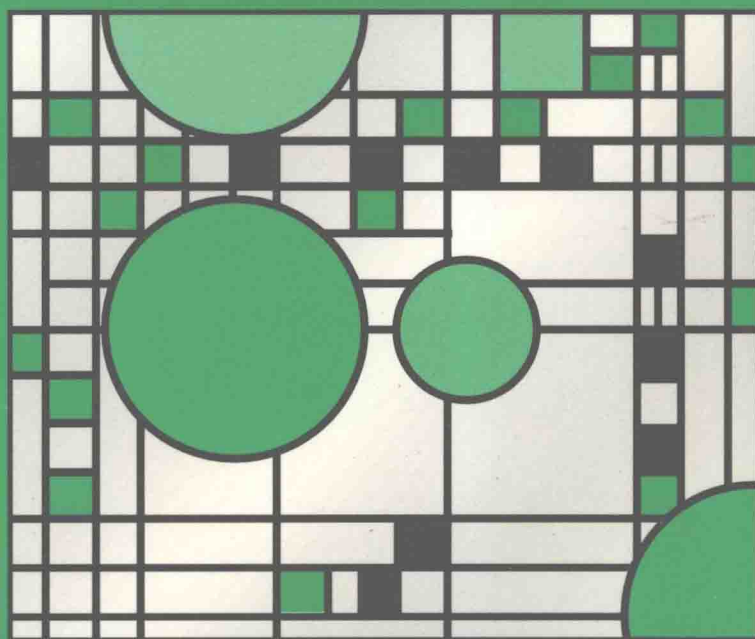


PRINCIPLES OF ECONOMICS

PREPUBLICATION EDITION

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ROBERT FRANK
BEN BERNANKE

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ROBERT H. FRANK
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BEN S. BERNANKE
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PRINCIPLES OF MICROECONOMICS

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Professor Bernanke received his B.A. in economics from Harvard University in 1975 and his Ph.D. in economics from MIT in 1979. He taught at the Stanford Graduate School of Business from 1979 to 1985 and moved to Princeton University in 1985, where he is the Howard Harrison and Gabrielle Snyder Beck Professor of Economics and Public Affairs, and where he is currently Chairman of the Economics Department. He has consulted for the Board of Governors of the European Central Bank and other central banks, and he serves on a U.S. State Department Committee that advises the Israeli government on economic policy. He is a Fellow of the Econometrics Society and a Research Associate for the National Bureau of Economic Research. He has been a visiting scholar at the Federal Reserve System in Boston, Philadelphia, and New York, and he is currently an advisor to the Federal Reserve Bank of New York.

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Preface

Dozens of principles of economics textbooks are available, and new entries into the market appear regularly. But with many copycats and few innovators, instructors' real choices are more limited than these numbers would suggest. We wrote this book from the conviction, born of long experience in the classroom, that there is a different, and better, way to introduce beginning students to economics. In bare bones, the philosophy of this text rests on two pillars: (1) the development and repeated application of a set of core economic principles, without the usual clutter, and (2) an active, student-centered approach to learning.

A Simple Agenda

The best way to teach introductory economics—or virtually any subject, for that matter—is to expose students to repeated applications of a short list of the core ideas of the discipline. But whose short list? If we asked a thousand economists to provide their own versions, we'd get a thousand different lists. Yet to dwell on their differences would be to miss their essential similarities. Indeed, we suspect that almost all the lists would contain variants of propositions like these:

The Scarcity Principle: Having more of one good thing usually means having less of another.

The Cost-Benefit Principle: Take no action unless its marginal benefit is at least as great as its marginal cost.

The Principle of Unequal Costs: Some costs (e.g., opportunity and marginal) matter in making decisions; other costs (e.g., sunk, average) don't.

The Principle of Comparative Advantage: Everyone does best when each concentrates on the activity for which he or she is relatively most productive.

The Principle of Increasing Opportunity Cost: Use the resources with the lowest opportunity cost before turning to those with higher opportunity costs.

The Equilibrium Principle: A market in equilibrium leaves no unexploited opportunities for individuals, but may not exploit all gains achievable through collective action.

The Efficiency Principle: Efficiency is an important social goal, because when the economic pie grows larger, everyone can have a larger slice.

Our point is not that this is the best short list, but that the introductory course will be taught most effectively if it begins with a well-articulated short list of some sort, and then doggedly hammers away at it, illustrating and applying each principle in context after context. It may be hackneyed to say, but it is nonetheless true that economics is a way of thinking, not a fixed body of facts to be memorized. Beginning students often find the economic way of thinking alien and difficult to master. Repetition and focus on a few core principles are the key to developing economic thinking skills, in the same way that they are the key to learning to play the saxophone or to hit an overhead smash in tennis.

Less Is More

Of course, many introductory economics textbooks pay lip service to the concepts of core ideas and thinking like an economist. And to be sure, versions of the core principles are found in many books—but often so is virtually every other economic principle that has surfaced over the past 200 years! The mind-boggling detail of these books—thousand-plus-page encyclopedic reference tomes, many of them—could not have been purposely designed to camouflage more effectively the handful of principles that really matter.

All too often, students leave the introductory course never having fully grasped the essence of economic fundamentals. Thus, for example, the concept of opportunity cost—so utterly central to our understanding of what it means to think like an economist—is but one among hundreds of other concepts that go by in a blur. Opportunity cost is more important than, say, the idea that the short-run average cost curve is tangent to the long-run average cost curve at the optimal output level. But students would never realize that from the relative emphasis these topics receive in most of our introductory textbooks.

We consciously decided to write a textbook, not an encyclopedia. Our coverage includes what we believe to be the essential economic ideas and issues of the day. We have pruned much of the accumulated undergrowth, confident that students' shortest path to clear thinking about economic issues lies in becoming fluent in the basic tools of economic analysis—not in being inundated with more ideas, facts, and opinions than they can reasonably assimilate.

Repetition, however, consumes time and space. So notwithstanding our firm belief in the less-is-more approach, our book does not enter the market with the shortest page count. Instructors with PhDs in economics may wonder whether so much repetition is really necessary, fearing that they will bore their students by exposing them to yet another application of the opportunity cost concept. To many, it will seem that the same time would be better spent discussing why the average fixed cost curve approaches zero.

At some point, it surely *is* better to move on to the technical properties of the average fixed cost curve. But in our view that point does not come during the principles course. For decades, each of us has had the privilege of teaching some of

the best undergraduates in the world. This experience has persuaded us that when we attempt to teach less, we end up teaching more.

Economic Naturalism

In our efforts to train students to think like economists, we aim not just for them to be *able* to apply core economic principles, but also to have an *inclination* to do so. The most effective strategy we have discovered for achieving that goal is to encourage students to become "economic naturalists." Studying biology enables people to observe and marvel at many details of the natural environment that would otherwise have escaped notice. For the naturalist, a walk in a quiet wood becomes an adventure. In much the same way, studying economics can enable students to see the everyday details of ordinary existence in a bright new light. Throughout the text, *Economic Naturalist* examples show students the relevance of economics to their world.

To illustrate, an economic naturalist is someone like Bill Tjoa, a recent student who asked, "Why do the keypad buttons on drive-up automatic teller machines have Braille dots?" A plausible answer, he reasoned, is that once the keypad molds have been manufactured, the cost of producing buttons with Braille dots is no higher than the cost of producing smooth ones. Making both types would require separate sets of molds and separate batches of inventory. If the patrons of drive-up machines found buttons with Braille dots harder to use, these extra costs might be worth incurring. But since the dots pose no difficulty for sighted users, the best and cheapest solution is to produce only keypads with dots.

In response to our challenge to employ economic principles to cast light on their own experiences, our students have tackled a host of other fascinating questions. Some recent examples from our classes:

- Why do brides spend so much money on wedding dresses, while grooms often rent cheap tuxedos, even though grooms could potentially wear their tuxedos on many other occasions and brides will never wear their dresses again? (Jennifer Dulski)
- Why, despite the proliferation of electrical appliances in the last century, do electrical outlets in newly built houses still have only two receptacles? (Beth Wollberg)
- Why do top female models earn so much more than top male models? (Fran Adams)
- Why are child safety seats required in cars but not in airplanes?" (Greg Balet)

Once students realize that they can pose and answer such questions on their own, they're hooked. A lifetime trajectory begins in which their mastery of economic principles not only doesn't decay with each year since completion of the course, but actually soars higher.

Active Learning

Our second guiding principle has been that active involvement by students—“student-centered” learning, in the jargon—is an essential part of an effective learning process. Merely understanding a concept—in the sense of being able to answer a test question about it the next day—is different from really *knowing* it. Even the brightest students never fully internalize a concept unless they use it repeatedly. So throughout the book, we use a number of devices to foster active learning.

- **Worked Examples.** New ideas and concepts are not simply asserted, as in most books. Instead, they are introduced by means of simple examples, usually numerical, which are worked through step-by-step in the text. These examples display the reasoning process used to reach the economic conclusion or insight, and they provide a model for the student to apply when working exercises and problems.
- **Exercises.** Following many examples, and indeed throughout a chapter, we pose in-text exercises that challenge the student to test and extend his or her understanding of the ideas being discussed. Worked-out answers to in-text exercises are provided at the end of the chapter, allowing immediate feedback.
- **Anecdotes and Illustrations.** Active learning is more likely to happen when students are engaged and motivated. We agree with Maria von Trapp that a spoonful of sugar helps the medicine go down (even if the medicine is not so unpleasant). In that spirit, we have tried to make reading this text an enjoyable experience. We begin every chapter with an anecdote that motivates the discussion, and we illustrate the ideas with memorable cartoons, photographs, and original line drawings. Most important, we have striven to minimize jargon and keep the writing direct and student friendly.
- **Recap Boxes and Summaries.** To keep students focused on the forest as well as the trees, at strategic points in each chapter we have provided “recap boxes.” Recaps put into a nutshell the main ideas of the previous section. The recap boxes are themselves recapitulated by bulleted end-of-chapter summaries, which are also designed to review the most important concepts presented in the chapter.
- **Review Questions and Problems.** Questions for review at the end of each chapter encourage the student to self-test understanding of the main ideas of the chapter. End-of-chapter problems are carefully crafted to help students internalize and extend core concepts.

Thoroughly Modern Micro

Although we believe pedagogy is extremely important, ours is not solely a book about pedagogy. Indeed, the decision about *what* to teach was at least as important to us as the decision of *how* to teach it. For example, because we believe that the most central concern of economics is efficiency, we have devoted extensive space to the concept of *economic surplus*. Introduced in Chapter 1 and applied repeatedly in Chapters 2-6, this concept is developed more fully in Chapter 7 than in any leading introductory text. Throughout the book, it underlies our ongoing argument in support of economic efficiency as an important social goal. Rather than speaking of tradeoffs between efficiency and other goals, we stress that maximizing economic surplus aids the achievement of all goals, both public and private.

A particularly distinctive feature of our book is its focus on the *normative implications of economic theory for decision-making*. Basic economic reasoning tells us that rational individuals should ignore sunk costs when making choices, for example, yet many people are in fact strongly influenced by them. (Someone who has purchased a ticket for an NBA playoff game for \$100 is, in practice, much more likely to drive through a snowstorm to get to the game than is an equally avid fan who won a ticket in a raffle.) Chapter 2 is devoted entirely to three pitfalls that are both widespread and important: the tendency to ignore opportunity costs, the tendency *not* to ignore sunk costs, and the tendency to confuse average and marginal costs and benefits. Throughout the book, we call students' attention to situations in which they themselves are likely to face similarly problematic choices.

Our goal of training economic naturalists has also helped dictate which topics to cover and which to leave out. Other things being equal, the more a topic enables us to make sense of our observations and experience, the stronger the case for including it. Thus, we are troubled that many people receive college degrees without ever having been exposed to ideas like the prisoner's dilemma or the tragedy of the commons. These and other *simple applications of game theory* are not only ideal vehicles for illustrating several of the core ideas of economics, but they also have enormous power to explain events in the world. In Chapter 10, we introduce students to the principles of games and strategic behavior in a highly intuitive way that does not rely on formal mathematics. We develop a limited number of simple principles that have proved entirely accessible to freshmen. In our experience, students are delighted to learn that these few principles can explain, among other things, why urban freeways are too crowded, why whales have been hunted to near extinction, why North Atlantic fisheries are near collapse, why the ozone layer is in danger, why many people fail to vote, and why the National Hockey League has a helmet rule.

Organization

The sixteen chapters of the microeconomics split are divided into four parts of four chapters each. Part 1, which is also included in the macroeconomics split, introduces students to the most basic ideas of economics, including all the core principles that

will be used throughout the book. Chapter 1 focuses on the ideas of scarcity, tradeoffs, costs, and benefits, including the fundamental notion that the desirability of any action depends on its marginal costs and benefits. As mentioned earlier, Chapter 2 extends this discussion by examining some common pitfalls for decision makers, such as the sunk cost fallacy. Chapter 3 introduces the ideas of specialization and gains from trade. Finally, Chapter 4 provides an introductory overview of the tools of supply-and-demand analysis.

Part 2 explores in greater detail the concepts of demand, supply, economic surplus, and efficiency in the context of pure competition. Building on the introduction to supply and demand in Chapter 4, Chapter 5 shows how demand curves are generated by the fact that people spend their limited income in rational ways. This chapter also discusses the concept of price elasticity and its uses. Chapter 6 turns to the sellers' side of the market, showing how upward-sloping supply curves follow from profit-maximizing decisions by producers. Chapter 7 develops the concept of economic surplus and explains Adam Smith's crucial insight—that when demand and supply curves fully reflect social benefits and costs, competitive markets maximize economic surplus. Finally, Chapter 8 examines the idea of economic profit and clarifies how the quest for profit drives competitive firms to provide a socially efficient allocation of resources.

In Part 3 we study deviations from the ideal of pure competition, emphasizing that outcomes in such situations need no longer be socially efficient. Chapter 9 examines one important type of deviation from competition, the existence of monopolistic and oligopolistic firms. When only a few producers exist in a market—and in many other noncompetitive situations—behavior often takes on a strategic component. Building on this observation, Chapter 10 introduces some elementary tools of game theory, demonstrating their applicability to a variety of economic situations. Chapter 11 considers the effects of externalities—situations in which supply and demand curves do not capture the full social costs and benefits of people's choices. We show that elementary game theory—including the ideas of the prisoner's dilemma, the arms race, and the tragedy of the commons—are quite useful for analyzing many situations with externalities. Chapter 12 examines yet another deviation from the competitive ideal, the case of incomplete or asymmetric information. Among many other examples, Chapter 12 includes a discussion of the “lemons” problem in the used-car market and an explanation of why clients prefer lawyers that wear expensive suits.

Finally, Part 4 uses the tools that have been developed to approach some issues of applied economics and economic policy. Chapter 13 tackles the question of why some people earn so much more than others, with attention to factors ranging from human capital investment to discrimination to “winner-take-all” markets. Chapter 14 shows how economic principles can be used to design economic policies that mitigate the effects of market imperfections, including anti-trust policies and policies about health care, the environment, and crime. Chapter 15 discusses public goods and taxation, as well as broader issues concerning the government's role in the economy. Completing the micro split, Chapter 16 extends the analysis of Chapter 15

by considering the benefits and pitfalls of government policies to redistribute income and reduce poverty.

The Challenge

The world is a more competitive place now than it was when we started teaching in the 1970s. In arena after arena, business as usual is no longer good enough. Baseball players used to drink beer and go fishing during the off season, but they now lift weights and ride exercise bicycles. Assistant professors used to work on their houses on weekends, but the current crop can now be found most weekends at the office. The competition for student attention has grown similarly more intense. There are many tempting courses in the typical college curriculum, and even more tempting diversions outside the classroom. Students are freer than ever to pick and choose.

Yet many of us seem to operate under the illusion that most freshmen arrive with a burning desire to become economics majors. And many of us seem not yet to have recognized that students' cognitive abilities and powers of concentration are scarce resources. To hold our ground we must become not only more selective in what we teach, but also more effective as advocates for our discipline. We must persuade students that we offer something of value.

A well-conceived and well-executed introductory course in economics can teach our students more about society and human behavior in a single term than virtually any other course in the university. This course can and should be an intellectual adventure of the first order. Not all students who take the kind of course we envisioned when writing this book will go on to become economics majors of course. But many will, and even those who do not will leave with a sense of admiration for the power of economic ideas.

A salesperson knows that he or she often gets only one chance to make a good first impression on a potential customer. Analogously, the principles course is often our only shot at helping a student appreciate the value of economics. By trying to teach them everything we know—rather than teaching them the most important things we know—we too often squander this opportunity.

Supplements

We believe that an ancillary package is most useful if each element in it is part of a well-considered whole. In order to ensure that our package was an integrated as possible, two solid economists and excellent teachers—Jack Mogab and Bruce McClung at Southwest Texas State University—were charged with overseeing the program. They suggested candidates, gave us advice, and provide feedback for virtually all of the components. Additionally, Jack and Bruce wrote the Study Guide and Bruce wrote the micro test bank.

For the Instructor

- **Instructor's Manual** Prepared by Margaret Ray at Mary Washington College, this manual will be extremely useful for all teachers, but especially for those new to the job. It

offers suggestions for using the study guide, the test bank, the economic naturalists, and cartoons and music for teaching; it supplies sample syllabi with assignments, sample exams, and supplemental material; and it provides for each chapter an overview, an outline, teaching objectives, economic naturalist discussion questions, answers to textbook questions and problems, a homework assignment with answers, and a sample quiz with answers.

- **Test Bank** Prepared by Bruce McClung at Southwest Texas State University, this manual contains more than 2500 multiple-choice questions categorized by Learning Objective (from the Study Guide); Learning Level (knowledge, comprehension, application, analysis); Type (graph, calculation, word problem); and Source (textbook, Study Guide, Web, unique).
- **Computerized Test Banks** The print test bank is also available in the latest Diploma test-generating software, ensuring maximum flexibility in test preparation, including the reconfiguring of graphing exercises. This Brownstone program is the gold standard of testing programs.
- **PowerPoints** Prepared by Rebecca Campbell at Southwest Texas State University, these slides contain all of the illustrations in the textbook, along with a detailed, chapter-by-chapter review of the important ideas presented in the textbook.
- **Overhead Transparencies** These more than 350, four-color acetates contain all the illustrations presented in the textbook.
- **Videos** Produced by Paul Solman, business and economics correspondent for the Lehrer News Hour and WGBH Boston, these 10-minute segments, available on CD or tape, cover five core concepts in economics.
- **Instructor's CD-ROM** This remarkable Windows software program, which contains the Instructor's Manual, the Computerized Test Banks, and the PowerPoints, also allows the instructor to create presentations from any of the materials on the CD or from additional material that can be imported.
- **Web site** For teachers there are, among other things, an online newsletter called "Teaching Using the Web"; the Instructor's Manual; the PowerPoints; Economics on the Web, an annotated set of urls/links to sites of interest to economists; along with a description of what's on the student site and some Optional Material from the book.

For the Student

- **Study Guide** Written by Jack Mogab and Bruce McClung at Southwest Texas State University, this guide provides the following elements for each chapter: a Key Point Review; a Learning Objective Grid; and Self-Tests (Key Term Matching, Multiple Choice, Problems) with answers.

- **DiscoverEcon** This menu-driven software, developed by Gerald Nelson at the University of Illinois, provides students with a book-specific tutorial. Each chapter offers two essay questions and a multiple-choice test, and when appropriate, interactive graphing problems let students observe how the economic picture is altered as data is changed. There are also links to the textbook glossary.
- **Web Site** For students there are such useful and exciting features for the book as a whole as Interpreting the News—articles and summaries of relevant articles with analysis and discussion questions; Videos—10-minute segments on key concepts produced by Paul Solman of WGBH in Boston; email Updates—periodic sending of information/study tips; the Glossary from the textbook; and Economics on the Web—annotated urls useful for economics students. Additionally, for each chapter there is an Electronic Learning Session that opens with a brief recap of the chapter, which is then followed by a test with answers and analysis; which is followed by a set of study sessions based on Economic Naturalist Exercises; Graphing Exercises; PowerPoints; and Key Terms; which is finally followed by a second quiz, with answers and analysis.

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PART

1

INTRODUCTION



As you begin the study of economics, perhaps the most important thing to realize is that economics is *not* a collection of settled facts to be copied down and memorized. Mark Twain once said that nothing is older than yesterday's newspaper, and the same can be said of yesterday's economic statistics. Indeed, the only prediction about the economy that can be confidently made is that there will continue to be large, and largely unpredictable, changes.

If economics is not a set of durable facts, then what is it? Fundamentally, it is a *way of thinking* about the world. Over many years economists have developed some simple but widely applicable principles that are useful for understanding almost any economic situation, from the relatively simple economic decisions that individuals make every day to the workings of highly complex markets, such as international financial markets. The principal objective of this book, and of this course, is to help you learn these principles and how to apply them to a variety of economic questions and issues.

The four chapters of Part I lay out the basic economic principles that will be used throughout the book. Chapter 1 introduces the notion of scarcity—the unavoidable fact that, although our needs and wants are boundless, the resources available to satisfy them are limited. The chapter goes on to show that deciding whether to take an action by comparing the cost and benefit of the action provides a useful approach for dealing with the inevitable trade-offs that scarcity creates. Chapter 2 looks at some additional important principles for effective economic decision making, in the process identifying several pitfalls that plague many decision makers. Chapter 3 goes beyond individual decision making to consider trade among both individuals and countries. An important reason for trade is that it permits people (or countries) to specialize in the production of particular goods and services, which in turn enhances productivity and raises standards of living. Chapter 4 is an overview of the concepts of supply and demand, perhaps the most basic and familiar tools economists use.

