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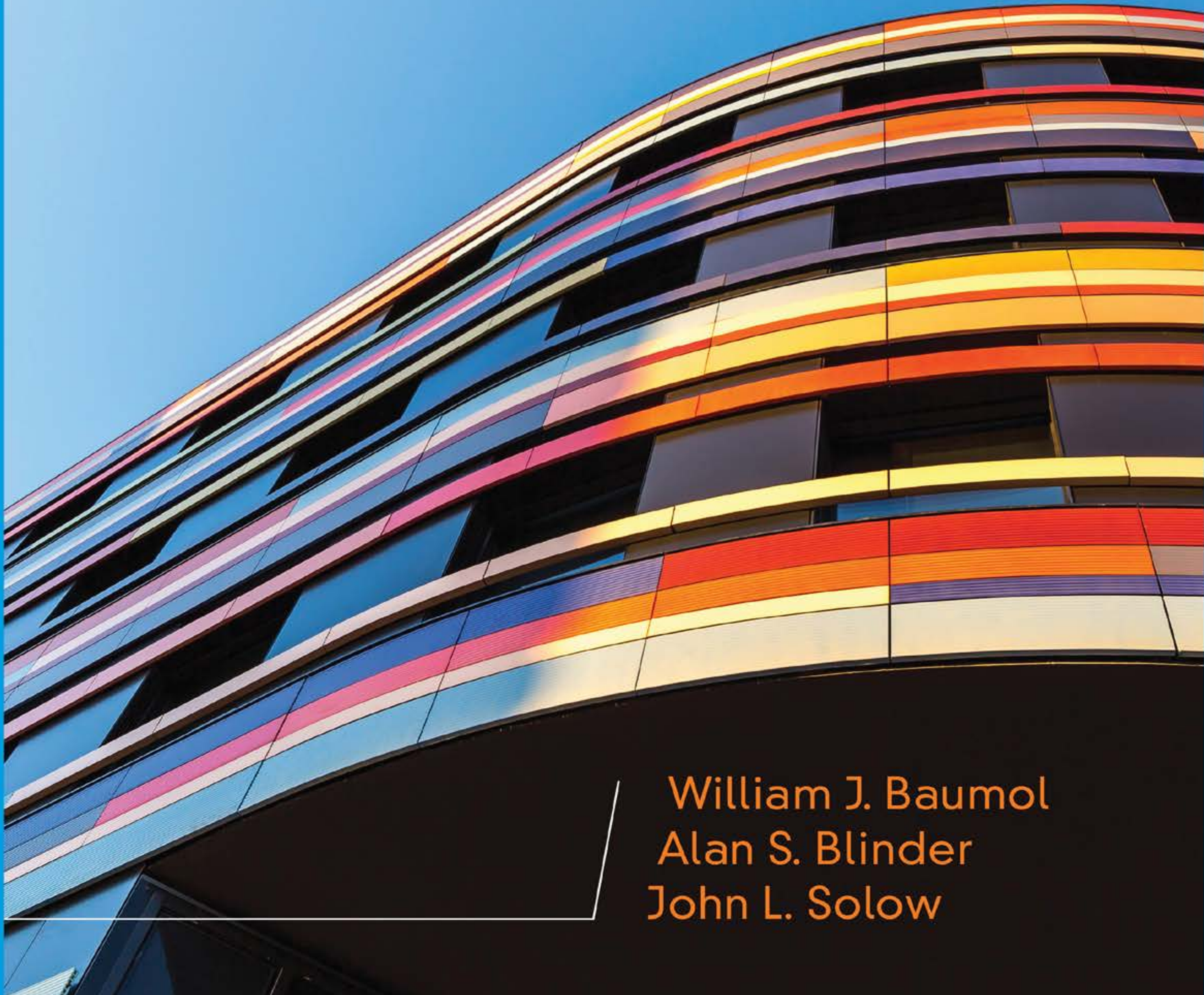
Fourteenth Edition

MACROECONOMICS

PRINCIPLES and POLICY



William J. Baumol
Alan S. Blinder
John L. Solow

Fourteenth Edition

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PRINCIPLES and POLICY

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***Macroeconomics: Principles and Policy,* Fourteenth Edition**

William J. Baumol, Alan S. Blinder, and John L. Solow

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To our wonderful wives, Madeline Blinder and Catherine Solow.

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PREFACE

It can be argued that, from the point of view of the general welfare, there are three topics of overriding importance in economics. One is the analysis of recessions and depressions, with the unemployment and general impoverishment they periodically bring. The second is economic growth and rising productivity, which, in the long run, is the way to raise standards of living in our country and throughout the world. The third is the distribution of income, where the issues of poverty and inequality take center stage.

In earlier editions of this book, before the problems stemming from the terrible worldwide economic crisis known as the Great Recession of 2007–2009 claimed—or perhaps we should say *reclaimed*—the spotlight, the new materials that we added from one edition to the next focused on the growth issue. Then, for two editions, the biggest changes came in the macroeconomic portions of the book, especially the parts relevant to understanding the financial crisis and the Great Recession. Those changes remain in this fourteenth edition—including the abandonment, almost unique among principles books, of pretending that there is only one interest rate. Instead, we explain and discuss the implications of having many different interest rates, based on differential risk.

The biggest changes in this edition come in the microeconomic portions of the book. We have reorganized several chapters substantially to highlight, first, the economist's argument for free markets—namely, that competitive markets lead to efficient allocations of resources—before turning to the presence of monopoly power and other market failures that lead to inefficient outcomes. The latter include expanded discussions of asymmetric information and the common-property resource problem.

In addition, we have added an entirely new chapter to this edition (Chapter 37) that examines 10 major economic concerns facing the society now and in the future—issues that will affect the lives of current students well after they graduate: Will artificially intelligent machines take their jobs? Who will pay for their health insurance? Is the national debt growing out of control? Will they benefit or be injured by globalization and are trade wars the answer? In each case, lessons learned in earlier chapters are relevant to the issue. But in each case, there are also important unanswered questions.

As in past revisions, this one includes literally hundreds of small changes to improve clarity of exposition and especially to update the text—both for relevant advances in economics and for recent events, particularly the aftermath of the Great Recession and the changes wrought by the Trump administration.

NOTE TO THE STUDENT

May we offer a suggestion for success in your economics course? Unlike some of the other subjects you may be studying, introductory economics is cumulative: Each week's lesson builds on what you have learned prior to that. You will save yourself a lot of frustration—and a lot of work—by keeping up on a week-to-week basis.

To assist you in doing so, we provide a chapter summary, a list of important terms and concepts, a selection of questions to help you review the contents of each chapter, as well as the answers to odd-numbered Test Yourself questions. Making use of these learning aids will help you master the material in your economics course. For additional assistance, we have prepared student supplements to help in the reinforcement of the concepts in this book and provide opportunities for practice and feedback.

MindTap

MindTap is a personalized teaching experience with relevant assignments that guide students to analyze, apply, and improve thinking, allowing you to measure skills and outcomes with ease.

- Personalized Teaching: Becomes yours with a Learning Path that is built with key student objectives. Control what students see and when they see it. Use it as-is or match it to your syllabus exactly—hide, rearrange, add, and create your own content.
- Guide Students: A unique learning path of relevant readings, multimedia, and activities that move students up the learning taxonomy from basic knowledge and comprehension to analysis and application.
- Promote Better Outcomes: Empower instructors and motivate students with analytics and reports that provide a snapshot of class progress, time in course, and engagement and completion rates.

MindTap for this edition has been thoroughly revised and improved to provide students with more resources and an enhanced learning experience. In addition to Aplia homework and flashcards, MindTap now also includes a bank of practice quiz questions for students to test themselves, GraphBuilder exercises in the interactive ebook, News Analysis articles, and Video Problem Walkthroughs.

Aplia

Aplia saves instructors valuable time they would otherwise spend on routine grading while giving students an easy way to stay on top of coursework with regularly scheduled assignments. Currently, Aplia supports college-level courses and has been used by more than 1,000,000 students at over 1,300 institutions. Aplia's economics students use interactive chapter assignments, tutorials, news analyses, and experiments to make economics relevant and engaging. Math and graphing tutorials help students overcome deficiencies in these crucial areas. Economics articles from top news sources challenge students to connect current events to course concepts.

End of Chapter and traditional homework problem sets allow students to work through the economic concepts they have learned in each chapter. Students can choose to "Grade It Now" on a homework problem and will receive instant feedback whether an answer is correct or incorrect. Students can then choose to complete another problem to test themselves on the same concept with randomization. Aplia End of Chapter will also be mobile enabled.

IN GRATITUDE

Our friends and colleagues Dean Alderucci, *New York University*; Rebecca Blank, *University of Michigan*; Gregory Chow, *Princeton University*; Avinash Dixit, *Princeton University*; Susan Feiner, *University of Southern Maine*; Claudia Goldin, *Harvard University*; Ronald Grieson, *University of California, Santa Cruz*; Daniel Hamermesh, *University of Texas*; Yuzo Honda, *Osaka University*; Peter Kenen, *Princeton University*; Melvin Krauss, *Stanford University*; Herbert Levine, *University of Pennsylvania*; Burton Malkiel, *Princeton University*; Edwin Mills, *Northwestern University*; Janusz Ordover, *New York University*; David H. Reiley Jr., *University of Arizona*; Uwe Reinhardt, *Princeton University*; Harvey Rosen, *Princeton University*; Joseph Seneca, *Rutgers University*; William Silber, *New York University*; Robert M. Solow, *MIT*; Laura Tyson, *University of California, Berkeley*; Martin Weitzman, *Harvard University*; and Lawrence White, *New York University* have all given generously of their knowledge in particular areas over the course of 14 editions. We have learned much from them and have shamelessly relied on their help. Alan Blinder also thanks Melissa Reed for research assistance in bringing this edition up to date.

Finally, we must acknowledge—with joy—our continuing debt to our wives, Hilda Baumol (the widow of the late William Baumol), and to Madeline Blinder, and Catherine Solow. They have suffered through the inescapable neglect and distraction that each new edition has imposed, for some as many as 14 times. Their tolerance and understanding have made no minor contribution to the project. We thank them most sincerely.

ABOUT THE AUTHORS

William J. Baumol

William J. Baumol, who was the co-author (with Alan Blinder) for the first 13 editions of this book, passed away in 2017 at the age of 95. He was born in New York City and received his BSS at the College of the City of New York and his Ph.D. at the University of London.

At his death, he was the Harold Price Professor of Entrepreneurship Emeritus at New York University, where he taught a course in introductory microeconomics, and the Joseph Douglas Green, 1895, Professor of Economics Emeritus and Senior Economist at Princeton University. He was a frequent consultant to the management of major firms in a wide variety of industries in the United States and other countries as well as to a number of governmental agencies. In several fields, including the telecommunications and electric utility industries, current regulatory policy is influenced by his explicit recommendations. Among his many contributions to economics are research on the theory of the firm, the contestability of markets, the economics of the arts and other services—the "cost disease of the services" is often referred to as "Baumol's disease"—and economic growth, entrepreneurship, and innovation. In addition to economics, he taught a course in wood sculpture at Princeton for about 20 years and was an accomplished painter.

Professor Baumol was president of the American Economic Association and three other professional societies, an elected member of the National Academy of Sciences, the American Philosophical Society, and the recipient of 11 honorary degrees.

Baumol was the author of hundreds of journal and newspaper articles and more than 45 books, including *Global Trade and Conflicting National Interests* (2000); *The Free-Market Innovation Machine* (2002); *Good Capitalism, Bad Capitalism* (2007); *The Microtheory of Innovative Entrepreneurship* (2010); and *The Cost Disease* (2012). His writings have been translated into more than a dozen languages.

Alan S. Blinder

Alan S. Blinder was born in New York City and attended Princeton University, where one of his teachers was William Baumol. After earning a master's degree at the London School of Economics and a Ph.D. at MIT, Blinder returned to Princeton, where he has taught since 1971, including teaching introductory macroeconomics since 1977. He is currently the Gordon S. Rentschler Memorial Professor of Economics and Public Affairs.

In January 1993, Blinder went to Washington as part of President Bill Clinton's first Council of Economic Advisers. Then, from June 1994 through January 1996, he served as vice chairman of the Federal Reserve Board. He thus played some role in formulating both fiscal and monetary policies, two topics discussed extensively in this book. He has also advised several presidential campaigns and numerous politicians.

Blinder has consulted for a number of the world's largest financial institutions, testified dozens of times before congressional committees, and been involved in several entrepreneurial start-ups. For many years, he has written newspaper and magazine articles on economic policy, including regular columns for the *Boston Globe*, *BusinessWeek*, and *The New York Times*. Currently, he has a regular monthly column in *The Wall Street Journal*. Blinder also appears frequently on PBS, CNBC, Bloomberg TV, and elsewhere. His book on the financial crisis (*After the Music Stopped*, Penguin, 2013) garnered many accolades and was a *New York Times* best-seller. His latest (non-textbook) book, *Advice and Dissent* (Basic Books, 2018) is about the clash between economics and politics.

Blinder has served as president of the Eastern Economic Association and vice president of the American Economic Association, which elected him a Distinguished Fellow in 2011. He has won numerous awards, including the Council for Economic Education's Visionary Award. He is a member of the American Philosophical Society, the American Academy of Arts and Sciences, the American Academy of Political and Social Science, and the Council on Foreign Relations.

Blinder and his wife have two grown sons, three grandsons, and live in Princeton, NJ.

John L. Solow

John L. Solow was born in Boston and attended Yale University. After spending a year at the Federal Energy Administration, he earned a master's degree and a Ph.D. in Economics at Stanford University. He taught at the University of Iowa from 1981 to 2019, and has taught Principles of Microeconomics since 1988. He is currently the White-Xander Professor of Economics in the College of Business at the University of Central Florida.

Solow has published articles in the areas of industrial organization and sports economics, and his research interests include sports economics, antitrust law and economics, and public policy. He has worked at the Electric Power Research Institute, served as a consultant to the U.S. Departments of Energy and Justice, Mid-American Energy, Qwest Telecommunications and numerous law firms, providing expert testimony in antitrust lawsuits. He has been a visiting scholar at Stanford University, the University of Auckland in New Zealand, and Monash University in Australia. Professor Solow is a member of the American Economic Association, the Western Economic Association, and the North American Association of Sports Economists.

Solow and his wife have a grown daughter and son, and live in Orlando, FL. He enjoys sailing, travel, and all Boston sports.

PART 1

Getting Acquainted with Economics

Welcome to economics! Some of your fellow students may have warned you that "econ is boring." Don't believe them—or at least, don't believe them too much. It is true that studying economics is hardly pure fun—we'll make you exercise your brain. But, a first course in economics can be an eye-opening experience. There is a vast and important world out there—the *economic* world—and this book is designed to help you understand it.

Have you ever wondered whether jobs will be plentiful or scarce when you graduate, or why college education becomes ever more expensive? Should the government be suspicious of big firms? Why can't pollution be eliminated? What happened to the U.S. economy in 2008–2009, and why has it performed so much better lately? If any of these questions have piqued your curiosity, read on. You may find that economics is more interesting than you thought!

It is only in later chapters that we will begin to give you the tools you need to begin carrying out your own economic analysis. However, the four chapters of Part 1, listed below, will introduce you to both the subject matter of economics and some of the methods that economists use to study their subject.

CHAPTERS

WHAT IS ECONOMICS? 1

Why does public discussion of economic policy so often show the abysmal ignorance of the participants? Why do I so often want to cry at what public figures, the press, and television commentators say about economic affairs?

ROBERT M. SOLOW, WINNER OF THE 1987 NOBEL PRIZE IN ECONOMICS

Economics is a broad-ranging discipline, both in the questions it asks and the methods it uses to seek answers. Many of the world's most pressing problems are economic in nature. The first part of this chapter gives you some idea of the sorts of issues that economic analysis helps to clarify and the kinds of solutions that economic principles suggest. The second part briefly introduces some tools that economists use. You are likely to find some of these tools useful in your career, personal life, and role as an informed citizen, long after this course is over.

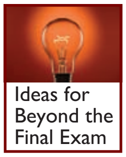
CONTENTS

1-1 IDEAS FOR BEYOND THE FINAL EXAM

Elephants may never forget, but people do. We realize that most students forget much of what they learn in a course—perhaps with a sense of relief—soon after the final exam. That's life. Nevertheless, we hope you will remember some of the most significant economic ideas and, even more important, the ways of thinking about economic issues that will help you evaluate policies in the future.

To help you identify some of the most crucial concepts, we have selected 7 from the many in this book. Some offer key insights into the workings of the economy, and several bear on important policy issues that appear in media; others point out common misunderstandings that occur among even thoughtful observers. Many of them indicate that it takes more than just good common sense to analyze economic issues effectively. As the opening quote of this chapter suggests, many politicians who failed to understand basic economic principles could have made wiser decisions. The same holds for judges, university administrators, and even business executives.

Try this one on for size. If Chinese companies can produce *every* manufactured good more cheaply than American companies can (which, by the way, is not true), must the United States lose by opening up trade with China? Would all American manufacturing jobs vanish? The perhaps surprising answer is: no. (See Idea 3.)



The 7 "Ideas for Beyond the Final Exam," many of which are counterintuitive, will be sketched briefly here but discussed in depth when they occur in the course of the book—where they will be called to your attention by the special icon in the margin. Don't expect to master these ideas fully now, but as you read the book, notice how some of the ideas arise again and again in different contexts. By the end of the course, you will have a better grasp of when common sense works and when it fails, and you will be able to recognize common fallacies that are all too often offered by public figures, the press, and television commentators.

1-1a Idea 1: How Much Does It Really Cost?

Because no one has infinite riches, people are constantly forced to make choices. If you purchase a new computer, you may have to give up that trip you had planned. If a business decides to retool its factories, it may have to postpone its plans for new executive offices. If a government expands its defense program, it may be forced to reduce its outlays on civilian infrastructure.

The **opportunity cost** of any decision is the value of the next best alternative that the decision forces the decision maker to forgo.

Economists say that the true costs of such decisions are not the number of dollars spent on the computer, the new equipment, or the military, but rather *the value of what must be given up in order to acquire the item*—the vacation trip, the new executive offices, the roads and bridges. These are called **opportunity costs** because they represent the opportunities the individual, firm, or government must forgo to make the desired expenditure. Economists maintain that rational decision making must be based on opportunity costs, not just dollar costs (see Chapter 3). And as we will see later, taking opportunity cost into account in your personal planning will help you to make more rational decisions.

The cost of a college education provides a vivid example. How much do you think it *costs* to go to college? Most people are likely to answer by adding together their expenditures on tuition, room and board, books, and the like, and then deducting any scholarship funds they may receive. Suppose that amount comes to $20,000.

Economists keep score differently. They first want to know how much you would be earning if you were not attending college. Suppose that salary is $25,000 per year. This may seem irrelevant, but because you *give up* these earnings by attending college, they must be added to your tuition bill. You have that much less income because you are attending college. On the other side of the ledger, economists would not count *all* of the university's bill for room and board as part of the costs of your education. They would want to know how much *more* it costs you to live at school rather than at home. Economists would count only these *extra* costs as an educational expense because you would have incurred these costs whether or not you attended college. On balance, college is probably costing you much more than you think.

1-1b Idea 2: Attempts to Repeal the Laws of Supply and Demand—The Market Strikes Back

When a commodity is in short supply, its price naturally tends to rise. Sometimes disgruntled consumers badger politicians into "solving" this problem by making the high prices illegal—by imposing a ceiling on the price. Similarly, when supplies are plentiful—say, when fine weather produces extraordinarily abundant crops—prices tend to fall. Falling prices naturally dismay producers, who often try to get legislators to impose price floors.

Such attempts to repeal the laws of supply and demand usually backfire and sometimes produce results virtually the opposite of those intended. Where rent controls are adopted to protect tenants, housing grows scarce because the law makes it unprofitable to build and maintain apartments. When price floors are placed under agricultural products, surpluses pile up because people buy less.

As we will see in Chapter 4 and elsewhere in this book, such consequences of interference with the price mechanism are not accidental. They follow inevitably from the way in which free markets work.

1-1c Idea 3: The Surprising Principle of Comparative Advantage

China today produces many products that Americans buy in huge quantities, including toys, textiles, and electronic equipment. American manufacturers often complain about Chinese competition and demand protection from the flood of imports that, in their view, threatens American standards of living. President Trump has made such complaints one of the bases of his trade policy. Is this view justified?

Economists think that it is often false. They maintain that both sides normally gain from international trade. But what if the Chinese were able to produce *everything* more cheaply than we can? Wouldn't Americans be thrown out of work and our nation be impoverished?

A remarkable result, called the principle of *comparative advantage,* shows that, even in this extreme case, the two nations could still benefit by trading and that each could gain as a result! We will explain this principle first in Chapter 3 and then more fully in Chapter 18. For now, a simple parable will make the reason clear.

Suppose Sally grows up on a farm and is a whiz at plowing, but she is also a successful country singer who earns $4,000 per performance. Should Sally turn down singing engagements to leave time to work in the fields? Of course not. Instead, she should hire Alfie, a much less efficient farmer, to do the plowing for her. Sally may be better at plowing, but she earns so much more by singing that it makes sense for her to specialize in that and leave the farming to Alfie. Although Alfie is a less skilled farmer than Sally, he is an even worse singer.

So Alfie earns his living at a job at which he at least has a *comparative* advantage (his farming is not as inferior as his singing), and both Alfie and Sally gain from the trade. The same is true of two countries. Even if one of them is more efficient at everything, both countries can gain by producing the things they do best *comparatively*.

1-1d Idea 4: Trade Is a Win–Win Situation

One of the most fundamental ideas of economics is that both parties must expect to gain something in a voluntary exchange. Otherwise, why would they have agreed to the deal? This principle seems self-evident, yet it is amazing how often it is ignored in practice.

For example, it was widely believed for centuries that in international trade one country's gain from an exchange must be the other country's loss (Chapter 18). Analogously, some people feel instinctively that if Ms. A profits handsomely from a deal with Mr. B, then Mr. B must have been exploited. Laws sometimes prohibit mutually beneficial exchanges between buyers and sellers—as when a loan transaction is banned because the interest rate is "too high", or when a willing worker is condemned to remain unemployed because the wage she is offered is "too low", or when the resale of tickets to sporting events ("ticket scalping") is outlawed even though the buyer is happy to get the ticket that she could not obtain at a lower price (Chapter 4).

In every one of these cases, well-intentioned but misguided reasoning blocks the possible mutual gains that arise from voluntary exchange and thereby interferes with one of the most basic functions of an economic system (see Chapter 3).

1-1e Idea 5: Government Policies Can Limit Economic Fluctuations—But Don't Always Succeed

One of the most persistent and troubling problems of market economies has been their tendency to go through cycles of boom and bust. The booms, as we shall see, often bring inflation, and the busts always raise unemployment. Years ago, economists, businesspeople, and politicians viewed these fluctuations as inevitable: There was nothing the government could or should do about them.

That view is now considered obsolete. As we will learn in Part 2, and especially Part 3, modern governments have an arsenal of weapons that they can and do deploy to try to mitigate fluctuations in their national economies—to limit both inflation and unemployment. Some of these weapons constitute what is called *fiscal policy*: control over taxes and government spending. Others come from *monetary policy*: control over money and interest rates. Both were used on a grand scale to fight the Great Recession of 2007–2009.

But *trying* to tame the business cycle is not the same as *succeeding*. Economic fluctuations remain with us, and one reason is that the government's fiscal and monetary policies sometimes fail—for both political and economic reasons. As we will see in Part 3, policy makers do not always make the right decisions. And even when they do, the economy does not always react as policymakers hope. Furthermore, for reasons we will explain later, the "right" decision is not always clear. To this day, many of the fiscal and monetary policies of 2008 and 2009 remain highly controversial.

1-1f Idea 6: The Short-Run Trade-Off between Inflation and Unemployment

The U.S. economy was lucky in the second half of the 1990s. A set of fortuitous events—falling energy prices, tumbling computer prices, a rising dollar, and so on—pushed inflation down even as unemployment fell to its lowest level in almost 30 years. The United States was not so fortunate during the 1970s and early 1980s. Skyrocketing prices for food and energy sent both inflation and unemployment up to extraordinary heights. In both episodes, then, inflation and unemployment moved in the same direction.

But economists maintain that neither of these two episodes was "normal." When we are experiencing neither unusually good luck (as in the 1990s) nor exceptionally bad luck (as in the 1970s), there is a *trade-off between inflation and unemployment*—meaning that low unemployment normally makes inflation rise and high unemployment normally makes inflation fall. For example, the high unemployment of 2008–2010 pushed the inflation rate down so low that people began worrying about *negative* inflation rates, or *de*flation. We will study the mechanisms underlying this trade-off in Parts 2 and 3, especially in Chapter 17. It poses one of the fundamental dilemmas of national economic policy.

1-1g Idea 7: Productivity Growth Is (Almost) Everything in the Long Run

Today, in Switzerland, workers in a watch factory turn out more than 100 times as many mechanical watches per year as their ancestors did three centuries ago. The productivity of labor (output per hour of work) in cotton production has probably gone up more than 1,000-fold in 200 years. It is estimated that rising labor productivity has increased the standard of living of a typical American worker approximately sevenfold in the past century (see Chapters 6 and 7).

Other economic issues such as unemployment, monopoly, and inequality are important to us all and receive much attention in economics. But in the long run, nothing has as great an effect on our material well-being and the amounts society can afford to spend on hospitals, schools, and social amenities as the rate of growth of productivity—the amount that an average worker can produce in an hour. Chapter 6 points out that what appears to be a small increase in productivity growth can have a huge effect on a country's standard of living over a long period of time because productivity compounds like the interest on savings in a bank. Similarly, a slowdown in productivity growth that persists for a substantial number of years can have a devastating effect on living standards.

1-1h Epilogue

These ideas are some of the more fundamental concepts you will find in this book—ideas that we hope you will retain beyond the final exam. There is no need to master them right now, for you will hear much more about each as you progress through the book. By the end of the course, you may be amazed to see how natural, or even obvious, they will seem.