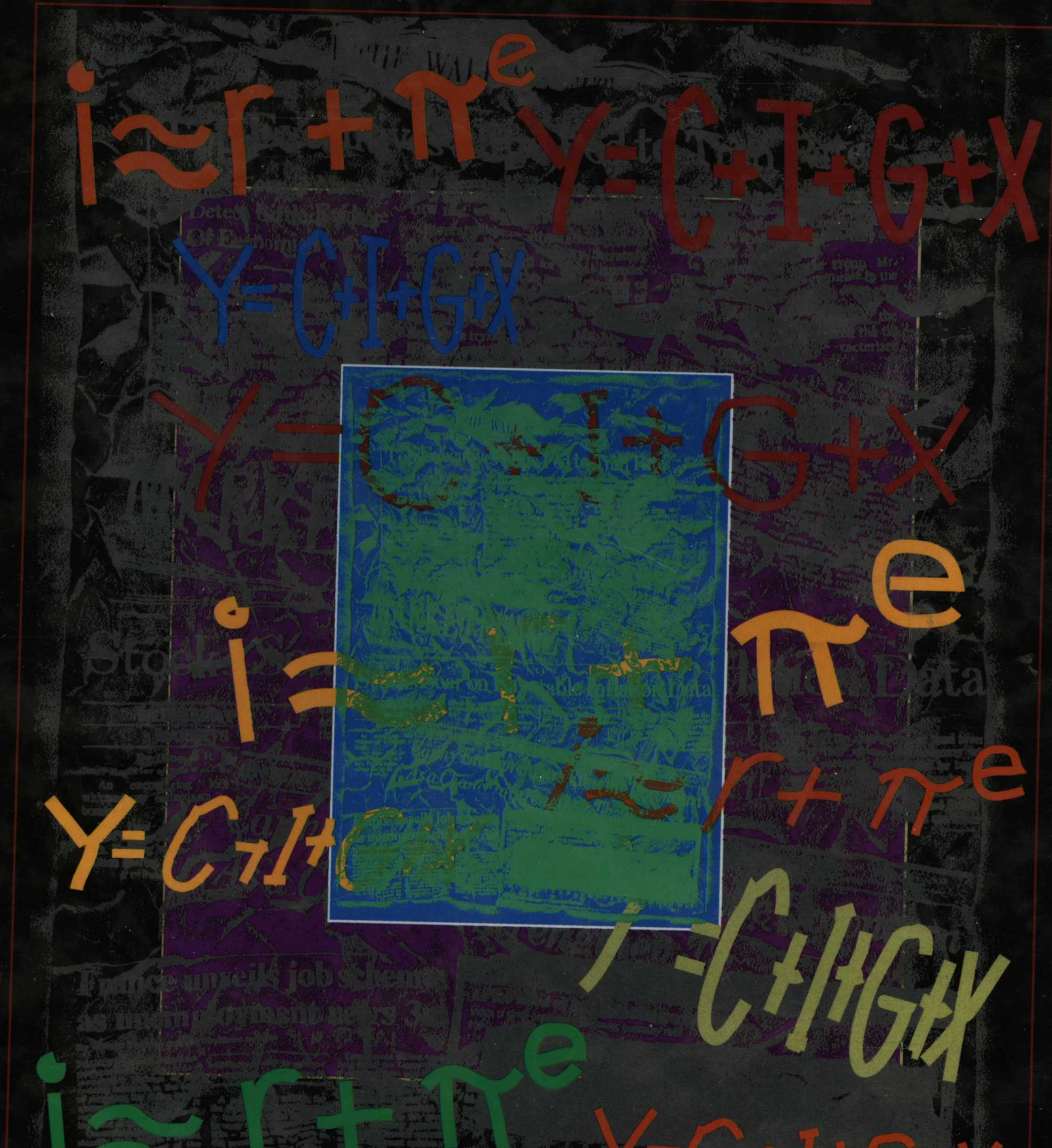
# MACROECONOMICS

## ANALYSIS AND APPLICATIONS




STEVEN L. GREEN

# MACROECONOMICS

## ANALYSIS AND APPLICATIONS

**STEVEN L. GREEN**

*Baylor University*

**THE DRYDEN PRESS**

**Harcourt Brace Jovanovich College Publishers**

Fort Worth Philadelphia San Diego New York Orlando Austin San Antonio
Toronto Montreal London Sydney Tokyo

**Editor in Chief** *Robert A. Pawlik*
**Acquisitions Editor** *Rick Hammonds*
**Developmental Editor** *Daryl Fox*
**Project Editor** *Jim Patterson*
**Production Manager** *Diane Southworth*
**Designer** *Don Fujimoto*
**Permissions Editor** *Van Strength*



*Address for Editorial Correspondence*
The Dryden Press, 301 Commerce Street, Suite 3700, Fort Worth, TX 76102

*Address for Orders*
The Dryden Press, 6277 Sea Harbor Drive, Orlando, FL 32887
1-800-782-4479, or 1-800-433-0001 (in Florida)

ISBN: 0-03-043629-X

Library of Congress Catalogue Number: 92-73444

Printed in the United States of America

3 4 5 6 7 8 9 0 1 2   036   9 8 7 6 5 4 3 2 1

The Dryden Press
Harcourt Brace Jovanovich

To my parents,
Victor and Sue Green,
in appreciation for the priceless
gift of a wonderful childhood

## The Dryden Press Series in Economics

Aronson
*The Electronic Scorecard*

Asch and Seneca
*Government and the Marketplace*
Second Edition

Baker
*An Introduction to International Economics*

Baumol and Blinder
*Economics: Principles and Policy*
Fifth Edition
(Also available in micro and macro paperbacks)

Baumol, Panzar, and Willig
*Contestable Markets and the Theory of Industry Structure*
Revised Edition

Berch
*The Endless Day: The Political Economy of Women and Work*

Breit and Elzinga
*The Antitrust Casebook: Milestones in Economic Regulation*
Second Edition

Campbell, Campbell, and Dolan
*Money, Banking, and Monetary Policy*

Claudon and Olsen
*Eco Talk*

Clower, Graves, and Sexton
*Intermediate Microeconomics*

Demmert
*Economics: Understanding the Market Process*

Dolan and Lindsey
*Economics*
Sixth Edition
(Also available in micro and macro paperbacks)

Eckert and Leftwich
*The Price System and Resource Allocation*
Tenth Edition

Edgmand, Moomaw, and Olson
*Economics and Contemporary Issues*

Estey
*The Unions: Structure, Development, and Management*
Third Edition

Friedman
*Milton Friedman Speaks (Video)*

Gardner
*Comparative Economic Systems*

Glahe
*Macroeconomics: Theory and Policy*
Third Edition

Glahe
*Microeconomics: Theory and Application*
Second Edition

Green
*Macroeconomics: Analysis and Applications*

Gwartney and Stroup
*Economics: Private and Public Choice*
Sixth Edition
(Also available in micro and macro paperbacks)

Gwartney, Stroup, and Clark
*Essentials of Economics*
Second Edition

Heilbroner and Singer
*The Economic Transformation of America: 1600 to the Present*
Second Edition

Hirsch and Rufolo
*Public Finance and Expenditure in a Federal System*

Hirschey and Pappas
*Fundamentals of Managerial Economics*
Fourth Edition

Hirschey and Pappas
*Managerial Economics*
Seventh Edition

Hoerneman, Howard, Wilson, and Cole
*CAPER: Computer Assisted Program for Economic Review*

Hyman
*Public Finance: A Contemporary Application of Theory to Policy*
Fourth Edition

Johnson and Roberts
*Money and Banking: A Market-Oriented Approach*
Third Edition

Kaufman
*The Economics of Labor Markets*
Third Edition

Keating and Wilson
*Fundamentals of Managerial Economics*

Keating and Wilson
*Managerial Economics*
Second Edition

Kennett and Lieberman
*The Road to Capitalism: The Economic Transformation of Eastern Europe and the Former Soviet Union*

Kidwell and Peterson
*Financial Institutions, Markets, and Money*
Fifth Edition

Klein
*Money and the Economy*
Sixth Edition

Kohn
*Money, Banking, and Financial Markets*
Second Edition

Kreinin
*International Economics: A Policy Approach*
Sixth Edition

Landsburg
*Price Theory and Applications*
Second Edition

Link, Miller, and Bergman
*EconoGraph II: Interactive Software for Principles of Economics*

Lott and Ray
*Applied Econometrics with Data Sets*

Nicholson
*Intermediate Microeconomics and Its Application*
Fifth Edition

Nicholson
*Microeconomic Theory: Basic Principles and Extensions*
Fifth Edition

Ormiston
*Intermediate Microeconomics*

Oser and Brue
*The Evolution of Economic Thought*
Fourth Edition

Puth
*American Economic History*
Third Edition

Ragan and Thomas
*Principles of Economics*
Second Edition
(Also available in micro and macro paperbacks)

Ramanathan
*Introductory Econometrics with Applications*
Second Edition

Rukstad
*Corporate Decision Making in the World Economy: Company Case Studies*

Rukstad
*Macroeconomic Decision Making in the World Economy: Text and Cases*
Third Edition

Samuelson and Marks
*Managerial Economics*

Scarth
*Macroeconomics: An Introduction to Advanced Methods*

Smith and Spudeck
*Interest Rates: Principles and Applications*

Thomas
*Economics: Principles and Applications*
(Also available in micro and macro paperbacks)

Wachtel
*Labor and the Economy*
Third Edition

Walton and Rockoff
*History of the American Economy*
Sixth Edition

Welch and Welch
*Economics: Theory and Practice*
Fourth Edition

Yarbrough and Yarbrough
*The World Economy: Trade and Finance*
Second Edition

Zimbalist, Sherman, and Brown
*Comparing Economic Systems: A Political-Economic Approach*
Second Edition

# PREFACE

Macroeconomic events matter for the lives of individuals and institutions. The purpose of this book is to help professors convey to students meaningful skills in the analysis, interpretation, and discussion of macroeconomic issues. These skills are useful and worth acquiring. Those who have them are better able to make sense of media stories about the economy, to evaluate more objectively the policy proposals of politicians, and to understand more fully and manage more effectively the impacts of macroeconomic events and issues for their personal and professional lives.

Economics is a way of thinking to be developed rather than a list of facts to be memorized. In a session on "Teaching College Economics" at the 1990 Convention of the American Economic Association, a group of well-known economists expressed this view as follows:[1]

> While facility with formal theoretical constructs should represent a necessary condition for passing [intermediate macroeconomics] courses, it should not be sufficient. Students must, in addition, be able to *use and appraise* theory—a challenging, but arguably a central skill . . ." (Emphasis in original)

This book is oriented around not only the development of theory, but also the use and appraisal of theory. It has important similarities with and differences from other intermediate macroeconomics texts. Its basic analytical framework, the aggregate supply and demand model, is standard and familiar. The distinguishing features of the book involve the way the aggregate supply and demand model is motivated, derived and used.

## FEATURES

To enhance the relevance of theory to the "real world," this book contains five "applications" chapters, four of which are devoted to the implications of macroeconomic events for phenomena not usually considered in intermediate macroeconomics textbooks. Other features that enhance the student's ability to use and evaluate theory include the use of shift variables, exhibits of media stories about the economy, extensive analysis of past business cycles, explicit discussion of trends and changes relative to trend, and explicit attention to the language economists use in discussing issues. I will now discuss each of these features in some detail.

---

[1] Siegfried, John J., Robin L. Bartlett, W. Lee Hansen, Allen C. Kelley, Donald N. McCloskey, and Thomas N. Tietenberg. "The Economics Major: Can and Should We Do Better than a B − ?" *American Economic Review Papers and Proceedings*, vol. 81, no. 2 (May 1991), p. 22.

## Applications

Perhaps the most profound departure of this book from convention is in the scope of issues to which macroeconomic ideas are applied. While most books focus mainly on macroeconomic policy as the major application of the theoretical material, this book also considers (in separate chapters) the implications of macroeconomic events for asset price determination (Chapter 18), management decisions (Chapter 19), social problems (Chapter 20), and personal employment and retirement planning. (Chapter 22). Macroeconomic policy is therefore discussed (in Chapter 21) only after the impact of macroeconomic events across a wide spectrum of individuals, firms, institutions, and markets has been considered fully.

These applications chapters serve to link the course to material students have studied in other (non-economics) courses. Chapter 20, with its emphasis on poverty and income distribution, provides an economist's perspecitve on issues normally discussed in sociology courses. Chapter 18 considers the interaction between theories of asset price determination (normally the domain of finance classes) and macroeconomic events. Although most management students must take macroeconomics courses, the management implications of macroeconomic events are rarely discussed in either discipline. Chapter 19 contains just such a discussion. The material in the chapter on policy, Chapter 21, has significant links with topics often addressed in political science courses.

More generally, the development in the book of the aggregate supply and demand model provides an extended example of the reasoning structures examined in logic courses. This structure emphasizes the distinction between premises (exogenous changes) and conclusions (endogenous changes), providing students with a clearer sense of economic analysis as a "way of thinking."

## Shift Variables

A key element of the model developed in the text is the use of "shift variables" to capture the effects of exogenous factors not considered explicitly. One shift variable, for example, represents the effects of all determinants of consumption spending other than real disposable income and the real interest rate. Another shift variable captures all determinants of money demand other than income and opportunity cost. A full chapter (Chapter 3) is devoted to an explanation of how economists use models, with special emphasis on the role of shift variables. That discussion is based on the supply and demand model of a single-market, which should be familiar to most students from introductory economics classes. A cursory understanding of that model is the only knowledge assumed of the reader.

The use of shift variables helps students acquire substantive skills in at least two ways. Shift variables are the "windows" through which the real world is brought into an economic model. By emphasizing this linkage, this book helps students learn in general terms how to "get started" on the analysis of economic issues—not just issues that the professor has discussed in class, but new issues that the student has never seen discussed explicitly.

The consistent use of shift variables throughout the book also provides a constant reminder to the reader that things happen in the economy for reasons other than government policy actions. The discussion shows explicitly that curves in the model can shift for many reasons related to private sector phenomena, in contrast to the tacit implication of most intermediate macro texts that curve shifts are caused primarily or exclusively by policy changes.

## The News Media and the Economy

This book also provides real-world illustrations of concepts and results with exhibits containing excerpts from newspaper and magazine stories about the economy. To the extent that the skills acquired by students in the study of macroeconomics will be useful after graduation, those skills will probably be used most frequently in the analysis and evaluation of media stories about the economy. Thus the media excerpts are useful not only in demonstrating the real-world relevance of the material, but also because they give students practice in what for many will be the most common future use of their analytical skills. In this way, the book emphasizes that theory is a means to an end rather than an end in itself. The true end of theory is understanding, and the presentation and discussion of media stories is one way theory is confronted with real world issues. The book also contains several boxed items entitled "Macroeconomics in the Media." These boxes discuss in detail various aspects of media coverage of the economy, such as the media's use of the Burns-Mitchell definition of the business cycle.

## Analysis of Past Business Cycles

Another confrontation of theory with reality in the book is the frequent discussion of specific business cycle episodes, such as the Great Depression of the 1930s or the stagflation of the 1970s. Part IV (Chapters 13–17) is devoted entirely to theories of the business cycle in general. The book evaluates these theories (for example, the Real Business Cycle theory in Chapter 16 and the New Keynesian theory in Chapter 17) according to how well each accounts for the "stylized facts" of business cycles. These stylized facts are themselves the subject of a complete chapter (Chapter 13), and the discussion in that chapter addresses up-to-date issues such as variable trends and the distinction between calendar time and business cycle time.

## Trends and Changes Relative to Trend

The book also contains a full chapter (Chapter 12) that discusses explicitly the distinction between the upward trends in macroeconomic variables and changes in variables relative to their upward trends. This means that the idea of ongoing inflationary equilibrium is discussed explicitly in terms of the aggregate supply and demand model. There is no awkward jump from supply and demand analysis to the Phillips Curve. The links between the aggregate supply and demand model and the Phillips Curve model are discussed thoroughly and explicitly in Chapter 20, which focuses on employment issues in detail.

## The Language of Macroeconomics

An individual with meaningful training in macroeconomic analysis should be able to discuss macroeconomic issues intelligently. Strong analytical skills are of little use without the ability to communicate. Throughout the book are boxed items entitled "The Language of Macroeconomics," which address some specific ways that economists used language. These items consider, for example, colloquial terms used by economists such as "shocks" and "stories." They also address strategies used by economists to convince other economists and the general public that an idea is valid, such as the choice to discuss the behavior of a variable in terms of its growth rate rather than its level.

## Analogies and Special Topics

Another feature of the book is the use of occasional boxed items drawing analogies between macroeconomic concepts or issues and non-economic ideas, events, or situations. One analogy compares the Keynesian-Monetarist controversy over the desirability of stabilization policy to the current controversy over the widespread use of nuclear power. The book also contains boxed items on special topics that clarify and elaborate on ideas that students tend to find confusing, such as the precise meaning of "money demand" and the role of shift variables in an economic model.

# THEORY COVERAGE

In terms of theoretical orientation, this book is eclectic in approach and has no theoretical axes to grind. The focus of the book is on building a general model which can serve to illustrate basic results and theoretical disagreements. The development of the aggregate supply & demand model proceeds in the following way. Part I motivates the study of macroeconomics, introduces a number of important concepts, and defines the price and quantity variables of the model. Part II considers in detail the determination of aggregate supply (Chapters 4 and 5) and aggregate demand (Chapters 6–9), introducing thereby a number of additional variables into the model. Part III solves the model and shows how it can be used to address macroeconomic issues and explain specific business cycle episodes. Part IV uses the model to illustrate competing theories of the business cycle in general, with emphasis on how well each theory accounts for the "stylized facts" of business cycles. Part V shows how the ups and downs of the business cycle are related to a wide variety of phenomena that can have profound implications for individuals, firms, and institutions.

## No "Fixed-Price" Model

The theory coverage aspect of this book has at least four important aspects. First, the discussion does not proceed from a "fixed-price" model to a "flexible-price" model. It assumes from the beginning that the aggregate price level is flexible, and the aggregate supply and demand model is motivated in Chapter 1 as a way of explaining simultaneously both price and quantity. Aggregate demand is derived from the ISLM model, and aggregate supply is derived from analysis of the aggregate labor market and production function. Both analyses consider the implications of changes in the price level, as well as the implications of changes in other factors when the price level is taken as given. The assumption that the price level is absolutely rigid is never employed, and students reading the book will not develop their intuitive understanding of how the economy works based on such a totally unrealistic assumption. (The distinction between "sticky wage" and "sticky output price" versions of the short-run is discussed.)

## Aggregate Supply First

The second important aspect of the book's theory coverage is that discussion of aggregate supply determination precedes discussion of aggregate demand determination. This placement reflects my belief that students who learn about aggregate demand first tend to have a more difficult time grasping and applying the distinction between the short-run and the long-run. Those instructors who prefer to address aggregate demand first may do so with no loss of continuity by covering Chapters 6–9 prior to Chapters 4–5.

## International Topics Throughout

The third important theory coverage feature is that international topics are integrated throughout the text. Net exports are considered part of GDP from the beginning, and exchange rate determination receives just as much emphasis as interest rate determination. Open economy questions and issues are not segmented from the rest of the material, so students never have the chance to treat international topics as an afterthought.

## Detail in Applications Rather than Theory

The fourth important feature of the book in terms of theory coverage is that it contains no detailed discussion of the central behavioral equations of the prototypical macroeconomic model such as consumption, investment, and money demand. It also does not consider in detail alternative specificiations of the open economy macroeconomic model. While many books contain an entire chapter devoted to each of these topics, this book does not. The emphasis of the book's analytical framework on shift variables, however, makes it very easy to describe the intuition behind advanced theories such as Ricardian equivalence.

Each of these theory content choices was made with the following question in mind: what is best for the "average" student at an "average" college or university? In my judgment, the average student does not need to spend a large amount of time learning advanced theories of consumption, investment, and money demand. The basic ideas behind those theories are clear enough, and the opportunity cost of detailed discussion in terms of time is much too high.

Instead, I have chosen to devote an entire section of the book to "real-world" applications of macroeconomic issues and events. Which is more useful for the typical student, a detailed understanding of the investment accelerator model, or an understanding of the implications of recession for management decisions? A detailed understanding of the life-cycle/permanent income hypothesis, or knowledge of the relationship between the business cycle and the incidence of poverty? A detailed understanding of Tobin's liquidity preference model of money demand, or an understanding of how and why announcements of economic statistics move asset prices? In each case, I have chosen the latter topic for inclusion in this book.

With only a few exceptions, the thousands of students who happen to be enrolled in intermediate macroeconomics courses at any particular time will not go on to become professional economists. Yet their lives will be just as affected, if not more so, by macroeconomic events than will the lives of those who make economics a career. I hope this book, and the course taken along with it, will help all students develop the skills they need to take maximum advantage of good economic times and to manage effectively the adversity associated with bad economic times.

## ACKNOWLEDGEMENTS

More than most authors, I have benefitted in writing this book from the assistance, support, and kindness of a large number of people. Marjo Glass, Paul Klegg, Dodd Carmichael, Mark Davison, and Wayne Baker were all extremely competent student assistants, cheerfully receiving rudimentary instructions from me, filling in the blanks, and returning with first-rate work.

My debts to colleagues are also extensive. One of my first economics mentors, Timothy W. Koch (now of the University of South Carolina), provided important advice and encouragement at the prospectus stage. Calvin Kent, now head of the Federal Energy Information Agency in Washington, and Tom Harrison, the Peat Warwick–Thomas L. Holton Professor of Accounting at Baylor, were both quite patient and helpful in guiding this first-time author through the intricacies of the publication process. Jan Hansen of the University of Wisconsin–Eau Claire has written an excellent test bank. Rendigs Fels, a former colleague from my stint on the Vanderbilt University faculty, responded promptly and insightfully to my questions about the Burns–Mitchell approach to business cycle analysis. My Baylor economics colleague Tom Odegaard has provided me with very helpful reactions to my ideas over the years I have been thinking about this book, and he has also written a first-rate study guide. Allen Seward, Steve Rich, Don Cunningham, and Bill Richenstein were patient as I filled much lunch-time conversation with talk of this project. Thanks also to Richard Scott, Dean of the Hankamer School of Business at Baylor University, and W. James Truitt, Chairman of the Department of Economics at Baylor, for released time from teaching and for logistical support.

Those individuals at The Dryden Press associated with this book at its inception have now moved on to other careers in publishing. Even so, I would like to thank Becky Ryan for taking a chance on a first-time author and Rita West for exceptional developmental guidance. Their successors, Rick Hammonds and Daryl Fox, have strongly reinforced my initial impression of Dryden as a top-notch company full of highly competent, creative, intelligent, and pleasant people committed to excellence. This characterization also applies to Jim Patterson, my project editor, to Don Fujimoto, the book designer, and to Diane Southworth, the production manager.

I would also like to thank the hundreds of Baylor students who have taken intermediate macroeconomics from me over the last few years. It was they who suffered from my lapses of clarity in early drafts, and it was they who had to suffer the inconvenience of handouts rather than pre-packaged orderliness of a textbook. Without the genuine reaction of those students to my frequent attempts to find better ways to teach macroeconomics, this book would be much less than it is.

My own view of the world as a teacher of macroeconomics has been shaped by many influences. I am grateful to the others who taught macroeconomics to me: Allen Seward and Charles Wells at the undergraduate level, and William Poole and Jerome Stein at the graduate level. My greatest intellectual debt is to my dissertation advisor, Herschel I. Grossman of Brown University. Thomas Schwartz, a philosopher, led a workshop at Vanderbilt University in the summer of 1985 that stimulated me to think carefully about the teaching of reasoning skills.

Several professors reviewed portions of the manuscript in various phases. Their comments were incisive and helpful, and the book is much better because of their careful criticisms. The reviewers were James R. Gale (Michigan Technological University), Loren Guffey (University of Central Arkansas), Dennis Jansen (Texas A&M University), Paul E. Junk (University of Minnesota-Duluth), Michael A. Nelson (Illinois State University), Chris Niggle (University of Redlands), Guy A. Schick (California State University at Fullerton), Case M. Sprenkle (University of Illinois), and William J. Swift (Pace University).

As with most authors, my final and most important words of thanks are reserved for my family. My parents, Vic and Sue Green, have been sources of strength and inspiration my entire life. My greatest debt and gratitude go to my wife, Judy. Her constant love, support and encouragement have meant more to me than words can ever express. Her balance has kept me focused on my work when work was necessary, while not allowing me to pass by any of the important treasures that life has to offer.

STEVEN L. GREEN
Waco, Texas
JANUARY 1993

# BRIEF TABLE OF CONTENTS

# TABLE OF CONTENTS