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# Macroeconomics

SEVENTH EDITION

Olivier Blanchard

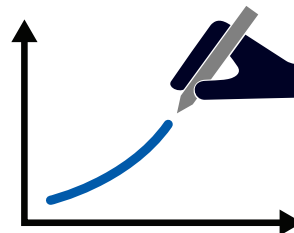


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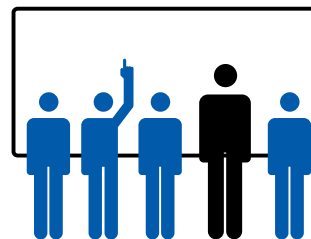
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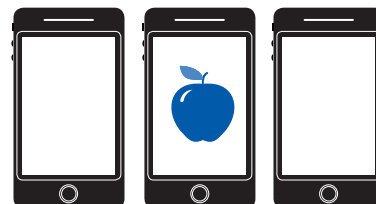
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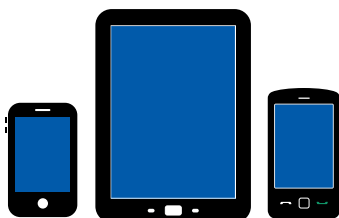
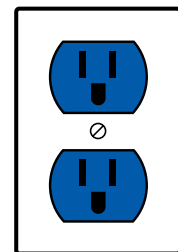
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Olivier Blanchard

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*To Noelle*



# About the Authors



A citizen of France, **Olivier Blanchard** has spent most of his professional life in Cambridge, U.S.A. After obtaining his Ph.D. in economics at the Massachusetts Institute of Technology in 1977, he taught at Harvard University, returning to MIT in 1982. He was chair of the economics department from 1998 to 2003. In 2008, he took a leave of absence to be the Economic Counsellor and Director of the Research Department of the International Monetary Fund. Since October 2015, he is the Fred Bergsten Senior Fellow at the Peterson Institute for International Economics, in Washington. He also remains Robert M. Solow Professor of Economics emeritus at MIT.

He has worked on a wide set of macroeconomic issues, from the role of monetary policy, to the nature of speculative bubbles, to the nature of the labor market and the determinants of unemployment, to transition in former communist countries, and to forces behind the recent global crisis. In the process, he has worked with numerous countries and international organizations. He is the author of many books and articles, including a graduate level textbook with Stanley Fischer.

He is a past editor of the *Quarterly Journal of Economics*, of the *NBER Macroeconomics Annual*, and founding editor of the *AEJ Macroeconomics*. He is a fellow and past council member of the *Econometric Society*, a past vice president of the *American Economic Association*, and a member of the *American Academy of Sciences*.

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# Preface

I had two main goals in writing this book:

- To make close contact with current macroeconomic events. What makes macroeconomics exciting is the light it sheds on what is happening around the world, from the major economic crisis which has engulfed the world since 2008, to monetary policy in the United States, to the problems of the Euro area, to growth in China. These events—and many more—are described in the book, not in footnotes, but in the text or in detailed boxes. Each box shows how you can use what you have learned to get an understanding of these events. My belief is that these boxes not only convey the “life” of macroeconomics, but also reinforce the lessons from the models, making them more concrete and easier to grasp.
- To provide an integrated view of macroeconomics. The book is built on one underlying model, a model that draws the implications of equilibrium conditions in three sets of markets: the goods market, the financial markets, and the labor market. Depending on the issue at hand, the parts of the model relevant to the issue are developed in more detail while the other parts are simplified or lurk in the background. But the underlying model is always the same. This way, you will see macroeconomics as a coherent whole, not a collection of models. And you will be able to make sense not only of past macroeconomic events, but also of those that unfold in the future.

## New to this Edition

The crisis that started in 2008, and is still lingering, forced macroeconomists to rethink much of macroeconomics. They clearly had understated the role of the financial system. They also had too optimistic a view of how the economy returned to equilibrium. Eight years later, I believe the main lessons have been absorbed, and this edition reflects the deep rethinking that has taken place. Nearly all chapters have been rewritten, and the main changes are as follows:

- A modified Chapter 5, and a modified presentation of the IS-LM. The traditional treatment of monetary policy assumed that the central bank chose the money supply and then let the interest rate adjust. In fact, modern central banks choose the interest rate and then let the money supply adjust. In terms of the IS-LM model used to describe the short run, the LM curve, instead of being upward sloping, should be treated as flat. This makes for a more realistic and a simpler model.
- A new Chapter 6. The chapter focuses on the role of the financial system in the economy. It extends the IS-LM model to allow for two interest rates, the interest rate set by monetary policy and the cost of borrowing for people or firms, with the state of the financial system determining the relation between the two.
- A new Chapter 9. The traditional aggregate supply-aggregate demand model was cumbersome and gave too optimistic a view of the return of output to potential. The model has been replaced by an IS-LM-PC model (where PC stands for Phillips curve), which gives a simpler and more accurate description of the role of monetary policy, and of output and inflation dynamics.
- The constraints on monetary policy, coming from the zero lower bound, and the constraints on fiscal policy, coming from the high levels of public debt, are recurring themes throughout the book.
- Many Focus boxes are new or extended. Among them: “Unemployment and Happiness” in Chapter 2; “The Liquidity Trap in the United Kingdom” in Chapter 4; Bank Runs in Chapter 6; “Why is the Natural Rate of Unemployment in Japan so Low?” in Chapter 8; “Okun’s Law” and “Deflation in the Great Depression” in Chapter 9; “The Construction of PPP Numbers” in Chapter 10; “The Role of Technology in the Decrease in Income Inequality in Latin America in the 2000s” in Chapter 13; “The Yield Curves for AAA-rated Central Government Bonds” in Chapter 14; “The Disappearance of Current Account Deficits in Euro Periphery Countries: Good News or Bad News?” in Chapter 18; “Euro Area Fiscal Rules: A Short History” in Chapter 21; and “Rules versus Discretion: New Absolute Budgetary Rules in the EU” and “How Japan Could Stand Such a Huge Debt?” in Chapter 22.
- Figures and tables have been updated using the latest data available.



In short, I see this edition as the first true post-crisis macroeconomics textbook. I hope it gives a clear guide not only to what has happened, and also to what may happen in the future.

## Organization

The book is organized around two central parts: A core, and a set of two major extensions. An introduction precedes the core. The two extensions are followed by a review of the role of policy. The book ends with an epilogue. A flowchart on the front endpaper makes it easy to see how the chapters are organized, and fit within the book's overall structure.

- Chapters 1 and 2 introduce the basic facts and issues of macroeconomics. Chapter 1 focuses first on the crisis, and then takes a tour of the world, from the United States, to Europe, to China. Some instructors will prefer to cover Chapter 1 later, perhaps after Chapter 2, which introduces basic concepts, articulates the notions of short run, medium run, and long run, and gives the reader a quick tour of the book.

While Chapter 2 gives the basics of national income accounting, I have put a detailed treatment of national income accounts to Appendix 1 at the end of the book. This decreases the burden on the beginning reader, and allows for a more thorough treatment in the appendix.

- Chapters 3 through 13 constitute the **core**.

Chapters 3 through 6 focus on the **short run**. These four chapters characterize equilibrium in the goods market and in the financial markets, and they derive the basic model used to study short-run movements in output, the *IS-LM* model. Chapter 6 is new, and extends the basic *IS-LM* model to take into account the role of the financial system. It then uses it to describe what happened during the initial phase of the crisis.

Chapters 7 through 9 focus on the **medium run**. Chapter 7 focuses on equilibrium in the labor market and introduces the notion of the natural rate of unemployment. Chapter 8 derives and discusses the relation between unemployment and inflation, known as the Phillips curve. Chapter 9 develops the *IS-LM-PC* (*PC* for Phillips curve) model which takes into account equilibrium in the goods market, in the financial markets, and in the labor market. It shows how this model can be used to understand movements in activity and movements in inflation, both in the short and in the medium run.

Chapters 10 through 13 focus on the long run. Chapter 10 describes the facts, showing the evolution of output across countries and over long periods of time. Chapters 11

and 12 develop a model of growth and describe how capital accumulation and technological progress determine growth. Chapter 13 focuses on the effects of technological progress on unemployment and on inequality, not only in the long run, but also in the short run and in the medium run.

- Chapters 14 through 20 cover the two major **extensions**.

Chapters 14 through 16 focus on the role of **expectations** in the short run and in the medium run. Expectations play a major role in most economic decisions, and, by implication, play a major role in the determination of output.

Chapters 17 through 20 focus on the implications of **openness** of modern economies. Chapter 20 focuses on the implications of different exchange rate regimes, from flexible exchange rates, to fixed exchange rates, currency boards, and dollarization.

- Chapters 21 through 23 return to **macroeconomic policy**. Although most of the first 20 chapters constantly discuss macroeconomic policy in one form or another, the purpose of Chapters 21 through 23 is to tie the threads together. Chapter 21 looks at the role and the limits of macroeconomic policy in general. Chapters 22 and 23 review fiscal and monetary policy. Some instructors may want to use parts of these chapters earlier. For example, it is easy to move forward the discussion of the government budget constraint in Chapter 22 or the discussion of inflation targeting in Chapter 23.

- Chapter 24 serves as an **epilogue**; it puts macroeconomics in historical perspective by showing the evolution of macroeconomics in the last 70 years, discussing current directions of research, and the lessons of the crisis for macroeconomics.

## Alternative Course Outlines

Within the book's broad organization, there is plenty of opportunity for alternative course organizations. I have made the chapters shorter than is standard in textbooks, and, in my experience, most chapters can be covered in an hour and a half. A few (Chapters 5 and 9 for example) might require two lectures to sink in.

- Short courses. (15 lectures or less)

A short course can be organized around the two introductory chapters and the core (Chapter 13 can be excluded at no cost in continuity). Informal presentations of one or two of the extensions, based, for example, on Chapter 16 for expectations (which can be taught as a stand alone), and on Chapter 17 for the open economy, can then follow, for a total of 14 lectures.

A short course might leave out the study of growth (the long run). In this case, the course can be organized around the introductory chapters and Chapters 3 through 9 in the core; this gives a total of 9 lectures, leaving enough time to cover, for example, Chapter 16 on expectations, Chapters 17 through 19 on the open economy, for a total of 13 lectures.

■ Longer courses (20 to 25 lectures)

A full semester course gives more than enough time to cover the core, plus one or both of the two extensions, and the review of policy.

The extensions assume knowledge of the core, but are otherwise mostly self-contained. Given the choice, the order in which they are best taught is probably the order in which they are presented in the book. Having studied the role of expectations first helps students to understand the interest parity condition, and the nature of exchange rate crises.

## Features

I have made sure never to present a theoretical result without relating it to the real world. In addition to discussions of facts in the text itself, I have written a large number of Focus boxes, which discuss particular macroeconomic events or facts, from the United States or from around the world.

I have tried to re-create some of the student–teacher interactions that take place in the classroom by the use of margin notes, which run parallel to the text. The margin notes create a dialogue with the reader and, in so doing, smooth the more difficult passages and give a deeper understanding of the concepts and the results derived along the way.

For students who want to explore macroeconomics further, I have introduced the following two features:

- Short appendixes to some chapters, which expand on points made within the chapter.
- A Further Readings section at the end of most chapters, indicating where to find more information, including a number of key Internet addresses.

Each chapter ends with three ways of making sure that the material in the chapter has been digested:

- A summary of the chapter’s main points.
- A list of key terms.
- A series of end-of-chapter exercises. “Quick Check” exercises are easy. “Dig Deeper” exercises are a bit harder, and “Explore Further” typically require either access to the Internet or the use of a spreadsheet program.
- A list of symbols on the back endpapers makes it easy to recall the meaning of the symbols used in the text.


## MyEconLab

MyEconLab is a powerful assessment and tutorial system that works hand-in-hand with Macroeconomics. It includes comprehensive homework, quiz, test, and tutorial options, allowing students to test their knowledge and instructors to manage all assessment needs in one program. Students and instructors can register, create, and access all of their MyLab courses, regardless of discipline, from one convenient online location: <http://www.pearsonmylab.com>.

Key innovations in the MyEconLab course for Macroeconomics, seventh edition, include the following resources for students and instructors:

- **MyEconLab Animation**—The key figures in the seventh edition have been converted to digital figure animations where the figures from the textbook are presented in step-by-step animations with audio explanations of the action. The goal of this digital resource is to help students understand shifts in curves, movements along curves, and changes in equilibrium values. Having animated versions of a graph helps students who have difficulty interpreting the static version found in the printed text.
- **MyEconLab Video**—There are approximately 100 videos featured in the new enhanced eText for the seventh edition. They provide real world explanations of key concepts with videos from the International Monetary Fund’s “World Economic Outlook” press conferences and interviews with author Olivier Blanchard. The videos include in depth market analysis and are accompanied by graded practice exercises to ensure mastery. These new videos are embedded in the eText and are accessible through MyEconLab
- **Pearson eText**—The Pearson eText gives students access to their textbook anytime, anywhere. In addition to notetaking, highlighting, and bookmarking, the Pearson eText offers interactive and sharing features. Students actively read and learn, through embedded and auto-graded practice, real-time data-graphs, animations, author videos, and more. Instructors can share comments or highlights, and students can add their own, for a tight community of learners in any class.
- **NEW: Math Review Exercises in MyEconLab.** MyEconLab now offers a rich array of assignable and auto-graded exercises covering fundamental math concepts geared for macroeconomics students. Aimed at increasing student confidence and success, the new math skills review in Chapter R is accessible from the assignment manager and contains over 150 graphing, algebra, and calculus exercises for homework, quiz, and test use.

- **Practice.** Algorithmically generated homework and study plan exercises with instant feedback ensure varied and productive practice that helps students improve their understanding and prepare for quizzes and tests. Exercises that require drawing figures encourage students to practice the language of economics.
- **Learning Resources.** Personalized learning aids such as Help Me Solve This Problem walkthroughs, Teach Me explanations of the underlying concept, and figure animations provide on-demand help when students need it most.
- **Study Plan.** Customized study plans show students which sections to study next, give easy access to practice problems, and provide an automatically generated quiz to prove mastery of the course material.
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- **MyEconLab Real-time data**—Real-time data figures and exercises allow students and instructors to use the very latest data from the Federal Reserve Bank of St. Louis's FRED site. These figures and exercises communicate directly with the FRED® site and update as new data are available.
 



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- **Digital Interactives.** Focused on a single core topic and organized in progressive levels, each interactive immerses students in an assignable and auto-graded activity. Digital Interactives are lecture tools for traditional, online, and hybrid courses, many incorporating real-time data, data displays, and analysis tools for rich classroom discussions.
- **Experiments in MyEconLab.** Flexible, easy to assign, auto-graded, and available in Single and Multiplayer versions, the Experiments in MyEconLab make learning fun and engaging.
- **Learning Catalytics.** Learning Catalytics™ is a “bring your own device” student engagement, assessment, and classroom intelligence system that lets learners use their smartphone, tablet, or laptop to participate in and stay engaged in lecture. It allows instructors to generate classroom discussion, guides lectures, and promotes peer-to-peer learning with real-time analytics. Now students can use any device to interact in the classroom, engage with content and even draw and share graphs.

Instructors can divide classes into pairs or groups based on learners' response patterns, and learners with greater proficiency help motivate other learners while allowing instructors time to provide individualized and focused attention to learners who will benefit from it.

- **Reporting Dashboard.** Faculty can view, analyze, and report learning outcomes clearly and easily using the Reporting Dashboard. It is available via the Gradebook and fully mobile-ready. The Reporting Dashboard presents student performance data at the class, section, and program levels in an accessible, visual manner.
- **LMS Integration.** Faculty can link from any LMS platform to access assignments, rosters, and resources, and synchronize MyLab grades with your LMS gradebook. For students, a new direct, single sign-on provides easier access to all the personalized learning MyLab resources.
- **Mobile Ready.** Students and instructors can access multimedia resources and complete assessments from any mobile device.

For more information, visit <http://www.myeconlab.com>.

## Supplements

The book comes with a number of supplements that support teaching and learning.

- **Instructor's Manual.** The Online Instructor's Manual, prepared by LaTanya Brown-Robertson, discusses pedagogical choices, alternative ways of presenting the material, and ways of reinforcing students' understanding. Chapters in the manual include six main sections: objectives, in the form of a motivating question; why the answer matters; key tools, concepts, and assumptions; summary; and pedagogy. Many chapters also include sections focusing on extensions and observations. The Instructor's Manual also includes the answers to all end-of-chapter questions and exercises. The Instructor's Manual is available for download as Word files or as PDFs from the Instructor Resource Center at [www.pearsonglobaleditions.com/Blanchard](http://www.pearsonglobaleditions.com/Blanchard).
- **Test Bank.** The online test bank, updated by Liping Zheng is completely revised with additional new multiple-choice questions for each chapter. The Test Item File can be downloaded from the Instructor Resource Center at [www.pearsonglobaleditions.com/Blanchard](http://www.pearsonglobaleditions.com/Blanchard).
- **Computerized Test Bank**—The Computerized Test Item File is designed for use with the computerized Test-Gen package, which allows instructors to customize, save, and generate classroom tests. The test program permits instructors to edit, add, or delete questions from the test bank; edit existing graphics and create new

graphics; analyze test results; and organize a database of tests and student results. This software allows for extensive flexibility and ease of use. It provides many options for organizing and displaying tests, along with search and sort features. The software and the Test Item File can be downloaded from the Instructor's Resource Center at [www.pearsonglobaleditions.com/Blanchard](http://www.pearsonglobaleditions.com/Blanchard), and all questions can be assigned via MyEconLab.

- **PowerPoint Lecture Slides**—These electronic slides, prepared by Jim Lee provide section lecture notes including tables, equations, and graphs for each chapter and can be downloaded from the Instructor's Resource Center at [www.pearsonglobaleditions.com/Blanchard](http://www.pearsonglobaleditions.com/Blanchard).

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# Introduction

The first two chapters of this book introduce you to the issues and the approach of macroeconomics.

## Chapter 1

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Chapter 1 takes you on a macroeconomic tour of the world. It starts with a look at the economic crisis that has shaped the world economy since the late 2000s. The tour then stops at each of the world's major economic powers: the United States, the Euro area, and China.

## Chapter 2

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Chapter 2 takes you on a tour of the book. It defines the three central variables of macroeconomics: output, unemployment, and inflation. It then introduces the three time periods around which the book is organized: the short run, the medium run, and the long run.



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# A Tour of the World

What is macroeconomics? The best way to answer is not to give you a formal definition, but rather to take you on an economic tour of the world, to describe both the main economic evolutions and the issues that keep macroeconomists and macroeconomic policy makers awake at night.

At the time of this writing (the fall of 2015), policy makers are sleeping better than they did just a few years ago. In 2008, the world economy entered a major macroeconomic crisis, the deepest since the Great Depression. World output growth, which typically runs at 4 to 5% a year, was actually negative in 2009. Since then, growth has turned positive, and the world economy is slowly recovering. But the crisis has left a number of scars, and some worries remain.

My goal in this chapter is to give you a sense of these events and of some of the macroeconomic issues confronting different countries today. I shall start with an overview of the crisis, and then focus on the three main economic powers of the world: the United States, the Euro area, and China.

**Section 1-1** looks at the crisis.

**Section 1-2** looks at the United States.

**Section 1-3** looks at the Euro area.

**Section 1-4** looks at China.

**Section 1-5** concludes and looks ahead.

Read this chapter as you would read an article in a newspaper. Do not worry about the exact meaning of the words or about understanding the arguments in detail: The words will be defined, and the arguments will be developed in later chapters. Think of this chapter as background, intended to introduce you to the issues of macroeconomics. If you enjoy reading this chapter, you will probably enjoy reading this book. Indeed, once you have read it, come back to this chapter; see where you stand on the issues, and judge how much progress you have made in your study of macroeconomics. ●

[MyEconLab](#) Video

◀ If you do not, please accept my apologies...

## 1-1 The Crisis

Figure 1-1 shows output growth rates for the world economy, for advanced economies, and for other economies, separately, since 2000. As you can see, from 2000 to 2007 the world economy had a sustained expansion. Annual average world output growth was 4.5%, with advanced economies (the group of 30 or so richest countries in the world) growing at 2.7% per year, and other economies (the other 150 or so countries in the world) growing at an even faster 6.6% per year.

In 2007 however, signs that the expansion might be coming to an end started to appear. U.S. housing prices, which had doubled since 2000, started declining. Economists started to worry. Optimists believed that, although lower housing prices might lead to lower housing construction and to lower spending by consumers, the Fed (the short name for the U.S. central bank, formally known as the *Federal Reserve Board*) could lower interest rates to stimulate demand and avoid a recession. Pessimists believed that the decrease in interest rates might not be enough to sustain demand and that the United States may go through a short recession.

Even the pessimists turned out not to be pessimistic enough. As housing prices continued to decline, it became clear that the problems were deeper. Many of the mortgages that had been given out during the previous expansion were of poor quality. Many of the borrowers had taken too large a loan and were increasingly unable to make the monthly payments on their mortgages. And, with declining housing prices, the value of their mortgage often exceeded the price of the house, giving them an incentive to default. This was not the worst of it: The banks that had issued the mortgages had often bundled and packaged them together into new securities and then sold these securities to other banks and investors. These securities had often been repackaged into yet new securities, and so on. The result is that many banks, instead of holding the mortgages themselves, held these securities, which were so complex that their value was nearly impossible to assess.

This complexity and opaqueness turned a housing price decline into a major financial crisis, a development that few economists had anticipated. Not knowing the quality of the assets that other banks had on their balance sheets, banks became reluctant to lend to each other for fear that the bank to which they lent might not be able to repay.

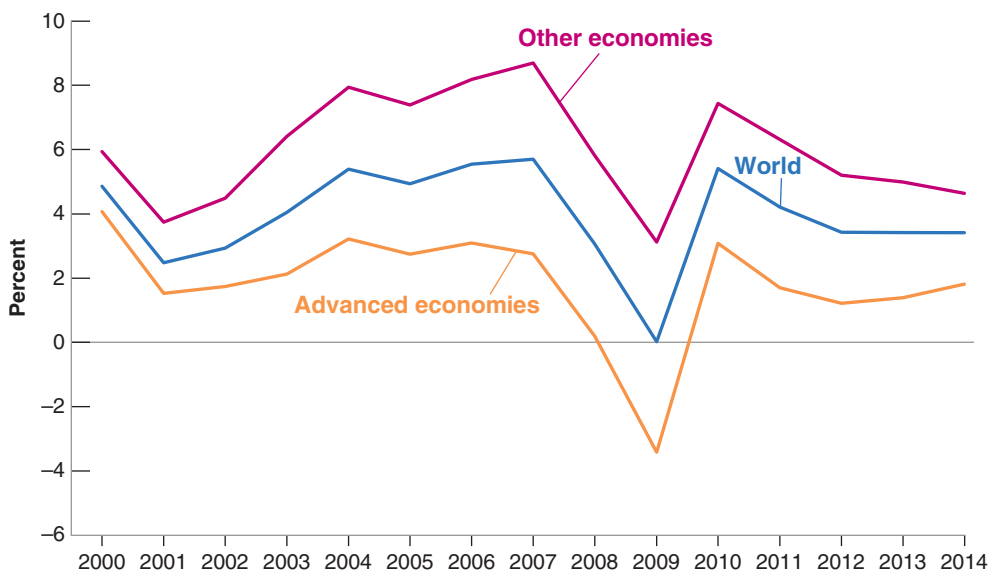
“Banks” here actually means “banks and other financial institutions.” But this is too long to write and I do not want to go into these complications in Chapter 1.

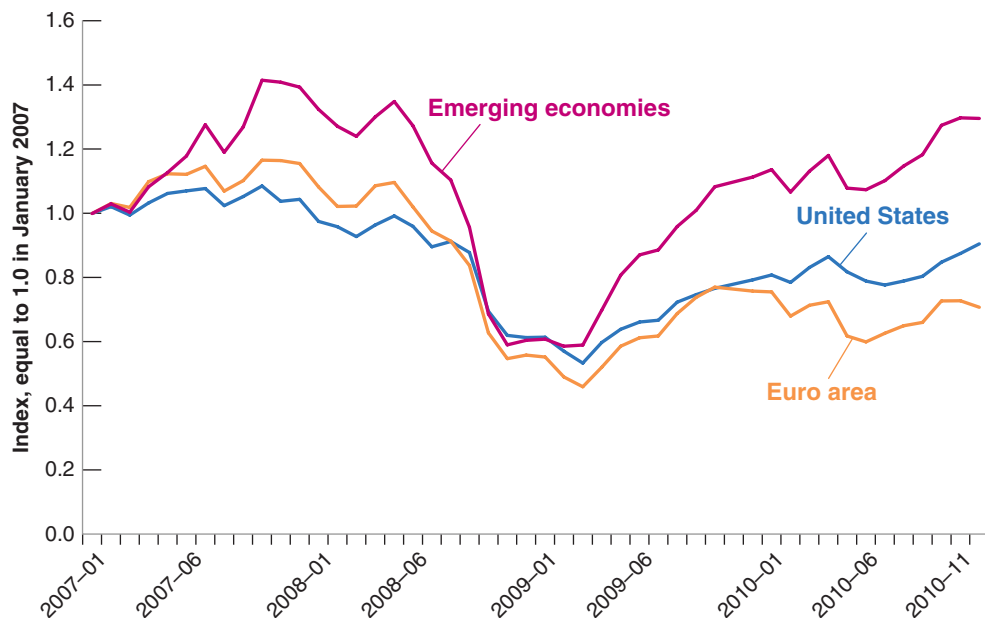
**Figure 1-1**

**Output Growth Rates for the World Economy, for Advanced Economies, and for Emerging and Developing Economies, 2000–2014**

Source: World Economic Outlook Database, July 2015. NGDP\_RPCH.A.

MyEconLab Real-time data





**Figure 1-2**

**Stock Prices in the United States, the Euro Area, and Emerging Economies, 2007–2010**

Source: Haver Analytics USA (S111ACD), Eurogroup (S023ACD), all emerging markets (S200ACD), all monthly averages.

Unable to borrow, and with assets of uncertain value, many banks found themselves in trouble. On September 15, 2008, a major bank, Lehman Brothers, went bankrupt. The effects were dramatic. Because the links between Lehman and other banks were so opaque, many other banks appeared at risk of going bankrupt as well. For a few weeks, it looked as if the whole financial system might collapse.

This financial crisis quickly turned into a major economic crisis. Stock prices collapsed. Figure 1-2 plots the evolution of three stock price indexes, for the United States, for the Euro area, and for emerging economies, from the beginning of 2007 to the end of 2010. The indexes are set equal to 1 in January 2007. Note how, by the end of 2008, stock prices had lost half or more of their value from their previous peak. Note also that, despite the fact that the crisis originated in the United States, European and emerging market stock prices decreased by as much as their U.S. counterparts; I shall return to this later.

Hit by the decrease in housing prices and the collapse in stock prices, and worried that this might be the beginning of another Great Depression, people sharply cut their consumption. Worried about sales and uncertain about the future, firms sharply cut back their investment. With housing prices dropping and many vacant homes on the market, very few new homes were built. Despite strong actions by the Fed, which cut interest rates all the way down to zero, and by the U.S. government, which cut taxes and increased spending, demand decreased, and so did output. In the third quarter of 2008, U.S. output growth turned negative and remained so in 2009.

One might have hoped that the crisis would remain largely contained in the United States. As Figures 1-1 and 1-2 both show, this was not the case. The U.S. crisis quickly became a world crisis. Other countries were affected through two channels. The first channel was trade. As U.S. consumers and firms cut spending, part of the decrease fell on imports of foreign goods. Looking at it from the viewpoint of countries exporting to the United States, their exports went down, and so, in turn, did their output. The second channel was financial. U.S. banks, badly needing funds in the United States, repatriated funds from other countries, creating problems for banks in those countries as well. As those banks got in trouble, lending came to a halt, leading to a decrease in spending and in output. Also, in a number of European countries, governments had accumulated high levels of debt and were now running large deficits. Investors began to worry about

I started my job as chief economist at the International Monetary Fund two weeks before the Lehman bankruptcy. I faced a steep learning curve.

whether debt could be repaid and asked for much higher interest rates. Confronted with those high interest rates, governments drastically reduced their deficits, through a combination of lower spending and higher taxes. This led in turn to a further decrease in demand, and in output. In Europe, the decline in output was so bad that this particular aspect of the crisis acquired its own name, the *Euro Crisis*. In short, the U.S. recession turned into a world recession. By 2009, average growth in advanced economies was  $-3.4\%$ , by far the lowest annual growth rate since the Great Depression. Growth in emerging and developing economies remained positive but was 3.5 percentage points lower than the 2000–2007 average.

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Since then, thanks to strong monetary and fiscal policies and to the slow repair of the financial system, most economies have turned around. As you can see from Figure 1-1, growth in advanced countries turned positive in 2010 and has remained positive since. The recovery is however both unimpressive and uneven. In some advanced countries, most notably the United States, unemployment has nearly returned to its pre-crisis level. The Euro area however is still struggling. Growth is positive, but it is low, and unemployment remains high. Growth in emerging and developing economies has also recovered, but, as you can see from Figure 1-1, it is lower than it was before the crisis and has steadily declined since 2010.

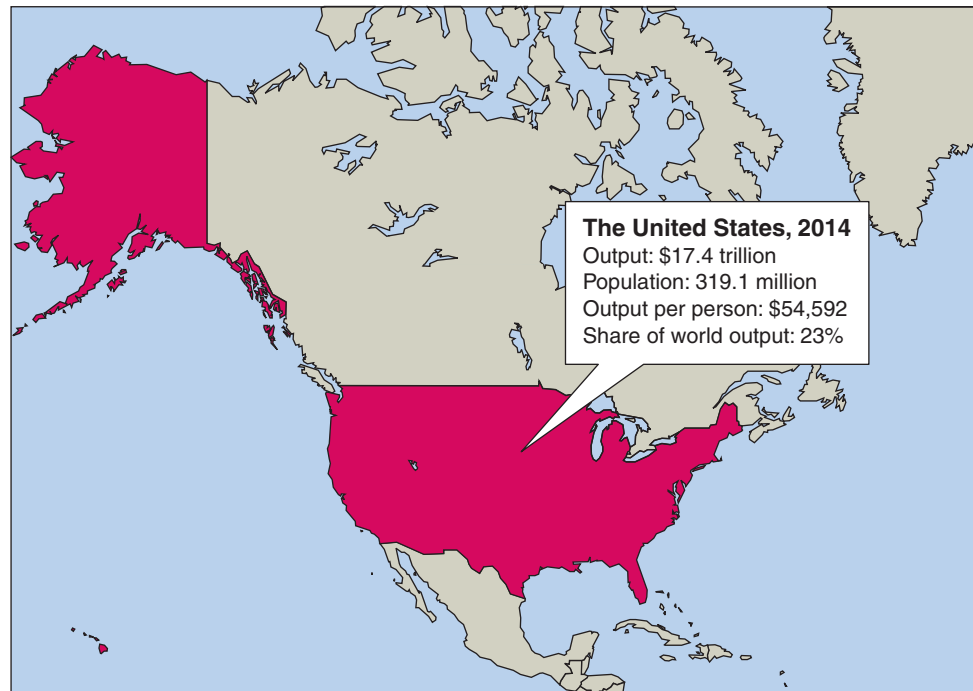
Having set the stage, let me now take you on a tour of the three main economic powers in the world, the United States, the Euro area, and China.

## 1-2 The United States

When economists look at a country, the first two questions they ask are: How big is the country from an economic point of view? And what is its standard of living? To answer the first, they look at output—the level of production of the country as a whole. To answer the second, they look at output per person. The answers, for the United States, are given in Figure 1-3: The United States is big, with an output of \$17.4 trillion in 2014,

**Figure 1-3**

*The United States, 2014*



accounting for 23% of world output. This makes it the largest country in the world in economic terms. And the standard of living in the United States is high: Output per person is \$54,600. It is not the country with the highest output per person in the world, but it is close to the top.

When economists want to dig deeper and look at the state of health of the country, they look at three basic variables:

- *Output growth*—the rate of change of output
- *The unemployment rate*—the proportion of workers in the economy who are not employed and are looking for a job
- *The inflation rate*—the rate at which the average price of goods in the economy is increasing over time

Numbers for these three variables for the U.S. economy are given in Table 1-1. To put current numbers in perspective, the first column gives the average value of each of the three variables for the period 1990 up to 2007, the year before the crisis. The second column shows numbers for the acute part of the crisis, the years 2008 and 2009. The third column shows the numbers from 2010 to 2014, and the last column gives the numbers for 2015 (or more accurately, the forecasts for 2015 as of the fall of 2015).

By looking at the numbers for 2015, you can see why economists are reasonably optimistic about the U.S. economy at this point. Growth in 2015 is forecast to be above 2.5%, just a bit below the 1990–2007 average. Unemployment, which increased during the crisis and its aftermath (it reached 10% during 2010), is decreasing and, at 5.4%, is now back to its 1990–2007 average. Inflation is low, substantially lower than the 1990–2007 average. In short, the U.S. economy seems to be in decent shape, having largely left the effects of the crisis behind.

Not everything is fine however. To make sure demand was strong enough to sustain growth, the Fed has had to maintain interest rates very low, indeed, too low for comfort. And productivity growth appears to have slowed, implying mediocre growth in the future. Let's look at both issues in turn.

## Low Interest Rates and the Zero Lower Bound

When the crisis started, the Fed tried to limit the decrease in spending by decreasing the interest rate it controls, the so-called *federal funds rate*. As you can see from Figure 1-4, on page 28 the federal funds rate went from 5.2% in July 2007 to nearly 0% (0.16% to be precise) in December 2008.

Why did the Fed stop at zero? Because the interest rate cannot be negative. If it were, then nobody would hold bonds, everybody would want to hold cash instead—because cash pays a zero interest rate. This constraint is known in macroeconomics as the *zero lower bound*, and this is the bound the Fed ran into in December 2008.

Can you guess some of the countries with a higher standard of living than the United States? *Hint:* Think of oil producers and financial centers. For answers, look for “Gross Domestic Product per capita, in current prices” at <http://www.imf.org/external/pubs/ft/weo/2015/01/weodata/weoselgr.aspx>

Because keeping cash in large sums is inconvenient and dangerous, people might be willing to hold some bonds even if those pay a small negative interest rate. But there is a clear limit to how negative the interest rate can go before people find ways to switch to cash.

Percent	1990–2007 (average)	2008–2009 (average)	2010–2014 (average)	2015
<b>Output growth rate</b>	<b>3.0</b>	<b>–1.5</b>	<b>2.2</b>	<b>2.5</b>
<b>Unemployment rate</b>	<b>5.4</b>	<b>7.5</b>	<b>8.0</b>	<b>5.4</b>
<b>Inflation rate</b>	<b>2.3</b>	<b>1.4</b>	<b>1.6</b>	<b>0.7</b>

Output growth rate: annual rate of growth of output (GDP). Unemployment rate: average over the year. Inflation rate: annual rate of change of the price level (GDP deflator).

Source: IMF, *World Economic Outlook*, July 2015.

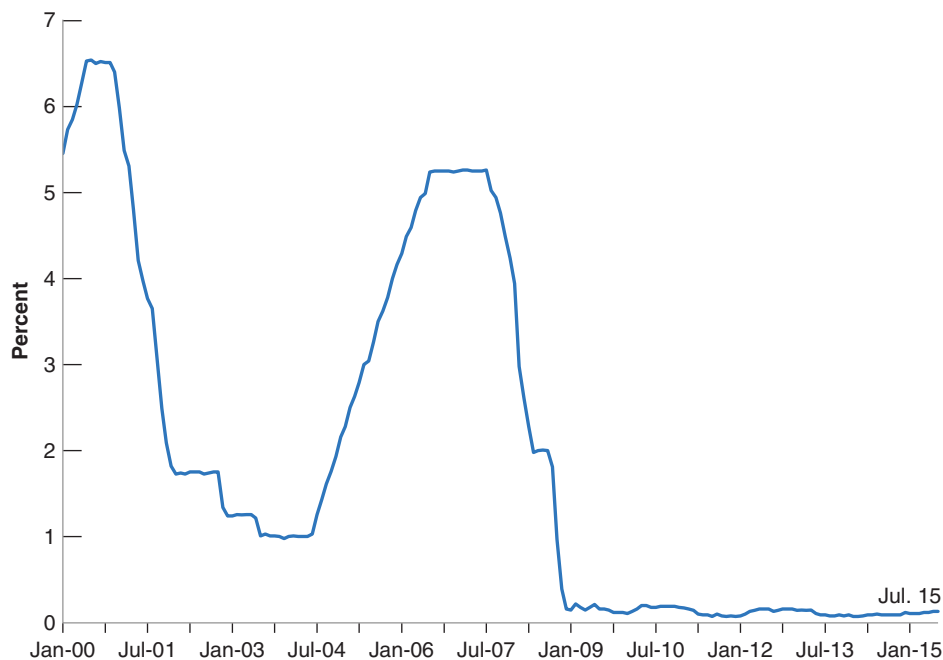
MyEconLab Real-time data

## Figure 1-4

### The U.S. Federal Funds Rate since 2000

Source: Haver Analytics.

MyEconLab Real-time data



This sharp decrease in the interest rate, which made it cheaper for consumers to borrow, and for firms to invest, surely limited the fall in demand and the fall in output. But, as we saw earlier and you can see from Table 1-1, this was not enough to avoid a deep recession: U.S. growth was negative in both 2008 and 2009. To help the economy recover, the Fed then kept the interest rate close to zero, where it has remained until now (the fall of 2015). The Fed's plan is to start increasing the interest rate soon, so when you read this book, it is likely that the rate will have increased, but it will still be very low by historical standards.

As you will see later in the book, central banks like the Fed can use a few other tools to increase demand. These tools are known as “unconventional monetary policy.” But they do not work as well as the interest rate.

Why are low interest rates a potential issue? For two reasons: The first is that low interest rates limit the ability of the Fed to respond to further negative shocks. If the interest rate is at or close to zero, and demand further decreases, there is little the Fed can do to increase demand. The second is that low interest rates appear to lead to excessive risk taking by investors. Because the return from holding bonds is so low, investors are tempted to take too much risk to increase their returns. And too much risk taking can in turn give rise to financial crises of the type we just experienced. Surely, we do not want to experience another crisis like the one we just went through.

## How Worrisome Is Low Productivity Growth?

Although the Fed has to worry about maintaining enough demand to achieve growth in the short run, over longer periods of time, growth is determined by other factors, the main one being productivity growth: Without productivity growth, there just cannot be a sustained increase in income per person. And, here, the news is worrisome. Table 1-2 shows average U.S. productivity growth by decade since 1990 for the private sector as a whole and for the manufacturing sector. As you can see, productivity growth in the 2010s has so far been about half as high as it was in the 1990s.

How worrisome is this? Productivity growth varies a lot from year to year, and some economists believe that it may just be a few bad years and not much to worry about. Others believe that measurement issues make it difficult to measure output and that productivity growth may be underestimated. For example, how do you measure

Table 1-2 Labor Productivity Growth, by Decade			
Percent change; year on year (average)	1990s	2000s	2010–2014
<b>Nonfarm Business Sector</b>	2.0	2.6	1.2
<b>Business Sector</b>	2.1	2.6	1.2
<b>Manufacturing</b>	4.0	3.1	2.4

Source: Haver Analytics.

the real value of a new smartphone relative to an older model? Its price may be higher, but it probably does many things that the older model could not do. Yet others believe that the United States has truly entered a period of lower productivity growth, that the major gains from the current IT innovations may already have been obtained, and that progress is likely to be less rapid, at least for some time.

◀ IT stands for information technology.

One particular reason to worry is that this slowdown in productivity growth is happening in the context of growing inequality. When productivity growth is high, most everybody is likely to benefit, even if inequality increases. The poor may benefit less than the rich, but they still see their standard of living increase. This is not the case today in the United States. Since 2000, the real earnings of workers with a high school education or less have actually decreased. If policy makers want to invert this trend, they need either to raise productivity growth or limit the rise of inequality, or both. These are two major challenges facing U.S. policy makers today.

## 1-3 The Euro Area

In 1957, six European countries decided to form a common European market—an economic zone where people and goods could move freely. Since then, 22 more countries have joined, bringing the total to 28. This group is now known as the **European Union**, or EU for short.

Until a few years ago, the official name was the *European Community*, or EC. You may still encounter that name.

In 1999, the EU decided to go a step further and started the process of replacing national currencies with one common currency, called the *euro*. Only 11 countries participated at the start; since then, 8 more have joined. Some countries, in particular, the United Kingdom, have decided not to join, at least for the time being. The official name for the group of member countries is the **Euro area**. The transition took place in steps. On January 1, 1999, each of the 11 countries fixed the value of its currency to the euro. For example, 1 euro was set equal to 6.56 French francs, to 166 Spanish pesetas, and so on. From 1999 to 2002, prices were quoted both in national currency units and in euros, but the euro was not yet used as currency. This happened in 2002, when euro notes and coins replaced national currencies. Nineteen countries now belong to this *common currency area*.

The area also goes by the names of “Euro zone” or “Euroland.” The first sounds too technocratic, and the second reminds one of Disneyland. I shall avoid them.

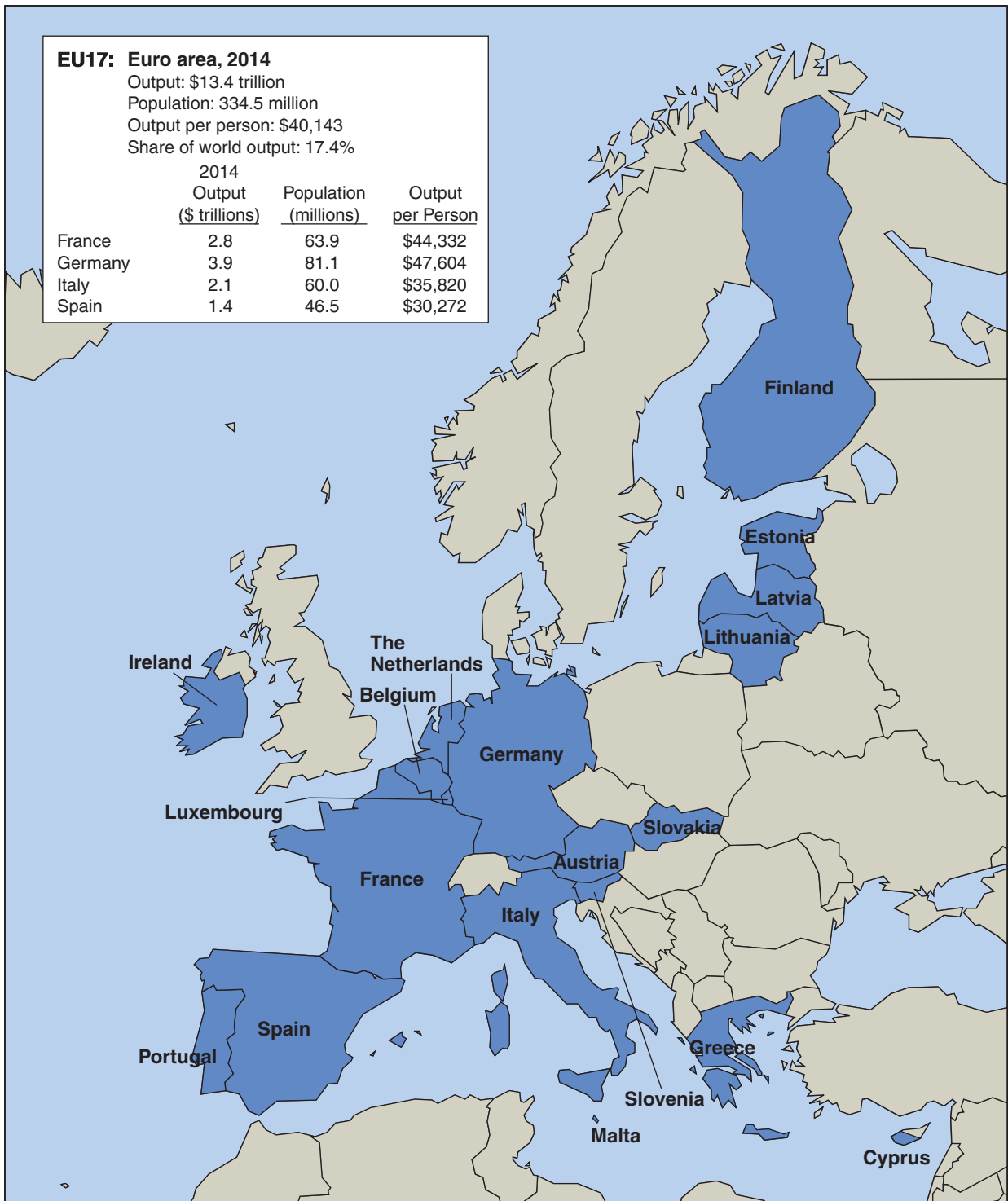
Table 1-3 Growth, Unemployment, and Inflation in the Euro Area, 1990–2015				
Percent	1990–2007 (average)	2008–2009 (average)	2010–2014 (average)	2015
<b>Output growth rate</b>	2.1	−2.0	0.7	1.5
<b>Unemployment rate</b>	9.4	8.6	11.1	11.1
<b>Inflation rate</b>	2.1	1.5	1.0	1.1

Output growth rate: annual rate of growth of output (GDP). Unemployment rate: average over the year.  
Inflation rate: annual rate of change of the price level (GDP deflator).

Source: IMF, *World Economic Outlook*, July 2015.

MyEconLab Real-time data





**Figure 1-5**  
*The Euro Area, 2014*