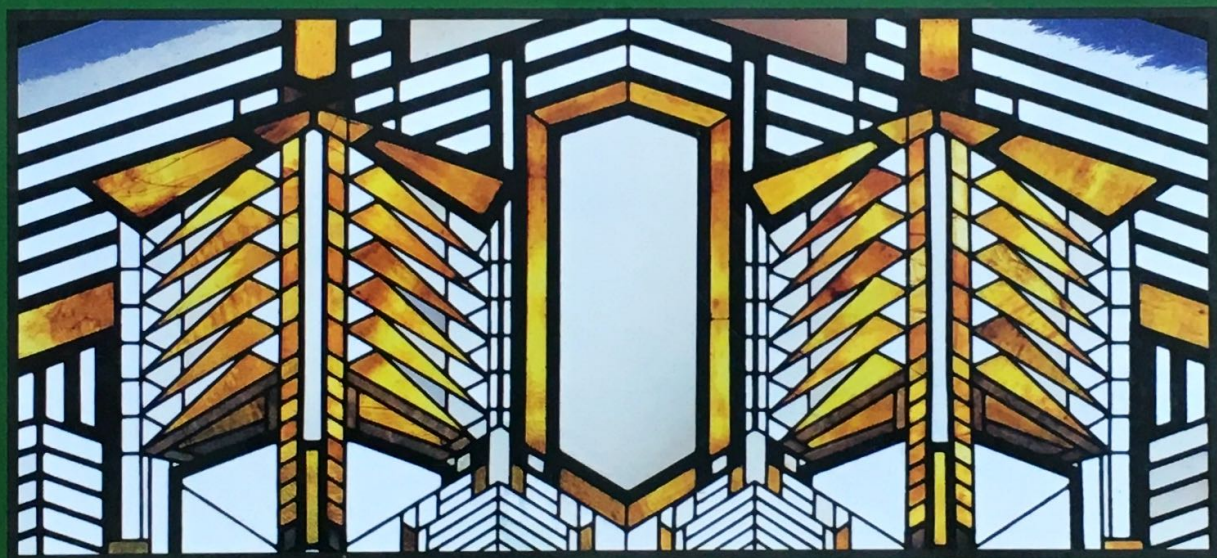


PRINCIPLES OF MICROECONOMICS

SECOND EDITION



ROBERT H. FRANK
BEN S. BERNANKE

PRINCIPLES OF MICRO- ECONOMICS

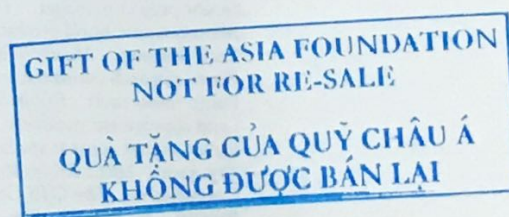
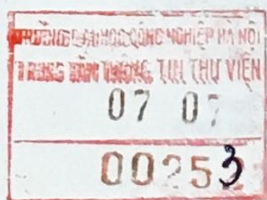
SECOND EDITION

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Cover: Leaded glass window designed by Frank Lloyd Wright for the Dave Thomas House, Springfield, Illinois, circa 1904, 61 cm x 97.5 cm

Photo: Doug Carr, Springfield, Illinois

Design of book: The images in the design of this book are based on elements of the architecture of Frank Lloyd Wright, specifically from the leaded glass windows seen in many of his houses. Wright's design was rooted in nature and based on simplicity and harmony. His windows use elemental geometry to abstract natural forms, complementing and framing the natural world outside. This concept of seeing the world through an elegantly structured framework ties in nicely to the idea of framing one's view of the world through the window of economics.

The typeface used for some of the elements was taken from the Arts and Crafts movement. The typeface, as well as the color palette, bring in the feeling of that movement in a way that complements the geometric elements of Wright's windows. The Economic Naturalist icon is visually set apart from the more geometric elements but is a representation of the inspirational force behind all of Wright's work.

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DEDICATION

For Ellen

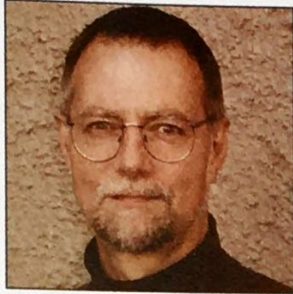
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B. S. B.

ABOUT THE AUTHORS

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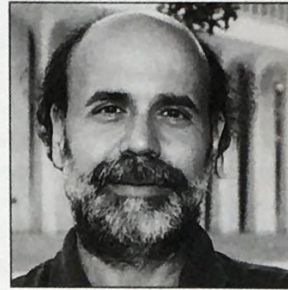


Professor Frank received his B.S. from Georgia Tech in 1966, then taught math and science for two years as a Peace Corps volunteer in rural Nepal. He received his M.A. in statistics and his Ph.D. in economics in 1972 from the University of California at Berkeley. He is the H. J. Louis Professor of Eco-

nomics at Cornell University's Johnson Graduate School of Management. During a leave of absence from Cornell he served as chief economist for the Civil Aeronautics Board (1978–1980), a Fellow at the Center for Advanced Study in the Behavioral Sciences (1992–1993), and Professor of American Civilization at l'École des Hautes Études en Sciences Sociales in Paris (2000–2001).

Professor Frank is the author of a best-selling intermediate economics textbook—*Microeconomics and Behavior*, Fifth Edition (McGraw-Hill/Irwin, 2003). He has published on a variety of subjects, including price and wage discrimination, public utility pricing, the measurement of unemployment spell lengths, and the distributional consequences of direct foreign investment. His research has focused on rivalry and cooperation in economic and social behavior. His books on these themes include *Choosing the Right Pond: Human Behavior and the Quest for Status* (Oxford University Press, 1985) and *Passions Within Reason: The Strategic Role of the Emotions* (W.W. Norton, 1988). He and Philip Cook are coauthors of *The Winner-Take-All Society* (The Free Press, 1995), which received a Critic's Choice Award and appeared on both the *New York Times* Notable Books list and the *Business Week* Ten Best list for 1995. His most recent general-interest publication, *Luxury Fever* (The Free Press, 1999), was named to the Knight-Ridder Best Books list for 1999. He was awarded an Andrew W. Mellon Professorship (1987–1990), a Kenan Enterprise Award (1993), and a Merrill Scholars Program Outstanding Educator Citation (1991). Professor Frank's introductory microeconomics course has graduated more than 5,000 enthusiastic economic naturalists over the years.

BEN S. BERNANKE



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 served as Chairman of the Economics Department. He has consulted for the Board of Governors of the European Central Bank and other central banks, and he served on a U.S. State Department Committee that advises the Israeli government on economic policy. He is a member of the American Academy of Arts and Sciences, 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 was recently named to the Board of Governors of the Federal Reserve.

Professor Bernanke's intermediate textbook, with Andrew Abel, *Macroeconomics*, Fourth Edition (Addison-Wesley, 2001) is a best seller in its field. He has written more than 50 scholarly publications in macroeconomics, macroeconomic history, and finance. He has done significant research on the causes of the Great Depression, the role of financial markets and institutions in the business cycle, and measuring the effects of monetary policy on the economy. His two most recent books, both published by Princeton University Press, are *Inflation Targeting: Lessons from the International Experience* (with coauthors) and *Essays on the Great Depression*. He is the editor of the *American Economic Review* and has been the coeditor of the *NBER Macroeconomics Annual* and of *Economics Letters*. He has served as associate editor for the *Journal of Financial Intermediation*, the *Quarterly Journal of Economics*, the *Journal of Money, Credit, and Banking*, and the *Review of Economics and Statistics*. Professor Bernanke has taught principles of economics at both Stanford and Princeton.

PREFACE

In recent years, innovative texts in mathematics, science, foreign languages, and other fields have achieved dramatic pedagogical gains by abandoning the traditional encyclopedic approach in favor of attempting to teach a short list of core principles in depth. The enthusiastic reactions of users of the first edition of this book confirm that this less-is-more approach affords similar gains in introductory economics. Although recent editions of a few other texts have paid lip service to this new approach, ours is by consensus the most carefully thought out and well-executed text in this mold. Avoiding excessive reliance on formal mathematical derivations, it presents concepts intuitively through examples drawn from familiar contexts. It relies throughout on a well-articulated short list of core principles, which it reinforces repeatedly by illustrating and applying each in numerous contexts. It asks students periodically to apply these principles to answer related questions, exercises, and problems.

The text encourages students to become “economic naturalists,” people who employ basic economic principles to understand and explain what they observe in the world around them. An economic naturalist understands, for example, that infant safety seats are required in cars but not in airplanes because the marginal cost of space to accommodate these seats is typically zero in cars but often hundreds of dollars in airplanes. Such examples engage student interest while teaching them to see each feature of their economic landscape as the reflection of an implicit or explicit cost-benefit calculation.

Our second edition incorporates several significant pedagogical improvements. Based on extensive reviewer feedback, it offers (1) even more streamlined coverage of the cost-benefit approach in the introductory chapter; (2) exercises that are more closely tied to the examples; (3) for important or difficult concepts, expanded narrative explanations that are more accessible to average students; and (4) expanded coverage of several key topics (see below). The result is a revision that is even more clutter-free, engaging, and pedagogically effective than its predecessor.

FEATURES

- **Core Principles Emphasized:** A few core principles do most of the work in economics. By focusing almost exclusively on these principles, the text ensures that students leave the course with a deep mastery of them. In contrast, traditional encyclopedic texts so overwhelm students with detail that they often leave the course with little useful working knowledge at all.
- **Economic Naturalism Introduced in Micro:** Our ultimate goal is to produce “economic naturalists”—people who see each human action as the result of an implicit or explicit cost-benefit calculation. The economic naturalist sees mundane details of ordinary existence in a new light and becomes actively engaged in the attempt to understand them. Some representative examples:
 - Why do auto manufacturers no longer make cars without heaters?
 - Why are whales, but not chickens, threatened with extinction?
 - Why do movie theaters give student discounts on the price of admission but not on the price of popcorn?



ECONOMIC
NATURALIST

- **Active Learning Stressed:** The only way to learn to hit an overhead smash in tennis or to speak a foreign language is through repeated practice. The same is true for learning economics. Accordingly, we consistently introduce new ideas in the context of simple examples and then follow them with applications showing how they work in familiar settings. At frequent intervals, we pose exercises that both test and reinforce the understanding of these ideas. The end-of-chapter questions and problems are carefully crafted to help students internalize and extend core concepts. Experience with our first edition confirms that our text really does prepare students to apply basic economic principles to solve economic puzzles drawn from the real world.
- **Modern Microeconomics:** Economic surplus, introduced in Chapter 1 and applied repeatedly thereafter, is more fully developed here than in any other text. This concept underlies the argument for economic efficiency as an important social goal. Rather than speak of trade-offs between efficiency and other goals, we stress that maximizing economic surplus facilitates the achievement of *all* goals. **Common decision pitfalls** identified by 2002 Nobel Laureate Daniel Kahneman and others—such as the tendency to ignore implicit costs, the tendency not to ignore sunk costs, and the tendency to confuse average and marginal costs and benefits—are introduced early in Chapter 1. The book devotes a chapter to the economics of information, making available in intuitively accessible form key insights that earned the 2001 Nobel Prize in economics for George Akerlof, Joseph Stiglitz, and Michael Spence.
- **Web site:** The site was developed by Scott Simkins of North Carolina A & T State University, an expert in the growing field of economics education on the World Wide Web. The ambitious web site contains a host of features that will enhance the principles discussed in the classroom, including dynamic graphs, email updates, microeconomic experiments, current news articles, information about the text, an eLearning session, and more.

IMPROVEMENTS

- **Introductory Material Shortened and Refined:** The material from the first edition's Chapters 1 and 2 has been reworked and condensed into one chapter in an effort to launch these important concepts as clearly and efficiently as possible. From the very beginning, the focus is on how rational people make choices among alternative courses of action.
- **Separate Chapter on Elasticity Added:** The material covered in this chapter (Chapter 4) was covered in parts of two separate chapters in the first edition (Chapters 5 and 6). The new combined chapter streamlines the presentation by making use of definitions and formulas common to both the supply and demand sides. The chapter also adds several new applications and graphical summaries of key relationships.
- **Cost Curve Coverage Added:** Responding to reviewer feedback, we added an introduction to average total cost and average variable cost curves in Chapter 6. To make the presentation as simple and uncluttered as possible, no single diagram ever portrays more than three cost curves at once, and most employ only two. While this treatment remains faithful to our belief that full-blown coverage of production functions and cost curves is ill-advised

at the principles level, it also provides substantially greater teaching flexibility. For example, it enables instructors to portray profits and losses graphically (Chapters 6, 8, and 9) and to discuss a firm's shutdown condition in diagrammatic terms (Chapter 6). It also facilitates an enriched discussion of the invisible hand process by which profit and loss signals drive resource allocation in competitive markets (Chapter 8).

- **Strategic Theory Accessible:** Chapter 10, "Thinking Strategically," includes many examples of how simple elements of game theory can be used not only to illuminate the interactions among oligopolists and other imperfectly competitive firms, but also to shed light on common patterns of human social interaction. This chapter
 - opens with an account of how the producers of a Robert DeNiro film lost several hundred thousand dollars by shooting most of the film before negotiating with the singer who was slated to appear in the final scene.
 - introduces the important Nash equilibrium concept through a series of intuitively accessible examples.
 - includes an extended discussion of the important prisoner's dilemma and strategies that have been developed for solving it.
 - deals with ultimatum bargaining games and unselfish human behavior.
- **Discussion of Labor Markets and Income Redistribution Streamlined:** Chapter 13 now contains material from the chapters on "Labor Markets" (13) and "Income Redistribution" (16) in the first edition. The new chapter is half the combined length of the earlier chapters, accomplished in part by eliminating examples, in part by trimming topic coverage. Sections on monopsony and comparable worth from the original Chapter 13 and sections on utilitarianism, tax policy and occupational choice, progressive consumption taxation, and redistribution and cost-benefit analysis from the original Chapter 16 have been deleted.
- **Discussion of International Trade Expanded:** The first edition had a brief section on international trade at the end of Chapter 3 on comparative advantage. This material has been expanded to an entire chapter (16) on trade. Because international trade involves important micro principles and policy issues, students will benefit greatly from this expanded coverage earlier in the book.

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 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.