# MACRO ECONOMICS

FOURTH EDITION

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# Preface

In writing the first edition of this book, we set ourselves the goal of presenting the new macroeconomics in a manageable form. The content and emphasis of our book have changed some over three editions, but the enthusiastic response to each one has encouraged us to stick to our original goal: build in the new developments, but keep the presentation manageable. This fourth edition includes important research and policy developments through the early 1990s. New research has been particularly substantial on endogenous economic growth and on banking and credit markets. New policy issues have arisen from concerns about the U.S. recession in the early 1990s and about the low projections for long-term economic growth.

Weaving up-to-date, real-world policy examples into the text has proven to be a useful pedagogical feature which we have tried to preserve in each writing. Earlier editions drew many examples from the disinflation and the recessions of the early 1980s. In preparing this fourth edition, we reviewed all of these examples, and where we felt we could enhance readers' interest, we replaced the examples with events from the recession of the early 1990s. The recent recession has provided new developments on the international front, which we also explore.

The major revision of the National Income and Product Accounts (NIPA) provides a new lens through which to examine macroeconomic fluctuations in the United States. And the new emphasis on Gross Domestic Product (GDP) in the NIPA receives a corresponding emphasis in the text. The fourth edition makes extensive use of the new data. It also defines, explores fully, and focuses on GDP as the primary measure of output.

Our professional experience since the first edition has allowed us to do something entirely new with real-world examples in this fourth edition: to examine how *new* macroeconomic research is being used in practical policymaking. This new research is not only everywhere apparent in the discipline, it is also, in our view, everywhere apparent in practical policymaking. In order to share this experience, we have developed a series of essays—placed at appropriate locations throughout the book—that highlight how new research has been used in practice. We portray how successful, or unsuccessful, each application has been. Of course, many noneconomic factors—security, diplomatic, or political—influence practical policy decisions, and we try to sort out the effects of one influence from another on policy decisions. This is difficult. Policymakers themselves may be unfamiliar with the research and therefore may deny its influence, but still may be influenced indirectly. In highlighting applications of new research, we do not mean to denigrate old research. Indeed, much early macroeconomic research is more important than ever. It is fully embedded in the basic model used in the book, with practical examples routinely woven into the text.

New technological developments outside economics are also seen in this fourth edition. All diagrams and charts have been reconstructed using a full multicolor design. In preparing for this reconstruction, we reviewed all the charts and diagrams and selected a color coding that we felt would help the reader understand, sort out, and remember the material. Moreover, several new charts have been added that exploit the advantages of a multicolor design. Overall we feel that this is an enormous pedagogical improvement.

Economic fluctuations—recessions and booms—continue to be a key theme of the book. Recessions cause serious hardship and economic loss. We continue to view them, however, as temporary departures of the economy from its full-employment long-run growth path. We emphasize in this fourth edition—in keeping with much recent research—that this long-run growth path is not exogenous. As with the third edition, we describe the determinants of growth—labor, capital, and technological change—early in the book (Chapters 4 and 5), but we now also discuss the determinants of these determinants.

We take the view that many types of shocks are responsible for departures of the economy from its long-run path. These include changes in monetary and fiscal policies, as well as sudden increases in world oil prices, a factor that was of great importance in the 1990 recession and its two direct predecessors. They also include technological shocks, which have been featured in real business cycle research as a major source of economic fluctuations.

In our view full employment is not restored immediately after a shock because the economy adjusts slowly, a sluggishness primarily due to price and wage rigidity. We study rigidities within an overall framework in which expectations and other features of people's behavior are basically rational, and we provide a microeconomic account of the way in which price and wage rigidities delay the return to full employment.

Changes in the instruments of monetary and fiscal policies have powerful effects in this kind of model. We see ourselves as part of a newly evolving consensus that recognizes the value of clearly stated, credible, and systematic monetary and fiscal policies. We examine how such policies should be designed and implemented.

As in the earlier editions, Part I is a short course in macroeconomics by itself. The *complete* model is developed in this part. It focuses on three major ideas: the fundamental determinants of output in the long run, the determination of output and employment in the short run through the aggregate demand curve and the predetermined price, and the process of price adjustment that takes the economy back to the long-run growth path after a shock causes a recession or boom. Part I also introduces our analysis of monetary and fiscal policies.

Part II gives a systematic treatment of the microfoundations of aggregate demand. Consumption, investment, imports, exports, government spending, taxes, and the monetary system are studied in detail. Part III considers the microfoundations of price and wage setting and the dynamic adjustment of the economy. Models with flexible prices as well as models with wage and price rigidities are studied. Part IV looks in detail at the design and implementation of monetary and fiscal policies using the fully embellished model with wage and price rigidities and rational expectations, both in a national and an international setting.

## Distinctive Features at a Glance

A number of important features have made this book work well in the classroom:

- Consistent development of a *complete working macro model* with short-run fluctuations, price adjustment, and long-run growth.
- Thorough examination of how macroeconomics is used in *practical policy applications.*
- Consistent *numerical values* of the coefficients of the complete model give a sense of the magnitudes involved and provide a bridge between the text and the end-of-chapter problems.
- *Computer software* that displays the same complete model and permits many kinds of experiments with the model.
- Discussion of the *determinants of long-run growth* before describing fluctuations around the growth path.

- Treating the *price level as a predetermined variable* consistently throughout the book.
- Considering the United States as an *open economy* throughout the book, rather than adding trade and exchange rates late in the book.
- Attention to the *microeconomic foundations* of all subjects discussed.
- Careful exposition of the *empirical regularities* of the U.S. economy at the start of each chapter on microfoundations.

## Summary of Pedagogical Features

Teachers and students who have used the text have found many pedagogical features that enhance the student's understanding of the material. Here is how those features work:

- *Summary boxes.* Key ideas are drawn together at appropriate places within each chapter. The boxes serve a reinforcing function by allowing readers to check their understanding of one aspect of the analysis before tackling new material. And they also serve a review function; they help readers locate the building blocks of the analysis without rereading entire chapters.
- *Topic boxes.* Special concepts that are related to the discussion in the text are introduced. These include computing growth rates, quarterly Gross Domestic Product statistics, budget projections, indexing taxes, and the relationship between graphs and algebra. The boxes also present discussions of historical examples, current policy issues, and other illustrations of points in the text.
- *Problems and policy simulations.* At the end of each chapter there are questions for review and three types of problems: numerical, analytical, and computer simulation exercises to be used with the *MacroSolve* program. The numerical problems require the use of a hand calculator and usually take more time. We have found these useful for special projects. The analytical questions can be done with graphs or simple algebra. We have found much enthusiasm for putting *MacroSolve* Exercises in the text in the third edition. In this fourth edition we have made the computer problems more interesting by simulating decisions facing policymakers in a practical setting.
- *References.* We have tried to keep footnotes to a minimum. Footnotes are used mainly to document a specific statement or reference in the text.
- *Parallel graphical and algebraic presentation.* In most cases arguments are presented in both graphical and algebraic form. We have found that some students learn better with graphs and some learn better with algebra, especially if the algebra is presented in a way that does not intimidate. Graphical arguments are not necessarily easier for all students, and the algebra is provided to help those with a preference for algebra. Of course, graphical presentation usually helps with the intuition, and we

expect even the less graphically inclined students to learn basic diagrams. A special effort has been made to demonstrate that graphs and algebra are just two ways to describe the same economic concepts.

- *Multicolor figures.* All diagrams and charts of data are now shown with several colors to highlight different ideas. Shifting curves are easier to visualize with these colors. Micro relationships are generally given special colors to distinguish them from macro relationships.
- *Policy essays: New Research in Practice.* In order to highlight how new research is used in practice, a series of policy essays have been placed at appropriate spots throughout the text.
- *Real-world examples.* Seeing how economic theory works in practice is the best way to learn. Too often, however, these lessons of experience are placed at some distance from the analysis, with the result that students often sense that a barrier exists between macroeconomic models and the real world from which they are drawn. We have chosen to make the performance of the economy an integral aspect of the exposition, with new concepts constantly illuminated by examples.
- *Teaching supplements.* An excellent *Study Guide* prepared by David H. Papell of the University of Houston is available for student purchase. An *Instructor's Manual* that we have prepared jointly with Michael Knetter of Dartmouth College and Gary W. Yohe of Wesleyan University is available to teachers from the publisher. This *Instructor's Manual* contains many teaching "tricks" to prompt students to become actively involved in the subject. These include macro-forecasting contests, policy projects on Federal Reserve monetary targeting and federal budget projections, debate formats for lectures, classroom skits to illustrate the forward-looking theory of consumption and other models, and formats for class participation in financial decision-making. There are also references to more complicated material related to the text and a large number of test questions. A *Test-Item File* of roughly 700 questions has been prepared by Michael Knetter and Gary W. Yohe and is available either in printed form as part of the *Instructor's Manual* or on diskette for most personal computers. *Transparencies* suitable for use with an overhead projector are available in full color for all the key figures.
- *Highly regarded computer software.* The MacroSolve package, written by Stephen R. King and Rick M. McConnell, embodies the IS-LM and price-adjustment equations developed in the text. This innovative software has received rave reviews from students and teachers and can now be ordered as part of the text. The user can shift curves on the graphical display and see immediately how the economy reacts.
- *Data sources.* Whenever possible the data in charts and tables are taken from the most recently available *Economic Report of the President.* This makes it easy for students and instructors to explore the data in more detail.

## A Guided Tour

The book starts with a short course in macroeconomic analysis in Part I. All the major topics are covered. We review the basic facts of macroeconomic fluctuations and develop a simple but complete model of the macroeconomy. We present the determinants of long-run growth and relate factor inputs to output. We consider short-run fluctuations around the long-run growth path. We use the aggregate demand curve to explain the determination of output in the short run when the price level is predetermined. Our approach to aggregate demand is standard, through the IS-LM apparatus. The aggregate demand curve also has an important role in long-run calculations, where the price level is determined.

The path to full employment is governed by the price-adjustment process. Our analysis shuttles back and forth from price adjustment to output determination. Once the price level has adjusted, output is found at the point of the new price level on the aggregate demand curve. We do not drop the predetermined-price assumption when we trace the economy's move to its long-run path. IS-LM remains our theory of output determination in each period of the dynamic analysis.

The expositional simplification we achieve in this way is enormous. We do not feel that the empirical evidence justifies the complexity of simultaneous determination of prices and output in each period. There is certainly no contradiction to the predetermined-price assumption if the period is a quarter of a year, and the assumption is valid as a close approximation if the period is a full year.

The adaptation of price adjustment to inflation ranks high among the ideas that have evolved in macroeconomics over the past two decades. We avoid characterizing this adaptation solely as a matter of changing expectations. Even with rational expectations, price adjustment depends partly on recent inflation experience since contracts and other rigidities prevent quick adjustments. We discuss how the adaptation of expectations to inflation depends on how prices and wages are set.

After the short course in macroeconomic analysis, we go on to develop the micro foundations of aggregate demand in Part II. At the start of each chapter we present the key facts or puzzles that need to be explained. At the end of each chapter we look at the implications for IS-LM. The consumption chapter (10) develops a forward-looking theory of consumption based on the life-cycle and permanent-income formulations, emphasizing the role of rational expectations. By establishing an intertemporal budget constraint, we avoid present discounted values and forbidding summations. Chapter 11, on investment, focuses on Dale Jorgensen's model. The foreign trade chapter (12) focuses on flexible exchange rates, with a rational expectations model of the exchange rate as its centerpiece. Chapter 13, on government, presents material on the deficit and government debt alongside a standard treatment of automatic stabilizers and related subjects. When the intertemporal budget constraint for the government is presented; the idea is already familiar to the student from consumption and investment. Chapter 14, on the monetary system, takes up money demand and describes the role of the Federal Reserve using financial balance sheets developed in Part I. We emphasize the credit, or intermediation, role of banks in addition to their role in determining the money supply. This role has received increased attention in recent research and policy discussion.

Part III contains much that we think is novel for an intermediate text. This part takes up the microeconomic foundations of wage and price setting. Chapter 15 considers market-clearing or equilibrium views, including Robert Lucas's imperfect information model of aggregate supply. Chapter 16 considers alternative views emphasizing the microfoundation of wage and price rigidities. Chapter 17 discusses the implications of gradual price adjustment for the dynamic behavior of the macroeconomy and compares these implications with actual experience.

Part IV pulls the analysis together into a comprehensive treatment of macroeconomic policy evaluation. Chapter 18 takes up general policy issues such as time inconsistency, multiplier uncertainty, targets and instruments, and the rational expectations critique of policy evaluation. The emphasis is on policy rules, rather than on one-time policy changes. The inflation/unemployment trade-off appears as a policy frontier between output stability and price stability. Chapter 19 then considers macroeconomic policy in the world economy, including a review of how the international monetary system evolved from Bretton Woods and how policy works in countries with fixed exchange rates.

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