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## Chapter

# ECONOMICS AND THE WORLD AROUND US: DEFINING MOMENTS

### Chapter Insight

**I**n 1900, 11 million people worked on farms in the United States. Today, a hundred years later, fewer than 1 million people are employed on farms. A century ago there were no airline pilots, truck drivers, medical technicians, or radio and television announcers, and engineering was considered a new profession. Fifty years ago only 70 percent of U.S. households had indoor plumbing; now over 99 percent have this necessity of modern life. In the 1950s, only the richest families in town had air-conditioned homes; today air conditioners are so common that we have them in our automobiles. Just 10 years ago, only the defense department and major corpo-



rations had the facilities to transmit computer messages over telephone lines. Now, school children routinely exchange e-mail messages and spend hours surfing the 'Net. Life has changed so much that a time-traveler from a century ago would be lost in a technological wonderland.

The enormous improvement in our standard of living is the most important economic fact of this century. Indeed, many of the poor in the United States, because they enjoy a number of things that were unheard-of luxuries in the 1930s and 1940s, live or could live like the middle class of just 50 years ago.

Yesterday's luxuries become today's necessities. With the rising multitude of new products and inventions, we wonder whether our children and their children will see such monumental changes in their lifetimes as we have seen in our own or whether economies are subject to "limits of growth." There are always skeptics. Two of our most famous economists (David Ricardo and Thomas Malthus) argued 150 years ago at the beginnings of the Industrial Revolution that standards of living cannot rise further. Computer specialists from a major Ivy League university concluded less than 30 years ago that current living standards cannot be sustained more than a decade with our limited resources. Other skeptics prophesy overpopulation, famine, and human disaster. Optimists see no reason why the next century should not see as much progress as the twentieth century. The respected chairman of the Federal Reserve

System declares that "information technology has begun to alter, fundamentally, the manner in which we do business and create economic value."<sup>1</sup> Scientists and corporations foresee a future of ever more powerful computers, human gene therapy, molecular medicine, the marriage of biology and engineering to produce brand-new materials, and hybrid cars that use advanced fuel cells built with ultralight polymers and ceramics.

A fact of economic life is that not all of us share in economic progress. Less than 20 percent of the world's population lives in affluent economies. Poor African and Asian countries perceive the poor of the United States as living in abundance and affluence. Citizens of Russia and Ukraine have seen their modest standards of living collapse to the levels of poor African and Asian economies in just one decade. How we organize and manage our economies explains why some are rich and others are poor. Countries with stable democracies, economic freedom, and low corruption tend to be affluent, whereas those with unstable governments, limited economic freedom, and high rates of corruption are poor and not improving. Economies that were once affluent, such as Argentina, have become poor. It is the strength of economic institutions that creates affluence. A society that makes the wrong choices runs the risk of losing its prosperity.

If we understand economics, we can protect ourselves against wrong choices. We must understand that affluent economies solve complex economic problems in a fluid manner that is largely unseen. We take for granted the fact that the 25 cent pencil is made from materials from Washington State, Sri Lanka, and Brazil. We do not wonder why each suc-

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<sup>1</sup>Alan Greenspan, chairman of the U.S. Federal Reserve System, quoted in the *Wall Street Journal*, Tuesday, September 21, 1999, A27.

cessive computer we buy is not only cheaper but also more powerful, that every year new jobs are created, that the products we want are in the stores when we want them. How and by whom have all these things been organized? Most economic activity, like the 25 cent pencil, the cheaper and more powerful computer, and the new job, is organized by “unseen” forces acting without any central direction or control. We shall analyze these forces throughout the chapters of this text, as we strive to bring the unseen into focus.

Economies work in complex and sometimes puzzling ways. To understand economics requires that you “think like an economist.” This is an exciting and challenging task. Economics did not spring forth from a vacuum; it was developed over many years by economists in response to various events and ideas. This chapter is the first step on your journey to understanding the major ideas of economics—their evolution and their impact on the economic events of today.

#### LEARNING OBJECTIVES

After completing this chapter you should be able to:

1. Understand the general definition of economics.
2. Be able to describe the five Defining Moments of Economics: The Industrial Revolution, the rise and fall of socialism, the Great Depression, Globalization, and the Information Revolution.
3. Understand how economics uses the scientific method to test economic theories.
4. Distinguish between positive and normative economics.
5. Recognize the logical fallacies.

**CHAPTER PUZZLE:** Will the Internet have as much of an effect on the next 500 years as the fifteenth century invention of the printing press had on the past 500 years?

## WHAT IS ECONOMICS?

The most fundamental fact of economics is that people must make choices. We cannot have everything we want. This simple fact applies to societies as well as to individuals. It applies to the rich and to the poor. Simply stated:

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**Economics** is the study of how people choose to use their limited resources (land, labor, and capital) to produce, exchange, and consume goods and services. It explains how these scarce resources are allocated among competing ends by the economic system.

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We shall expand on this definition in the next chapter when we discuss the meanings of resources, production, and exchange.

During the past one and a half centuries, as nations and their citizens have made economic choices, they have been influenced by one of two competing philosophies. The philosophy of *capitalism* maintains that private ownership and private decision making provide the best framework for creating growth and prosperity; that is, if people are simply left alone to pursue self-interests, good things will happen. The competing philosophy of *socialism* teaches that private ownership and self-interest lead to bad economic results—inequality, poverty, and depressions. Socialism argues that the state can better look after the interests of society at large through state ownership and central planning.

How we organize our economic affairs—the blend of capitalism and socialism that we select—depends on how we understand the events that shape our lives. Economists offer a framework for interpreting such events. Robert Heilbroner called the great economists of the past the “Worldly Philosophers” because, while they command no armies, they influence the way we run our world by determining what we believe about the economy and how it works.<sup>2</sup>

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<sup>2</sup>Robert Heilbroner, *The Worldly Philosophers*, 6th. ed. (New York: Simon and Schuster, 1986), esp. p. 13.

## DEFINING MOMENTS OF ECONOMICS

Our understanding of the economic aspects of our lives is conditioned by past events and ideas. Our material circumstances were not created overnight. We didn't wake up one day to discover high-technology factories, a complex legal system, an information superhighway, a transportation network, and sophisticated financial markets. All these resources and institutions are the consequence of past events.

Change occurs sometimes gradually, sometimes rapidly. Sometimes monumental changes take place that we recognize only after the fact. There are even times when we think change has occurred when it has not—and so it is with economic change.

Over the past two centuries there have taken place a number of changes so important that they have defined the direction of economics and influenced the lives of millions of people. These “defining moments” have provided the stimulus for the great economic thinkers to provide explanations that became the great theories of economic science.

A **Defining Moment of economics** is an event or idea, or a set of related events or ideas over time, that has changed in a fundamental way the manner in which we conduct our everyday lives and the way in which we think about the economy.



We focus on five Defining Moments of economics:

1. The Industrial Revolution
2. The Rise (and Fall) of Socialism
3. The Great Depression
4. Globalization
5. The Information Revolution

Each of these Defining Moments illustrates a fundamental idea of economics. The Worldly Philosophers developed powerful and influential theories to explain why each moment happened and what its consequences were. You will frequently encounter these Defining Moments throughout the text, for they define the basic themes, concepts, problems, and puzzles not only of the past but also of contemporary economic life. The issues raised by the Defining Moments—growth, affluence, poverty, cycles, trade, ownership, economic institutions—

constitute the major economic issues of the past, the present, and the future.

### 1. The Industrial Revolution: The Benefits of Voluntary Exchange

In the early eighteenth century, enormous economic changes began to take place, first in England and then in Europe and North America. These changes are now known as the Industrial Revolution.

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The **Industrial Revolution** occurred as a result of extensive mechanization of production systems that shifted manufacturing from the home to large-scale factories. This combination of scientific and technological advances and the expansion of free-market institutions created, for the first time, sustained economic growth.

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In 1700, England was primarily an agricultural nation of only 10 million people. Most of its citizens were peasants tilling the soil with simple plows; a few were merchants and artisans; a very few were the ruling aristocracy living on large estates. Their lives were not much different from those of their ancestors a century or two earlier.

At first slowly and then more quickly, factories powered by water mills and later by steam engines sprang up. Employment in industry began to outpace employment in agriculture. People flocked from the countryside to the industrial centers of London, Birmingham, and Glasgow. Inventors and scientists sought and found better ways of making products that people wished to buy. With the development of mass production techniques, costs of production fell. Products that had previously been inaccessible to the average household became affordable. The Industrial Revolution created the conditions for those increased levels of living standards that we enjoy today.

Adam Smith (1723–1790), the founder of modern economics, explained simply and eloquently the Defining Moment of the Industrial Revolution. Smith's 1776 masterpiece, *An Inquiry into the Nature and Causes of the Wealth of Nations*, combined simple theory with his prodigious learning and insights. One of the most important books ever written, *The Wealth of Nations* brought Smith lasting fame and changed forever the way we view the economy.

In his work, Smith explained the ongoing Industrial Revolution with one powerful insight. He realized through careful observation that a massive increase in production and wealth could take place spontaneously without government direction and control. Smith proposed that self-interest could be relied upon to organize our economic affairs. He wrote:

It is not from the benevolence of the butcher, the brewer, or the baker, that we expect our dinner, but from their regard to their own interest.

Adam Smith's key insight was that two parties to a voluntary exchange will both benefit. It is not necessary to direct people to engage in transactions from which they benefit. Through the pursuit of self-interest, individuals voluntarily engage in those activities in which they themselves earn the most income. Individuals contribute to the well-being of the entire society not just through charitable impulses but by self-interest. Each person, as Adam Smith said, "intends only his own gain," but is "led by an invisible hand" to promote the general interest of society through the magic of the marketplace.

Smith argued that free enterprise solves economic problems better than did the pervasive government monopolies and intrusive regulations of his day. Individuals must be allowed to make their own decisions in the pursuit of their self-interest. If they make the right decisions, the result will be profit; wrong decisions mean losses. This insight paved the way for a hands-off approach of government that allowed England, through the benefits of the Industrial Revolution, to become the world's most prosperous nation.

Much of this book describes how we compete with one another in the marketplace. One Internet service provider competes with another for customers by trying to offer better prices and better quality. Airlines fight for survival by learning how to provide safe service at a cost lower than that offered by their competitors. One architect competes with another by offering more original designs at a better price. In such a system, success is measured by profit; failure is measured by losses. It is this competition that guides the invisible hand.

Adam Smith's lesson of history is that economic growth and progress come from spontaneous interaction of self-interested individuals.

## 2. The Rise (and Fall) of Socialism

Spontaneous interactions create change. The Industrial Revolution was an event of monumental change. It increased the real wages of workers and created a middle class. People began to live longer. Birth rates rose, death rates fell, and population grew. Farmers and villagers voluntarily left their homes to seek a better life in the city. The Industrial Revolution benefited many more people than just the rich. From 1760 to 1860, the poorest 65 percent of the British population increased their average real income by over 70 percent.<sup>3</sup>

Adam Smith taught that economic life consists of successes and failures. We must compete to prosper. We pursue our self-interest, while others pursue their self-interest. There will be winners and there will be losers.

The supporters of socialism, however, chose to focus on the misfortunes imposed by the Industrial Revolution. Whereas Smith saw economic progress, they saw struggle and failure. The Industrial Revolution centralized production by shifting workers from the farm or household shop to the factory.

Industrial workers in the coal mines of England, the steel mills of Germany and France, and the textile factories of New England began to question the fairness of a system in which they performed the work and only the owners appeared to reap the rewards. They saw themselves in a class struggle with the capitalists. They formed labor unions, struck factories, and formed political parties to represent the interests of workers. The ground was fertile for socialism, our second Defining Moment.

The foremost philosopher of socialism, Karl Marx (1818–1883), wrote about the unfairness of the capitalist system in his masterwork *Das Kapital*. He explained why class struggle would lead to the eventual overthrow of capitalism and its replacement by a superior economic system called *communism*. In 1848, 72 years after the publication of *The Wealth of Nations*, Marx issued his *Communist Manifesto*, calling for the workers of the world to revolt against their capitalist bosses. Marx promised that, under communism, class conflicts would disappear, people

<sup>3</sup>See Nicholas Crafts, *British Economic Growth During the Industrial Revolution* (Oxford: Clarendon Press, 1985).

would work for pleasure, and distribution would reflect need.

After several failed attempts, socialism's next Defining Moment came with the formation of the world's first socialist government in Russia as a consequence of the Bolshevik Revolution in 1917. The Soviet communists under Lenin and Stalin began the twentieth century's greatest social experiment—the creation of a socialist economy based on state ownership and the use of state planning to replace the market. The state actions of Marx replaced the spontaneous interactions of Smith. Instructions came from the state and from the Communist party; personal initiative and innovation were discouraged; and people were told to think of the interests of society, not of their own interests.

The Soviet experiment at first appeared to yield successes. Russia escaped the Great Depression that overwhelmed the capitalist world in the 1930s. Communism spread to one-third of the world's population, engulfing Eastern Europe, China, Vietnam, Cuba, and North Korea. By the late 1950s, the leaders of the Soviet Union promised to “bury capitalism.” The reverse has happened: capitalism buried communism, not by waging war, but by providing living standards to ordinary people far above those available under communism. The Soviet Union was disbanded in 1991, and other countries from the former socialist world soon followed suit. The former socialist countries now face the difficult task of transition from socialism to capitalism.

The failure of socialism was predicted as early as the 1920s by two powerful economic thinkers. Ludwig von Mises and Friedrich Hayek, both Austrian economists, were early skeptics concerning the ability of a socialist economy to sustain itself. Like Adam Smith, von Mises and Hayek taught that we can best understand economic behavior by logically analyzing the actions of individuals. Capitalism works by making people pay for failure and benefit from success. Rewarding success and penalizing failure encourage people to work effectively. Under capitalism, the shoe manufacturer that produces at a high cost shoes no one wants will fail and disappear. Von Mises and Hayek predicted that socialism must fail because in that system, errors of judgment need not be corrected. If a shoe manufacturer loses money in a socialist state, the losses will be covered by the state. After all, it was the state that told the shoe manufacturer what to do in the first place. There is little or no incentive to keep costs low or to produce a product

that people want. Unlike the capitalist shoe manufacturer, whose investment and property are at stake, under state ownership everyone and hence no one is the owner. And, thus, no one really cares. Indeed, we shall discuss the importance of incentives throughout this text.

The lesson of socialism regarding economics is that if people do not have the incentives to use goods and services efficiently, then waste and inefficiency will result. Capitalism corrects mistakes by forcing those who make them to pay for them.

The Soviet Union was socialism's great experiment, but it was not socialism's only legacy. While Russia reacted to socialism's appeal with revolution in 1917, the rest of Europe reacted by introducing the welfare state.

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The **welfare state** provides substantial benefits to the less fortunate—unemployment insurance, poverty assistance, old-age pensions—to protect them from further economic misfortune.

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First in Germany and then in other parts of Europe, governments enacted social security legislation, government health insurance, progressive income taxes, worker safety laws, and unemployment insurance. This legislation was designed to make capitalism more humane—to reduce the risks of capitalism and to make the state responsible for those bearing the costs of capitalism.

The welfare state raises a fundamental question: To what extent are the enormous benefits of capitalism, as described by Adam Smith and Ludwig von Mises, jeopardized by a mixed economic system that makes the state rather than individuals responsible for its risks?

### 3. The Great Depression: The Cost of Progress

The Industrial Revolution in England, Western Europe, and North America created long-term economic growth. Prior civilizations (for example, the Greeks and Romans) had achieved growth but

could not sustain it. The economic growth that followed the Industrial Revolution was not perfectly even, but occurred in cycles. Although newspaper headlines spoke of financial panics and depressions, each downswing seemed to correct itself and upward progress continued. Throughout the nineteenth century and during the early part of the twentieth century, bad times were followed by good times in a seemingly endless cycle—until the late 1920s.

The Great Depression—our third Defining Moment—took hold first in Europe, and then in the United States. Overnight, people saw their paper fortunes disappear. On Wall Street, bankrupt investors hurled themselves out of skyscrapers in despair. Banks closed. Ordinary citizens lost their homes. The stock market crash of 1929 was only a financial manifestation of a larger economic phenomenon. The Great Depression itself constituted a severe and sustained drop in output and jobs.

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**The Great Depression** was a sustained period of high unemployment and falling output that occurred in Europe and North America in the 1920s and 1930s.

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Those who did not live through the Great Depression cannot possibly comprehend its effects on millions of lives. Some three years after the start of the Depression, output in the United States had fallen by one-third, and one of four people who wished to work did not have a job. It was not until the late 1930s that the economy recovered to the level of output before the market crash, and it was not until 1942 and the beginning of World War II that the unemployment rate recovered to its previous low.

The main effect of the Great Depression was to cause many Americans and Europeans to question whether growth and prosperity are automatic. The Depression created a sense of concern about the future. Prosperity was no longer something to be taken for granted. The government came to be viewed as an instrument of good to protect people against further economic downturns, both large and small.

The Great Depression was an unanticipated event of such magnitude that it required a great economist to develop a new theory explaining it. That economist was John Maynard Keynes (1883–1946), an English intellectual, teacher, journalist, and statesman.

Smith and his followers had argued that the free market would promote economic progress. In his 1936 *General Theory of Employment, Interest and Money*, Keynes advanced a theory that showed why capitalist economies are subject to periodic breakdowns that can be corrected only by massive doses of government spending. While Smith emphasized the incentives to produce goods and services, Keynes emphasized the incentives of people to buy goods and services.

Keynesian economics is the source of the idea that buying a car or a house is “good for the economy.” The importance of spending was hard to deny in the years following the Great Depression. Keynes argued that the Great Depression occurred because we did not spend enough. If there is not enough private spending, then government spending must make up the difference.

Keynes provided a justification for government spending to achieve macroeconomic objectives: If government spending is needed to keep the economy healthy, politicians can spend more without taxing. They can make their constituents happy without the pain of higher taxes. While households and businesses must be subject to financial discipline, the government need not be. Indeed, most of us are aware that until 1998 the federal government had been running deficits year after year for 50 years.

The rise in government spending and the expansion of the welfare state raise the question of the extent to which we can reap the benefits of capitalism if we protect individuals from the risks and competition of capitalism.

Another great economic thinker presented a different picture of the Great Depression. The Austrian-born American economist Joseph Schumpeter (1883–1950) developed the theory that the Great Depression had roots in technological changes that were transforming the twentieth century. His main insight was that the *business cycle* is necessary for economic progress. New products always displace old products. The automobile replaced the horse-drawn carriage; the personal computer replaced the typewriter. Schumpeter considered the Great Depression to be an event in which many different forces converged. According to Schumpeter, it was no accident that the Soviet Union escaped the Great Depression, because it also escaped the opportunity for economic progress. Progress requires the freedom to develop new goods

and new markets. Progress requires the competition of old and new ideas; progress requires winners and losers.

#### 4. Globalization

Archaeologists are astonished by evidence of trade in remote times. Bronze artifacts cast in the Middle East in 3500 B.C.E. have been found thousands of miles away in ancient French villages. Through the ages, school children have been fascinated by Marco Polo's thirteenth-century accounts of traveling from his native Venice to China in search of exotic silks and spices. Human beings have always sought out for their own use new and exotic products produced by other societies. Human beings have, as Adam Smith remarked, a "propensity to truck, barter, and exchange one thing for another." He wrote:

Nobody ever saw a dog make a fair and deliberate exchange of one bone for another with another dog. Nobody ever saw one animal by its gestures and natural cries signify to another, this is mine, that yours; I am willing to give this for that.

Although we are naturally drawn toward trading with one another, trade has grown unevenly. Trade depends on the ease of communication and the costs of transporting goods and services long distances. Marco Polo's journey to China consumed more than half his lifetime; today, the same trip can be made in one day on a commercial jet. His letters from China to Venice took years to deliver; now, such messages can be delivered in seconds by fax or e-mail.

Like the Industrial Revolution, the socialist revolution, and the Great Depression, the globalization of the world economy is a Defining Moment.

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**Globalization** refers to the degree to which national economic markets and international businesses are integrated and interrelated into a world economy.

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The participation of any economy in global markets may not take place swiftly and continuously; it may be a long-term process with stops and starts.

Globalization, like the other Defining Moments, was a response not only to inexorable events but also to a powerful economic insight—that trade benefits

both parties irrespective of their strengths and weaknesses. This insight had already paved the way for the expansion of trade in Great Britain in the nineteenth century.

Adam Smith had to argue against those who claimed that trade with other nations could lead to national bankruptcy. However, the great English economist David Ricardo (1772–1823) demonstrated that both weak and powerful nations benefit from trade by doing those things they do relatively more efficiently than others. His discovery of the surprisingly simple yet subtle law of comparative advantage (explained in later chapters) is perhaps one of the greatest contributions economics has made to our understanding of the world about us. As we will show, this law demonstrates that every country can specialize in those goods in which it has a comparative advantage, regardless of how rich or poor the country might be or how high or low its wages.

It was Ricardo's law of comparative advantage that persuaded the English Parliament to adopt a free trade policy in the first half of the nineteenth century, with the passage of the Corn Laws. The remarkable success of England's experiment with free trade forced other countries to reduce barriers to trade imposed by narrow special interest groups.

The Industrial Revolution brought forth the first strong and sustained wave of globalization of the world economy. Coal-powered boats and railroads linked markets; the telegraph and later the telephone made long-distance communication possible. The Industrial Revolution was accompanied by strong and sustained growth in international trade. Two world wars and the Great Depression halted the globalization of the world economy. However, the major powers entered the postwar era determined to avoid the mistakes of the past and to promote the growth of trade and commerce.

Thus, in the past 50 years we have experienced an explosion of international commerce and trade. We can rightly say that we are a world economy, made possible by the revolutionary developments in transportation and communication and the conscious decisions of countries to lower their barriers to trade. In the 1990s agreements to create common markets in Europe and North America provided new impulses for globalization.

A world economy has benefited our lives in a variety of ways. We now have a wealth of choices among cars, foodstuffs, computers—almost every product that we consider. Companies are no longer national in

nature: A Japanese company located in Germany can be headed by an American president. Stocks of U.S. companies are traded in Japan as we sleep, continue to be traded in London as we begin our day, and complete their trading in New York as we finish lunch. The car you drive might be made in Korea, your neighbor might work for British Petroleum, and your business loan could be from a Canadian bank. Despite its complexities, globalization has enriched our lives not only in terms of economic opportunities and options but also in a broader philosophical sense.

International trade brings broad benefits, but it hurts special interest groups. Markets that were secure are threatened by foreign competitors. Everyone must take part in competition to win customers with superior products, lower prices, or a combination of both. For example, domestic beef producers are threatened by lower-cost foreign producers. Automobile companies and their unions warn against the threat of foreign imports.

Although it brings broad benefits, globalization is opposed by special interest groups. Thus, the progress of globalization is not steady or guaranteed.

## 5. The Information Revolution

We require information to carry out economic activity. If I don't know you want to buy my product, I cannot sell it to you. The better the information businesses have on prices and competitive products, the more efficiently they can be run. Stock markets cannot function without up-to-date information on who wants to buy, who wants to sell, and at what prices. When information is costly, economic activity is limited; when the costs of information decline, prosperity should increase. Economists also have long recognized that improving knowledge is the major factor behind rising living standards. If information on newly created knowledge can be spread and used rapidly, prosperity should increase. Information is like the cost of labor and materials. Producers and consumers get the same benefits when information becomes cheaper that they get when material costs become cheaper.

The monumental increase in information technology over the past two decades is our fifth Defining Moment:

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The staggering improvements in our ability to create, use, and exchange information that have accompanied the vast improvements in information technology (computerization, the Internet, wireless telephones) are termed the **Information Revolution**.

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The Information Revolution is entering its third decade. Therefore, we still do not know what its long-run effects will be. It was initiated by a series of inventions—the transistor, the semiconductor, the silicon chip, fiber optics, microprocessors, cable TV—all of which brought together the computer's ability to generate and process information with telecommunications' ability to transmit it.

The Information Revolution was not caused by science alone; it would not have occurred without changes in economic policy. Key steps in creating the Information Revolution were the U.S. government's decision to deregulate telecommunications and television broadcasting—steps followed by governments in England, Europe, Japan, and Latin America. Competition in telecommunications created new broadcast frequencies, which provided entrepreneurs with new ways to transmit information by regular phone lines, wireless transmissions, and underground television cable. Improvements in our ability to transmit information would have been meaningless if there were no one to receive this information. Our ability to receive and process vast amounts of information was made possible by the spread of ever cheaper and ever more powerful personal computers.

As with the Industrial Revolution, the Information Revolution was spurred by farsighted entrepreneurs and entrepreneurial companies, such as Bill Gates (Microsoft), Gordon Moore (Intel), Steve Jobs (Apple Computer), CompuServe and AOL, the inventor of the World Wide Web, Timothy Berners-Lee, or the developer of the Web browser, Marc Andreessen, all of whom saw profit opportunities in information technology.<sup>4</sup> A short 15 years ago, callers could make their local or long distance calls through only one provider, and international long distance calls cost several dollars per minute—if they could be placed at all. Documents could be sent only

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<sup>4</sup>Tim Berners-Lee, *Weaving the Web* (San Francisco: Harper, 1999).

by the U.S. Postal Service: there was no FedEx or UPS to promise overnight delivery. There were no fax transmissions. A business wishing to send papers across town had to use messenger services. Businesses used to have throngs of clerks, armed with pencils and paper, to keep track of inventories; now inventories are tracked by electronic scanners that place automatic orders for goods in short supply. Retailers previously could sell goods only by setting up expensive stores; now they can sell through the Internet. Scientists can disseminate their latest results instantaneously on the World Wide Web.

When economists are confronted with a new Defining Moment, like the Information Revolution, they must study its effects. Some economists, such as Nobel laureate George J. Stigler, anticipated the effects of an Information Revolution by pointing out the advantages of reducing the cost of information. Others, such as Paul Romer, are currently studying the effects of an Information Revolution on long-term economic growth and concluding that the future of the world economy is bright. At some point in the future, we will have a new Defining Moment economist, whose work will be forever associated with the Defining Moment of the Information Revolution.

## ECONOMIC THEORY AND THE SCIENTIFIC METHOD

The economy is a complex mixture of many types of decision makers, each with different goals and knowledge about how things work. The U.S. economy is made up of millions of households and firms, and thousands of separate federal, state, and local governments. Each makes production and consumption decisions. Consumers want to pay low prices for the things they buy and earn high wages. Firms want to charge high prices and pay low wages. Automobile companies want low-priced steel; steel companies want high-priced steel. Gathering information about all these choices is a complex task. It is essential to abstract from the irrelevant or unimportant facts in order to gain an understanding of the way the economy works.

### Economic Theories and Models

Smith, Marx, Keynes, Schumpeter, and Ricardo all explained events by formulating economic *theories* of how the world works. Theories can cover the

workings of an entire economy or limit their scope to explain, for example, what happens to consumer spending when prices change. Simply defined:

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A **theory** is a simplified and coherent explanation of the relationship among certain facts.

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The most important economic theories explain in a logical manner the Defining Moments we have just discussed. Adam Smith explained how an industrial revolution could occur using a system of free enterprise. Karl Marx explained how people might turn to socialism. Von Mises and Hayek explained why socialism would fail. John Maynard Keynes sought to explain the Great Depression. When the industrialized countries experienced rising inflation and rising unemployment in the 1970s and 1980s, new and powerful theories were put forward to explain this unusual phenomenon.

The world is so complicated that all theories, economic or physical, must be devised by eliminating irrelevant facts and concentrating on only the most important relevant ones. For example, in explaining the demand for gasoline, the color of cars—black, white, or red—is not important and should be ignored. Other things, however, like the price of gasoline or the incomes of automobile owners, may be important and should be considered. Economic theories focus on the most important systematic factors that explain economic behavior.

For example, we might theorize that the demand for coffee depends inversely on the price of coffee and positively on the price of tea. A model illustrating this theory might show that an increase in the price of coffee by \$1 would reduce worldwide sales by one million pounds. Models can be illustrated by graphs, equations, or words; they show the concrete workings of the theory.

### The Scientific Method

Economic theories are not fanciful abstract exercises; they must explain the real world to be useful. If a theory is not supported by the facts, it should be discarded in favor of one that is. How do we know that a theory is correct? A theory is a simplified explana-

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<sup>5</sup>Richard Feynman, “*Surely You’re Joking, Mr. Feynman!*” *Adventures of a Curious Character* (New York: Bantam Books, 1986), pp. 311–312.

tion of the relationship between two or more facts. You observe that when the price of videocassettes rises, the number that are sold falls. To explain this observation, you come up with the following theory: “People have allocated so many dollars to the purchase of videocassettes. Thus, if the price rises, people must buy fewer units in order to keep from exceeding their budget.” You check the actual facts and find that as the price of videos fell, people spent more dollars on videos. This finding would refute your theory, which requires that people spend the same amount.

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The **scientific method** is the process of formulating theories, collecting data, testing theories, and revising theories.

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This simple example shows that the scientific method requires confronting theories with additional facts. The scientific method enables us to evaluate our beliefs in a way that can be tested by others. The Nobel physicist Richard Feynman put it this way:

If you make a theory, . . . and advertise it, or put it out, then you must also put down all the facts that disagree with it, as well as those that agree with it. . . . You want to make sure, when explaining what it fits, that those things it fits are not just the things that gave you the idea for the theory; but that the finished theory makes something else come out right, in addition.<sup>5</sup>

The advantage of learning a theory is that you are freed from having to learn the facts of each situation covered by the theory. If the theory is correct, the facts of each situation will be consistent with it.

According to the scientific method, a theory that does not work in practice cannot be a good theory. Finding that a theory does not fit the facts leads to new theories that cover more experience. In science, this process represents progress. The Italian economist Vilfredo Pareto (1848–1923) once remarked,

Give me a fruitful error anytime, full of seeds, bursting with its own corrections. You can keep your sterile truth for yourself.


### Logical Fallacies

Logical fallacies plague all scientific thinking. The three most common to economics are the *ceteris paribus fallacy*, the *false-cause fallacy*, and the *false fallacy of composition*.

Economic phenomena are complicated; they are generally caused by several factors. Consider a videocassette example in which you observe that the number of units that are sold increases when the price rises. Does this mean that price increases cause customers to buy more? In this case, we might suspect that the number of videocassettes sold depends on something other than the price. Income may be increasing, so the number of buyers may be increasing along with the prices of videocassette recorders. To understand the true relationship between the price of cassettes and units sold (which we presume to be negative), we must hold these other factors constant. To conclude from these facts that a higher price brings about greater sales is a *ceteris paribus* fallacy.

*Ceteris paribus* is a Latin term meaning “other things being equal.” Any attempt to establish the relationship between two factors must hold constant the effects of other factors to avoid confusing the relationship; otherwise, the *ceteris paribus* problem will occur.

To understand how one factor affects another, we must be able to sort out the effects of all other relevant factors. An entire branch of economics, econometrics, combines economic theory and statistics to deal with the *ceteris paribus* problem.



The ***ceteris paribus* problem** occurs when the effect of one factor on another is masked by changes in other factors.

Consider the odd fact that in 20 of the last 23 years, the stock market rose when the National Football Conference team won the Super Bowl and fell when it lost. To conclude that the one event (the NFC team wins the Super Bowl) caused the other event (a rise in stock market prices) is a false-cause fallacy. Some people even buy or sell in the stock market on the basis of which team wins the Super Bowl!

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The **false-cause fallacy** is the assumption that because two events occur together, one event has caused the other.

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Economic theory tries to establish in a scientific manner whether a cause-and-effect relationship exists. Since there is no logical reason for a football game to affect the stock market, we must reject a cause-and-effect relationship. Economics, however,

can offer a number of logical theories that specify cause-and-effect relationships between variables (such as the overall state of the economy, interest rates, expectations of inflation) and the stock market.

The third major fallacy involves reasoning from special cases to the general case, or the reverse. Imagine a fire in a crowded movie theater. If *one* of us runs to the exit, he or she will escape unharmed. If *all* of us run to the nearest exit, few will escape unharmed. It is a *fallacy of composition* to suppose that what is true for one is true for all.

If your employer replaces you with a robot, you would rightly complain that the robot has put you out of a job. But beware of committing a fallacy of composition. If you say, “robots are destroying American jobs,” you have fallen into a logical trap. For the whole economy, robots might be increasing the number of jobs of all types. It is only correct for you to say that the robot took your particular job, and now you have to find a new one!

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The **fallacy of composition** is the assumption that what is true for each part taken separately is also true for the whole or, in reverse, that what is true for the whole is true for each part considered separately.

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### Positive and Normative Economics

We often hear people joke about getting “six different answers from five economists.” This image of disagreement is a distortion of the truth. There is, in fact, considerable agreement among economists about what *can* be done.

Economists agree that widespread freezes in citrus-growing areas raise citrus prices, that rising gas prices reduce gas consumption, and that price controls cause shortages. Disagreements about “what is” focus primarily on complex phenomena like inflation, unemployment, and business cycles. We can use the scientific method to test the theories of positive economics.

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**Positive economics** is the study of how the economy works; it explains the economy in measurable terms.

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There is, however, considerably more disagreement over what *ought to* be done. You will find economists disagreeing on whether we should have government-mandated universal health insurance;

whether income taxes should be lowered for the middle class, the rich, or the poor; whether there should be job programs for the poor. These disagreements are only partly over “what is.” We may agree on what will happen if program A is chosen over program B, but we may disagree sharply over the desirability of those consequences.

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**Normative economics** is the study of what ought to be in the economy; it is value based and cannot be tested by the scientific method.

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Disagreements in other sciences are less visible than in economics. Theoretical physicists still disagree about the physical nature of the universe, but this controversy is understood by only a few theoretical physicists. On the other hand, economic disputes attract immediate attention. We are concerned about whether inflation will accelerate, whether we will lose our jobs, or whether interest rates will fall. We all want to know what the future holds in store.

Should economists be able to foresee the future? If they cannot correctly predict what will happen, does this mean that economics has failed? Some events can, indeed, be predicted. If gas prices rise sharply, we shall eventually buy less gas. Other events—such as stock market fluctuations, inflation, or the business cycle—are difficult if not impossible to predict. As we shall see in later chapters, economic principles themselves imply that systematically correct predictions about complex economic phenomena are not possible.

### UNANSWERED QUESTIONS

The five Defining Moments of economics we have discussed reveal the major issues of economics that will occupy our attention in this text—growth, business cycles, unemployment, inflation, competition, incentives, economic systems, and technology.

Economics is constantly evolving as events unfold. There will be new Defining Moments, and future economists must establish important theories to explain them. In fact, today there is much economists do not know or can explain only poorly. For example:

1. They do not understand well how to dismantle socialist economic systems to return them to capitalism. This task will probably occupy us for the next quarter century.

2. They do not fully understand the business cycle—why economies are still subject to ups and downs—despite the powerful explanations of Keynes and Schumpeter.

3. They do not understand how to measure the links between technological advances, the business cycle, and the true rate of economic growth.

If we knew the answers to these and other economic questions, economics would not be the exciting field of study it is. Because we are still searching for answers, we require building blocks of knowledge to formulate explanations.

In the next chapter let us use some of the tools of the scientific method to understand how economic choices are made in a world of scarce resources. What are the costs of making choices? What arrangements are used to resolve the problem of choice?

Graphical analysis makes these questions easier to answer. As an aid to using these tools, we shall review the guidelines for working with graphs in the appendix to this chapter.

economy, and the Information Revolution. Each Defining Moment is associated with a great economic idea. Adam Smith explained the Industrial Revolution; Karl Marx, the appeal of socialism; John Maynard Keynes and Joseph Schumpeter, the Great Depression; David Ricardo, the benefits of globalization; and Ludwig von Mises and Friedrich von Hayek, the weaknesses of socialism. The economist identified with the Information Revolution is yet to be determined.

2. Theory allows us to make sense of the real world and to learn how the facts fit together. There is no conflict between good theory and good practice. Economic theories are based on the scientific method of hypothesis formulation, collection of relevant data, and testing of theories.

3. The *ceteris paribus* problem occurs when it is difficult to determine relationships between two factors because other factors have not been held constant.

4. Two other logical fallacies plague economic analysis: the false-cause fallacy (assuming that event A has caused event B because A is associated with B) and the fallacy of composition (assuming that what is true for each part taken separately is true for the whole or, conversely, assuming that what is true for the whole is also true for each part).

5. Economists tend to agree on positive economic issues (what is), whereas they tend to disagree on normative issues (what ought to be). Disagreements among economists are more visible to the public eye than disagreements in other scientific professions.

## KEY TERMS

economics 5  
 Defining Moment of economics 5  
 Industrial Revolution 6  
 welfare state 8  
 Great Depression 8  
 globalization 10  
 Information  
 Revolution 11  
 theory 12  
 scientific method 12  
*ceteris paribus*  
 problem 13  
 false-cause fallacy 13  
 fallacy of  
 composition 13  
 positive economics 13  
 normative  
 economics 14

## SUMMARY

1. The Defining Moments of economics are the Industrial Revolution, the rise (and fall) of socialism, the Great Depression, the globalization of the world

## QUESTIONS AND PROBLEMS

1. In what ways has the growing globalization of the economy changed our everyday lives?
2. Explain how you would use the scientific method to determine what factors cause the grade point averages of students in your class to differ.

3. "If I stand up at the game, I will see better."  
Explain under what conditions this statement is true and under what conditions it is a logical fallacy. Also explain which logical fallacy is involved.
4. "The price of corn is low today because people are now watching too much TV." This statement is a potential example of which logical fallacy (or fallacies)?
5. Economists are more likely to agree on the answers to which of the following questions? Why?
  - a. Should tax rates be lowered for the rich?
  - b. How would lowering tax rates for the rich affect economic output?
  - c. How would an increase in the price of VCRs affect purchases of VCRs?
  - d. Should government defense expenditures be reduced?
  - e. How would an increase in military spending affect employment?
6. "The severe heat and drought this summer substantially reduced revenue from wheat and corn crops in the Midwest. The incomes of all wheat and corn farmers therefore will fall." Which

logical fallacy may be involved in this statement and why?

7. Use the data in Table A to devise some simple theories and to test them against "the facts."

TABLE A

	1990	1997
New passenger cars (millions sold)	9.3	8.3
New car prices (1990 = 100)	100	120
Personal income (billions of dollars)	4977	7132

Source: <http://www.Economagic.com>

8. Can we say that the data in Table A "prove" the theory? Is it better to say that they "support" the theory?
9. Identify which of the following statements are theories (or hypotheses).
  - a. The U.S. population rose more rapidly in the 1950s than in the 1990s.
  - b. People who get severely sunburned are more likely to develop skin cancer.
  - c. An increase in income causes people to buy more consumer goods.
  - d. The United States and Western Europe have the highest incomes among the world's nations.
  - e. Cats can see better in the dark than dogs.
  - f. If people believe that a product is hazardous to their health, they will consume less of it.
10. Marx, von Mises, and Hayek had quite different views of socialism. Explain their basic differences of opinion.
11. What was the Industrial Revolution? How does it differ from the Information Revolution?

### INTERNET CONNECTION

12. Using the links from [http://www.awl.com/ruffin\\_gregory](http://www.awl.com/ruffin_gregory), read the article "Economic Development for the 21st Century: New Measures of Well-Being" on the Federal Reserve Bank of Minneapolis Web site.
  - a. According to the author, how should one measure well-being?