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Useful Economic Tools and Concepts

Economists have developed a number of basic concepts that are useful when we want to describe how an economy works, and to think about how we, in our private roles and through government action, might make it work better. This reading will present some of the most important concepts in economics, including how to approach trade-offs (when we have to choose among different things we might want); what markets really are (hint: they aren't just one thing); and the importance, in economics, of such abstract things as trust and money. (You didn't think money was abstract? Wait and see!) Before we get into these concepts, however, we'll review economists' basic tools of investigation. The concepts and methods we discuss in this reading will help us better understand modern economic debates.

1. Our Tools for Understanding

Explaining macroeconomic phenomena, we will see, involves using three main modes of investigation: empirical, theoretical, and historical.

Three main modes of investigation are empirical, theoretical, and historical

1.1 Empirical Investigation

Empirical investigation is observation and recording of specific happenings in the world. It is convenient when the happenings of interest can be adequately described in terms of numerical data. However, useful empirical investigation of a specific item of interest may also be represented in words or images.

empirical investigation: observation and recording of the specific phenomena of concern

When the observations take the form of showing how a numerical economic variable changes over time, we call them **time series data**.

time series data: observations of how a numerical variable changes over time

You will see many examples of time series data as you study economics—for GDP growth, employment, and other economic variables. The accompanying Math Review box will help you refresh your skills in working with data and graphs, using a time series example.

Math Review: Graphing Empirical Data

To help you review your math skills, we will recreate a famous macroeconomic graph. The Phillips curve, originally derived by economist A.W. Phillips using British data, played a very important role in U.S. economic theorizing and policymaking, especially during the 1960s.

First, we can present the data in terms of a table. Table 1 presents data for the years 1963-1969, showing the average unemployment rate for the U.S. and the year-to-year inflation rate (i.e., the rate at which prices rose from one year to the next).

Table 1

Year	Unemployment Rate (percent)	Inflation (percent per year)
1963	5.7	1.1
1964	5.2	1.5
1965	4.5	1.8
1966	3.8	2.8
1967	3.8	3.1
1968	3.6	4.3
1969	3.5	5

Source: Economic Report of the President 2004, Tables B-3, B-42.

We can interpret this data in visual form, by plotting each series separately on a time series graph, as shown in Figures 1 and 2. For example, the third point from the left in Figure 1 represents the fact that, in the year 1965, the unemployment rate was 4.5%. What does the point labeled with a question mark represent? Figure 1 presents a visual picture of the fact that unemployment fell fairly steadily throughout this period. Figure 2 reveals that inflation steadily rose.

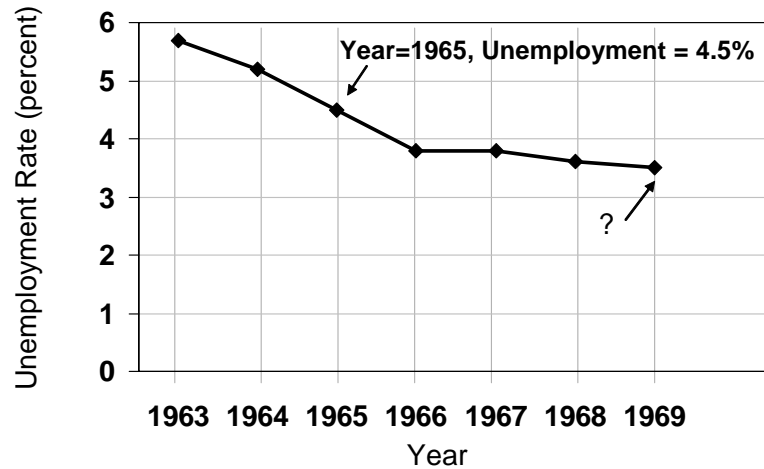


Figure 1. The U.S. Unemployment Rate, 1963-1969
During this period in the 1960s, the unemployment rate was generally falling.

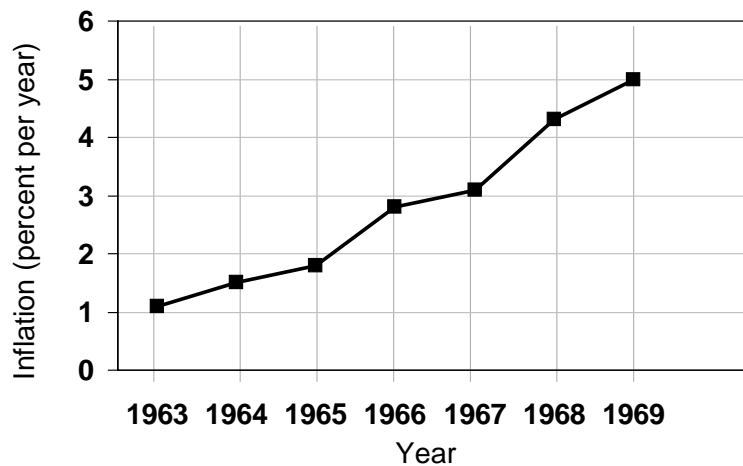


Figure 2. The U.S. Inflation Rate, 1963-1969
During this period in the 1960s, the inflation rate steadily rose.

We might also be interested in how the two measures empirically relate to each other over time. For this, we can make a scatter plot graph, as shown by the dots in Figure 3. For example, the dot to the far right in this graph indicates that when the unemployment rate was 5.7%, inflation was 1.1%. The label on the point tells us that the year when this occurred was 1963. Interpret another point on the graph, with reference to Table 1, for practice.

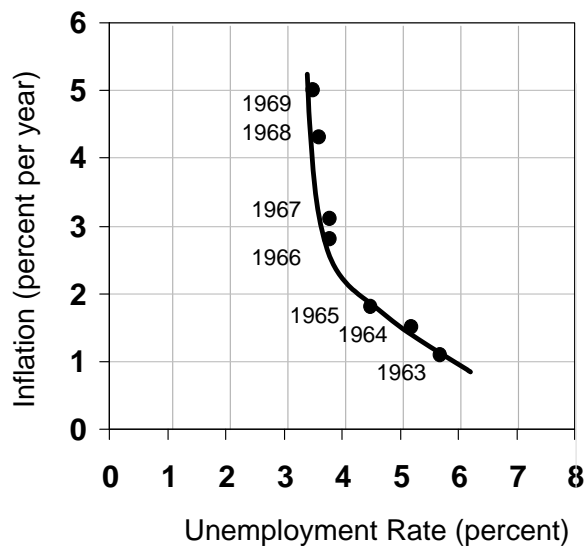


Figure 3. The Empirical Relation between Unemployment and Inflation in the U.S., 1963-1969

The smooth line that can be fitted to data points such as these became known as the Phillips Curve.

When high values for one variable are associated with low values for the other (and low with high), we say the two variables have a **negative or inverse relationship**. On a scatter plot graph, such data points look as if they could be grouped around an (imagined) downward-sloping line. Conversely, when high values for one variable are associated with high values for another, and low with low, we say the two variables have a **positive or direct relationship**. On a graph, such a pattern of points suggests an upward-sloping line. Sometimes in empirical data such relationships, one way or the other, are very apparent. Other times, the data points may seem to be randomly scattered across a graph (or lie on perfectly horizontal or vertical lines), and so neither type of empirical relationship is apparent. If you study statistics and econometrics, you will learn how to describe empirical economic relationships (or the lack thereof) in a more formal and detailed way.

In the case of inflation and unemployment rates over this period in the 1960s, the data points seem to form a very clear pattern. We have added a smooth line to the graph that comes very close to going through every data point. Anyone looking at this graph would conclude that inflation and unemployment are *negatively or inversely* related in these data. It seems that *low* unemployment is associated with *high* inflation. The smooth line drawn in Figure 3 is the famous Phillips Curve.

negative (or inverse) relationship: the relationship between two variables if an increase in one is associated with a decrease in the other.

positive (or direct) relationship: the relationship between two variables when an increase in one is associated with an increase in the other

It is tempting to think that if two economic variables have an empirical relationship with each other, that there must be some kind of *underlying* relation between the two—or, in particular, that changes in one variable must be *causing* changes in the other.

Sometimes this is true. In the case of the upward trends over time that have occurred in both global production and carbon dioxide levels, there *is* causality: Growing industrial production has led, over time, to increasing accumulations of CO₂, one of the primary gases involved in global climate change. There are good scientific reasons to believe that the rise in accumulated carbon dioxide is a direct result of years of fossil fuels intensive economic growth.

But two variables may be related empirically (or be “correlated” with each other, to use the statistical term) *without* there being a well-defined causal relationship between them. In the case of unemployment rates and inflation, graphed in the Math Review box, the two economic variables display a very strong empirical inverse relation for the period 1963-1969. Many economists during this period came to believe that this association was based on an underlying causal relationship. They thought that the government could “trade off” inflation and unemployment, suffering a little more inflation in order to get more people working. That is, it was thought that the government could make unemployment rates fall by allowing some inflation.

The existence of an observable relationship between two economic variables does not imply that changes in one variable *cause* changes in the other. An important warning to keep in mind in all empirical work is that “correlation does not imply causality.”

We can see why this sort of thinking had to be modified when we add data points for later years. In 1970 inflation continued to rise slightly, to 5.3 percent, while the unemployment rate unexpectedly also *rose*, to 4.9%. As you can see in Figure 4, the idea that there was a clear, causal relationship between these two variables became far less plausible as the nation moved into the 1970s and 1980s!



Figure 4. The Empirical Relation between Unemployment and Inflation in the U.S., 1963-1983

The inverse relationship suggested by the Phillips Curve during the 1960s disappeared as the nation moved into the 1970s and 1980s.

Empirical investigation creates the foundation for relevant macroeconomic analysis. Looking at the puzzle presented by the data on unemployment and inflation, we can see, however, that more tools are clearly needed if economists are to try to *explain*, rather than simply describe, macroeconomic phenomenon.

1.2 Theoretical Investigation

The adjective “empirical” is usually contrasted with “theoretical,” where the latter refers to statements that are made on the basis of mental constructs and processes, such as assumptions and logical deductions. The class you are taking will introduce you to economists’ **theories** about how economies function.

As you will see, the theories we introduce are based on “thought experiments.” Rarely having access to controlled laboratory experiments, as in the physical sciences, economists create theories based on assumptions about the economic agents and institutions, from which, with careful reasoning, they draw out potential implications for economic behavior.

| **theoretical investigation:** analysis based in abstract thought

In the mid-1960s, for example, economists created theories that plausibly (that is, believably) explained how the downward-sloping Phillips curve might have come about. They made assumptions about how workers and investors would respond to monetary and fiscal policies and other economic conditions. They created plausible stories about a

chain of events that would connect higher inflation to more people wanting to offer or accept jobs.

In order to make it possible to build a theory, it is sometimes useful temporarily to isolate certain aspects of economic behavior from their larger historical and environmental context, in order to examine more closely the complex elements involved. A **model** is an analytical tool that highlights some aspects of reality while ignoring others. It can take the form of a simplified story, an image, a figure, a graph, or a set of equations, and it always involves simplifying assumptions. We'll take a look at a couple of examples of economic models later in this reading when we examine the Production Possibility Frontier and the basic neoclassical model.

| **model:** an analytical tool that highlights some aspects of reality while ignoring others

An important part of many models is the **ceteris paribus** assumption. This Latin phrase means “other things equal” or “all else constant.” In the models built around the Phillips curve relation in the mid-1960s, for example, one of the things “held constant” was people’s expectations about future inflation. The models assumed that even though inflation was rising steadily, people essentially wouldn’t notice. This assumption seemed to hold reasonably well for the period 1963-1969. Most economists now believe, however, that one of the main reasons for the jump in unemployment in 1970 was that people started to *expect* inflation, and to build inflation adjustments (such as cost-of-living raises) into the contracts they made for employment. The theory built around the Phillips curve assumed that something (expectations) would stay constant, and the theory provided a plausible description of reality only along as this *ceteris paribus* assumption held. When it ceased to hold, new theories—now including an additional factor of *expectations*—were created.

| **ceteris paribus:** a Latin phrase meaning “other things equal” or “all else constant”

Theorizing takes place in economists’ heads—hence the term “thought experiment.” “Is the resulting theory true?” you may rightly wonder. Generally, that is not a question that can be strictly answered “yes” or “no,” since our theories reflect only some selected aspects of the real world. Better questions to ask about economic theories include “Is the theory helpful in giving insight?” “Does it focus on things that we consider important?” Models can be useful—even though they require temporarily setting aside many complications and much of the larger context—when they are understood simply as tools to understanding, and when they remain open to revision as history evolves and new evidence is acquired.

1.3 Historical Investigation

Throughout your study of economics, you will notice the importance of knowledge of **historical** events—observations of happenings in the near or distant past, within the context of what went before and what came after, that are broader than the

more narrowly focused empirical investigation. The Great Depression of the 1930's, World War II, the Bretton Woods monetary agreement of 1947, the oil crisis of 1973, the invention of computers, the entry of women into market work, and the growing concern about environmental issues—all are examples of historical events that have had significant macroeconomic impact.

| **historical investigation:** study of past events

Economists have become increasingly aware that, while gathering and analyzing data and thinking theoretically about what *could* be true are valid and important tasks, a knowledge of the real-world evolution of political, economic, and social life is indispensable to understanding macroeconomics.

Discussion Questions

1. Consider the following examples of investigation. For each one, indicate which mode of investigation it most closely represents – empirical, theoretical, or historical.
 - a. a biologist tries to determine the number of different species of plants found on a plot of rainforest
 - b. Albert Einstein develops his theory of relativity
 - c. an economist measures how GDP varies across countries
 - d. the political unrest in the United States during the 1960s and 1970s is explained to primarily be a result of the Vietnam War
 - e. an economist states that a rise in inflation will lead to a fall in unemployment.

2. Model building is sometimes compared to map making. If someone asks you how to get to your house, what will you put on the map you draw for them? On the other hand, what if the question asked has to do with the location of the highest point in town, or the town's political boundaries, or how your dwelling links up to the local sewer system? Is it possible for a single, readable map to answer every possible question? Does the goal you have in mind for the map affect what you put on it?

2. Economic Tradeoffs

As individuals, and as members of a larger society, people make choices about *what* should be produced, *how* it should be produced, and *for whom* it should be produced.

2.1. Abundance and Scarcity

When you think of all the abundant natural resources in our world, all the human time and intelligence that exist, all the investments that have been made in organizing human societies, and the massive stock of machinery and other productive resources now accumulated, you realize that the world is wealthy indeed. Although the distribution of resources is far from even, across countries or among people within countries,

contemporary human society as a whole still has a rich resource base on which to build. No wonder that many world religions and ethical teachings encourage an attitude of gratefulness on the part of their adherents toward the sources of life's **abundance**.

abundance: resources are abundant to the extent that they exist in plentiful supply for meeting various goals.

It may seem odd, then, that many economists emphasize the notion of **scarcity**—that is, the notion that there is too little to go around—when discussing society's choices concerning *what*, *how* and for *whom*. What this really means is that even with all the available resources, and even with a steady eye on the goal of well-being, not everything that is socially desirable can be accomplished, at least not all at once.¹ The current capacity of a particular hospital, for example, may allow it to increase the number of heart transplants it performs *or* increase the amount of care it can provide for the severely mentally ill, but not both. A given resource, like an hour of your time, when dedicated to one beneficial activity (like studying) will be unavailable for certain other beneficial activities (like relaxing with your friends). Choices have to be made.

scarcity: resources are scarce to the extent that they are not sufficient to allow all goals to be accomplished at once

Macroeconomics is centrally concerned with how an overall economic environment emerges from the choices made by individuals and organizations, and to what extent choices made by governments can make this economic environment better or worse.

2.2 Society's Production Possibilities Frontier

Economists use the notion of a societal production possibilities frontier to illustrate concepts of scarcity, tradeoffs, choice, full employment, and efficiency.

The simplest version of this concept models an economy as if the only thing it has to consider is how to allocate its currently usable resources between the production of two possible flows of output over the coming year.² The classic example is to take “guns” as one output, and “butter” as the other. In more general terms, the guns-and-butter tradeoff can refer to any society's more general, and real-world, choice between becoming a more militarized society (“guns”) and becoming a more civilian- or consumer-oriented society (“butter”).

¹ An alternative definition of scarcity, dating to the 1930s, defined resources as scarce relative to presumably unlimited human *wants*, without any question of whether these wants promoted well-being or not.

² The resources considered to be available for economic production in the coming year will be *only a portion* of a society's total resource stock. Some quantities of resources—for example, of nonrenewable mineral and energy resources—should be left idle this coming year in order to provide a base or production in year thereafter. The question of how to wisely decide how much should be considered to be available for production in the coming year is discussed in the following section.

Figure 5 shows a **production possibilities frontier** (PPF) for this case. In this graph, the quantity of “butter” produced over a year is measured on the horizontal axis, or *X* axis. The quantity of “guns” is measured on the vertical axis, or *Y* axis. Every point on the graph represents a pair of quantities: one quantity of guns and another of butter. The points on the PPF curve illustrate the maximum quantities of guns and butter that the society could produce. For example, point A, where the curve intersects the horizontal axis, shows that this society can produce 120 units of butter if it does not produce any guns. Moving up and to the left, point B illustrates production, over the year, of 60 units of butter and 8 units of guns.³ If the society produces no butter, how many guns can it produce? While it may seem odd to think about a society that only produces two goods, the PPF figure is nevertheless helpful for illustrating several important economic concepts.

production possibilities frontier (PPF): a curve showing the maximum amounts of two outputs that society could produce from given resources, over a given time period

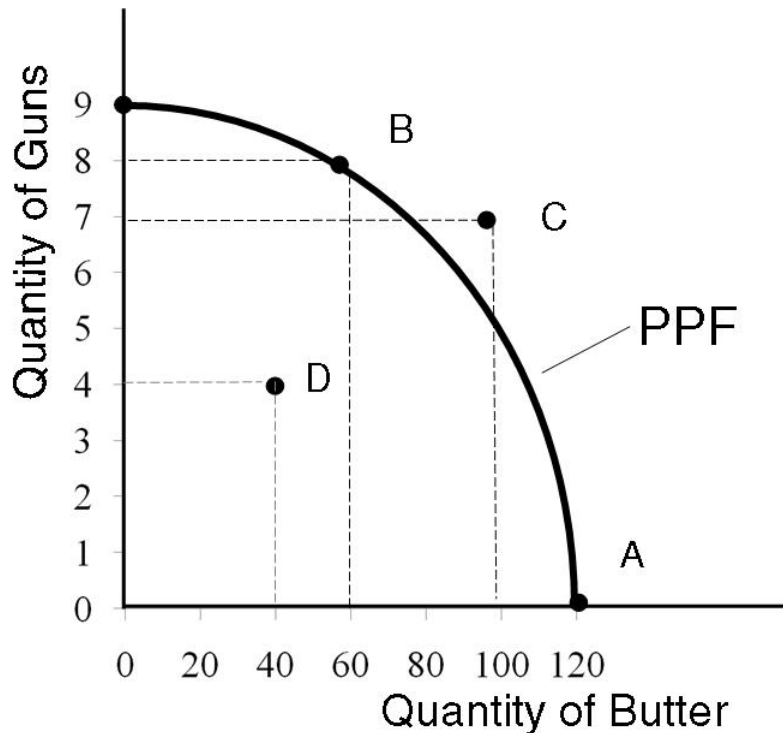


Figure 5. Society’s Production Possibilities Frontier

As you select different points along the PPF you see that the more you get of one good, the less you can have of another.

³ At this level of abstraction, it is not necessary to be specific about what is meant by “units.” You may imagine these as tons of butter and thousands of guns, if you like. Also, it is possible to imagine PPFs that include more than two products—but they would have to be graphed in three (or more) dimensions.

Scarcity

Point C in Figure 2.5 represents a production combination that is not attainable, given existing resources. To produce at that point would take more resources than society has. The PPF is specifically defined so that only those points on or inside it represent outputs that can actually be produced.

Tradeoffs

Points that lie on the PPF illustrate the important notion that scarcity creates a need for tradeoffs. Along the frontier, one can get more of one output only by “trading off” some of the other. Figure 2.5 illustrates the important concept of **opportunity cost**.

Opportunity cost is the value of the best alternative to the choice one actually makes. Looking at the PPF, we see that the cost of increasing gun production is less butter. For example, suppose the economy is at Point A, producing 120 units of butter and no guns, but then decides that it needs to produce eight guns. Point B illustrates that after some resources have been moved from butter production into producing the eight guns, the maximum amount of butter that can be produced is 60 units. The gain of eight guns comes at a “cost” to the economy of a loss of 60 units of butter. Likewise, starting from a point where the economy is producing some guns, the “cost” of producing more butter would be fewer guns.

opportunity cost: the value of the next best alternative, foregone when a choice is made

Efficiency

An **efficient** process is one that uses the *minimum value of resources* to achieve the desired result. Put another way, efficiency is achieved when the *maximum value of output* is produced from a given set of inputs. Points that lie *on* the PPF illustrate the maximum combinations that a society can produce. But what about points *inside* the frontier, such as point D? At point D, the economy is not producing as much as it could. It is producing 40 units of butter and 4 guns, even though it *could* produce more of one or the other, or both. Some resources are apparently being wasted. There are at least three reasons why this could occur. First, the resources may be wasted because they are being left idle. For example, workers may be left unemployed, or cows could be left unmilked. Second, even if resources are fully employed, the technology and social organization being applied to the resources may be less than the best. For example, suppose the gun factory is poorly designed, so that a lot of the workers’ time is wasted carting parts from one area to another. In this case, a better, more efficient organization of the work flow could increase production, with no increase in resources. Third, the allocation of resources between the two production activities (that is, guns and butter) might not be optimal. For example, if gun factories are built on the best pasture land when they could just as well be built on poorer land, the ability of the economy to graze cows and produce butter would be hampered. When an economy is imagined to be *on* the PPF, and thus producing

efficiently, the only way to produce more of one good is to produce less of the other. If an economy is *inside* the PPF, on the other hand, it is producing inefficiently, and improvements in the employment of resources, the application of available technology and social organization, or allocation of resources among production activities could allow it to move toward the frontier (that is, to produce more of both goods).

efficiency: the use of resources in a way that does not involve any waste. Inputs are used in such a way that they yield the highest possible value of output, or a given output is produced using the lowest possible value of inputs.

The bowed-out shape of the curve comes from the fact that some resources are likely to be more suited for production of one good than for the other. We can see, for example, that the society only has to give up 60 units of butter production to get the first eight guns. Workers, for example, can be pulled out of butter production and set to work on relatively plentiful supplies of the materials most suited for guns, such as easily tapped veins of iron ore and minerals for gunpowder. Gun manufacturing plants can—if allocation decisions are made wisely—be built on land unsuitable for pasture. The last single gun, on the other hand, gained by moving from point B up to where the PPF hits the vertical axis, comes at the cost of 60 units of butter! Pulling the remaining workers and land out of butter production, and directing the workers toward increasingly less accessible veins of mineral ores, or to the now-crowded gun assembly lines, dramatically decreases butter production while adding little to the production of guns.

Of course, we could put on the axis many other pairs of outputs, besides guns and butter, and still illustrate these concepts. We could look at coke and pizza, cars and bicycles, or health care and highways. This classic example, however, is a good one. In the real world, such guns/butter or militarization/peacetime tradeoffs can be crucially important. (See the accompanying Economics in the Real World box.)

What precise combination of outputs, such as guns and butter, or health care and highways, should society choose to produce? The PPF does *not* answer this question. The curve shows the range of efficient possibilities, but does not tell us which one of these combinations of outputs is best. To determine this, we would have to know more about a society's requirements and priorities. Is civilian satisfaction a high priority? Then the society would lean toward production of butter. Does the society fear attack by a foreign power? Perhaps then it would choose a point more toward the guns axis. For good social decision making, this production question would have to be considered right alongside questions of resource maintenance, distribution, and consumption, since all have effects on well-being. In a society with free speech and democratic discussion, there is wide room for disagreement about what the best mix of goods might be. The PPF provides a mental image for thinking about scarcity, tradeoffs, and efficiency but does not, itself, tell us how to choose among the possibilities it illustrates.

Economics in the Real World: The Opportunity Costs of Military Expenditures

What do military buildups and wars really cost? One way to look at this is to consider what else could have been bought with the money spent on armaments.

World military expenditures in 2006 totaled \$1,204 billion, or 2.5 percent of world GDP. This represents a 37 percent increase, in real terms, over the previous ten years. The United States is by far the biggest spender, accounting on its own for 46 percent of the global total. The United Kingdom, France, China, and Japan are the next biggest military spenders. Smaller and poorer countries spend less, but some of the poorest countries—including Eritrea and Burundi—spend more on the military than they do on public services such as health and education. Where do such countries get their weapons? The United States and Russia are the leading suppliers of military goods to international markets

Meanwhile, about ten million children every year—over 27,000 every day—die before they reach the age of five, most of them from malnutrition and poverty. The Millennium Development Goals set out by the United Nations aspire to cutting the rates of extreme poverty in half, and improving health, literacy, gender equity, and environmental sustainability in the poorest areas of the world. All this comes at a cost, of course. The amount of money that would be needed to achieve these goals has been estimated to be between \$121 and \$189 billion per year, from now until 2015—that is, about 10–15 percent of what is currently spent on arms. This amount of funding has not been forthcoming, however, and indications are that a number of the goals will not be met.

As former U.S. president Dwight D. Eisenhower said back in 1953, “Every gun that is made, every warship launched, every rocket fired, signifies in the final sense a theft from those who hunger and are not fed, those who are cold and are not clothed.”

Sources: Stockholm International Peace Research Institute, *SIPRI Yearbook 2007* (Stockholm, 2007); United Nations Development Project, *Human Development Report 2007/2008* (New York, 2007); The Millennium Project, *Investing in Development: A Practical Plan to Achieve the Millennium Development Goals* (New York, 2005).

2.3 Tradeoffs Over Time

We have said that a PPF reflects possible production combinations given the stock of currently available resources, and using the current state of technology. These ideas deserve more investigation. If we remember that achieving well-being involves questions of *how* and *for whom*, then the question becomes complex. For example, we generally want to conserve resources so that we can produce goods not only right now but later in

our lives. And we have an obligation to future generations to include them in our considerations of *for whom*.

Some production activities are also resource-maintenance activities, of course, and the flow of output from these adds to the stock of resources available for the future. Investments in plant and equipment can provide productive capacity not just for a few months, but often for years. Production of goods and services that protect the environment, or that encourage the formation of new forms of knowledge and social organization, also lead to an improved resource base. **Technological progress** can lead to long-run improvements in productive capacity. New technologies can create new, more efficient methods for converting resources into outputs—or even create kinds of products never before imagined. To the extent that production is of this sort, production can *add* to the production possibilities for the future. The PPF may expand over time, out and to the right, making previously unobtainable points obtainable, as shown in Figure 6.

technological progress: the development of new products and new, more efficient, methods of productions

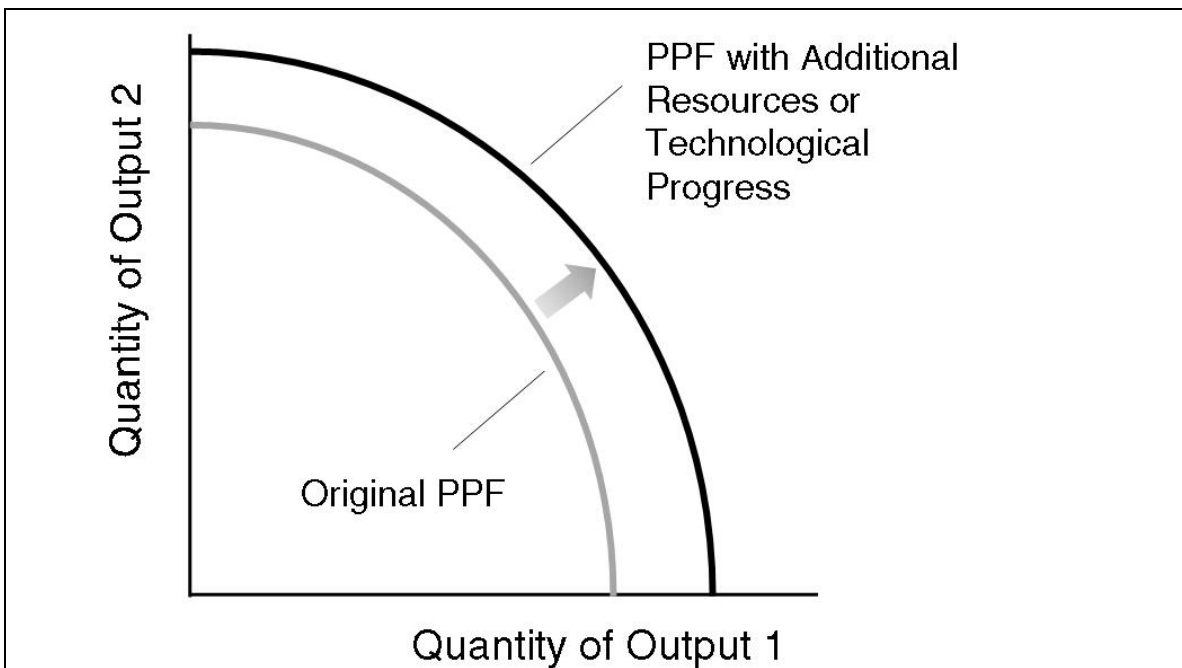


Figure 6. An Expanded Production Possibilities Frontier

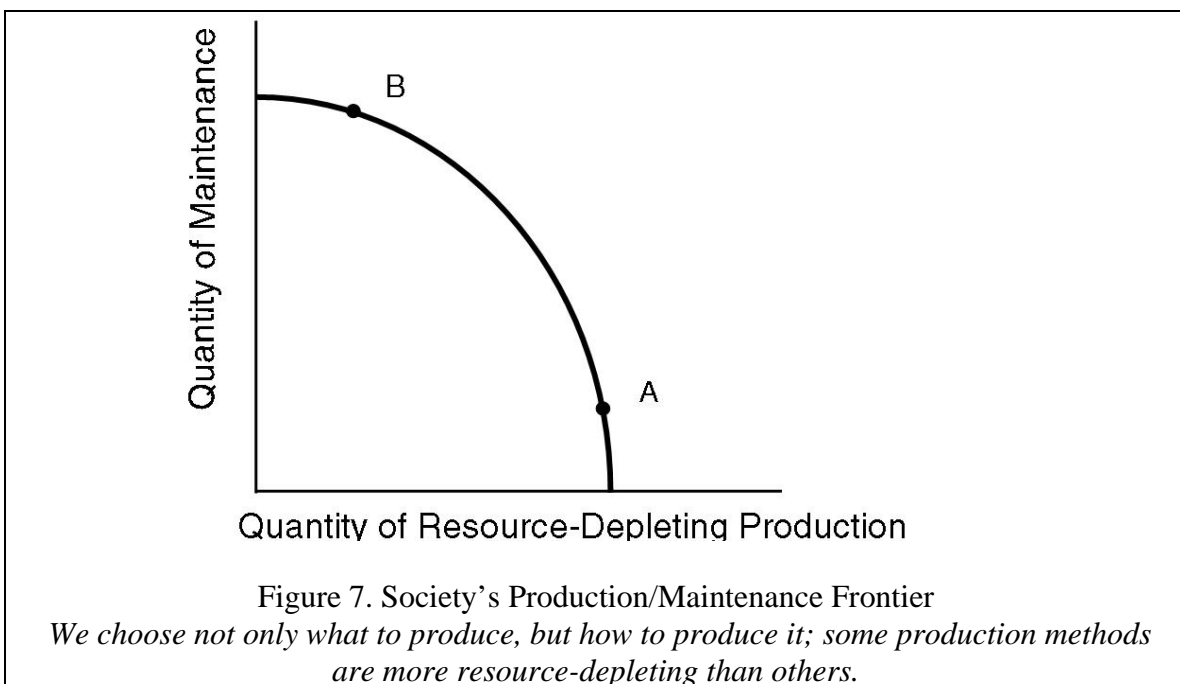
When the PPF moves “out” (away from the origin) our choices are still constrained but, overall, it becomes possible to get more of both things, as compared to the “lower” PPF.

Some productive activities contribute an ongoing flow of outputs without drawing down the stock of capital resources. Sustainable production activities, such as some agricultural and forestry processes when they are suitably planned and carried out, may not add to the resource base, but neither do they deplete it.

But many other productive activities lead to resource depletion or degradation. The intensive use of fossil fuels is now depleting petroleum reserves, degrading air quality, and contributing to global climate change. Production processes that destroy important watersheds and wildlife habitats are also resource-depleting. Mind-numbing drudgery, or work in dangerous circumstances, can degrade human resources by leaving people exhausted or in bad mental or physical health. These kinds of productive activities are at odds with resource maintenance.

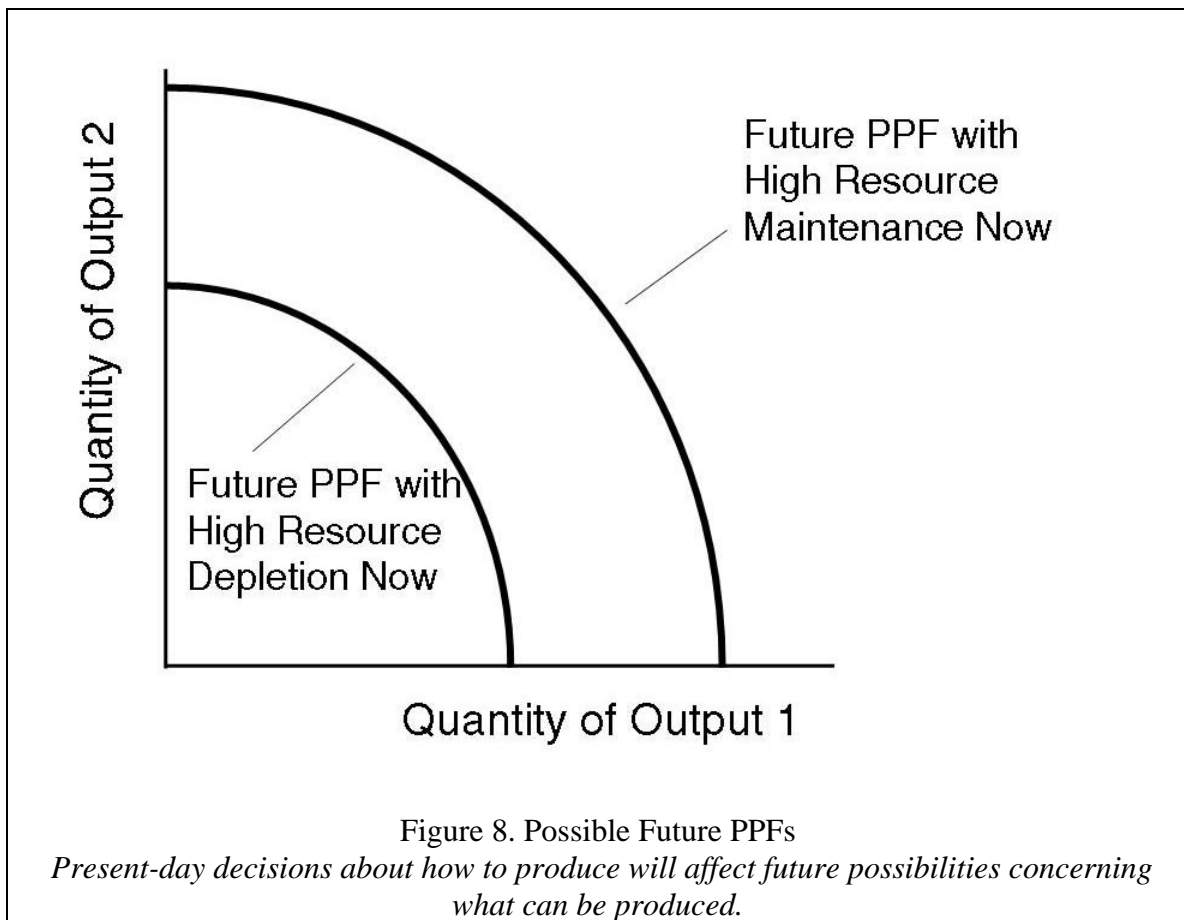
Taking a longer-term view, then, it is clear that getting the absolute most production, right now, out of the available resources is not an intelligent social goal. Decisions such as guns vs. butter need to be accompanied by another decision about now vs. later. What needs to be currently produced, what needs to be maintained, and what investments are needed to increase future productivity?

Figure 7 shows a production/maintenance frontier, which illustrates the tradeoff between resource-depleting kinds of production and resource-maintenance activities (the latter including both conservation and investment). Point A illustrates a societal decision to engage in considerable resource-depleting production in the present year, while putting little emphasis on maintenance for the future. Point B illustrates a decision to engage in a higher level of maintenance this year and in a lower level of resource-depleting production.



The consequences of choosing between points A and B are illustrated in Figure 8, where once again we portray a two-output (such as guns vs. butter) PPF. Now, however, the depiction is of some time in the future, following the current choice between A and B. As Figure 8 shows, a decision to maintain more for the future, by choosing point B in Figure 7, leads to a larger set of production possibilities in future years. A decision to engage in considerable resource depletion, by choosing point A in Figure 7, leads to the smaller future PPF shown in Figure 8.

Of course, some will argue that advances in technology (which we have included as a resource-maintaining type of production) will always push out the PPF (as in Figure 6) more than resource depletion will pull it in (as in Figure 8). But this is no more than an assertion of belief. If this belief turns out not to be warranted, then acting on the basis of it may lead to large-scale, unfortunate, and irreversible consequences.



Discussion Questions

1. Suppose that your time for studying can be allocated to either studying for this course or studying for another course. Your two “outputs” are your grade in each course. Draw a production possibilities curve for these two outputs. Would the curve be shaped like the PPF in Figure 5? Discuss.
2. Consider the following activities. Which ones do you think would expand society’s PPF in the future? Which ones would shrink it? (There may be room for disagreement on some.)
 - a. increasing education spending
 - b. increasing the production of sport utility vehicles
 - c. building a nuclear power plant
 - d. restoring wetlands
 - e. building a new interstate highway
 - f. expanding Internet capacity

3. The Role of Markets

One of the major areas of interest—and dispute—among economists concerns how markets function. Those who develop theories along the lines of classical economics believe that market systems function fairly smoothly and are largely self-regulating. Those who lean more towards the Keynesian side believe that market economies need some help from government policy to serve goals of human well-being. But what do economists mean by “markets”?

3.1 The Meaning of Markets

When people talk about markets, they may be referring to a number of different meanings of the word, from very concrete to very abstract. In the language of economics there are at least three different uses of the word "market," and the appropriate meaning must be judged from the context in which it appears. We will start with the most concrete and move toward the more abstract definitions

The most concrete and commonsense definition of a market is the idea that a market is a *location*—that is, a *place* where people go to buy and sell things. This is historically appropriate: Markets such as the Grand Bazaar in Istanbul or African village produce stands have flourished for ages as meeting places for people who wish to make exchange transactions. The same criterion applies today, even when the “market” has become a shopping center or mall, with many retail stores sharing one huge building, or a stock or commodity exchange, where brokers stand on a crowded floor and wave signals to each other. A market, as suggested by these examples, can be defined as a physical place where there is a reasonable expectation of finding both buyers and sellers for the same product or service.

market (first meaning): a physical place where there is a reasonable expectation of finding both buyers and sellers for the same product or service.

However not all markets are physical places where buyers and sellers interact. We can think of markets in more general terms as *institutions* that bring buyers and sellers together.

Institutions are ways of structuring the interactions between individuals and groups. Like markets, institutions can also be thought of in concrete or abstract terms. A hospital can be considered an institution that structures the interactions between doctors and patients. A university is an institution that structures the interactions between professors and students. But institutions can also be embodied in the customs and laws of a society. For example, marriage is an institution that places some structure on family relationships. Laws, courts, and police forces are institutions that structure the acceptable and unacceptable ways that individuals and groups interact.

institutions: ways of structuring the interactions between individuals and groups, including both formally constituted establishments and the generally recognized patterns of organization embodied in customs, habits, and laws

When we think of markets as institutions, we see that a market does not need to be a physical location. Internet auctions, such as eBay, are market institutions that bring buyers and sellers together. The New York Stock Exchange can be considered both a physical location--a building on Wall St. where brokers buy and sell stocks--and an institution where investors all over the world interact indirectly according to a set of established rules and structures.

market (second meaning): an institution that brings buyers and sellers into communication with each other, structuring and coordinating their actions

Thinking of markets as institutions, rather than concrete places, leads to various ways of discussing *particular* markets. Many economists spend much of their time investigating one or more such specific institutional markets. They may track the trades made at various prices over time for a specific good, like heating oil or AT&T bonds, try to forecast what might happen in the future, or advise on the specifics of market structures. When such an economist speaks of a market, he or she most often means the institutional market for such a specific good.

In this sense, several different markets may operate under one roof, within the same organization. For example, in the United States the Chicago Board of Trade operates many markets for a variety of farm products, including wheat, corn, and soybeans, among many others. Indeed, even a term like "wheat" may be too general to define a market for some purposes, given the existence of such distinct varieties as "No. 2 dark winter wheat" and "No. 1 dark northern spring wheat." Or such an institutional

market might cover a number of different physical locations, such as when an economist speaks of a market in regional terms. The “New England market for home heating oil” for example, may involve transactions by a number of different companies at a number of different physical locations.

In the most abstract terms, people sometimes talk of “the market” as a situation of idealized unencumbered exchange. Without reference to either physical places or social institutions, buyers and sellers are imagined to come to instantaneous, costless agreements. This definition of the market may refer to all market relationships at a national or even global level. When economists speak of the merits (or limitations) of “free markets,” they are referring to the concept at this level of abstraction. Often what people have in mind in this case is not so much specific, institutional markets as a particular model of how markets *could* behave, in an ideal case. Economists who have a “pro-market” view believe that markets should generally be left to function with very little government intervention in order to maximize economic prosperity. They may claim, for example, that problems of environmental protection can and should be solved by “the market.” Others recognize the effectiveness of markets but believe that problems such as poverty, inequality, environmental degradation, and declines in social ethics may be caused or exacerbated by unchecked and unregulated markets.

“the market”: a phrase that people often use to mean an abstract situation of pure exchange or a global system of exchange relationships

3.2 The Basic Neoclassical Model

The **basic neoclassical model**, traditionally taught in detail in most *microeconomics* courses at the introductory level, is a model of market exchange that—while abstracting away from many real-world factors (some of which are discussed below)—portrays in a simple and elegant way some important aspects of markets.⁴ Neoclassical economics arose during the late 19th and early 20th century. It took the earlier classical idea that economies can be thought of as systems of smoothly-functioning markets, and expressed this idea in terms of formalized assumptions, equations and graphs. (The prefix “neo-“ means “new.”)

In this model, the world is simplified to two kinds of economic actors. Households are assumed to consume and to maximize their utility (or satisfaction). Firms are assumed to produce and to maximize profits. Households are considered to be the ultimate owners of all resources, and they sell or rent these to firms, receiving monetary payments in return. Firms produce goods and services, which they sell to households in return for monetary payments. This model can be portrayed in the circular flow diagram in Figure 9. The model further assumes that there are so many firms and households involved in the market for any good or service that a situation of “perfect competition” reigns, in which prices are determined purely by forces of supply and demand.

⁴ This may also be called the “traditional microeconomic model.”

basic neoclassical model: a simple, mechanical model that portrays the economy as a collection of profit-maximizing firms and utility-maximizing households interacting through perfectly competitive markets

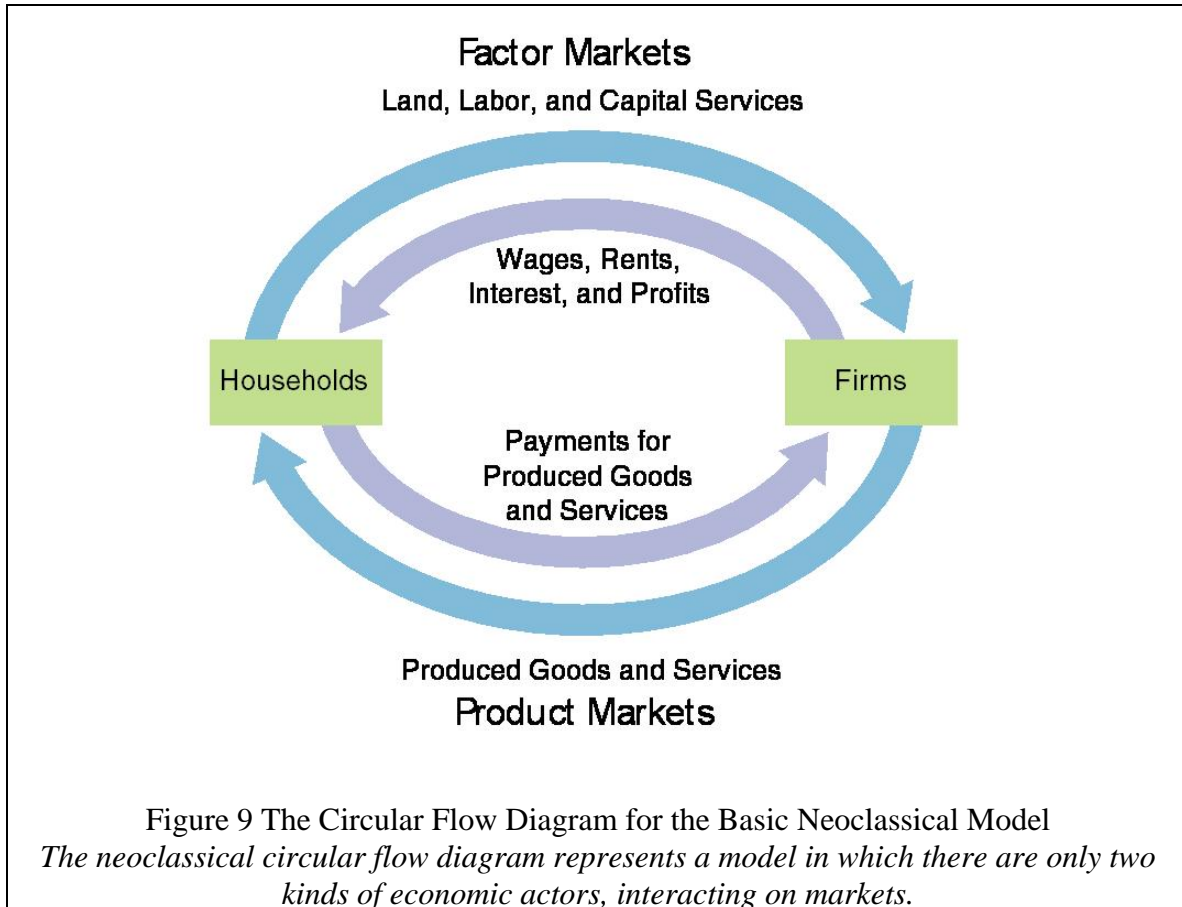


Figure 9 The Circular Flow Diagram for the Basic Neoclassical Model
The neoclassical circular flow diagram represents a model in which there are only two kinds of economic actors, interacting on markets.

In this idealized world, goods and services are produced, distributed, and consumed in such a way that the market value of production is as high as it can be. The model combines important observations about markets with assumptions about human values and human behavior (as both producers and consumers). (In reading through the following statements, see if you can recognize which parts are “positive” observations of facts, and which are assumptions, which may include a “normative” slant, towards “the way things ought to be.”) Full social and economic efficiency is said to arise because:

- The prices set by the forces of supply and demand in smoothly functioning markets carry signals throughout the economy, coordinating the actions of many individual decision-makers in a highly decentralized way.
- The profit motive gives perfectly competitive firms an incentive to look for low-cost inputs and convert them into highly valuable outputs. Production decisions

are thus made in such a way that resources are put to their most (market) valuable uses.

- Consumption decisions made by individuals and households are assumed to maximize the “utility” or satisfaction of consumers.
- Maximizing the market value of production is assumed to be a reasonable proxy for maximizing human well-being

Extending the model to include international trade, the story of “comparative advantage,” which you may study at some point, similarly demonstrates how specialization and trade may lead to a greater (market) value of production on an international scale, compared to a situation in which each country produces only for itself.

3.3 The Advantages of Markets

Economies that rely heavily on markets to coordinate production, distribution, and consumption have certain important advantages over the main recent historical alternative to markets, central planning.

The bureaucratic socialist systems that used to exist in the former Soviet Union and Eastern Europe, for example, were notorious for their inefficiency in resource allocation—both within enterprises and across the whole economy. According to economic historian Alec Nove, Soviet economic planning at its peak spelled out production targets for almost 50,000 commodities, involving a staggering and virtually unmanageable level of detail. Separate production decisions had to be made for the millions of distinguishable commodities in the Soviet Union (e.g., every size for each different style of shoes). A large bureaucracy had to be established to run all this. The economy was steered very much toward heavy industry and military production—allowing the Soviet Union to become a world power—while neglecting consumer goods and agriculture. Dissatisfaction with the results of this centrally-controlled system contributed greatly to its collapse in 1992.

Because information and decision-making in a market economy is decentralized, and producers have an incentive to respond to consumer desires, market systems can lead to a more efficient use of resources than entirely centrally planned economic systems. While the workings of real-world markets are more complex, the principle of efficiency highlighted in the basic neoclassical model should not be neglected.

The fact that market exchange is *voluntary*, not coerced, is often considered to be an additional advantage of markets. While most people are in some sense forced to offer their labor for pay in order to survive in a market economy, market systems generally offer people some choice about where they work and what they buy. Other market advocates claim that, by offering financial incentives, markets encourage people to be creative, innovate, and communicate with each other.

However, it is one thing to recognize that markets have advantages, and another to claim that markets are *always* the best way to organize economic activity.

Classically-minded macroeconomists tend to emphasize potential efficiency gains from markets, and stay fairly close to the basic neoclassical model in their theories. They tend to believe that most economic decisions should be left to “free markets.”

More Keynesian-oriented macroeconomists, on the other hand, tend to emphasize how real-world markets might differ from the smoothly functioning markets that exist in theory. Real-world markets require an impressive set of associated institutions to work well, they point out. And markets on their own are not well-suited to addressing certain kinds of economic problems.

3.4 The Institutional Requirements of Markets

Contemporary large-scale markets do an amazing thing: they allow many, many separate decision makers, acting from decentralized information, to coordinate their behavior, resulting in highly complex patterns of voluntary exchange transactions. They do not, however, operate in a vacuum. Economists have identified a number of even more basic institutions that market institutions require in order to function. We will classify these in four broad groups: individualist institutions related to property and decision making, social institutions of trust, infrastructure for the smooth flow of goods and information, and money as a medium of exchange.

Markets require individualist institutions related to property and decision making, social institutions of trust, infrastructure for the smooth flow of goods and information, and money as a medium of exchange.

Individualist institutions related to property and decision making

For markets to work, people need to know what belongs to whom. Private property is the ownership of physical or financial assets by nongovernment economic actors. Actors must also be allowed to make their own decisions about how to allocate and exchange resources. Prices, in particular, must not be under the complete control of guilds or central bureaus, but must, rather, generally be allowed to be set by the interactions of market participants themselves.

private property: ownership of assets by nongovernment economic actors

The institutions of private property and individualist decision making exist both formally, as in codes of law, and informally, in social norms. For example, some Western economists expected markets to grow quickly in the countries of the former Soviet Union as soon as communism was dismantled and opportunities for markets opened up. However, many people were accustomed to being told where to work and what to do by

the state. Norms of individual initiative and entrepreneurship, it turns out, do not just arise naturally but need to be fostered and developed.

Social institutions of trust

A second critical institutional requirement for markets is that some degree of trust must exist between buyers and sellers. When a buyer puts down her payment, she must trust that the seller will hand over the merchandise and that it will be of good quality. A seller must be able to trust that the payment offered is valid, whether it is in the form of currency, personal check, credit card charges, or other kinds of promise of future payment. Social institutions must be created to reduce the risk involved.

Again, trust is an institution that exists both in social norms and formal establishments. Cultural norms and ethical or religious codes can help establish and maintain an atmosphere of trustworthiness. One-on-one exchanges between customers and businesses help build trust and make future transactions smoother. Many companies have built up a reputation for making quality products or providing good service. Marketers try to capitalize on the tendency of buyers to depend on reputation by using advertising to link certain expectations about quality and price to a recognizable brand name and thus creating “brand loyalty” among repeat customers.

In modern complex economies, contracts are often needed to define the terms of an exchange. An informal or **implicit contract** exists when the terms of an exchange are defined verbally or through commonly-accepted norms and traditions. **Explicit contracts** are formal, usually written, agreements that provide a legally-enforceable description of the agreed-upon terms of exchange. For formal contracts to work, there must be laws that define contracts, state the legal obligation to honor contracts, and establish penalties for those who fail to do so, and a system for enforcing those laws.

implicit contract: an informal agreement about the terms of exchange, based on verbal discussions and on common norms, traditions, and expectations

explicit contract: a formal, often written, agreement that states the terms of exchange and may be enforceable through a legal system.

In highly marketized economies many other institutions have evolved to deal with the issue of trust. For example, credit bureaus keep track of consumer credit trustworthiness, Better Business Bureaus keep track of complaints against businesses, “money back” guarantees give consumers a chance to test the quality of a good before they commit to purchasing, and escrow accounts provide a place where money can be put until goods or services are delivered. Government agencies like the U.S. Food and Drug Administration and local boards of health are charged with monitoring the quality and purity of many goods that are sold.

However, even in complex transactions among large groups of strangers, social norms are still essential. Detailed formal contracts are costly to write and costly to

enforce. It is not practical to police every detail of every contract, and it is impossible to cover every conceivable contingency. The legal system can work smoothly only if most people willingly obey most laws and believe that it is dishonorable to cheat. In effect, relationships, social norms, and the governmentally-created apparatus of law are institutions that must exist side by side, reinforcing one another. None of these alone can carry the whole burden of making complex contracts work, and hence make markets possible.

Infrastructure for the smooth flow of goods and information

A third set of basic institutions for market functioning have to do with making possible a smooth flow of goods and information. Most obviously, there needs to be a system of **physical infrastructure** for transportation and storage that provides the basic foundation for moving goods around. Such infrastructure includes roads, ports, railroads, and warehouses in which to store goods awaiting transport or sale. This sort of infrastructure can be most noticeable when it is absent, such as in economies ravaged by war.

physical infrastructure: the equipment, buildings, physical communication lines, roads and other tangible structures that provide the foundation for economic activity

In addition, there needs to be an infrastructure in place for the flow of information. Producers and sellers need information on what, and how much, their customers want to buy; in a well-functioning marketized economy, this information indicates what, and how much, should be produced and offered for sale. At the same time, consumers need to know what is available, and how much of something else they will have to give up (i.e., how much they will have to pay) to get the products that are on the market. In fact, ideally consumers should be able to compare all potential purchases, as a basis for deciding what to acquire and what to do without.

Money as a medium of exchange

The final critical institution required for markets to operate smoothly is a generally accepted form of money. Many different things have been used as money in the past. Early monetary systems used precious or carved stones, particular types of seashells, or other rare goods. Gold, silver, and other metal coins were the most common choice for many centuries; more recently, paper currency has become important. Today, financial instruments such as bank account balances play an even larger role; in a developed country, the amount of money that changes hands in the form of business and personal checks is several times as great as the volume of transactions conducted with paper and metal currency. The use of credit cards (a form of debt, to be later paid by a bank account draft), electronic bank transfers, and payments over the Internet further ease the making of payments in exchange.

What makes something **money**? One obvious criterion is that money must be widely accepted as a medium of exchange; money is whatever everyone else thinks it is. Yet this alone is not enough. Imagine the problems that would occur if everyone agreed

that heads of lettuce were money! A form of money that starts to rot within a week or two would be difficult to use. Thus a second criterion is that money must provide a durable store of value, of the same value today as at any time in the near future. If there is inflation – that is, an increase in the average price level for all goods and services – then money gradually loses a little of its value. Usually, however, inflation occurs slowly enough that people can retain confidence in the value of money from day to day. Relatively rare episodes of "hyperinflation" – in Germany after World War I; in several Latin American countries during the second half of the 20th century; or in Russia after 1989—when prices shoot upward and money suddenly wilts like old lettuce, have led to great social stresses and inequities.

money: a medium of exchange—something that people trust has value and so will accept in exchange for goods or services. It is desirable that it also be a durable store of value and have minimal handling and storage costs.

Even with durability added, the definition of money is still not complete. Some durable goods would not be successful as money. Bottles of wine retain their value for many years but are too bulky and breakable to be used widely in exchanges. A final criterion, therefore, is that money must have minimal handling and storage costs. By this criterion, paper currency is better than coins, and financial records on a computer are better still.

In many cases, money is created or sanctioned by the government but this is not essential. For example, cigarettes were a form of money in prisons and concentration camps during World War II. Money is, ultimately, based upon common agreement. While once backed by precious metals in Fort Knox, the value of a U.S. dollar is now based only on the understanding that other people will take it in exchange. In this sense, money is also a social institution of trust, as well as part of the institutional infrastructure of functioning markets.

3.5 The Limitations of Markets

Real-world choices are not limited to either a system where a centralized government exerts total control or the radically “free market” system described in the basic neoclassical model. Actual market-oriented economies always include a mixture of decentralized private decision-making and more public-oriented decision-making.

This is not because voters and government officials are not aware of the advantages markets can have in helping an economy run efficiently. Rather, it is because in real world economies there are a number of important, complex factors that are not taken account of in the basic neoclassical model. Some of the major factors which are important include: public goods, externalities, transaction costs, market power, questions of information and expectations, and concerns for human needs and equity.

Economic systems cannot rely solely on “free markets” to organize activity because of factors including public goods, externalities,

| transaction costs, market power, questions of information and expectations, and concerns for human needs and equity.

Public goods

Some goods cannot, or would not, be well-provided by private individuals or organizations acting alone. A **public good** (or service) is one where the use of it by one person does not diminish the ability of another person to benefit from it (“nondiminishable”), and where it would be difficult to keep any individuals from enjoying its benefit (“nonexcludable”).

| **public goods:** goods for which (1) use by one person does not diminish usefulness to others, and (2) it would be difficult to exclude anyone from benefiting

For example, if a local police force helps make a neighborhood safe, all the residents benefit. Public roads (at least those that are not congested and have no tolls) are also public goods, as is national defense. Education and quality childcare are public goods because everyone benefits from living with a more skilled and socially well-adjusted population. A system of laws and courts provides the basic legal infrastructure on which all business contracting depends. Environmental protection that makes for cleaner air benefits everyone.

Because it is difficult to exclude anyone from benefiting, public goods cannot generally be bought and sold on markets. Even if individual actors would be willing to pay if necessary, they have little incentive to pay because they can’t be excluded from the benefit. Economists call people who would like to enjoy a benefit without paying for it **free riders**. Because of the problem of free riders, it often makes sense to provide public goods through government agencies, supported by taxes, so that the cost of the public benefit is also borne by the public at large.

| **free riders:** people who would like to enjoy the benefit of a public good without paying for it

Externalities

Other activities, while they may involve goods and services that are bought and sold in markets, create **externalities**. Externalities are side effects or unintended consequences of economic activities. They affect persons, or entities such as the environment, that are not among the economic actors directly involved in a particular economic activity. These effects can be positive or negative. Sometimes positive externalities are referred to as “external benefits” and negative externalities are referred to as “external costs.” Externalities are one of the primary ways in which the true *social* value of a good or service may differ from its *market* value.

| **externalities:** side effects or unintended consequences, either positive or negative, that affect persons, or entities such as the environment,

| that are not among the economic actors directly involved in the economic activity that caused the effect.

Examples of negative externalities include a manufacturing firm dumping pollutants in a river, decreasing water quality downstream, or a bar that plays loud music that annoys its neighbors. Examples of positive externalities include the fact that parents who, out of love for their children, raise them to become decent people (rather than violent criminals) also create benefits for society at large, or the way in which one person getting vaccinated against a communicable disease to protect himself or herself also protects people around him or her from the disease's spread. In both cases, there are social benefits from individual actions. Well-educated, productive citizens are an asset to the community as well as to their own families, and disease control reduces risks to everyone.

Some of the most important externalities have to do with the economic activity of resource maintenance: Relying on markets alone to coordinate economic activities allows many activities to happen that damage or deplete the natural environment, because the damage often does not carry a price tag and because people in future generations are not direct parties to the decision-making.

If economic activities affected only the actors directly involved in decision-making about them, we might be able to think about economic activity primarily in terms of individuals making decisions for their own benefit. But we live in a social and ecological world, in which actions, interactions, and consequences are generally both widespread and interknit. If decisions are left purely to individual self-interest, then from a societal point of view too many negative externalities will be created, and too few positive externalities: The streets might be strewn with industrial wastes, while children might be taught to be honest in dealings within their family, but not outside of it. Market values and human or social values do not always coincide.

Transaction costs

Transaction costs are the costs of arranging economic activities. In the basic neoclassical model, transaction costs are assumed to be zero. If a firm wants to hire a worker, for example, it is assumed in that model that the only cost involved is the wage paid. In the real world, however, the activity of getting to a hiring agreement may involve its own set of costs. The firm may need to pay costs related to searching, such as placing an ad or paying for the services of a recruiting company. The prospective worker may need to pay for preparation of a resume and transportation to an interview. One or both sides might hire lawyers to make sure that the contract terms reflect their interests. Because of the existence of such costs, some economic interactions that might be lead to greater efficiency, and that would occur in a transaction-cost free, frictionless idealized world, may not happen in the real world.

| **transaction costs:** the costs of arranging economic activities

Market power

In the basic neoclassical model, all markets are assumed to be “perfectly competitive,” such that no one buyer or seller has the power to influence the prices or other market conditions they face. In the real world, however, we see that many firms have **market power**. For example, when there is only one firm (a monopolist) or a few firms selling a good, they may be able to use their power to increase their prices and their profits, creating inefficient allocations of resources in the process. Workers may also be able to gain a degree of market power by joining together to negotiate as a labor union. A government, too, can have market power, for example when the Department of Defense is the sole purchaser of military equipment from private firms.

| **market power:** the ability to control, or at least affect, the terms and conditions of the exchanges in which one participates

Businesses may also gain power by their sheer size—many corporations now function internationally, and have revenues in the tens of billions of dollars. The decisions of individual large corporations can have substantial effects on the employment levels, economic growth, living standards, and economic stability of regions and countries. Governments may need to factor in the responses of powerful business groups in making their macroeconomic decisions. National leaders may fear, for example, that raising business tax rates or the national minimum wage may cause companies to leave their country and go elsewhere. Corporations frequently also try to influence government policies directly, through lobbying, campaign contributions, and other methods.

Information and expectations

In the basic neoclassical model, in which purely decentralized decisions lead to efficient outcomes, people are assumed to have easy access to all the information they need to make good choices. This analysis is **static**; that is, it deals with an idealized case in a timeless manner. The model doesn’t consider the time it might take for a person to make a decision, or the time it might take for a factory to gear up to produce a good. In the real, **dynamic**, world, getting good information may be difficult, and planning for an uncertain future is a big part of anyone’s economic decision-making.

| **static analysis:** analysis that does not take into account the passage of time

| **dynamic analysis:** analysis that takes into account the passage of time

A manufacturing business, for example, might be considering whether or not to borrow funds to build an additional factory. If the company’s directors were able to know in advance exactly what demand for its products will be like in the future and what interest rates will be—along with additional information about things like future wages, energy costs, and returns on alternative investments—the decision would be a simple matter of mathematical calculation.

But the directors will have to guess at most of these things. They will form expectations about the future, but these expectations may turn out to be correct or incorrect. If their expectations are optimistic, they will tend to make the new investment and hire new workers. Often optimism is “contagious,” and if a lot of *other* business leaders become optimistic, too, then the economy will boom. If, on the other hand, people share an attitude of pessimism, they may all tend to cut back on spending and hiring.

Since no one business wants to take the risk of jumping the gun by expanding too soon, it can be very difficult to get a decentralized market economy out of a slump. How people get their information, how they time their actions, and how they form their expectations of the future, then, are all important topics in macroeconomics that are not addressed in the basic neoclassical model. Taking these factors into account means that sometimes markets may not work as smoothly as that model suggests.

Human needs and equity

In the basic neoclassical model, the only consumer demands for goods and services that count are those that are backed up by a consumer’s ability to pay. This has several implications.

First, there is nothing in the model that assures that resources are distributed in such a way that people can meet their basic human needs. If a few rich people have a lot of money to spend on diamonds, for example, while a great number of poor people lack the money to pay for basic health care, “free markets” will motivate producers to respond to the demand for diamonds, but not to the need for basic health care. More deliberate policies of economic development, government provision, subsidies, or income redistribution—sometimes incorporating, or sometimes replacing, market means—are often enacted to try to ensure that decent living standards become more widespread.

Second, the model does not take into account non-marketed production, such as the care given to children, the sick and the elderly by family and friends. There is nothing in the basic neoclassical model that assures that these sorts of production will be supplied in adequate quantities and quality.

Lastly, it is also the case that problems like unemployment and inflation usually tend to affect some people more than others, so that how a country deals with these problems also has distributional consequences.

Clearly, although market systems have strong advantages in some areas, they cannot solve all economic problems. Economists sometimes use the term **market failure** to refer to a situation in which a market form of organization would lead to inefficient or harmful results. Because of the existence of public goods, externalities, transaction costs, market power, questions of information and expectations, and concerns for human needs and equity, macroeconomic systems cannot rely on “free markets” alone if they are to generate human well-being.

market failure: a situation in which markets yield inefficient or inappropriate outcomes.

To some extent *private* non-market institutions may help remedy “market failure.” For example, a group of privately-owned factories located around a lake may voluntarily decide to restrict their waste emissions, because too much deterioration in water quality hurts them all. Likewise, a widespread custom of private charitable giving may help alleviate poverty. But sometimes the problems are so large or widespread that only governmental, *public* actions at the national or international levels seem to offer a solution. Exactly how much governmental action is required, and exactly what governments should do, however, are much-debated questions within contemporary macroeconomics.

Discussion Questions

1. In what sense is the term “market” being used in each of the following sentences? “Go to the market and get some bananas.” “The market is the best invention of humankind.” “The labor market for new Ph.D.’s is bad this year.” “The advance of the market leads to a decline in social morality.” “The market performance of IBM stock weakened last month.” Can you think of other examples from your own readings or experience?
2. “Indeed it has been said that democracy is the worst form of Government,” said British Prime Minister Winston Churchill (1874–1965), “except all those other forms that have been tried from time to time.” Some people make the same claim about more marketized forms of economic systems. What do they mean? Would you agree or disagree?

Review Questions

1. What are the three main modes of economic investigation? Describe each.
2. What is a model? How does the *ceteris paribus* assumption simplify the creation of a model?
3. How do abundance and scarcity create the possibility of, and the necessity of, economic decision-making?
4. What three requirements are met in producing along a production possibilities frontier?
5. Draw a societal production possibilities frontier, and use it to explain the concepts of tradeoffs (opportunity cost), attainable and unattainable output combinations, and efficiency.
6. What kinds of decisions would make a PPF expand over time? What kinds of decisions would make it shrink over time?
7. What are the three different meanings of the term “markets?”
8. What are some of the assumptions of the basic neoclassical model? Why are markets said to be efficient according to this model?

9. What are the four institutional requirements of markets?
10. What is a public good? Why will private markets generally undersupply public goods?
11. What are negative and positive externalities? Give examples of each.
12. Besides public goods and externalities, describe four real world factors which can cause market outcomes to be less than ideal.

Exercises

1. Consider the following data, taken from the Economic Report of the President 2004. Perform the graphing exercises below using either pencil and graph paper or a computer spreadsheet or presentation program.

Year	Unemployment Rate (percent)	Inflation (percent per year)
1992	7.5	2.3
1993	6.9	2.3
1994	6.1	2.1
1995	5.6	2
1996	5.4	1.9
1997	4.9	1.7
1998	4.5	1.1
1999	4.2	1.4

- a. Looking at the data listed in the chart, can you detect a trend in the unemployment rate during these years? In the inflation rate? If so, what sort of trends do you see?
 - b. Create a time series graph for the unemployment rate during 1992-1999.
 - c. Create a scatter plot graph with the unemployment rate on the horizontal axis and inflation on the vertical axis.
 - d. Using your graph in part (c), do the two variables seem to have an empirical relationship during this period, or do the points seem to be randomly scattered? If there appears to be an empirical relationship, is it inverse or direct?
 - e. How does the empirical relationship between unemployment and inflation in this period compare to the period 1963-1969 (discussed in the reading)?
2. The notion of “scarcity” reflects the idea that resources cannot be stretched to meet all the goals that people desire. But what makes a particular resource “scarce”? If there seems to be more of it around than is needed (like desert sand), is it scarce? If it is freely open to the use of many people at once (like music on the radio waves), is it scarce? What about resources like social attitudes of trust and respect? Make a list of a few resources that clearly *are* “scarce” in the economists’ sense. Make another list of a few resources that are not.

3. How is the concept of efficiency related to the concept of scarcity? Consider, for example, your own use of time. When do you feel time to be more, and when less, scarce? Do you think about how to use your time differently during exam week, compared to when you are on vacation?

4. Suppose that society could produce the following combinations of pizzas and books:

Alternative	Pizzas	Books
A	50	0
B	40	10
C	30	18
D	20	24
E	10	28
F	0	30

- Using graph paper (or a computer program), draw the production possibilities frontier (PPF) for pizza and books, being as exact and neat as possible. (Put books on the horizontal axis. Assume that the dots define a complete curve.)
- Is it possible and/or efficient for this society to produce 25 pizzas and 25 books?
- Is it possible and/or efficient for this society to produce 42 pizzas and 1 book?
- If society is currently producing alternative B, then the opportunity cost of moving to alternative A (and getting 10 more pizzas) is _____ books.
- Is the opportunity cost of producing pizzas higher or lower moving from alternative F to E than moving from alternative B to A? Why is this likely to be so?
- Suppose that the technologies used in producing both pizzas and books improve. Draw one possible new production possibilities frontier in the graph above which represents the results of this change. Indicate the direction of the change that occurs with an arrow.

5. Match each concept in Column A with a definition or example in Column B.

Column A

- a. a positive externality
- b. theoretical investigation
- c. time series data
- d. a public good
- e. opportunity cost of buying an apple
- f. scarcity
- g. efficient production
- h. technological progress
- i. an institutional requirement of markets
- j. market power
- k. a negative externality
- l. an assumption of the basic neoclassical model
- m. static analysis

Column B

- i. an apple pie producer trusts that apple growers will supply the apples they promise to deliver
- ii. the annual harvest of apples in a country from 1970-2000
- iii. producing a combination along a production possibilities frontier
- iv. apple growers will seek to maximize their profits
- v. you don't get to have an orange
- vi. there is only one apple producer who is able to make very high profits
- vii. doesn't take into account the passage of time
- viii. an orchard used to grow a full crop of apples cannot also be used to grow a full crop of pears
- ix. the apple tree you plant for your own enjoyment also pleases people passing by
- x. can expand a production possibilities frontier outward over time
- xi. an inspection program for imported apples protects the nation's orchards from a severe tree disease
- xii. Inspired by a falling apple, Isaac Newton proposes the existence of something called "gravity"
- xiii. the production of apple pie creates water pollution that harms downstream communities

