

MACRO ECONOMICS

THIRD EDITION



Charles I. Jones

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Charles I. Jones

Stanford University, Graduate School of Business



W. W. NORTON & COMPANY
NEW YORK LONDON

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Printed in the United States of America

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Composition: Jouve

Manufacturing: Quad Graphics

Library of Congress Cataloging-in-Publication Data

Jones, Charles I. (Charles Irving)

Macroeconomics/Charles I. Jones, Stanford University, Graduate School of Business. — Third Edition.

pages cm

Includes bibliographical references and index.

ISBN 978-0-393-92390-2 (hardcover : alk. paper) 1. Macroeconomics. I. Title.

HB172.5.J65 2014

339—dc23

2013041076

W. W. Norton & Company, Inc., 500 Fifth Avenue, New York, NY 10110

wwnorton.com

W. W. Norton & Company Ltd., Castle House, 75/76 Wells Street, London W1T 3QT

1 2 3 4 5 6 7 8 9 0

To Terry; for Audrey and Charlie

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PREFACE TO THE THIRD EDITION

The macroeconomic events of the last several years are truly breathtaking—a once-in-a-lifetime (we hope) occurrence. While the basics of how economists understand the macroeconomy remain solid, the global financial crisis and the Great Recession take us into waters that, if not uncharted, at least haven't been visited in recent decades. The remarkable collapse in housing prices, the large rise in the financial risk premium, the massive expansion of the Federal Reserve's balance sheet, and the global nature of the financial crisis are among the novel changes in the macroeconomy.

This new edition continues the tradition established in previous versions of the book of providing up-to-date, modern analysis of both current events and classic issues in macroeconomics. For example, the latest research on the Great Recession (Chapters 10 and 14), China's impact on U.S. jobs and wage inequality (Chapter 7), new measures of standards of living (Chapter 2), and the Euro-area financial crisis (Chapter 20) are all incorporated. In addition, I'm especially excited to introduce a new chapter on DSGE (dynamic, stochastic, general equilibrium) models—the new Chapter 15. This chapter explains state-of-the-art business cycle modeling at a level appropriate for all intermediate macro students, complementing the more traditional AS/AD-style analysis of earlier chapters. This third edition also incorporates many new case studies and exercises, extensive updates to tables and figures to reflect the most current data, and improvements on nearly every page in the text.

It is a fascinating time to study macroeconomics, and I look forward to sharing astounding facts about the macroeconomy with you and to discussing the Nobel-caliber ideas that help us understand them.

Innovations

(This section will make the most sense to readers with some familiarity with macroeconomics, especially instructors. Students new to the subject might skip to the Guided Tour.)

Most other textbooks for teaching intermediate macroeconomics were first written more than twenty years ago. Our understanding of the macroeconomy has improved substantially since then. This textbook provides an accessible and yet modern treatment. Its order and structure will feel familiar to instructors, but the execution, examples, and pedagogy have been updated to incorporate the best that macroeconomics instruction has to offer.

What's special about this book? Innovations occur throughout, but the key ones are described below.

Two Chapters on the Great Recession

The global financial crisis and the Great Recession that followed are obviously the most important macroeconomic events in decades. While these events are discussed throughout the section of the book devoted to the short-run, two chapters explicitly focus on recent events. Chapter 10 (The Great Recession: A First Look) follows immediately after the first introductory chapter on the short-run, exposing students to the facts of the last several years and to critical concepts like leverage, balance sheets, and securitization. Chapter 14 (The Great Recession and the Short-Run Model) is the last chapter of the short-run section of the book. It provides a detailed application of the short-run model to recent events, explaining in the process the unconventional aspects of monetary and fiscal policy that have been featured prominently in the government's response to the crisis.

Rich Treatment of Economic Growth

Economic growth is the first major topic explored in the book. After an overview chapter describes the facts and some tools, Chapter 4 presents a (static) model based on a Cobb-Douglas production function. Students learn what a model is with this simple structure, and they see it applied to understanding the 50-fold differences in the per capita GDP that we see across countries. Chapter 5 presents the Solow model but with no technological change or population growth—which simplifies the presentation. Instead, students learn Robert Solow’s insight that capital accumulation cannot serve as the engine for long-run economic growth.

Chapter 6 then offers something absent in most other intermediate macro books: a thorough exposition of the economics of ideas and Paul Romer’s insight that the discovery of new ideas can drive long-run growth.

The approach taken here is to explain the macroeconomics of the long run before turning to the short run. It is much easier to understand fluctuations in macroeconomic aggregates when one understands how those aggregates behave in normal times.

Familiar Yet Updated Short-Run Model

The “modern” version of the short-run AS/AD model is the crowning achievement of the short-run section. By modern, I mean several things. First and foremost, the AS/AD graph is drawn with inflation on the vertical axis rather than the price level—perfect for teaching students about the threat of deflation that has reared its head following the Great Recession, the Volcker disinflation, and the Great Inflation of the 1970s. All the short-run analysis—including explicit dynamics—can be performed in this single graph.

Another innovation in getting to the AS/AD framework is a focus on interest rates and the absence of an LM curve. The central bank sets the interest rate in Chapter 12. Chapter 13 introduces a simple version of John Taylor’s monetary policy rule to get the AD curve.

A final innovation in the short-run model is that it features an open economy from the start. Business cycles in the rest of the world are one source of shocks to the home economy. To keep things

simple, however, the initial short-run model does not include exchange rates.

DSGE Models: The Frontier of Business Cycle Research

I’m particularly excited about a brand new chapter that has been added in this third edition, Chapter 15. A well-known tension exists between macroeconomics as it is taught in most intermediate courses and macroeconomics as it is practiced by policymakers, central bankers, and researchers. Traditionally, it has been thought that the more difficult mathematics used by practitioners necessitated this divide. However, in the new Chapter 15, I’ve found a way to bridge some of this gap, giving students insights into the much richer DSGE models typically used to study macroeconomic fluctuations. Two innovations make this possible. First, I present the “impact effect” of shocks in a DSGE framework by studying the labor market. Second, I introduce impulse response functions graphically and then show estimates of these dynamic effects using state-of-the-art methods (in particular, the estimates of the famous Smets-Wouters model).

Interplay Between Models and Data

A tight connection between models and data is a feature of modern macroeconomics, and this connection pervades the book. Many exercises ask students to work with real data. Some of this is available in the book itself; some is obtained by using the online *Economic Report of the President*; and some is available in a new data tool I’ve put together: Country Snapshots. This is a pdf file available from www.stanford.edu/~chadj/snapshots.html that contains a page of graphs for each country in the world. The data underlying the graphs can be obtained as a spreadsheet simply by clicking on a link at the top of each page.

Worked Exercises at the End of Each Chapter

One of the most effective ways to learn is by working through problems, and a carefully chosen collection of exercises is included at the end of each chapter. From among these, one or two are selected and worked out in detail. Students are

encouraged to attempt these exercises on their own before turning to the full solution.

More Emphasis on the World Economy

Relative to many intermediate macro books, this text features more emphasis on the world economy. This occurs in three ways. First, the long-run growth chapters are a main emphasis in the book, and these inherently involve international comparisons. Second, the short-run model features an open economy (albeit without exchange rates) from the very beginning. Finally, the book includes two international chapters in Part 4: in addition to the standard international finance chapter that appears as Chapter 20, Chapter 19 is entirely devoted to international trade.

Better Applications and Microfoundations

Part 4 includes five chapters of applications and microfoundations. The basic structure of this part is traditional; there is a chapter for each component of the national income identity: consumption, investment, the government, and the international economy. However, the material inside this part is modern and novel. For example, the consumption chapter (Chapter 16) is centered around the famous Euler equation that lies at the heart of today's macroeconomics. The investment chapter (Chapter 17) highlights the strong parallels between investment in physical capital and financial investments in the stock market, using the "arbitrage equation" approach. The chapter on the government and the macroeconomy (Chapter 18) includes an application to what I call "The Fiscal Problem of the Twenty-First Century"—how to finance the growing expenditures on health care. And, as mentioned above, the international section features two chapters, one on international trade and one on international finance. These chapters are not essential, and some instructors may wish to skip one or both of them depending on time constraints.

A Guided Tour

The book consists of three main parts: The Long Run, The Short Run, and Applications and Microfoundations. Surrounding these are an introductory section (Preliminaries) and a concluding chapter (Parting Thoughts).

This organization reflects an increasing appreciation in the profession of the importance of long-run macroeconomics. In addition, it makes sense from a pedagogical standpoint to put the long run first: this way students understand what it is that the economy fluctuates *around* when we get to the short-run chapters.

A brief overview of each part follows.

Part 1: Preliminaries

We begin with an overview of macroeconomics: what kind of questions macroeconomics addresses and how it goes about its business. A second chapter then discusses the data of macroeconomics in more detail, with a focus on national income accounting.

Part 2: The Long Run

The second part of the book consists of Chapters 3 through 8, and these chapters consider the macroeconomy in the long run. Chapter 3 presents an overview of the facts and tools that economists use to study long-run macroeconomics, with special attention to economic growth. Chapter 4 introduces the Cobb-Douglas production function as a way to understand the enormous differences in standards of living that we see across countries. The interplay between theory and data that is central to macroeconomics makes a starring appearance in this chapter.

Chapter 5 considers the Solow model of economic growth, one of the workhorse models of macroeconomics. We study the extent to which the Solow model can help us understand (a) why some countries are rich while others are poor, and (b) why people in the advanced countries of the world are so much richer today than they were a hundred years ago. Somewhat to our surprise, we will see that the model does not do a good job of explaining long-run economic growth.

For this explanation, we turn in Chapter 6 to the Romer model, which emphasizes the role played by the discovery of new ideas. Thinking about the economics of ideas leads to profound changes in the way we understand many areas of economics.

Chapter 7 studies the most important market in modern economies, the labor market. We learn about the determination of the unemployment rate

in the long run and discover that many readers of this book are already, in some sense, millionaires.

Chapter 8 concludes the long-run portion of the book by considering inflation. The quantity theory of money provides a long-run theory of inflation, which, according to Milton Friedman, occurs because of “too much money chasing too few goods.”

Part 3: The Short Run

Part 3 is devoted to the branch of macroeconomics that students are probably most familiar with: the study of booms, recessions, and the rise and fall of inflation in the short run. The five chapters of this part form a tight unit that develops our short-run model and applies it to current events.

Chapter 9 provides an overview of the macroeconomy in the short run, summarizing the key facts and providing an introduction to the short-run model that will explain these facts. Chapter 10 provides a “first look” at the financial crisis and the Great Recession, carefully laying out the facts of how the crisis evolved and introducing the important concepts of “leverage” and “balance sheets.”

The next three chapters then develop the short-run model. Chapter 11 introduces the IS curve, a key building block of the short-run model. The IS curve reveals that a fundamental determinant of output in the short run is the real interest rate. Chapter 12 shows how the central bank in an economy can move the interest rate in order to keep the economy close to full employment. Chapter 12 also provides the link between the real economy and inflation, called the Phillips curve.

Chapter 13 looks at our short-run model in an aggregate supply/aggregate demand (AS/AD) framework. This framework allows the complete dynamics of the economy in the short run to be studied in a single graph. Using this framework, the chapter emphasizes the key roles played by expectations, credibility, and time consistency in modern macroeconomic policymaking.

Chapter 14 uses the short-run model to help us understand the financial crisis and the Great Recession and discusses the macroeconomic prospects going forward. Chapter 15 presents the new

material on DSGE models of macroeconomic fluctuations that was discussed earlier in the preface.

Part 4: Applications and Microfoundations

Part 4 includes five chapters of applications and microfoundations. While it may be unapparent to the student new to macroeconomics, the organization of these chapters follows the “national income identity,” a concept discussed early in the book. These chapters include a number of important topics. For example, Chapter 16 studies how individuals make their lifetime consumption plans. Chapter 17 considers the pricing of financial assets, such as stocks and houses, in the context of a broader chapter on investment.

Chapter 18 studies the role played by the government in the macroeconomy, including the role of budget deficits and the government’s budget constraint. The chapter also considers a key problem that governments around the world will face in coming decades: how to finance the enormous increases in health spending that have occurred for the last fifty years and that seem likely to continue.

Both the long-run and the short-run parts of the book place the study of macroeconomics in an international context. Indeed, the short-run model includes open economy forces from the very beginning. The final two applications of the book, however, go even farther in this direction.

Chapter 19 focuses on international trade. Why do countries trade? Are trade deficits good or bad? How have globalization and outsourcing affected the macroeconomy? Chapter 20 studies international finance, including the determination of the exchange rate and the Euro-area financial crisis.

Parting Thoughts

Chapter 21 concludes our study of macroeconomics. We summarize the important lessons learned in the book, and we offer a brief guide to the key questions that remain less than well understood.

Learning Aids

- *Overview:* The opening page of each chapter provides an overview of the main points that will be covered.

- *Boxes around key equations:* Key equations are boxed to highlight their importance.
- *Graphs and tables:* The main point of each figure is summarized in an accompanying text box. Tables are used to summarize the key equations of a model.
- *Guide to notation:* The inside back cover contains a guide to notation, listing each symbol, its meaning, and the chapter in which it first appears.
- *Case studies:* Case studies in each chapter highlight items of interest.
- *Chapter summaries in list form:* The main points of each chapter are listed for easy reference and review.
- *Key concepts:* Important economic concepts are presented in bold type when they first appear. At the end of the chapter, they are listed together for review.
- *Review questions:* Review questions allow students to quiz themselves on what they've learned.
- *Exercises:* Carefully chosen exercises reinforce the material from the chapter and are intended to be used for homework assignments. These exercises include many different kinds of problems. Some require graphical solutions, others use numbers. Some ask you to look for economic data online and interpret it in a particular way. Others ask you to write a position paper for a presidential candidate or to pretend you are advising the chair of the Federal Reserve.
- *Worked exercises:* From the exercises, one or two are selected and worked out in detail at the end of each chapter. These exercises are indicated by the “worked exercise” icon in the margin. You will find these answers most helpful if you consult them only after you have tried to work through each exercise on your own.
- *Glossary:* An extensive glossary at the end of the book defines terms and provides page numbers where more information can be found.



Supplements for Students

Student StudySpace

David Agrawal, *University of Michigan*

www.wwnorton.com/college/econ

[/macroeconomics2/](http://www.wwnorton.com/college/econ/macroeconomics2/)

The student StudySpace for *Macroeconomics* is a free and open resource for students to review key concepts and test themselves prior to midterms and finals. It contains a link to the SmartWork homework problems.

The StudySpace offers the following features:

- **Chapter Outlines**
- **Quiz + Assessment:** Quiz+ presents students with a targeted study plan that offers specific page references, links to the ebook, and other online learning tools.
- **Interactive Graphs:** interactive versions of the graphs presented in the text
- **Data Plotter:** a set of tools to compare and contrast real economic data to better understand trends and concepts related to data models
- **Interactive Concept Tutorials:** These interactive tutorials provide students with the extra help they need to learn the most challenging concepts in the course, and they offer opportunities for students to demonstrate critical-thinking skills and comprehension to their instructors.
- **Short-Answer Review Questions**
- **An Economics in the News RSS Feed**

Country Snapshots

www.wwnorton.com/college/econ

[/macroeconomics2/snapshots.aspx](http://www.wwnorton.com/college/econ/macroeconomics2/snapshots.aspx)

To accompany the book, I've put together a resource containing data from more than 200 countries. Each page of the file snapshots.pdf corresponds to a country and provides graphs of that country's key macroeconomics statistics. Moreover, the data underlying the graphs can be obtained as a spreadsheet simply by selecting a link at the top of each page. Whenever you read about a particular country in the newspaper or in this book, detailed macroeconomics statistics are only a click away.

Supplements for Instructors

SmartWork

Online Homework and Tutorial Program with an Integrated Ebook.

Developed by university educators, SmartWork is the most intuitive online tutorial and homework-management system available for the intermediate macroeconomics course. The powerful assessment engine supports a wide range of questions, including multiple-choice, interactive graphing, and macroeconomics equations.

Answer-specific feedback, tutorial questions, and hints coach students through solving problems, while links to the integrated ebook encourage active reading and provide easy reference to the concepts discussed in the text. Assigning, editing, and administering homework is easy with SmartWork's intuitive authoring tools, which allow instructors to modify existing problems or create their own.

Completely revised and updated, the new SmartWork course for *Macroeconomics* Second Edition features new homework questions, more worked solutions, additional answer-specific feedback, and more algorithmically-generated questions. The entire SmartWork system has been updated with an improved user interface that is more intuitive for both instructors and students.

SmartWork highlights:

- An intuitive and easy-to-use interface with extensive hinting and answer-specific feedback, including multistep guided tutorial problems
- A wide range of question types, including interactive graphs, multiple-choice questions, and economics equations
- Intuitive authoring tools that give instructors an easy-to-use environment for modifying existing problems or creating their own
- An easy-to-use math palette for composing graphs and mathematical expressions
- Algorithmically generated variables so each student sees a slightly different version of the same problem
- An at-a-glance gradebook that offers a visual summary of students' work

- A full complement of tools for managing assignments and grades

Lecture PowerPoints

This set of PowerPoint slides includes every graph and table from the text, along with insightful annotations and suggestions for lecture content. It also contains PowerPoint slides covering each key concept presented in the chapter, thus providing a lecture-ready resource for the instructor.

Instructor's Resource Site

Downloadable resources will include the test bank in rich-text, Blackboard, and ExamView formats, graphs in jpeg format and as PowerPoints, lecture PowerPoints, and chapter quizzes in WebCT and Blackboard format.

Instructor's Manual

Anthony Laramie, Boston College, with contributions from Pavel Kapinos, Carleton College, and Kenneth Kuttner, Williams College

This valuable instructor's resource includes for each chapter an overview, a suggested approach to the chapter lecture, expanded case studies, additional case studies, and complete answers to the end-of-chapter problems. Updated for the second edition, the instructor's manual now includes numerical examples and simulations, as well as Excel-based problems that will make an excellent supplement to any lecture.

Test Bank

Robert Sonora, Fort Lewis College, with contributions from Todd Knoop, Cornell College, and Dietrich Vollrath, University of Houston

Available on CD-ROM or for download in rich-text, Blackboard Learning System, and *ExamView® Assessment Suite* formats, the updated test bank includes over 1,800 carefully constructed true/false and multiple-choice questions. And, new for the second edition, over 100 short answer/numerical questions.

ACKNOWLEDGMENTS

This book could not have been written without the tremendous support, encouragement, and assistance that I have received from many people. I am especially grateful to my colleagues in the economics profession for many insights, comments, and suggestions for improving the manuscript:

David Aadland
University of Wyoming

Yamin S. Ahmad
University of Wisconsin, Whitewater

Ehsan Ahmed
James Madison University

Francisco Alvarez-Cuadrado
McGill University

William Bennett
Loyola University

Jules van Binsbergen
Stanford University

Peter Bondarenko
University of Chicago

Ronald Britto
Binghamton, SUNY

Robin Burgess
London School of Economics

Miki Brunyer
West Virginia University

Colleen M. Callahan
American University

Gabriele Camera
Purdue University

Tiago Cavalcanti
Purdue University

Betty C. Daniel
University of Albany, SUNY

Steven Davis
*University of Chicago, Booth School
of Business*

A. Edward Day
University of Texas, Dallas

Firat Demir
*University of Oklahoma, Norman
Campus*

Robert J. Derrell
Manhattanville College

Alissa Dubnicki
Syracuse University

Robert A. Driskill
Vanderbilt University

Ryan Edwards
Queens College, CUNY

J. Peter Ferderer
Macalester College

John Fernald
*Federal Reserve Bank of San
Francisco*

Lance Fisher
Macquarie University

Edward N. Gamber
Lafayette College

David H. Gillette
Truman State University

Pierre-Olivier Gourinchas
University of California, Berkeley

Kristin Harnett
University of Pittsburgh

William R. Hauk, Jr.
Washington University

William Hawkins
Yeshiva University

Marc D. Hayford
Loyola University of Chicago

Denise Hazlett
Whitman College

Will C. Heath
University of Louisiana

Timo Henckel
Australian National University

Ryan Herzog
Gonzaga University

Christopher L. House
University of Michigan

Chang-Tai Hsieh
*University of Chicago, Booth School
of Business*

Murat F. Iyigun
University of Colorado, Boulder

Garett B. Jones
George Mason University

Louis D. Johnston
*College of Saint Benedic/ Saint
John's University*

Oscar Jorda
University of California, Davis

Pavel Kapinos,
Carleton College

Cem Karayalcin
Florida International University

John W. Keating
Kansas University

Manfred Keil
Claremont McKenna College

Young Se Kim
University of North Texas

Miles Kimball
University of Michigan

Pete Klenow
Stanford University

Ken Kletzer
*University of California,
Santa Cruz*

Todd Knoop
Cornell College

Per Krusell
Stockholm University

Corinne M. Krupp
Duke University

James Kwak
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South Dakota State University

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University of Georgia

Man-Lui Lau
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Junsoo Lee
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University of Northern Iowa

Ted Miguel
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Fabio Milani
University of California, Irvine

Jenny A. Minier
University of Kentucky

Sergey Mityakov
Clemson University

Bruck M. Mizrach
Rutgers University

John A. Neri
University of Maryland

Phacharaphot Nuntramas
San Diego State University

Ann Owen
Hamilton College

Christakis Papageorgiou
Louisiana State University

Bruce Preston
Monash University

Gérard Roland
University of California, Berkeley

Alexander W. Richter
Auburn University

David Romer
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Paul Romer
New York University

Benjamin Russo
*University of North Carolina,
Charlotte*

John E. Sabelhaus
*Board of Governors of the Federal
Reserve System*

Mikael Sandberg
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Paul Shea
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Rebecca Achée Thornton
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Byron Tsang
Virginia Tech University

Diego E. Vacaflares
Texas State University

Victor J. Valcarcel
Texas Tech University

Koen Vermeylen
Universiteit van Amsterdam

Dietrich Vollrath
University of Houston

Andre Watteyne
Katholieke Universiteit Leuven

Akila Weerapana
Wellesley College

John Williams
*Federal Reserve Bank of San
Francisco*

Wei Xiao
University of New Orleans

Steven Yamarik
*California State University, Long
Beach*

Several research and teaching assistants helped in many ways, including David Agrawal, Mark Borgschulte, Dean Scrimgeour, Josie Smith, Luke Stein, and William Vijverberg. El Lee and Tina Bernard provided excellent advice and assistance on many facets of the book.

The people at W. W. Norton & Company have been exceptionally supportive, dedicated, and thorough. For the third edition, I am once again most indebted to Jack Repcheck, my editor, for his constant enthusiasm and excellent suggestions. The stellar Norton team again did a tremendous job: Hannah Bachman, Cassie del Pilar, Sujin Hong, Theresia Kowara, Eric Pier-Hocking, and Carson Russell.

For their expert work on earlier editions, I am and will remain eternally grateful to Jack Repcheck, Melissa Atkin, Marian Johnson, and Susan Gaustad. I would also like to thank Matt Arnold, Mik Awake, Christopher Granville, Richard Mickey, Dan Jost, Lorraine Klimowich, John McAusland, Brian Sisco, Jason Spears, and Rubina Yeh for their excellent work. I am also extremely grateful to my colleagues who prepared the superb supplements for students and instructors: David Agrawal, Elias Aravantinos, Ryan Edwards, David Gillette, Anthony Laramie, and Robert Sonora.

Finally, I would like to thank my family, near and far, for everything.

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