ECONOMIC GROWTH, THE FINANCIAL SYSTEM, AND BUSINESS CYCLES

Chapter 10

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Chapter Outline

- **10.1** Long-Run Economic Growth
- **10.2** Saving, Investment, and the Financial System
- **10.3** The Business Cycle

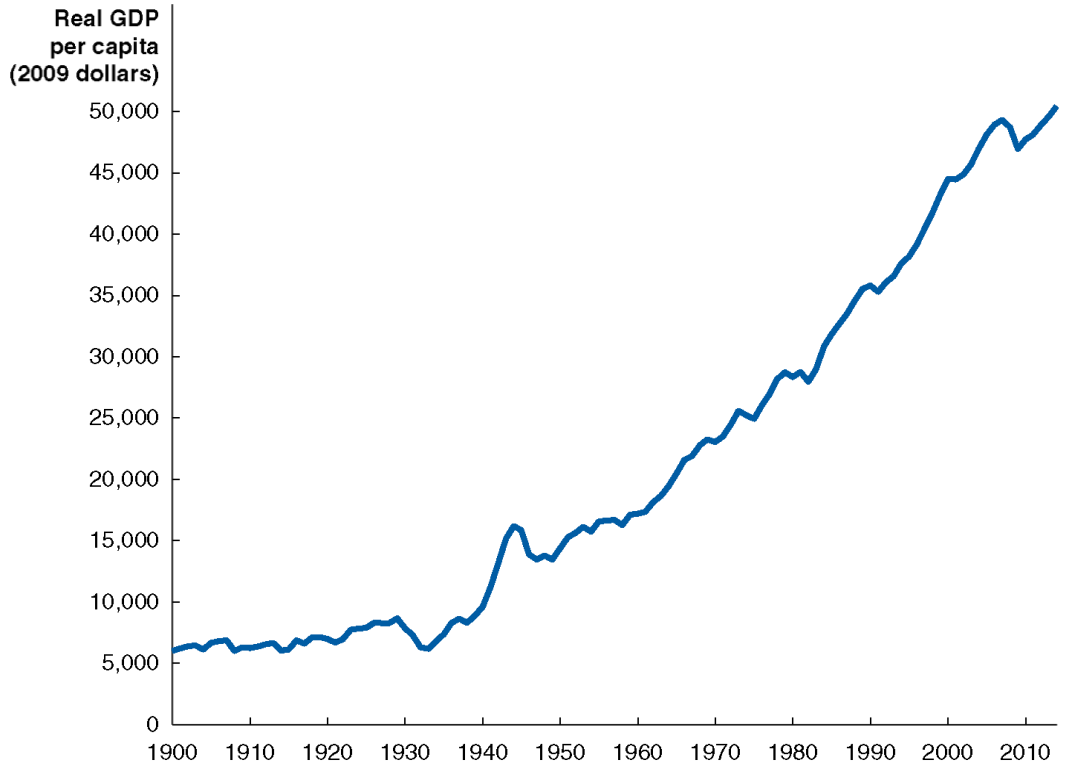
Obtaining Economic Growth

- We all want the United States to have a “strong” economy, since this will hopefully result in a better life for us and the people we care about.
- Similarly, people all over the world want their respective countries to have “strong” economies. Unfortunately, most countries in the world do not have strong economies.
- What does it mean for the economy to be “strong” vs. “weak”?
- In this chapter, we will explore what the concepts mean in the long-term and also in the short-term.
- We will also explore what sorts of things seem to lead to a stronger vs. weaker economy.

10.1 Long-Run Economic Growth

- When we speak of **long-run economic growth**, we mean the process by which rising productivity increases the average standard of living.
- The most commonly used measure of this average standard of living is *real GDP per capita*: the amount of production in the economy, per person, adjusted for changes in the price level.
- Do you think real GDP per capita is a good measure of standard of living? Why or why not?

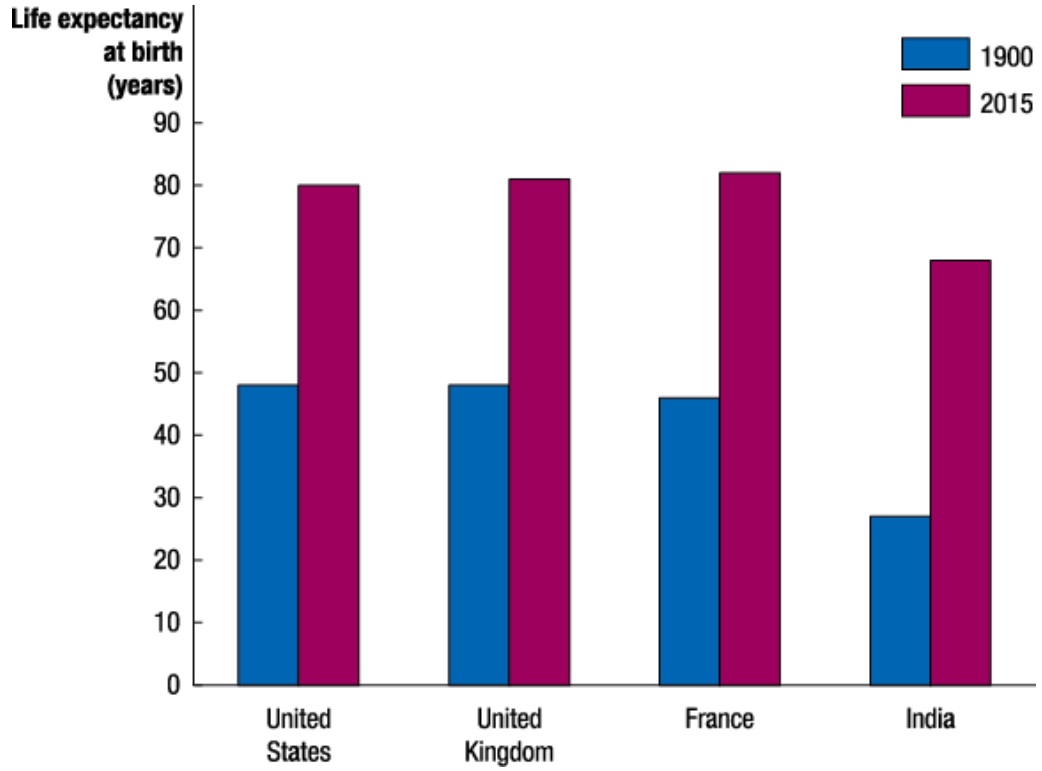
Figure 10.1 The Growth in Real GDP per Capita, 1900-2014



- Real GDP per capita has risen more than eight-fold since 1900; the average American can buy more than eight times as many goods and services now as in 1900.

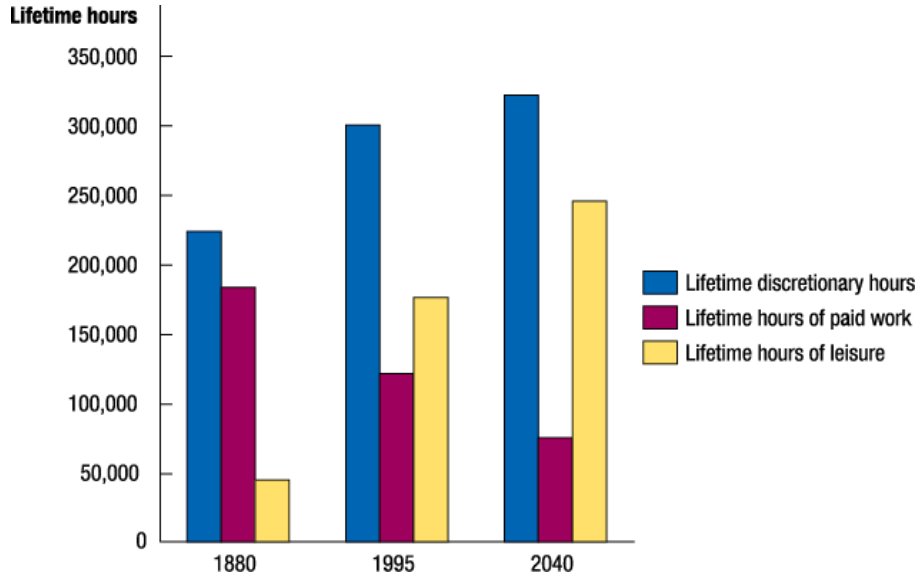
Making the Connection: Economic Prosperity and Health (1 of 2)

- Economic prosperity and health go hand in hand: richer nations can devote more resources to improving the health of their citizens, and healthier citizens are more productive.
- While growth in real GDP per capita is an important measure of our improvement, another important measure is the increase in our lifespans. These have also increased markedly over the last century.



Making the Connection: Economic Prosperity and Health (2 of 2)

- Another good measure of our economic prosperity is the amount of time we can spend on leisure.
- As our lifespan grows, we can spend more time on leisure, and also, as we grow more productive, we can devote less time to work, and hence more to leisure.
- Nobel Prize-winner Robert Fogel predicts improvements will continue.



Calculating Growth Rates

Recall, the growth rate of an economic variable like real GDP or real GDP per capita is equal to the percentage change from one year to the next.

- In 2013, Real GDP was $15,710 billion
- In 2014, Real GDP was $16,086 billion

- $\text{Real GDP growth} = \left(\frac{\$16{,}086 \text{ billion} - \$15{,}710 \text{ billion}}{\$15{,}710 \text{ billion}}\right) \times 100 = 2.4\%$

Growth Rates over a Few Years

Over periods of a few years, we can average the growth rates to find the approximate annual rate of growth.

- In 2012, real GDP growth was 2.3%
- In 2013, real GDP growth was 2.2%
- In 2014, real GDP growth was 2.4%

$$\text{Average annual real GDP growth} = \frac{2.3\% + 2.2\% + 2.4\%}{3} = 2.3\%$$

Growth Rates over Longer Periods

- For longer time periods, we wouldn't want to calculate each of the annual growth rates and then take an average in order to find the average annual growth rate; instead we would solve for the **growth rate *g***, where:
- $$\text{Previous real GDP} \times (1 + g)^t = \text{Current real GDP}$$

with *t* the number of time periods between the previous and current periods.

- A useful shortcut called the *Rule of 70* can help us to determine how long it will take for an economic variable to double:
- $$\text{Number of years to double} = \frac{70}{\text{Growth rate}}$$
- If growth rate is 5 percent, the variable will double in $70/5 = 14$ years.
- Remember and practice these formulas.

What Determines the Rate of Long-Run Growth?

Increases in real GDP per capita rely on increases in **labor productivity**: the quantity of goods and services that can be produced by one worker or by one hour of work.

- *Why can the average American consume eight times as many goods and services now than in 1900?*
- *Because the average American produces eight times as many goods and services in an hour now than in 1900.*

So most of the answer to "what determines the rate of long-run growth" is the same as the answer to "what determines labor productivity growth?"

Factors Affecting Labor Productivity Growth (1 of 2)

1. *Increases in capital per hour worked*

- **Capital** is manufactured goods that are used to produce other goods and services.
- The more capital a worker has available to use (including *human capital*, the accumulated knowledge and skills workers possess), the more productive he or she will be.

2. *Technological change*

- *Improvements* in capital or methods to combine inputs into outputs (i.e. *new technologies)* allow workers to produce more in a given period of time.
- The role of *entrepreneurs* here is critical, in pioneering new ways to bring together the factors of production to produce better or lower cost products.

Factors Affecting Labor Productivity Growth (2 of 2)

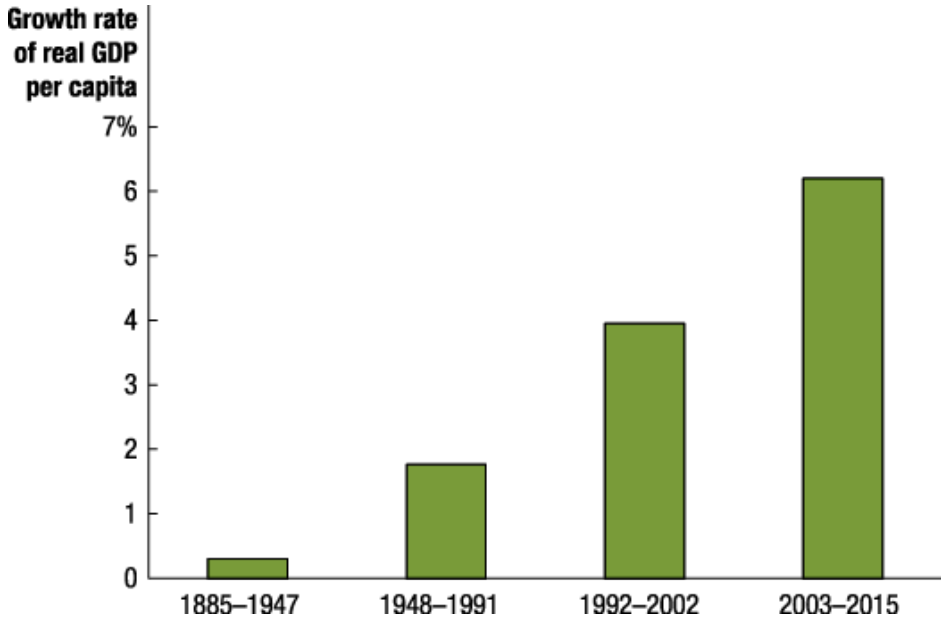
3. *Property rights*

- A market system cannot function unless rights to private property are secure
- Governments can aid growth by establishing independent court systems

Making the Connection: Can India Sustain Its Rapid Growth?

To many people, the rapid economic rise of India was unexpected.

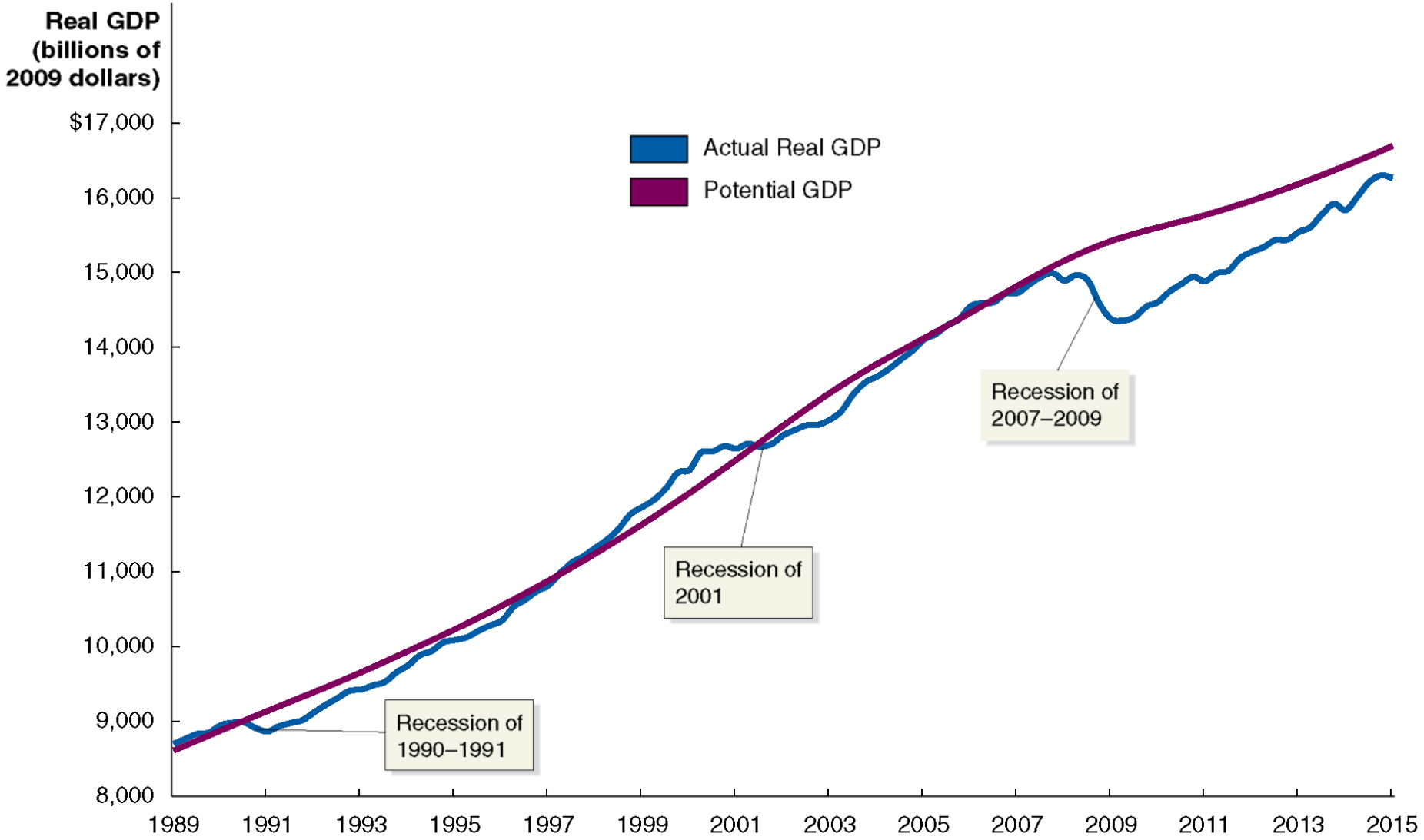
- Before its independence from England in 1947, growth rates in India were very low, and India was desperately poor.
- In 1991, the Indian government decided to scale back central planning, reduce regulations, and introduce market-based reforms.
- Continued growth will require upgraded infrastructure, improved educational and health services, and commitment to rule of law.



Potential GDP

- **Potential GDP** refers to the level of real GDP attained when all firms are operating at capacity. *Capacity* here refers to "normal" hours and a "normal" sized workforce.
- Potential GDP rises when the labor force expands, when a nation acquires more capital stock, or when new technologies are created.
- The growth in potential GDP in the U.S. has been relatively steady at about 3.3 percent; that is, the potential to produce final goods and services has been growing in the U.S. at about this rate over time.
- The recession of 2007-2009 resulted in a wider than usual gap between potential and actual GDP, as the next slide illustrates.

Figure 10.2 Actual and Potential GDP



10.2 Saving, Investment, and the Financial System

- Firms can finance some of their own expansion through *retained earnings* (savings from the previous year), reinvesting profits back into the firm.
- But often firms want to obtain more funds for expansion than are available in this way.
- They obtain these funds via the **financial system**: the system of financial markets and financial intermediaries through which firms acquire funds from households.

Financial Markets and Financial Intermediaries

- **Financial markets** are markets where financial securities, such as stocks and bonds, are bought and sold.
- *Financial security*: a document (sometimes electronic) stating the terms under which funds pass from the buyer of the security to the seller.
- *Stock*: a financial security representing partial ownership of a firm.
- *Bond*: a financial security promising to repay a fixed amount of funds. A bond is essentially a loan from a household to a firm.
- **Financial intermediaries** are firms, such as banks, mutual funds, pension funds, and insurance companies, that borrow funds from savers and lend them to borrowers.

Three Key Services of the Financial System

- *Risk sharing*

  By allowing investors to spread their money over many different assets, investors can reduce their risk while maintaining a high expected return on their investment.

- *Liquidity*

  The financial system allows savers to quickly convert their investments into cash.

- *Information*

  The prices of financial securities represent the beliefs of other investors and financial intermediaries about the future revenue stream from holding those securities.

This aggregation of information makes funds flow to the right firms.

The Macroeconomics of Savings and Investment

We will now derive the result that *the total value of saving in the economy must equal the total value of investment.*

Recall that we can express the GDP of a nation (Y) as the sum of consumption (C), investment (I), government purchases (G), and net exports (NX). That is,

$$Y = C + I + G + NX$$

We will assume a ***closed economy*** (with no exports or imports); so

$$Y = C + I + G$$

We can rearrange this to obtain an expression for investment:

$$I = Y - C - G$$

That is, investment in a closed economy is equal to income minus consumption and government purchases.

Savings

Savings is composed of ***private savings*** (by households, $S_{Private}$) and ***public savings*** (by the government, S_{Public}).

$S_{Private}$ is household income that is not spent; household income includes payments for factors of production (*Y)* and transfer payments (*TR*); households consume (*C*) and pay taxes (*T*). So

$$S_{Private} = Y + TR - C - T$$

The government "saves" whatever it brings in but does not spend (this may be negative, known as *dissaving*):

$$S_{Public} = T - G - TR$$

So total saving is:

$$S = S_{Private} + S_{Public} \quad = Y + TR - C - T + T - G - TR$$
$$= Y - C - G$$

Savings Equals Investment

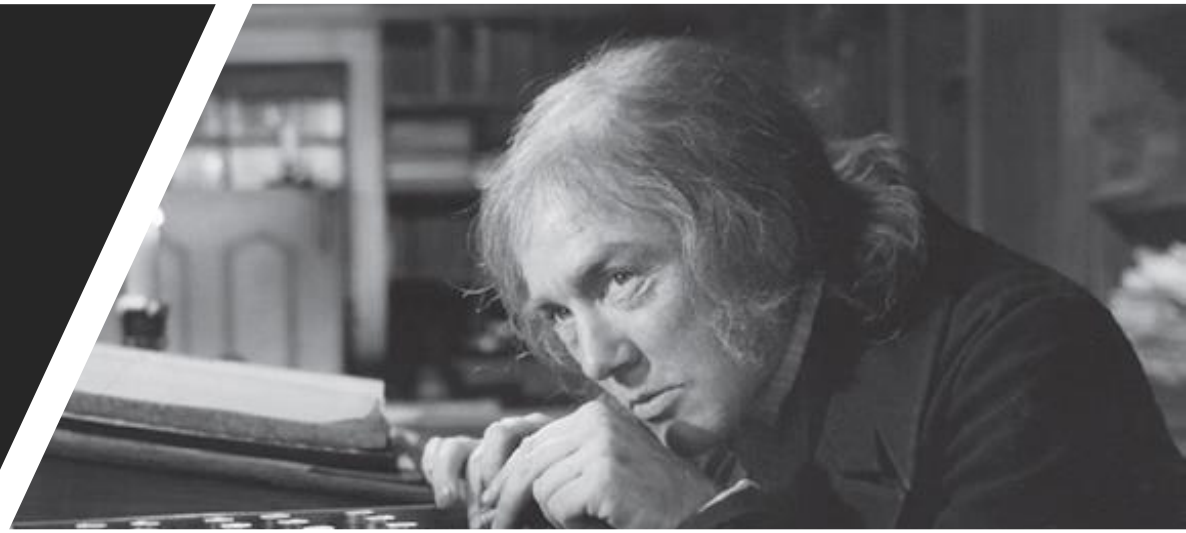
The two previous slides led us to the same expressions for savings and investment. So we conclude that savings must equal investment:

$$S = I$$

- When S_{Public} is zero, the government spends as much as it brings in; this is known as a *balanced budget*. Negative and positive values for S_{Public} are known as *budget deficits* and *budget surpluses* respectively.
- Since the federal government funds its current deficits with borrowing (selling Treasury bonds), this takes away from the money available for investment spending.

Making the Connection: Ebenezer Scrooge: Accidental Promoter of Economic Growth?

- In Charles Dickens' *A Christmas Carol*, Ebenezer Scrooge initially spends little. In the book, this is portrayed negatively, but is this really fair?
- By declining to consume, Scrooge elects to save. Society's resources can then be set toward investment, increasing productive capacity and hence future consumption.
- Eventually, Scrooge starts to spend his wealth. While this encourages current production, society was probably better served—and achieved stronger growth—when Scrooge chose to save instead.



The Market for Loanable Funds

If savings must equal investments, how exactly does this occur?

The financial system is composed of many different markets—the market for stocks, for bonds, for certificates of deposits at banks, etc.

A convenient way to model these is as a single market: the **market for loanable funds**, a (conceptual) interaction of borrowers and lenders determining the market interest rate and the quantity of loanable funds exchanged.

For now, we will assume that interactions are only between domestic households and firms—there is no interaction with foreign lenders and borrowers.

Figure 10.3 The Market for Loanable Funds

- Firms borrow loanable funds from households. They borrow more when households demand a lower return on their money—a lower real interest rate.
- Households supply loanable funds to firms. They provide more when firms offer them a greater reward for delaying consumption—a higher real interest rate.
- Governments, through their saving or dissaving, affect the quantity of funds that "pass through" to firms.

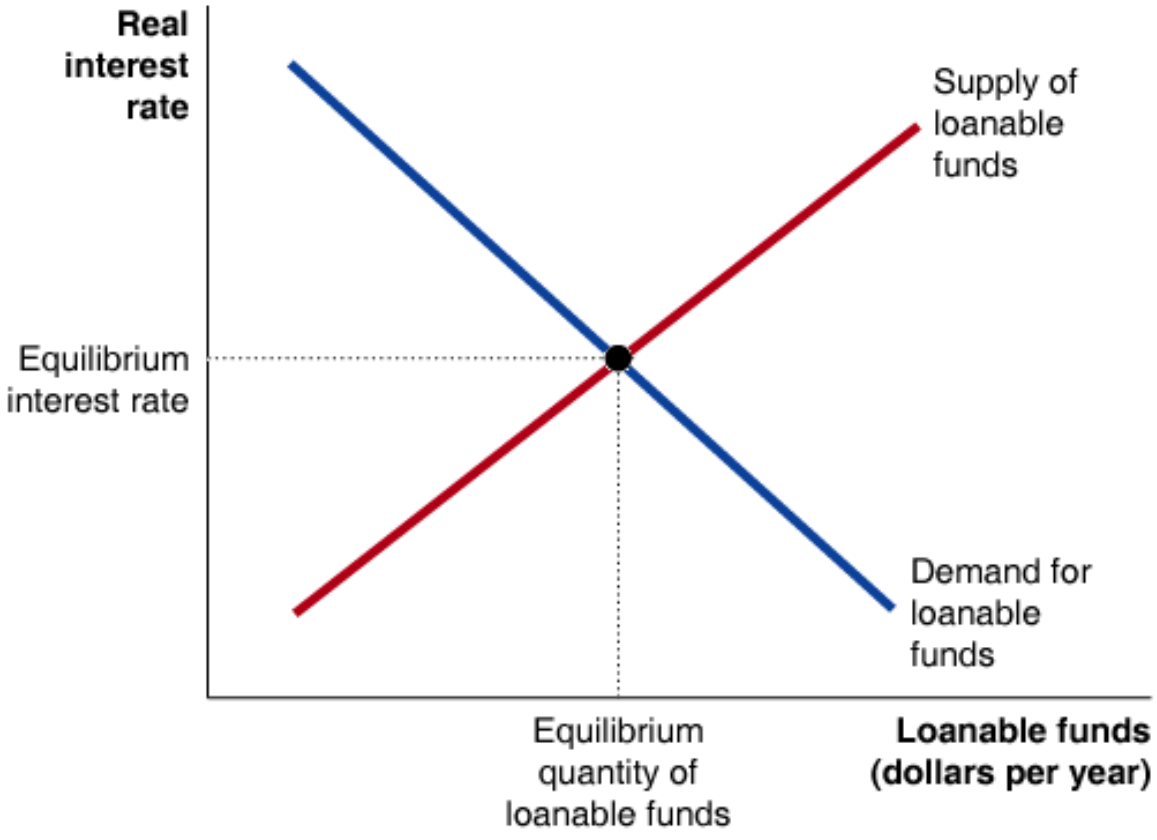


Figure 10.4 An Increase in the Demand for Loanable Funds

- Suppose that technological change occurs so that investments become more profitable for firms.
- This will increase the demand for loanable funds.
- The real interest rate will rise, as will the quantity of funds loaned.

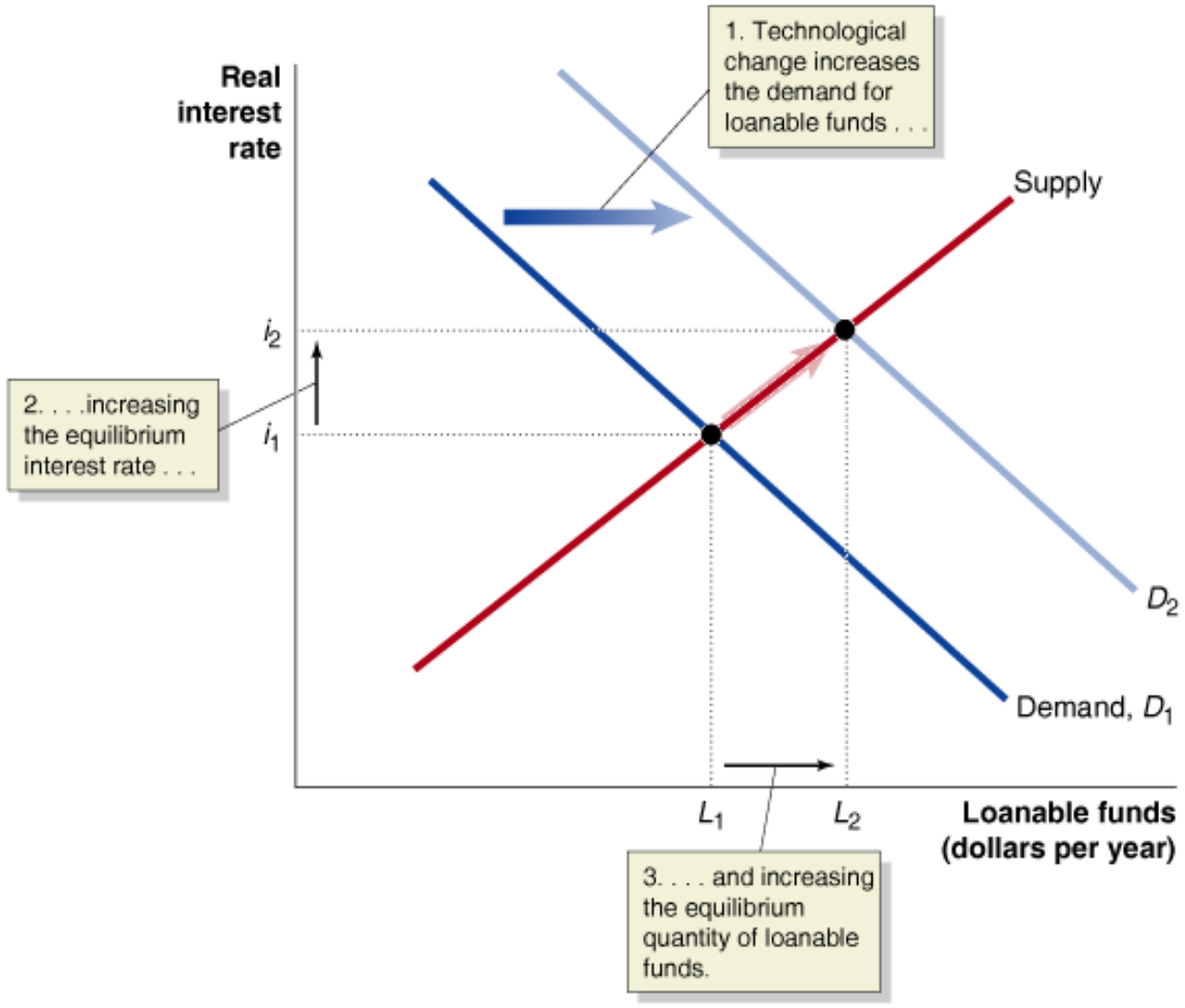
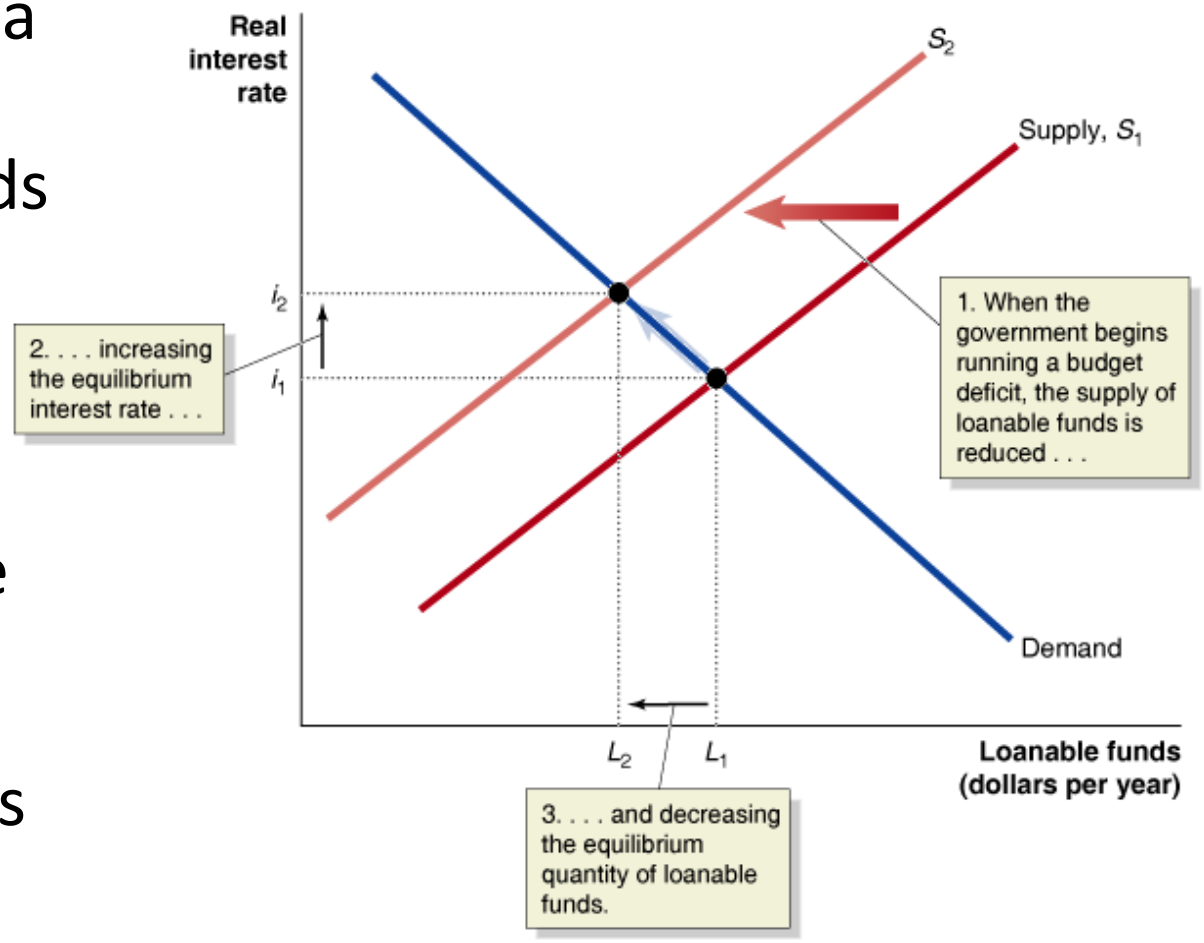


Figure 10.5 The Effect of a Budget Deficit on the Market for Loanable Funds

- Suppose the government runs a budget deficit.
- To fund the deficit, it sells bonds to households, decreasing the supply of funds available to firms.
- This raises the equilibrium real interest rate and decreases the funds loaned to firms.
- This is **crowding out**: the decline in private expenditures as a result of increases in government purchases.



How Important Is Crowding Out?

- In practice, the effect of government budget deficits and surpluses on the equilibrium interest rate is relatively small.
- How small? According to one study, increasing borrowing by 1 percent of GDP would increase the real interest rate 0.003 points.
- Why would the effect be so small?
- Interest rates are influenced by global markets, so even a few hundred billion dollars is a relatively minor amount.

Table 10.1 Summary of Loanable Funds Model (1 of 2)

An increase in …	will shift the …	causing …	Graph of the effect on equilibrium in the loanable funds market
the government's budget deficit	supply of loanable funds curve to the left	the real interest rate to increase and investment to decrease.	
the desire of households to consume today	supply of loanable funds curve to the left	the real interest rate to increase and investment to decrease.	
tax benefits for saving, such as 401(k) retirement accounts, which increase the incentive to save	supply of loanable funds curve to the right	the real interest rate to decrease and investment to increase.	

Table 10.1 Summary of Loanable Funds Model (2 of 2)

An increase in …	will shift the …	causing …	Graph of the effect on equilibrium in the loanable funds market
expected future profits	demand for loanable funds curve to the right	the real interest rate and the level of investment to increase.	
corporate taxes	demand for loanable funds curve to the left	the real interest rate and the level of investment to decrease.	

10.3 The Business Cycle

- While real GDP per capita has risen about eight-fold since the start of the twentieth century, it has not risen consistently every year.
- Since at least the early nineteenth century, the American economy has experienced alternating periods of expanding and contracting economic activity.
- These alternating periods are called the **business cycle**.

Figure 10.6 The Business Cycle (1 of 2)

- The figure shows a typical idealized path for real GDP—rising, falling, then rising again.
- The phases of rising are known as *expansion*; the periods of falling are *recessions*.
- We refer to the points at which the economy changes from one phase to the other as *peaks* or *troughs*, respectively.

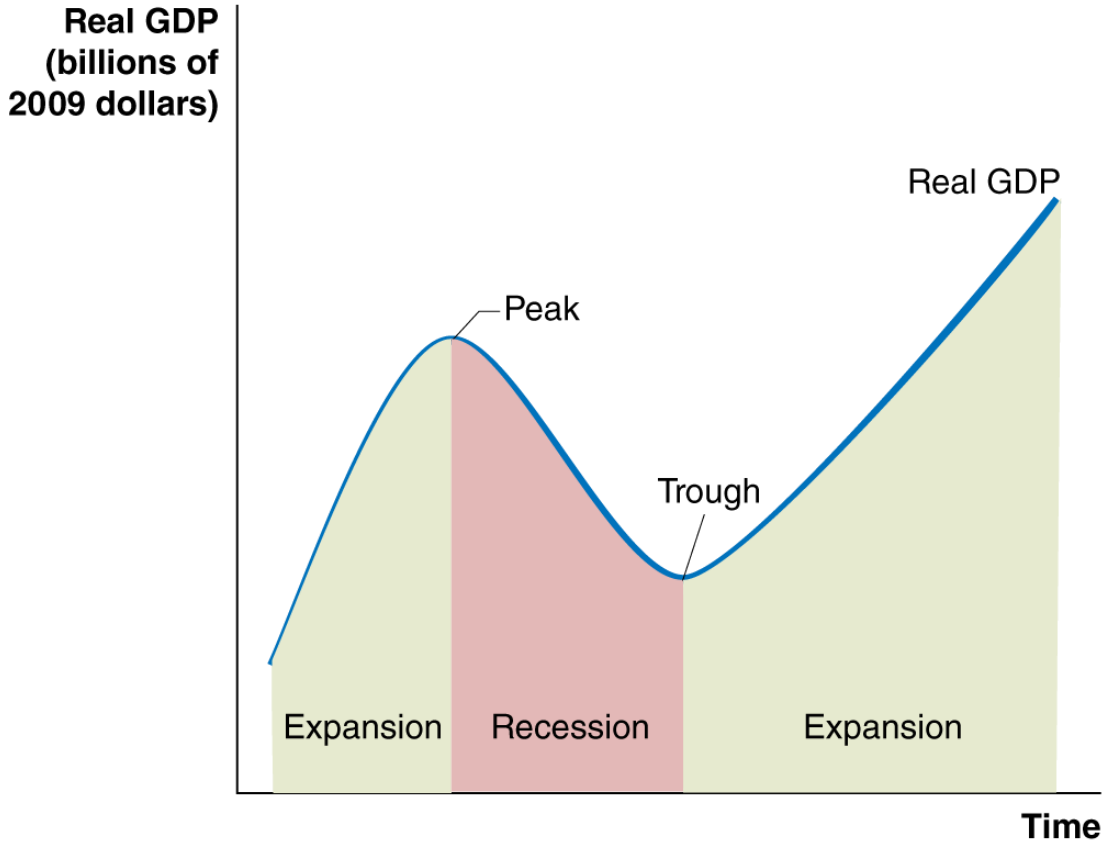
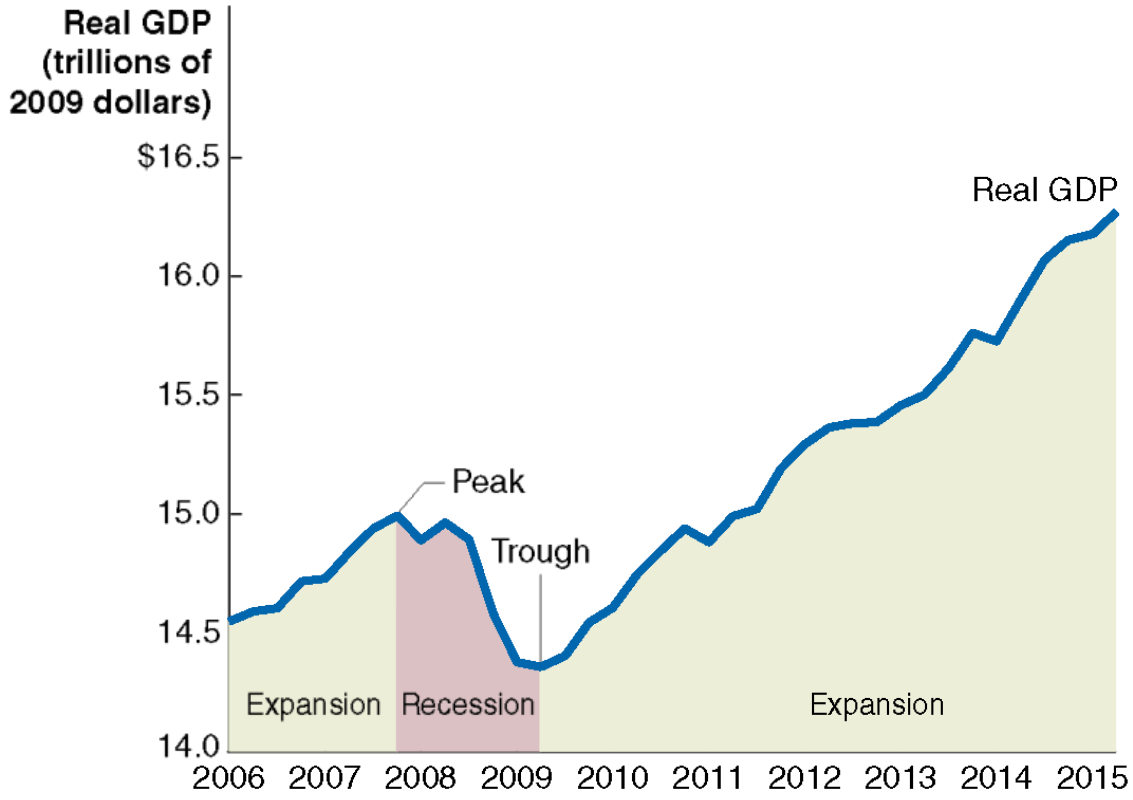


Figure 10.6 The Business Cycle (2 of 2)

- This figure shows the movements in real GDP in the U.S. from 2006 to 2015.
- The period of recession starting in late 2007 and ending in mid 2009 was the longest and most severe since the Great Depression of the 1930s, prompting some to refer to it as the *Great Recession*.
- Real GDP growth after this recession has been slower than is typical at the start of a business cycle expansion.



How do we know when the economy is in a recession?

The federal government does not define when a recession starts or ends.

- The typical media definition of a recession is “two consecutive quarters of declining real GDP.”
- Most economists defer to the judgment of the National Bureau of Economic Research:

  “A recession is a significant decline in activity spread across the economy, lasting more than a few months, visible in industrial production, employment, real income, and wholesale-retail trade.”

- Check Table 10.2 in the textbook.

Making the Connection: Can a Recession Be a Good Time to Expand?

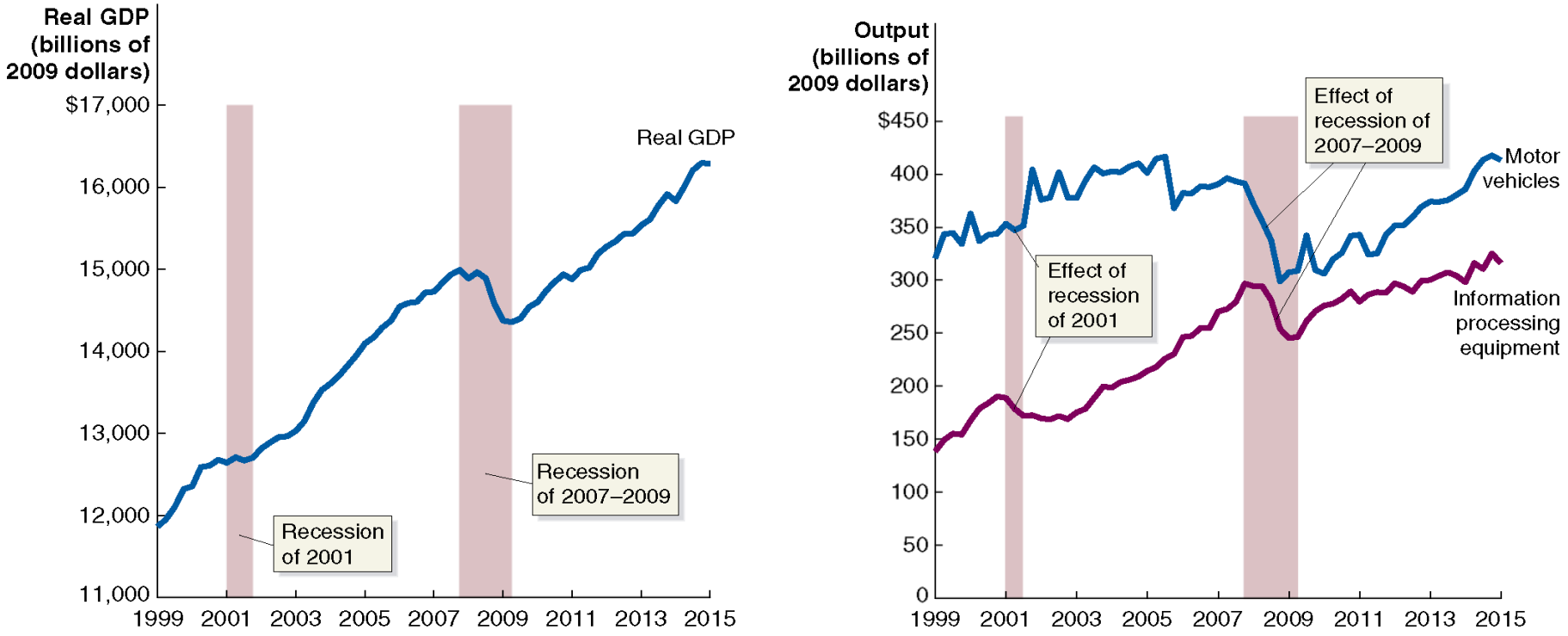
- Historically, recessions have generally been followed by periods of strong economic growth.
- With low real interest rates and failing competitors, this can be a great time to expand.
- For example, VF Corporation (the largest apparel maker in the world) decided to open 89 new stores in 2008 and 70 in 2009.
- By 2015, the company's sales and profits continued to increase, making their decision look very smart.

Effects of Business Cycles on Firms

- When a recession hits, workers reduce spending due to expectations about their current and future incomes decreasing.
- But this reduction in spending doesn't affect all goods equally. Consumers mostly continue to buy *nondurables* like food and clothing. But purchases of *durable* goods, ones that (by definition) are expected to last three or more years, are more strongly affected.
- This includes goods like furniture, appliances, and automobiles—goods that consumers can continue to use for a little longer when their purchasing power decreases.
- Hence firms selling durable goods are more likely to be hit hard by a recession.

See Figure 10.7 to understand the effects of business cycle on corning.

Figure 10.7 The Effects of the Business Cycle on Corning



- Corning sells ceramics for automobile emissions systems, and display panels for televisions and computers—durable goods, hit hard by the recession.
- So Corning was strongly affected by the Great Recession.

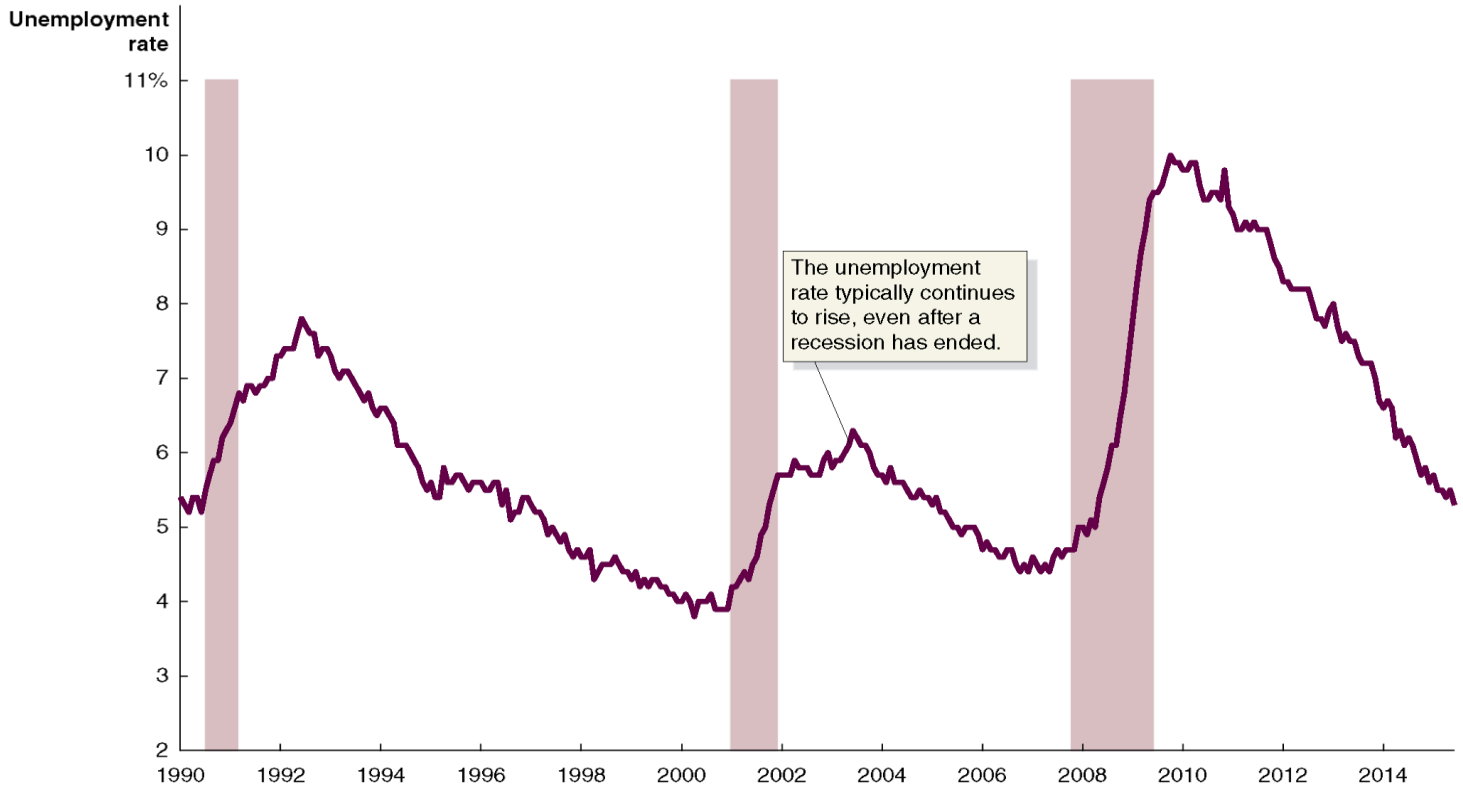
The Effect of the Business Cycle on Inflation

- The *inflation rate* measures the change in the *price level* from one year to the next.
- During expansions, demand for products is high relative to supply, resulting in prices increasing—high inflation.
- During recessions, demand for products is low relative to supply, resulting in prices increasing more slowly or even decreasing—low inflation or deflation.
- The graph on the next slide shows the movements in the (CPI) inflation rate over the last two decades.

Figure 10.8 The Effect of Recessions on the Inflation Rate

- Inflation tends to rise toward the end of an expansion and fall over the course of each recession.

Figure 10.9 How Recessions Affect the Unemployment Rate



- As firms see their sales start to fall in a recession, they generally reduce production and lay off workers.
- Notice that unemployment often continues to rise after the end of each recession.

Business Cycles At A Glance

- Annual fluctuations in real GDP were typically greater before 1950 than after 1950.
- Business cycles have been particularly mild since the mid-1980s, with some economists calling the ensuing period the *Great Moderation*.

Check Figure 10.10 in the textbook.

- The length and severity of the recession of 2007-2009 has made some economists and policymakers wonder if we would return to the previous pattern of long expansions and short, mild recessions.
- To judge whether the Great Moderation is over, it is useful to consider why it has occurred at all, and consider what if anything has fundamentally changed.

Check Table 10.3 in the textbook.

Explaining the Great Moderation (1 of 2)

- Several factors help to explain the Great Moderation:
- *The increasing importance of services*
- Manufacturing (especially of durable goods) is more strongly affected by recessions. The economy is based more on services now, decreasing the effect of the business cycle on GDP.
- *The establishment of unemployment insurance*
- Before the 1930s, unemployment insurance and other government transfer programs like Social Security did not exist. These programs increase the ability of consumers to purchase goods and services during recessions.

Explaining the Great Moderation (2 of 2)

Several factors help to explain the Great Moderation:

- *Active federal government stabilization policies*

  Many, though not all, economists believe that active government policies to lengthen expansions and minimize the effects of recessions have had the desired effect. The debate over the role of government in this way became particularly intense during the recession of 2007-2009.

- *Increased stability of the financial system*

  The severity of the Great Depression of the 1930s was in part caused by instability in the financial system; similar instability exacerbated the recession of 2007-2009. Returning to macroeconomic stability will require a stable financial system.

THE END

“The most effective way to shake an economy out of a terrible downturn when we're at the zero lower bound is an aggressive change in policy that makes people wake up, say 'this is a new day' and change their expectations.” - Christina Romer

“It’s a recession when your neighbor loses his job; it’s a depression when you lose your own.”
— Harry Truman

“I wish politicians the world over would stop claiming credit for economic growth that happens despite them, not because of them. Grow up...”
— Ziad K. Abdelnour, Economic Warfare: Secrets of Wealth Creation in the Age of Welfare Politics