

Alternative Microeconomics

Two Chapter

Allocation and Provisioning

I Introduction to the Economic Problem

Finite resources and a given technology combined with "unlimited" wants results in scarcity

The allocative question is how to allocate scarce resources to maximize the satisfaction of wants

Economics as a study of provisioning deals with the nature of wants, the social institutions and technology as well as the allocation problem.

Individuals and societies try to solve the scarcity problem through social interaction and knowledge.

Society is confronted with a finite set of resources and a given state of technology at any given point in time. As a result, there is a finite amount of goods and services that can be produced in that time frame. Given human desires and need for food, clothing and shelter, it is not always possible to produce everything that everyone would like to have. When individuals want more than can be produced, the most obvious question is: "How can relatively scarce resources be allocated to satisfy as many unlimited wants as possible?" This question is the basis for orthodox microeconomics.

Provisioning is process that by which individuals in societies provide themselves with the means for survival and betterment. From this perspective, many other questions may be addressed. What is the nature of wants? What forces shape individual wants? Are these wants consistent with community values? What are the alternative social mechanisms that individuals may use to allocate resources? To what extent do moral values guide the allocative process? What social institutions are necessary for different allocative mechanisms to function? Which allocative mechanisms are most appropriate for specific allocation tasks? What forces determine what we define as resources or inputs? What is the nature of resources or inputs? What is the nature of technology and what is its role in the economic system? Do changes in technology influence social institutions? To what extent do social institutions influence technology? The answers to these and other questions provide the background to help frame the question and answers about optimal allocation.

The questions about allocation and provisioning are interrelated. It is possible to address the allocation problem without making the provisioning problem explicit. A particular set of social institutions, property rights, income distribution and other circumstances may be taken as given and not made explicit. It is not possible to deal with the questions about provisioning without dealing with the allocation problem.

Every society faces the problems of allocation and provisioning. There are two broad approaches to these economic problems: social interaction and the advancement of knowledge.

Individuals acting together can often accomplish more than when they act alone. This is one of the reasons that humans are social. They work together in groups, tribes, firms or other organizational forms for protection and producing the means of sustenance.

Knowledge about how the natural and built environments can be manipulated

to satisfy wants is another way to minimize the scarcity problem. Propositional knowledge is knowledge or beliefs about natural phenomena: knowledge about the basic nature of things. Propositional knowledge provides the basis for instructional or prescriptive knowledge. (Mokyr, pp 4-6) Technology or prescriptive knowledge is a set of instructions to about how to use resources to attain objectives. Advances in knowledge improve the techniques by which individuals seek to achieve objectives. The process by which societies acquire knowledge and adapt it to their use is an important part of the both the allocation and provisioning processes.

II The Allocation Problem

The allocation problem can be addressed by;
 1) *Increasing the output*
 2) *altering the mix of goods produced*
 3) *altering wants and preferences.*

There are three possible approaches to the narrow allocation problem. First, an increase in the output of goods and services is the most simplistic and most obvious answer. A second approach is to alter the mix (relative amounts) of goods and services produced, so that more highly valued goods are produced by reducing the output of lower valued goods. A third strategy would be to alter or reduce individuals' wants.

In modern, neoclassical, economic analysis (we will call this "orthodox" economics), the problem is usually structured so the wants are taken as given and the problem is to produce the goods that satisfy the greatest wants. The line of reasoning follows:

- The objective or goal of society is to maximize utility (welfare or wellbeing) of the members of society;

This can be expressed as a mathematical statement, $U_S = f(U_A, U_B, \dots, U_N)$

Where U_S represents the total utility of society, U_A is the utility of individual A (Adam), U_B is the utility of individual B (Barbara) and U_N is the utility of the N^{th} individual. "The utility of society is a function (f) of the utilities of the individuals."

- The utility of society is the sum of the individuals' utilities.

If the welfare of the community (U_S) is the sum of the individuals' utility we can be more specific:

$U_S = U_A + U_B + \dots + U_N$ "the welfare or utility of society is the sum of the utility obtained by each individual." If the individuals' utility functions are interdependent (my welfare or utility is affected by your utility), the utilities cannot be summed.

- Each person's utility is a function of the quantity of goods and services consumed.

Where Q_{XA} is the amount of Xebecs (good X) and Q_{YA} is the amount of Yawls (good Y) received by individual A (Adam). (Q_{iA} is the i^{th} good received by Adam), then Adam's preferences (tastes or utility function) can be expressed:

$$U_A = f_A(Q_{XA}, Q_{YA}, \dots, Q_{iA})$$

Barbra's utility function could be expressed: $U_B = f_B(Q_{XB}, Q_{YB}, \dots, Q_{iB})$

The utility of the N^{th} individual would be $U_N = f_n(Q_{XN}, Q_{YN}, \dots, Q_{iN})$

And the output of good X would be $Q_X = Q_{XA} + Q_{XB} + \dots + Q_{iN}$

- Since the utility or welfare of the community is a function of the welfare of the individuals and the utility of the individuals is a function of the goods they consume, the utility of the community is a function of the quantity of goods and services available: more is preferred to

less. The more goods and services available, the greater the welfare of society: $U_S = f(Q_X + Q_Y + \dots + Q_i)$

This chain of reasoning assumes that the utility of an individual is determined by the goods consumed. Aesthetics, personal relationships, health, security and other variables are not explicitly included in the orthodox model. A study of provisioning would include non-market values. The orthodox line of reasoning also leads to the conclusion that economic growth is a major goal for macroeconomic policies. A few years ago, a popular T-shirt slogan expressed this idea; "He who dies with the most toys WINS"

A less obvious set of conclusions is that the welfare of society as measured by U_S can be altered by changing the relative amounts of the goods produced or by altering the relative amounts of each good that each person receives.

Ceteris Paribus
is used to indicate that there are implicit variables that are to be held constant.

The economist uses the concept of *ceteris paribus* to deal with the problem. *Ceteris paribus* is a Latin expression which notifies the reader that there are other things to consider but they will not be changed and remain implicit so that we can focus on the relationship described.

Opportunity cost
is the value of the best alternative that is given up or sacrificed when a choice is made

The second approach is to increase the output of goods that individuals value most and reduce the output of goods that are less desirable. Scarcity requires that the individual or agent make choices about which goods to produce. If resources are fully employed and the best technology is used, increased production of one good (Xebecs, Q_X) requires a reduction in the production of some other good (Yawls, Q_Y). The sacrifice of the reduced production of Yawls is the opportunity cost of the additional amount of Xebecs. Opportunity cost is one of the major tools used to make decisions about what and how much to produce.

The third approach is to alter the nature and level of wants. One approach to the good life is to simplify one's desires and possessions. By eliminating the extraneous or superfluous goods in their lives, an individual can appreciate more fully the important things or aesthetics. Religious groups often take this approach. St. Francis of Assisi and Buddhist monks shared a desire for a more meaningful life by reducing wants or desires for material possessions. In the secular, industrialized world, this approach is not often mentioned.

ALLOCATIVE MECHANISMS

Property rights define the rights of an individual or group to specify the control or use of a good or resource.

The allocative process requires that rights to control and use resources and goods be defined and enforced. The concept of property rights is multifaceted and will be described in more detail later in the text. For current purposes, property rights will be described as the right to control the use of a good or resource. If these property rights are held by individuals, they are called private property rights. Organizations, governments, corporations and other institutions may hold property rights. In some cases, such as air, property rights may be held in common; these are called common property rights. For an economic system to function, it is necessary that property rights be defined and enforced whether they are private, public or common property rights.

Society must devise a process by which the control and use of

resources and goods can be assigned to an agent who controls its use. An agent is an individual who has the authority to evaluate, select, and act on an alternative to achieve an end.

Allocative mechanisms are the methods by which societies to shift the property rights to different uses.

The process of assigning and enforcing property rights to goods and resources is a social process. If the allocative problem is to allocate resources to maximize the utility of the community then the property rights should be assigned to the agents who get the most utility from them. It is necessary for society to devise allocative mechanisms to facilitate the assignment of property rights to different agents and uses. There are a number of allocative mechanisms, these include; exchange, reciprocity, eminent domain, philanthropy, inheritance and theft.

EXCHANGE

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.

Exchange is a quid pro quo; the terms of the transfer of property rights is clearly specified. A specific property right is traded or exchanged for another specific property right, the terms of trade are known to both parties.

The participants in the exchange do not need to know each other; they only need to know the terms of the exchange. The information requirements are quite low. In many cases, the exchange may be made easier by social institutions. Laws that protect buyers and sellers may facilitate the exchange. Trust may be an important element as well.

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 is a system of obligatory gifts. A gift from one individual to another establishes an obligation for the recipient to do something for the other individual.

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.

Eminent domain is an assignment of property rights by an authority..

PHILANTHROPY

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.

Philanthropy is a transfer of property rights with nothing expected in return.

Inheritance is the transfer of property rights from a deceased person to an agent. Theft is the illegitimate transfer of property rights.

INHERITANCE AND THEFT

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.

III Provisioning

Economics as a provisioning problem includes the allocation problem but includes and analysis of the social infrastructure, knowledge and ideological framework in which economic behavior occurs. Individuals pursue their objectives in a social context. The values, beliefs and ideology that influence economic choices are framed by society. What individuals believe and value is an input into their preferences and the process by which they make choices.

Knowledge is seldom acquired as an individual effort in isolation. There is a common body of knowledge that each person accepts (or rejects) and builds upon. The origins and nature of knowledge greatly influences the economic functions of a society. Science and technology determine the known feasible alternatives that compose the choice set.

The social values often promote or restrain the uses of knowledge. Religious and moral beliefs may alter the way in which knowledge is used. Max Weber (*The Protestant Ethic and the Spirit of Capitalism*, 1904-05) and Robert Tawney (*Religion and the Rise of Capitalism*, 1926) both hypothesize that the rise of the capitalist system was predicated on protestant beliefs. These works have been controversial and the role of religion in the operation of economies is not accepted by everyone.

Each individual is influenced by the infrastructure of society. Roads, books, tools, telephones, the Internet, the legal system, property rights, double entry bookkeeping, dams, energy plants and distribution systems are examples elements of the infrastructure which facilitates individual effort. What may appear as a major individual accomplishment is often one step in a social process. Wrights' powered flight depended on the existence of internal combustion engines, bicycles, fabric, gliders, metallurgy, and a host of other items. The flight of the Wright Brothers contributed to landing on the moon and the thousands of commercial flights each day.

THE ROBINSON CRUSOE EXAMPLE

Many early economists used Robinson Crusoe as an example of the allocation problem. The story of Robinson Crusoe (1719) was written by an

The origin and nature of knowledge is related to the economic functions in a society.

Social values and beliefs may influence the uses of knowledge in economic activities.

The infrastructure provides a foundation for individual economic activities.

Robison Crusoe was the sailor who was marooned on a desert island. He had to make choices about what goods should be salvaged from the shipwreck and was then confronted with choices about how to live.

Englishman, Daniel Defoe (1659-1731). It is the story of a young man who was born in York, England. He was educated to enter the law profession but yearned to go to sea. Against the advice of his family, he went to sea, was successful in trading but was captured by a Turkish ship and made a slave. Crusoe escaped in a stolen boat, was rescued by a Portuguese ship and ultimately became a plantation owner. Seeking another adventure, he was shipwrecked on a desert island in 1659. Defoe's story is that of survival and isolation. Robinson Crusoe was confronted with the problems of allocation and provisioning.

Robinson Crusoe began his stay on the island with the tools and knowledge of the English society..

As an individual in isolation (Defoe's Robinson Crusoe before Friday) would have to make choices since time and resources are limited. His first set of choices is what to salvage from the wrecked ship. Guns, powder, carpenter's tools, paper and ink are valued more highly than money. It is these things, not money that will allow Crusoe to provide for himself. His choice about which things to salvage (he cannot get all of the resources of the ship to shore on makeshift rafts) is partly an allocation problem and partly provisioning. The natives of the neighboring islands have different beliefs, values and infrastructure (tools, knowledge, etc). They have a different social structure and their approach to provisioning and the allocation problem is different. The allocation choices they make are not the same as those made by Crusoe. His English education, beliefs, training as a sailor and the tools he saved are part of his provisioning process; he salvaged a good deal of the infrastructure of the British society.

Opportunity cost is one of the criteria that guides Crusoe's economic behavior.

Once ashore and the ship washed out to sea, it became necessary to choose whether time was to be spent catching fish, gathering coconuts, reading or building shelter. These choices are shaped by the tools and knowledge he brought to the island. If the choice were to catch fish, he would have to choose between making a net, a fishing pole or trying to catch fish by hand. The choice to spend an hour fishing implies that that hour cannot be used to gather coconuts. The sacrifice of coconuts is called "opportunity cost."

Even Robison Crusoe's world of isolation did not last long. When Friday came to the island, it became necessary to decide who did what and who got what. It is necessary to coordinate the preferences and activities of Crusoe and Friday. Since the story of Robinson Crusoe was written by an Englishman, Daniel Defoe (1659-1731), Crusoe's values are dominant and he has a greater influence on the decisions than Friday. In 1719, the perspective of an English writer was that aboriginals of various lands were subordinate. Still, it is necessary to coordinate their activities.

SOCIAL INTERACTION

Social interaction is constrained and/or coordinated by both competition and cooperation

Individuals can often accomplish more by interacting than they can as individuals. In a society, this team or group behavior of individuals must be coordinated through social interaction. This social interaction may take many forms ranging from cooperation to competition. In the process of resolving the allocation problem through social interaction, a set of institutions, organizations, beliefs, principles, perspectives and commonly held values are created. Society, guided by these values, perceptions and beliefs and constrained by institutions, technology and resource endowment, must solve the problem of provisioning. The specific uses of goods and resources must be determined. These choices involve which resources to use, which goods to produce, who will bear the costs and who

will benefit.

The basic problem is the coordination of the choices and behavior of individuals. The protection of the autonomy of the individual while coordinating social behavior has been an important goal of most great writers on social topics.

SPECIALIZATION

Specialization and division of labour can increase production

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.

When one person, firm, or country focuses on the production of one good, it has "specialized"

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.

Institutions are habitual patterns of behavior

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]

Specialization and justice in Plato's [Republic](#)

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 lead 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.

Specialization requires social interaction

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

Division of labour is the process of breaking the production process into individual steps.

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."

Division of labour and economic growth in Smith

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,

Smith's concern about ill effects of specialization

*"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.

Coordination of human activities as an objective in economics and social science

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.

IV Economic Activities

Production, distribution and consumption are clearly economic activities. Each of these activities is interrelated with other aspects of society as well as the natural and built environments.

It may be helpful to think of an economic system as a process that begins with a set of inputs (or resources) that are used for production that must be distributed for ultimate consumption.

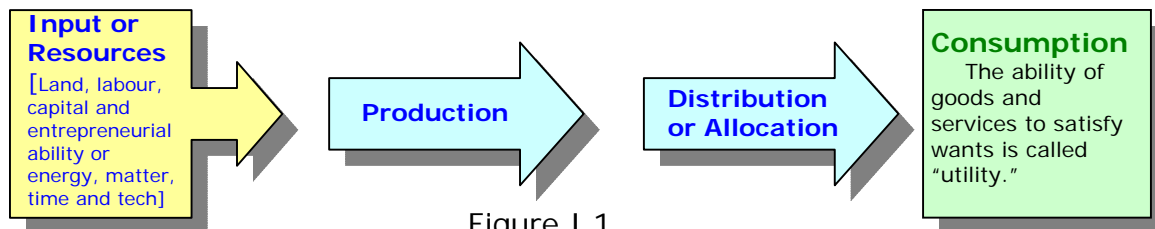


Figure I.1

In Figure I.1, the economy is shown as a process of altering a set of inputs to satisfy individual wants. In this example, the steps in the economic process are production, distribution and consumption.

INPUTS OR RESOURCES

The economic process begins with a set of inputs. These inputs are often referred to as resources or "factors of production." Typically, these resources are classified as labour, capital, land, and entrepreneurial ability. This taxonomy reflects the evolution of the social structure in the industrial economies. During the medieval era (500-1500 by many accounts but there is no consensus as to exact dates), there were three major social classes; serfs, nobility and the clergy. The serfs provided labour. The nobility and clergy were the landholders. Labour and land were the two major inputs. After the Crusades (1095-1270), trade became more widespread and a merchant class developed. It took time to go to the East to acquire goods (spices, silk and the like), bring them back and exchange them for money. The merchants were the beginning of the commercial class. With the development of manufacturing, the commercial class expanded and was characterized by their ownership of the means of production, capital. Textiles, pottery, printing books and a host of industries moved from the home to the factory. This social class of the owners and manufacturers became the

capitalists.

Land, labour and capital reflected the social classes. The fourth factor of production, entrepreneurial ability was added much later. The return to land was called rent. Labour earned wages and capital (at least until entrepreneurial ability was added as the fourth factor of production) earned profit and interest. Entrepreneurial ability was added to explain the existence of profits.

Land is a "gift of nature." The return to land is rent

LAND

Land is a resource or input that is a "gift of nature" It exists independently of human activities. Soil, a forest, a deposit of oil, coal, rain, a river, the climate are a few examples of land. In economics the payment for land is often called rent. There are many categories of land.

Some resources, like solar or wind, are referred to as "flow resources." If the resource is used for one purpose, there is no significant impact on the availability of the resource for other uses.

Land resources can be flow, renewable or exhaustible.

Other land resources are called "renewable." A forest, fishery, herd of buffalo, whales, water quality and the like are renewable resources. Trees may be harvested from a forest at a maximum rate equal to the growth rate of new trees. This is called the maximum sustainable yield. Fish, whales and buffalo (and other wildlife) can be harvested and if a large enough population is left it will "renew" or replenish.

Other resources are called exhaustible resources. There is a finite amount available and once used it is gone, it cannot be replaced. Coal and oil are examples of these resources. In practice, society does not know about all deposits of those resources. As one deposit of coal is mined out, new deposits may be discovered.

LABOUR

Labour is human effort to produce goods and services.

Labour is any human effort to produce goods and services. The payment for labour is usually called wages (payments might be commissions, salary, bonus or whatever). Labour can be physical or mental. A person digging a ditch, managing a firm, or performing accounting functions is providing labour.

CAPITAL

Capital is any good that is made by humans to be used for the further production of goods and services.

Capital is a means of production that is made by human labour and used for the further production of goods and services. Drill presses, dams, roads, irrigation canals and buildings are examples of things that may be considered as capital if they are used to produce other goods. The payment for capital is usually measured as interest.

ENTREPRENEURIAL ABILITY

Entrepreneurial ability is the creative and innovative process in the economy.

The term entrepreneur was first used in economics by Richard Cantillon (1680-1734). The term was later popularized by Jean-Baptiste Say (1767-1832). Joseph Schumpeter (1883-1950) further developed the concept of the entrepreneur. For Schumpeter, the term was applied to those persons who were innovators and creators of new goods and processes. The act of creating something new is fundamental to the concept of the entrepreneur. The person who provides the capital for a new venture is not an

entrepreneur. The person who manages a project after its creation is not an entrepreneur. The process of creating new goods or processes is usually accompanied by risk. Innovation and risk are important elements of the entrepreneurial function. The return to the entrepreneur is usually thought of as profit.

The taxonomy of resources or factors of production is not always clear. A stand of old growth timber should be classified as land. Yet, a reforested area may be more like capital. An individual may play the role of a manager (labour) and an entrepreneur. An automobile may be capital for a traveling salesperson or a consumer good for someone else.

There are other ways to categorize the factors of production. Time, knowledge, energy and matter is another taxonomy. A different system of categorizing inputs may result in different questions and/or different perspective of the economic problem. When the factors of production are identified with social classes, the questions are framed with regard to the power and influence of those classes. If resources are associated with physical concepts like energy, matter, time and technology, the questions (and answers) are less likely to be influenced by political power and stakeholders.

PRODUCTION

Production is the process of altering inputs to increase their ability to satisfy human wants

Production is the process of altering inputs to increase their ability to satisfy human wants. Production can occur if inputs are physically altered to increase their ability to satisfy wants (utility). Steel that has been made into a pan may provides more utility that a sheet of steel or an iron ingot. The iron has been physically altered to increase its ability to satisfy wants. A change in the location of a good can increase its ability to satisfy wants. Lobster is moved from Maine to Arizona because it will satisfy more wants in Arizona than in Maine. Changes in time or ownership are other types of productive activities.

Production can result from;
1) a change in physical characteristics
2) a change in location
3) a change in time
4) a change in ownership

Physical production is the most obvious and easiest to measure. Units of automobiles, cans of peaches, pizzas and bottles of wine can be counted. A variation in the quality of these goods is often ignored. (Relative prices paid for goods **may** be an indicator of quality.) Airlines measure their production by passenger-miles. Trucking companies use ton-miles to measure output. Services are often more difficult to measure. A police department may produce safety or security. How is that measured? A teacher produces education. How is that measured? Is the output of a fire department measured as the number of fires they put out or the number of fires they prevented?

DISTRIBUTION

Distribution usually describes the process of allocating the property rights to goods and services that have been produced. Societies have used market exchange, reciprocity, eminent domain, inheritance, theft and philanthropy to distribute these property rights. The primary means of distribution or allocative mechanisms that are used in most societies are exchange, reciprocity and eminent domain. The techniques used to

CONSUMPTION

The end purpose of economic activity is to provide for the survival and betterment of the conditions for individuals in a society. One aspect of this

is the production of goods and services that can be consumed by individuals to satisfy needs and wants. Modern, neoclassical economists generally do not like to use the word “needs.” The use of the word “wants” is an attempt to take subjective judgment out of the analysis.

Consumption is influenced by tastes, income, wealth, alternatives, prices, etc.

Consumption patterns are influenced by preferences (tastes), income, wealth, and the relative prices of goods. Preferences cannot be measured directly. The choices that individuals make give some indication as to preferences. The consumption choices are often correlated with variables that can be measured. Age, gender, ethnicity, religion and other characteristics may be related to preferences and consumption choices. In orthodox microeconomics, demand analysis is one approach to summarizing the consumption choices.

Consumption includes more than just goods and services that are exchanged in a market.

Consumptive activities may include more than goods and services that are exchanged in a market. Individuals value security, aesthetics, creativity, leisure, a sense of belonging, and other non-market phenomena. These consumption activities should be considered in the study of the provisioning problem. The role of these things frequently arises in the allocation process because individuals may trade market goods for non-market values. An artist may give up some income to engage in creative activities. Income or goods that can be purchased with that income may be given up for leisure or job security. Societies may tradeoff electricity or irrigation to have a free flowing river.

INTERRELATION OF ECONOMIC ACTIVITIES

Production, distribution and consumption are interrelated processes

Production, distribution and consumption are interrelated. What to produce is influenced by what individuals want to consume. What people want to consume is influenced by the distribution process and what can potentially be produced. This coordination may come in the form of cooperative activities, such as the creation of a business firm. The firm usually organizes production internally as a cooperative process but must compete externally. Alternatively, the coordination of activities may be accomplished by competition or some combination of cooperation and competition.

V Technology

Technology is knowledge about how resources, individuals and social organization can be used to accomplish objectives. Technology is what Joel Mokyr calls instructional or prescriptive knowledge. This prescriptive knowledge is based on propositional knowledge about the nature of things. (Mokyr, pp 4-6)

The study of the nature and limits of knowing (or knowledge) is called epistemology. Technology is one small piece of knowledge. Here the role of technology in the economic process will be considered. Epistemology and the dual problems of (1) What do I know? and (2) How do I know? will be presented in the section on Methodology.

Technology is the knowledge about how resources can be used to satisfy human wants.

Technology is more than a set of skills to do things. It is a perspective about the relationships between humans and their world. Technology is the sum total of the ways in which human societies interact with natural and built environments. Humans seek to understand these interactions and develop technology by combining and reorganizing existing technologies.

In economics, technology is the knowledge about the manipulation of resources, people and social institutions to produce goods and services that

satisfy human wants. Prescriptive knowledge about how we do things, "technology," is not limited to machines. The discovery of a calendar or the realization that crops can be planted on a three field rotation may be as important as the invention of the padded horse collar, the steam engine or the PC. Prescriptive knowledge about the use of organizational structure to achieve an objective is, in a sense, a form of technology.

Technology and society are interrelated

The values and structure of society are connected to the state of technology. Society is shaped by technology and at the same time is an important force in the determination of the course of technological change. This relationship between technology, society and the individual can be driven by curiosity and/or material gain.

Technological change is a pervasive process

Technological change is pervasive. During some periods of history, technology changes at a slow pace. At other times, the rate of change is more rapid and more dramatic. During the medieval period, technological change was slow. With the development of mechanical clocks, the plague, moveable type, gunpowder, new techniques in art and other innovations, the "Renaissance" (usually thought of as the 14th-17th centuries) was a period of dramatic change. During the 17th and 18th centuries, the "age of Enlightenment" was fueled by technological change. The "Industrial Revolution" (which is often dated as about 1750) is another term used to identify a period of rapid technological change. Each of these periods involves changes in ideas, values, knowledge and social institutions. Each altered economic and social processes.

Technology may be driven by profits

Technology may be a self-generating process

There are opposing views as to the process of technological change. One view is the Thomas A. Edison perspective. In this case, technological development is driven by profits. If a technology is profitable, it will be invented. The other view is that technology is a self-generating process. New technology is the result of old technology(ies) being recombined in new ways and used for new purposes. In the second view, profits cannot create the development of technology but determines its uses.

Technology influences what we perceive as resources.

What an individual perceives as a resource is influenced by the nature of technology. In the 18th century, obsidian was an important resource among the inhabitants of the western United States; uranium was not. In the 21st century, obsidian is not normally regarded as a very important resource while uranium has become a resource.

Factor endowment can alter the modes of technology that are used.

Factor endowment may influence the direction that technology develops. In a society with an abundance of arable land and a shortage of labour may produce (and consume) different goods and seek different technologies to produce them.

Technological change can be influenced by profits, curiosity, factor endowment, and existing technology(ies) as well as social institutions.

In the Edison view, the light bulb was invented because there was a demand for it and it could be developed and produced for a profit. In the second view, it is not possible to invent high-pressure steam engines, even though they may be profitable, until the technology of metallurgy develops metals to contain the higher pressure. Either view supports the argument that technology builds upon itself. The creation of an internal combustion engine depended on its connections to cannons, oil, Maybach's spray carburetor, levers and gears. Each of these in turn depended on other technologies. When Daimler and Maybach built the automobile, it was the result of a series of connections between technologies that had been developed by many people over a long period. (see Burke, *Connections*, pp 175-183)

*Technological
change involves
1) invention
2) innovation
3) dissemination*

It is useful to think about technological change as a process. First, a piece of knowledge emerges or an “invention” occurs. Second, someone finds an application for the new knowledge (innovation) and uses it. Third is the process of dissemination, i.e. the use of the idea is spread throughout the social system. Each stage of technological change may produce or require significant changes in values and social institutions. Changes in social structure or the natural environment may encourage technological change.

Technology and the social system are interconnected. Technology has a strong influence on the structure of society and individual behavior. The Industrial Revolution may be thought of as a fundamental change in technology of production that altered society. The development of the mechanical clock was driven by the clergy’s desire to satisfy the institution of prayers at specific times of the day.

VI Allocation, Provisioning and the Economic System

Economics as a study of the allocation problem is straightforward. Given a set of resources, a state of technology, a group of individuals who have a set of preferences and a set of social (including economic) institutions, what is the optimal allocation of those resources. There are the five basic allocation questions;

- 1) What goods (and services) should be produced?
- 2) How many units of each good should be produced?
- 3) How should those goods be produced?
- 4) When should those goods be produced?
- 5) Who should get the goods produced?

The ways individuals and societies choose to answer to each of these questions is dependent on the philosophical and social context of the society. The answers as well as the approaches taken evolve and change over time. Economics as a study of provisioning is the study of how individuals and societies evolve over time. Knowledge, beliefs, values, principles, social institutions and economic behavior change.

Provisioning is concerned with the social structure and the alternative ways in which the allocation problem is approached. The concern of provisioning is with the economic actors (agents), the context in which their choices are made and the criteria used to make and evaluate those choices.

In the next chapter the nature of knowing, technology and the methods used by economists will be explored.