

TWENTIETH EDITION

# ECONOMICS TODAY

ROGER LEROY MILLER

THE MICRO VIEW



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TWENTIETH EDITION

# Economics Today

**The Micro View**

Roger LeRoy Miller

*Research Professor of Economics,  
University of Texas–Arlington*



# Dedication

For Sabine,  
Courage has always been your strong suit.  
And I continue to admire it greatly.

R.L.M.

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# PREFACE

I have modified the learning and teaching package for this 20th edition of *Economics Today* to make learning more efficient for your students. At the same time, the hallmark of each previous edition has been maintained—teaching and learning through examples.

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## Solving Learning and Teaching Challenges

### Improving Student Success Through Videos and Animation

Depending on which version you choose for your students, there are available:

- Concept videos with voiceovers
- Concept videos with on-screen live instructor presence
- Improved animated graphs, often with live instructor presence

In addition, for those of you who require that your students access an online version of the text, all of the **Self Check** exercises have easily viewable click-on answers available. These *Self Checks* are numbered for easy reference by you.

### Learning Economic Skills That Are Practical

An increasing number of beginning economics students want concrete examples about economics that can help them today and tomorrow in their real life. To this end, I have done the following in this new edition:

- I have added short paragraphs throughout the text, which relate previously discussed theory with practical applications.
- I have also added *Real Application* questions throughout. These questions relate to careers, managerial decision making, future household behavior, and voting choices, to list just a few.
- Each chapter ends with a feature called *Economics in Your Life*, plus an additional *Real Application* question.
- Each chapter-ending *Issue and Application* ends with a *Real Application* question.

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## What's New to This Edition

### Explaining Artificial Intelligence (AI) Applications in the Real World

New to this edition, I have added a feature entitled *AI—Decision-Making Through Data*. There are almost three dozen of these, including:

- The Global Tourism Industry (Chapter 3)
- Contemplating Big Data as a Public Good (Chapter 5)
- Preserving National Tax Bases (Chapter 6)

### Other New Features

Already mentioned are the chapter-ending features called *Economics in Your Life*. Another new feature is *What Happens When . . .*. This new feature will help students apply previously discussed theory. Some examples are:

- What Happens When . . . people's actual reactions to incentives differ from how they claim they would respond in answers to survey questions? (Chapter 1)
- What Happens When . . . *both* buyers *and* sellers anticipate that the price of an item will increase in the future? (Chapter 3)
- What Happens When . . . the New York City government effectively raises the legal minimum price of cigarettes within the city's boundaries to almost twice the average U.S. price? (Chapter 4)

### All Other Features That Are New to This Edition

*Economics Today* has always been known to provide the latest high-interest features. To this end, I have replaced every feature in the text, including:

- All chapter-opening *Did You Know That . . .* features
- All *Examples*, *Policy Examples*, and *International Examples*
- All *Behavioral Economics Examples*
- All *Issues and Applications*

## ABOUT THE AUTHOR

**Roger LeRoy Miller** studied at the University of California at Berkeley where he earned a B.S. in economics while garnering the Departmental Prize. He graduated Phi Beta Kappa and Summa Cum Laude and was the recipient of numerous fellowships, including a National Science Foundation Fellowship. He chose to become a Lilly Honor Fellow at the University of Chicago and received his Ph.D. in a record 2½ years.

He has taught at the University of Washington and the University of Miami, where he also co-founded The Law and Economics Center. He is currently Research Professor of Economics at the University of Texas, Arlington. In addition to writing *Economics Today*, he has authored or co-authored dozens of textbooks, including *Applied Econometrics*, *Intermediate Microeconomics*, *Intermediate Macroeconomics*, *Money and Banking*, and *The Economics of Public Issues*.

He continues to be a passionate athlete, regularly entering sanctioned triathlons, cross-country ski races, and road-bike time trials.

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I welcome ideas and criticisms from both professors and students alike.

R.L.M.

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# 1

## The Nature of Economics



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### LEARNING OBJECTIVES

**After reading this chapter, you should be able to:**

- 1.1** Define economics and discuss the difference between microeconomics and macroeconomics
- 1.2** Identify the three basic economic questions and the two opposing sets of answers
- 1.3** Evaluate the role that rational self-interest plays in economic analysis
- 1.4** Explain why economics is a science
- 1.5** Distinguish between positive and normative economics

In 1950, the typical woman who married did so at age 20. Now, however, she is waiting until age 27. Furthermore, a larger number of women are choosing not to marry at all. Contributing to delayed marriages and nonmarriages is the fact that fewer women are agreeing to marry non-college-educated men employed by or seeking to work in manufacturing industries. In this chapter, you will learn that diminished prospects for male employment by manufacturing firms and decreased male earnings at these companies have provided women with *economic incentives* that reduce their willingness to marry these men. Indeed, you will learn that such incentives play significant roles in most decisions made by all individuals, including choices about when and whether to marry.

## DID YOU KNOW THAT...

more than one out of every four vehicles on Russian roads is equipped with a dashboard camera? Russian residents likely are no more tech savvy than residents of many other nations, but they have stronger incentives to document auto accidents that may occur while they are driving. Russia's Arctic winter conditions and poor maintenance of many of its roads contribute to large numbers of accidents that drivers might wish to document in case their insurers question whether they or other drivers were at fault. In addition, Russian Highway Patrol officers commonly stop drivers who have committed no driving offenses and threaten them with tickets unless they pay bribes. Furthermore, criminal organizations commonly stage accidents or provide damaged vehicles as evidence for filing insurance claims against motorists. Taken together, the prevalence of icy roads, police corruption, and faked accident claims gives drivers in Russia particularly strong incentives to install dashboard cameras and compile video documentation of every second their vehicles spend on the road.

In this chapter, you will learn why contemplating the nature of self-interested responses to **incentives** is the starting point for analyzing choices people make in all walks of life. After all, how much time you devote to studying economics in this introductory course depends in part on the incentives established by your instructor's grading system. As you will see, self-interest and incentives are the underpinnings for all the decisions you and others around you make each day.

**Incentives**

Rewards or penalties for engaging in a particular activity.

**1.1** Define economics and discuss the difference between microeconomics and macroeconomics

## The Power of Economic Analysis

Simply knowing that self-interest and incentives are central to any decision-making process is not sufficient for predicting the choices that people will actually make. You also have to develop a framework that will allow you to analyze solutions to each economic problem. You must do so whether you are trying to decide how much to study, which courses to take, or to finish school, or whether you are evaluating if the U.S. government should provide more grants to universities or raise taxes. The framework that you will learn in this text is the *economic way of thinking*.

This framework gives you power—the power to reach informed judgments about what is happening in the world. You can, of course, live your life without the power of economic analysis as part of your analytical framework. Indeed, most people do. Economists believe, though, that economic analysis can help you make better decisions concerning your career, your education, financing your home, and other important matters.

In the business world, the power of economic analysis can help increase your competitive edge as an employee or as the owner of a business. As a voter, for the rest of your life you will be asked to make judgments about policies that are advocated by political parties. Many of these policies will deal with questions related to international economics, such as whether the U.S. government should encourage or discourage immigration or restrict other countries from selling their goods here.

### Defining Economics

**Economics** is part of the social sciences and, as such, seeks explanations of real events. All social sciences analyze human behavior, as opposed to the physical sciences, which generally analyze the behavior of electrons, atoms, and other nonhuman phenomena.

*Economics is the study of how people allocate their limited resources in an attempt to satisfy their unlimited wants. As such, economics is the study of how people make choices.*

To understand this definition fully, two other words need explaining: *resources* and *wants*. **Resources** are things that have value and, more specifically, are used to produce goods and services that satisfy people's wants. **Wants** are all of the items that people would purchase if they had unlimited income.

**Economics**

The study of how people allocate their limited resources to satisfy their unlimited wants.

**Resources**

Things used to produce goods and services to satisfy people's wants.

**Wants**

What people would buy if their incomes were unlimited.

Whenever an individual, a business, or a nation faces alternatives, a choice must be made, and economics helps us study how those choices are made. For example, you have to choose how to spend your limited income. You also have to choose how to spend your limited time. You may have to choose how many of your company's limited resources to allocate to advertising and how many to allocate to new-product research. In economics, we examine situations in which individuals choose how to do things, when to do things, and with whom to do them. Ultimately, the purpose of economics is to explain choices.

## Microeconomics versus Macroeconomics

Economics is typically divided into two types of analysis: **microeconomics** and **macroeconomics**.

*Microeconomics is the part of economic analysis that studies decision making undertaken by individuals (or households) and by firms. It is like looking through a microscope to focus on the small parts of our economy.*

*Macroeconomics is the part of economic analysis that studies the behavior of the economy as a whole. It deals with economywide phenomena such as changes in unemployment, in the general price level, and in national income.*

Microeconomic analysis, for example, is concerned with the effects of changes in the price of gasoline relative to that of other energy sources. It examines the effects of new taxes on a specific product or industry. If the government establishes new health care regulations, how individual firms and consumers will react to those regulations would be in the realm of microeconomics. The effects of higher wages brought about by an effective union strike would also be analyzed using the tools of microeconomics.

In contrast, issues such as the rate of inflation, the amount of economywide unemployment, and the yearly growth in the output of goods and services in the nation all fall into the realm of macroeconomic analysis. In other words, macroeconomics deals with **aggregates**, or totals—such as total output in an economy.

Be aware, however, of the blending of microeconomics and macroeconomics in modern economic theory. Modern economists are increasingly using microeconomic analysis—the study of decision making by individuals and by firms—as the basis of macroeconomic analysis. They do this because even though macroeconomic analysis focuses on aggregates, those aggregates are the result of choices made by individuals and firms.

Recent technological developments have contributed further to the theoretical blending of microeconomics and macroeconomics. Increasingly, businesses, governments, and even individuals are turning to **artificial intelligence (AI) technologies**, which are digital-app-based or -assisted tools utilized in making and implementing decisions. AI technologies often implement sophisticated and typically automated *data-analytics methods* for working with very substantial volumes of information, commonly known as *big data*, to reveal previously hidden relationships. In the past, people applied their skills in using basic statistical techniques to examine and learn from large sets of data. To a growing extent, however, people now have adopted *machine learning*, or the application of simple or sophisticated AI-guided programming of digital devices, to search through massive bodies of data that human minds might struggle to comprehend. Increasingly, AI technologies also entail the use of *virtual-reality techniques*, which allow people to view or perceive fully artificial environments, or *augmented-reality methods*, which enable individuals to observe virtual overlays of information alongside real images. With such AI technologies, businesses, governments, and consumers can make more informed decisions. Furthermore, a growing number of economists also are employing AI technologies to examine people's decision making and choices.

Why does the application of big data analytics potentially have microeconomic *and* macroeconomic implications?

### Microeconomics

The study of decision making undertaken by individuals (or households) and by firms.

### Macroeconomics

The study of the behavior of the economy as a whole, including such economywide phenomena as changes in unemployment, the general price level, and national income.

### Aggregates

Total amounts or quantities. Aggregate demand, for example, is total planned expenditures throughout a nation.

### Artificial intelligence (AI) technologies

The development and implementation of methods of utilizing automated data-analytics techniques, machine learning, or virtual- or augmented-reality techniques to examine and evaluate information in an effort to help consumers, businesses, and governments to make decisions.



# AI | DECISION MAKING THROUGH DATA

## Microeconomic and Macroeconomic Applications

AI technologies can be applied to both microeconomic and macroeconomic issues. At the level of a company, for instance, data-analytics techniques can be applied to vast amounts of information on prices of products, quality features, numbers of units, amounts purchased, and so on. For example, U.S. companies, such as Amazon, Apple, and Google, currently are spending tens of billions of dollars per year on digital equipment used to conduct automated data analytics. Information about prices, characteristics, and quantities purchased can be subjected to a variety of automated data-analytics techniques. Even though substantial volumes of individual bits of information may be contained in such a large set of data, the scope of such an evaluation would be *micro* economic.

In contrast, practitioners of big data analytics use the techniques to contemplate large sets of data involving economic aggregates. For example, central banks interested in coordinating their policies must evaluate considerable information encompassing annual price levels,

total outputs of goods and services, levels of employment of workers, and so on for many of the world's economies over a lengthy interval. The nature of analyzing such very large sets of data via automated data-analytics techniques is *macro* economic.

In spite of the differences in microeconomic and macroeconomic scopes of various large sets of data, the methods of big data analytics used to study the datasets are similar. This fact helps to explain why the advent of AI technologies has tended to increase the blending of microeconomics and macroeconomics.

### FOR CRITICAL THINKING

*Why do you suppose that economists might sometimes disagree about whether to classify as a microeconomic or macroeconomic endeavor the application of big data analytics to massive volumes of information encompassing virtually all of a nation's industries and interactions among those industries?*

Sources are listed at the end of this chapter.

**1.2** Identify the three basic economic questions and the two opposing sets of answers

### Economic system

A society's institutional mechanism for determining the way scarce resources are used to satisfy human desires.

## The Three Basic Economic Questions and Two Opposing Sets of Answers

In every nation, three fundamental questions must be addressed irrespective of the form of its government or who heads that government, how rich or how poor the nation may be, or what type of **economic system**—the institutional mechanism through which resources are utilized to satisfy human wants—has been chosen.

### The Three Basic Questions

The three fundamental questions of economics concern the problem of how to allocate society's scarce resources:

1. *What and how much will be produced?* Some mechanism must exist for determining which items will be produced while others remain inventors' pipe dreams or individuals' unfulfilled desires.
2. *How will items be produced?* There are many ways to produce a desired item. It is possible to use more labor and fewer machines, or vice versa. It is possible, for instance, to produce an item with an aim to maximize the number of people employed. Alternatively, an item may be produced with an aim to minimize the total expenses that members of society incur. Somehow, a decision must be made about the mix of resources used in production, the way in which they are organized, and how they are brought together at a particular location.
3. *For whom will items be produced?* Once an item is produced, who should be able to obtain it? People use scarce resources to produce any item, so typically people value access to that item. Thus, determining a mechanism for distributing produced items is a crucial issue for any society.

Now that you know the questions an economic system must answer, how do current systems actually answer them?

### ECONOMICS IN YOUR LIFE

To contemplate a recent example from U.S. housing finance regarding choosing among answers to the three basic economic questions, take a look at **Government Involvement Enables a Private U.S. Housing Finance Company to Provide "Cheap" Loans** on page 12.

## Two Opposing Sets of Answers

At any point in time, every nation has its own economic system. How a nation's residents go about answering the three basic economic questions depends on that nation's economic system.

**Centralized Command and Control** Throughout history, one common type of economic system has been *command and control* (also called *central planning*). Such a system is operated by a centralized authority, such as a king or queen, a dictator, a central government, or some other type of authority. Such an entity assumes responsibility for addressing fundamental economic issues. Under command and control, this authority decides what items to produce and how many, determines how the scarce resources will be organized in the items' production, and identifies who will be able to obtain the items.

For instance, in a command-and-control economic system, a government might decide that particular types of automobiles ought to be produced in certain numbers. The government might issue specific rules for how to manage the production of these vehicles, or it might even establish ownership over those resources so that it can make all such resource allocation decisions directly. Finally, the government may then decide who will be authorized to purchase or otherwise utilize the vehicles.

**The Price System** The alternative to command and control is the *price system* (also called a *market system*), which is a shorthand term describing an economic system that answers the three basic economic questions via decentralized decision making. Under a pure price system, individuals and families own all of the scarce resources used in production. Consequently, choices about what and how many items to produce are left to private parties to determine on their own initiative, as are decisions about how to go about producing those items. Furthermore, individuals and families choose how to allocate their own incomes to obtain the produced items at prices established via privately organized mechanisms.

In the price system, which you will learn about in considerable detail in later chapters, prices define the terms under which people agree to make exchanges. Prices signal to everyone within a price system which resources are relatively scarce and which are relatively abundant. This *signaling* aspect of the price system provides information to individual buyers and sellers about what and how many items should be produced, how production of items should be organized, and who will choose to buy the produced items.

Thus, in a price system, individuals and families own the facilities used to produce automobiles. They decide which types of automobiles to produce, how many of them to produce, and how to bring labor and machines together within their facilities to generate the desired production. Other individuals and families decide how much of their earnings they wish to spend on automobiles.

**Mixed Economic Systems** By and large, the economic systems of the world's nations are mixed economic systems that incorporate aspects of both centralized command and control and a decentralized price system. At any given time, some nations lean toward centralized mechanisms of command and control and allow relatively little scope for decentralized decision making. At the same time, other nations limit the extent to which a central authority dictates answers to the three basic economic questions, leaving people mostly free to utilize a decentralized price system to generate their own answers.

A given country may reach different decisions at different times about how much to rely on command and control versus a price system to answer its three basic economic questions. Until 2008, for instance, U.S. residents preferred to rely mainly on a decentralized price system to decide which and how many financial services to produce and

how to produce them. During some years since then, the U.S. government has owned substantial fractions of financial firms and hence has exerted considerable command-and-control authority over production of financial services.

**1.3** Evaluate the role that rational self-interest plays in economic analysis

## The Economic Approach: Systematic Decisions

Economists assume that individuals act *as if* they systematically pursue self-motivated interests and respond predictably to perceived opportunities to attain those interests. This central insight of economics was first clearly articulated by Adam Smith in 1776. Smith wrote in his most famous book, *An Inquiry into the Nature and Causes of the Wealth of Nations*, that “it is not from the benevolence [good will] of the butcher, the brewer, or the baker that we expect our dinner, but from their regard to their own interest.” Thus, the typical person about whom economists make behavioral predictions is assumed to act *as though* he or she systematically pursues self-motivated interest.

### The Rationality Assumption

The **rationality assumption** of economics, simply stated, is as follows:

*We assume that individuals do not intentionally make decisions that would leave them worse off.*

The distinction here is between what people may think—the realm of psychology and psychiatry and perhaps sociology—and what they do. Economics does *not* involve itself in analyzing individual or group thought processes. Economics looks at what people actually do in life with their limited resources. It does little good to criticize the rationality assumption by stating, “Nobody thinks that way” or “I never think that way” or “How unrealistic! That’s as irrational as anyone can get!” In a world in which people can be atypical in countless ways, economists find it useful to concentrate on discovering the baseline. Knowing what happens on average is a good place to start. In this way, we avoid building our thinking on exceptions rather than on reality.

Take the example of driving. When you consider passing another car on a two-lane highway with oncoming traffic, you have to make very quick decisions: You must estimate the speed of the car that you are going to pass, the speed of the oncoming cars, the distance between your car and the oncoming cars, and your car’s potential rate of acceleration. If we were to apply a model to your behavior, we would use the rules of calculus. In actual fact, you and most other drivers in such a situation do not actually think of using the rules of calculus, but to predict your behavior, we could make the prediction *as if* you understood those rules.

### Responding to Incentives

If it can be assumed that individuals never intentionally make decisions that would leave them worse off, then they will respond to changes in incentives. Indeed, much of human behavior can be explained in terms of how individuals respond to changing incentives over time.

Schoolchildren are motivated to do better by a variety of incentive systems, ranging from gold stars and certificates of achievement when they are young, to better grades with accompanying promises of a “better life” as they get older. Of course, negative incentives affect our behavior, too. Penalties, punishments, and other forms of negative incentives can raise the total cost of engaging in various activities.

How have earnings-based and tuition-expense-related incentives of pursuing a college degree changed in recent years?

#### Rationality assumption

The assumption that people do not intentionally make decisions that would leave them worse off.



**EXAMPLE****The Altered Incentives Confronting Prospective College Students**

In 1975, an individual considering enrolling in a college and successfully completing about four years of coursework required for a bachelor's degree could anticipate an inflation-adjusted annual payoff of about \$20,000 every year following graduation. By 2000, this inflation-adjusted annual earnings incentive to earn a college degree had increased to about \$33,000. This substantial jump in average annual income helps to explain why the percentage of U.S. adults holding college degrees steadily increased from 13 percent in 1975 to 33 percent today.

Since 2000, however, the average inflation-adjusted annual earnings gain from obtaining a college degree has dropped to about

\$29,500 per year. Accompanying this 11 percent decrease in the anticipated earnings payoff from a college degree has been an inflation-adjusted increase in average tuition and fees of 75 percent over the same interval. Thus, today's dollars-and-cents incentives to pursue a college degree are much weaker than was true a generation ago.

**REAL APPLICATION**

*Sometimes adults tell young people to “get all the education you can get.” Does that mean you should necessarily obtain an advanced degree?*

Sources are listed at the end of this chapter.

**Defining Self-Interest**

Self-interest does not always mean increasing one's wealth measured in dollars and cents. We assume that individuals seek many goals, not just increased wealth measured in monetary terms. Thus, the self-interest part of our economic-person assumption includes goals relating to prestige, friendship, love, power, helping others, creating works of art, and many other matters. We can also think in terms of enlightened self-interest, whereby individuals, in the pursuit of what makes them better off, also achieve the betterment of others around them. In brief, individuals are assumed to want the ability to further their goals by making decisions about how items around them are used. The head of a charitable organization usually will not turn down an additional contribution, because accepting the funds yields control over how they are used, even though their use is for other people's benefit.

Does the fact that many people donate to charity necessarily imply that the donors only wish to help others?

**BEHAVIORAL EXAMPLE****Assessing Whether Charitable Donations Reflect Caring for Others or for Oneself**

When contemplating making a charitable donation, people often consider two motivations. The first is a desire to help others. The second is the possibility of benefiting from incentives that governments provide to those who make donations, such as certain tax deductions granted to charitable donors by tax authorities.

Three behavioral economists—Eiji Yamamura of Seinan Gakuin University, Yoshiro Tsutsui of Konan University, and Fumio Ohtake of Osaka University—have studied how these motivations interacted in Japan during the years following an unusually damaging earthquake in the eastern part of the country. Under Japan's tax laws, people were allowed to respond to the earthquake by directing portions of their local tax payments, potentially supplemented with extra donations, to municipalities that suffered most from the quake. At the same time, however, municipal governments in Japan could compete for directed tax payments and donations by offering donors reciprocal gifts, including gift cards, digital devices, home appliances, jewelry, and even gold or silver.

The researchers find evidence that Japan's taxpayers definitely responded to the earthquake in a caring manner by directing more taxes

and additional donations to earthquake-stricken municipalities. Yet directed taxes and donations to regions whose governments offered gifts were more than six times larger than those that taxpayers directed to areas in which governments offered no gifts. The researchers conclude that allowing governments unaffected by the earthquake to offer reciprocal gifts reduced directed taxes and donations to governments of regions damaged by the quake. Thus, in the absence of governmental reciprocal gifts to donors, even more funds would have reached parts of Japan that suffered the greatest harm from the earthquake.

**FOR CRITICAL THINKING**

*How might the fact that the U.S. government allows larger tax deductions for some charitable donations than for others affect U.S. taxpayers' incentives about how much to donate and to whom they direct their donations?*

Sources are listed at the end of this chapter.

## 1.4 Explain why economics is a science

### Models, or theories

Simplified representations of the real world used as the basis for predictions or explanations.

### Variables

Choices that people make or other human outcomes that are subject to change.

## Economics as a Science

Economics is a social science that employs the same kinds of methods used in other sciences, such as biology, physics, and chemistry. Like these other sciences, economics uses models, or theories. Economic **models, or theories**, are simplified representations of the real world that we use to help us understand, explain, and predict economic phenomena in the real world. There are, of course, differences between sciences. Social scientists, including economists, tend to make less use of laboratory experiments in which changes in **variables**—human choices or outcomes subject to change—are studied under controlled conditions. Social scientists often test their models, or theories, by examining what has already happened in the real world.

### Models and Realism

At the outset it must be emphasized that no model in *any* science, and therefore no economic model, is complete in the sense that it captures *every* detail or interrelationship that exists. Indeed, a model, by definition, is an abstraction from reality. It is conceptually impossible to construct a perfectly complete realistic model. For example, in physics we cannot account for every molecule and its position and certainly not for every atom and subatomic particle. Not only is such a model unreasonably expensive to build, but working with it would be impossibly complex.

The nature of scientific model building is that the model should capture only the *essential* relationships that are sufficient to analyze the particular problem or answer the particular question with which we are concerned. *An economic model cannot be faulted as unrealistic simply because it does not represent every detail of the real world.* A map of a city that shows only major streets is not faulty if, in fact, all you wish to know is how to pass through the city using major streets. As long as a model is able to shed light on the *central* issue at hand or forces at work, it may be useful.

A map is the quintessential model. It is *always* a simplified representation. It is *always* unrealistic. It is, however, also useful in making predictions about the world. If the model—the map—predicts that when you take Campus Avenue to the north, you always run into the campus, that is a prediction. If a simple model can explain observed behavior in repeated settings just as well as a complex model, the simple model has some value and is probably easier to use.

### Assumptions

Every model, or theory, must be based on a set of assumptions. Assumptions define the array of circumstances in which our model is most likely to be applicable. When some people predicted that sailing ships would fall off the edge of the earth, they used the *assumption* that the earth was flat. Columbus did not accept the implications of such a model because he did not accept its assumptions. He assumed that the world was round. The real-world test of his own model refuted the flat-earth model. Indirectly, then, it was a test of the assumption of the flat-earth model.

Is it possible to use our knowledge about assumptions to understand why driving directions sometimes contain very few details?

## EXAMPLE

### Getting Directions

Assumptions are a shorthand for reality. Imagine that you have decided to drive from your home in San Diego to downtown San Francisco. Because you have never driven this route, you decide to use a travel-planner device such as global-positioning-system equipment.

When you ask for directions, the electronic travel planner could give you a set of detailed maps that shows each city through which

you will travel—Oceanside, San Clemente, Irvine, Anaheim, Los Angeles, Bakersfield, Modesto, and so on—with the individual maps showing you exactly how the freeway threads through each of these cities. You would get a nearly complete description of reality because the GPS travel planner will not have used many simplifying assumptions. It is more likely, however, that the travel planner will

simply say, “Get on Interstate 5 going north. Stay on it for about 500 miles. Follow the signs for San Francisco. After crossing the toll bridge, take any exit marked ‘Downtown.’” By omitting all of the trivial details, the travel planner has told you all that you really need and want to know. The models you will be using in this text are similar to the simplified directions on how to drive from San Diego to San

Francisco—they focus on what is relevant to the problem at hand and omit what is not.

### FOR CRITICAL THINKING

*In what way do small talk and gossip represent the use of simplifying assumptions?*

**The *Ceteris Paribus* Assumption: All Other Things Being Equal** Everything in the world seems to relate in some way to everything else in the world. It would be impossible to isolate the effects of changes in one variable on another variable if we always had to worry about the many other variables that might also enter the analysis. Similar to other sciences, economics uses the *ceteris paribus* assumption. *Ceteris paribus* means “other things constant” or “other things equal.”

Consider an example taken from economics. One of the most important determinants of how much of a particular product a family buys is how expensive that product is relative to other products. We know that in addition to relative prices, other factors influence decisions about making purchases. Some of them have to do with income, others with tastes, and yet others with custom and religious beliefs. Whatever these other factors are, we hold them constant when we look at the relationship between changes in prices and changes in how much of a given product people will purchase.

### ***Ceteris paribus* [KAY-ter-us PEAR-uh-bus] assumption**

The assumption that nothing changes except the factor or factors being studied.

## Deciding on the Usefulness of a Model

We generally do not attempt to determine the usefulness, or “goodness,” of a model by evaluating how realistic its assumptions are. Rather, we consider a model “good” if it yields usable predictions that are supported by real-world observations. In other words, can we use the model to predict what will happen in the world around us? Does the model provide useful implications about how things happen in our world?

Once we have determined that the model may be useful in predicting real-world phenomena, the scientific approach to the analysis of the world around us requires that we consider evidence. Evidence is used to test the usefulness of a model. This is why we call economics an **empirical** science. *Empirical* means that evidence (data) is looked at to see whether we are right. Economists are often engaged in empirically testing their models.

### **Empirical**

Relying on real-world data in evaluating the usefulness of a model.

## Models of Behavior, Not Thought Processes

Take special note of the fact that economists’ models do not relate to the way people *think*. Economic models predict how people *act* and what they do in life with their limited resources. The economist does not attempt to predict how people will think about a particular topic, such as a higher price of oil products, accelerated inflation, or higher taxes. Rather, the task at hand is to predict how people will behave, which may be quite different from what they *say* they will do (much to the consternation of poll takers and market researchers). Thus, people’s *declared* preferences are generally of little use in testing economic theories, which aim to explain and predict people’s *revealed* preferences. The people involved in examining thought processes are psychologists and psychiatrists, not typically economists.

## WHAT HAPPENS WHEN...

**people’s actual reactions to incentives differ from how they claim they would respond in answers to survey questions?**

When businesses contemplate actions, such as price increases, that alter people’s incentives to consume a product, the firms sometimes conduct surveys to try to gauge how purchases might be affected. For instance, large banks often hire public-opinion firms to survey people about how they think they would respond to a new fee on banking services previously provided at no charge. A common response people give

to such questions is that they would halt entirely their consumption of such services. In fact, however, what typically occurs is that, although the total quantity of banking services purchased declines after a fee is imposed, many people pay the new fee and continue to utilize the services. Hence, the *declared* preferences of consumers do not necessarily accord with their true preferences.

**Behavioral economics**

An approach to the study of consumer behavior that emphasizes psychological limitations and complications that potentially interfere with rational decision making.

**Bounded rationality**

The hypothesis that people are *nearly*, but not fully, rational, so that they cannot examine every possible choice available to them but instead use simple rules of thumb to sort among the alternatives that happen to occur to them.

## Behavioral Economics and Bounded Rationality

In recent years, some economists have proposed paying more attention to psychologists and psychiatrists. They have suggested an alternative approach to economic analysis. Their approach, known as **behavioral economics**, examines consumer behavior in the face of psychological limitations and complications that may interfere with rational decision making.

**Bounded Rationality** Proponents of behavioral economics suggest that traditional economic models assume that people exhibit three “unrealistic” characteristics:

1. *Unbounded selfishness.* People are interested only in their own satisfaction.
2. *Unbounded willpower.* Their choices are always consistent with their long-term goals.
3. *Unbounded rationality.* They are able to consider every relevant choice.

As an alternative, advocates of behavioral economics have proposed replacing the rationality assumption with the assumption of **bounded rationality**, which assumes that people cannot examine and think through every possible choice they confront. As a consequence, behavioral economists suggest, individuals cannot always pursue, on their own, their best long-term personal interests. They sometimes require help.

**Rules of Thumb** A key behavioral implication of the bounded rationality assumption is that people should use so-called *rules of thumb*: Because every possible choice cannot be considered, an individual will tend to fall back on methods of making decisions that are simpler than trying to sort through every possibility.

A problem confronting advocates of behavioral economics is that people who *appear* to use rules of thumb may in fact behave *as if* they are fully rational. For instance, if a person faces persistently predictable ranges of choices for a while, the individual may rationally settle into repetitive behaviors that an outside observer might conclude to be consistent with a rule of thumb. According to the bounded rationality assumption, the person will continue to rely on a rule of thumb even if there is a major change in the environment that the individual faces. Time and time again, however, economists find that people respond to altered circumstances by fundamentally changing their behaviors. Economists also generally observe that people make decisions that are consistent with their own self-interest and long-term objectives.

**Behavioral Economics Goes Mainstream** The bulk of economic analysis continues to rely on the rationality assumption as the basis for constructing economic models. In most contexts, economists view the rationality assumption as a reasonable foundation for constructing models intended to predict human decision making.

Nevertheless, a growing number of economists are exploring ways in which psychological elements might improve analysis of decision making by individual consumers, firm owners and managers, and government officials. These economists are applying the bounded rationality assumption to study effects of limitations on people’s capabilities to pursue self-interest, to assess how choices relate to long-term goals, or to consider all available choices. As you will learn in later chapters, behavioral theories and methods are being applied to the study of both microeconomic and macroeconomic issues.

**1.5** Distinguish between positive and normative economics

## Positive versus Normative Economics

Economics uses *positive analysis*, a value-free approach to inquiry. No subjective or moral judgments enter into the analysis. Positive analysis relates to statements such as “If A, then B.” For example, “If the price of gasoline goes up relative to all other prices, then the amount of it that people buy will fall.” That is a positive economic statement. It is a statement of *what is*. It is not a statement of anyone’s value judgment or subjective feelings.

## Distinguishing between Positive and Normative Economics

For many problems analyzed in the “hard” sciences such as physics and chemistry, the analyses are considered to be virtually value-free. After all, how can someone’s values enter into a theory of molecular behavior? Economists, however, face a different problem. They deal with the behavior of individuals, not molecules. That makes it more difficult to stick to what we consider to be value-free or **positive economics** without reference to our feelings.

When our values are interjected into the analysis, we enter the realm of **normative economics**, involving *normative analysis*. A positive economic statement is “If the price of gas rises, people will buy less.” If we add to that analysis the statement “so we should not allow the price to go up,” we have entered the realm of normative economics—we have expressed a value judgment. In fact, any time you see the word *should*, you will know that values are entering into the discussion. Just remember that positive statements are concerned with *what is*, whereas normative statements are concerned with *what ought to be*.

Each of us has a desire for different things. That means we have different values. When we express a value judgment, we are simply saying what we prefer, like, or desire. Because individual values are diverse, we expect—and indeed observe—that people express widely varying value judgments about how the world ought to be.

### A Warning: Recognize Normative Analysis

It is easy to define positive economics. It is quite another matter to catch all unlabeled normative statements in a textbook, even though an author goes over the manuscript many times before it is printed or electronically created. Therefore, do not get the impression that a textbook author will be able to keep all personal values out of the book. They will slip through. In fact, the very choice of which topics to include in an introductory textbook involves normative economics. There is no value-free way to decide which topics to use in her or his textbook. The author’s values ultimately make a difference when choices have to be made. From your own standpoint, though, you might want to be able to recognize when you are engaging in normative as opposed to positive economic analysis. Reading this text will help equip you for that task.

#### Positive economics

Analysis that is *strictly* limited to making either purely descriptive statements or scientific predictions. For example, “If A, then B.” A statement of *what is*.

#### Normative economics

Analysis involving value judgments about economic policies; relates to whether outcomes are good or bad. A statement of *what ought to be*.

## ECONOMICS AS IT APPLIES TO YOUR EVERYDAY LIFE AND YOUR FUTURE

Throughout this new edition, you will find numerous examples of how to apply economics to your everyday life and to decision making with respect to your career, your family, and even how you analyze political statements. In other words, *you will learn economic skills that are practical*.

In many of the examples and other features throughout the text, you will find a **Real Application** question. These questions relate to:

- Career choices
- Managerial choices if you decide to go into business
- Future behavior in your household
- Voting choices

The next-to-last chapter-ending feature, called *Economics in Your Life*, always ends with a **Real Application** question.

The last feature in each chapter, called *Issues & Applications*, will also always end with a **Real Application** question.

## ECONOMICS IN YOUR LIFE

### Government Involvement Enables a Private U.S. Housing Finance Company to Provide “Cheap” Loans

David Brickman, an executive vice president of a government-sponsored financial company called the Federal Home Loan Mortgage Corporation—FHLMC or “Freddie Mac”—has announced a new program to provide real-estate owners with loans at interest rates lower than those available from the private price system. Recipients of this special loan must agree not to raise rents on tenants during the full ten-year term of the loan.

“There’s nothing about our typical loan that prevents someone from raising rents,” even though, “[t]he supply of workforce housing is rapidly declining,” says Brickman. “There’s an urgent need to preserve [current housing] and find ways that you can effectively create more.” For these reasons, he explains, Freddie Mac has created its low-interest loan to induce landlords who receive the funds to agree to maintain fixed rents for a decade.

#### FOR CRITICAL THINKING

*Overall, does it appear that the affordable-housing loans offered by Freddie Mac arise from the application of centralized command and control, the price system, or a mix of the two? Explain your reasoning.*

#### REAL APPLICATION

*Assume that you and two friends decide to buy an apartment building next to a college. Renters are primarily full-time students. Should you take advantage of the low-interest-rate loan? What calculations do you have to make?*

Sources are listed at the end of this chapter.

## ISSUES & APPLICATIONS

### Why Fewer Men in Manufacturing Jobs Helps to Explain Why Fewer Women Are Married

#### CONCEPTS APPLIED

- Self-Interest
- Rationality Assumption
- Incentives

Naturally, whether to marry is a personal decision for any woman who contemplates the possibility. It is also a self-interested decision that involves assessing tangible valuations of the economic contributions that a man has to offer to a combined household. Considerable evidence indicates that during recent years, women have begun placing lower valuations on the potential economic contributions of non-college-educated men who are employed or regularly seek employment in manufacturing industries. The result has been a reduction in the number of women who have decided to marry these men. This fact helps to explain why the prevalence of marriage has decreased.



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### The Choice Faced by a Woman Considering Marriage to a Man Working or Seeking Work in Manufacturing

In years past, inflation-adjusted hourly earnings of male manufacturing workers were among the highest available to men not receiving education beyond high school. In

2000, more than 16 million men had these higher-paying manufacturing jobs, but in the years since, the number of men working in manufacturing industries has declined by about 25 percent.

If a woman’s behavior is consistent with the rationality assumption, she will recognize that fewer non-college-educated men are now finding manufacturing employment