

# ECO 202 Principles of Economics II

## *Lecture 5: Economic Growth, the Financial System, and Business Cycles*

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February 9, 2018

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.

## **What does it mean for the economy to be “strong” versus “weak”?**

We will explore what economic growth and related concepts both in the long-term and the short-term.

We will also explore what sorts of things seem to lead to a stronger vs. weaker economy.

## 1 Long-Run Economic Growth

- Intuition
- Calculating Growth Rate
- Determination of the Rate of Long-Run Growth
- Potential GDP

## 2 Saving, Investment, and the Financial System

- Financial Markets and Financial Intermediaries
- The Macroeconomics of Savings and Investment
- The Market for Loanable Funds

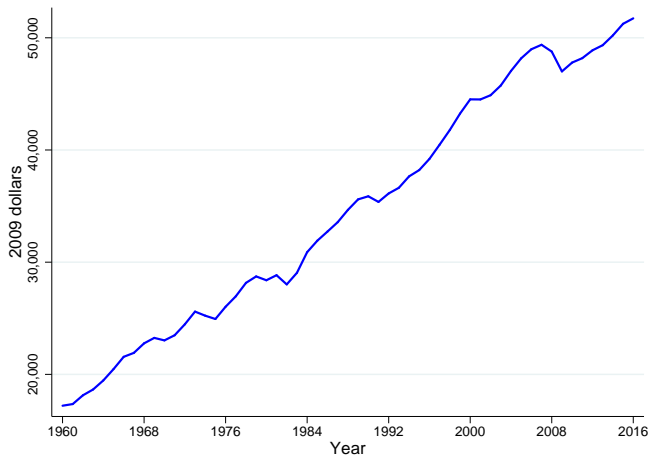
## 3 The Business Cycles

- Facts
- Effects
- The Great Moderation

# Long-Run Economic Growth

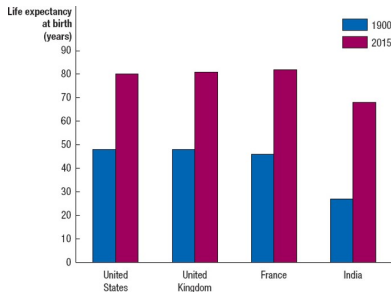
- When we speak of **long-run economic growth**, we mean the process by which *rising productivity* increases the average standard of living.
- The most commonly used measure of this average standard of living is *real GDP per capita*: the amount of production in the economy, per person, adjusted for changes in the price level.

# U.S. Real GDP per Capita



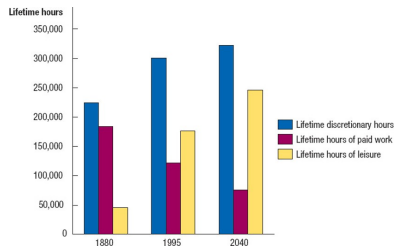
Real GDP per capita has risen more than eight-fold since 1900; the average American can buy more than eight times as many goods and services now as in 1900.

# Economic Prosperity and Health



- 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.
- Growth in real GDP per capita is an important measure of our improvement, and another important measure is the increase in our lifespans.

# Economic Prosperity and Health



- 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.



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.

## Example

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

$$\text{Real GDP Growth} = \frac{\$16086 - \$15710}{\$15710} \times 100 = 2.4\%$$

## Example

In 2012, real GDP growth was 2.3%. In 2013, real GDP growth was 2.2%. In 2014, real GDP growth was 2.4%. The average annual real GDP growth can be calculated as

$$\text{AvgGR} = \frac{2.3\% + 2.2\% + 2.4\%}{3} = 2.3\%.$$

## Growth Rates over Long 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.

# What Determines the Rate of Long-Run Growth?

The key is **labor productivity**.

## Definition

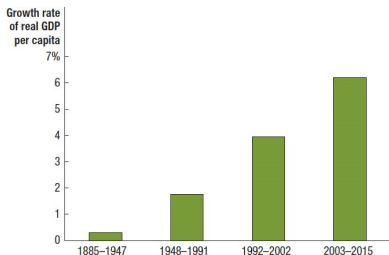
Labor productivity is the quantity of goods and services that can be produced by one worker or by one hour of work.

- 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?”

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

# Example: Can India Sustain Its Rapid Growth



- Before India's 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.

## Definition

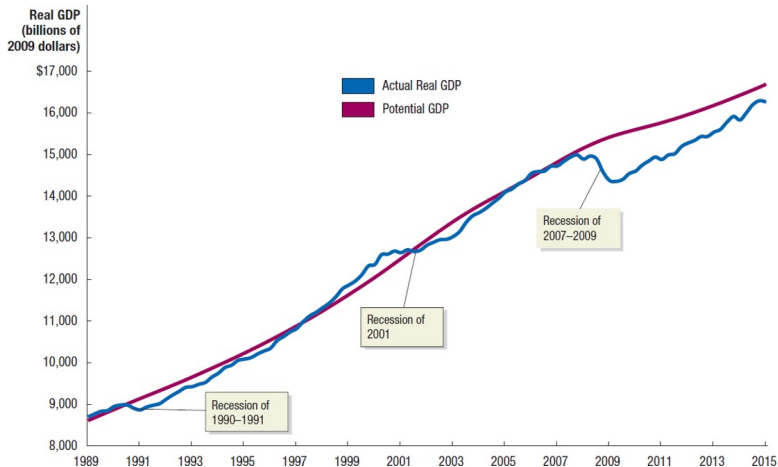
Potential GDP refers to the level of real GDP attained when all firms are operating at capacity. Capacity here refers to “normal” hours and a “normal” sized workforce.

- 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.

# Potential GDP





## Saving, Investment, and the Financial System

Firms obtain these funds via the financial system: the system of financial markets and financial intermediaries through which firms acquire funds from households.

## Definition

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.

## Definition

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
  - Portfolio
- Liquidity
  - Quick conversion of investment into cash
- Information
  - Price
  - Right price

We will now derive the result that the **total value of saving in the economy must equal the total value of investment**. Recall the national account identity:

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

We assume a closed economy, so there is no exports or imports:

$$Y = C + I + G.$$

Rearrange we get:

$$I = Y - C - G.$$

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

- Saving is composed of **private savings** (by households,  $S_p$ ) and **public savings** (by government,  $S_g$ ).
- $S_p$  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

$$S_p = Y + TR - C - T.$$

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

$$S_g = T - G - TR.$$

- Total saving is

$$S = S_p + S_g = Y + TR - C - T + T - G - TR = Y - C - G$$

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

$$S = I.$$

- If  $S_g = 0$ , then government is balanced budget, meaning it spends as much as it brings in.
- Negative and positive values for  $S_g$  are known as budget deficits and budget surpluses.

Since the federal government funds its current deficits with borrowing (selling Treasury bonds), this **takes away** from the money available for investment spending.

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

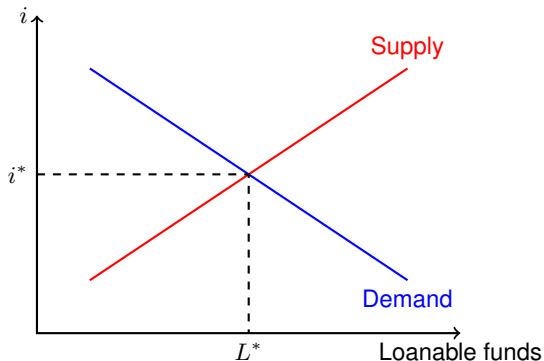
The financial system is composed of many different markets-the market for stocks, for bonds, for certificates of deposits at banks, etc.

- 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.

# The Market for Loanable Funds

- Firms borrow loanable funds from households.
- Households supply loanable funds to firms.
- Governments, through their saving or dissaving, affect the quantity of funds that “pass through” to firms.



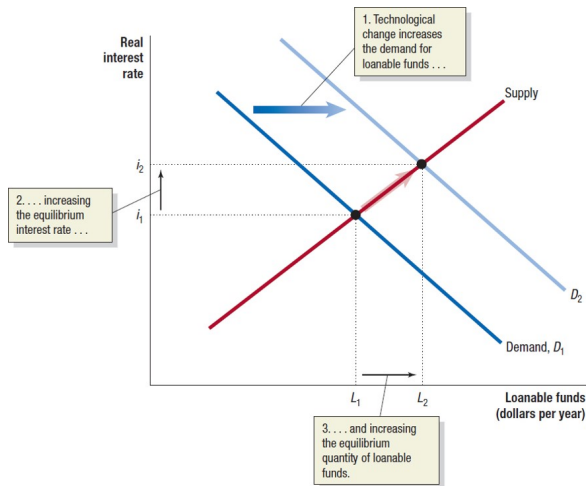


- Understand the factors that will shift the supply and demand curves of loanable funds.

## Example

Suppose that technological change occurs so that investments become more profitable for firms. How will the loanable funds market react?

# 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.
- According to one study, increasing borrowing by 1 percent of GDP would increase the real interest rate 0.003 points.
- Because interest rates are influenced by global markets, so even a few hundred billion dollars is a relatively minor amount.

# Supply of Loanable Funds Model

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<b>An increase in ...</b>	<b>will shift the ...</b>	<b>causing ...</b>
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.

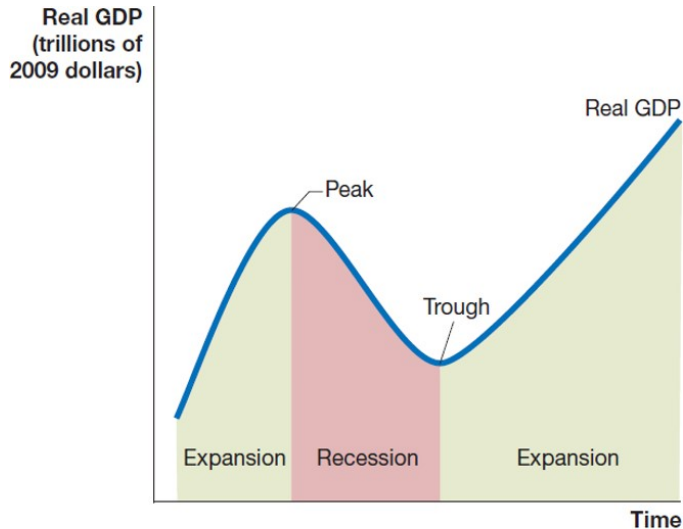
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<b>An increase in ...</b>	<b>will shift the ...</b>	<b>causing ...</b>
expected future profits	demand for loanable funds curve to the right	the real interest rate and the level of investment to increase.
corporate taxes	demand for loanable funds curve to the left	the real interest rate and the level of investment to decrease.

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# The Business Cycles

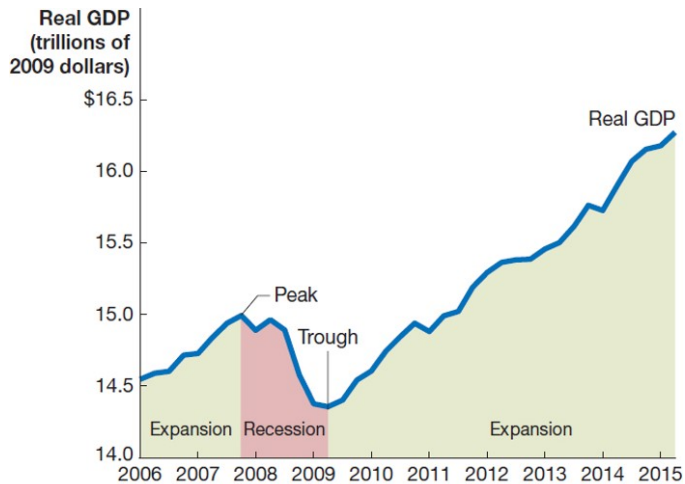
# The Business Cycle Illustration



(a) An idealized business cycle



# The Business Cycle Illustration



(b) Movements in real GDP, 2006–2015

Peak	Trough	Length of Recession
July 1953	May 1954	10 months
August 1957	April 1958	8 months
April 1960	February 1961	10 months
December 1969	November 1970	11 months
November 1973	March 1975	16 months
January 1980	July 1980	6 months
July 1981	November 1982	16 months
July 1990	March 1991	8 months
March 2001	November 2001	8 months
December 2007	June 2009	18 months

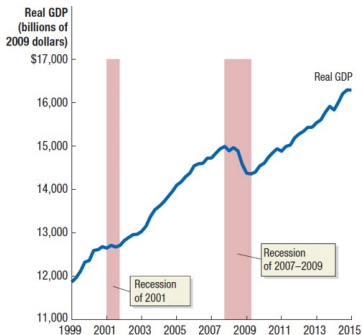
- How do we know when the economy is in a recession?
- The typical media definition of a recession is “two consecutive quarters of declining real GDP”.
- NBER: A recession is a significant decline in activity spread across the economy, lasting more than a few months, visible in industrial production, employment, real income, and wholesale-retail trade.



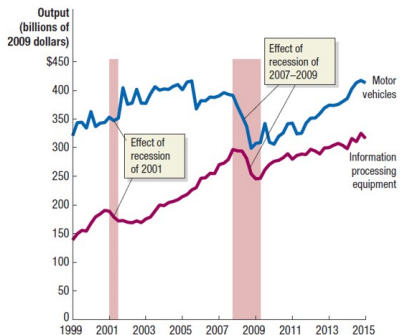
- Historically, recessions have generally been followed by periods of strong economic growth.
- Low real interest rates and failing competitors.
- For example, VF Corporation (the largest apparel maker in the world) decided to open 89 new stores in 2008 and 70 in 2009.

- Expected income decreases for workers  $\Rightarrow$  reduce spending
- Mostly affect **durable** goods such as furniture, appliances, and automobiles.
- Hence firms selling durable goods are more likely to be hit hard by a recession.

Corning sells ceramics for automobile emissions systems, and display panels for televisions and computers durable goods, hit hard by the recession.



(a) Movements in real GDP

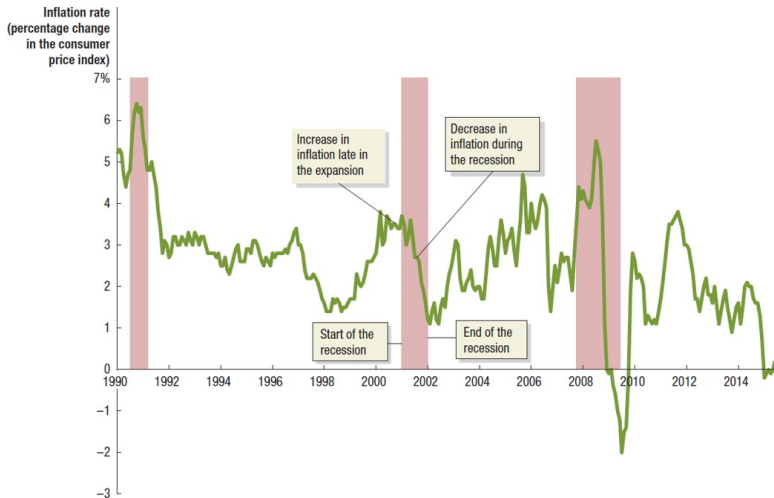


(b) Movements in the real value of sales of motor vehicles and information processing equipment

The inflation rate measures the change in the price level from one period to the next.

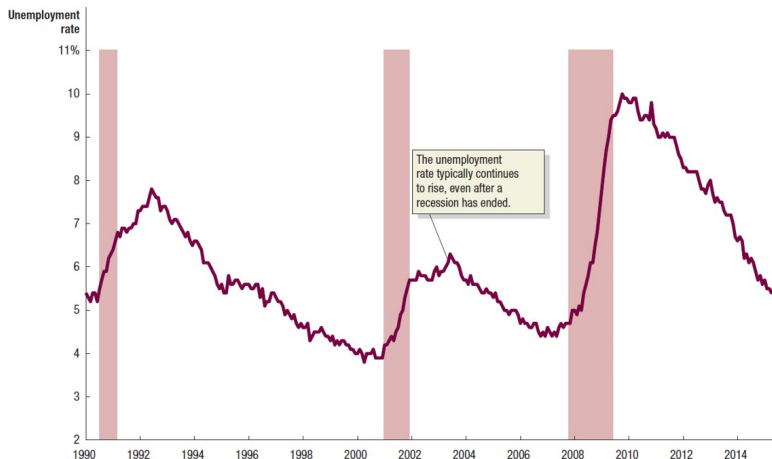
- During expansions, demand for products is high relative to supply, resulting in prices increasing-high inflation.
- During recessions, demand for products is low relative to supply, resulting in prices increasing more slowly or even decreasing-low inflation or deflation.

# Effects on Inflation



# Effects on Unemployment

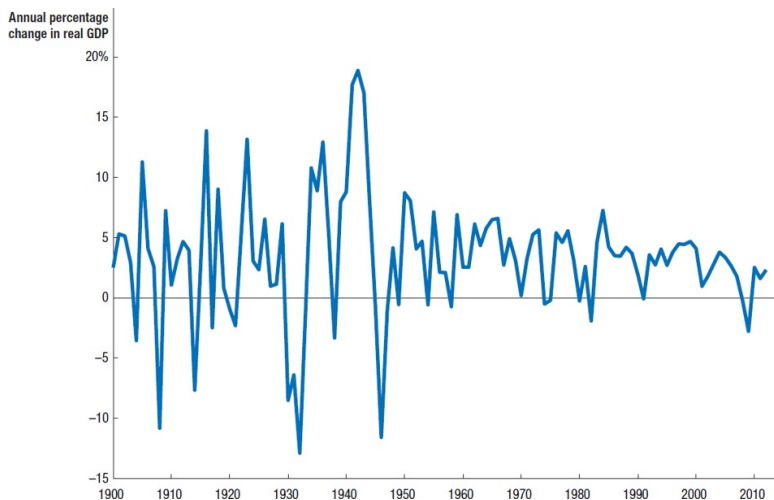
- As firms see their sales start to fall in a recession, they generally reduce production and lay off workers.
- Notice that unemployment often continues to rise after the end of each recession.





# The Great Moderation

Business cycles have been particularly mild since the mid-1980s, with some economists calling the ensuing period the **Great Moderation**.



Is the Great Moderation Over?

<b>Period</b>	<b>Average Length of Expansions</b>	<b>Average Length of Recessions</b>
1870–1900	26 months	26 months
1900–1950	25 months	19 months
1950–2009	61 months	11 months

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.

- The increasing importance of services.
  - Manufacturing (especially of durable goods) is more strongly affected by recessions.
- The establishment of unemployment insurance
  - Welfare programs increase the ability of consumers to purchase goods and services during recessions.
- Active federal government stabilization policies (still in debate)
- Increased stability of the financial system