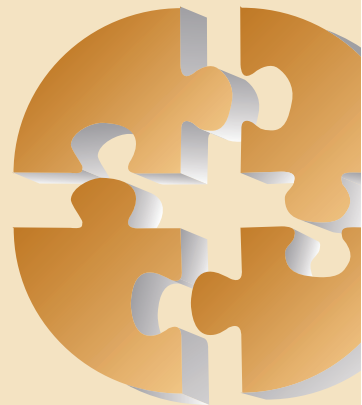


In this chapter, you will learn to solve these economics puzzles:

- Why do so few rock stars and movie stars go to college?
- Why would you spend an extra hour reading this text rather than going to a movie or sleeping?
- Why are investment and economic growth so important?



THREE FUNDAMENTAL ECONOMIC QUESTIONS

Whether rich or poor, every nation must answer the same three fundamental economic questions: (1) *What* products will be produced? (2) *How* will they be produced? (3) *For Whom* will they be produced? Later, the chapter on economies in transition introduces various types of economic systems and describes how each deals with these three economic choices.

What to Produce?

Should society devote its limited resources to producing more health care and fewer military goods? Should society produce more iPods and fewer CDs? Should more capital goods be produced instead of consumer goods, or should small hybrid cars and fewer SUVs be produced? The problem of scarcity restricts our ability to produce everything we want during a given period, so the choice to produce “more” of one good requires producing “less” of another good.

How to Produce?

After deciding which products to make, the second question for society to decide is how to mix technology and scarce resources in order to produce these goods. For instance, a towel can be sewn primarily by hand (labor), partially by hand and partially by machine (labor and capital), or primarily by machine (capital). In short, the *How* question asks whether a production technique will be more or less capital-intensive.

Education plays an important role in answering the *How* question. Education improves the ability of workers to perform their work. Variation in the quality and quantity of education among nations is one reason economies differ in their capacities to apply resources and technology to answer the *How* question. For example, the United States is striving to catch up with Japan in the use of robotics. Answering the question *How do we improve our robotics?* requires engineers and employees with the proper training in the installation and operation of robots.

For Whom to Produce?

Once the *What* and *How* questions are resolved, the third question is *For Whom*. Among all those desiring the produced goods, who actually receives them? Who is fed well? Who drives a Mercedes? Who receives organ transplants? Should economics professors earn a salary of \$1 million a year and others pay higher taxes to support economists? The *For Whom* question means that society must have a method to decide who will be “rich and famous” and who will be “poor and unknown.”

OPPORTUNITY COST

Because of scarcity, the three basic questions cannot be answered without sacrifice or cost. But what does the term *cost* really mean? The common response would be to say that the purchase price is the cost. A movie ticket *costs* \$8, or a shirt *costs* \$50. Applying the economic way of thinking, however, *cost* is defined differently. A well-known phrase from Nobel Prize-winning economist Milton Friedman says, “There is no such thing as a free lunch.” This expression captures the links among the concepts of scarcity, choice, and cost. Because of scarcity, people must make choices, and each choice incurs a cost (sacrifice). Once one option is chosen, another option is given up. The money you spend on a movie ticket cannot also buy a DVD. A business may purchase a new textile machine to manufacture towels, but this same money cannot be used to buy a new recreation facility for employees.

The DVD and recreation facility examples illustrate that the true cost of these decisions is the **opportunity cost** of a choice, not the purchase price. Opportunity cost is the best alternative sacrificed for a chosen alternative. Stated differently, it is the cost of not choosing the next best alternative. This principle states that some highly valued opportunity must be forgone in all economic decisions. The actual good or use of time given up for the chosen good or use of time measures the opportunity cost. We may omit the word *opportunity* before the word *cost*, but the concept remains the same. Exhibit 1 illustrates the causation chain linking scarcity, choice, and opportunity cost.

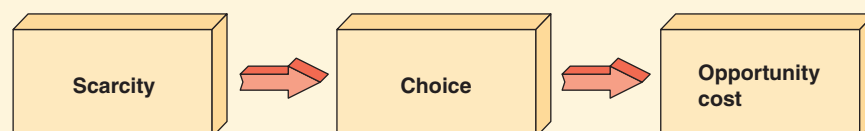
Opportunity cost

The best alternative sacrificed for a chosen alternative.

Exhibit 1

The Links between Scarcity, Choice, and Opportunity Cost

Scarcity means no society has enough resources to produce all the goods and services necessary to satisfy all human wants. As a result, society is always confronted with the problem of making choices. This concept is captured in Milton Friedman’s famous phrase, “There is no such thing as a free lunch.” This means that each decision has a sacrifice in terms of an alternative not chosen.



Examples are endless, but let's consider a few. Suppose your economics professor decides to become a rock star in the Rolling in Dough band. Now all his or her working hours are devoted to creating hit music, and the opportunity cost is the educational services no longer provided. Now a personal example: The opportunity cost of dating a famous model or movie star (name your favorite) might be the loss of your current girlfriend or boyfriend. Opportunity cost also applies to national economic decisions. Suppose the federal government decides to spend tax revenues on a space station. The opportunity cost depends on the next best program *not* funded. Assume roads and bridges are the highest-valued projects not built as a result of the decision to construct the space station. Then the opportunity cost of the decision to devote resources to the space station is the forgone roads and bridges and not the money actually spent to build the space station.

To personalize the relationship between time and opportunity cost, ask yourself what you would be doing if you were not reading this book. Your answer might be watching television or sleeping. If sleeping is your choice, the opportunity cost of studying this text is the sleep you sacrifice. Rock stars and movie stars, on the other hand, must forfeit a large amount of income to attend college. Now you know why you see so few of these stars in class.

Decisions often involve sacrifice of *both* goods and time. Suppose you decide to see a movie at a theater located 15 minutes from campus. If you had not spent the money at the movie theater, you could have purchased a DVD and watched a movie at home. And the time spent traveling to and from the movie and sitting through it could have been devoted to studying for your economics exam. The opportunity cost of the movie consists of giving up (1) a DVD and (2) study time needed to score higher on the economics exam.

MARGINAL ANALYSIS

At the heart of many important decision-making techniques used throughout this text is **marginal analysis**. Marginal analysis examines the effects of additions to or subtractions from a current situation. This is a very valuable tool in the economic-way-of-thinking toolkit because it considers the “marginal” effects of change. The rational decision maker decides on an option only if the marginal benefit exceeds the marginal cost. For example, you must decide how to use your scarce time. Should you devote an extra hour to reading this book, going to a movie, watching television, talking on the phone, or sleeping? Which of your many options do you choose? The answer depends on marginal analysis. If you decide the benefit of a higher grade in economics exceeds the opportunity cost of, say, sleep, then you allocate the extra hour to studying economics. Excellent choice!

Businesses use marginal analysis. Hotels, for example, rent space to student groups for dances and other events. Assume you are the hotel manager and a student group offers to pay \$400 to use the ballroom for a party. To decide whether to accept the offer requires marginal analysis. The marginal benefit of renting otherwise vacant space is \$400, and the marginal cost is \$300 for extra electricity and cleaning services. Since the marginal benefit exceeds the marginal cost, the manager sensibly accepts the offer.

Marginal analysis

An examination of the effects of additions to or subtractions from a current situation.

Similarly, farmers use marginal analysis. For example, a farmer must decide whether to add fertilizer when planting corn. Using marginal analysis, the farmer estimates that the corn revenue yield will be about \$75 per acre without fertilizer and about \$100 per acre using fertilizer. If the cost of fertilizer is \$20 per acre, marginal analysis tells the farmer to fertilize. The addition of fertilizer will increase profit by \$5 per acre because fertilizing adds \$25 to the value of each acre at a cost of \$20 per acre.

Marginal analysis is an important concept when the government considers changes in various programs. For example, as demonstrated in the next section, it is useful to know that an increase in the production of military goods will result in an opportunity cost of fewer consumer goods produced.

THE PRODUCTION POSSIBILITIES CURVE

The economic problem of scarcity means that society's capacity to produce combinations of goods is constrained by its limited resources. This condition can be represented in a model called the **production possibilities curve**. The production possibilities curve shows the maximum combinations of two outputs that an economy can produce in a given period of time with its available resources and technology. Three basic assumptions underlie the production possibilities curve model:

1. **Fixed Resources.** The quantities and qualities of all resource inputs remain unchanged during the time period. But the “rules of the game” do allow an economy to shift any resource from the production of one output to the production of another output. For example, an economy might shift workers from producing consumer goods to producing capital goods. Although the number of workers remains unchanged, this transfer of labor will produce fewer consumer goods and more capital goods.
2. **Fully Employed Resources.** The economy operates with all its factors of production fully employed and producing the greatest output possible without waste or mismanagement.
3. **Technology Unchanged.** Holding existing **technology** fixed creates limits, or constraints, on the amounts and types of goods any economy can produce. Technology is the body of knowledge applied to how goods are produced.

Exhibit 2 shows a hypothetical economy that has the capacity to manufacture any combination of military goods (“guns”) and consumer goods (“butter”) per year along its production possibilities curve (*PPC*), including points *A*, *B*, *C*, and *D*. For example, if this economy uses all its resources to make military goods, it can produce a *maximum* of 160 billion units of military goods and zero units of consumer goods (combination *A*). Another possibility is for the economy to use all its resources to produce a *maximum* of 100 billion units of consumer goods and zero units of military goods (point *D*). Between the extremes of points *A* and *D* lie other production possibilities for combinations of military and consumer goods. If combination *B* is chosen, the economy will produce 140 billion units of military goods and 40 billion units of consumer goods. Another possibility (point *C*) is to produce 80 billion units of military goods and 80 billion units of consumer goods.

Production possibilities curve

A curve that shows the maximum combinations of two outputs an economy can produce in a given period of time with its available resources and technology.

Technology

The body of knowledge applied to how goods are produced.