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# Macroeconomics

EIGHTH EDITION

Olivier Blanchard



Eighth Edition  
Global Edition

# MACROECONOMICS

Olivier Blanchard



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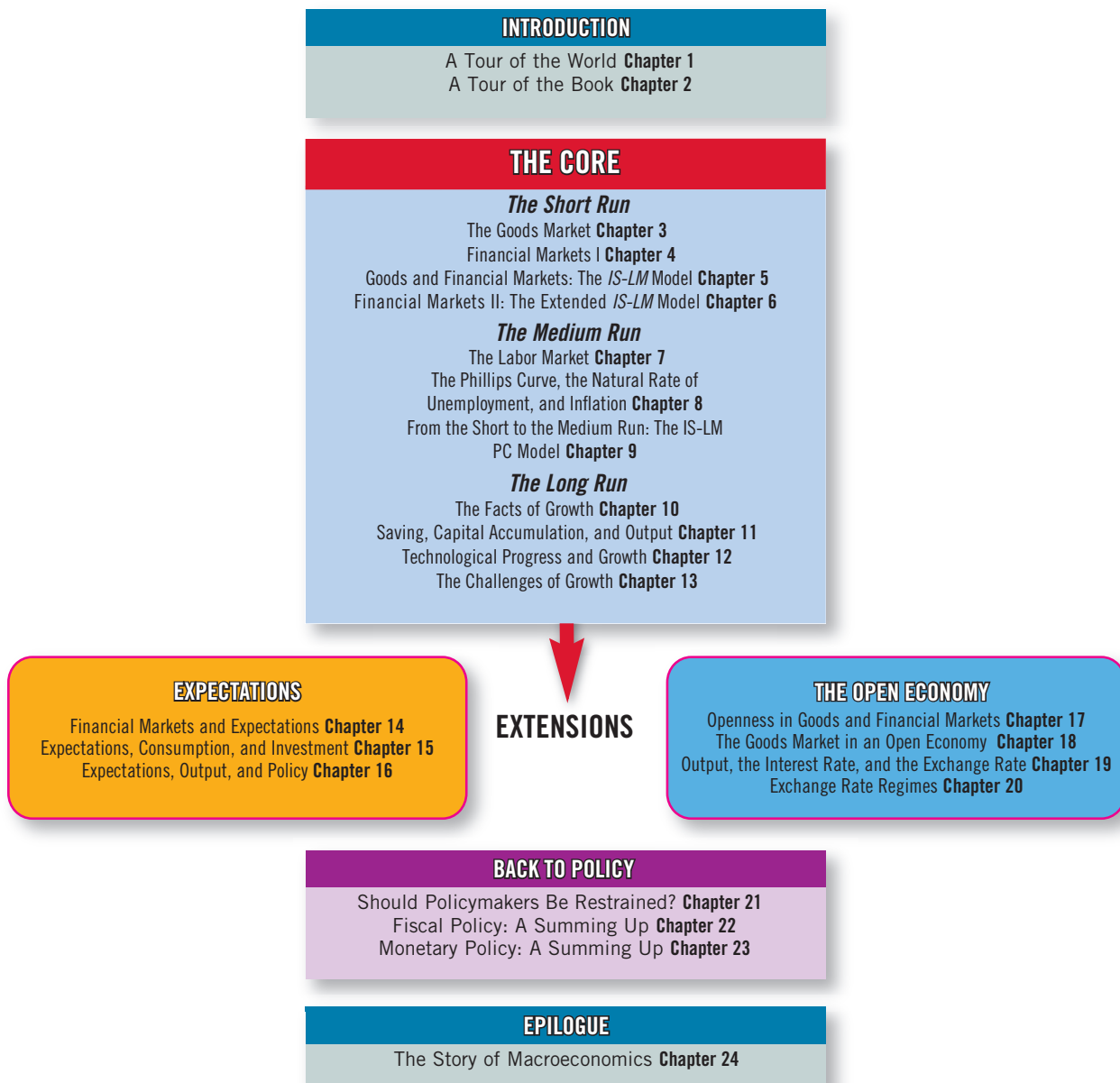
*To Noelle*



# Flexible Organization

*Macroeconomics*, eighth edition is organized around two central parts: A core and a set of two major extensions. The text's **flexible organization** emphasizes an integrated view of macroeconomics, while enabling professors to focus on the theories, models, and applications that they deem central to their particular course.

The flowchart below quickly illustrates how the chapters are organized and fit within the book's overall structure. For a more detailed explanation of the **Flexible Organization**, and for an extensive list of **Alternative Course Outlines**, see pages 13–14 in the preface.



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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 engulfed the world in the late 2000s, 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.

## Solving Learning and Teaching Challenges

### Flexible 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. The flowchart at the beginning of this book 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 takes you on an economic

tour of the world, from the Euro area, to the United States, and 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 in 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**. Chapters 3 to 5 characterize equilibrium in the goods market and in the financial markets, and derive the basic model used to study short-run movements in output, the IS-LM model. Chapter 6 extends the basic IS-LM model to reflect the role of the financial system. It then uses it to describe what happened during the initial phase of the financial 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, which is new, focuses on the challenges to growth, from inequality to climate change.

- 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 examine the implications of openness of modern economies. Chapter 20 looks at 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 over the last 80 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 standalone) 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 and 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.

## Innovative 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 many Focus boxes, which discuss particular macroeconomic events or facts from around the world. Many of those are new to this edition.

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 key Internet addresses.

Each chapter starts with a one- or two-sentence summary at the end of the introduction, and 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" activities typically require either access to the Internet or use of a spreadsheet program.
- A list of symbols at the end of the book makes it easy to recall the meaning of the symbols used in the text.

## What's New in This Edition

A new Chapter 13 on the challenges to growth. Topics include whether the introduction of robots will lead to mass unemployment, the relation between growth and inequality, and the challenges of climate change.

A revised Chapter 8 on the Phillips curve, reflecting a major change in the US economy. The Phillips curve is now a relation between inflation and unemployment rather than between the change in inflation and unemployment.

A revised Chapter 9 showing how the changes in the Phillips curve relation have led to changes in monetary policy.

A new appendix in Chapter 1, 'What Do Macroeconomists Do?', which will give you a sense of what careers you may pursue if you were to specialize in macroeconomics.

Updated Focus Boxes include:

- NEW! Will Bitcoins Replace Dollars? (Chapter 4)
- From Henry Ford to Jeff Bezos (Chapter 7)
- NEW! Growth and Changes in Standards of Living in Southeast Asia (Chapter 10)
- NEW! Nudging US Households to Save More (Chapter 11)
- What Lies Behind Chinese Growth? (Chapter 12)
- Uncertainty and Fluctuations (Chapter 16)
- NEW! China and the Mundell-Fleming Trilemma (Chapter 19)

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Olivier Blanchard  
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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 has been 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 president of the *American Economic Association*, and a member of the *American Academy of Sciences*.

# Introduction

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

## Chapter 1

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 euro area, the United States, and China.

## Chapter 2

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

# 1

**W**hat 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 policymakers awake at night.

At the time of this writing (the start of 2019), policymakers are sleeping better than they did a decade 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 negative in 2009. Since then, growth has turned positive, and the world economy has largely recovered. But the crisis, now known as the **Great Financial Crisis**, has left several 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 euro area, the United States, and China.

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

**Section 1-2** looks at the euro area.

**Section 1-3** looks at the United States.

**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.

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

**If you remember one basic message from this chapter, it should be: Economies, like people, get sick – high unemployment, recessions, financial crises, low growth. Macroeconomics is about why it happens, and what can be done about it. ▶▶▶**

# 1-1 THE CRISIS

Figure 1-1 shows output growth rates for the world economy, for advanced economies, and for emerging and developing 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 emerging and developing economies 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. US 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 Federal Reserve Bank (the US central bank, called the Fed for short) 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 might 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 sold 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. 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 then 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.

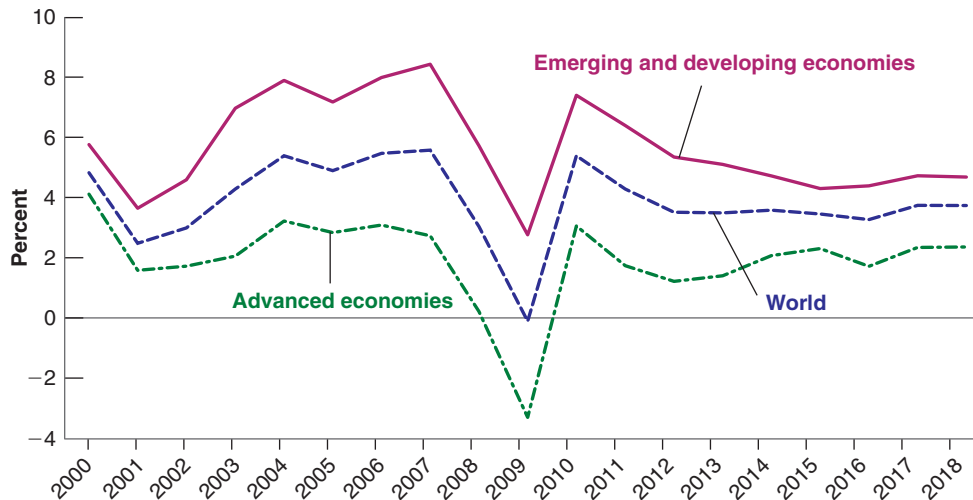
This complexity and opaqueness turned a housing price decline into a major financial crisis, a development that few economists had anticipated. Not knowing the quality of the assets that other banks had on their balance sheets, banks became reluctant to lend to each other for fear that the bank to which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

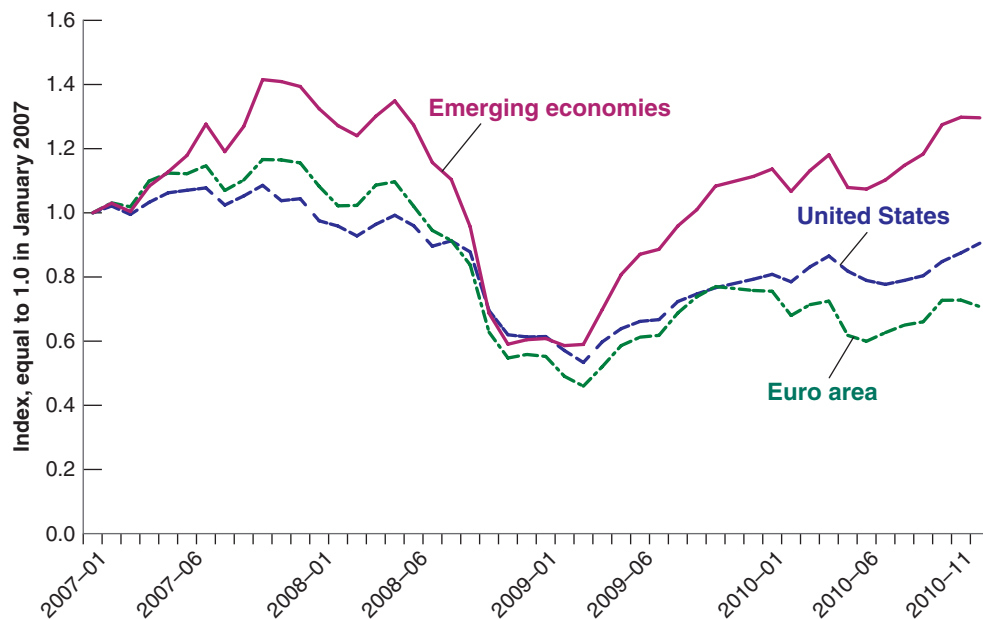
“Banks” here actually means “banks and other financial institutions.” But this is too long to write and I do not want to go into these complications in Chapter 1. ▶

**Figure 1-1**

**Output Growth Rates for the World Economy, for Advanced Economies, and for Emerging and Developing Economies, 2000–2018**

Source: IMF, World Economic Outlook Database, July 2018. NGDP\_RPCH.A.





**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.

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 stock price indexes for the United States, the euro area, and emerging economies from the beginning of 2007 to the end of 2010. The indexes are set equal to 1 in January 2007. Note that, by the end of 2008, stock prices had lost half or more of their value from their previous peak. Note also that, even though the crisis originated in the United States, European and emerging market stock prices decreased by as much as their US 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 US government, which cut taxes and increased spending, demand decreased, and so did output. In the third quarter of 2008, US 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 US crisis quickly became a world crisis. Other countries were affected through two channels.

The first channel was trade. As US 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 finance. US 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 several European countries, governments had accumulated high levels of debt and were now running large deficits. Investors began to worry about whether debt could be repaid and asked for much higher interest rates. Confronted

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



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 aspect of the crisis acquired its own name, the *Euro Crisis*. In short, the US 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.

Thanks to strong monetary and fiscal policies and to the gradual repair of the financial system, economies turned around and started recovering. As you can see from Figure 1-1, growth in advanced countries turned positive in 2010 and has remained positive since. In some advanced countries, most notably the United States, unemployment is now very low. The euro area, however, is still struggling; growth is positive, but 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.

Now that I have set the stage, let me 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 EURO AREA

Until a few years ago, the official name was the *European Community*, or EC. You may still encounter that name. EC now stands for *European Commission*, the executive arm of the European Union. ▶

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

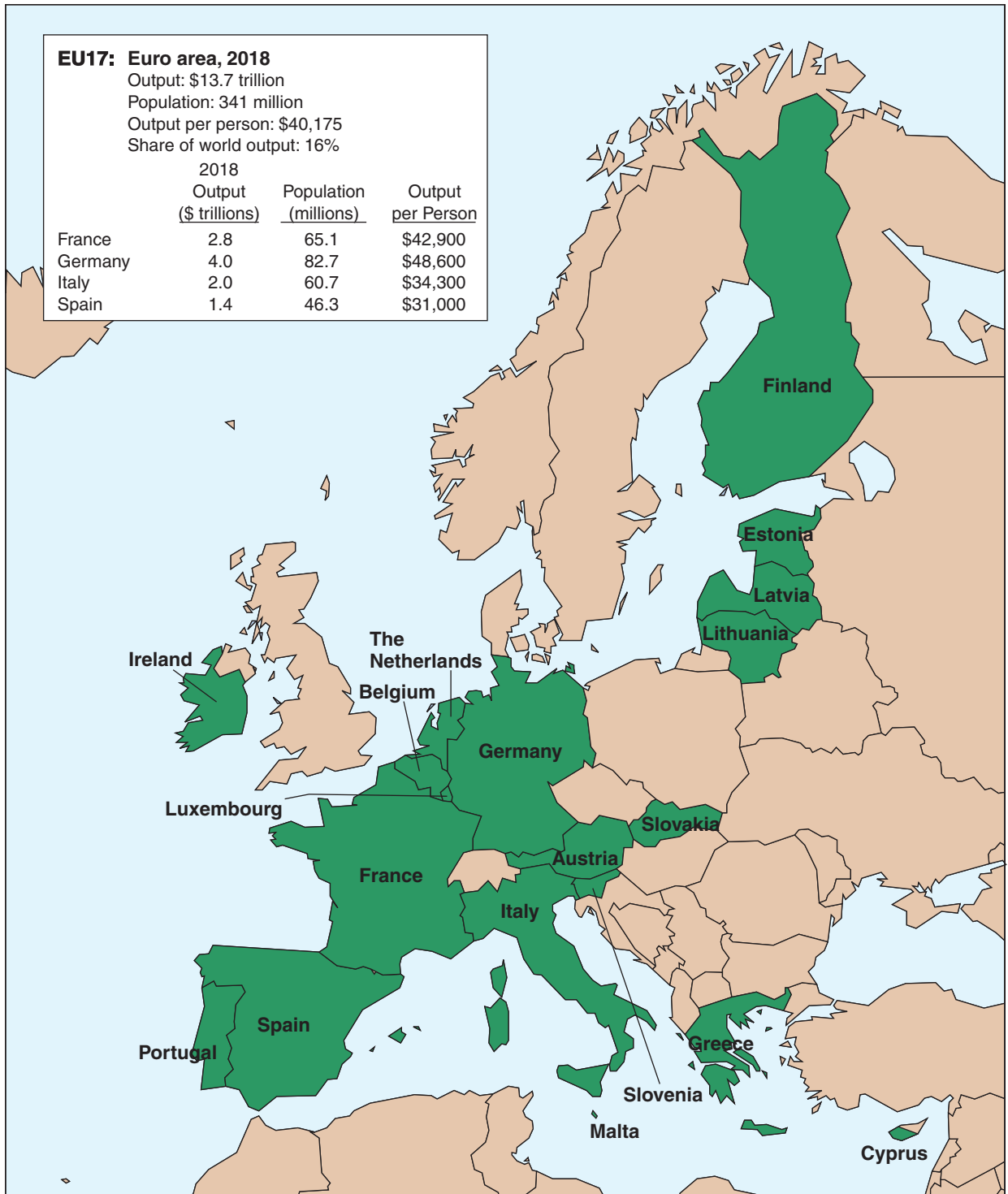
In 1957, six European countries decided to form a common European market—an economic zone where people, goods, and services could move freely. Over time, 22 more countries joined, bringing the total to 28. This group is now known as the **European Union (EU)** and its scope extends beyond just economic issues. In 2016, the United Kingdom held a referendum in which the government was given the mandate to exit the Union. At this juncture, the number of EU member countries have come down to 27. The United Kingdom withdrew from the EU on January 31, 2020.

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. Nineteen countries now belong to this **common currency area**, known as the **euro area**.

As you can see from the numbers in Figure 1-3, the euro area is a strong economic power. At the current exchange rate between the euro and the dollar, its output is equal to two-thirds of US output. (The EU as a whole has an output equal to 90% of that of the United States.)

Table 1-1 gives the numbers for output growth, the unemployment rate, and the inflation rate for 1990–2007, 2008–2009, 2010–2017, and 2018. Just as in the United States, the acute phase of the crisis, 2008–2009, was characterized by negative growth. Whereas the United States recovered, growth in the euro area remained anemic. Indeed, while this is not shown in the table, growth was negative in both 2012 and 2013. Growth has now increased, reaching 2% in 2018, but the unemployment rate remains high, at 8.3%. Inflation remains too low, below the 2% target of the European Central Bank (ECB).

The euro area faces two main issues today. The first is how to reduce unemployment. Second is whether and how it can function efficiently as a common currency area. Let’s look at the two issues in turn.



**Figure 1-3**  
*The Euro Area, 2018*

**Table 1-1** Growth, Unemployment, and Inflation in the Euro Area, 1990–2018

Percent	1990–2007 (average)	2008–2009 (average)	2010–2017 (average)	2018
<b>Output growth rate</b>	2.1	-2.0	1.3	2.0
<b>Unemployment rate</b>	9.4	8.6	10.6	8.3
<b>Inflation rate</b>	2.1	1.5	1.0	1.5

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, October 2018.

## Can European Unemployment Be Reduced?

The high average unemployment rate for the euro area, 8.3% in 2018, hides large variations across the euro countries. At one end, Greece and Spain have unemployment rates of 20% and 15%, respectively. At the other, Germany's unemployment rate is close to 3%. In the middle are countries like France and Italy, with unemployment rates of 9% and 11%, respectively. Thus, how to reduce unemployment must be tailored to the specifics of each country.

To show the complexity of the issues, it is useful to look at a country with high unemployment, say Spain. Figure 1-4 shows the striking evolution of the Spanish unemployment rate since 1990. After a long boom starting in the mid-1990s, the unemployment rate decreased from a high of nearly 25% in 1994 to 8% by 2007. But, with the crisis, unemployment exploded again, exceeding 25% in 2013. It has declined since then, but still stands at 15%.

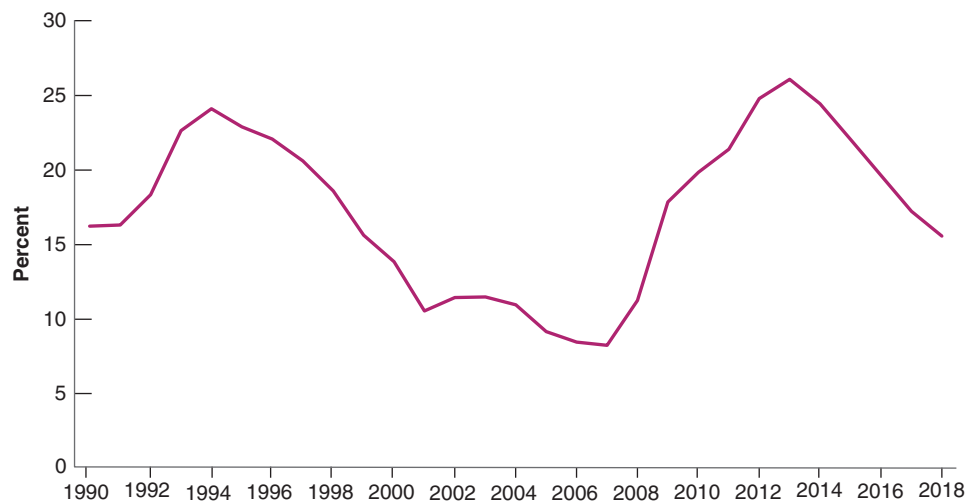
The figure suggests two conclusions:

- Part of the high unemployment rate today is probably still a result of the crisis and the sudden collapse in demand we discussed in the first section. A housing boom that turned into a housing bust, plus a sudden increase in interest rates, triggered the increase in unemployment from 2008 on. One can hope that, eventually, demand will continue to increase, and unemployment will decrease further.

**Figure 1-4**

### Unemployment in Spain since 1990

(Source: International Monetary Fund, World Economic Outlook, October 2018).



- Even at the peak of the boom, the unemployment rate in Spain never went below 8%, nearly three times the unemployment rate in Germany today. This suggests that more is at work than the crisis and the fall in demand. The fact that, for most of the last 20 years, unemployment has exceeded 10%, points to problems in the labor market. The challenge is then to identify exactly what these problems are.

Some economists believe the main problem is that European states protect workers too much. To prevent workers from losing their jobs, they make it expensive for firms to lay off workers. One of the unintended results of this policy is to deter firms from hiring workers in the first place, thus increasing unemployment. Also, to protect workers who become unemployed, European governments provide generous unemployment insurance. But, by doing so, they decrease the incentives for the unemployed to take jobs rapidly; this also may increase unemployment. The solution, these economists argue, is to be less protective, to eliminate these *labor market rigidities*, and to adopt US-style labor market institutions. This is what the United Kingdom has largely done, and its unemployment rate is low.

Others, and this includes me, are more skeptical. They point to the fact that unemployment is not high everywhere in Europe. Yet most European countries provide protection and generous social insurance to workers. This suggests that the problem may lie not so much with the degree of protection but with the way it is implemented. The challenge, these economists argue, is to understand what the low-unemployment European countries are doing right, and whether what they do right can be exported to the other European countries.

Resolving these questions is one of the major tasks facing European macroeconomists and policymakers.

## What Has the Euro Done for Its Members?

When the process of conversion from national currencies to the euro ended in early 2002, the euro became the common currency for 11 European countries. (See the Focus Box “The Euro: A Short History.”)

Supporters of the euro point to its enormous symbolic importance. In light of the many past wars among European countries, what better proof of the permanent end to conflict than the adoption of a common currency? They also point to the economic advantages of having a common currency: no more changes in exchange rates for European firms to worry about; no more need to change currencies when crossing borders. Together with the removal of other obstacles to trade among European countries, the euro contributes, they argue, to the creation of a large economic power in the world. There is little question that the move to the euro was indeed one of the main economic events of the start of the 21st century.

Others worry, however, that the symbolism of the euro has come with substantial economic costs. Even before the crisis, they pointed out that a common currency means a common monetary policy, which means the same interest rate across the euro countries. What if, they argue, one country plunges into recession while another is in the middle of an economic boom? The first country needs lower interest rates to increase spending and output; the second country needs higher interest rates to slow down its economy. If interest rates must be the same in both countries, what will happen? Isn't there the risk that one country will remain in recession for a long time or that the other will not be able to slow down its booming economy? A common currency also means the loss of the exchange rate as an instrument of adjustment within the euro area. What if, they argue, a country has a large trade deficit and needs to become more competitive? If it cannot adjust its exchange rate, it must adjust by decreasing prices relative to its competitors. This is likely to be a painful and long process.

Until the euro crisis, the debate had remained somewhat abstract. It no longer is. As a result of the crisis, several euro members, from Ireland and Portugal to Greece, have gone

## The Euro: A Short History

- As the European Union (EU) celebrated its 30th anniversary in 1988, a number of governments decided the time had come to plan a move to a common currency. They asked Jacques Delors, president of the EU, to prepare a report, which he presented in June 1989. The Delors report suggested moving to a European Monetary Union (EMU) in three stages: Stage I was the abolition of capital controls. Stage II was the choice of fixed parities, to be maintained except for “exceptional circumstances.” Stage III was the adoption of a single currency.
- Stage I was implemented in July 1990.
- Stage II began in 1994, after the exchange rate crises of 1992–1993 had subsided (see the Focus Box “The 1992 EMS Crisis”). A minor but symbolic decision involved choosing the name of the new common currency. The French liked ECU (European currency unit), which is also the name of an old French currency. But its partners preferred euro, and the name was adopted in 1995.
- In parallel, EU countries held referendums on whether they should adopt the Maastricht treaty. The treaty, negotiated in 1991, set three main conditions for joining the EMU: low inflation, a budget deficit below 3%, and a public debt below 60%. The Maastricht treaty was not popular, and in many countries the outcome of the popular vote was close. In France, the treaty passed with only 51% of the votes. In Denmark, the treaty was rejected. The United Kingdom negotiated an “opt-out” clause that allowed Britain not to join the new currency union.
- In the mid-1990s, it looked as if few European countries would satisfy the Maastricht conditions. But

several countries took drastic measures to reduce their budget deficit. When the time came to decide, in May 1998, which countries would be members of the euro area, 11 countries made the cut: Austria, Belgium, Finland, France, Germany, Italy, Ireland, Luxembourg, the Netherlands, Portugal, and Spain. The United Kingdom, Denmark, and Sweden decided to stay out. Greece did not qualify initially and didn’t join until 2001. (After it joined, it was revealed that it had “cooked the books” and understated the size of its budget deficit in order to qualify.) Since then, Cyprus, Estonia, Malta, Slovakia, and Slovenia have joined.

- Stage III began in January 1999. Parities between the 11 currencies and the euro were “irrevocably” fixed. The new European Central Bank (ECB) based in Frankfurt became responsible for monetary policy for the euro area.

From 1999 to 2002, the euro existed as a unit of account, but euro coins and bank notes did not exist. In effect, the euro area was still functioning as an area with fixed exchange rates. The next and final step was the introduction of euro coins and bank notes in January 2002. For the first few months of 2002, national currencies and the euro circulated side by side. Later in the year, national currencies were taken out of circulation. Today, the euro is the only currency used in the euro area. The numbers of countries adopting the euro reached 19 when Latvia and Lithuania joined.

For more on the euro, go to [www.euro.ecb.int/](http://www.euro.ecb.int/). The Wikipedia page on the euro is also very good.

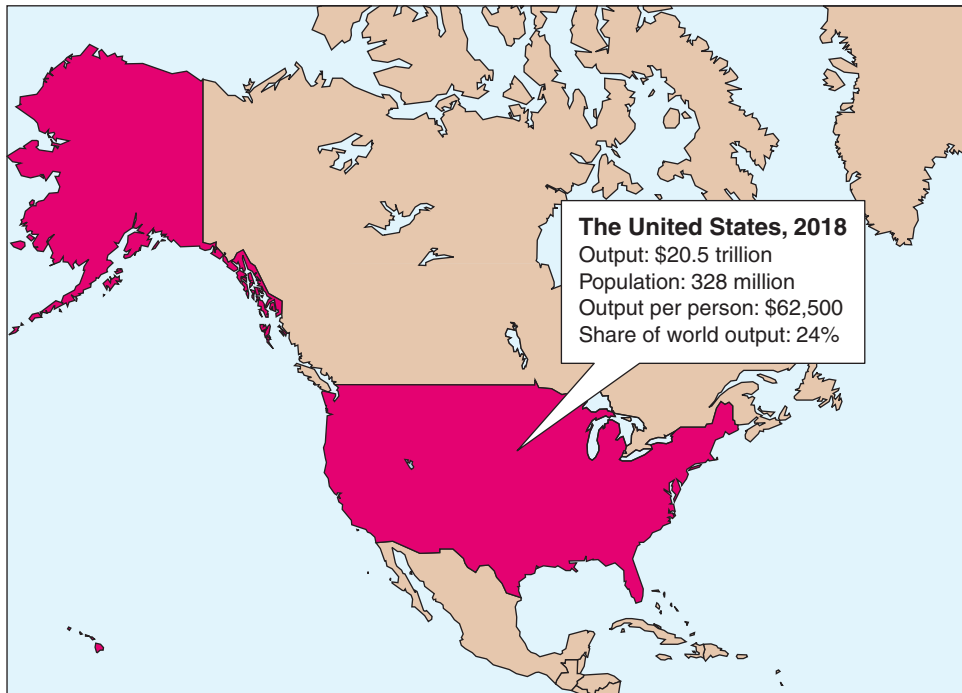
At the time of this writing, some Italian politicians argue that Italy, which suffers from low growth, would be better off outside the euro and advocate euro exit. ▶

through deep recessions. If they had their own currency, they could have depreciated their currency vis-à-vis other euro members to increase the demand for their exports. Because they shared a currency with their neighbors, this was not possible. Thus, some economists conclude, some countries should drop out of the euro and recover control of their monetary policy and their exchange rate. Others argue that such an exit would be both unwise because it would give up the other advantages of being in the euro and extremely disruptive, leading to even deeper problems for the country that exited. This issue is likely to remain a hot one for some time to come.

### 1-3 THE UNITED STATES

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” in the WEO database (see the chapter appendix for the web address). ▶

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 1-5: The United States is big, with an output of \$20.5 trillion in 2018, accounting for 24% of world output. And the standard of living in the United States is high: Output per person is \$62,500. It is not the country with the highest output per person in the world, but it is close to the top.

**Figure 1-5***The United States, 2018*

When economists want to dig deeper and look at the 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 US economy are given in Table 1-2. To put current numbers in historical 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 2017, and the last column gives the numbers for 2018.

By looking at the numbers for 2018, you can see why economists are upbeat about the US economy at this point. Growth in 2018 is 2.9%, close to the 1990–2007 average. The unemployment rate, which increased during the crisis and its aftermath (it reached

Percent	1990–2007 (average)	2008–2009 (average)	2010–2017 (average)	2018
<b>Output growth rate</b>	3.0	–1.3	2.2	2.9
<b>Unemployment rate</b>	5.4	7.5	6.8	3.7
<b>Inflation rate</b>	2.3	1.3	1.6	2.3

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, October 2018.

10% during 2010), has steadily decreased and is now 3.7%, substantially lower than the 1990–2007 average. Inflation is also low, equal to its 1990–2007 average. In short, the US economy seems to be in good shape, having largely left the effects of the crisis behind.

So what are the main macroeconomic problems facing US policymakers? I shall pick two. The first concerns the short run, namely whether policymakers have the necessary tools to handle a recession. The second is how to increase productivity growth in the long run. Let's look at both issues in turn.

## Do Policymakers Have the Tools to Handle the Next Recession?

The recovery from the financial crisis started in the United States in June 2009. Since then, output growth has been positive, and at the time of writing, the expansion has gone on for 115 months. If it goes on until July 2019, it will be the longest expansion on record since 1945.

If history is any guide, however, the sad reality is that expansions do not go on forever, and the United States will, sooner or later, go through another recession. It may come from several places. It may be triggered by a trade war, leading, for example, to a sharp decrease in exports. It may come from increased uncertainty, leading people to consume less and firms to invest less. It may come from another financial crisis, despite the measures that have been taken since 2009 to decrease risk. Or it may come, as has happened many times in the past, from events we simply have not thought about.

Donald Rumsfeld, a past secretary of defense, had a very insightful quote. "There are known unknowns. But there are also unknown unknowns. And it is the latter category that tend to be the difficult ones."

When the recession comes, the question will be what policymakers can do to limit the decline in output. The Fed will have to play a central role. This is for two reasons. First, because part of the mandate of the Fed is indeed to fight recessions. Second, because it has the best policy instrument to do so, namely control of the interest rate. By decreasing the interest rate, the Federal Reserve can stimulate demand, increase output, and decrease unemployment. By increasing the interest rate, it can slow down demand and increase unemployment.

The problem that the Fed faces at this point, however, is shown in Figure 1-6, which shows the path of the policy interest rate (called the *Federal Funds Rate*) since 2000. Note how much the Fed decreased the interest rate when the crisis hit, from 5.3% in July 2008 to close to 0% in December 2008. Note then that the rate remained close to 0% until the end of 2015, and how it has increased a little since then and now stands at 2.4%.

**Figure 1-6**

**The US Federal Funds Rate, since 2000**

