Facebook doesn’t charge you a penny, so it’s tempting to say, “it’s free.”

Is Facebook free?

Here’s another way to think about it. What do you give up when you use Facebook? That’s a different kind of question. Facebook doesn’t take your money, but it does take your time. If you spend an hour each day on Facebook, you are giving up some alternative use of that time. You could spend that time playing soccer, watching Hulu videos, napping, daydreaming, or listening to music. There are many ways to use your time. For example, a typical U.S. college student employed 7 hours per week earns almost $4,000 in a year—enough to pay the annual lease on a sports car. A part-time job is just one alternative way to use the time that you spend on Facebook. In your view, what is the best alternative use of your Facebook time? That’s the economic way of thinking about the cost of Facebook.

In this chapter, we introduce you to the economic way of thinking about the world. Economists study the choices that people make, especially the costs and benefits of those choices, even the costs and the benefits of Facebook.

CHAPTER OUTLINE

1.1 The Scope of Economics
1.2 Three Principles of Economics
1.3 The First Principle of Economics: Optimization
1.4 Is Facebook free?
1.5 The Second Principle of Economics: Equilibrium
1.6 The Third Principle of Economics: Empiricism
1.7 Is Economics Good for You?
Most people are surprised to learn how much ground economics covers. Economists study all human behavior, from a person’s decision to lease a new sports car, to the speed the new driver chooses as she rounds a hairpin corner, to her decision not to wear a seat belt. These are all choices, and they are all fair game to economists. And they are not all directly related to money. Choice—not money—is the unifying feature of all the things that economists study.

In fact, economists think of almost all human behavior as the outcome of choices. For instance, imagine that Dad tells his teenage daughter that she must wash the family car. Though it may not be obvious, the daughter has several options: she can wash it, she can negotiate for an easier chore, she can refuse to wash it and suffer the consequences, or she can move out (admittedly, a drastic response, but still a choice). Obeying one’s parents is a choice, though it may not always feel like one.

Economic Agents and Economic Resources

Saying that economics is all about choices is an easy way to remember what economics is. To give you a more precise definition, we first need to introduce two important concepts: economic agents and resource allocation.

An economic agent is an individual or a group that makes choices. Let’s start with a few types of individual economic agents. For example, a consumer chooses to eat bacon cheeseburgers or tofu burgers. A parent chooses to enroll her children in public school or private school. A student chooses to attend his classes or to skip them. A citizen chooses whether or not to vote, and if so, which candidate to support. A worker chooses to do her job or pretend to work while texting. A criminal chooses to hotwire cars or mug little old ladies. A business leader chooses to open a new factory in Chile or China. A senator chooses to vote for or against a bill. Of course, you are also an economic agent because you make an enormous number of choices every day.

Not all economic agents, however, are individuals. An economic agent can also be a group—a government, an army, a firm, a university, a political party, a labor union, a sports team, a street gang. Sometimes economists simplify their analysis by treating these groups as a single decision maker, without worrying about the details of how the different individuals in the group contributed to the decision. For example, an economist might say that Apple prices the iPhone to maximize its profits, glossing over the fact that hundreds of executives participated in the analysis that led to the choice of the price.
Scarce resources are things that people want, where the quantity that people want exceeds the quantity that is available.

Scarcity is the situation of having unlimited wants in a world of limited resources.

Economics is the study of how agents choose to allocate scarce resources and how those choices affect society.

The second important concept to understand is that economics studies the allocation of scarce resources. Scarce resources are things that people want, where the quantity that people want exceeds the quantity that is available. Gold wedding bands, Shiatsu massages, Coach handbags, California peaches, iPhones, triple-chocolate-fudge ice cream, and rooms with a view are all scarce resources. And so are most ordinary things, like toilet paper, subway seats, and clean drinking water. Scarcity exists because people have unlimited wants in a world of limited resources. The world does not have enough resources to give everyone everything they want. Consider sports cars. If sports cars were given away for free, there would not be enough of them to go around. Instead, sports cars are sold to the consumers who are willing to pay for them.

The existence of a marketplace for sports cars gives economic agents lots of choices. You have 24 hours to allocate each day—this is your daily budget of time. You choose how many of those 24 hours you will allocate to Facebook. You choose how many of those 24 hours you will allocate to other activities, including a job. If you have a job, you also choose whether to spend your hard-earned wages on a sports car. These kinds of decisions determine how scarce sports cars are allocated in a modern economy: to the consumers who are able and willing to pay for them.

Economists don’t want to impose our tastes for sports cars, hybrids, electric vehicles, SUVs, or public transportation on you. We are interested in teaching you how to use economic reasoning so that you can compare the costs and benefits of the alternative options and make the choices that are best for you.

Definition of Economics

We are now ready to define economics precisely. Economics is the study of how agents choose to allocate scarce resources and how those choices affect society.

As you might have expected, this definition emphasizes choices. The definition also takes into account how these choices affect society. For example, the sale of a new sports car doesn’t just affect the person driving off the dealer’s lot. The sale generates sales tax, which is collected by the government, which in turn funds projects like highways and hospitals. The purchase of the new car also generates some congestion—that’s one more car in rush-hour gridlock. And it’s another car that might grab the last parking spot on your street. If the new owner drives recklessly, the car may also generate risks to other drivers. The car will also be a source of pollution. Economists study the original choice and its multiple consequences for other people in the world.
Positive Economics and Normative Economics

We now have an idea of what economics is about: people’s choices. But what is the reason for studying choices? Part of the answer is that economists are just curious, but that’s only a small part of the picture. Understanding people’s choices is practically useful for two key reasons. Economic analysis:

1. Describes what people actually do (positive economics).
2. Recommends what people ought to do (normative economics).

The first application is descriptive and the second is advisory.

Positive Economics Describes What People Actually Do

Descriptions of what people actually do are objective statements about the world. Such factual statements can be confirmed or tested with data. For instance, it is a fact that in 2010, 50 percent of U.S. households earned less than $52,000 per year. Describing what has happened or predicting what will happen is referred to as positive economics or positive economic analysis.

For instance, consider the prediction that in 2020 U.S. households will save about 5 percent of their income. This forecast can be compared to future data and either confirmed or disproven. Because a prediction is ultimately testable, it is part of positive economics.

Normative Economics Recommends What People Ought to Do

Normative economics, the second of the two types of economic analysis, advises individuals and society on their choices. Normative economics is about what people ought to do. Normative economics is almost always dependent on subjective judgments, which means that normative analysis depends at least in part on personal feelings, tastes, or opinions. So whose subjective judgments do we try to use? Economists believe that the person being advised should determine the preferences to be used.

For example, if an economist were helping a worker to decide how much to save for retirement, the economist would first ask the worker about her own preferences. Suppose the worker expressed a high degree of patience—“I want to save enough so I can maintain my level of expenditure when I retire.” In this case, the economist would recommend a saving rate that achieves the worker’s desire for steady consumption throughout her life—about 10 to 15 percent of income for most middle-income families. Here the economist plays the role of engineer, finding the saving rate that will deliver the future level of retirement spending that the worker wants.

The economist does not tell the worker what degree of patience to have. Instead, the economist asks the worker about her preferences and then recommends a saving rate that is best for the worker given her preferences. In the mind of most economists, it is legitimate for the worker to choose any saving rate, as long as she understands the implications of that saving rate for expenditure after retirement.

Normative Analysis and Public Policy

Normative analysis also generates advice to society in general. For example, economists are often asked to evaluate public policies, like taxes or regulations. When public policies have winners and losers, citizens tend to have opposing views about the desirability of the government program. One person’s migratory bird sanctuary is another person’s mosquito-infested swamp. Protecting a wetland with environmental regulations benefits bird-watchers but harms landowners who plan to develop that land.

When a government policy has winners and losers, economists will need to make some ethical judgments to conduct normative analysis. Economists must make ethical judgments whenever we evaluate policies that make one group worse off so another group can be made better off.

Ethical judgments are usually unavoidable when economists think about government policies, because there are very few policies that make everyone better off. Deciding whether the costs experienced by the losers are justified by the benefits experienced by the winners is partly an ethical judgment. Is it ethical to create environmental regulations that prevent a real estate developer from draining a swamp so he can build new homes? What if...
those environmental regulations protect migratory birds that other people value? Are there other solutions to this seemingly unresolvable problem? Should the government try to buy the land from the real estate developer? And if land purchasing is the government’s policy, how should society determine the price that the government offers the developer? Should the developer be forced to sell at that price? These public policy questions—which all ask what society should do—are normative economic questions.

Microeconomics and Macroeconomics

There is one other distinction that you need to know to understand the scope of economics. Economics can be divided into two broad fields of study, though many economists do a bit of both.

**Microeconomics** is the study of how individuals, households, firms, and governments make choices, and how those choices affect prices, the allocation of resources, and the well-being of other agents. For example, microeconomists design policies to reduce pollution. Because global warming is partially caused by carbon emissions from coal, oil, and other fossil fuels, microeconomists design policies to reduce the use of these fuels. For example, a “carbon tax” targets carbon emissions. Under a carbon tax, relatively carbon-intensive energy sources—like coal power plants—pay more tax per unit of energy produced than energy sources with lower carbon emissions—like wind farms. Microeconomists have the job of designing carbon taxes and determining how such taxes will affect the energy usage of households and firms. In general, microeconomists are called upon whenever we want to understand a small piece of the overall economy.

**Macroeconomics** is the study of the economy as a whole. Macroeconomists study economy-wide phenomena, like the growth rate of a country’s total economic output, or the percentage increase in overall prices (the inflation rate), or the fraction of the labor force that is looking for work but cannot find a job (the unemployment rate). Macroeconomists design government policies that improve overall, or “aggregate,” economic performance.

For example, macroeconomists try to identify the best policies for stimulating an economy that is experiencing a sustained period of negative growth—in other words, an economy in recession. During the 2007–2009 financial crisis, when housing prices were plummeting and banks were failing, macroeconomists had their hands full. It was their job to explain why the economy was contracting and to recommend policies that would bring it back to life.

### 1.2 Three Principles of Economics

You now have a sense of what economics is about. But you might be wondering what distinguishes it from the other social sciences, including, anthropology, history, political science, psychology, and sociology. All of the social sciences study human behavior, so what sets economics apart?

Economists emphasize three key concepts.

1. **Optimization:** We have explained economics as the study of people’s choices. The study of all human choices may initially seem like an impossibly huge topic. And at first glance, choosing a double-bacon cheeseburger at McDonalds does not appear to have much in common with a corporate executive’s decision to build a $500 million laptop factory in China. Economists have identified some powerful concepts that unify the enormous range of choices that economic agents make. One such insight is that all choices are tied together by optimization: people decide what to do by consciously or unconsciously weighing all of the known pros and cons of the different available options and trying to pick the best feasible option. In other words, people make choices that are motivated by calculations of benefits and costs.
1.3 The First Principle of Economics: Optimization

Let’s now consider our first principle in more detail. Economics is the study of choices, and economists have a theory about how choices are made. Economists believe that economic agents try to optimize, meaning that economic agents try to choose the best feasible option, given the information that they have. Feasible options are those that are available and affordable to an economic agent. If you have $10 in your wallet and no credit/debit/ATM cards, then a $5 Big Mac is a feasible lunch option, while a $50 filet mignon is not.

The concept of feasibility goes beyond the financial budget of the agent. There are many different constraints that determine what is feasible. For instance, it is not feasible to work more than 24 hours in a day. It is not feasible to attend meetings (in person) in New York and Beijing at the same time.

The definition of optimization also refers to the information available at the time of the choice. For example, if you choose to drive from San Diego to Los Angeles and your car is hit by a drunk driver, you are unlucky but you haven’t necessarily failed to optimize. As long as you made your travel plans taking into account the realistic risk of a car crash, then you have optimized. Optimization means that we weigh the potential risks in a decision, not that we perfectly foresee the future. When someone chooses the best feasible option given the information that is available, economists say that the decision maker is being rational or, equivalently, he or she is exhibiting rationality. Rational action does not require a crystal ball, just a logical appraisal of the costs, benefits, and risks associated with each decision.

On the other hand, if you decide to let a friend drive you from San Diego to Los Angeles and you know that your friend has just had a few beers, this is probably a case in which you failed to optimize. It is important to note that the test of optimization is the quality of your decision, and not the outcome. If you arrive at your destination without a crash, that would still (probably) be a suboptimal choice, because you got lucky despite making a bad decision.

We devote much of this book to the analysis of optimization. We explain how to optimize, and we discuss lots of evidence that supports the theory that economic agents usually optimize. We also discuss important cases where behavior deviates from optimization. In the cases where agents fail to optimize, normative economic analysis can help them realize their mistakes and make better choices in the future.

Finally, it is important to note that what we optimize varies from person to person and group to group. Although most firms try to maximize profits, most economic agents are not...
trying to maximize only income. If that were our goal, we’d all work far more than 40 hours per week and we’d keep working well past retirement age. Most households are trying to optimize overall well-being, which requires income, leisure, health, and a host of other factors (like social networks and a sense of purpose in life). Most governments are trying to optimize a complex mix of policy goals. For most economic agents, optimization is not just about how much money we have.

Trade-offs and Budget Constraints

To understand optimization, you need to understand trade-offs. Trade-offs arise when some benefits must be given up in order to gain others. Think about Facebook. If you spend an hour on Facebook, then you cannot spend that hour doing other things. For example, you cannot work at most part-time jobs at the same time you are editing your Facebook profile.

Economists use budget constraints to describe trade-offs. A budget constraint is the set of things that a person can choose to do (or buy) without breaking her budget.

Here’s an illustration. Suppose that you can do only one of two activities with your free time: work at a part-time job or surf the Web. Suppose that you have 5 free hours in a day (once we take away necessities like sleeping, eating, bathing, attending classes, doing problem sets, and studying for exams). Think of these 5 free hours as your budget of free time. Then your budget constraint would be:

\[
5 \text{ hours} = \text{Hours surfing the Web} + \text{Hours working at part-time job.}
\]

This budget constraint equation implies that you face a trade-off. If you spend an extra hour surfing the Web, you need to spend one less hour working at a part-time job. Likewise, if you spend an extra hour working at the part-time job, you need to spend one less hour surfing the Web. More of one activity implies less of the other. We can see this in Exhibit 1.2, where we list all of the ways that you could allocate your 5 free hours.

Budget constraints are useful economic tools because they quantify trade-offs. When economists talk about the choice that an economic agent faces, the economist first specifies the budget constraint.

Opportunity Cost

We are now ready to introduce another critical tool in the optimization toolbox: opportunity cost. Our Web surfing example provides an illustration of the concept. The time that we spend on the Web is time that we could have spent in some other way: playing basketball, jogging, daydreaming, sleeping, calling a friend, catching up on e-mail, working on a problem set, working at a part-time job, and so on. You implicitly sacrifice time on these alternative activities when you spend time surfing the Web (unless you secretly use Facebook while you are being paid for a job—in this case, please keep your boss off your friend list).

Try generating your own list of alternative activities that are squeezed out when you surf the Web. Think about the best alternative to Web surfing, and put that at the top; then work down from there. Your list illustrates the concept of opportunity cost; you can either spend...
Section 1.3 | The First Principle of Economics: Optimization

Opportunity cost is the best alternative use of a resource.

Assigning a Monetary Value to an Opportunity Cost

Economists sometimes try to put a monetary value on opportunity cost. Translating benefits and costs into monetary units, like dollars or yen, makes everything easier to analyze. One way to estimate the monetary value of an hour of your time is to analyze the consequences of taking a part-time job or working additional hours at the part-time job you already have.

The opportunity cost of your time is at least the net benefit that you would receive from a job (assuming that you can find one that fits your schedule). Here’s why. A part-time job is one item in the long list of alternatives to surfing the Web. If the part-time job is at the top of your list, then it’s the best alternative, and the part-time job is your opportunity cost of surfing the Web. What if the part-time job is not at the top of your list, so it’s not the best alternative? Then the best alternative is even better than the part-time job, so the best alternative is worth more than the part-time job. To sum up, your opportunity cost is either the net benefit of a part-time job or a value that is even greater than that.

To turn these insights into something quantitative, it helps to note that the median wage for U.S. workers between 16 and 24 years of age was $11.35 per hour in 2013—this data is from the U.S. Bureau of Labor Statistics. However, a job has many attributes other than the wage you are paid: unpleasant tasks (like being nice to obnoxious customers), on-the-job training, friendly or unfriendly coworkers, and resume building, just to name a few.

If we ignore these non-wage attributes, the benefit of an hour of work is just the wage (minus taxes paid). On the other hand, if the positive and negative non-wage attributes don’t cross each other out, the calculation is much harder. To keep things simple, we’ll focus only on the after-tax wage in the analysis that follows—about $10 per hour for young workers—but we urge you to keep in mind all of the non-wage consequences that flow from a job.

Cost-Benefit Analysis

Let’s use opportunity cost to solve an optimization problem. Specifically, we want to compare a set of feasible alternatives and pick the best one. Economists call this process cost-benefit analysis. Cost-benefit analysis is a calculation that adds up costs and benefits using a common unit of measurement, like dollars. It is used to identify the alternative that has the greatest net benefit, which is equivalent to benefits minus costs.
To see these ideas in action, suppose that you and a friend are going to Miami Beach from Boston for spring break. The only question is whether you should drive or fly. Your friend argues that you should drive because splitting the cost of a rental car and gas “will only cost $200 each.” He tries to seal the deal by pointing out “that’s much better than a $300 plane ticket.”

To analyze this problem using cost-benefit analysis, you need to list all of the costs and benefits of driving relative to the alternative of flying. You then need to translate those costs and benefits into a common unit of measurement.

From a benefit perspective, driving saves you $100—the difference between driving expenses of $200 and a plane ticket of $300. From a cost perspective, driving costs you an extra 40 hours of time—the difference between 50 hours of round-trip driving time and about 10 hours of round-trip airport/flying time. Spending 40 extra hours traveling is a cost of driving.

But we still don’t know whether driving is a good idea or a bad idea, because we haven’t yet expressed everything in common units. Suppose the opportunity cost of your time is $10 per hour (slightly below the median wage for U.S. workers between ages 16 and 24). This is the value of your time. Then the net benefit of driving relative to flying is

\[(100 \text{ Cost saving}) - (40 \text{ Hours of additional travel time}) \times (10/\text{hour}) = 100 - 400 = -300.\]

Hence, the net benefit of driving is overwhelmingly negative. An optimizer would choose to fly.

Your decision about travel to Miami is a simple example of cost-benefit analysis, which is a great tool for collapsing all sorts of things down to a net dollar benefit. This book will guide you in making such calculations. If you are making choices as to which house to buy, which job to take, or whether Medicare should pay for heart transplants, cost-benefit analysis can help. Economists are not popular for making some of these “cold-hearted” calculations, but it’s nonetheless useful to be able to quantitatively analyze difficult decisions.

To an economist, cost-benefit analysis and optimization are the same thing. When you pick the option with the greatest net benefits—benefits minus costs—you are optimizing. So cost-benefit analysis is useful for normative economic analysis. It enables an economist to determine what an individual or a society should do. Cost-benefit analysis also yields many useful positive economic insights. In most cases, cost-benefit analysis correctly predicts the choices made by actual consumers.

Evidence-Based Economics

Q: Is Facebook free?

We can now turn to the question we posed at the beginning of the chapter. By now you know that Facebook has an opportunity cost—the best alternative use of your time. We will now estimate this cost. To do this, we’re going to need some data. Whenever you see a section in this textbook titled “Evidence-Based Economics,” you’ll know that we are using data to analyze an economic question.

In 2013, Web users worldwide spent 250 million hours on Facebook each day. On a per person basis, each of the nearly 1 billion Facebook users allocated an average of 15 minutes per day to the site. College students used Facebook more intensively. The average college student spent about an hour per day on Facebook.
We estimate that the time spent worldwide on Facebook has an average opportunity cost of $5 per hour. We generated this estimate with a back-of-the-envelope—in other words, approximate—calculation that averages together every Facebook user’s opportunity cost.

Here’s how we did the calculation. First, we assume that users in the developed world—which represents wealthy countries such as France, Japan, and the United States—have an opportunity cost of $9 per hour, which is a typical minimum wage in a developed country. Employers are legally required to pay at least the minimum wage, and most workers in developed countries get paid much more than this. Even people who choose not to work still value their time, since it can be used for lots of good things like napping, texting, dating, studying, playing angry birds, and watching movies. It’s reasonable to guess that these nonworkers—for instance, students—will also have an opportunity cost of at least the minimum wage.

Second, we assume that Facebook users in the developing world—which represents all countries, except the developed countries—have a relatively lower opportunity cost of time. We assume that Facebook users in the developing countries have an opportunity cost of $1 per hour—for instance, their employment opportunities are far less favorable than those in the developed world.

To evaluate the reasonableness of these estimates, ask yourself this question: “How much would someone need to pay you to take away an hour of your free time?” Does your answer correspond more closely to our estimate for the developed world ($9/hour) or the developing world ($1/hour)?

About half of Facebook users live in developed countries and half live in developing countries, so, given our assumptions, the average opportunity cost is \( \frac{1}{2} \times 9 + \frac{1}{2} \times 1 = 5 \) per hour. Accordingly, the total opportunity cost of time spent on Facebook is calculated by multiplying the total number of hours spent on Facebook each day, by the average opportunity cost of time per hour:

\[
\left( \frac{250 \text{ million hours}}{\text{day}} \right) \times \left( \frac{5}{\text{hour}} \right) = \left( \frac{1.25 \text{ billion}}{\text{day}} \right).
\]

Multiplying this by 365 days per year yields an annualized opportunity cost of over $450 billion. This is an estimate of the cost of Facebook. As you have seen, this is only a crude approximation, since we can’t directly observe the opportunity cost of each person’s time.

We can also think about this calculation another way. If people had substituted their time on Facebook for work with average pay of $5 per hour, the world economy would have produced about $450 billion more measured output in 2013. This is more than the annual economic output of Austria.

Finally, we can also estimate the opportunity cost of a typical U.S. college student who spends 1 hour per day on Facebook. Assuming that this student’s opportunity cost is equal to $10 per hour, the opportunity cost is $3,650 per year.

\[
(10/\text{hour}) \times (365 \text{ hours/year}) = 3,650 \text{ per year}.
\]

We chose $10 per hour for the opportunity cost, since the median before-tax wage of 16- to 24-year-old U.S. workers was $11.35 per hour in 2013, and such low-income workers don’t pay much in taxes.

So far, we have gone through a purely positive economic analysis, describing the frequency of Facebook usage and the trade-offs that this usage implies. None of this analysis, however, answers the related question: Are Facebook and other social networking sites worth it? We’ve seen that the time spent on sites like these is costly because it has valuable alternative uses. But Facebook users are deriving substantial benefits that may justify this allocation of time. For example, social networking sites keep us up-to-date
### Exhibit 1.3 What Could You Buy with $3,650?

Everyone would choose to spend $3,650 in their own particular way. This list illustrates one feasible basket of goods and services. Note that this list includes just the monetary costs. A complete economic analysis would also include the opportunity cost of the time that you’ll need to consume them.

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost per unit</th>
<th>Number of units</th>
<th>Total cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starbucks cappuccino</td>
<td>$4</td>
<td>52 cups</td>
<td>$208</td>
</tr>
<tr>
<td>iPhone</td>
<td>$400</td>
<td>1</td>
<td>$400</td>
</tr>
<tr>
<td>Roundtrip: NYC to Paris</td>
<td>$1,000</td>
<td>1</td>
<td>$1,000</td>
</tr>
<tr>
<td>Hotel in Paris</td>
<td>$250</td>
<td>4 nights</td>
<td>$1,000</td>
</tr>
<tr>
<td>Roundtrip: NYC to U.S. Virgin Islands</td>
<td>$300</td>
<td>1</td>
<td>$300</td>
</tr>
<tr>
<td>Hotel in Virgin Islands</td>
<td>$180</td>
<td>4 nights</td>
<td>$720</td>
</tr>
<tr>
<td>11 iPhone apps</td>
<td>$2</td>
<td>11</td>
<td>$22</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td><strong>$3,650</strong></td>
</tr>
</tbody>
</table>

on the activities of our friends and family. They facilitate the formation of new friendships and new connections. And Facebook and similar sites are entertaining.

Because we cannot easily quantify these benefits, we’re going to leave that analysis to you. Economists won’t tell you what to do, but we will help you identify the trade-offs that you are making in your decisions. Here is how an economist would summarize the normative question that is on the table:

Assuming a $10 per hour opportunity cost, the opportunity cost of using Facebook for an hour per day is $3,650 per year. Do you receive benefits from Facebook that exceed this opportunity cost?

Economists don’t want to impose their tastes on other people. In the view of an economist, people who get big benefits from intensive use of Facebook should stay the course. Economists don’t want to dictate choices. Instead, we want economic agents to recognize the implicit trade-offs that are being made. Economists are interested in helping people make the best use of scarce resources like budgets of money and time. In many circumstances, people are already putting their resources to best use. Occasionally, however, economic reasoning can help people make better choices.
The Second Principle of Economics: Equilibrium

In most economic situations, you aren’t the only one trying to optimize. Other people’s behavior will influence what you decide to do. Economists think of the world as a group of economic agents who are interacting and influencing one another’s efforts at optimization. Recall that equilibrium is the special situation in which everyone is optimizing, so nobody would benefit personally by changing his or her own behavior.

An important clarification needs to accompany this definition. When we say that nobody would benefit personally by changing his or her own behavior, we mean that nobody believes they would benefit from such a change. In equilibrium, all economic agents are making their best feasible choices taking into account all of the information they have, including their beliefs about the behavior of others. We could rewrite the definition by saying that in equilibrium, nobody perceives that they will benefit from changing their own behavior.

To build intuition—which means understanding—for the concept of equilibrium, consider the length of the regular checkout lines at your local supermarket (ignore the express lines). If any line has a shorter wait than the others, optimizers will choose that line. If any line has a longer wait than the others, optimizers will avoid that line. So the short lines will attract shoppers, and the long lines will drive them away. And it’s not just the length of the lines that matters. You pick your line by estimating which line will move the fastest, which incorporates everything that you can see, including the number of items in each person’s shopping cart. Economists say that “in equilibrium” all of the checkout lines will have roughly the same wait time. When the wait times are expected to be the same, no shopper has an incentive to switch lines. In other words, nobody perceives that they will benefit by changing their behavior.

Here’s another example. Suppose the market price of gasoline is $3/gallon and the gasoline market is in equilibrium. Three conditions will need to be satisfied.

1. The amount of gasoline produced by gasoline sellers—oil companies—will equal the amount of gasoline purchased by buyers.
2. Oil companies will only operate wells where they can extract oil and produce gasoline at a cost that is less than the market price of gasoline: $3/gallon.
3. The buyers of gasoline will only use it for activities that are worth at least $3/gallon—like driving to their best friend’s wedding—and they won’t use it for activities that are worth less than $3/gallon—like visiting their least favorite relatives. When gas prices go up, who in the family can’t make it for Thanksgiving?

In equilibrium, both the sellers and the buyers of gasoline are optimizing, given the market price of gasoline. Nobody would benefit by changing his or her behavior.

In this book, we often study the behavior of groups of economic agents. A group could be 2 chess players; or 30 participants in an eBay auction; or millions of investors buying and selling shares on the New York Stock Exchange; or billions of households buying gasoline to fuel their tractors, trucks, mopeds, motorcycles, and cars. In all these cases, we study the equilibrium that emerges when all of these economic agents interact. In other words, we examine these environments using the assumption that everyone is constantly simultaneously optimizing—for instance, at every move in a chess game and during every trade on the New York Stock Exchange. Economists believe that this
equilibrium analysis provides a good description of what actually happens when groups of people interact.

**The Free-Rider Problem**

Let’s use the concept of equilibrium to analyze an economic problem that may interest you: roommates. Assume that five roommates live in a rented house. The roommates can spend some of their free time contributing to the general well-being of the group by throwing away used pizza boxes and soda cans and otherwise cleaning up after themselves. Or they can spend all their free time on activities that only benefit themselves—for instance, watching YouTube videos or listening to Pandora.

It would be beneficial to the group if everyone chipped in and did a little cleaning. But each of the five roommates has an incentive to leave that to others. If one roommate spends 30 minutes doing the dishes, all the other roommates benefit without having to lift a finger. Consequently, rentals with lots of roommates are often a mess.

Lazy roommates are an example of something that economists call the *free-rider problem*. Most people want to let someone else do the dirty work. We would like to be the free riders who don’t contribute but still benefit from the investments that others make.

Sometimes free riders get away with it. When there are very few free riders and lots of contributors, the free riders might be overlooked. For example, a small number of people sneak onto public transportation without paying. These turnstile jumpers are such a small group that they don’t jeopardize the subway system. But if everyone started jumping turnstiles, the subway would soon run out of cash.

In the subway system, free riding is discouraged by security patrols. In rooming groups, free riding is discouraged by social pressure. Even with these “punishment” techniques, free riding is sometimes a problem because it’s not easy to catch the free rider in the act.

It’s possible to slip over a turnstile in a quiet subway station. It’s easy to leave crumbs on the couch when nobody is watching.

People’s private benefits are often out of sync with the public interest. Jumping the subway turnstile is cheaper than paying for a subway ticket. Watching YouTube is more fun than sweeping up the remains of last night’s party. Equilibrium analysis helps us predict the behavior of groups of people and understand why free riding occurs. People sometimes pursue their own private interests and don’t contribute voluntarily to the public interest. Unfortunately, selfless acts—like those of a war hero—are exceptional, and selfish acts are more common. When people in a group act, each member of the group might do what’s best for himself or herself instead of acting in a way that optimizes the well-being of the entire group.

Equilibrium analysis helps us design special institutions—like financial contracts—that reduce or even eliminate free riding. For example, what would happen in the rooming group if everyone agreed to pay $5 per week so the roommates could hire a cleaning service? It would be easier to enforce $5 weekly payments than to monitor compliance with the rule “clean up after yourself, even when nobody is here to watch you.” Pizza crumbs don’t have name tags. So equilibrium analysis explains why individuals often fail to serve the interest of the group and how the incentive structure can be redesigned to fix these problems.

**1.5 The Third Principle of Economics: Empiricism**

Economists test their ideas with data. We call such evidence-based analysis, empirical analysis or *empiricism*. Economists use data to determine whether our theories about human behavior—like optimization and equilibrium—match up with *actual* human behavior.
Of course, we want to know if our theories fail to explain what is happening in the world. In that case, we need to go back to the drawing board and come up with better theories. That is how economic science, and science in general, progresses.

Economists are also interested in understanding what is causing things to happen in the world. We can illustrate what causation is—and is not—via a simple example. Hot days and crowded beaches tend to occur at the same time of the year. What is the cause and what is the effect here? It is, of course, that hot days cause people to go swimming. It is not that swimming causes the outside air temperature to rise.

But there are other cases when cause and effect are hard to untangle. Does being relatively smart cause people to go to college? Or does going to college cause people to be relatively smart? Or do both directions of causation apply?

We’ll come back to the topic of empiricism in general, and causality in particular, in great detail in Chapter 2. Sometimes causes are easy to determine but sometimes identifying cause and effect requires great ingenuity.

Is taking this course good for you? Let’s start by thinking about the costs. Though opportunity costs are often hard to see, they are still important. The key opportunity cost of this course is another course that you won’t be able to take during the time spent as a student. What other course did economics crowd out? Japanese history? Biochemistry? Russian poetry? If you are taking the two-semester version of this course, then you need to consider the two other courses that economics is crowding out.

Now consider the benefits of an economics education. The benefits come in a few different forms, but the biggest benefit is the ability to apply economic reasoning in your daily life. Whether you are deciding how much to spend on a date, where to go on vacation, or how to keep an apartment with four other roommates clean, economic reasoning will improve the quality of your decisions. These benefits will continue throughout your life as you make important decisions, such as where to invest your retirement savings and how to secure the best mortgage.

Most decisions are guided by the logic of costs and benefits. Accordingly, you can use positive economic analysis to predict other people’s behavior. Economics illuminates and clarifies all human behavior.

We also want you to use economic principles when you give other people advice and when you make your own choices. This is normative economics. Learning how to make good choices is the biggest benefit you’ll realize from learning economics. That’s why we have built our book around the concept of decision making. Looking at the world through the economic lens puts you at an enormous advantage throughout your life.

We also think that economics is a lot of fun. Understanding people’s motivations is fascinating, particularly because there are many surprising insights along the way.

To realize these payoffs, you’ll need to connect the ideas in this textbook to the economic activities around you. To make those connections, keep a few tips in mind:

- You can apply economic tools such as trade-offs and cost-benefit analysis to any economic decision. Learn to use them in your own daily decisions. This will help you master the tools and also appreciate their limitations.
- Even if you are not in the midst of making a decision, you will learn a lot of economics by keeping your eyes open when you walk through any environment in which people are using or exchanging resources. Think like an economist the next time you find yourself in a supermarket, a used car dealership, a soccer match, or a poker game.
- The easiest way to encounter economic ideas is to keep up with what’s happening in the world. Go online and read a national newspaper like the New York Times or the Wall Street Journal. News magazines will also do the job. There’s even a newsmagazine called The Economist, which is required reading for prime ministers.
and presidents. Almost every page of any magazine—including People, Sports Illustrated, and Vogue—describes events driven by economic factors. Identifying and understanding these forces will be a challenge. But over time, you’ll find that it gets very easy to recognize and interpret the economic story behind every headline.

Once you realize that you are constantly making economic choices, you’ll understand that this course is only a first step. You’ll discover the most important applications outside class and after the final exam. The tools of economics will improve your performance in all kinds of situations—making you a better businessperson, a better consumer, and a better citizen. Keep your eyes open and remember that every choice is economics in action.

Summary

Economics is the study of how agents choose to allocate scarce resources and how those choices affect society. Economics can be divided into two kinds of analysis: positive economic analysis (what people actually do) and normative economic analysis (what people ought to do). There are two key topics within economics: microeconomics (individual decisions and individual markets) and macroeconomics (the total economy).

Economics is based on three key principles: optimization, equilibrium, and empiricism.

Choosing the best feasible option, given the available information, is optimization. To optimize, an economic agent needs to consider many issues, including trade-offs, budget constraints, opportunity costs, and cost-benefit analysis.

Equilibrium is a situation in which nobody would benefit personally by changing his or her own behavior.

Economists test their ideas with data. We call such evidence-based analysis empirical analysis or empiricism. Economists use data to determine whether our theories about human behavior—like optimization and equilibrium—match actual human behavior. Economists also use data to determine what is causing things to happen in the world.

Key Terms

- economic agent p. 3
- scarce resources p. 4
- scarcity p. 4
- economics p. 4
- positive economics p. 5
- normative economics p. 5
- microeconomics p. 6
- macroeconomics p. 6
- optimization p. 6
- equilibrium p. 7
- empiricism p. 7
- trade-off p. 8
- budget constraint p. 8
- opportunity cost p. 9
- cost-benefit analysis p. 9
Questions

All questions are available in MyEconLab for practice and instructor assignment.

1. Why do we have to pay a price for most of the goods we consume?
2. Many people believe that the study of economics is focused on money and financial markets. Based on your reading of the chapter, how would you define economics?
3. Examine the following statements and determine if they are normative or positive in nature. Explain your answer.
   a. The U.S. automotive industry registered its highest growth rate in 5 years in 2012; U.S. auto sales increased by 13% compared to those in 2011.
   b. The U.S. government should increase carbon taxes to reduce carbon emissions that cause global warming.
4. How does microeconomics differ from macroeconomics? Would the supply of iPhones in the United States be studied under microeconomics or macroeconomics? What about the growth rate of total economic output in the national economy?
5. What does a budget constraint represent? How do budget constraints explain the trade-offs that consumers face?
6. This chapter introduced the idea of opportunity cost.
   a. What is meant by opportunity cost? How are the opportunity costs of various choices compared?

Problems

All problems are available in MyEconLab for practice and instructor assignment.

1. In an episode of the sitcom Seinfeld, Jerry and his friends Elaine and George are waiting to be seated at a Chinese restaurant. Tired of waiting, Elaine convinces the others that they should bribe the maître d’ to get a table.
   a. What factors should they consider when they are deciding how high to make their bribe?
   b. Jerry, Elaine, and George had tickets for a movie after dinner. How would this have affected the amount that they were willing to pay as a bribe?
   c. The amount that they finally decide to pay is higher than the value of the meal that they would have had. Does this mean that they are being irrational?
Adapted from: http://yadayadayadaecom/clip/10/

2. You are thinking about buying a house. You find one you like that costs $200,000. You learn that your bank will give you a mortgage for $160,000 and that you will have to use all of your savings to make the down payment of $40,000. You calculate that the mortgage payments, property taxes, insurance, maintenance, and utilities would total $950 per month. Is $950 the cost of owning the house?

3. You have 40,000 frequent flier miles. You could exchange your miles for a round-trip ticket to Bermuda over spring break. Does that mean your flight to Bermuda would be free? Explain your reasoning.

4. You have decided that you are going to consume 600 calories of beer and snacks at a party Saturday night. A beer has 150 calories and a snack has 75 calories.
   a. Create a table that shows the various combinations of beer and snacks you can consume. To keep things simple, use only round numbers (e.g., you could choose 1 or 2 beers, but not 1.5 beers).
   b. What is the opportunity cost of a beer?

5. There is an old saying that “The proof of the pudding is in the eating,” which means that by definition good decisions work out well and poor decisions work out badly. The following scenarios ask you to consider the wisdom of this saying.
   a. Lower infant mortality and an improvement in nutrition
   b. A surge in cocoa prices and a pest attack on the cocoa crop that year
   c. Does this mean that they are being irrational?

6. What about the growth rate in 5 years in 2012; U.S. auto sales increased by 13% compared to those in 2011.
7. Suppose your New Year’s resolution is to get back in shape. You are considering various ways of doing this: you can sign up for a gym membership, walk to work, take the stairs instead of the elevator, or watch your diet. How would you evaluate these options and choose an optimal one?
8. Suppose the market price of corn is $5.50 per bushel. What are the three conditions that will need to be satisfied for the corn market to be in equilibrium at this price?
9. Economists are often concerned with the free-rider problem.
   a. What is meant by free riding? Explain with an example.
   b. Are public parks subject to the free-rider problem? What about keeping city streets clean? Explain your answer.
10. Explain the concept of causation with the help of a simple real-life example.
11. Identify cause and effect in the following examples:
   a. Lower infant mortality and an improvement in nutrition
   b. A surge in cocoa prices and a pest attack on the cocoa crop that year

12. Identify cause and effect in the following examples:
   a. The U.S. government should increase carbon taxes to reduce carbon emissions that cause global warming.
   b. The U.S. automotive industry registered its highest growth rate in 5 years in 2012; U.S. auto sales increased by 13% compared to those in 2011.
   c. The amount that they finally decide to pay is higher than the value of the meal that they would have had. Does this mean that they are being irrational?

13. What are the three conditions that will need to be satisfied for the corn market to be in equilibrium at this price?
14. Economists are often concerned with the free-rider problem.
   a. What is meant by free riding? Explain with an example.
   b. Are public parks subject to the free-rider problem? What about keeping city streets clean? Explain your answer.
15. Explain the concept of causation with the help of a simple real-life example.
16. Identify cause and effect in the following examples:
   a. Lower infant mortality and an improvement in nutrition
   b. A surge in cocoa prices and a pest attack on the cocoa crop that year

17. What is meant by opportunity cost? How are the opportunity costs of various choices compared?
18. What is meant by opportunity cost? How are the opportunity costs of various choices compared?
19. What is meant by opportunity cost? How are the opportunity costs of various choices compared?
have no backup plan if it does rain. The weather turns out to be lovely on their wedding day. Do you think your friends were being rational when they made their wedding plans? Explain.

b. You usually have to see a doctor several times each year. You decided to buy health insurance at the start of last year. It turns out you were never sick last year and never had to go to the doctor. Do you think you were being rational when you decided to buy health insurance? Explain.

c. Given your answers to the first two parts of this question, do you agree or disagree that “The proof of the pudding is in the eating?” Explain.

6. Consider the following three statements:
   i. You can either stand during a college football game or you can sit. You believe that you will see the game very well if you stand and others sit but that you will not be able to see at all if you sit and others stand. You therefore decide to stand.
   ii. Your friend tells you that he expects many people to stand at football games.
   iii. An economist studies photos of many college football games and estimates that 75 percent of all fans stand and 25 percent sit.

Which of these statements deals with optimization, which deals with equilibrium, and which deals with empiricism? Explain.

7. The costs of many environmental regulations can be calculated in dollars, but the benefits often are in terms of lives saved (mortality) or decreases in the incidence of a particular disease (morbidity). What does this imply about the cost-benefit analysis of environmental regulations? There is an old saying “You can’t put a price on a human life.” Do you agree or disagree? Explain.

8. This chapter discussed the free-rider problem. Consider the following two situations in relation to the free-rider concept.
   a. The Taft-Hartley Act (1947) allows workers to be employed at a firm without joining the union at their workplace or paying membership fees to the union. This arrangement is known as an open shop. Considering that unions negotiate terms of employment and wages on behalf of all the workers at a firm, why do you think that most unions are opposed to open shops?
   b. For your business communication class, you are supposed to work on a group assignment in a team of six. You soon realize that a few of your team members do not contribute to the assignment but get the same grade as the rest of the team. If you were the professor, how would you redesign the incentive structure here to fix this problem?