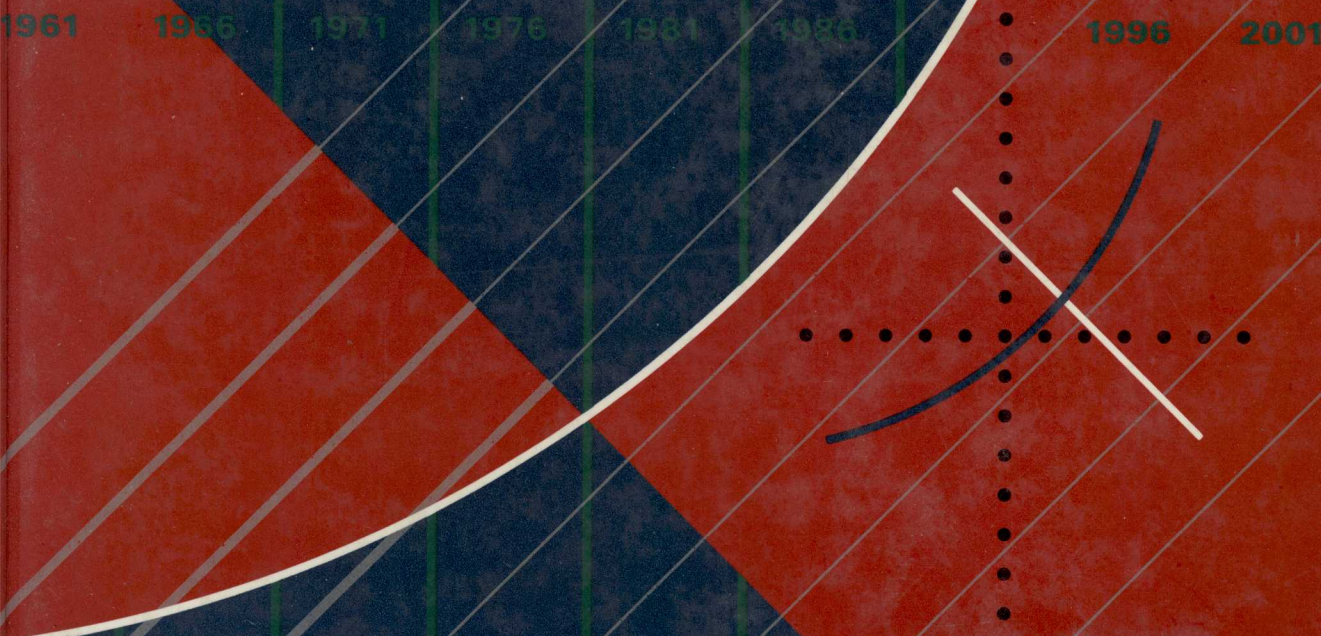
Macroeconomics



N. Gregory Mankiw

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Harvard University

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About the Author

N. Gregory Mankiw is Professor of Economics at Harvard University, where he has been teaching both undergraduate and graduate courses since 1985. He began his study of economics as an undergraduate at Princeton University and received his Ph.D. in economics from MIT in 1984.

Professor Mankiw has worked at the Council of Economic Advisers in Washington, D.C., and he is now a research associate at the National Bureau of Economic Research, a nonprofit think tank in Cambridge, Massachusetts. His research ranges across the entire field of macroeconomics and includes work on consumer behavior, price rigidity, financial markets, monetary and fiscal policy, housing, and economic growth.

Professor Mankiw is a regular contributor to scholarly journals, having published over 50 articles in the past 10 years. He is currently on the editorial boards of the *Review of Economics and Statistics* and the *Journal of Economic Perspectives*. He is also a frequent lecturer in both the United States and Europe. In 1991, Harvard economics students awarded him the Galbraith Prize for Teaching.

Professor Mankiw lives in Wellesley, Massachusetts, with his wife, Deborah, who also works at the National Bureau of Economic Research. In his free time, he plays with his border terrier, Keynes.

To Deborah

Those branches of politics, or of the laws of social life, in which there exists a collection of facts sufficiently sifted and methodized to form the beginning of a science should be taught *ex professo*. Among the chief of these is Political Economy, the sources and conditions of wealth and material prosperity for aggregate bodies of human beings. . . .

The same persons who cry down Logic will generally warn you against Political Economy. It is unfeeling, they will tell you. It recognises unpleasant facts. For my part, the most unfeeling thing I know of is the law of gravitation: it breaks the neck of the best and most amiable person without scruple, if he forgets for a single moment to give heed to it. The winds and waves too are very unfeeling. Would you advise those who go to sea to deny the winds and waves—or to make use of them, and find the means of guarding against their dangers? My advice to you is to study the great writers on Political Economy, and hold firmly by whatever in them you find true; and depend upon it that if you are not selfish or hard-hearted already, Political Economy will not make you so.

John Stuart Mill
1867

Preface

Why write a textbook?

I was asked this question many times during the three years I worked on this book. Sometimes, sorting through the piles of suggestions from reviewers and editors, I asked it myself. My answer was always the same: although several good textbooks for intermediate courses in macroeconomics were already available, I envisioned a book that was very different and, I believed, much better.

Having invested so much time in this book, I am not objective enough to judge whether it is in fact better. That is a task for others. But I can say without hesitation that it is different. Although in some ways the approach I take in this book is traditional, in other ways it tries to redefine—or at least reorient—the teaching of macroeconomics.

First, I attempt to achieve a balance between short-run and long-run macroeconomics. Courses in macroeconomics will always present the theory of short-run economic fluctuations, for it provides the basis for understanding most discussions of monetary and fiscal policy. Yet if students are to understand fully the implications of public policies, courses must give ample attention to long-run topics as well, including economic growth, the natural rate of unemployment, persistent inflation, and government debt. As if we needed reminding, the past decade has highlighted the importance of understanding the effects of policies at all time horizons: any intelligent discussion of continuing budget deficits requires balancing short-run and long-run concerns.

Second, I integrate the insights of both Keynesian and classical economics. The prominent role of the Keynesian approach to economic fluctuations in this and most other textbooks is testament to the influence and importance of Keynes's *General Theory*. Yet, in the aftermath of the Keynesian revolution, too many economists forgot that classical economics provides the right answers to many fundamental questions. In this book I incorporate many of the contributions of the classical economists before Keynes and the new classical economists of the past two decades. Substantial coverage is given, for example, to the loanable-funds theory of the interest rate, the quantity theory of money, and the problem of time inconsistency. At the same time, however, I recognize that many of the ideas of Keynes and the new Keynesians are necessary

to understand economic fluctuations. Substantial coverage is given also to the *IS-LM* model of aggregate demand, the short-run tradeoff between inflation and unemployment, and modern theories of wage and price rigidity.

Third, I present macroeconomics using a variety of simple models. Instead of pretending that there is one model that is complete enough to explain all facets of the economy, I encourage students to learn how to use and compare a set of prominent models. This approach has the pedagogical value that each model can be kept relatively simple and can be presented within one or two chapters. More important, this approach asks students to think like economists, who always keep a variety of models in mind when analyzing economic events or public policies.

Fourth, I emphasize that macroeconomics is an empirical discipline, motivated and guided by a wide variety of historical experience. This book contains many case studies that use macroeconomic theory to shed light on real-world data or events. I have chosen the case studies to highlight the broad applicability of the basic theory. The reader learns how to analyze the policies of John Kennedy, Henry Ford, and Alexander Hamilton, and how to apply economic principles to issues from fourteenth-century Europe, the island of Yap, and the land of Oz.

In these four ways, this book differs markedly from those I used as a student. I have found that these changes work well with the current generation of students. During the years I was writing this book, students at Berkeley, Brown, Harvard, Illinois, Michigan, Michigan State, Rochester, Smith, Vanderbilt, and Yale used early drafts of the manuscript in their courses. The response was heartening. The feedback I received individually and from questionnaires kept me going during the long process of writing and rewriting.

The Arrangement of Topics

My basic strategy when teaching this course is first to examine the long run when prices are flexible, and then to examine the short run when prices are sticky. That is, I begin with classical models of the economy and explain fully the long-run equilibrium before discussing deviations from that equilibrium. This strategy has several advantages:

- Students learn first the material that is less controversial among macroeconomists.
- Beginning with market-clearing models makes clearer the link between macroeconomics and microeconomics.
- When I turn to short-run fluctuations, students understand fully the long-run equilibrium around which the economy is fluctuating.
- Because the classical dichotomy permits the separation of real and monetary issues, the long-run material is easier for students to understand.

The book follows this organizational strategy. It is made up of four parts (including 18 chapters) and an epilogue. Here is a whirlwind tour:

Part One: Introduction

I have kept the introductory material as brief as possible in order to get to the core topics quickly. Chapter 1 discusses the broad questions that macroeconomists address and the economist's approach of building models to explain the world. Chapter 2 introduces the key data of macroeconomics, emphasizing gross national product, the consumer price index, and the unemployment rate.

Part Two: The Economy in the Long Run

Part Two examines the long run over which prices are flexible. Chapter 3 presents the basic classical model of national income. In this model, the factors of production and the production technology determine the level of income, and the marginal products of the factors determine its distribution to households. In addition, the model shows how fiscal policy influences the allocation of the economy's resources among consumption, investment, and government purchases, and it highlights how the real interest rate equilibrates the supply and demand for goods and services.

Chapter 4 makes the classical analysis of the economy dynamic. It uses the Solow growth model to examine the evolution of the economy over time. The Solow model provides the basis for discussing why the standard of living varies so widely across countries and how public policies influence the level and growth of the standard of living.

Chapter 5 relaxes the assumption of full employment by discussing the dynamics of the labor market and the natural rate of unemployment. It examines various causes of unemployment, including job search, minimum-wage laws, union power, and efficiency wages. It also presents some important facts about patterns of unemployment.

Money and the price level are introduced in Chapter 6. Because prices are assumed to be fully flexible, the chapter presents the prominent ideas of classical monetary theory. It discusses the quantity theory of money, the inflation tax, the Fisher effect, the causes of hyperinflation, and the social costs of inflation.

The study of open-economy macroeconomics begins in Chapter 7. Maintaining the assumption of full employment, this chapter presents models to explain the current account, the capital account, and the real and nominal exchange rates. It addresses various issues of economic policy: the relation between the budget deficit and the current-account deficit, the macroeconomic impact of protectionist trade policies, and the effect of monetary policy on the value of a currency in the market for foreign exchange.

Part Three: The Economy in the Short Run

Part Three examines the short run when prices are sticky. It begins in Chapter 8 by introducing the model of aggregate supply and aggregate demand as well as the role of stabilization policy. Subsequent chapters refine the ideas introduced here.

Chapters 9 and 10 look more closely at aggregate demand. Chapter 9 presents the Keynesian cross and the theory of liquidity preference, and it uses these models as building blocks for the *IS-LM* model. Chapter 10 uses the *IS-LM* model to explain economic fluctuations and the aggregate demand curve. It concludes with an extended case study of the Great Depression.

Chapter 11 looks more closely at aggregate supply. It examines the various approaches to explaining the short-run aggregate supply curve, and it discusses the short-run tradeoff between inflation and unemployment. It also discusses some recent new Keynesian developments in the theory of aggregate supply.

After the model of aggregate supply and aggregate demand has been fully developed, Chapter 12 turns to the hotly contested issue of how this model should be applied to economic policy. It emphasizes two broad questions. Should monetary and fiscal policy be active or passive? Should policy be conducted by rule or by discretion? The chapter presents arguments on both sides of the debate.

The study of open-economy macroeconomics continues in Chapter 13, which discusses short-run fluctuations in an open economy. This chapter presents the Mundell-Fleming model and shows how monetary and fiscal policy affect the economy under floating and fixed exchange-rate systems. It also discusses the debate over whether exchange rates should be floating or fixed.

Finally, Chapter 14 presents the theory of real business cycles as an alternative way to view economic fluctuations. It discusses the basic elements of this new classical approach and the arguments advanced by both its advocates and critics.

Part Four: More on the Microeconomics Behind Macroeconomics

After developing the long-run and short-run models, the book discusses several topics that refine our understanding of the economy by analyzing more fully the microeconomics behind macroeconomics. Chapter 15 presents the various theories of consumer behavior, including the Keynesian consumption function, Fisher's model of intertemporal choice, Modigliani's life-cycle hypothesis, and Friedman's permanent-income hypothesis. Chapter 16 discusses the debate between the traditional and Ricardian views of government debt, emphasizing that the argument is ultimately over how consumers behave. Chapter 17 presents the theory behind the investment function. Chapter 18 provides additional material on the money market, including the role of the banking system in de-

termining the money supply and the Baumol-Tobin model of money demand.

Epilogue

The book ends with a brief epilogue, which reviews the broad lessons about which most macroeconomists would agree and some of the most important unresolved questions. Here and throughout the book, I emphasize that despite the disagreements among macroeconomists, there is much we know about how the economy works.

Alternative Syllabus

Economics professors differ in the importance they place on various topics and the sequence in which they prefer to cover these topics. In writing this book, I have tried to make it as flexible as possible. Many of the chapters are self-contained. Instructors can change the emphases of their courses by rearranging the chapters or by omitting some chapters entirely.

One possible alternative syllabus is presented here as an example. This syllabus maintains the strategy of first examining output and prices in the long run when prices are flexible, but it introduces sticky prices and short-run fluctuations earlier in the course. It defers all open-economy macroeconomics until after the study of fluctuations, and it defers the study of economic growth and the natural rate of unemployment until the end of the course.

Introduction

1. The Science of Macroeconomics
2. The Data of Macroeconomics

Income and Prices

3. National Income: Its Production, Distribution, and Allocation
6. Inflation
8. Introduction to Economic Fluctuations
9. Aggregate Demand I
10. Aggregate Demand II
11. Aggregate Supply
12. Macroeconomic Policy
14. The Theory of Real Business Cycles

Open-Economy Macroeconomics

7. The Open Economy
13. The Open Economy in the Short Run

More on the Microeconomics Behind Macroeconomics

15. Consumption
16. Two Views of Government Debt
17. Investment
18. Money Supply and Money Demand
5. Unemployment
4. Economic Growth

Learning Tools

I have made every effort to keep this text user-friendly. Students are continually asked to use and review what they have learned.

Case Studies

Economics comes to life when it is applied to understand the world. Therefore, the 74 case studies in this text are its most important learning tool. The frequency with which they occur ensures that a student does not need to grapple with an overdose of theory before seeing the theory applied. Students report that the case studies are their favorite part of the book.

FYI Boxes

These boxes present ancillary material "for your information." I use these boxes to clarify difficult concepts, to provide additional information about the tools of economics, and to show how economics relates to our daily lives.

Mathematical Notes

I use occasional mathematical footnotes to keep more difficult material out of the body of the text. These notes make an argument more rigorous or present a proof of a mathematical result. They are designed for students who know basic calculus and can easily be skipped by those who don't.

Chapter Summaries

Every chapter ends with a brief, nontechnical summary of its major lessons. Students can use the summaries to place the material in perspective and to review for exams.

Key Concepts

Every chapter includes a number of key concepts. Within the chapter, each key concept is **boldfaced** when it is introduced. At the end of the chapter, the key concepts are listed for review.

Questions for Review

After finishing a chapter, students can immediately test their understanding of its basic lessons by answering the Questions for Review.

Problems and Applications

Each chapter includes a number of Problems and Applications designed for homework assignments. Some of these are numerical applications of

the theory in the chapter. Others encourage the student to go beyond the material in the chapter by addressing new issues that are closely related to the chapter topics.

Chapter Appendices

Six chapters include appendices presenting additional material, sometimes at a higher level of mathematical sophistication. These are designed so that professors can cover certain topics in greater depth if they wish. The appendices can be skipped altogether without any loss of continuity.

Glossary

Like all fields, macroeconomics has its own language. To help students become familiar with this new language, a glossary of more than 250 terms is provided at the end of the book.

Supplements

Worth Publishers and I have put together a talented team of economics professors to develop the supplements that accompany this book.

Student Guide and Workbook

Roger Kaufman of Smith College has written a superb study guide for students. It provides an abundance of ways for students to learn the material in the text and assess their understanding.

- *Fill-In Questions* give students the opportunity to review and check their knowledge of the key terms and concepts in the chapter.
- *Multiple-Choice Questions* allow students to test themselves on the chapter material.
- *Exercises* guide students step by step through the various models using graphs and numerical examples.
- *Problems* ask students to apply the models on their own.
- *Questions to Think About* require critical thinking as well as economic analysis.
- *Data Questions* ask students to obtain and learn about readily available economic data.

Student Software

David Weil of Brown University has developed an innovative software package that students can use throughout the course. *MacroBytes* provides a range of activities to aid and motivate the student:

- *Self-Tests.* Students can test their knowledge of the material in the book by taking multiple-choice tests on any chapter or combination of chapters. After the student responds, the program explains the answer and directs the student to specific sections in the book for additional study.
- *Data Plotter.* Students can explore macroeconomic data with time-series graphs and scatterplots.
- *Macro Models.* These modules provide simulations of the models presented in the book. Students can change the exogenous variables and see the outcomes in terms of shifting curves and recalculated numerical values of the endogenous variables. Each module contains exercises that instructors can assign as homework. These exercises help ensure mastery of the models in the book.
- *2001: A Game for Macroeconomists.* The game allows students to become President of the United States in the year 2001 and to make macroeconomic policy decisions based on news events, economic statistics, and approval ratings. It gives students a sense of the complex interconnections that influence the economy.

The *Instructor's Resource Manual* gives suggestions on various ways to integrate the software into the course. *MacroBytes* is available for the IBM PC.

Instructor's Resource Manual

Andrew John of Michigan State University has developed an extensive resource manual which instructors will find invaluable. Each chapter contains notes to the instructor, a detailed lecture outline, a series of "briefs," an annotated reading list, the answers to the end-of-chapter questions in the text, suggestions on ways to incorporate the *MacroBytes* software into the course, and answers to the software exercises. The notes to the instructor provide a clear and concise discussion of the approach and goals of each chapter. These notes complement the detailed lecture outlines, which cover all of the topics in each text chapter.

A special feature of the *Instructor's Resource Manual* is the series of briefs for each chapter. These lively supplemental discussions address current economic events and emerging research, give additional case studies, and take in-depth looks at selected topics in the text. Instructors can use these briefs to enrich their lectures, or they can reproduce the briefs as handouts for students.

Test Bank and Computerized Test-Generation System

Charles Bischoff of the State University of New York at Binghamton has written a test bank of over 500 multiple-choice questions to accompany the text. Several numerical problems are also provided for each chapter. Professors can obtain either a printed and bound copy of the test bank,

a disk, or both. The disk includes a test-generation program and is available for both the IBM PC and Macintosh computers.

Transparency Masters

Worth Publishers will provide enlarged master copies of all the figures in the text. Instructors can use these to prepare overhead transparencies for use in lecture.

Acknowledgments

When writing this book, I benefited from the input of many editors, reviewers, and colleagues. In addition, over 1,000 students at nearly a dozen universities read the manuscript at various stages of revision. Their comments and suggestions have made this a better book.

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I am also grateful to Jeanette DeHaan, my secretary at Harvard. As always, her work went beyond the call of duty.

Finally, I would like to encourage those who use this book to send me their reactions—both positive and negative. Regular revision is necessary to keep a textbook up-to-date. Suggestions from teachers and students were invaluable in writing this first edition, and I am sure they will be again when I start writing the second.

N. Gregory Mankiw

Cambridge, Massachusetts
May 1991

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