

# chapter 1

## >> First Principles

### COMMON GROUND

The annual meeting of the Canadian Economics Association draws hundreds of economists, young and old, famous and obscure. There are booksellers, business meetings, and quite a few job interviews. But mainly the economists gather to talk and listen. During the busiest times, 20 or more presentations may be taking place simultaneously, on questions that range from the future of the stock market to who does the cooking in two-earner families.

What do these people have in common? An expert on the stock market probably knows very little about the economics of housework, and vice versa. Yet an economist who wanders into the wrong seminar and ends up listening to presentations on some unfamiliar topic is nonetheless likely to hear much that is familiar. The reason is that all economic analysis is based on a set of common principles that apply to many different issues.

Some of these principles involve *individual choice*—for economics is, first of all, about the choices that individuals make. Do you choose to work over the summer or take a backpacking trip? Do you buy a new CD or go to a movie? These decisions involve *making a choice* among a limited number of alternatives—limited

because no one can have everything that he or she wants. Every question in economics at its most basic level involves individuals making choices.

But to understand how an economy works, you need to understand more than how individuals make choices. None of us is Robinson Crusoe, alone on an island—we must make decisions in an environment that is shaped by the decisions of others. Indeed, in a modern economy even the simplest decisions you make—say, what to have for breakfast—are shaped by the decisions of



One must choose.

thousands of other people, from the banana grower in Costa Rica who decided to grow the fruit you eat to the farmer in Saskatchewan who provided the wheat in your toast. And because each of us in a market economy depends on so many others—and they, in turn, depend on us—our choic-

### What you will learn in this chapter:

- ▶ A set of principles for understanding the economics of how individuals make choices
- ▶ A set of principles for understanding how individual choices interact

es interact. So although all economics at a basic level is about individual choice, in order to understand how market economies behave, we must also understand economy-wide *interaction*—how my choices affect your choices, and vice versa.

In this chapter, we will look at nine basic principles of economics—four “basic principles” involving individual choice, and five “principles of interaction” involving the way individual choices interact.

**Individual choice** is the decision by an individual of what to do, which necessarily involves a decision of what not to do.

## Individual Choice: The Core Of Economics

Every economic issue involves, at its most basic level, **individual choice**—decisions by an individual about what to do and what *not* to do. In fact, you might say that it isn't economics if it isn't about choice.

Step into a big store like a Sears or Canadian Tire. There are thousands of different products available, and it is extremely unlikely that you—or anyone else—could afford to buy everything that you might want to have. And anyway, there's only so much space in your dorm room or apartment. So will you buy another bookcase or a mini-refrigerator? Given limitations on your budget and your living space, you must choose which products to buy and which to leave on the shelf.

The fact that those products are on the shelf in the first place involves choice—the store manager chose to put them there, and the manufacturers of the products chose to produce them. All economic activities involve individual choice.

Four basic economic principles underlie the economics of individual choice, as shown in Table 1-1. We'll now examine each of these principles in more detail.

**TABLE 1-1**

### Principles That Underlie the Economics of Individual Choice

1. Resources are scarce.
2. The real cost of something is what you must give up to get it.
3. “How much?” is a decision at the margin.
4. People usually exploit opportunities to make themselves better off.

A **resource** is anything that can be used to produce something else.

Resources are **scarce**—the quantity available isn't large enough to satisfy all productive uses.

### Basic Principle #1: Resources Are Scarce

You can't always get what you want. Everyone would like to have a beautiful house in a great location (and help with the housecleaning), two or three luxury cars, and frequent vacations in fancy hotels. But even in a rich country like Canada not many families can afford all of that. So, they must make choices—whether to go to Disney World this year or buy a better car, whether to make do with a small backyard or accept a longer commute in order to live where land is cheaper.

Limited income isn't the only thing that keeps people from having everything they want. Time is also in limited supply: there are only 24 hours in a day. And because the time we have is limited, choosing to spend time on one activity also means choosing not to spend time on a different activity—spending time studying for an exam means forgoing a night at the movies. Indeed, many people are so limited by the number of hours in the day that they are willing to trade money for time. For example, convenience stores normally charge higher prices than a regular supermarket. But they fulfill a valuable role by catering to time-pressured customers who would rather pay more than travel farther to the supermarket.

Why do individuals have to make choices? The ultimate reason is that *resources* are **scarce**. A **resource** is anything that can be used to produce something else. Lists of the economy's resources usually begin with land, labour (the available time of workers), capital (machinery, buildings, and other man-made productive assets), and human capital (the educational achievements and skills of workers). A resource is **scarce** when the quantity of the resource available isn't large enough to satisfy all productive uses. There are many scarce resources. These include natural resources—resources that come from the physical environment—such as minerals, lumber, and petroleum. There is also a limited quantity of human resources—labour, skill, and intelligence. And in a growing world economy with a rapidly increasing human population, even clean air and water have become scarce resources.

Just as individuals must make choices, the scarcity of resources available to an economy means that society as a whole must make choices. One way for a society to make choices is simply to allow them to emerge as the result of many individual choices, which is what usually happens in a market economy. For example, Canadians as a group have only so many hours in a week: how many of those hours will they spend going to supermarkets to get lower prices, rather than saving time by shopping at convenience stores? The answer is the sum of individual decisions: each of the millions of individuals in the economy makes his or her own choice about where to shop, and the overall choice is simply the sum of those individual decisions.

But for various reasons, there are some decisions that a society decides are best not left to individual choice. For example, in 2003 there was a house-building boom in Canada, with many new urban communities springing up in previously undeveloped areas. Most local residents feel that a community will be a more pleasant place to live if some of the land is left undeveloped and made available as public parks or play areas. But no individual has an incentive to keep his or her land as open space, rather than selling it to a developer. As a result, provincial governments legislate, in their community planning acts, that a certain minimum amount of space must be set aside (by the developers) for community parks and playgrounds. We'll see in later chapters why decisions about how to use scarce resources are often best left to individuals, but sometimes should be made at a higher, community-wide level.

## Basic Principle #2: The Real Cost of Something Is What You Must Give Up to Get It

It is the last term before you graduate from university, and your class schedule allows you to take only one elective. There are two, however, that you would really like to take: History of Jazz and Introduction to Canadian Film.

Suppose that you decide to take the History of Jazz course. What's the cost of that decision? It is the fact that you can't take the film course. Economists call that kind of cost—what you must forego in order to get something you want—the **opportunity cost** of that item. So the opportunity cost of the History of Jazz class is the enjoyment you would have derived from the film class.

The concept of opportunity cost is crucial to understanding individual choice because, in the end, all costs are opportunity costs. Sometimes critics claim that economists are concerned only with costs and benefits that can be measured in dollars and cents. But that is not true. Much economic analysis involves cases like our elective course example, where it costs no extra tuition to take one elective course—that is, there is no direct monetary cost. Nonetheless, the elective you choose has an opportunity cost—the other desirable elective course that you must forgo because your limited time permits taking only one.

You might think that opportunity cost is an add-on—that is, something *additional* to the monetary cost of an item. Suppose that an elective course costs additional tuition of \$750; now there is a monetary cost to taking History of Jazz. Is the opportunity cost of taking that course something separate from that monetary cost?

Well, consider two cases. First, suppose that taking Introduction to Canadian Film also costs \$750. In this case you would have to spend that \$750 no matter which class you take. So what you give up to take the History of Jazz class is still the film class, period—you would have to spend that \$750 either way. But suppose there isn't any fee for the film class. In that case, what you give up to take the jazz class is the film class *plus* whatever you would have bought with the \$750.

Either way, the cost of taking your preferred class is what you give up to get it. All costs are ultimately opportunity costs.

Sometimes the money you have to pay for something is a good indication of its opportunity cost. But many times it is not. One very important example of how

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The real cost of an item is its **opportunity cost**: what you must give up in order to get it.

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## FOR INQUIRING MINDS

### GOT A PENNY?

At many cash registers—for example, the one in our university cafeteria—there is a little basket full of pennies. People are encouraged to use the basket to round their purchases up or down: if it costs \$5.02, you give the cashier \$5 and take two pennies from the basket; if it costs \$4.99, you pay \$5 and the cashier throws in a penny. It makes everyone's life a bit easier. Of course, it would be easier still if we just abolished the penny, a step that some economists have urged.

But then why do we have pennies in the first place? If it's too small a sum to worry

about, why calculate prices that exactly?

The answer is that a penny wasn't always such a negligible sum: the purchasing power of a penny has been greatly reduced by inflation. Forty years ago, a penny had more purchasing power than a nickel does today.

Why does this matter? Well, remember the saying: "A penny saved is a penny earned." But there are other ways to earn money, so you must decide whether saving a penny is a productive use of your time. Could you earn more by devoting that time to other uses?

Forty years ago, the average wage was about \$2 an hour. A penny was equivalent to 18 seconds' worth of work—it was worth saving a penny if doing so took less than 18 seconds. But wages have risen along with overall prices, so that the average (industrial) worker in Canada is now paid around \$16 per hour. A penny is, therefore, equivalent to about 2 seconds of work—and so it's not worth the opportunity cost of the time it takes to worry about a penny more or less.

In short, the rising opportunity cost of time in terms of money has turned a penny from a useful coin into a nuisance.



AP/Wide World Photos

Tiger Woods understood the concept of opportunity cost. The rest is history.

poorly monetary cost can indicate opportunity cost is the cost of attending university. Tuition and housing are major monetary expenses for most students; but even if these things were free, attending university would still be an expensive proposition because most university students, if they were not in university, would have a job. That is, by going to university, students *forgo* the income they could have made if they had worked instead. This means that the opportunity cost of attending university is what you pay for tuition and housing *plus* the forgone income that you would have earned in a job.

It's easy to see that the opportunity cost of going to university is especially high for people who could be earning a lot during what would otherwise have been their university years. That is why star athletes often skip university or, like Tiger Woods, leave before graduating.

### Basic Principle #3: "How Much?" Is a Decision at the Margin

Some important decisions involve an "either-or" choice—for example, you decide either to go to university or to begin working; you decide either to take economics or to take something else. But other important decisions involve "how much" choices—for example, if you are taking both economics and chemistry this semester, you must decide how much time to spend studying for each. When it comes to understanding "how much" decisions, economics has an important insight to offer: "how much" is a decision made at the *margin*.

Suppose you are taking both economics and chemistry. And suppose you are a pre-med student, so that your grade in chemistry matters more to you than your grade in economics. Does that therefore imply that you should spend *all* your study time on chemistry and wing it on the economics exam? Probably not; even if you think your chemistry grade is more important, you should put some effort into studying for economics.

Spending more time studying for economics involves a benefit (a higher expected grade in that course) and a cost (you could have spent that time doing something else, such as studying to get a higher grade in chemistry). That is, your decision involves a **trade-off**—a comparison of costs and benefits.

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You make a **trade-off** when you compare the costs with the benefits of doing something.

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How do you decide this kind of “how much” question? The typical answer is that you make the decision a bit at a time, by asking how you should spend the next hour. Say both exams are on the same day, and the night before the exams you spend time reviewing your notes for both courses. At 6 P.M., you decide that it’s a good idea to spend at least an hour on each course. At 8 P.M., you decide you’d better spend another hour on each course. At 10 P.M., you are getting tired and figure you have one more hour to study before bed—chemistry or economics? If you are pre-med, it’s likely to be chemistry; if you are pre-MBA, it’s likely to be economics.

Note how you’ve made the decision to allocate your time: at each point the question is whether or not to spend *one more hour* on either course. And in deciding whether to spend another hour studying for chemistry, you weigh the costs (an hour foregone of studying for economics or an hour foregone of sleeping) versus the benefits (a likely increase in your chemistry grade). As long as the benefit of studying one more hour for chemistry outweighs the cost, you should choose to study for that additional hour.

Decisions of this type—what to do with your next hour, what to do with your next dollar, and so on—are **marginal decisions**. They involve making trade-offs *at the margin*: comparing the costs and benefits of doing a little bit more of an activity versus doing a little bit less. The study of such decisions is known as **marginal analysis**.

Many of the questions that we face in economics—as well as in real life—involve marginal analysis: How many workers should I hire in my shop? After how many kilometres should I change the oil in my car? What is an acceptable rate of negative side effects from a new medicine? Marginal analysis plays a central role in economics because it is the key to deciding “how much” of an activity to do.

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Decisions about whether to do a bit more or a bit less of an activity are **marginal decisions**. The study of such decisions is known as **marginal analysis**.

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### Basic Principle #4: People Usually Exploit Opportunities to Make Themselves Better Off

Every weeknight, CBC Radio broadcasts a show called *As It Happens*. It directly follows *The World at Six*, and delves deeper into the news. It has a special fondness for stories that are weird or wacky. One evening it reported on a story that the best way to park your car in Manhattan is to go to Jiffy Lube for an oil change—they keep your car all day and it only costs US\$19.95. In comparison, parking in a garage would run you at least US\$30 a day. What was amusing was what happened when the host of the show tried to talk to the owner of the Jiffy Lube for his comment. They discovered that there is no Jiffy Lube in Manhattan. It’s a great story, but unfortunately it turned out not to be true.

It’s too bad there’s no Jiffy Lube in Manhattan. But if there were, you can be sure there would be a lot of oil changes there. Why? Because when people are offered opportunities to make themselves better off, they normally take them—and if they could find a way to park their car all day for \$19.95 rather than \$30, they would.

When you try to predict how individuals will behave in an economic situation, it is a very good bet that they will exploit opportunities to make themselves better off. Furthermore, individuals will *continue* to exploit these opportunities until they have been fully exhausted—that is, people will exploit opportunities until those opportunities have been fully taken.

If there really were a Manhattan Jiffy Lube and an oil change really were a cheap way to park your car, we can safely predict that before long the waiting list for oil changes would be weeks, if not months.

In fact, the principle that people will exploit opportunities to make themselves better off is the basis of *all* predictions by economists about individual behaviour. If the earnings of those who get MBAs soar while the earnings of those who get law degrees decline, we can expect more students to go to business school and fewer to go to law school. If the price of gasoline rises and stays high for an extended period of time, we

## FOR INQUIRING MINDS

## PAYING FOR GRADES IN FLORIDA? PAYING FOR BABIES IN QUEBEC?

Do people always respond to incentives? Would you work harder for an exam if you were given a cash bonus for doing well? Would you have a baby if the government gave you a cash bonus for doing so? You may answer ‘no’ to these questions. You may feel that there is already enough pressure to do well on exams. You may feel that you will start a family only when you are ready, and that a financial incentive would not affect you. Indeed, you may feel that having children because of a financial incentive is immoral. But statistically, incentives have been shown to work for both grades and babies.

For example, a few years ago, some Florida schools stirred widespread debate by offering actual cash bonuses—up to \$50 in a savings bond—to students who scored high on the state’s standardized exams. They did this because the state government had introduced a pay-for-performance scheme for schools: schools whose students earned high marks on the state exams received extra state funds. Interviews with students suggested that the cash bonuses did spur at least some students to try harder. And the schools themselves reported substantial improvements in student performance.

With regard to babies, Québec offered its residents baby bonuses between 1988 and 1997—starting at \$500 for a first baby and rising to \$8000 for a third. They did this to combat declining fertility rates. And it worked. Fertility in the province grew overall by 12 percent during the period.

The point is that these incentives are likely to affect people *at the margin*. Couples don’t have babies for the baby bonus—it’s too small an amount. But for a couple on the borderline between having another child and not, or between having a baby sooner rather than later, the baby bonus tips the scales.

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An **incentive** is anything that offers rewards to people who change their behavior.

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can expect people to buy smaller cars with better fuel economy—making themselves better off in the presence of higher gas prices by driving more fuel-efficient cars.

When changes in the available opportunities offer rewards to those who change their behaviour, we say that people face new **incentives**. If the price of parking in Manhattan rises, those who can find alternative ways to get to their Wall Street jobs will save money by doing so—and so we can expect fewer people to drive to work.

One last point: economists tend to be sceptical of any attempt to change people’s behaviour that *doesn’t* change their incentives. For example, a plan that calls on manufacturers to reduce pollution voluntarily probably won’t be effective; a plan that gives them a financial incentive to reduce pollution is a lot more likely to work.

## Individual Choice: Summing It Up

We have just seen that there are four basic principles of individual choice:

- *Resources are scarce.* It is always necessary to make choices.
- *The real cost of something is what you must give up to get it.* All costs are opportunity costs.
- *“How much?” is a decision at the margin.* Usually the question is not “whether,” but “how much.” And that is a question whose answer hinges on the costs and benefits of doing a bit more.
- *People usually exploit opportunities to make themselves better off.* As a result, people will respond to incentives.

So are we ready to do economics? Not yet—because most of the interesting things that happen in the economy are not merely the result of individual choices, but of the way those individual choices *interact*.

## *economics in action*

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### A Woman’s Work

One of the great social transformations of the twentieth century was the change in the nature of women’s work. In 1900, only 6 percent of married women worked for



TABLE 1-2

**Principles That Underlie the Interaction of Individual Choices**

1. There are gains from trade.
2. Markets move toward equilibrium.
3. Resources should be used as efficiently as possible to achieve society's goals.
4. Markets usually lead to efficiency.
5. When markets don't achieve efficiency, government intervention can improve society's welfare.

In a market economy, individuals engage in **trade**: they provide goods and services to others and receive goods and services in return.

There are **gains from trade**: people can get more of what they want through trade than they could if they tried to be self-sufficient. This increase in output is due to **specialization**: each person specializes in the task that he or she is good at performing.

farmers (and their counterparts in the U.S. and Europe) have been so successful at producing larger yields, agricultural prices have steadily fallen. These falling prices have reduced the incomes of many farmers, and as a result fewer and fewer people find farming worth doing. That is, an individual farmer who plants a better variety of wheat is better off; but when many farmers plant a better variety of wheat, the result may be to make farmers as a group worse off.

A farmer who plants a new, more productive wheat variety doesn't just grow more wheat. Such a farmer also affects the market for wheat through the increased yields attained, with consequences that will be felt by other farmers, consumers, and beyond.

Just as there are four economic principles that fall under the theme of choice, there are five principles that fall under the theme of interaction. These five principles are summarized in Table 1-2. We will now examine each of these principles more closely.

### Principle of Interaction #1: There Are Gains from Trade

Why do the choices I make interact with the choices you make? A family could try to take care of all its own needs—growing its own food, sewing its own clothing, providing itself with entertainment, writing its own economics textbooks. But trying to live that way would be very hard. The key to a much better standard of living for everyone is **trade**, in which people divide tasks among themselves and each person provides a good or service that other people want in return for different goods and services that he or she wants.

The reason we have an economy, not many self-sufficient individuals, is that there are **gains from trade**: by dividing tasks and trading, two people (or 6 billion people) can each get more of what they each want than they could get by being self-sufficient. Gains from trade arise, in particular, from this division of tasks which economists call **specialization**, a situation in which different people each engage in a different task.

The advantages of specialization, and the resulting gains from trade, were the starting point for Adam Smith's 1776 book *The Wealth of Nations*, which many regard as the beginning of economics as a discipline. Smith's book begins with a description of an eighteenth-century pin factory where, rather than each of the 10 workers making a pin from start to finish, each worker specialized in one of the many steps in pin-making:

One man draws out the wire, another straightens it, a third cuts it, a fourth points it, a fifth grinds it at the top for receiving the head; to make the head requires two or three distinct operations; to put it on, is a particular business, to whiten the pins is another; it is even a trade by itself to put them into the paper; and the important business of making a pin is, in this manner, divided into about eighteen distinct operations...Those ten persons, therefore, could make among them upwards of forty-eight thousand pins in a day. But if they had all wrought separately and independently, and without any of them having been educated to this particular business, they certainly could not each of them have made twenty, perhaps not one pin a day. . . .

The same principle applies when we look at how people divide tasks among themselves and trade in an economy. *The economy, as a whole, can produce more when each person specializes in a task and trades with others.*

The benefits of specialization are the reason a person typically chooses only one career. It takes many years of study and experience to become a doctor; it also takes many years of study and experience to become a commercial airline pilot. Many doctors might well have had the potential to become excellent pilots, and vice versa; but it is very unlikely that anyone who decided to pursue both careers would be as good a pilot or as good a doctor as

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"I hunt and she gathers—otherwise we couldn't make ends meet."



someone who decided at the beginning to specialize in that field. So it is to everyone's advantage that individuals specialize in their career choices.

Markets are what allow a doctor and a pilot to specialize in their own fields. Because markets for commercial flights and for doctors' services exist, a doctor is assured that she can find a flight, and a pilot is assured that he can find a doctor. As long as individuals know that they can find the goods and services that they want in the market, they are willing to forgo self-sufficiency and are willing to specialize. But what assures people that markets will deliver what they want? The answer to that question leads us to our second principle of economy-wide interaction.

## Principle of Interaction #2: Markets Move toward Equilibrium

It's a busy afternoon at the supermarket; there are long lines at the checkout counters. Then one of the previously closed cash registers opens. What happens?

The first thing that happens, of course, is a rush to that register. After a couple of minutes, however, things will have settled down; shoppers will have rearranged themselves so that the line at the newly opened register is about the same length as the lines at all the other registers.

How do we know that? We know from our fourth principle of individual choice that people will exploit opportunities to make themselves better off. This means that people will rush to the newly opened register in order to save time standing in line. And things will settle down when shoppers can no longer improve their position by switching lines—that is, when the opportunities to make themselves better off have all been exploited.

A story about supermarket checkout lines may seem to have little to do with economy-wide interactions, but in fact it illustrates an important principle. A situation in which individuals cannot make themselves better off by doing something different—the situation in which all the checkout lines are the same length—is what economists call an **equilibrium**. An economic situation is in equilibrium when no individual would be better off doing something different.

Recall the story about the mythical Jiffy Lube, where it was supposedly cheaper to leave your car for an oil change than to pay for parking. If that opportunity had



Chuck Keeler/Stone/Getty Images

See equilibrium in action at the checkout lines in your neighbourhood supermarket.

An economic situation is in **equilibrium** when no individual would be better off doing something different.

## FOR INQUIRING MINDS

### CHOOSING SIDES

Why do people in North America drive on the right side of the road? Of course, it's the law. But long before it was the law, it was an equilibrium.

Before there were formal traffic laws, there were informal "rules of the road", practices that everyone expected everyone else to follow. These rules included an understanding that people would normally keep to one side of the road. In some places, such as England, the rule was to keep to the left; in others, such as France, it was to keep to the right.

Why would some places choose the right and others, the left? That's not completely

clear, although it may have depended on the dominant form of traffic. Men riding horses and carrying swords on their left hip preferred to ride on the left (think about getting on or off the horse, and you'll see why). On the other hand, right-handed people walking but leading horses apparently preferred to walk on the right.

In any case, once a rule of the road was established, there were strong incentives for each individual to stay on the "usual" side of the road: those who didn't would keep colliding with oncoming traffic. So once established, the rule of the road would be self-enforcing—that is, it would

be an equilibrium.

Nowadays, of course, which side you drive on is determined by law; some countries have even changed sides (Sweden went from left to right in 1967). But what about pedestrians? There are no laws—but there are informal rules. In Canada, urban pedestrians normally keep to the right. But if you should happen to visit Japan, watch out: the Japanese, who drive on the left, also typically walk on the left. So when in Japan, do as the Japanese do. You won't be arrested if you walk on the right, but you will be worse off than if you accept the equilibrium and walk on the left.

really existed, and people were still paying \$30 to park in garages, the situation would *not* have been an equilibrium.

And that should have been a giveaway that the story couldn't be true.

In reality, people would have seized an opportunity to park cheaply, just as they seize opportunities to save time at the checkout line. And in so doing they would have eliminated the opportunity! Either it would have become very hard to get an appointment for an oil change, or the price of a lube job would have increased to the point that it was no longer an attractive option (unless you really needed a lube job).

As we will see, markets usually reach equilibrium via changes in prices, which rise or fall until no opportunities for individuals to make themselves better off remain.

The concept of equilibrium is extremely helpful in understanding economic interactions because it provides a way of cutting through the sometimes complex details of those interactions. To understand what happens when a new line is opened at a supermarket, you don't need to worry about exactly how shoppers rearrange themselves, who moves ahead of whom, which register just opened, and so on. What you need to know is that any time there is a change, the situation will move to an equilibrium.

The fact that markets move toward equilibrium is why we can depend on markets to work in a predictable way. In fact, we can trust markets to supply us with the essentials of life. For example, people who live in big cities can be sure that the supermarkets shelves will always be fully stocked. Why? Because if some merchants who distribute food *didn't* make deliveries, a big profit opportunity would be created for any merchant who did—and there would be a rush to supply food, just like the rush to a newly opened cash register. So the market ensures that food will always be available for city-dwellers. And, returning to our previous principle, this allows city-dwellers to be city-dwellers—to specialize in doing city jobs rather than living on farms and growing their own food.

A market economy also allows people to achieve gains from trade. But how do we know how well such an economy is doing? The next principle gives us a standard to use in evaluating an economy's performance.

### Principle of Interaction #3: Resources Should Be Used as Efficiently as Possible to Achieve Society's Goals

Suppose you are taking a course in which the classroom is too small for the number of students—many people are forced to stand or sit on the floor—despite the fact that large, empty classrooms are available nearby. You would say, correctly, that this is no way to run a university. Economists would call this an *inefficient* use of resources.

But if an inefficient use of resources is undesirable, just what does it mean to use resources *efficiently*? You might imagine that the efficient use of resources has something to do with money, maybe that it is measured in dollars-and-cents terms. But in economics, as in life, money is only a means to other ends. The measure that economists really care about is not money but people's happiness or welfare. Economists say that *an economy's resources are used efficiently when they are used in a way that has fully exploited all opportunities to make everyone better off*. To put it another way, an economy is **efficient** if it takes all opportunities to make some people better off without making other people worse off.

In our classroom example, there clearly was a way to make everyone better off—moving the class to a larger room would make people in the class better off without hurting anyone else in the university. Assigning the course to the smaller classroom was an inefficient use of the university's resources, while assigning the course to the larger classroom would have been an efficient use of the university's resources.

When an economy is efficient, it is producing the maximum gains from trade possible given the resources available. Why? Because there is no way to rearrange how resources are used in a way that can make everyone better off. When an economy is efficient, one person can be made better off by rearranging how resources are used *only*

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An economy is **efficient** if it takes all opportunities to make some people better off without making other people worse off.

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by making someone else worse off. In our classroom example, if all larger classrooms were already occupied, the university would have been run in an efficient way: your class could be made better off by moving to a larger classroom only by making people in the larger classroom worse off by making them move to a smaller classroom.

Should economic policy-makers always strive to achieve economic efficiency? Well, not quite, because efficiency is not the only criterion by which to evaluate an economy. People also care about issues of fairness or **equity**. And there is typically a trade-off between equity and efficiency: policies that promote equity often come at a cost of decreased efficiency in the economy, and vice versa.

To see this, consider the case of disabled-designated parking spaces in public parking lots. Many people have great difficulty walking due to age or disability, so it seems only fair to assign closer parking spaces specifically for their use. You may have noticed, however, that a certain amount of inefficiency is involved. To make sure that there is always an appropriate space available should a disabled person want one, there are typically quite a number of disabled-designated spaces. So at any one time there are typically more such spaces available than there are disabled people who want one. As a result, desirable parking spaces are unused. (And the temptation for non-disabled people to use them is so large that we must be dissuaded by fear of getting a ticket.) So, short of hiring parking valets to allocate spaces, there is a conflict between *equity*, making life 'fairer' for disabled people, and *efficiency*, making sure that all opportunities to make people better off have been fully exploited by never letting close-in parking spaces go unused.

Exactly how far policy-makers should go in promoting equity over efficiency is a very difficult question that goes to the heart of the political process. As such, it is not a question that economists can answer. What is important for economists, however, is to always seek to use the economy's resources as efficiently as possible in the pursuit of society's goals, whatever those goals may be.

#### Principle of Interaction #4: Markets Usually Lead to Efficiency

No branch of the Canadian government is entrusted with ensuring the general economic efficiency of our market economy—we don't have agents who go around making sure that brain surgeons aren't ploughing fields, that Saskatchewan farmers aren't trying to grow oranges, that prime beachfront property isn't taken up by used-car dealerships, that universities aren't wasting valuable classroom space. The government doesn't need to enforce efficiency because in most cases the invisible hand does the job.

In other words, the incentives built into a market economy already ensure that resources are usually put to good use, that opportunities to make people better off are not wasted. If a university were known for its habit of crowding students into small classrooms while large classrooms go unused, it would soon find its enrolment dropping, putting the jobs of its administrators at risk. The "market" for university students would respond in a way that induces administrators to run the university efficiently.

A detailed explanation of why markets are usually very good at making sure that resources are used well will have to wait until we have studied how markets actually work. But the most basic reason is that in a market economy, in which individuals are free to choose what to consume and what to produce, opportunities for mutual gain are normally taken. If there is a way that some people can be made better off, people will usually be able to take advantage of that opportunity. And that is exactly what defines efficiency: all of the opportunities to make everyone better off have been exploited.

As we learned in the Introduction, however, there are exceptions to this principle that markets are generally efficient. In cases of *market failure*, the individual pursuit of self-interest found in markets makes society worse off—that is, the market outcome is inefficient. And, as we will see in examining the next principle,

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**Equity** means that everyone gets his or her fair share. Since people can disagree about what's "fair", equity isn't as well-defined a concept as efficiency.

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when markets fail, government intervention can help. But short of instances of market failure, the general rule is that markets are a remarkably good way of organizing an economy.

### Principle of Interaction #5: When Markets Don't Achieve Efficiency, Government Intervention Can Improve Society's Welfare

Let's recall from the Introduction the nature of the market failure caused by traffic congestion—a commuter driving to work has no incentive to take into account the cost that his or her action inflicts on other drivers in the form of increased traffic congestion. There are several possible remedies to this situation; examples include charging road tolls, subsidizing the cost of public transportation, or taxing sales of gasoline to individual drivers. All of these remedies work by changing the incentives of would-be drivers—motivating them to drive less and use alternative transportation. But they also share another feature: each relies on government intervention in the market.

This brings us to our fifth and last principle of interaction: *when markets don't achieve efficiency, government intervention can improve society's welfare*. That is, when markets go wrong, an appropriately designed government policy can sometimes move society closer to an efficient outcome by changing how society's resources are used.

A very important branch of economics is devoted to studying why markets fail and what policies should be adopted to improve social welfare. We will study these problems and their remedies in depth in later chapters, but here we give a brief overview of why markets fail. They fail for three principal reasons:

- Individual actions have *side effects* that are not properly taken into account by the market.
- One party prevents mutually beneficial trades from occurring in the attempt to capture a greater share of resources for itself.
- Some goods, by their very nature, are unsuited for efficient management by markets.

An important part of your education in economics is to learn to identify not just when markets work, but also when they don't work—and to judge what government policies are appropriate in each situation.

## *economics in action*

### Restoring Equilibrium on the Freeways

In 1994 a powerful earthquake struck the Los Angeles area, causing several freeway bridges to collapse and thereby disrupting the normal commuting routes of hundreds of thousands of drivers. The events that followed offer a particularly clear example of interdependent decision making—in this case, the decisions of commuters about how to get to work.

In the immediate aftermath of the earthquake, there was great concern about the impact on traffic, since motorists would now have to crowd onto alternative routes or detour around the blockages by using city streets. Public officials and news programs warned commuters to expect massive delays and urged them to avoid unnecessary travel, reschedule their work to commute before or after the rush, or use mass transit. These warnings were unexpectedly effective. In fact, so many people heeded them that in the first few days following the quake, those who maintained their regular commuting routine actually found the drive to and from work faster than before.

Of course, this situation could not last. As word spread that traffic was actually not bad at all, people abandoned their less convenient new commuting methods and reverted to their cars—and traffic got steadily worse. Within a few weeks after the quake, serious traffic jams had appeared. After a few more weeks, however, the situation stabilized: the reality of worse-than-usual congestion discouraged enough drivers to prevent the nightmare of city-wide gridlock from materializing. Los Angeles traffic, in short, had settled into a new equilibrium, in which each commuter was making the best choice he or she could, given what everyone else was doing. ■

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### >>CHECK YOUR UNDERSTANDING 1-2

1. Explain how each of the following situations illustrates one of the five principles of interaction.
  - a. Using the university's student website, any student who wants to sell a used textbook for at least \$X is able to sell it to another who is willing to pay \$X.
  - b. At a university tutoring co-op, students can arrange to provide tutoring in subjects they are good in (like economics) in return for receiving tutoring in subjects they are poor in (like philosophy).
  - c. The local municipality imposes a law that requires bars and nightclubs near residential areas to keep their noise levels below a certain threshold.
  - d. To provide better care for low-income patients, the city of Toronto has decided to close some underutilized neighbourhood clinics and shift funds to the main hospital.
  - e. On the university website, books of a given title with approximately the same level of wear and tear sell for about the same price.
2. Which of the following describes an equilibrium situation? Which does not? Explain your answer.
  - a. The restaurants across the street from the university dining hall serve better-tasting and cheaper meals than those served at the university dining hall. The vast majority of students continue to eat at the dining hall.
  - b. You currently take the subway to work. Although taking the bus is cheaper, the ride takes longer. So you are willing to pay the higher subway fare in order to save time.

Solutions appear at back of book.

### • A LOOK AHEAD •

The nine basic principles we have described lie behind almost all economic analysis. Although they can be immediately helpful in understanding many situations, they are usually not enough. Applying the principles to real economic issues takes one more step.

That step is the creation of *models*—simplified representations of economic situations. Models must be realistic enough to provide real-world guidance but simple enough that they allow us to see clearly the implications of the principles described in this chapter. So our next step is to show how models are used to actually do economic analysis.

## SUMMARY

1. All economic analysis is based on a short list of basic principles. These principles apply to two levels of economic understanding. First, we must understand how individuals make choices; second, we must understand how these choices interact.
2. Everyone has to make choices about what to do and what not to do. **Individual choice** is the basis of economics—if it doesn't involve choice, it isn't economics.
3. The reason choices must be made is that **resources**—anything that can be used to produce something else—are **scarce**. Individuals are limited in their choices by money and time; economies are limited by their supplies of human and natural resources.
4. Because you must choose among limited alternatives, the true cost of anything is what you must give up to get it—all costs are **opportunity costs**.

### >> QUICK REVIEW

- > A feature of most economic situations is the *interaction* of choices made by individuals, the end result of which may be quite different from what was intended. In a market economy, this takes the form of *trade* between individuals.
- > Individuals interact because there are *gains from trade*. Gains from trade arise from *specialization*.
- > Economic situations normally move toward *equilibrium*.
- > As far as possible, there should be an *efficient* use of resources to achieve society's goals. But efficiency is not the only way to evaluate an economy; *equity* may also be desirable, and there is often a trade-off between equity and efficiency.
- > Markets normally *are* efficient, except for certain well-defined exceptions.
- > When markets fail to achieve efficiency, government intervention can improve society's welfare.

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5. Many economic decisions involve questions not of “whether”, but of “how much”—how much to spend on some good, how much to produce, and so on. Such decisions must be taken by performing a **trade-off at the margin**—by comparing the costs and benefits of doing a bit more or a bit less. Decisions of this type are called **marginal decisions**, and the study of them, **marginal analysis**, plays a central role in economics.
6. The study of how people *should* make decisions is also a good way to understand actual behaviour. Individuals usually exploit opportunities to make themselves better off. If opportunities change, so does behaviour: people respond to **incentives**.
7. **Interaction**—my choices depend on your choices, and vice versa—adds another level to economic understanding. When individuals interact, the end result may be different from what anyone intends.
4. The reason for interaction is that there are **gains from trade**: by engaging in the **trade** of goods and services with one another, the members of an economy can all be made better off. Underlying gains from trade are the advantages of **specialization**, of having individuals specialize in the tasks they are good at.
9. Economies normally move toward **equilibrium**—a situation in which no individual can make himself or herself better off without taking a different action.
10. An economy is **efficient** if all opportunities to make someone better off without making others worse off are taken. Resources should be used as efficiently as possible to achieve society’s goal. But efficiency is not the sole way to evaluate an economy: **equity**, or fairness, is also desirable, and there is often a trade-off between equity and efficiency.
11. Markets usually lead to efficiency, with some well-defined exceptions.
12. When markets fail and do not achieve efficiency, government intervention can improve society’s welfare.

## KEY TERMS

Individual choice p. x  
 Resource p. x  
 Scarce p. x  
 Opportunity cost p. x  
 Trade-off p. x

Marginal decisions p. x  
 Marginal analysis p. x  
 Incentive p. x  
 Interaction p. xx  
 Trade p. x

Gains from trade p. xx  
 Specialization p. xx  
 Equilibrium p. xx  
 Efficient p. xx  
 Equity p. xx

## PROBLEMS

1. In each of the following situations, identify which of the nine principles is at work:
  - a. You choose to shop at the local discount store rather than paying a higher price for the same merchandise at the local department store.
  - b. On your spring vacation trip, your budget is limited to \$35 a day.
  - c. The student union provides a website on which departing students can sell items such as used books, appliances, and furniture rather than giving them away to their roommates as they formerly did.
  - d. You decide how many cups of coffee to have when studying the night before an exam by considering how much more work you can do by having another cup versus how jittery it will make you feel.
  - e. There is limited lab space available to do the project required in Chemistry 101. The lab supervisor assigns lab time to each student based on when that student is able to come.
  - f. You realize that you can graduate a semester early by forgoing a semester of study abroad.
  - g. At the student union there is a bulletin board on which people advertise used items for sale, such as bicycles. Once you have adjusted for differences in quality, all the bikes sell for about the same price.
  - h. You are better at performing lab experiments, and your lab partner is better at writing lab reports. So, the two of you agree that you will do all the experiments, and she will write up all the reports.
  - i. Provincial governments mandate that it is illegal to drive without passing a driving exam.
2. Describe some of the opportunity costs when you decide to do the following.
  - a. Attend university instead of taking a job
  - b. Watch a movie instead of studying for an exam
  - c. Ride the bus instead of driving your car
3. Liza needs to buy a textbook for the next economics class. The price at the university bookstore is \$65. One online site offers it for \$55 and another site for \$57. All prices include sales tax. The accompanying table indicates the typical shipping and handling charges for the textbook ordered online.

Shipping method	Delivery time	Charge
Standard Shipping	3–7 days	\$3.99
Second-day air	2 business days	\$8.98
Next-day air	1 business day	\$13.98

- a. What is the opportunity cost of buying online?
  - b. Show the relevant choices for this student. What determines which of these options the student will choose?
4. Use the concept of opportunity cost to explain the following:
    - a. More people choose to get graduate degrees when the job market is poor.
    - b. More people choose to do their own home repairs when the economy is slow.
    - c. There are more parks in suburban areas than in urban areas.
    - d. Convenience stores, which have higher prices than supermarkets, cater to busy people.
    - e. Fewer students enrol in classes that meet before 10 A.M.
  5. In the following examples, state how you would use the principle of marginal analysis to make a decision:
    - a. Deciding how many days to wait before doing your laundry
    - b. Deciding how much library research to do before writing your term paper
    - c. Deciding how many bags of chips to eat
    - d. Deciding how many lectures of a class to skip
  6. This morning you made the following individual choices: you bought a bagel and coffee at the local café, you drove to school in your car during rush hour, and you typed your roommate's term paper because you are a fast typist—in return for which she will do your laundry for a month. In each of these actions, describe how your individual choices interacted with the individual choices made by others. Were other people left better off or worse off by your choices in each case?
  7. On the east side of the Miramachie River lives the Hatfield family, while the McCoy family lives on the west side. Each family's diet consists of fried chicken and corn-on-the-cob, and each is self-sufficient, raising their own chickens and growing their own corn. Explain the conditions under which each of the following would be true:
    - a. The two families are made better off when the Hatfields specialize in raising chickens, the McCoy's specialize in raising corn, and the two families trade.
    - b. The two families are made better off when the McCoy's specialize in raising chickens, the Hatfields specialize in raising corn, and the two families trade.
  8. Which of the following situations describes an equilibrium? Which does not? If the situation does not describe an equilibrium, what would an equilibrium look like?
    - a. Many people regularly commute from the suburbs to downtown Pleasantville. Due to traffic congestion, the trip takes 30 minutes when you travel by highway, but only 15 minutes when you go by the side streets.
    - b. At the intersection of Main and King are two gas stations. One station charges 90 cents a litre for regular gas and the other charges 85 cents a litre. Customers can get service immediately at the first station, but must wait in a long line at the second.
    - c. Every student enrolled in Economics 101 must also attend a weekly tutorial. This year there are two sections offered: Section A and Section B, which meet at the same time in adjoining classrooms and are taught by equally competent instructors. Section A is overcrowded, with people sitting on the floor and often unable to see the chalkboard. Section B has many empty seats.
  9. In each of the following cases, explain whether you think the situation is efficient or not. If it is not efficient, why not? What actions would make the situation efficient?
    - a. Electricity is included in the rent at your dorm. Some residents in your dorm leave lights, computers, and appliances on when they are not in their rooms.
    - c. Although they cost the same amount to prepare, the cafeteria in your dorm consistently provides too many dishes that diners don't like, such as tofu casserole, and too few dishes that diners do like, such as roast turkey with dressing.
    - d. The enrolment for a particular course exceeds the spaces available. Some students who need to take this course to complete their major are unable to get a space, while others who are taking it as an elective do get a space.
  10. Discuss the efficiency and equity implications of each of the following policies. How would you go about balancing the concerns of equity and efficiency in these areas?
    - a. The government pays the full tuition for every college student to study whatever subject he or she wishes.
    - b. When people lose their job, the government provides unemployment benefits until they find new ones.
  11. Governments often adopt certain policies in order to promote desired behaviour among their citizens. For each of the following policies, determine what the incentive is and what behaviour the government wishes to promote. In each case, why do you think that the government might wish to change people's behaviour, rather than allow their actions to be solely determined by individual choice?
    - a. A tax of \$5 per pack is imposed on cigarettes.
    - b. The government pays parents \$100 when their child is vaccinated for measles.
    - c. The government pays for university students to tutor children from low-income families.
    - d. The government imposes a tax on the amount of air pollution that a company discharges.

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**12.** In each of the following situations, explain how government intervention could improve society's welfare by changing people's incentives. In what sense is the market going wrong?

**a.** Pollution from auto emissions has reached unhealthy levels.

**b.** Everyone in Woodville would be better off if streetlights were installed in the town. But no individual resident is willing to pay for installation of a streetlight in front of his or her house because it is impossible to recoup the cost by charging other residents for the benefit they receive from it.

**>web...** To continue your study and review of concepts in this chapter, please visit the Krugman/Wells website for quizzes, animated graph tutorials, web links to helpful resources, and more.

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