operations, of which the effects too are, perhaps, always the same, or very nearly the same, has no occasion to exert his understanding, or to exercise his invention in finding out expedients for removing difficulties which never occur. He naturally loses, therefore, the habit of such exertion, and generally becomes as stupid and ignorant as it is possible for a human creature to become....But in every improved and civilized society this is the state into which the labouring poor, that is the great body of the people must necessarily fall, unless government takes some pains to prevent it. [Smith, *Wealth of Nations*, p 734-735]*

Smith, a professor of moral philosophy, constructed a system to explain a set of forces that would guide social and economic behavior. In *The Theory of Moral Sentiments* [1759] he showed the need for justice and a system of morality. In *An Inquiry into the Nature and Causes of the Wealth of Nations* [1776] he describes the role of self-interest and markets. In a third book that was destroyed at his request at the time of his death, he describes the need for a system of jurisprudence. Two sets of students' notes have been used to show these basic arguments in *Lectures on Jurisprudence* [1762-63 and 1766 published in 1978]. Smith describes a social system that requires morality, markets and jurisprudence to guide and constrain individual action in a social context.

Once humans use the division of labour and specialization, it is necessary for them to coordinate their efforts. They must interact on a variety of levels. Society is a complex set of interactions among groups and individuals. These interactions give rise to social institutions. The study of these interactions and institutions is "social science." Human interaction can be studied from a variety of perspectives. Sociology, political science, law, history, psychology, religion, anthropology and economics are examples of social sciences. These are often studied as separate disciplines. However, we should remain aware they are all interrelated perceptions of human behavior. While economics specializes in the study of the processes that coordinate human behavior as it allocates scarce resources to satisfy unlimited wants, its relationship to other social sciences should not be overlooked.

## Choices

At any given point in time, resources or inputs are finite. Neoclassical economics assumes that wants are unlimited. As a result, individuals and society must make choices about what to produce, which resources to use, how to use them. Once goods are produced, it must be decided how they will be distributed among the members of society.

It may be helpful to divide choices into two levels. First, there is a choice about the nature of the social infrastructure that acts as the "rules of the game." Secondly, there is another set of choices that deals with the allocation problem.

## RULES OF THE GAME

In any society there is a set of rules that constrains and/or guides the behavior of individuals and groups. This set of rules includes explicit rules such as law, regulations and codes of conduct and implicit rules. Explicit rules may be consciously created and enforced by various levels of government, churches, organizations (such as corporations) and social groups. Additionally, some rules evolve over time and are implicit in the social structure. Ethics, morality, institutions (embedded habitual patterns of behavior), customs, mores, traditions, and rules of thumb are a few examples of these implicit rules.

Douglass North argues that

*Institutions are the rules of the game in a society or, more formally, are the humanly devised constraints that shape human interaction. In consequence they structure incentives in human exchange, whether political, social, or economic. Institutional change shapes the way societies evolve through time and hence is the key to understanding historical change. (North, 1990, p 3)*

North expands "human exchange" to include human interactions that include "political, social or economic" phenomenon. Human exchange is interpreted as "human interaction on social, political and economic levels." North's broader definition will be used in this chapter even though the term "exchange" is quite specific:

*Exchange involves a quid pro quo, i.e. an exchange of private property rights between individual agents. The terms of the exchange are clearly specified: "I will give you this if you will give me that." The goods to be exchanged are clearly specified, as are the terms of the exchange. (Chapter 2, p 15)*

North identifies the roles of these institutions;

- *"Institutions reduce uncertainty by providing structure to everyday life." (North, p 3)*
- *"Institutions include any form of constraint that human beings devise to shape human interaction. Are institutions formal or informal? They can be either, and I am interested both in formal constraints – such as rules that humans beings devise – and informal constraints – such as conventions and codes of behavior." (North, p 4)*
- *"Institutional constraints include both what individuals are prohibited from doing and, sometimes, under what conditions some individuals are permitted to undertake certain activities." (North p 4)*
- *"A crucial distinction in this study is made between institutions and organizations. Like institutions, organizations provide a structure to human interaction. (North, pp 4-5; North points out that organizations are considered as one of the players or actors while institutions are the underlying rules of the game.)*

*"Institutions are a creation of human beings. They evolve and are altered by human beings; . . . Integrating individual choices with the constraints institutions impose on choice sets is a major step toward unifying social science research." (North, p 5)*

North refers to some institutions as "conventions and codes of conduct." Traditions, customs, mores, rules of thumb are other examples of implicit institutions that are part of the rules of the game. These habitual patterns of behavior or embedded rules may arise spontaneously. Individuals seek solutions to problems. When they find something that works (or provides a reasonable solution), they learn to try the same approach when the same or new problems arise. These institutions become short cuts to analyzing and

devising new solutions for every new problem.

These implicit institutions may be transmitted to others in a variety of ways.

Custom and traditions are the most obvious. It is possible to create codes of conduct that may be communicated through religious beliefs. Religious law and jurisprudence are common to almost all societies. In societies that depend on interpersonal relationships, these implicit institutions may be dominant in influencing behavior patterns.

In cases where the community becomes complex, the effects of social values on individual choices may be weakened. If implicit social institutions are weakened, force of law (formal explicit institutions) may be used to encourage some behavioral patterns and discourage others. Adam Smith had a manuscript on jurisprudence destroyed at the time of his death (1790). Copies of students' notes on Smith's lectures on jurisprudence (1762-63, 1766) were found and published as *Lectures on Jurisprudence (LJ)*. In these notes, Smith describes the role of law within a society.

The two traditions of common law and the Napoleonic code provide the framework for the legal systems in most Western industrial countries. Common law is based on *stare decisis*; i.e. laws emerge over time on the basis of precedence. As society, technology, relationships, environment and other features of society change, laws are modified. The Napoleonic code (dates from 1804) is based on Roman Law. It establishes a clear legal framework on issues of property, inheritance, the family and individual freedom. Both approaches provide formal rules of the game and may be considered as an explicit, formal institution.

The relationship between the legal and economic system is well established. John R. Commons (*Legal Foundations of Capitalism*, 1924) and Richard Posner (*The Economic Analysis of the Law*, 1973, sixth edition 2003) are foundations for two traditional approaches to law and economics.

#### INSTITUTIONS AND COSTS

The provisioning process and the allocation process both involve the ownership of resources and goods as well as the mechanisms by which the rights of ownership are transferred. Within a society, the transfer of ownership of goods is not without costs. In the case of eminent domain, there are costs (opportunity costs) to the authority that defines and enforces the transfer of ownership of goods (property rights). Individuals who are affected by eminent domain incur costs as well. There are also costs of using exchange. These costs are the effort (sacrifice) of individuals to obtain information about goods, other individuals who are willing to enter a contract and the effort to negotiate the contract or terms of exchange.

Social institutions and organizations are a social response to reduce the costs of exchange and eminent domain. Social institutions also facilitate and enforce reciprocity. The costs of using exchange are referred to as "transaction costs." (see Coase, "Nature of the Firm". 1937)

The institutions define the rules of the game; provide individuals with information and some degree of certainty in their social interactions. This reduces the time and effort (transaction costs) that individuals devote to the allocation problem.

Institutions and organizations are human creations that are intended to solve problems. It should be noted that these human creations might be intentional and explicit or unintentional and implicit. As in all human endeavors, some attempts are more successful than others; i.e. some institutions are more successful at achieving objectives than others.

Institutions arise as solutions to a given set of problems. Should the elements of the problem change (the actors, agents, technology, information, other institutions), the institutions may need to adapt. However, any set of institutions is correlated with the interests of particular individuals. Some of these individuals benefit from the particular structure while others are not. Those who benefit from a particular institutional structure have a vested interest in preventing changes in the institutions. These vested interests may use their positions and power to prevent institutional change and to work to alter institutions (particularly explicit institutions such as law) in their interests. Consequently, the institutions that are prevalent at any point in time may lag behind environmental, technological and social changes.

Patents, copyrights, regulations of communication industries (radio, television, newspapers, internet and the like) determine the behavior of the agents and firms in those industries. George Stigler (1911-1991) described a "capture theory of regulation." (Stigler, 1971, Published first in 1962 with Claire Friedland) He argues that when an industry is regulated, it is in the interests of that industry to capture the regulatory agency and influence its policies. The communication industries have a greater incentive to influence the policies of the Federal Communications Commission (FCC) than the average person. Recent actions by the FCC have allowed greater concentration of news media. Companies that publish music have more interest in the laws regarding the ownership (copyrights) and royalties to music than the public; the "Napster" incident on downloading music files from the Internet is an example.

The insurance, pharmaceutical, hospital and medical industries have more interest in the social institutions that influence the delivery of health care than individuals. Health insurance emerged in the mid 1930's as a solution to the problems of random, catastrophic health care costs and how hospitals and doctors would receive financial payment. The insurance and health care providers (doctors, pharmaceutical, hospitals and insurance industries and firms) have a vested interest in maintaining the system that maintains their sources of revenue.

The vested interests have an incentive to shape the formal and informal institutions that relate to their activities.

The institutional structure is the result of many forces. The nature and evolution of this institutional structure is of great importance to the functioning of any economic system. The institutional structure may promote or inhibit the achievement of such goals as economic growth, productivity, justice, stability, security, or personal liberty. The structure and evolution of the institutional structure of an economic system is of great interest. An interest in the relations between economic behavior and social institutions can be traced from the German Historical School of Economics to Institutionalists to the New Institutional Economics.

At one level it is desirable to consider whether the structure of the built environment or rules of the game are correlated to the economic objectives of the society. Economic growth, efficiency, stability, security and justice are possible objectives that may or may not be correlated to the institutional structure. At another level, it is desirable to consider the effects of changes in the rules of the game. Public policy is based on analysis of how changes in law, regulations, organizational structure or other rules will alter the achievement of social goals.

## ALLOCATION

Traditional approaches to microeconomics tend to focus on the allocation processes in market economies. The typical definition of economics is that it is

the study of how scarce resources are allocated to satisfy unlimited wants in a social context. This definition presumes that the rules of the game are given and that the fundamental problem in economics is to allocate resources to their highest valued use. There are five basic questions that principles of economics books discuss;

- What goods and services should be produced?
- How many goods and services of each type should be produced?
- How should the goods and services be produced?
- When should the goods and services be produced?
- Who should get to consume the goods and services?

## *Criteria for Choices*

Some choices are better than other choices. Societies have different approaches to the problem of scarcity. Some economic systems are more adept at satisfying the wants of the individuals in society. What criteria can be used to evaluate the rules of the game or social institutions? Given an economic system with a specific set of rules of the game, what criteria can be used to evaluate the choices about (1) What to produce, (2) How much to produce, (3) How to produce, (4) When to produce and (5) Who gets it?

Economics is the study of evaluating both the institutions that shape the economic system and the choices that are made given a system. We will call the process of creating and evaluating the rules of the game provisioning. The process of making and evaluating choices within a system will be referred to as allocation.

Choices can be evaluate by two different criteria; efficiency and ethics. Ethics is the criteria used to evaluate the right and wrong or goodness and badness of an objective, action or outcome. Efficiency is the criteria used to judge the degree to which an objective is achieved.

### **ETHICS**

Ethics consists of the moral principles used to evaluate the rightness and wrongness or goodness and badness of motives, objectives, behavior and outcomes of choices. The issues of ethics are complex and lengthy. For our purposes we will simplify and consider two approaches to ethical problems:

- Deontological ethics
- Consequentialist ethics.

#### **DEONTOLOGICAL ETHICS**

Deontological ethics is a standard of right and wrong based on duty. If I am deciding whether or not to vote in a presidential election, I might reason there is no point since my vote will not affect the outcome. If you try to convince me to vote because my vote is important, you will be hard pressed to find rational reasons. Deontological ethics is the only way you can convince me that I should vote; it is my duty to vote. If I fail in my duty, my action is wrong.

#### **CONSEQUENTIALIST ETHICS**

Neoclassical economics is based on a consequentialist ethic called "Utilitarianism." The rightness or wrongness of my objective or action is based on the outcome or consequences of my choice. Utilitarianism was formalized by Jeremy Bentham. Jeremy Bentham [1748-1832], an English philosopher, lay the foundation for British Utilitarian

microeconomics in his Introduction to the Principles of Morals and Legislation [1780]. Bentham presumed that human behavior was rational and was directed by "felicific calculus," an evaluation of the pains and pleasures associated with each choice. In Bentham's words:

*"Nature has placed mankind under the governance of two sovereign masters, pain and pleasure. It is for them alone to point out what we ought to do, as well as to determine what we shall do. On the one hand the standard of right and wrong, on the other the chain of causes and effects are fastened to their throne. They govern us in all we do, in all we say, in all we think: every effort we make to throw off our subjection, will serve but to demonstrate and confirm it. In words a man may pretend to abjure their empire: but in reality he will remain subject to it all the while. The principle of utility recognizes this subjection, and assumes it for the foundation of that system, the object of which is to rear the fabric of felicity by the hands of reason and law. . .*

*By the principle of utility is meant that principle which approves or disapproves of every action whatsoever; and therefore, not only of every action of a private individual, but of every measurement of government.*

*By utility is meant that property in any object, whereby it tends to produce benefit, advantage, pleasure, good, or happiness. . . or . . . to prevent the happening of mischief, pain, evil, or unhappiness to the party whose interest is considered; if that party be the community in general, then the happiness of the community; if a particular individual, then the happiness of that individual.*

*The community is a fictitious body, composed of the individual persons who are considered as constituting as it were its members. The interest of the community then is, what? -- the sum of the interests of the several members who compose it.*

*It is vain to talk of the interest of the community, without understanding what is the interest of the individual. A thing is said to promote the interest . . . of an individual, when it tends to add to the sum total of his pleasures; or, what comes to the same thing, to diminish the sum total of his pains.*

*An action then may be said to be conformable to the principle of utility . . . when the tendency it has to augment the happiness of the community is greater than any it has to diminish it.*

*A measure of government. . . may be said to be conformable to or dictated by the principle of utility, when in like manner the tendency which it has to augment the happiness of the community is greater than any which it has to diminish it." [Bentham, An Introduction to the Principle of Morals and Legislation, 1823 edition, Printed in Utilitarians, Anchor Books, Garden City, NY, pp.17-18]*

There were several rudimentary ideas advanced by Bentham that were extracted by economists and became crucial to the development of British utilitarian microeconomics:

- individuals are rational
- individuals are guided by pain and pleasure (utility)
- right and wrong are "tied" to pain and pleasure
- the sum of the utilities of individuals is the total utility of the community

- if each individual maximizes their utility it will maximize the utility of the community... "the greatest good for the greatest number" (*Notice in the quote above, Bentham states that the purpose of utilitarianism is to "...produce benefit, advantage, pleasure, good, or happiness. . .or. . . to prevent the happening of mischief, pain, evil, or unhappiness to the party whose interest is considered; if that party be the community in general, then the happiness of the community; if a particular individual, then the happiness of that individual."*)

Neoclassical economics is founded on a consequentialist ethic, Utilitarianism. Actions that increase the utility of the members of society are right and good. Actions that decrease utility are wrong or bad. At the same time, avoiding pain and seeking pleasure provides the incentives to encourage particular patterns of behavior.

## EFFICIENCY

Efficiency is the measure of how well one achieves objectives given a set of constraints. Efficiency is not in and of itself the objective. The word "efficiency" is a popular term and is often used to justify choices and behavior.

**Technical efficiency** is conceptually measured as a ratio of output to input.

For any given set of inputs, technology and output of one good, the maximum output of the other good is technically efficient.

Technical efficiency can be considered in the production of a single good. In the short run where one input is fixed (say K), the maximum efficiency of the variable input (say L) occurs at the maximum of the  $AP_L$  (where  $MP_L = AP_L$ ). The level of technical efficiency of labour is a function of the amount of K as well as technology.

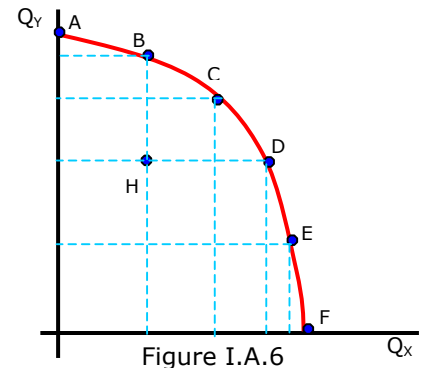
Technical efficiency does not consider the value or relative prices of either inputs or outputs. In physics, efficiency the concept of efficiency can be calculated by the different measures of energy (or the capacity to do work). Foot-pounds, foot-pounds per sec, Ergs, Joules, horsepower, horsepower-hours, BTU, kilowatts are all measures of energy. The input and output of energy of a particular process (internal combustion engine, electric motor, etc) can often be measured. From the perspective of economics, technical efficiency can be more problematic. What is the efficiency of an automobile? This depends on the measures of inputs and outputs chosen. Typically, miles per gallon may be used as a measure. Miles traveled is the presumed output and "gallons of fuel" is the input. This measure presumes that the number of miles traveled is the sole objective output. Passenger miles, passenger safety, status of owner, or many other measures may better reflect the desired output or objective of the automobile. The same problem exists for the inputs. The presumption is that fuel is the only input. The other inputs such as energy to produce the tons of steel to create the car may be ignored.

The optimization (maximization) of technical efficiency can occur by maximizing the outputs for a given input or by minimizing the inputs for a given output. It is not possible to maximize output and minimize inputs at the same time. If a public health agency instituted a policy to immunize preschoolers for DPT (diphtheria, pertussis and tetanus) and wanted to maximize efficiency, the problem could be framed in two ways. First, they might be allocated a set of resources (vaccine, personnel, offices, etc) and then try to vaccinate as many children as possible. Alternatively, they might try to vaccinate all children by using as few resources as possible. Neither the process nor the results are the

same.

In the transformation or production possibilities model, technical efficiency lies on the transformation or production possibilities frontier.

The location and shape of the PPF is determined by technology, quantity and quality of inputs. It represents all output combinations possible. The quantity and quality of inputs are fixed. The task is to maximize the outputs. The output combination identified at point H is "technically inefficient." More of good Y or good X (or more of both) can be produced with the same set of inputs and technology. All technically efficient solutions lie on the PPF. Technical efficiency does not answer the question about which output combination is preferred or most valuable. Allocative or economic efficiency is required to answer that question.

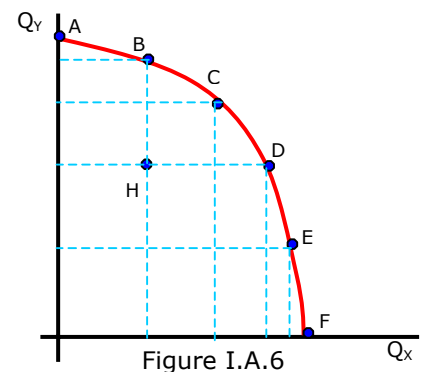


**Allocative or economic efficiency** includes the values or relative prices of outputs and inputs. The benefit or value of a choice is represented by the product of the price and quantity of each good or output (value of output =  $P_x Q_x + P_y Q_y + \dots + P_n Q_n$ ). The value of the inputs or cost is represented by the product of the prices and quantities of the inputs (cost =  $P_L L + P_K K + \dots + P_i Q_i$ ). Allocative efficiency is attained when we maximize the value of the outputs relative to the value of the inputs. The cost is minimized for a given output or output is maximized for a given cost. The economically efficient solution must lie on the production possibilities function.

**Pareto efficiency** is the condition where there are no alternatives that will increase the welfare (utility) of one person without reducing the welfare (utility) of any other person(s). Once an output combination on the production possibility function is attained, that output combination is Pareto Optimal.

Pareto efficiency is a restrictive criteria and tends to promote the *status quo*. Most choices involve marginal benefits and marginal costs that change the welfare or utility of more than one individual. The Pareto efficiency criterion

The output combination at point H is not Pareto Optimal. Irrespective of individual preferences a move from point H to output combinations at point B or D (or any where in the area HDB) represent "Pareto Improvements." Each alternative in the area HDB is "Pareto Superior" to the alternative represent by point H. If the current output combination were at point E, it would be Pareto Optimal even if it were not the highest valued output. Any increase in good Y (or X) would require a decrease in good X (or Y). The individuals who prefer X (or Y) to Y (or X) would be "worse off" (their utility or welfare is lower). If the output is currently at point H, the area HDB is called "Pareto Safe."



fails to justify choices that result in the highest valued use of resources (economic efficiency). To remedy this problem the criterion of **Pareto Potential** is used. Pareto Potential justifies the choice of an alternative so long as the "winners" (individuals whose utility increased) can hypothetically compensate the "losers" (individuals whose utility decreased) and still be better off. This is the foundation of criteria such as Benefit/cost analysis, rate of return on investment and internal rates of return. The problem with Pareto

Potential is that it introduces the question of equity. Consider the problem of breaching dam is the Pacific Northwest. There are winners and losers. Environmentalists, individuals who benefit from anadromous fish and agents who earn income from tourists are some of the winners. Electricity generators and farmers are examples of losers. Even if the marginal benefits of breaching the dam exceeded the marginal costs, there is no mechanism to insure the winners would compensate the losers. There is necessarily a judgment about the morality of the dams and the imposition of costs and benefits of various groups of individuals. This example also illustrates the issue that the *status quo* tends to be supported by the Pareto Optimality criterion. Building the dams imposed costs and conferred benefits on different groups of people just as breaching the dams will. As societies and individuals change their preferences, technology and environments change and alter the objectives and optimal use of scarce resources. In an ideal world, informed individuals engaged in voluntary exchanges will result in transfers of property rights that are Pareto improvements and lead to economic efficiency.

## Making Choices

Choices may be made by individuals or by groups of individuals. The primary role of any economic system is to coordinate the choices made by individuals so that the utility, satisfaction, welfare, or wellbeing of the society is optimized.

### INDIVIDUAL CHOICES

Individuals may use a number of approaches to the process of making choices. They may use reason (rationality), rules, habitual patterns or intuition.

#### RATIONALITY

Rationality requires the individual to have information. They must know their objectives and the feasible alternatives they may choose.

Further, they must know the relationship between each feasible alternative and the probability of achieving the objective. This information is not costless. As a result, the individual must consider the cost and effort they are willing to incur to acquire the information; the economics of information is the analysis of the acquisition and use of information. Generally, rational choice requires:

- a known objective
- knowledge of feasible alternatives
- a criteria to evaluate each feasible alternative with respect to the objective

#### STRATEGIC AND RATIONAL BEHAVIOR

The behavior of individuals acting alone may or may not be rational. By rational we simply mean that an agent knows their objective and is able to evaluate among all feasible alternative actions or choices to find that choice which "best" achieves the objective. This process involves some subjective valuation of "best." This subjective evaluation must include a ranking or valuation of priorities, knowledge of constraints, and the (marginal) benefits and costs associated with each choice.

- Economic behavior involves interactions with others. Each choice requires the agent to consider the reactions of others. A seller must consider how the buyer and other sellers will react to their behavior. Market structures offer some clues as to the reactions of participants in market behavior.

## RULES AND HABITS

If behavior is constrained or influenced by rules, rules of thumb or habits, the nature of those rules and the process by which the rules evolves is of interest to economists. If the agent's decision is constrained, the nature of those constraints is of concern.

Rules may be implicit or explicit. Explicit rules often take the form of law and maybe imposed by governments or organizations. Generally, explicit rules are conscious creations and must be communicated and enforced. Social groups may also use explicit rules. Business firms, churches, and other organizations may explicitly impose rules. Implicit rules may also be important constraints. Implicit rules are not consciously created but must still be communicated implicitly or explicitly. Social expectations, customs, mores and traditions often inform individuals about rules of behavior.

Certain types of behavior are expected and influenced by such social constructs as "manners," mores, custom, rules of thumb and traditions. These rules are short cuts to problem solving. If over time a particular problem is always, or nearly always, resolved by a specific approach, that approach becomes a habit or rule of thumb. These rules and habits provide ready-made solutions that do not have to be derived by reason or intuition. If a habit, institution or custom fails to provide reasonable solutions over a period of time, new solutions emerge to become new rules, customs or institutions.

## INTUITION

In recent years, there has been a growing interest in the interrelationship between psychology and economics. Daniel Kahneman (Nobel Foundation prize winner) has explored intuition and reason as thinking and decision processes. (Kahneman, pp 1449-1475) According to Kahneman, intuition can be powerful and accurate, requires practice and is "rapid and effortless." The reasoning process provides a check on the intuitive process.

## COORDINATION OF INDIVIDUAL CHOICES

Ideally, each individual is free to make choices that are consistent with their desires (preferences, values) and at the same time, these choices are consistent with the commonweal. Competition, cooperation and conscription may be used to coordinate individual actions. Different societies have attempted different approaches at different times.

## COOPERATION AND CONSCRIPTION

Cooperation implies voluntary agreements and a coordinated approach to the solution of a problem. Conscription implies a non-voluntary or forced behavioral choice in the allocation process. An economic input (labour, capital, land) or good can be conscripted. Conscription implies the ability of one person or group to force another to make choices they would not prefer. Conscription implies that some form of coercion has taken place. Cooperation and conscription are opposite ends of a spectrum or range of behavioral patterns. At another level voluntary and coerced behavior are at opposite ends of a spectrum of motivations.

The degree to which a choice is voluntary or coerced is not always clear. A group of Inuit people above the Arctic Circle may use cooperation as an important element of the coordination process. "Cooperation" may

be encouraged by strongly held common values or necessity. Each member of the society understands that their chance for survival is reduced if she or he is not a member of the community. A behavior that is not sanctioned by the community (e.g. theft, murder, or even stating an idea that is not shared by others, etc) may result in the individual being ostracized and expelled from the community, the result being death. Is the acceptance of group values and activities voluntary or coerced? If a government (a formal social institution for allocating power and decision making authority in a community) uses sanctions to force behavior or choice it is clearly coercion and conscription. If I threaten you with harm if you do not make a given choice or act in a specific way, that is coercion. If a person's mother says, "You go ahead but it will break my heart!" is that coercion?

Voluntary cooperation and coerced conscription lie at opposite ends of a continuum. It is a variation of the arguments about whether individuals have free will. The shift from voluntary coordinated behavior (cooperation) to coerced coordinated behavior (conscription) is a matter of degrees. In both cases, individuals have an incentive to coordinate their behavior. In the case of coercion, the incentive is the costs created and imposed by other individuals or groups of individuals. A student in high school may feel coerced by their peers, the class bully or the rules of the system. A worker may be coerced by social pressure, other workers, the management of the firm, corporate rules and government regulations.

#### COMPETITION

Market oriented societies focus on the use of competition to constrain individual behavior. In Western industrial societies, competition is regarded as the optimal way to coordinate economic behavior. A market exchange is a contract between sellers and buyers where each seeks to optimize their self-interest. The seller competes to get the highest possible price (or best deal), while the buyer competes to buy at the lowest possible price. The competition between the buyer and seller is influenced by the tastes (or preferences), information that each has, the alternatives that each has, their relative incomes and the "rules of the game" (customs, mores, laws, regulations, institutions, ideologies, values, principles, etc).

The word "competition" has at least two meanings in economics. One refers to rivalry. In rivalry, there is a winner and a loser. Tennis players are rivals; one wins, one loses. The other is a structural notion of "pure" competition based on the number of sellers and buyers and their responses within markets. The sellers do not see themselves as rivals (Farmers are often thought of as being engaged in highly competitive markets but do not see themselves as rivals; farmer A will help farmer B harvest her crop.).

#### MODERN ECONOMY IS A MIX OF COOPERATION, CONSCRIPTION AND COMPETITION

Generally, societies use a mix of cooperation, conscription and competition. The difference among different economic systems is the degree to which one (or more) of these processes is emphasized. The aboriginal society in Australia has been based on traditions, customs and mores for 40,000 years according to some estimates. Certainly there has been cooperation, conscription and competition as elements of that society. Western industrial societies have emerged in the last 250 to 500 years (depending on the criteria used). In each case, the

mix of cooperation, conscription and competition has been different and resulted in fundamentally different societies with different solutions to the economic problems of allocation and provisioning.

All societies develop social institutions (behavioral patterns) to coordinate the activities of production, distribution and consumption. There is a wide range of forms these institutions may take depending on the physical environment, state of technical knowledge, social values and other factors. These institutions and behavioral patterns may rely on some combination of competition, cooperation. Market systems tend to focus on competition while other systems may have a larger role for cooperation or conscription.

A bicycle race is a useful metaphor. There are rules that govern equipment, use (or nonuse) of drugs, routes and tactics. In a road race, the riders cooperate in the peleton (the large group of riders in a bicycle race) by drafting (using the rider in front to reduce the wind drag). When a group breaks away from the peleton, they typically form a pace line and each shares the work of riding in front of the group. Eventually, the structure of the pace line disintegrates and the riders compete in a sprint to the finish or they fall back into the group. The race is a mixture of cooperation and competition. The rules of the race, the equipment available, the shared values of the racers (expectations about the behavior of other riders), the route and the surface of the course are examples of provisioning. The structure and character of these elements determines the nature of the race. A road race is fundamentally different from a mountain bike race. The ability and determination of each rider, given the structure of the race, determines or allocates the finishing position (winner, 2<sup>nd</sup>, 3<sup>rd</sup>, etc) of each rider. The winner of a mountain bike race may not be the winner in a road race. Soccer and American football have 11 players on each side and a ball. Because the rules are different, a good soccer player may not be a good football player.

In the context of a firm, colleagues cooperate to achieve ends. At the same time, they may compete for promotions or raises. Some one who is too competitive and doesn't cooperate (or is too cooperative and doesn't compete) may not get the big promotion.

Joan Robinson argues that an economic system "... requires a set of rules, an ideology to justify them, and a conscience in the individual which makes him (sic) strive to carry them out." (Robinson, p 13) Provisioning is the way in which society develops the rules, ideology and conscience. The allocation mechanism is the ways in which individuals choose to act given the rules.

## *Allocative Mechanisms*

There is a variety of allocative mechanisms that society may use to coordinate individual choices. These allocative mechanisms are processes by which property rights are transferred from one individual or agent to another. These include:

- Markets
- Reciprocity
- Eminent domain
- Philanthropy, theft, householding (subsistence)

## MARKETS

A market consists of all potential buyers and sellers of a related good.

In neoclassical economics, a market is usually represented by supply and demand functions. The supply function represents the behavioral patterns of sellers while the demand function represents those of buyers. The idea of an economic system based primarily on markets emerged in the mid 18<sup>th</sup> century. One of the first schools of economic thought to advocate *laissez faire* and a reliance on unimpeded markets was the Physiocrats led by Francois Quesnay (1694-1774). Adam Smith's (1723-1791) "*Inquiry into the Nature and Causes of the Wealth of Nations*" (1776) was the first book that outlined an economic system based on markets.

A simplified version of a market relies on voluntary exchange of goods with nonattenuated property rights between two or more agents. A market exchange is a contract that specifies the nature and conditions of the exchange. It is based on *quid pro quo*; one thing in return for another. What is given and what is given in return is specified and known to the parties to the contract.

Agents are individuals who make choices and have the authority to act on those decisions. An agent may represent a principal, i.e. an individual (principal) may empower another individual (agent) to act for them. An individual owner of common stock may allow another individual to make decisions and act for them. A patient (principal) may allow a physician (agent) to act for them, an individual who buys stocks may allow a stockbroker to act for them, a person may allow a lawyer to act as their agent. Later we will explore the problem of an agent who has a conflicting interest that is counter to the interests of the principal; this is the principal agent problem.

In order for markets to coordinate the interests of agents, exchange must be voluntary and involve goods that have nonattenuated property rights.

### *Voluntary Transactions*

In order to ensure that an exchange is a Pareto improvement the agents must enter into the exchange voluntarily. In neoclassical economics, it is assumed that an individual will enter into a contract or exchange only if they are made "better off" or at least no worse off. Consequently, any voluntary exchange or contract then is a Pareto improvement, i.e. someone or both are "better off" and no one is any worse off. If a contract or exchange is not voluntary, we cannot be sure that it is a Pareto improvement. Contracts made under duress, with minors or under other specific conditions are not enforceable.

### *Nonattenuated Property Rights*

The operation markets and market exchange is facilitated by strong or "nonattenuated" property rights. The benefits and costs of exchange and use of resources and goods affect only the parties to the exchange. The welfare of individuals who are not engaged in the transaction or use of economic goods is not altered.

Furubotn and Pejovich define property rights as:

*Property rights are understood as sanctioned behavioral relations among men [sic] that arise from the existence of goods and pertain to their use. These relations specify the norms of behavior with respect to*

*goods that each and every person must observe in his daily interactions with other persons, or bear the cost of non-observance. The term "good" is used here for anything that yields utility or satisfaction to a person. Thus, and this point is important, the concept of property rights in the context of the new approach applies to all scarce goods. The concept encompasses both the rights over material things (to sell my typewriter) as well as 'human' rights (the right to vote, publish etcetera). The prevailing system of property rights in the community is, then, the sum of economic and social relations with respect to scarce resources in which individuals stand to each other. (Furubotn, p 3)*

These "sanctioned behavioral relations" include both the formal sanction of legal systems and informal sanctions of social institutions. A sense of community, social values, religion, politeness and respect for others are probably more efficient ways to enforce property rights than the enforcement of laws by the state. Property rights may be "private" property rights or "public" property rights.

Strong or nonattenuated property rights that facilitate the effective use of market exchange have three basic characteristics:

- Exclusivity
- Enforceability
- Transferability

#### EXCLUSIVITY

It is impossible for the property rights to any good or resource to be completely exclusive. However, the greater the exclusivity the more likely market exchanges will produce improvements to the welfare of society. An exclusive property right is one where all the benefits and cost associated with a choice fall on the person(s) making the choice. If Nigel drinks a cup of tea, the costs and benefits of that act fall (for the most part) on Nigel. A case of nonexclusive property rights occurs when Harold smokes a cigar in church. The smoke may impose significant costs on other members of the congregation. It might be possible that Aunt Mabel and others in the congregation could contract (or pay) with Harold not to smoke. If a voluntary contract is made, Harold is better off because he prefers the payment to smoking. Aunt Mabel and the congregation are better off because they were willing to pay Harold not to smoke. This assumes that Harold had a property right to smoke. An alternative view is to ban smoking in the church by assigning the property rights to smoke free air to Aunt Mabel and the others. If Harold wanted to smoke, he would have to contract with the congregation for the right to do so.

#### EXTERNALITY

The failure of exclusive property rights results in three problems in the market. First is the problem of "externalities." The example of second hand smoke in the previous paragraph is an example. Pollution from a steel mill or odor from a pig farm are other examples. A negative externality results in "too much" or over use of a resource or good since the marginal costs to society exceed the marginal cost to the economic agent who makes the decision. The Environmental Protection Agency was created to deal with many of the problems of negative externalities.

Externalities may also be positive. The marginal benefits to society are greater than the marginal benefits to the decision maker or economic agents engaged in an exchange. If I landscape my front lawn, it may

increase the property values of my neighbor. The benefits to my neighbor are not taken into account by my decision. In general, the market signals an under utilization of goods and resources that have positive externalities

### PUBLIC GOODS

A second problem is that of "public goods." A public good is one in which the marginal cost of an additional user is zero and it is impossible to exclude anyone from its use. National defense is often used as an example of a public good. There are other goods like roads, bridges, etc. that may be treated as public goods even though it is possible to exclude users. These are sometimes referred to as "quasi-public goods."

### COMMON PROPERTY RESOURCES

The third property rights problem is "common property resources." A common property resource is one where users are not excluded but the marginal cost of users is positive. Garret Hardin's 1968 article, "Tragedy of the Commons" argues that common property tends to be overused and can be driven to extinction. Passenger pigeons, whales, American bison, and fisheries are often cited as common property resources. The property rights for these common property resources are not clearly defined and are "fugitive" resources; whoever captures the resource has ownership rights. It is in the interests of the economic agents to capture as much as possible as quickly as possible. The result is the market signals an overuse of the resource. Treaties and government regulation may be used to establish property rights that will result in a more economic use of the resource. International treaty protects whales. State fish and game departments may sell license and regulate the capture of game.

Externalities, public goods and common property resources are fodder for debates between pro and anti market advocates. The economics of non-exclusive property rights will be covered in more detail in later chapters.

### ENFORCEABILITY

The establishment of property rights is fundamental to society. Social institutions and a sense of community (with a respect for others) establish the nature of property rights. John Locke, Adam Smith Karl Marx and many other writers have argued that one of the functions of government (or the "state") is to define and enforce property rights. In a world of chattel and real property, property rights can be defined and enforced. In a world of intellectual property rights, computers, copy machines and all manner of devices to copy and transmit intellectual property with 0's and 1's, the enforcement of property rights is more problematic. As the society has shifted to greater emphasis of an "information" economy, intellectual property has become more important. Music, computer software, books, and knowledge of how to do things has made the enforcement of property rights and market exchanges difficult in many cases. The development of technology to electronically copy and transmit information has increased the problems of enforcing property rights to that information.

Copyright and patent laws are examples of attempts to define and enforce property rights. Pharmaceuticals, DNA and knowledge are often the source of legal action. As the technology to develop, copy

and transmit information improves, the enforcement of intellectual property rights will become more difficult and expensive to enforce. Many interesting economics questions will accompany these changes.

### TRANSFERABILITY

In many cases, it is technically impossible to transfer property rights. The property rights to a person's height or athletic skill cannot be transferred. I cannot become a professional basketball player by purchasing a player's height or skill. I might hire some one to coach me but there is no way to transfer property rights to height and skill. However, with the "advances" in science it may be possible to genetically modify a fetus with DNA from a person who has some physical characteristic that is desired.

Often society will choose to prevent the transfer of property rights by making an exchange illegal. Buying and selling children is technically possible but societies usually choose to make it illegal. The Organ Transplantation Act of 1984 is another example. While it is technically feasible to transplant organs (heart, kidney, lung, pancreas, liver, etc.), the law makes it illegal to sell an organ for transplantation. However, it is now possible to travel to other countries to "buy" a kidney. There is some evidence that a black market (or illegal market) has been developing. There are also advocates of creating a market for transplantable organs.

### RECIPROCITY

Reciprocity is a system of obligatory gift giving: I will do you a favor or give you a gift, but you are then obligated to do an unspecified favor or give me a gift at some (possibly unspecified) point in the future.

Reciprocity requires a sense of community. Kinship ties or membership in the community is needed so that the obligation of returning a favor is enforced by social forces. If a friend helped you move apartments one weekend and then helped you fix your car the next weekend, your refusal to help that person at some point in the future would have social repercussions. The friends you have in common might come to regard you as a freeloader. Social pressure may induce you to return the favor.

### EMINENT DOMAIN

Eminent domain is a redistribution of private property rights through the authority of some organization. The individual is required to give up their claims to private property by an authority. Usually the process of eminent domain is legitimized by government, religion or some other authority.

### OTHER MECHANISMS

The act of giving a gift with nothing expected in return is called philanthropy. This is an important method of distribution in blood drives and the donation of organs for transplantation.

Inheritance is the process transferring private property rights from a person who has died to an agent. The form that the inheritance laws take may greatly influence the accumulation of wealth in a society. In countries where primogeniture (the eldest son inherits the estate) is practiced, the size of land holdings may be maintained. Where the property is divided among all surviving children, the land holdings may be divided up into smaller and smaller units.

Theft is the process of transferring property rights by illegitimate force.

Few societies can function if theft is widely used.

These allocative mechanisms appear in almost all societies to a greater or lesser degree. The relative emphasis that a society places on each of these mechanisms is an important characteristic of that society's economic system. The allocative mechanism used for specific goods and resources may alter their nature.