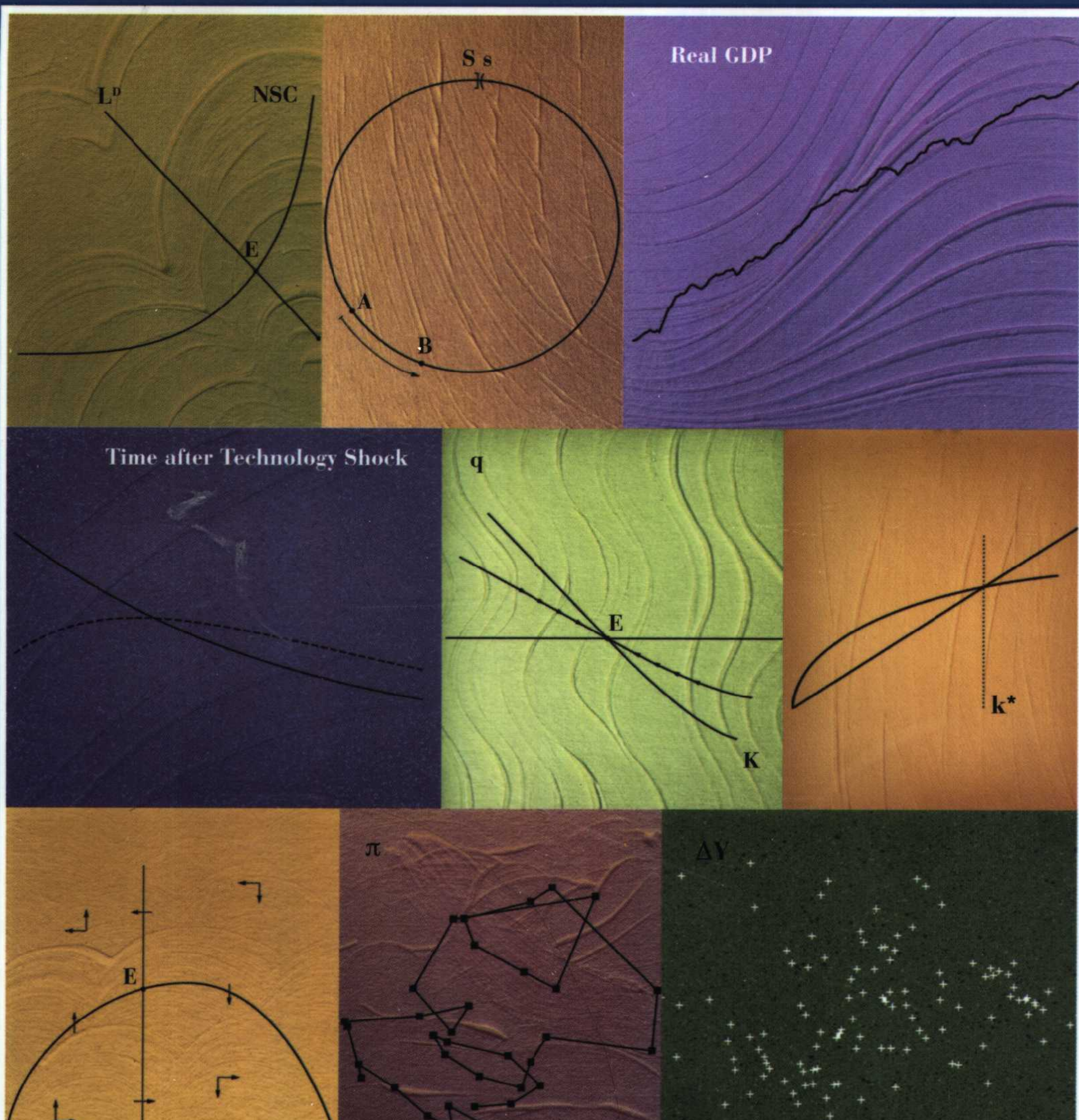
ADVANCED MACROECONOMICS

second edition



DAVID ROMER

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University of California, Berkeley

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ABOUT THE AUTHOR

David Romer is the Royer Professor in Political Economy at the University of California, Berkeley, where he has been on the faculty since 1988. He received his A.B. from Princeton University, where he was valedictorian, and his Ph.D. from the Massachusetts Institute of Technology. He has been on the faculty at Princeton and has been a visiting faculty member at M.I.T. and Stanford University. He is also a Research Associate of the National Bureau of Economic Research. At Berkeley he has received both the Graduate Economics Association Distinguished Teaching Award and its Distinguished Advising Award. His main research interests are monetary policy, the foundations of price stickiness, empirical evidence on economic growth, and asset-price volatility. He is married to Christina Romer, who is also an economist, and has three children, Katherine, Paul, and Matthew.

To Christy

PREFACE TO THE SECOND EDITION

Macroeconomics is an exciting field. New theories are constantly being proposed, new tests devised and implemented, and existing theories and evidence reconsidered. For the author of a book like this one, which tries to provide an introduction to the current state of the field, this is both a blessing and a curse. It is a blessing because there has been a great deal of work since I wrote the first edition that provides important new insights into many of the central questions of macroeconomics. It is a curse because a substantial amount of what was in the first edition needed to be changed.

Readers who are familiar with the first edition of this book will see many changes. There is a completely new chapter on fiscal policy. In addition to discussing the main issues in this area, this chapter provides an introduction to the burgeoning research on political economy. The second half of Chapter 3, which examines cross-country income differences, bears no resemblance to the corresponding material in the first edition: the evidence and ideas developed in the five years since I wrote the first edition have caused me to completely rethink my views on that subject. In other chapters, there are new sections on the environment and economic growth, the cyclical behavior of the real wage, and the conduct of monetary policy. I have also rewritten a great deal of material to reflect recent developments and changing views, or simply to make the presentation clearer.

At the same time, I have tried hard to maintain what readers perceived to be the main virtues of the first edition. I have tried to keep the focus on substantive questions rather than models, to concentrate on the essentials, to have a good balance between theoretical and empirical work, and to be concise.

This book owes a great deal to many people. The book is an outgrowth of courses I have taught at Princeton University, the Massachusetts Institute of Technology, Stanford University, and especially the University of California, Berkeley. I want to thank the many students in these courses for their feedback, their patience, and their encouragement.

Four people provided detailed, thoughtful, and constructive comments on almost every aspect of the first and second editions: Laurence Ball, A. Andrew John, N. Gregory Mankiw, and Christina Romer. Each significantly improved the book, and I am deeply grateful to them for their efforts.

In addition, Susanto Basu, Robert Chirinko, Matthew Cushing, Charles Engel, Mark Gertler, Robert Gordon, Mary Gregory, A. Stephen Holland, Hiroo Iwanari, Frederick Joutz, Gregory Linden, Maurice Obtsfeld, Stephen Perez, Robert Rasche, Peter Skott, and Peter Temin made valuable comments and suggestions concerning some or all of the book. Jeffrey Rohaly prepared the superb *Solutions Manual.* Teresa Cyrus and Ryan Edwards helped with the preparation of some of the tables and figures, and both Jeffrey Rohaly and Ryan Edwards provided invaluable help with proofreading and checking the manuscript. Finally, the editorial and production staff at McGraw-Hill did an excellent job of turning the manuscript into a finished product. I thank all these people for their help.

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EMPIRICAL APPLICATIONS

INTRODUCTION

Macroeconomics is the study of the economy as a whole. It is therefore concerned with some of the most important questions in economics. Why are some countries rich and others poor? Why do countries grow? What are the sources of recessions and booms? Why is there unemployment, and what determines its extent? What are the sources of inflation? How do government policies affect output, unemployment, inflation, and growth? These and related questions are the subject of macroeconomics.

This book is an introduction to the study of macroeconomics at an advanced level. It presents the major theories concerning the central questions of macroeconomics. Its goal is to provide both an overview of the field for students who will not continue in macroeconomics and a starting point for students who will go on to more advanced courses and research in macroeconomics and monetary economics.

The book takes a broad view of the subject matter of macroeconomics; it views it as the study not just of aggregate fluctuations but of other features of the economy as a whole. A substantial portion of the book is devoted to economic growth, and separate chapters are devoted to the natural rate of unemployment, inflation, and budget deficits. Within each part, the major issues and competing theories are presented and discussed. Throughout, the presentation is motivated by substantive questions about the world. Models and techniques are used extensively, but they are treated as tools for gaining insight into important issues, not as ends in themselves.

The first three chapters are concerned with growth. The analysis focuses on two fundamental questions: Why are some economies so much richer than others, and what accounts for the huge increases in real incomes over time? Chapter 1 is devoted to the Solow growth model, which is the basic reference point for almost all analyses of growth. The Solow model takes technological progress as given and investigates the effects of the division of output between consumption and investment on capital accumulation and growth. The chapter presents and analyzes the model and assesses its ability to answer the central questions concerning growth.

Chapter 2 relaxes the Solow model's assumption that the saving rate is exogenous and fixed. It covers both a model where the set of households in the economy is fixed (the Ramsey model) and one where there is turnover (the Diamond model).

Chapter 3 presents the new growth theory. The first part of the chapter explores the sources of the accumulation of knowledge, the allocation of resources to knowledge accumulation, and the effects of that accumulation on growth. The second part focuses specifically on the sources of the enormous differences in average incomes across countries.

Chapters 4 through 6 are devoted to short-run fluctuations—the year-to-year and quarter-to-quarter ups and downs of employment, unemployment, and output. Chapter 4 investigates models of fluctuations where there are no imperfections, externalities, or missing markets and where the economy is subject only to real disturbances. This presentation of real-business-cycle theory considers both a baseline model whose mechanics are fairly transparent and a more sophisticated model that incorporates additional important features of fluctuations.

Chapters 5 and 6 then turn to Keynesian models of fluctuations. These models are based on sluggish adjustment of nominal wages and prices, and emphasize monetary as well as real disturbances. Chapter 5 takes the existence of sluggish adjustment as given. It first reviews the closed-economy and open-economy versions of the traditional *IS-LM* model. It then investigates the implications of alternative assumptions about price and wage rigidity, market structure, and inflationary expectations for the cyclical behavior of real wages, productivity, and markups, and for the relationship between output and inflation.

Chapter 6 examines the fundamental assumption of Keynesian models that nominal wages and prices do not adjust immediately to disturbances. The chapter covers the Lucas imperfect-information model, models of staggered adjustment of prices or wages, and new Keynesian theories of small frictions in price-setting. The chapter concludes with a brief discussion of theories of fluctuations based on coordination failures and real non-Walrasian features of the economy.

The analysis in the first six chapters suggests that the behavior of consumption and investment is central to both growth and fluctuations. Chapters 7 and 8 therefore examine the determinants of consumption and investment in more detail. In each case, the analysis begins with a baseline model and then considers alternative views. For consumption, the baseline is the life-cycle/permanent-income hypothesis; for investment, it is q theory.

Chapter 9 turns to the labor market. It focuses on the determinants of an economy's natural rate of unemployment. The chapter also investigates the impact of fluctuations in labor demand on real wages and employment. The main theories considered are efficiency-wage theories, contracting and insider/outsider theories, and search and matching models.

The final two chapters are devoted to macroeconomic policy. Chapter 10 investigates monetary policy and inflation. It begins by explaining the central role of money growth in causing inflation and by investigating the effects of money growth on inflation, interest rates, and the real money stock. The remainder of the chapter considers two sets of theories of