PART I

Introduction: Markets and Prices

CHAPTERS

*P*art I surveys the scope of microeconomics and introduces some basic concepts and tools. Chapter 1 discusses the range of problems that microeconomics addresses, and the kinds of answers it can provide. It also explains what a market is, how we determine the extent of a market, and how we measure market price.

Chapter 2 covers one of the most important tools of microeconomics: supply-demand analysis. We explain how a competitive market works and how supply and demand determine the prices and quantities of goods. We also show how supply-demand analysis can be used to determine the effects of changing market conditions, including government intervention.

CHAPTER 1

Preliminaries

*E*conomics is divided into two main branches: microeconomics and macroeconomics. Microeconomics deals with the behavior of individual economic units. These units include consumers, workers, investors, owners of land, business firms-in fact, any individual or entity that plays a role in the functioning of our economy.[1] Microeconomics explains how and why these units make economic decisions. For example, it explains how consumers make purchasing decisions and how their choices are affected by changing prices and incomes. It also explains how firms decide how many workers to hire and how workers decide where to work and how much work to do.

Another important concern of microeconomics is how economic units interact to form larger units-markets and industries. Microeconomics helps us to understand, for example, why the American automobile industry developed the way it did and how producers and consumers interact in the market for automobiles. It explains how automobile prices are determined, how much automobile companies invest in new factories, and how many cars are produced each year. By studying the behavior and interaction of individual firms and consumers, microeconomics reveals how industries and markets operate and evolve, why they differ from one another, and how they are affected by government policies and global economic conditions.

By contrast, macroeconomics, the other major branch of economics, deals with aggregate economic quantities, such as the level and growth rate of national output, interest rates, unemployment, and inflation. But the boundary between macroeconomics and microeconomics has become less and less distinct in recent years. The reason is that macroeconomics also involves the analysis of markets-for example, the aggregate markets for goods and ser-

[1] The prefix *micro-* is derived from the Greek word meaning "small." However, many of the individual economic units that we will study are small only in relation to the U.S. economy as a whole. For example, the annual sales of General Motors, IBM, or Exxon are larger than the gross national products of many countries.

vices, for labor, and for corporate bonds. To understand how these aggregate markets operate, one must first understand the behavior of the firms, consumers, workers, and investors who make up these markets. Thus, macroeconomists have become increasingly concerned with the microeconomic foundations of aggregate economic phenomena, and much of macroeconomics is actually an extension of microeconomic analysis.

1.1 *The Use and Limitations of Microeconomic Theory*

Like any science, economics is concerned with the *explanation* and *prediction* of observed phenomena. Why, for example, do firms tend to hire or lay off workers when the prices of raw materials needed in the production process change? How many workers are likely to be hired or laid off by a firm or an industry if the price of raw materials increases by, say, 10 percent?

In economics, as in other sciences, explanation and prediction are based on *theories.* Theories are developed to explain observed phenomena in terms of a set of basic rules and assumptions. The theory of the firm, for example, begins with a simple assumption-firms try to maximize their profits. The theory uses this assumption to explain how firms choose the amounts of labor, capital, and raw'materials that they use for production, as well as the amount of output they produce. It also explains how these choices depend on the *prices* of inputs, such as labor, capital, and raw materials, as well as the price the firm can receive for its output.

Economic theories are also the basis for making predictions. Thus, the theory of the firm tells us whether a firm's output level will increase or decrease in response to an increase in wage rates or a decrease in the price of raw materials. With the application of statistical and econometric techniques, theories can be used to construct *models,* from which quantitative predictions can be made. A model is a mathematical representation, based on economic theory, of a firm, a market, or some other entity. For example, we might develop a model of a particular firm and use it to predict by *how-much* the firm's output level will change as a result of, say, a 10 percent drop in the price of raw materials.[2]

No theory, whether it be in economics, physics, or any other science, is perfectly correct. The usefulness and validity of a theory depend on whether it succeeds in explaining and predicting the set of phenomena that it is intended to explain and predict. Consistent with this goal, theories are continually tested against observation. As a result of this testing,theories are often modified or

[2] Statistics and econometrics also let us measure the *accuracy* of our predictions. For example, suppose we predict that a 10 percent drop in the price of raw materials will lead to a 5 percent increase in output. Are we sure that the increase in output will be exactly 5 percent, or might it be between 3 and 7 percent? Quantifying the accuracy of a prediction can be as important as the prediction itself.

refined and occasionally even discarded. The process of testing and refining theories is central to the development of economics as a science.

When evaluating a theory, it is important to keep in mind that it is invariably imperfect This is the case in every branch of science. For example, in physics, Boyle's law relates the volume, temperature/and pressure of a gas.[3] The law is based on the assumption that individual molecules of a gas behave as though they were tiny, elastic billiard balls. Physicists today know that gas molecules do not, in fact, always behave like billiard balls, and partly because of this, Boyle's law breaks down under extremes of pressure and temperature. Nonetheless, under most conditions it does an excellent job of predicting how the temperature of a gas will change when the pressure and volume change, and it is therefore an essential tool for engineers and scientists.

The situation is much the same in economics. For example, firms do not maximize their profits all the time. Perhaps because of this, the theory of the firm has had only limited success in explaining certain aspects of firms' behavior, such as the timing of capital investment decisions. Nonetheless, the theory does explain a broad range of phenomena regarding the behavior, growth, and evolution of firms and industries, and so it has become an important tool for managers and policymakers.[4]

1.2 *Positive versus Normative Analusis*

Microeconomics deals with both *positive* and *normative* questions. Positive questions have to do with explanation and prediction, normative questions with what ought to be. Suppose the U.S. government imposes a quota on the import of foreign cars. What will happen to the price of cars and to their production and sales? What impact will this have on American consumers? On workers in the automobile industry? These questions are all in the realm of positive analysis. Positive analysis is central to microeconomics. As we explained above, theories are developed to explain phenomena, are tested against observations, and are used to construct models from which predictions are made.

The use of economic theory for prediction is important both for the managers of firms and for public policy. Suppose the federal government is considering raising the tax on gasoline. The tax would affect the price of gasoline,

[3] Robert Boyle (1627-1691) was a British chemist and physicist who discovered experimentally that pressure (*P*), volume (V), and temperature *(T)* were related in the following way: $PV = RT$, where *R is* a constant. Later, physicists derived this relationship as a consequence of the kinetic theory of gases, which describes the movement of gas molecules in statistical terms.

[4] A recent study shows that the managers of large American corporations make increasing use of microeconomic concepts. See Giuseppe A. Forgionne, "Economic Tools Used by Management in Large American Operated Corporations," *Business Economics* 19 (April 1984): 5-17.

consumers' preferences for small or large cars, the amount of driving that people do, and so on. To plan sensibly, oil companies, automobile companies, producers of automobile parts, and firms in the tourist industry would all want to know how large the various effects of this tax will be. Government policymakers would also need quantitative estimates of the effects of the tax. They would want to determine the costs imposed on consumers (perhaps broken down by income categories); the effects on profits and employment in the oil, automobile, and tourist industries; and the amount of tax revenue likely to be collected each year.

Sometimes we want to go beyond explanation and prediction to ask questions, such as "What is best?" This involves *normative* analysis, which is also important both for managers of firms and for designers of new public policies. Again, consider a new tax on gasoline. Automobile companies would want to determine the best (profit-maximizing) mix of large and small cars to produce once the tax is in place, or how much money should be invested to make cars more fuel-efficient. For policymakers, the primary issue is likely to be whether this tax is in the public interest. The same policy objectives (say, an increase in tax revenues and a decrease in our dependence on imported oil) might be met more cheaply with a different kind of tax, such as a tariff on imported oil.

Normative analysis is not only concerned with alternative policy options; it also involves the design of particular policy choices. For example, suppose it has been decided that a gasoline tax is desirable. Balancing costs and benefits, we then ask what is the optimal size of the tax?

Normative analysis is often supplemented by value judgments. For example, a comparison between a gasoline tax and an oil import tariff might conclude that the gasoline tax is easier to administer but has a greater impact on lower-income consumers. At that point society must make a value judgment, weighing equity against economic efficiency.[5] When value judgments are involved, microeconomics cannot tell us what the best policy is. However, it can clarify the trade-offs and thereby help to illuminate and sharpen the debate.

EXAMPLE 1.1 UNEMPLOYMENT AND THE LABOR FORCE PARTICIPATION OF WOMEN

Women's participation in the labor force has increased rapidly since World War II, from a rate of 31.4 percent in 1950 to 57.8 percent in 1992. (A person participates in the labor force by either working or looking for work.) Why has the rate of labor force participation by women grown? What are the policy im-

[5] Most of the value judgments involving economic policy boil down to just this trade-off–equity versus economic efficiency. This conflict and its implications are discussed clearly and in depth in Arthur M. Okun, *Equality and Efficiency: The Big Tradeoff* (Washington, D.C.: Brookings Institution, 1975).

plications of this growth? Microeconomic theory applied to labor markets helps us address these positive and normative questions.

In this example, we will focus on the relationship between the unemployment rate and labor force participation of married women. (The unemployment rate is the number of unemployed people divided by the number of people in the labor force.) Anyone who is unemployed or has dropped out of the labor force because he or she could not find suitable work is a cause for concern in our society. When the unemployment rate decreases, it is important to know whether that decrease is the result of economic policies that reduce the number of unemployed, or because people have stopped looking for a job. Microeconomic theory predicts that a change in the unemployment rate can have two conflicting effects on the rate of labor force participation of married women.

The *additional-worker effect* says that a higher unemployment rate will lead to a *higher* labor force participation rate for married women because previously unemployed wives are forced to enter the labor force to support their families when their husbands are unemployed. If high unemployment means less work for a husband, the likelihood that his wife will enter the labor force will increase.

By contrast, the *discouraged-worker effect* says that a higher unemployment rate will lead to a *lower* labor force participation rate because people who might otherwise look for work will become discouraged and drop out of the labor force. The higher the unemployment rate, the less likely a woman will be to try to find a job.

These two effects work in opposite directions. Which is more important? One way to find out is to examine data that relate the labor force participation rate for married women to the overall unemployment rate for different cities in the United States. A statistical analysis of the data for large cities shows that higher unemployment rates are associated with *lower* labor force participation rates. Specifically, for every 1 percent increase in the overall unemployment rate, the labor force participation rate of married women falls by 1.4 percent. Thus, the data indicate that the discouraged-worker effect is more important than the additional-worker effect.

In this particular case, the evidence is strong-and has been supported by more sophisticated analyses.[6] The policy implications are also clear-decreasing unemployment rates for married women that are associated with lower labor force participation rates should not be viewed as improvements in social welfare. They may be masking serious social problems that must be directly confronted.

[6] See Tim Maloney, "Employment Constraints and the Labor Supply of Married Women," *The Journal of Human Resources* 22 (1987): 51-61.

1.3 *Why Study Microeconomics?*

We think that after reading this book, you will have no doubt about the importance and broad applicability of microeconomics. In fact, one of our major goals is to show you how to apply microeconomic principles to actual decision-making problems. Nonetheless, some extra motivation early on never hurts. Here are two examples that show the use of microeconomics in practice and also provide a preview of the book.

Corporate Decision Making: Ford Introduces the Taurus

In late 1985 Ford introduced the Taurus-a newly designed, aerodynamically styled, front-wheel-drive automobile. The car was a huge success at the time and helped Ford almost to double its profits by 1987. The design and efficient production of this car involved not only some impressive engineering advances, but a lot of economics as well.

First, Ford had to think carefully about how the public would react to the Taurus' design. Would consumers be swayed by the styling and performance of the car? How strong would demand be initially, how fast would it grow, and how would demand depend on the price Ford charged? Understanding consumer preferences and trade-offs and predicting demand and its responsiveness to price were essential parts of the Taurus program. (We discuss consumer preferences and demand in Chapters 3, 4, and 5.)

Next, Ford had to be concerned with the cost of the car. How high would production costs be, and how would this depend on the number of cars Ford produced each year? How would union wage negotiations or the prices of steel and other raw materials affect costs? How much and how fast would costs decline as managers and workers gained experience with the production process? And to maximize profits, how many cars should Ford plan to produce each year? (We discuss production and cost in Chapters 6 and 7 and the profit-maximizing

Ford also had to design a pricing strategy for the car and consider how its competitors would react to this strategy. For example, should Ford charge a low price for the basic stripped-down version of the car but high prices for individual options, such as air conditioning and power steering? Or would it be more profitable to make these options "standard" items and charge a high price for the whole package? Whatever prices Ford chose, how were its competitors likely to react? Would GM and Chrysler try to undercut Ford by lowering prices? Might Ford be able to deter GM and Chrysler from lowering prices by threatening to respond with its own price cuts? (We discuss-pricing in,Chapters 10 and 11 and competitive strategy in Chapters 12 and 13.)

The Taurus program required a large investment in new capital equipment, and Ford had to consider the risks involved and the possible outcomes. Some

of this risk was due to uncertainty over the future price of gasoline (higher gasoline prices would shift demand to smaller cars), and some was due to uncertainty over the wages that Ford would have to pay its workers. What would happen if world oil prices doubled or tripled again, or if the government imposed a new tax on gasoline? How much bargaining power would the unions have, and how might this affect wage rates? How should Ford take these uncertainties into account when making its investment decisions? (Commodity markets and the effects of taxes are discussed in Chapters 2 and 9. Labormarkets and union power are discussed in Chapter
the role of uncertainty are discussed in Chapters 5 and 15.)

Ford also had to worry about organizational problems. Ford is an integrated firm-separate divisions produce engines and parts, then assemble finished cars. How should the managers of the different divisions be rewarded? What price should the assembly division be charged for engines it receives from another division? Should all the parts be obtained from the upstream divisions, or should some of them be purchased from outside firms? (We discuss internal pricing and organizational incentives for the integrated firm in Chapters 11 and 17.)

Finally, Ford had to think about its relationship to the government and the effects of regulatory policies. For example, the Taurus had to meet federal emission standards, and production line operations had to comply with health and safety regulations. How were these regulations and standards likely to change over time? How would they affect the company's costs and profits? (We discuss the role of government in limiting pollution and promoting health and safety in Chapter 18.)

Public Policy Design: Automobile Emission Standards

In 1970, the federal Clean Air Act imposed strict tailpipe emission standards on new automobiles. These standards have become increasingly stringent, so that if the program reaches its desired goal in the 1990s, the 1970 levels of nitrogen oxides,hydrocarbons, and carbon monoxide emitted by automobiles will be reduced by roughly 90 percent.

The design of a program like the Clean Air Act involves a careful analysis of the ecological and health effects of auto emissions. But it also involves a good deal of economics. First, the government has to evaluate the monetary impact of the program on consumers. The emission standards affect the cost both of purchasing a car (catalytic converters would be necessary, which would raise the cost of cars) and of operating it (gas mileage would be lower, and the catalytic converters would have to be repaired and maintained). Consumers ultimately bear much of this added cost, so it is important to know how it affects their standards of living. This requires an analysis of consumer preferences and demand. For example, would consumers drive less and spend more of their income on other goods? If so, would they be nearly as well off? (Consumer preferences and demand are discussed in Chapters 3 and 4.)

To answer these questions, the government needs to determine how the standards would affect the cost of producing cars. Might automobile producers use other materials to produce cars, so that cost increases would be small? (Production and cost are discussed in Chapters 6 and 7.) Then the government needs to know how the changes in production costs affect the level of production and the prices of new automobiles-are the additional costs absorbed or passed on to consumers in the form of higher prices? (Output determination is discussed in Chapter 8, and pricing in Chapters 10 through 13.)

Finally, the government needs to ask why the problems related to air pollution are not solved by our market-oriented economy. The answer is that much of the cost of air pollution is external to the firm. If firms do not find it in their self-interest to deal with auto emissions adequately, then what is the best way to alter their incentives? Should standards be set, or is it more economical to impose air pollution fees? How do we decide what people will pay to clean up the environment when there is no explicit market for clean air? Is the political process likely to solve these problems? The ultimate question is whether the auto emissions control program makes sense on a cost-benefit basis. Are the aesthetic, health, and other benefits of clean air worth the higher cost of automobiles? (These problems are discussed in Chapter 18.)

These are just two examples of how microeconomics can be applied; you will see more applications throughout this book. Many of these applications deal with markets and prices. These two words are a part of our everyday language, but it is important to be clear about their meaning.

1.4 *What Is a Market?*

We can divide individual economic units into two broad groups according to function-*buyers* and *sellers.* Buyers include consumers, who purchase goods and services, and firms, which buy labor, capital, and raw materials that they use to produce goods and services. Sellers include firms, which sell their goods and services; workers who sell their labor services; and resource owners, who rent land or sell mineral resources to firms. Clearly, most people and most firms act as both buyers and sellers, but we will find it helpful to think of them as simply buyers when they are buying something, and sellers when they are selling something.

Together, buyers and sellers interact to form *markets. A market is a collection of buyers and sellers that interact, resulting in the possibility for exchange.* Note that a market includes more than an industry. An *industry* is a collection of firms that sell the same or closely related products. In effect, an industry is the supply side of the market.

Markets are at the center of economic activity, and many of the most interesting questions and issues in economics concern how markets work. For ex-

ample, why do only a few firms compete with one another in some markets, while in other markets a great many firms compete? Are consumers necessarily better off if there are many firms? If so, should the government intervene in markets with only a few firms? Why have prices in some markets risen or fallen rapidly, while in other markets prices have hardly changed at all? And which markets offer the best opportunities for an entrepreneur thinking of going into business?

Competitive Versus Noncompetitive Markets

In thas book we study the behavior of both competitive and noncompetitive markets. A *perfectly competitive market* has many buyers and sellers, so that no single buyer or seller has a significant impact on price. Most agricultural markets are close to being perfectly competitive. For example, thousands of farmers produce wheat, which thousands of buyers purchase- to produce flour and other products. As a result, no single farmer and no single buyer can significantly affect the price of wheat.

Many other markets are competitive enough to be treated as if they were perfectly competitive. The world market for copper, for example, contains a few dozen major producers. That is enough for the impact on price to be negligible if any one producer goes out of business. The same is true for many other natural resource markets, such as those for coal, iron, tin, or lumber.

Other markets containing only several producers may still be treated as competitive for purposes of analysis. For example, the airline industry in the United States contains several dozen firms, but most routes are served by only a few firms. Nonetheless, competition among those firms is often (but not always!) fierce enough, so that for some purposes (but not others) the market can be treated as competitive. Finally, some markets contain many producers but are *noncompetitive;* that is, individual firms can affect the price of the product. The world oil market is one example; since the early 1970s, the market has been dominated by the OPEC cartel. (A *cartel* is a group of producers that acts collectively.)

MarketPrice

Markets provide the possibility of transactions between buyers and sellers. Quantities of a good are sold at specific prices. In a perfectly competitive market, a single price-the *market price*-will usually prevail. The price of wheat in Kansas City and the price of gold in New York are two examples. These prices are also usually easy to measure. For example, you can find the price of corn, wheat, or gold each day in the business section of a newspaper.

In markets that are not perfectly competitive, different firms might charge different prices for the same product. This might happen because one firm is trying to win customers from its competitors, or because customers have brand

loyalties that allow some firms to charge higher prices than their competitors. For example, two brands of laundry detergent might be sold in the same supermarket at different prices. Or, two supermarkets in the same town might be selling the same brand of laundry detergent at different prices, In. cases like this, when we refer to the market price, we will mean the price averaged across brands or supermarkets.

The market prices of most goods will fluctuate over time, and for many goods the fluctuations can be rapid. This is particularly true for goods sold in competitive markets. The stock market, for example, is highly competitive- there are typically many buyers and sellers for any one stock. As anyone who has invested in the stock market knows, the price of any particular stock fluctuates from minute to minute and can rise or fall substantially during a single. day. Similarly, the prices of commodities such as wheat, soybeans, coffee, oil, gold, silver, or lumber can also rise or fall dramatically in a day or a week.

The Extent of a Market

The *extent of a market* refers to its *boundaries,* both *geographic* and in terms of the *range of products* to be included in it. When we refer to the market for gasoline, for example, we must be clear about its geographic boundaries. Are we referring to downtown Los Angeles, southern California, or the entire United States? And we must also be clear about the range of products we are referring to. Should regular octane and high octane premium gasoline be included in the same market? Leaded and unleaded gasoline? Gasoline and diesel fuel?

For some goods, it makes sense to talk about a market only in terms of very restrictive geographic boundaries. Housing is a good example. Most people who work in downtown Chicago will look for housing within commuting distance of that city. They will not look at homes that are 200 or 300 miles away, even though those homes might be much cheaper. And homes (together with the land they are sitting on) 200 miles away cannot easily be moved closer to Chicago. Hence the housing market in Chicago is separate and distinct from, say, the housing markets in Cleveland, Houston, Atlanta, or Philadelphia. Retail gasoline markets, on the other hand, are less limited geographically, but are still regional because of the expense of shipping gasoline long distances. Thus the market for gasoline in southern California is distinct from the market in northern Illinois.

Gold, on the other hand, is bought and sold in a world market. The reason is that the cost of transporting gold is small relative to its value. Thus if the price of gold in New York were substantially lower than the price in Zurich, people would buy gold in New York and sell it at a- profit in Zurich. (This is called *arbitrage,* and the people who engage in it are called *arbitrageurs.* It is the possibility of arbitrage that prevents the prices of gold in New York and Zurich from differing significantly.)

When discussing a market, we must also be clear about the range of products that we mean to include in it. For example, there is a market for 35-mil-

limeter single lens reflex (SLR) cameras, and many brands compete in that market. But what about Polaroid instant cameras? Should they be considered part of the same market? Probably not, because they are used for different purposes, and so do not compete with SLR cameras. Gasoline is another example. Regular and premium octane gasolines might be considered part of the same market because most consumers can use either in their cars. Diesel fuel, however, is not part of this market because cars that use regular gasoline cannot use diesel fuel, and vice versa.[7]

1.5 *Real Versus Nominal Prices*

We often want to compare the price of a good today with what it was in the past or is likely to be in the future. To make such a comparison meaningful, we need to measure prices relative to the overall price level. In absolute terms, the price of a dozen eggs is many times higher today than it was 50 years ago, but relative to prices overall, it is actually lower. Therefore, we must be careful to correct for inflation when comparing prices across time. This means measuring prices in *real* rather than *nominal* terms.

The *nominal price* of a good (sometimes called its "current dollar" price) is just its absolute price. For example,the nominal priceofaquartofmilk was about 40 cents in 1970, about 65 cents in 1980, and about 90 cents in 1993. These are the prices you would have seen in supermarkets in those years. The *real price* of a good (sometimes called its "constant dollar price) is the price relative to an aggregate measure of prices.

The aggregate measure most often used is the Consumer Price Index (CPI). The CPI is calculated by the U.S. Bureau of Labor Statistics and is published monthly. It records how the cost of a large market basket of goods purchased by a "typical" consumer in some base year changes over time. (Currently the base year is 1983.) Percentage changes in the CPI measure the rate of inflation in the economy.[8]

After correcting for inflation, was milk more expensive in 1993 than in 1970? To find out, let's calculate the 1993 price of milk in terms of 1970 dollars. The

[7] How can we determine the extent of a market? Since the market is where the price of a good is established, one approach focuses on market prices. We ask whether product prices in different geographic regions (or for different product types) are approximately the same, or whether they tend to move together. If either is the case, we place them in the same market. For a more detailed discussion, see George J. Stigler and Robert A. Sherwin, "The Extent of the Market," *Journal of Law and Economics* 27 (Oct. 1985): 555-585.

[8] Because the market basket is fixed, the CPI can tend to overstate inflation. The reason is that when the prices of some goods rise substantially, consumers will shift some of their purchases to goods whose prices have not risen as much, and the CPI ignores this.

CPI was 38.8 in 1970 and rose to about 144 in 1993.[9] (There was considerable inflation in the United States during the 1970s and early 1980s.) In 1970 dollars the price of milk was therefore

$$\frac{38.8}{144} \times \$0.90 = \$0.26$$

In real terms the price of milk was lower in 1993 than it was in 1970. Put another way, the nominal price of milk went up by about 125 percent, but the CPI went up 271 percent, so that milk prices fell relative to inflation.

In this book we will usually be concerned with real rather than nominal prices because consumer choices involve an analysis of how one price compares with another. These relative prices can most easily be evaluated if there is a common basis of comparison. Stating all prices in real terms achieves this objective. Thus, even though we will often measure prices in dollars, we will be thinking in terms of the real purchasing power of those dollars.

EXAMPLE 1.2 THE PRICE OF EGGS AND THE PRICE OF A COLLEGE EDUCATION

In 1970 Grade A eggs cost about 61 cents a dozen. In the same year, the average annual cost of a college education in a private four-year college, including room and board, was about $2,530. By 1990 the price of eggs had risen to 95 cents a dozen, and the average cost of a college education was $12,800. In real terms, were eggs more expensive in 1990 than in 1970? Had a college education become more expensive?

Table 1.1 shows the nominal price of eggs, the nominal cost of a college education, and the CPI for 1970-1993. (The CPI is based on 1983 = 100.) Also shown are the *real* prices of eggs and a college education in 1970 dollars, calculated as follows:

$$\text{Real price of eggs in 1975} = \frac{\text{CPI}_{1970}}{\text{CPI}_{1975}} \times \text{nominal price in 1975},$$

$$\text{Real price of eggs in 1980} = \frac{\text{CPI}_{1970}}{\text{CPI}_{1980}} \times \text{nominal price in 1980},$$

and so forth.

The table shows clearly that the real cost of a college education rose (by 62 percent) during this period, while the real cost of eggs fell (by 56 percent). It is these relative changes in the prices of eggs and college that are important for the choices that consumers must make, not the fact that both eggs and college cost more in dollars today than they did in 1970.

[9] Two good sources of data on the national economy are the *Economic Report of the President and the Statistical Abstract of the United States.* Both are published annually and are available from the U.S. Government Printing Office.

TABLE 1.1 The Real Prices of Eggs and of a College Education

	1970	1975	1980	1985	1990	1993
Nominal Prices						
Grade A Eggs	$0.61	$0.77	$0.84	$0.80	$0.95	$1.01
College Education	$2530	$3403	$4912	$8156	$12,800	$15,212
Consumer Price Index	38.8	53.8	82.4	107.6	130.2	144.0
Real Prices ($1970)						
Grade A Eggs	$0.61	$0.56	$0.40	$0.29	$0.28	$0.27
College Education	$2530	$2454	$2313	$2941	$3814	$4099

In the table, we calculated real prices in terms of 1970 dollars, but we could have just as easily calculated them in terms of the dollars of some other base year. For example, suppose we want to calculate the real price of eggs in 1980 *dollars*. Then:

$$\text{Real price of eggs in 1975} = \frac{\text{CPI}_{1980}}{\text{CPI}_{1975}} \times \text{nominal price in 1975},$$

$$\text{Real price of eggs in 1985} = \frac{\text{CPI}_{1980}}{\text{CPI}_{1985}} \times \text{nominal price in 1985},$$

and so forth. By going through the calculations, you can check that in terms of 1980 dollars, the real price of eggs was $1.30 in 1970, $1.18 in 1975, 84 cents in 1980, 61 cents in 1985, 60 cents in 1990, and 58 cents in 1993. You can also check that the percentage declines in real price are the same no matter which base year we use.

Summary

1. Microeconomics is concerned with the decisions made by small economic units-consumers,workers, investors, owners of resources, and business firms. It is also concerned with the interaction of consumers and firms to form markets and industries.
2. Microeconomics relies heavily on the use of theory, which can (by simplification) help to explain how economic units behave and predict what that behavior will be in the future. Models are mathematical representations of theory that can help in this explanation and prediction process.
3. Microeconomics is concerned with positive questions that have to do with the explanation and prediction of phenomena. But microeconomics is also important for normative analy-

sis, in which we ask what choices are best-for a firm or for society as a whole. Normative analyses must often be combined with individual value judgments because issues of equity and fairness as well as of economic efficiency may be involved.

4. A *market* refers to a collection of buyers and sellers who interact and to the possibility for sales and purchases that results. Microeconomics involves the study of both perfectly competitive markets in which no single buyer or seller has an impact on price and noncompetitive markets in which individual entities can affect price.
5. The market price is established by the interaction of buyers and sellers. In a perfectly competitive market, a single price will usually prevail. In markets that are not perfectly competitive, different sellers might charge different prices. Then the market price refers to the average prevailing price.
6. When discussing a market, we must be clear about its extent in terms both of its geographic boundaries and of the range of products to be included in it. Some markets (e.g., housing) are highly localized, whereas others (e.g., gold) are worldwide.
7. To eliminate the effects of inflation, we measure real (or constant dollar) prices, rather than nominal (or current dollar) prices. Real prices use an aggregate price index/such as the CPI, to correct for inflation.

Questions for Review

1. What is the difference between a market and an industry? Are there interactions among firms in different industries that you might describe as taking place within a single market?

2. It is often said that a good theory is one that can in principle be refuted by an empirical, data-oriented study. Explain why a theory that cannot be evaluated empirically is not a good theory.

3. In Example 1.1, both the additional-worker and the discouraged-worker theories are economic in nature, because they reflect the responses of married women to the economic conditions that their husbands .face in the market. Could it be that both theories are correct, but that the additional-worker theory applies to certain households, and the discouraged-worker theory applies to others? If so, how might you figure out which theory applies to whom?

4. Which of the following two statements involves positive economic analysis and which normative? How do the two kinds of analysis differ?

a. Gasoline rationing (allocating to each individual a maximum amount of gasoline that can be purchased each year) is a poor social policy because it interferes with the workings of the competitive market system.

b. Gasoline rationing is a policy under which more people are made worse off than are made better off.

5. Suppose the price of unleaded regular octane gasoline were 20 cents per gallon higher in New Jersey than in Oklahoma. Do you think there would be an opportunity for arbitrage (i.e., that firms could buy gas in Oklahoma and then sell it at a profit in Jersey)? Why or why not?

6. In Example 1.2, what economic forces explain why the real price of eggs has fallen, while the real price of a college education has increased? How have these changes affected consumer choices?

7. Suppose that the Japanese yen rises against the U.S. dollar; that is, it now takes more dollars to buy any given amount of Japanese yen. Explain why this simultaneously increases the real price of Japanese cars for U.S. consumers and lowers the real price of U.S. automobiles for Japanese consumers.