

Introduction

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I've often wondered what goes into a hot dog. Now I know and I wish I didn't.
—William Zinsser

If each of us could get all the food, clothing, and toys we want without working, no one would study economics. Unfortunately, most of the good things in life are scarce—we can't all have as much as we want. Thus scarcity is the mother of economics.

Microeconomics is the study of how individuals and firms make themselves as well off as possible in a world of scarcity and the consequences of those individual decisions for markets and the entire economy. In studying microeconomics, we examine how individual consumers and firms make decisions and how the interaction of many individual decisions affects markets.

Microeconomics is often called *price theory* to emphasize the important role that prices play. Microeconomics explains how the actions of all buyers and sellers determine prices and how prices influence the decisions and actions of individual buyers and sellers.

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1. **Microeconomics: The Allocation of Scarce Resources.** Microeconomics is the study of the allocation of scarce resources.
2. **Models.** Economists use models to make testable predictions.
3. **Uses of Microeconomic Models.** Individuals, governments, and firms use microeconomic models and predictions in decision making.

In this chapter, we examine three main topics

1.1 Microeconomics: The Allocation of Scarce Resources

Individuals and firms allocate their limited resources to make themselves as well off as possible. Consumers pick the mix of goods and services that makes them as happy as possible given their limited wealth. Firms decide which goods to produce, where to produce them, how much to produce to maximize their profits, and how to produce those levels of output at the lowest cost by using more or less of various inputs such as labor, capital, materials, and energy. The owners of a depletable natural resource such as oil decide when to use it. Government decision makers—to benefit consumers, firms, or government bureaucrats—decide which goods and services the government produces and whether to subsidize, tax, or regulate industries and consumers.

Trade-Offs

People make trade-offs because they can't have everything. A society faces three key trade-offs:

- **Which goods and services to produce.** If a society produces more cars, it must produce fewer of other goods and services, because there are only so many *resources*—workers, raw materials, capital, and energy—available to produce goods.
- **How to produce.** To produce a given level of output, a firm must use more of one input if it uses less of another input. Cracker and cookie manufacturers switch between palm oil and coconut oil, depending on which is less expensive.
- **Who gets the goods and services.** The more of society's goods and services you get, the less someone else gets.

Who Makes the Decisions

These three allocation decisions may be made explicitly by the government or may reflect the interaction of independent decisions by many individual consumers and firms. In the former Soviet Union, the government told manufacturers how many cars of each type to make and which inputs to use to make them. The government also decided which consumers would get a car.

In most other countries, how many cars of each type are produced and who gets them are determined by how much it costs to make cars of a particular quality in the least expensive way and how much consumers are willing to pay for them. More consumers would own a handmade Rolls-Royce and fewer would buy a mass-produced Ford Taurus if a Rolls were not 21 times more expensive than a Taurus.

APPLICATION

Flu Vaccine Shortage

In 2004, the U.S. government expected a record 100 million flu vaccine doses to be available, but one vaccine maker, Chiron, could not ship 46 million doses because of contamination.¹ As a consequence, the government expected a shortage at the traditional price.

In response, government and public health officials urged young, healthy people to forgo getting shots until the sick, the elderly, and other high-risk populations, such as health care providers and pregnant women, were inoculated. Public spirit failed to dissuade enough healthy people. Perversely, the high-priority adult population was the group most likely to show self-control and not ask for a shot (de Janvry et al., 2008). Consequently, federal, state, and local governments restricted access to the shots to high-risk populations. Again, in 2009 and 2010, when faced with shortages of the H1N1 “swine flu” vaccine, most government agencies restricted access to the highest risk groups.

In most non-health-related goods markets, prices adjust to prevent shortages. In contrast, during the flu shot shortage, governments didn't increase the price to reduce demand, but relied on exhortation and formal allocation schemes.

¹Sources for applications appear at the end of the book.

Prices Determine Allocations

An Economist's Theory of Reincarnation: If you're good, you come back on a higher level. Cats come back as dogs, dogs come back as horses, and people—if they've been real good like George Washington—come back as money.

Prices link the decisions about *which goods and services to produce, how to produce them, and who gets them*. Prices influence the decisions of individual consumers and firms, and the interactions of these decisions by consumers, firms, and the government determine price.

market

an exchange mechanism that allows buyers to trade with sellers

Interactions between consumers and firms take place in a **market**, which is an exchange mechanism that allows buyers to trade with sellers. A market may be a town square where people go to trade food and clothing, or it may be an international telecommunications network over which people buy and sell financial securities. Typically, when we talk about a single market, we refer to trade in a single good or group of goods that are closely related, such as soft drinks, movies, novels, or automobiles.

Most of this book concerns how prices are determined within a market. We show that the *number of buyers and sellers* in a market and the amount of *information* they have help determine whether the price equals the cost of production. We also show that if there is no market—and hence no market price—serious problems, such as high levels of pollution, result.

APPLICATION

Twinkie Tax

Many American, Australian, British, Canadian, New Zealand, and Taiwanese jurisdictions are proposing a “Twinkie tax” on unhealthy fatty and sweet foods to reduce obesity and cholesterol problems, particularly among children. One survey found that 45% of adults would support a 1¢ tax per pound of soft drinks, chips, and butter, with the revenues used to fund health education programs.

In 2010, many communities around the world debated (and some passed) new taxes on sugar-sweetened soft drinks. At least 25 states differentially tax soft drinks, candy, chewing gum, and snack foods such as potato chips. Today, many school districts throughout the United States ban soft drink vending machines. This ban discourages consumption, as would an extremely high tax. Britain's largest life insurance firm charges the obese more for life insurance policies.

New taxes will affect *which foods are produced*, as firms offer new low-fat and low-sugar products, and *how fast-foods are produced*, as manufacturers reformulate their products to lower their tax burden. These taxes will also influence *who gets these goods* as consumers, especially children, replace them with less expensive, untaxed products.

1.2 Models

Everything should be made as simple as possible, but not simpler.

—Albert Einstein

model

a description of the relationship between two or more economic variables

To *explain* how individuals and firms allocate resources and how market prices are determined, economists use a **model**: a description of the relationship between two or more economic variables. Economists also use models to *predict* how a change in one variable will affect another.

APPLICATION

Income Threshold Model and China

According to an *income threshold model*, no one who has an income level below a threshold buys a particular consumer durable, which is a good that can be used for long periods of time, such as a refrigerator or car. The theory also holds that almost everyone whose income is above the threshold does buy the durable.

If this theory is correct, we predict that, as most people's incomes rise above that threshold in less-developed countries, consumer durable purchases will go from near zero to large numbers virtually overnight. This prediction is consistent with evidence from Malaysia, where the income threshold for buying a car is about \$4,000.

Incomes are rising rapidly in China and are exceeding the threshold levels for many types of durable goods. As a result, many experts predicted that China would experience the greatest consumer durable goods sales boom in history over the next couple of decades. Anticipating this boom, many companies greatly increased their investments in durable goods manufacturing plants in China. Annual foreign direct investments went from \$41 billion a year in 2000 to \$92.4 billion in 2008 (before dipping slightly in 2009 and then rising again in 2010). In expectation of this growth potential, even traditional political opponents of the People's Republic—Taiwan, South Korea, and Russia—invested in China.

Li Rifu, a 46-year-old Chinese farmer and watch repairman, thought that buying a car would improve the odds that his 22- and 24-year-old sons would find girlfriends, marry, and produce grandchildren. After Mr. Li purchased his Geely King Kong for the equivalent of \$9,000, both sons soon found girlfriends, and his older son quickly married. Four-fifths of all new cars sold in China are bought by first-time customers. An influx of first-time buyers was responsible for China's more than eightfold increase in car sales from 2000 to 2008 and increased another 75% increase in 2009.

Simplifications by Assumption

We stated the income threshold model in words, but we could have presented it using graphs or mathematics. Regardless of how the model is described, an economic model is a simplification of reality that contains only its most important features. Without simplifications, it is difficult to make predictions because the real world is too complex to analyze fully.

By analogy, if the manual accompanying your new TiVo recorder has a diagram showing the relationships between all the parts in the TiVo, the diagram will be overwhelming and useless. In contrast, if it shows a photo of the buttons on the front of the machine with labels describing the purpose of each button, the manual is useful and informative.

Economists make many *assumptions* to simplify their models.² When using the income threshold model to explain car purchasing behavior in China we *assume* that factors other than income, such as the color of cars, are irrelevant to the decision to buy cars. Therefore, we ignore the color of cars that are sold in China in describing the relationship between average income and the number of cars consumers want. If

²An economist, an engineer, and a physicist are stranded on a desert island with a can of beans but no can opener. How should they open the can? The engineer proposes hitting the can with a rock. The physicist suggests building a fire under it to build up pressure and burst the can open. The economist thinks for a while and then says, "Assume that we have a can opener. . . ."

this assumption is correct, by ignoring color, we make our analysis of the auto market simpler without losing important details. If we're wrong and these ignored issues are important, our predictions may be inaccurate.

Throughout this book, we start with strong assumptions to simplify our models. Later, we add complexities. For example, in most of the book, we assume that consumers know the price each firm charges. In many markets, such as the New York Stock Exchange, this assumption is realistic. It is not realistic in other markets, such as the market for used automobiles, in which consumers do not know the prices each firm charges. To devise an accurate model for markets in which consumers have limited information, we add consumer uncertainty about price into the model in Chapter 19.

Testing Theories

Blore's Razor: When given a choice between two theories, take the one that is funnier.

Economic *theory* is the development and use of a model to test *hypotheses*, which are predictions about cause and effect. We are interested in models that make clear, testable predictions, such as “If the price rises, the quantity demanded falls.” A theory that said “People’s behavior depends on their tastes, and their tastes change randomly at random intervals” is not very useful because it does not lead to testable predictions.

Economists test theories by checking whether predictions are correct. If a prediction does not come true, they may reject the theory.³ Economists use a model until it is refuted by evidence or until a better model is developed.

A good model makes sharp, clear predictions that are consistent with reality. Some very simple models make sharp predictions that are incorrect, and other more complex models make ambiguous predictions—any outcome is possible—which are untestable. The skill in model building is to chart a middle ground.

The purpose of this book is to teach you how to think like an economist in the sense that you can build testable theories using economic models or apply existing models to new situations. Although economists think alike in that they develop and use testable models, they often disagree. One may present a logically consistent argument that prices will go up next quarter. Another, using a different but equally logical theory, may contend that prices will fall. If the economists are reasonable, they agree that pure logic alone cannot resolve their dispute. Indeed, they agree that they’ll have to use empirical evidence—facts about the real world—to find out which prediction is correct.

Although one economist’s model may differ from another’s, a key assumption in most microeconomic models is that individuals allocate their scarce resources so as to make themselves as well off as possible. Of all affordable combinations of goods, consumers pick the bundle of goods that gives them the most possible enjoyment. Firms try to maximize their profits given limited resources and existing technology. That resources are limited plays a crucial role in these models. Were it not for scarcity, people could consume unlimited amounts of goods and services, and sellers could become rich beyond limit.

³We can use evidence on whether a theory’s predictions are correct to *refute* the theory but not to *prove* it. If a model’s prediction is inconsistent with what actually happened, the model must be wrong, so we reject it. Even if the model’s prediction is consistent with reality, however, the model’s prediction may be correct for the wrong reason. Hence we cannot prove that the model is correct—we can only fail to reject it.

As we show throughout this book, the maximizing behavior of individuals and firms determines society's three main allocation decisions: which goods are produced, how they are produced, and who gets them. For example, diamond-studded pocket combs will be sold only if firms find it profitable to sell them. The firms will make and sell these combs only if consumers value the combs at least as much as it costs the firm to produce them. Consumers will buy the combs only if they get more pleasure from the combs than they would from the other goods they could buy with the same resources.

Positive Versus Normative

The use of models of maximizing behavior sometimes leads to predictions that seem harsh or heartless. For instance, a World Bank economist predicted that if an African government used price controls to keep the price of food low during a drought, food shortages would occur and people would starve. The predicted outcome is awful, but the economist was not heartless. The economist was only making a scientific prediction about the relationship between cause and effect: Price controls (cause) lead to food shortages and starvation (effect).

positive statement
a testable hypothesis
about cause and effect

Such a scientific prediction is known as a **positive statement**: a testable hypothesis about cause and effect. “Positive” does not mean that we are certain about the truth of our statement—it only indicates that we can test the truth of the statement.

If the World Bank economist is correct, should the government control prices? If the government believes the economist's predictions, it knows that the low prices help those consumers who are lucky enough to be able to buy as much food as they want while hurting both the firms that sell food and the people who are unable to buy as much food as they want, some of whom may die. As a result, the government's decision whether to use price controls turns on whether the government cares more about the winners or the losers. In other words, to decide on its policy, the government makes a value judgment.

Instead of first making a prediction and testing it and then making a value judgment to decide whether to use price controls, the government could make a value judgment directly. The value judgment could be based on the belief that “because people *should* have prepared for the drought, the government *should* not try to help them by keeping food prices low.” Alternatively, the judgment could be based on the view that “people *should* be protected against price gouging during a drought, so the government *should* use price controls.”

normative statement
a conclusion as to
whether something is
good or bad

These two statements are *not* scientific predictions. Each is a value judgment or **normative statement**: a conclusion as to whether something is good or bad. A normative statement cannot be tested because a value judgment cannot be refuted by evidence. It is a prescription rather than a prediction. A normative statement concerns what somebody believes *should* happen; a positive statement concerns what *will* happen.

Although a normative conclusion can be drawn without first conducting a positive analysis, a policy debate will be more informed if positive analyses are conducted first.⁴ Suppose your normative belief is that the government should help the poor. Should you vote for a candidate who advocates a higher minimum wage (a law that requires that firms pay wages at or above a specified level), a European-style

⁴Some economists draw the normative conclusion that, as social scientists, economists *should* restrict ourselves to positive analyses. Others argue that we shouldn't give up our right to make value judgments just like the next person (who happens to be biased, prejudiced, and pigheaded, unlike us).

welfare system (guaranteeing health care, housing, and other basic goods and services), an end to our current welfare system, a negative income tax (in which the less income a person has, the more the government gives that person), or job training programs? Positive economic analysis can be used to predict whether these programs will benefit poor people but not whether they are good or bad. Using these predictions and your value judgment, you can decide for whom to vote.

Economists' emphasis on positive analysis has implications for what we study and even our use of language. For example, many economists stress that they study people's *wants* rather than their *needs*. Although people need certain minimum levels of food, shelter, and clothing to survive, most people in developed economies have enough money to buy goods well in excess of the minimum levels necessary to maintain life. Consequently, in wealthy countries, calling something a "need" is often a value judgment. You almost certainly have been told by some elder that "you *need* a college education." That person was probably making a value judgment—"you *should* go to college"—rather than a scientific prediction that you will suffer terrible economic deprivation if you do not go to college. We can't test such value judgments, but we can test a hypothesis such as "One-third of the college-age population *wants* to go to college at current prices."

1.3 Uses of Microeconomic Models

Have you ever imagined a world without hypothetical situations?
—Steven Wright

Because microeconomic models *explain* why economic decisions are made and allow us to make *predictions*, they can be very useful for individuals, governments, and firms in making decisions. Throughout this book, we consider examples of how microeconomics aids in actual decision making.

Individuals can use microeconomics to make purchasing and other decisions (Chapters 4 and 5). Consumers' purchasing and investing decisions are affected by inflation and cost of living adjustments (Chapter 5). Whether it pays financially to go to college depends, in part, on interest rates (Chapter 16). Consumers decide for whom to vote based on candidates' views on economic issues.

Firms must decide which production methods to use to minimize cost (Chapter 7) and maximize profit (starting with Chapter 8). They may choose a complex pricing scheme or advertise to raise profits (Chapter 12). They select strategies to maximize profit when competing with a small number of other firms (Chapters 13 and 14). Some firms reduce consumer information to raise profits (Chapter 19). Firms use economic principles to structure contracts with other firms (Chapter 20).

Your government's elected and appointed officials use (or could use) economic models in many ways. Recent administrations have placed increased emphasis on economic analysis. Today, economic and environmental impact studies are required before many projects can commence. The President's Council of Economic Advisers and other federal economists analyze and advise national government agencies on the likely economic effects of all major policies.

One major use of microeconomic models by governments is to predict the probable impact of a policy before it is adopted. For example, economists predict the likely impact of a tax on the prices consumers pay and on the tax revenues raised (Chapter 3), whether a price control will create a shortage (Chapter 2), the differential effects of tariffs and quotas on trade (Chapter 9), and the effects of regulation on monopoly price and the quantity sold (Chapter 11).

SUMMARY

1. **Microeconomics: The Allocation of Scarce Resources.** Microeconomics is the study of the allocation of scarce resources. Consumers, firms, and the government must make allocation decisions. The three key trade-offs a society faces are which goods and services to produce, how to produce them, and who gets them. These decisions are interrelated and depend on the prices that consumers and firms face and on government actions. Market prices affect the decisions of individual consumers and firms, and the interaction of the decisions of individual consumers and firms determines market prices. The organization of the market, especially the number of firms in the market and the information consumers and firms have, plays an important role in determining whether the market price is equal to or higher than marginal cost.
2. **Models.** Models based on economic theories are used to predict the future or to answer questions about how some change, such as a tax increase,

affects various sectors of the economy. A good theory is simple to use and makes clear, testable predictions that are not refuted by evidence. Most microeconomic models are based on maximizing behavior. Economists use models to construct *positive* hypotheses concerning how a cause leads to an effect. These positive questions can be tested. In contrast, *normative* statements, which are value judgments, cannot be tested.

3. **Uses of Microeconomic Models.** Individuals, governments, and firms use microeconomic models and predictions to make decisions. For example, to maximize its profits, a firm needs to know consumers' decision-making criteria, the trade-offs between various ways of producing and marketing its product, government regulations, and other factors. For large companies, beliefs about how a firm's rivals will react to its actions play a critical role in how it forms its business strategies.