

# CHAPTER 1

## What Is Economics?

Economics studies the allocation of scarce resources among people—examining what goods and services wind up in the hands of which people. Why scarce resources? Absent scarcity, there is no significant allocation issue. All practical, and many impractical, means of allocating scarce resources are studied by economists. Markets are an important means of allocating resources, so economists study markets. Markets include stock markets like the New York Stock Exchange and commodities' markets like the Chicago Mercantile, but also farmers' markets, auction markets like Christie's or Sotheby's (made famous in movies by people scratching their noses and inadvertently purchasing a Ming vase) or eBay, or more ephemeral markets such as the market for music CDs in your neighborhood. In addition, goods and services (which are scarce resources) are allocated by governments, using taxation as a means of acquiring the items. Governments may be controlled by a political process, and the study of allocation by the politics, which is known as political economy, is a significant branch of economics. Goods are allocated by certain means, like theft, deemed illegal by the government, and such allocation methods nevertheless fall within the domain of economic analysis; the market for marijuana remains vibrant despite interdiction by the governments of most nations. Other allocation methods include gifts and charity, lotteries and gambling, and cooperative societies and clubs, all of which are studied by economists.

Some markets involve a physical marketplace. Traders on the New York Stock Exchange get together in a trading pit. Traders on eBay come together in an electronic marketplace. Other markets, which are more familiar to most of us, involve physical stores that may or may not be next door to each other, and customers who search among the stores, purchasing when the customer finds an appropriate item at an acceptable price. When we buy bananas, we don't typically go to a banana market and purchase from one of a dozen or more banana sellers, but instead go to a grocery store. Nevertheless, in buying bananas, the grocery stores compete in a market for our banana patronage, attempting to attract customers to their stores and inducing them to purchase bananas.

Price—exchange of goods and services for money—is an important allocation means, but price is hardly the only factor even in market exchanges. Other terms, such as convenience, credit terms, reliability, and trustworthiness are also valuable to the participants in a transaction. In some markets such as 36-inch Sony WEGA televisions, one-ounce bags of Cheetos, or Ford Autolite spark plugs, the products offered by distinct sellers are identical; and, for such products, price is usually the primary factor considered by buyers, although delivery and other aspects of the transaction may still matter. For other products, like restaurant meals, different brands of camcorders or traveling on competing airlines, the products differ to some degree, by quality reliability and convenience of service. Nevertheless, these products are considered to be in the same market because they are reasonable substitutes for each other.

Economic analysis is used in many situations. When British Petroleum sets the price for its Alaskan crude oil, it employs an estimated demand model, for gasoline consumers and for the refineries to which BP sells. A complex computer model governs the demand for oil by each refinery. Large companies such as Microsoft and its rival Netscape routinely use economic analysis to assess corporate conduct and to determine if their behavior is harmful

to competition. Stock market analysts rely on economic models to forecast profits and dividends of companies in order to predict the price of their stocks. Government forecasts of the budget deficit or estimates of the impact of new environmental regulation are predicated on a variety of different economic models. This book presents the building blocks for the models that are commonly by an army of economists thousands of times per day.

## 1. NORMATIVE AND POSITIVE THEORIES

### LEARNING OBJECTIVES

1. How is economics used?
2. What is an economic theory?
3. What is a market?

#### Positive analysis

A study that aims to understand the world without value judgments.

#### Normative analysis

A study that makes value judgments.

#### Cost-benefit analysis

A normative analysis that weighs the gains and losses to different individuals to determine changes that provide greater benefits than harm.

#### Willingness-to-pay

The amount a customer is willing and able to pay for a good.

#### Welfare analysis

A normative analysis that trades off gains and losses to different individuals.

Economic analysis serves two main purposes. The first is to understand how goods and service, the scarce resources of the economy are actually allocated in practice. This is a **positive analysis**, like the study of electromagnetism or molecular biology; it aims to understand the world without value judgments. The development of this positive theory, however, suggests other uses for economics. Economic analysis can predict how changes in laws, rules, and other government policies will affect people; and, whether these changes are socially beneficial on balance. Such predictions combine positive analysis—predicting the effects of changes in rules—with studies that make value judgments known as **normative analyses**. For example, a gasoline tax to build highways harms gasoline buyers (who pay higher prices), but helps drivers (by improving the transportation system). Since drivers and gasoline buyers are typically the same people, a normative analysis suggests that everyone will benefit. Policies that benefit everyone are relatively uncontroversial.

In contrast, **cost-benefit analysis** weighs the gains and losses to different individuals to determine changes that provide greater benefits than harm. For example, a property tax to build a local park creates a benefit to park users, but harms property owners who pay the tax. Not everyone benefits, since some taxpayers don't use the park. Cost-benefit analysis weighs the costs against the benefits to determine if the policy is beneficial on balance. In the case of the park, the costs are readily measured in monetary terms by the size of the tax. In contrast, the benefits are more difficult to estimate. Conceptually, the benefits are the amount the park users would be willing to pay to use the park. However, if there is no admission charge to the park, one must estimate a **willingness-to-pay**, the amount a customer is willing and able to pay for a good. In principle, the park provides greater benefits than costs if the benefits to the users exceed the losses to the taxpayers. However, the park also involves transfers from one group to another.

**Welfare analysis** is another approach to evaluating government intervention into markets. It is a normative analysis that trades off gains and losses to different individuals. Welfare analysis posits social preferences and goals, such as helping the poor. Generally a welfare analysis requires one to perform a cost-benefit analysis, that accounts for the overall gains and losses but also weighs those gains and losses by their effects on other social goals. For example, a property tax to subsidize the opera might provide more value than costs, but the bulk of property taxes are paid by lower- and middle-income people, while the majority of operagoers are wealthy. Thus, the opera subsidy represents a transfer from relatively low-income people to wealthy people, which contradicts societal goals of equalization. In contrast, elimination of sales taxes on basic food items like milk and bread has a greater benefit to the poor, who spend a much larger percentage of their income on food, than do the rich. Thus, such schemes are desirable primarily for their redistribution effects. Economics is helpful for providing methods to determining the overall effects of taxes and programs, as well as the distributive impacts. What economics can't do, however, is advocate who ought to benefit. That is a matter for society to decide.

## KEY TAKEAWAYS

- A positive analysis, analogous to the study of electromagnetism or molecular biology, involves only the attempt to understand the world around us without value judgments.
- Economic analyses employing value judgments are known as normative analyses. When everyone is made better off by a change, recommending that change is relatively uncontroversial.
- A cost-benefit analysis totals the gains and losses to different individuals in dollars and suggests carrying out changes that provide greater benefits than harm. A cost-benefit analysis is a normative analysis.
- Welfare analysis posits social preferences and goals, permitting an optimization approach to social choice. Welfare analysis is normative.
- Economics helps inform society about the consequences of decisions, but the valuation of those decisions is a matter for society to choose.

## 2. OPPORTUNITY COST

## LEARNING OBJECTIVES

1. What is opportunity cost?
2. How is it computed?
3. What is its relationship to the usual meaning of cost?

Economists think of cost in a slightly quirky way that makes sense, however, once you think about it for a while. We use the term **opportunity cost** to remind you occasionally of our idiosyncratic notion of cost. For an economist, the cost of buying or doing something is the value that one foregoes in purchasing the product or undertaking the activity of the thing. For example, the cost of a university education includes the tuition and textbook purchases, as well as the wages that were lost during the time student was in school. Indeed, the value of the time spent in acquiring the education—is a significant cost of acquiring the university degree. However, some “costs” are not opportunity costs. Room and board would not be a cost since one must eat and live whether one is working or at school. Room and board are a cost of an education only insofar as they are expenses that are only incurred in the process of being a student. Similarly, the expenditures on activities that are precluded by being a student such as—hang-gliding lessons, or a trip to Europe—represent savings. However, the value of these activities has been lost while you are busy reading this book.

Opportunity cost is defined by the following:

*The opportunity cost is the value of the best foregone alternative.*

This definition emphasizes that the cost of an action includes the monetary cost as well as the value foregone by taking the action. The opportunity cost of spending \$19 to download songs from an online music provider is measured by the benefit that you would have received had you used the \$19 instead for another purpose. The opportunity cost of a puppy includes not just the purchase price but the food, veterinary bills, carpet cleaning, and time value of training, as well. Owning a puppy is a good illustration of opportunity cost, because the purchase price is typically a negligible portion of the total cost of ownership. Yet people acquire puppies all the time, in spite of their high cost of ownership. Why? The economic view of the world is that people acquire puppies because the value they expect exceeds their opportunity cost. That is, they reveal their preference for owning the puppy, as the benefit they derive must apparently exceed the opportunity cost of acquiring it.

Even though opportunity costs include nonmonetary costs, we will often monetize opportunity costs, by translating these costs into dollar terms for comparison purposes. Monetizing opportunity costs is valuable, because it provides a means of comparison. What is the opportunity cost of 30 days in jail? It used to be that judges occasionally sentenced convicted defendants to “thirty days or thirty dollars,” letting the defendant choose the sentence. Conceptually, we can use the same idea to find out the value of 30 days in jail. Suppose you would pay a fine of \$750 to avoid the 30 days in jail but would serve the time instead to avoid a fine of \$1,000. Then the value of the 30-day sentence is somewhere between \$750 and \$1,000. In principle there exists a critical price at which you’re indifferent to “doing the time” or “paying the fine.” That price is the monetized or dollar cost of the jail sentence.

### Opportunity cost

The value that one foregoes in purchasing a product or undertaking an activity.

**Certainty equivalent**

The amount of money that provides equal utility to the random payoff of the gamble.

**Risk management**

Field devoted to studying the buying or selling of assets and options to reduce overall risk.

**Risk premium**

The difference between the expected payoff and the certainty equivalent.

**Hedonic pricing**

Method of valuation in which each item is first evaluated separately and then the item values are added together to arrive at a total value.

The same process of selecting between payment and action may be employed to monetize opportunity costs in other contexts. For example, a gamble has a **certainty equivalent**, which is the amount of money that makes one indifferent to choosing the gamble versus the certain payment. Indeed, companies buy and sell risk, and the field of **risk management** is devoted to studying the buying or selling of assets and options to reduce overall risk. In the process, risk is valued, and the riskier stocks and assets must sell for a lower price (or, equivalently, earn a higher average return). This differential, known as a **risk premium**, is the monetization of the risk portion of a gamble.

Buyers shopping for housing are presented with a variety of options, such as one- or two-story homes, brick or wood exteriors, composition or shingle roofing, wood or carpet floors, and many more alternatives. The approach economists adopt for valuing these items is known as **hedonic pricing**. Under this method, each item is first evaluated separately and then the item values are added together to arrive at a total value for the house. The same approach is used to value used cars, making adjustments to a base value for the presence of options like leather interior, GPS system, iPod dock, and so on. Again, such a valuation approach converts a bundle of disparate attributes into a monetary value.

The conversion of costs into dollars is occasionally controversial, and nowhere is it more so than in valuing human life. How much is your life worth? Can it be converted into dollars? Some insight into this question can be gleaned by thinking about risks. Wearing seatbelts and buying optional safety equipment reduce the risk of death by a small but measurable amount. Suppose a \$400 airbag reduces the overall risk of death by 0.01%. If you are indifferent to buying the airbag, you have implicitly valued the probability of death at \$400 per 0.01%, or \$40,000 per 1%, or around \$4,000,000 per life. Of course, you may feel quite differently about a 0.01% chance of death compared with a risk ten thousand times greater, which would be a certainty. But such an approach provides one means of estimating the value of the risk of death—an examination of what people will, and will not, pay to reduce that risk.

**KEY TAKEAWAYS**

- The opportunity cost is the value of the best-foregone alternative.
- Opportunity cost of a purchase includes more than the purchase price but all of the costs associated with a choice.
- The conversion of costs into dollar terms, while sometimes controversial, provides a convenient means of comparing costs.

**3. ECONOMIC REASONING AND ANALYSIS****LEARNING OBJECTIVES**

1. How do economists reason?
2. What is comparative static?
3. What assumptions are commonly made by economists about human behavior?
4. What do economists mean by marginal?

*What this country needs is some one-armed economists.*

- Harry S. Truman

Economic reasoning is rather easy to satirize. One might want to know, for instance, what the effect of a policy change—a government program to educate unemployed workers, an increase in military spending, or an enhanced environmental regulation—will be on people and their ability to purchase the goods and services they desire. Unfortunately, a single change may have multiple effects. As an absurd and tortured example, government production of helium for (allegedly) military purposes reduces the cost of children's birthday balloons, causing substitution away from party hats and hired clowns. The reduction in demand for clowns reduces clowns' wages and thus reduces the costs of running a circus. This cost reduction increases the number of circuses, thereby forcing zoos to lower admission fees to compete with circuses. Thus, were the government to stop subsidizing the manufacture of helium, the admission fees of zoos would likely rise, even though zoos use no helium. This example is superficially reasonable, although the effects are miniscule.

To make any sense at all of the effects of a change in economic conditions, it is helpful to divide up the effects into pieces. Thus, we will often look at the effects of a change in relation to “other things equal,” that is, assuming nothing else has changed. This isolates the effect of the change. In some cases, however, a single change can lead to multiple effects; even so, we will still focus on each effect individually. A gobbledygook way of saying “other things equal” is to use Latin and say “**ceteris paribus**.” Part of your job as a student is to learn economic jargon, and that is an example. Fortunately, there isn’t too much jargon.

We will make a number of assumptions that you may find implausible. Not all of the assumptions we make are necessary for the analysis, but are used instead to simplify things. Some, however, are necessary and therefore deserve an explanation. There is a frequent assumption in economics that the people we will talk about are exceedingly selfish relative to most people we know. We model the choices that people make, presuming that they select on the basis of their own welfare only. Such people—the people in the models as opposed to real people—are known as “**homo economicus**.” Real people are indubitably more altruistic than homo economicus, because they couldn’t be less: homo economicus is entirely selfish. (The technical term is **self-interested behavior**.) That doesn’t necessarily invalidate the conclusions drawn from the theory, however, for at least four reasons:

1. People often make decisions as families or households rather than as individuals, and it may be sensible to consider the household as the “consumer.” Identifying households as fairly selfish is more plausible perhaps than identifying individuals as selfish.
2. Economics is mostly silent on why consumers want things. You may wish to make a lot of money to build a hospital or endow a library, which would be altruistic. Such motives are not inconsistent with self-interested behavior.
3. Corporations are expected to serve their shareholders by maximizing share value, thus inducing self-interested behavior on the part of the corporation. Even if corporations could ignore the interests of their shareholders, capital markets would require them to consider shareholder interests as necessary condition for raising funds to operate and invest. In other words, people choosing investments for high returns will force corporations to seek a high return.
4. There are good, as well as bad, consequences that follow from people acting in their self-interest, and it is important for us to know what they are.

Thus, while the theory of self-interested behavior may not be universally descriptive it is nonetheless a good starting point for building a framework to study the economics of human behavior.

Self-interested behavior will often be described as “maximizing behavior,” where consumers maximize the value they obtain from their purchases, and firms maximize their profits. One objection to this economic methodology is that people rarely carry out the calculations necessary to literally maximize anything. However, that is not a fatal flaw to the methodology. People don’t consciously do the physics calculations to throw a baseball or thread a needle, yet they somehow accomplish these tasks. Economists often consider that people act “as if” they maximize an objective, even though no explicit calculation is performed. Some corporations in fact use elaborate computer programs to minimize costs or maximize profits, and the field of operations research creates and implements, such maximization programs. Thus, while individuals don’t necessarily calculate the consequences of their behavior, some companies do.

A good example of economic reasoning is the **sunk cost fallacy**. Once one has made a significant nonrecoverable investment, there is a psychological tendency to invest more, even when subsequent investment isn’t warranted. France and Britain continued to invest in the Concorde (a supersonic aircraft no longer in production) long after they realized that the project would generate little return. If you watch a movie to the end, even after you know it stinks, you haven’t fallen prey to the sunk cost fallacy. The fallacy is attempting to make an investment that has gone bad turn out to be good, even when it probably won’t. The popular phrase associated with the sunk cost fallacy is “throwing good money after bad.” The fallacy of sunk costs arises because of a psychological tendency to make an investment pay off when something happens to render it obsolete. It is a mistake in many circumstances.

Casinos often exploit the fallacy of sunk costs. People who lose money gambling hope to recover their losses by gambling more. The sunk “investment” to win money, may cause gamblers to invest even more in order to win back what has already been lost. For most games like craps, blackjack, and one-armed bandits the house wins on average, so that the average gambler (and even the most skilled slot machine or craps player) loses on average. Thus, for most, trying to win back losses is to lose more on average.

### Ceteris paribus

Latin phrase meaning “other things equal.”

### Homo economicus

A model of the choices that people make, presuming that they select on the basis of their own welfare only.

### Self-interested behavior

Selfishness.

### Sunk cost fallacy

A psychological tendency to invest more once one has made a significant nonrecoverable investment, even when subsequent investment isn’t warranted.

**Comparative static**

A prediction that allows one to determine how one variable affects another, at least in the setting described by the model.

The way economics performs is by a proliferation of mathematical models, and this proliferation is reflected in this book. Economists reason with models. Models help by removing extraneous details from a problem or issue, which allows one to analyze what remains more readily. In some cases the models are relatively simple, like supply and demand. In other cases, the models are more complex. In all cases, the models are constructed to provide the simplest analysis possible that allows us to understand the issue at hand. The purpose of the model is to illuminate connections between ideas. A typical implication of a model is “when  $A$  increases,  $B$  falls.” This “**comparative static**” prediction lets us determine how  $A$  affects  $B$  at least in the setting described by the model. The real world is typically much more complex than the models we postulate. That doesn’t invalidate the model, but rather by stripping away extraneous details, the model is a lens for focusing our attention on specific aspects of the real world that we wish to understand.

**Marginal**

Term meaning “the derivative of.”

One last introductory warning before we get started. A parody of economists talking is to add the word **marginal** before every word. Marginal is just economists’ jargon for “the derivative of.” For example, marginal cost is the derivative of cost; marginal value is the derivative of value. Because introductory economics is usually taught to students who have not yet studied calculus or (can’t be trusted to remember it) economists avoid using derivatives and instead refer to the value of the next unit purchased, or the cost of the next unit, in terms of the marginal value or cost. This book uses “marginal” frequently because we wish to introduce the necessary jargon to students who want to read more advanced texts or take more advanced classes in economics. For an economics student not to know the word marginal would be akin to a physics student who does not know the word mass. The book minimizes jargon where possible, but part of the job of a principled student is to learn the jargon, and there is no getting around that.

**KEY TAKEAWAYS**

- It is often helpful to break economic effects into pieces.
- A common strategy is to examine the effects of a change in relation to “other things equal,” that is, assuming nothing else has changed, which isolates the effect of the change. “Ceteris paribus” means “other things equal.”
- Economics frequently models the choices that people make by assuming that they make the best choice for them. People in a model are known occasionally as “homo economicus.” Homo economicus is entirely selfish. The technical term is acting in one’s self-interest.
- Self-interested behavior is also described as “maximizing behavior,” where consumers maximize the net value they obtain from their purchases, and firms maximize their profits.
- Once one has made a significant nonrecoverable investment, there is a psychological tendency to invest more, even when the return on the subsequent investment isn’t worthwhile, known as the sunk cost fallacy.
- Economists reason with models. By stripping out extraneous details, the model represents a lens to isolate and understand aspects of the real world.
- Marginal is just economists’ jargon for “the derivative of.” For example, marginal cost is the derivative of cost; marginal value is the derivative of value.