The Discipline of Economics 2

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- → MACROECONOMICS vs. MICROECONOMICS
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ECONOMICS DEFINED

Economics is a social science that studies how resources are used and is often concerned with how resources can be used to their fullest potential. Is it wise to use our resources to explore outer space or should we build low-income housing instead? Should we explore for oil fields in the United States or should we use our resources for other endeavors while we import the oil we need?

Consider the case of a student who has only 24 hours to spend each day. Some of this precious resource (time) must be spent on the necessities of life such as eating and sleeping. But of the hours remaining, how many should be devoted to studying? Socializing? Relaxing? Too much socializing and relaxing will not allow the student to live his or her life to its fullest potential. Neither will going overboard on the study time. One problem every student faces is just how much time should be allocated to each of the various activities that make for a full life. This is an economic problem, since the student must decide how the resource (time) will be used to its maximum potential.

The discipline of economics is not directly concerned with money or politics or the stock market; however, economic problems abound in each of these areas. People want to spend their money in the best way. Politicians want to make decisions to achieve the maximum benefit, and investors want the highest return from their savings. Any time someone is trying to make the most out of what he has, we are in the realm of economics.

Notice that our resources are scarce compared to our unlimited wants. There must be some resources that are unlimited. Air? Water? Time? No, all resources have their limits. You might contend that your material wants are modest, but then don't you have friends and relatives you would like to help? Economics is about how we deploy our resources to deal with scarcity.

It is only natural for families, firms, and nations to strive for the best outcomes, given their endowments of resources. For that reason every person and institution must grapple with economic problems every day.

TIP

The general distinction between macroeconomics and microeconomics is that the former deals with the overall economy whereas the latter is concerned with particular individuals, firms, industries, or regions within the economy.

Macroeconomics vs. Microeconomics

The discipline of economics is broken into two fields: macroeconomics and microeconomics. Macroeconomics involves economic problems encountered by the nation as a whole. For example, do we spend too many of our resources on national defense and not enough on education of our youth? If households are required to pay fewer taxes, will national savings be affected? Will prices rise or fall because of a tax cut? Will increasing the money supply increase production levels in the economy?

Microeconomics is concerned with the economic problems faced by individual units within the overall economy. Here we will be focusing in on particular families, individuals, and firms. Some examples of microeconomic issues are: Does a particular family save enough to provide for its future needs? How will a tax break affect XYZ Corporation's output? If the Smiths win the lottery, how will their spending patterns change?

Positive vs. Normative Economics

The discipline of economics can be split in another way—positive and normative economics. Positive economics is based on the scientific method. That means hypotheses are formulated and tested. For instance, one theory holds that if a family's income increased, their spending will increase but not by as much as the increase in income. There are several ways that this theory could be tested. One way is to observe how a group of families behave when their income is increased. Another might be to survey lottery winners to see how they disposed of their winnings.

Normative economics involves value judgments. Someone may feel that resources are better spent exploring outer space than providing free breakfasts for elementary school children. If this is the person's opinion, not based on a scientific investigation of the matter, then we are in the realm of normative economics. Normative economics is economics based on the way someone believes things *ought* to be.

It may appear as if positive economics is a superior form of the discipline since it is grounded in the scientific method and normative economics is based on opinions. However, normative economics is a crucial part of the economics discipline. Any scientific study will require an experiment, and experiments can be designed to highlight a scientist's prejudices. Even if an economist can keep his biases out of a study, why did he choose this particular question to investigate? However much economists strive to be like biologists and physicists, there will always be a large normative aspect to economics. Some economists claim that the normative side of the economics discipline is the more interesting.

RESOURCES

Economists, like most professionals, have special words and phrases that are used to describe concepts and ideas that occur frequently in their work. In order to understand economics, one must master the jargon. Familiar words and expressions can take on new meaning as economic jargon. The term "resource" is a case in point. To the layperson, a resource is something that can be used or drawn upon in a particular situation or endeavor. Economists do not dispute this definition, and use the word "resource" to mean much

the same thing. However, the economist gives the term a special, more particular definition. *A resource is anything that can be used to produce a good or service.* This definition is broad enough to cover such dissimilar things as farmland, crude oil, machinery, and even intellectual ability.

In macroeconomics every resource is classified into one of three categories: land, labor, or capital.

- **Land** does not only refer to the ground we walk on, but all natural resources. Therefore, resources such as farmland, crude oil, timber stands, oceans, and mineral deposits are all classified under the term "land."
- **Labor**, the second classification, encompasses all human attributes that are productive. Humans have the ability to perform a multitude of tasks, so there are many forms of this type of resource. Labor can be the person pounding nails at a construction site or the neurosurgeon in the operating room. Any time anyone is performing a service, function, or task, it is the resource "labor" at work. The professor in the classroom is using his intellectual capability to provide a service, just as a professional basketball player uses her athletic ability to produce points. In both cases, humans are using their attributes to produce things society finds valuable.
- **Capital**, in the economic sense of the term, is productive equipment or machinery. Again, many disparate items can fit into this classification: factory buildings, forklifts, computers, and paper clips are a few examples.

Not all resources fit neatly into this classification scheme. Resources such as time, health, money, adventurousness, and the willingness to take risks would all be difficult to categorize. Some economists have added categories to the classification system so that hard-to-classify resources have a place of their own, but most economists stick with the jargon and maintain that the productive assets of an economy are land, labor, and capital.

OPPORTUNITY COST

Opportunity cost is what must be sacrificed to obtain something. The concept of opportunity cost is quite general and ubiquitous in everyday life. When someone decides to spend two hours studying—obtaining wisdom or better grades—something must be sacrificed. For some individuals this might be two hours of watching TV; for others the opportunity cost of two hours of study time may be two hours of lost quality time with the family.

When someone decides to attend college, costs are always a consideration. Even if the money cost of tuition and books is not an issue for the student, the opportunity costs are. The opportunity costs of attending college will be different for each student, since each student sacrifices something different to attend. For most students the opportunity cost of college is the work experience or leisure activities that must be foregone in order to be in college.

In the macroeconomic sphere, opportunity cost takes on a more specific meaning. If a nation decides to produce one more unit of product A, how many units of product B will have to be sacrificed? Producing another unit of product A will use up resources. Exactly how many units of product B could have been produced with those resources?

Table 2.1 shows various combinations of guns and butter that an economy could produce using all of its resources fully and efficiently. Using resources efficiently means that they are not used foolishly or wasted in the production process. Efficiency implies using resources to their maximum potential.

Table 2.1 Hypothetical Production Possibilities

Point	Guns	Butter
A	0	30
B	3	25
C	6	20
D	9	15
E	12	10
F	15	5
G	18	0

It may seem peculiar that this society produces only guns and butter. Guns can be thought of as all types of national defense, while butter represents consumer goods. The number of products in our example could be increased, but that would complicate the analysis unnecessarily.

Notice that each time the country portrayed in Table 2.1 produces three more guns, it must give up five pounds of butter. If it were decided to produce one more gun, then 1.67 pounds of butter would have to be sacrificed. Therefore, the opportunity cost of guns is 1.67 pounds of butter for this nation.

Conversely, if one more pound of butter were produced, society would have to forego the production of 0.6 guns. The opportunity cost of butter is 0.6 guns.

To calculate the opportunity cost of guns, divide the change in butter production by the change in gun production as you move from one line of Table 2.1 to the next.

$$\text{Opportunity Cost of Guns} = \frac{\text{Change in Butter Production}}{\text{Change in Gun Production}} = \frac{5}{3} = 1.67 \text{ Pounds Butter}$$

The opportunity cost of butter is the reciprocal of the opportunity cost of guns.

$$\text{Opportunity Cost of Butter} = \frac{\text{Change in Gun Production}}{\text{Change in Butter Production}} = \frac{3}{5} = 0.6 \text{ Guns}$$

The concept of opportunity cost illustrates the simple fact that some amount of one product must be given up when more of another product is desired.

PRODUCTION POSSIBILITIES FRONTIER

The production possibilities frontier is the graphical portrayal of the information contained in Table 2.1. It shows the combinations of two goods that can be produced if the economy uses all of its resources fully and efficiently. Figure 2.1 is the production possibilities frontier that corresponds to Table 2.1. Points A through G are plotted with gun production measured on the vertical axis and butter production along the horizontal axis.

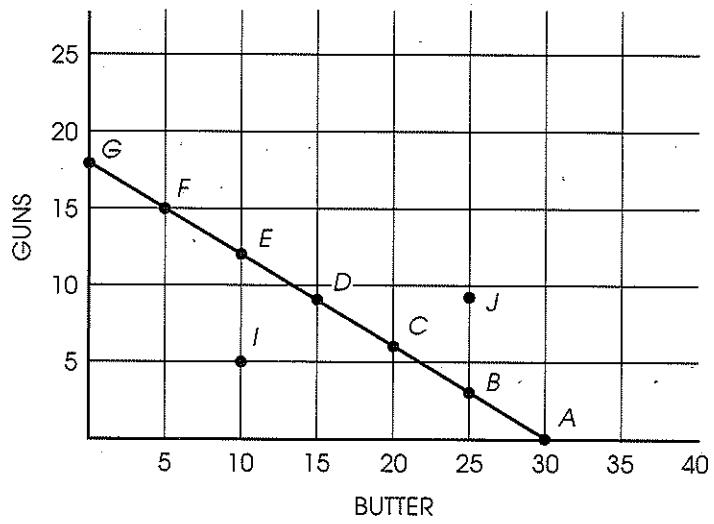


Fig. 2.1 Production Possibilities Frontier

The economy has the option of producing any combination of guns and butter along the frontier. At Point B most of the economy's resources are devoted to butter production. Only three guns are produced. At Point F gun production is predominant. Still, the economy is using its resources fully and efficiently at both points. A normative analysis is required to determine which point is preferred. On efficiency grounds all the points along the frontier are equal.

Points inside the frontier (Point I) are possible also. However, if the economy is operating at a point inside the frontier, resources are not being used fully or efficiently. Consider Point I, where 10 pounds of butter and five guns are being produced per year. By the definition of the production possibilities frontier we know that when the economy produces 10 pounds of butter, 12 guns could be produced if resources were used fully and efficiently (Point E). Point I represents a combination of guns and butter that does not require full or efficient resource utilization. The economy could do better by producing some combination of the two goods that lies on the frontier.

Points outside the production possibilities frontier (Point J) are unobtainable. Point J represents a combination of 25 pounds of butter and nine guns per year. By the definition of the production possibilities frontier we know that if 25 pounds of butter are produced, only three guns can be produced (Point B) if resources are used fully and efficiently. Therefore, points outside the frontier cannot be attained at this time.

Points outside the production possibilities frontier may be attained at some future date because the frontier may shift so that points like J lie along the new frontier. The frontier can also shift inward representing a change for the worse. Two factors cause the production possibilities frontier to shift:

1. changes in the amount of resources in the economy, and
2. changes in technology and productivity.

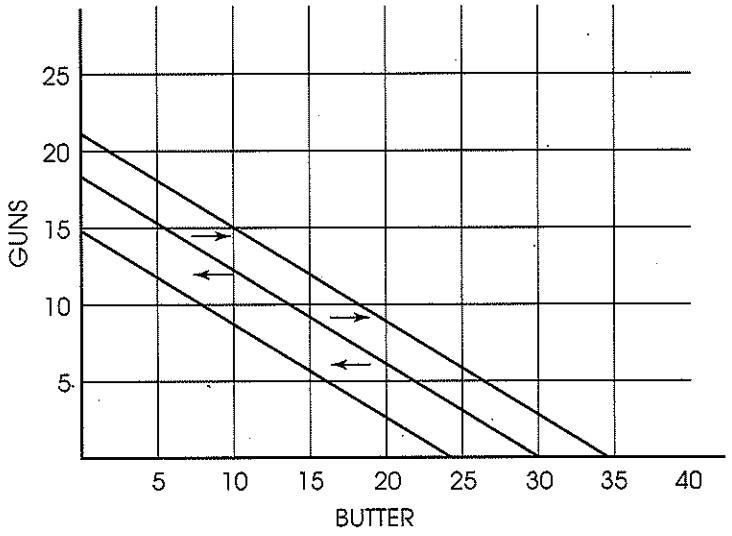


Fig. 2.2 Shifts in the Production Possibilities Frontier

TIP

A decline in unemployment does not shift the production possibilities frontier. If unemployment exists, then the economy is operating inside the frontier. A decline in unemployment would move the economy to a point closer to or onto the frontier.

It stands to reason that if the economy obtains more resources, larger combinations of guns and butter could be produced. This would shift the frontier to the right as in Figure 2.2. Similarly, a technological advance that made a given amount of resources more productive would also shift the frontier to the right.

The amount of resources in a country can increase for a variety of reasons. The amount of labor could increase through population growth. New territories could be acquired or existing land could be opened up for oil exploration or mining. The amount of capital could be increased by producing and putting in place more equipment and machinery.

The production possibilities frontier would shift to the left if the amount of resources were decreased or technology took a step backward. It is easy to imagine the amount of resources in an economy decreasing due to devastating weather, war, or a decline in population. But why take a technological step backward? However, economies sometimes do use less efficient production techniques because of government regulation or tradition.

Government regulations to ensure worker safety or protect the environment often force firms to use less efficient production techniques. Hopefully, the benefits of increased worker safety and a less polluted environment are worth the cost of lower output. By tradition, Amish farmers still use horses to plow their fields. When less efficient production techniques are adopted, the production possibilities frontier shifts to the left. Again, the costs of maintaining this tradition (less output) might be worth the benefits (a more wholesome life).

LAW OF INCREASING COSTS

The production possibilities frontier is not typically a straight line as in Figures 2.1 and 2.2. You may have noticed that each time gun production increases by three in Table 2.1, butter production decreases by five. The opportunity cost of gun production is $5/3 = 1.67$ pounds of butter between all points. In other words, opportunity cost is constant throughout Table 2.1. This gives rise to the straight-line production possibilities frontier.

However, there is a good reason why opportunity cost will not be constant in the real world. The law of increasing costs states that as more of a product is produced, the opportunity cost increases. Table 2.2 presents data that comply with the law of increasing costs. The

opportunity cost of guns is $2/3 = 0.67$ pounds of butter between Points A and B, and rises to $3/3 = 1$ pound of butter between Points B and C. A quick check will show that the farther down Table 2.2 we go, the higher the opportunity cost of guns. The more guns we are initially producing, the more expensive it will be to produce one more gun in terms of butter production lost.

Table 2.2 Hypothetical Production Possibilities with Increasing Costs

Point	Guns	Butter
A	0	25
B	3	23
C	6	20
D	9	15
E	12	10
F	15	5
G	18	0

This holds true for butter production also. In this case we move up Table 2.2 since more butter is produced as we go toward the top of the table. Between Points D and C the opportunity cost of butter is $3/5 = 0.6$ guns, whereas the opportunity cost is $3/2 = 1.5$ guns between Points B and A. These numbers are in line with the law of increasing costs, which states that the more of a product that is initially being produced, the higher the opportunity cost will be to produce still more.

When the numbers in Table 2.2 are graphed to form the production possibilities frontier the result is a line that is curved concave to the origin. This is shown in Figure 2.3. Concave-to-the-origin production possibilities frontiers are due to the law of increasing costs.

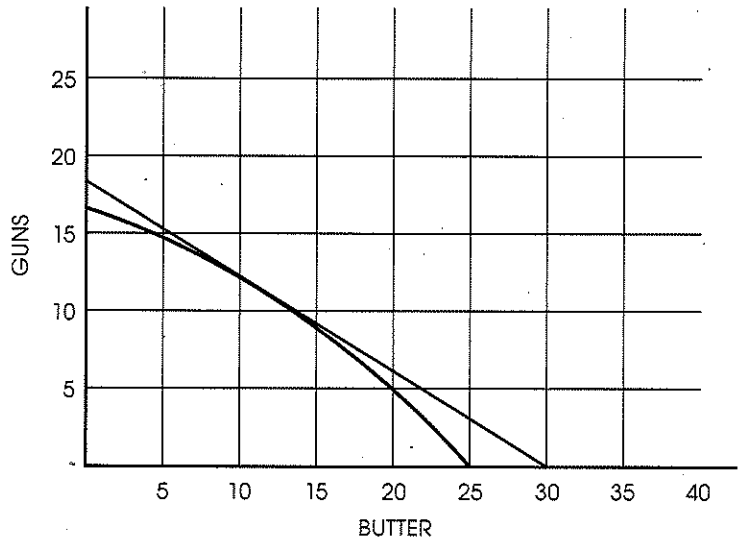


Fig. 2.3 Concave to the Origin Production Possibilities Frontier

Causes

But what is the cause of the law of increasing costs? Why does it cost more (in terms of butter) to produce another gun when a lot of guns are already being produced? To see the answer to these questions you must imagine the situation in an economy that is already producing a lot of guns. Most of the resources in the economy will be devoted to gun production, while only a few resources, such as farmers, cows, milking machines, and so forth, are engaged in butter production. Now, if that society wants to produce more guns, resources will have to be taken from butter production and used to produce guns. This means some farmers and cows will be employed in gun manufacture. (The cows could be used to turn mills that polish gun bores.) But farmers and cows are good at making butter and are not used in gun production, so when the resources are shifted from butter to gun production, not many more guns are produced, but a lot of butter must be sacrificed. In short, the opportunity cost of producing guns is high when gun production is already at a high level.

When gun production is low, the opportunity cost of increasing gun production is low. That is because most of society's resources are employed making butter. Imagine gunsmiths and gunmaking equipment being used to make butter since they are not needed to make the small number of guns being produced. Now, when gun production is increased, the resources that are adept at making guns can be shifted off the farm and into gun production—not much butter will be lost, but many more guns are produced. The opportunity cost of guns is low when a low level of guns is being produced.

The law of increasing costs is due to the fact that some resources are more adept at the production of one good than another. When resources are forced to work in an industry where they are not proficient, they are less productive. Thus, the opportunity cost of producing a good becomes greater as more resources are forced into industries where they are not as productive. This causes the production possibilities frontier to be concave to the origin.

COMPARATIVE ADVANTAGE

A survey of economists undertaken in early 2012 indicates that 96 percent of them believed that restrictions to free trade, such as tariffs and quotas, reduce economic welfare for the country that imposes them. The basis for this widespread support of free trade is the law of comparative advantage.

The law of comparative advantage was delineated convincingly by David Ricardo in the early 1800s. The law is an important element in introductory micro- and macroeconomics courses. It is also an application of the concept of opportunity cost.

The law of comparative advantage advocates specialization for increased output. The idea that specialization can improve productivity impressed Adam Smith when he visited a pin factory in the 1700s. In his famous tome *The Wealth of Nations* he wrote about his observations:

> *One man draws out the wire, another straights it, a third cuts it, a fourth points it, a fifth grinds it at the top for receiving the head; to make the head requires two or three distinct operations; to put it on is a peculiar business; to whiten the pins is another; it is even a trade by itself to put them into the paper; and the important business of pin making is, in this manner, divided into about eighteen distinct operations, . . .*

Smith showed how the division of labor into specialized tasks could increase productivity and output. The law of comparative advantage shows that the notion of specialization for increased productivity and output applies to nations as well.

When David Ricardo wrote about the benefits of free trade it was in opposition to the Corn Laws of England. The Corn Laws prohibited the importation of grains from outside England in order to protect domestic farmers. Ricardo, like 93 percent of today's economists, felt that the economic well-being of England suffered because of this restriction of trade.

To prove his point, Ricardo set up a scenario very similar to the one depicted in Table 2.3.

Table 2.3 A Hypothetical Example of Production Costs

	Labor Hours Needed to Produce a Unit of:	
Country	Wheat	Cloth
Portugal	10	20
England	20	60

The table shows how many hours of labor are required to produce one unit of wheat or cloth in Portugal and England. According to Table 2.3, Portugal can produce both products more efficiently than England. In Portugal, a unit of wheat can be produced with 10 hours of labor, while it requires 20 hours in England. One unit of cloth can be produced in Portugal with 20 hours of labor, while the corresponding number in England is 60.

Portugal is said to have the absolute advantage in the production of both wheat and cloth. Absolute advantage implies that the product can be produced more efficiently, that is, with fewer inputs. You might wonder why Portugal would want to trade with England at all, as England is an inefficient producer of both products. That was the genius of Ricardo's exposition—trade can be mutually advantageous to both countries even if one country has the absolute advantage in all products, because mutually advantageous trade is based on comparative advantage, not absolute advantage.

Comparative advantage means that a nation can produce the good with a lower opportunity cost. Consider the opportunity cost of wheat in Portugal. It takes 10 hours to produce a unit of wheat. If it was decided to produce another unit of wheat in Portugal, then half a unit of cloth would have to be given up since the labor would be pulled off cloth production and it takes 20 hours to produce a unit of cloth.

Opportunity cost, you will recall, is how much of one thing must be sacrificed in order to obtain a unit of something else. Here half a unit of cloth must be given up in order to obtain an extra unit of wheat. By similar reasoning, the opportunity cost of cloth in Portugal is two units of wheat. Table 2.4 outlines the calculations required to determine the opportunity costs of wheat and cloth in Portugal and England.

Portugal has the lower opportunity cost in cloth production (two units of wheat), and England has the lower opportunity cost in wheat production ($\frac{1}{3}$ unit of cloth). Portugal has the comparative advantage in cloth, and England in wheat. Ricardo showed that if each country produced only the good in which it held a comparative advantage and traded for the other product, then both countries could consume more of both goods.

Table 2.4 Calculations of Opportunity Costs from Table 2.3

Portugal
Opportunity cost of wheat = 10/20 = 1/2 cloth
Opportunity cost of cloth = 20/10 = 2 wheat
England
Opportunity cost of wheat = 20/60 = 1/3 cloth
Opportunity cost of cloth = 60/20 = 3 wheat

You might convince yourself of this by assuming that each nation has 120 hours of labor to divide between the production of both goods. For instance, England could use 120 hours to produce a unit of cloth and three units of wheat; Portugal could produce five units of cloth and two units of wheat. Total cloth production by both countries would be six units, and total wheat production would be five units.

Table 2.5 Production of Wheat and Cloth in 120 Hours

In Isolation	Wheat	Cloth
Portugal	2	5
England	3	1
Total	5	6
Specialization	**Wheat**	**Cloth**
Portugal	0	6
England	6	0
Total	6	6
With Trade	**Wheat**	**Cloth**
Portugal	2.5	5
England	3.5	1

However, if Portugal devoted its entire 120 hours to cloth production, there would be six units produced and England could use 120 hours to make six units of wheat. This is specialization according to comparative advantage. Notice that total cloth production is six units as it was before specialization, but total wheat production is now six units, not five. The extra unit of wheat could be shared by the citizens of each country through specialization of production and trade.

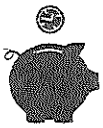
In fact, we could determine what the terms of trade would have to be so that the extra unit of wheat would add to the welfare of at least one, if not both, countries. Suppose England offered to trade two units of wheat for two units of cloth. Portugal would not accept since she would be left with four units of cloth and the two units of wheat. In isolation she could have enjoyed five units of cloth and two units of wheat.

The terms of trade would have fallen somewhere between two units of wheat for one unit of cloth (which would leave Portugal no better off than in isolation) and three units of wheat for one unit of cloth (which would leave England no better off than in isolation). Let's say the two countries strike a deal to trade 2.5 units of wheat for one unit of cloth. Then both countries would consume 0.5 units more wheat than in isolation and the same amount of cloth.

In other words, the countries would share the extra unit of wheat production that was gained by specialization according to comparative advantage and trade.

Notice that the terms of trade must fall between the opportunity costs of both countries. Portugal's opportunity cost of cloth from Table 2.4 is 2 wheat and England's is 3 wheat. So the terms of trade must lie between 2 and 3 wheat, for one unit of cloth. It amounts to the same thing to state the terms of trade as falling between $\frac{1}{2}$ and $\frac{1}{3}$ cloth for one unit of wheat.

The idea that trade is beneficial to all parties involved even when one party has an absolute advantage in everything has an analogy in microeconomics. Consider a lawyer who happens to be very fast and accurate at keying legal documents. It would still pay for the lawyer to hire a secretary to do the keying, even if the secretary is not as efficient. That is because the secretary has the comparative advantage (lower opportunity cost) in keying. If the lawyer does her own keying, the opportunity cost is the income that could have been earned writing law briefs.



SUMMARY

- Economics is about using resources wisely. When we focus on one individual or one household or one firm and analyze its use of resources, we are practicing *microeconomics*. When we study whether a nation is allocating its resources in an efficient manner, we are practicing *macroeconomics*.
- Both macroeconomics and microeconomics will require some normative analysis. That is, value judgments will have to be made at some point to answer most economic questions, but there is a tendency to be as positive as possible. Being positive means sticking to the scientific method of reaching conclusions and avoiding personal biases and opinions.
- Even if you have never studied economics before, you are well acquainted with it because everyone strives to make the most out of what they've got. Many people associate businesspeople or stocks and bonds with economics. That is correct because businesspeople are trying to make the most out of their company's resources, while stock and bond traders are trying to maximize their returns—but economics is so much more than that. Whenever a person, a firm, or a nation tries to make the most of its resources, it is practicing economics.
- Remember that the next time you have to decide between studying and watching TV. There's nothing wrong with watching TV. But you should realize that there is a cost to watching TV that goes beyond the cost of the electricity. The opportunity cost of watching TV is the study time you sacrifice. If you think it's worth it, then go for the TV, especially if you have a headache and wouldn't get much out of studying anyway. It's not just businesspeople and Wall Street players who make economic decisions.
- The idea that something must be sacrificed in order to pursue an alternative is captured in the concepts of opportunity cost and the production possibilities frontier. The law of increasing costs suggests that the production possibilities frontier will be bowed and concave to the origin as opposed to a straight line.

TERMS

Absolute Advantage the ability to produce something more efficiently

Capital productive equipment or machinery

Comparative Advantage the ability to produce something with a lower opportunity cost

Economics a social science that studies how resources are used and is often concerned with how resources can be used to their fullest potential

Efficiency using resources to their maximum potential

Labor all human activity that is productive

Land all natural resources

Law of Increasing Costs law that states that when more of a product is initially being produced, the higher the opportunity cost will be to produce still more

Macroeconomics economic problems encountered by the nation as a whole

Microeconomics economic problems faced by individual units within the overall economy

Normative Economics economics involving value judgments

Opportunity Cost the amount of one good that must be sacrificed to obtain an alternative good

$$\text{Opportunity Cost of Good X} = \frac{\text{Change in Good Y Production}}{\text{Change in Good X Production}}$$

Or

$$\text{Opportunity Cost of Good X} = \frac{\text{Amount of Time Required to Make 1 Unit of Good X}}{\text{Amount of Time Required to Make 1 Unit of Good Y}}$$

Positive Economics economic analysis that draws conclusions based on logical deduction or induction; value judgments are avoided

Production Possibilities Frontier the combinations of two goods that can be produced if the economy uses all of its resources fully and efficiently

Resource anything that can be used to produce a good or service

Terms of Trade the amount of one good a country is willing and able to trade for another

MULTIPLE-CHOICE REVIEW QUESTIONS

1. Economics is a social science that
   (A) is primarily concerned with money.
   (B) is primarily concerned with how resources are used.
   (C) relies solely on the scientific method for analysis.
   (D) is primarily concerned with maximizing spiritual well-being.
   (E) is purely normative.

2. Macroeconomics focuses on
   (A) government and its laws that affect commerce.
   (B) individuals and their resource use.
   (C) corporations and their production levels.
   (D) the resource use of the entire nation.
   (E) money.

3. Given the table below, what is the opportunity cost of wheat in France?

	Labor hours needed to produce a unit of:	
Country	**Wheat**	**Cloth**
France	5	10
England	20	60

   (A) ½ cloth
   (B) ½ wheat
   (C) 2 cloth
   (D) 2 wheat
   (E) ¼ cloth

4. Given the table below, which statement is true?

	Labor hours needed to produce a unit of:	
Country	**Wheat**	**Cloth**
France	5	10
England	20	20

   (A) England has the absolute advantage in both products.
   (B) France should specialize in and export wheat while England should specialize in and export cloth.
   (C) France has the comparative advantage in cloth.
   (D) England has the comparative advantage in wheat.
   (E) France has the absolute advantage in wheat while England has the absolute advantage in cloth.

5. Which of the following statements is positive?
   (A) An economy that produces more butter than guns is better off than an economy that produces more guns than butter.
   (B) Nations should concentrate their resources on producing wholesome consumer goods as opposed to the weapons of war.
   (C) The production possibilities frontier is concave to the origin because of the law of increasing costs.
   (D) Nations ought to devote at least some of their resources to national defense.
   (E) Nations would do better by producing toward the middle of their production possibilities frontiers as opposed to the extreme points near the axes.

6. The primary focus of microeconomics is
   (A) families and how they make money.
   (B) firms and how they make profits.
   (C) individual units within the overall economy.
   (D) government.
   (E) small countries.

7. Economists use the term "capital" to mean
   (A) money.
   (B) plants and equipment.
   (C) where the central government is located.
   (D) the center of the economy.
   (E) a major idea.

8. What you give up to pursue another alternative is known as
   (A) capital.
   (B) land.
   (C) money cost.
   (D) the price of the product.
   (E) opportunity cost.

9. Given the following table,

   (combinations that can be produced using resources fully and efficiently)

Apples	Oranges
0	20
7	10
14	0

   the opportunity cost of apples is
   (A) 10/7 oranges.
   (B) 7/10 oranges.
   (C) 10/7 apples.
   (D) 7/10 apples.
   (E) 70 percent.

10. Given the following table,

    (combinations that can be produced using resources fully and efficiently)

Soup	Nuts
0	15
1	10
2	5

    the opportunity cost of soup is
    (A) 5 nuts.
    (B) 5 soup.
    (C) 20 percent.
    (D) 500 percent.
    (E) not constant.

11. Production possibilities frontiers are concave to the origin because
    (A) of inefficiencies in the economy.
    (B) of opportunity cost.
    (C) of the law of increasing costs.
    (D) of constant opportunity costs.
    (E) the extreme points are not as well established.

12. When opportunity cost is constant across all production levels, the production possibilities frontier is
    (A) concave to the origin.
    (B) convex to the origin.
    (C) undefined.
    (D) shifted.
    (E) a straight diagonal line sloping downward from left to right.

13. When an economy produces a combination of goods that lies on the production possibilities frontier,
    (A) resources are being used fully and efficiently.
    (B) prices are constant.
    (C) opportunity cost is constant.
    (D) resources will never be depleted.
    (E) prices will rise.

14. The law of increasing costs
    (A) does not apply to guns and butter.
    (B) is the result of resources not being perfectly adaptable between the production of two goods.
    (C) implies that prices will rise when the costs of making a good rise.
    (D) causes the production possibilities frontier to be a straight line.
    (E) implies that opportunity costs will rise as production levels fall.

15. Land refers to
    (A) all productive resources.
    (B) all natural resources.
    (C) farmland only.
    (D) real estate.
    (E) chattels.

FREE-RESPONSE REVIEW QUESTIONS

1. The law of increasing costs states that the opportunity cost of producing a good will rise as more of the good is initially being produced. Explain why this is so.

2. Select two goods for which the law of increasing costs might not apply. Explain why the law would not apply in this case.

3. Select two goods for which it is clear the law of increasing costs would definitely apply. Explain why the law is definitely applicable in this case.

Multiple-Choice Review Answers

1. **(B)**	5. **(C)**	9. **(A)**	13. **(A)**
2. **(D)**	6. **(C)**	10. **(A)**	14. **(B)**
3. **(A)**	7. **(B)**	11. **(C)**	15. **(B)**
4. **(B)**	8. **(E)**	12. **(E)**	

Free-Response Review Answers

1. The law of increasing costs indicates that the opportunity cost of producing a good will be higher when more of the good is being produced. This is because when the economy is devoting a significant amount of its resources toward the production of a particular product, all the resources that are proficient in the production of the good are already being used to produce it. If more of the good is to be produced, resources that are not as proficient will have to be drawn into the production process. You won't get much more production of this good but production of other goods will fall significantly. This means the opportunity cost of producing more of the good is high. The situation is reversed when production levels of the good are low to begin with.

2. The law of increasing costs would not apply to refrigerators and freezers because the resources required for the production of these two goods are essentially the same. Since the resources are perfectly adaptable between the two goods, we always have to give up the same amount of refrigerators to produce one more freezer, regardless of how many freezers we are producing to begin with.

3. The law of increasing costs would most likely apply to milk and computers. Most of the resources required to produce milk are not very useful in computer production. Therefore, when most of the economy's resources are already being used to produce computers, only cows, farmland, tractors, and farmers are left producing milk. In order to produce still more computers you will have to take these resources off the farm and use them to make computers. You will have to give up quite a bit of milk just to produce one more computer.