The Economist’s Toolbox

In Section 4, you will
• demonstrate how and why economists use economic models
• understand how and why economists use statistics, charts, tables, and graphs
• compare macroeconomics to microeconomics
• contrast positive economics with normative economics

KEY CONCEPTS
An old joke notes that economics is everything we already know expressed in a language we don’t understand. While many economists might disagree with the second part of this joke, they probably would have little argument with the first part. Economics is something that everybody engages in every day, and in that way everyone has knowledge of it. Individuals, business owners, and government officials make economic decisions all the time. Economists study these decisions and look for logical ways to explain why some nations are rich while others are poor, or why some consumers want one kind of product while others want another.

Since economists can’t interview every person in every nation about economic choices, they rely on statistics—numerical data or information—to see patterns of behavior. To help organize and interpret the data they collect, they develop economic models. As you recall from Section 3, an economic model is a simplified representation of complex economic forces. The language of economists—these statistics and models—may sometimes be a little hard to understand. However, it is a more efficient way of explaining economic relationships and interactions than everyday language.

Using Economic Models
In science class, you may have seen a model of a lunar eclipse, which shows how, with the sun behind it, the earth casts a shadow on the moon. The model assumes certain laws of planetary orbit and simplifies the relationships among the objects in the solar system. However, these assumptions and simplifications make the process of the eclipse quite clear.
Economic models work in the same way. They are based on assumptions and are simplified because they focus on a limited number of variables. Economists can express their models in words, graphs, or equations. Models help economists explain why things are as they are. In some cases, models can help economists to predict future economic activity. You’ve already learned how economists construct and use one important economic model—the production possibilities curve—in Section 3. You’ll learn about another, the circular flow model, in Chapter 2.

Using Charts and Tables

Economists study statistics in a particular way, looking for trends, connections, and other interesting relationships. They have several tools to help them with this task. Among the most common tools are charts and tables, in which data are arranged and displayed in rows and columns. (See Figure 1.7 above.) By showing numbers in relation to other numbers, charts and tables can reveal patterns in the data.

Suppose, for example, you were curious about how much money various developed countries give to help developing countries. In Figure 1.7, if you looked at one set of numbers, you would see that Luxembourg contributed $236 million, while Canada gave more than ten times that, offering nearly $2.6 billion. Your immediate interpretation of these data might be that Canada gives far more in foreign aid than Luxembourg does. But looking at other sets of numbers might suggest a different interpretation. Luxembourg may have contributed far less than Canada in actual dollar amounts. However, the foreign aid Luxembourg gave represented close to 1 percent of the value of all the goods and services the nation produced. Canada’s contribution, in contrast, was about 0.3 percent of its total economy. After studying these numbers, you might conclude that in relative terms Luxembourg gives more than Canada in foreign aid.

Using Graphs

When economists are interested in identifying trends in statistics, they often use graphs, or visual representations of numerical relationships. The most common type is the line graph. Line graphs are particularly useful for showing changes over time.

Statistics  During a debate in the U.S. Senate on the future of Social Security, Senator Charles Grassley of Iowa illustrates a point using statistics in graph form.
All line graphs use at least two sets of numbers, or variables: one plotted along the horizontal axis, running from left to right, the other plotted along the vertical axis, running from bottom to top. On the line graph in Figure 1.8 above, the range of time from 1995 to 2001 is shown on the horizontal axis. The number of PCs (personal computers) per 100 people in developing countries is shown on the vertical axis.

The number of PCs for each year is plotted on the graph and then these points are joined to form a line. The line may slope upward, showing an upward trend, or downward, showing a downward trend. The line may be straight, keeping the same slope throughout, or it may be curved, having a varied slope. (In later chapters you’ll see that where graphs are used to illustrate economic concepts, lines are referred to as curves whether they are straight or curved.) How would you describe the trend shown in Figure 1.8?

A bar graph is especially useful for comparisons. The bar graph in Figure 1.9 above shows information on the percentage of households in the United States that have access to computers and the Internet. The bars vividly illustrate that access to information technology increased dramatically in the United States between 1998 and 2003.

A pie graph, often called a pie chart or circle graph, is especially good for representing numbers in relation to a whole. Take a look at the pie graph in Figure 1.10 above. The whole circle represents all the Internet users in the world. The slices of the pie, which represent regions of the world, are drawn in proportion to the percentage of the whole they constitute.

APPLICATION Interpreting Graphs

A. Look at the pie graph in Figure 1.10 above. Write a generalization based on information in the graph.
Microeconomics and Macroeconomics

KEY CONCEPTS

For scientists, everything in the earth, air, and water—and beyond—is a source of data to be observed and studied. Yet the data often make little sense until they are seen through the lens of a microscope or telescope. Economic information, as with scientific data, takes on meaning when it is viewed through the most useful lens. Two of the lenses through which economists observe economic behavior are microeconomics and macroeconomics. Microeconomics is the study of the behavior of individual players in an economy, such as individuals, families, and businesses. Macroeconomics is the study of the behavior of the economy as a whole and involves topics such as inflation, unemployment, aggregate demand, and aggregate supply.

Microeconomics

As the prefix micro-, meaning small, would suggest, microeconomics examines specific, individual elements in an economy. The elements include prices, costs, profits, competition, and the behavior of consumers and producers. Microeconomics can help you understand how the sandwich shop owner arrived at the price of the lunch you bought today, why the neighborhood has several sandwich shops offering the same kinds of food, and why some of these shops flourish while others fail. Microeconomics also can offer explanations for why students decide to work only on the weekends and not on school nights, why some families buy a used car rather than a new car, and why the mom-and-pop grocery store in your neighborhood closed after the superstore opened nearby.

Within the field of microeconomics there are areas of specialized concentration. Business organization, labor markets, agricultural economics, and the economics of environmental issues are among the topics that microeconomists might study. You will study the issues of microeconomics in more depth starting in Chapter 4.

Macroeconomics

Macroeconomics, as its prefix macro-, meaning large, would suggest, examines the economic “big picture.” In other words, macroeconomics is the study of the economy as a whole. While the limited spending power of an unemployed person would be in the realm of microeconomics, the effect of widespread unemployment on the whole nation would be a macroeconomic issue. In a similar way, the rising price of coffee would interest a microeconomist, but a general rise in prices, a sign that the whole economy is experiencing inflation, would be a matter for a macroeconomist.

QUICK REFERENCE

Microeconomics is the study of individuals, families, and businesses in an economy.

Macroeconomics is the study of the economy as a whole and is concerned with large-scale economic activity.

Microeconomics vs. Macroeconomics Changes in coffee prices might interest a microeconomist. A macroeconomist might study general changes in prices.

The Economic Way of Thinking 27
While microeconomics considers the individual consumer, macroeconomics studies the consumer sector, also called the household sector. A sector is a combination of all the individual units into one larger whole. Macroeconomics also examines the business sector, and the public, or government, sector—that part of the economy that provides public goods and services.

Macroeconomists bring a national or global perspective to their work. They study the monetary system, the ups and downs of business cycles, and the impact of national tax policies on the economy. In addition, they look at such global issues as international trade and its effect on rich and poor nations. You will study macroeconomics in depth beginning in Chapter 10.

**APPLICATION Categorizing Economic Information**

B. Which does each of the news headlines relate to—microeconomics or macroeconomics?

1. National Unemployment Figures Rise
2. World Trade Organization Meets
3. Shipbuilder Wins Navy Contract
4. Cab Drivers on Strike!
5. Gasoline Prices Jump 25 Cents
Positive Economics and Normative Economics

KEY CONCEPTS

Economics also can be viewed through another pair of lenses. One of those lenses is **positive economics**, a way of describing and explaining economics as it is, not as it should be. Positive economics involves verifiable facts, not value judgments. The other is **normative economics**, a way of describing and explaining what economic behavior ought to be, not what it actually is. Normative economics does involve value judgments because it seeks to make recommendations for actions.

Positive Economics

Positive economics uses the scientific method to observe data, hypothesize, test, refine, and continue testing. Statements made within positive economics can be tested against real-world data and either proved (or at least strongly supported) or disproved (or at least strongly questioned). Suppose, for example, your state is debating the pros and cons of a lottery to raise money for education. In the framework of positive economics, researchers would study data from states with lotteries to see if educational spending increased after the lotteries were begun.

Normative Economics

Normative economics, in contrast, is based on value judgments. It goes beyond the facts to ask if actions are good. Since the values of people differ, so do the recommendations based on normative economics.

Consider the issue of using lottery money to fund education. Two economists might agree that the data show that state-run lotteries result in more money for schools, and that many lottery tickets are purchased by people who are poor. Their recommendations, however, might differ because they have different values. One economist might support a lottery because it increases funding for schools. The other might oppose a lottery because it places a burden on the poor.

APPLICATION Applying Economic Concepts

C. Are the following statements examples of positive economics or normative economics?

1. Because of scarcity, everyone must make choices.
2. Americans buy too many cars and do not use mass transit enough.

Quick Reference

Normative Economics

Why is this statement about the North American Free Trade Agreement (NAFTA) an example of normative economics?
Some 250 years ago, economics as an academic discipline did not even exist. Any discussion of economic issues usually took place in the fields of politics and philosophy. In 1776, however, Adam Smith completely changed this.

**Seeing the Invisible**

No other economist has had as much influence as Adam Smith, yet he would not have even considered himself an economist. Smith was born in Kirkcaldy, Scotland, in 1723 and studied, and later taught, literature, logic, and moral philosophy. In 1764 he traveled to France and met many European Enlightenment writers and thinkers. His discussions with them encouraged him to look at the world anew. The result was his groundbreaking work, *An Inquiry into the Nature and Causes of the Wealth of Nations*, which he published in 1776.

In *The Wealth of Nations*, Smith challenged the idea that mercantilism—a system by which the government of the homeland controlled trade with its colonies—was economically sound. Instead, he argued, a nation would be wealthier if it engaged in free trade. It was in this market where goods could be exchanged freely that Adam Smith saw a new economic relationship.

He reasoned that people behave in ways that satisfy their economic self-interest. A tailor will make clothes as long as people will buy them at a price that satisfies him. If he makes more clothes than customers wish to buy, he will cut back and make fewer until he finds the balance again. In this way, according to Smith, an “invisible hand” guides the marketplace. In such a free market, both the buyer and the seller benefit from each transaction. Smith’s idea of the “invisible hand,” as well as many other principles he explained in *The Wealth of Nations*, became the foundation of modern economic theory.

**APPLICATION Analyzing Effects**

**D.** What impact do you think individual self-interest has on the economy as a whole? Illustrate your answer with examples.
SECTION 4  Assessment

REVIEWING KEY CONCEPTS

1. Explain the differences between the terms in each of these pairs:
   a. statistics  b. macroeconomics  c. positive economics
      economic model  microeconomics  normative economics

2. Why do economists often choose to present statistics in charts, tables, or graphs?

3. Create a simple model to explain how you decide how much time to study and how much time to unwind each evening. You may use words, charts or graphs, or equations.

4. Think of an example of a macroeconomic issue that affects an individual person, family, or business and explain its effect.

5. Explain the value of statistics and other data to positive economics and to normative economics.

6. Using Your Notes In what ways was Adam Smith a microeconomist? In what ways a macroeconomist? Refer to your completed comparison and contrast chart.
   Use the Graphic Organizer at Interactive Review @ ClassZone.com

CRITICAL THINKING

7. Making Inferences How do you think politicians might use normative economics statements?

8. Applying Economic Concepts In which category does each item below belong—microeconomics or macroeconomics? Why?
   a. Studying statistics to see how well the economy is doing at creating jobs or increasing exports;
   b. Studying statistics on gasoline sales and hotel bookings to explore the impact of higher gas prices on vacation plans.

9. Distinguishing Fact from Opinion Consider the example of the state lottery to raise money for education. How might it be possible for two economists to see the same information and arrive at different opinions about what to do?

10. Challenge When you go out shopping, do you often worry that there will be a shortage of something you really want? If so, explain why you think there might be a shortage. If not, explain why there seems to be enough of everything you would want to buy.

ECONOMICS IN PRACTICE

Using Graphs
Graphs are among the most important tools used by economists.

Create Graphs Use the following information about Model T Fords (shown above) to create two line or bar graphs.

<table>
<thead>
<tr>
<th>Year</th>
<th>Average price per car</th>
<th>Number of cars sold</th>
</tr>
</thead>
<tbody>
<tr>
<td>1909</td>
<td>$904</td>
<td>12,176</td>
</tr>
<tr>
<td>1911</td>
<td>$811</td>
<td>40,400</td>
</tr>
<tr>
<td>1913</td>
<td>$638</td>
<td>179,199</td>
</tr>
<tr>
<td>1915</td>
<td>$626</td>
<td>355,249</td>
</tr>
</tbody>
</table>

Source: Model T Ford Club of America

Challenge As Henry Ford lowered the price of the Model Ts, he potentially reduced his profit—the amount of money he made—on the sale of each car. Why was that a good economic choice?

Use SMARTGraPher @ ClassZone.com to complete this activity.