This Chapter

- What is a Business Cycle?
- The American Business Cycle: The Historical Record
- Business Cycle Facts
- Business Cycle Analysis: A Preview
Long Run Growth vs. Short-Run Fluctuations
Short-Run Fluctuations: Output

![Graph showing real GDP fluctuations](image-url)
What is a Business Cycle?

Burns and Mitchell (Measuring Business Cycles, 1946) makes five main points about business cycles:

1. **Business cycles** are fluctuations of aggregate economic activity, not a specific variable

2. There are *expansions/booms* and *contractions/recessions*

3. Economic variables show *comovement*; they have regular and predictable patterns of behavior over the course of the business cycle

4. The business cycle is recurrent, but **not periodic**

5. The business cycle is **persistent**: business cycles vary in duration from more than one year to twelve years
Business Cycle Chronology

U.S. research on cycles began in 1920 at the National Bureau of Economic Research (NBER)

- NBER maintains the **business cycle chronology**: a detailed history of business cycles
- NBER sponsors business cycle cycle studies
- The NBER does not define a **recession** in terms of two consecutive quarters of decline in real GDP. Rather, a recession is a significant decline in economic activity spread across the economy, lasting more than a few months, normally visible in real GDP, real income, employment, industrial production, and wholesale-retail sales.
Expansions and contractions

- A **trough** is the lowpoint of the recession
- A **peak** is the highpoint of the expansion
- Peaks and troughs are **turning points** and are officially designated by the NBER Business Cycle Dating Committee
- A particularly severe recession is called a **depression**
- The sequence from one peak to the next, or from one trough to the next, is a **business cycle**
<table>
<thead>
<tr>
<th>Trough</th>
<th>Expansion (months from trough to peak)</th>
<th>Peak</th>
<th>Contraction (months from peak to next trough)</th>
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<tbody>
<tr>
<td>Dec. 1854</td>
<td>30</td>
<td>June 1857</td>
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<td>22</td>
<td>Oct. 1860</td>
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<tr>
<td>June 1861</td>
<td>46 (Civil War)</td>
<td>Apr. 1865</td>
<td>32</td>
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<td>Dec. 1867</td>
<td>18</td>
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<td>Dec. 1895</td>
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<td>44 (WWI)</td>
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<td>Nov. 1927</td>
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<td>Aug. 1929</td>
<td>43 (Depression)</td>
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<td>Mar. 1933</td>
<td>50</td>
<td>May 1937</td>
<td>13 (Depression)</td>
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<td>June 1938</td>
<td>80 (WWII)</td>
<td>Feb. 1945</td>
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<td>45 (Korean War)</td>
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<td>Nov. 1970</td>
<td>36</td>
<td>Nov. 1973</td>
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<td>July 1980</td>
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<td>July 1981</td>
<td>16</td>
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<tr>
<td>Nov. 1982</td>
<td>92</td>
<td>July 1990</td>
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<tr>
<td>Mar. 1991</td>
<td>120</td>
<td>Mar. 2001</td>
<td>8</td>
</tr>
<tr>
<td>Nov. 2001</td>
<td>73</td>
<td>Dec. 2007</td>
<td>18</td>
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<tr>
<td>June 2009</td>
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</table>

NBER BCD committee waits a long time to make a decision:

- July 1990 peak announced April 1991 (9 months)
- March 1991 trough announced December 1992 (21 months)
- March 2001 peak announced November 2001 (8 months)
- November 2001 trough announced July 2003 (20 months)
- December 2007 peak announced in December 2008 (12 months)
- June 2009 trough announced September 2010 (15 months)

Why? Data revisions; need to be sure of turning point, not temporary movement.

We won’t know for sure whether there is recession right now until much later.
The American Business Cycle Historically
Pre - World War I Period

- Recessions were common from 1865 to 1917
- 338 months of contraction and 382 months of expansion
  [compared with 642 months of expansion and 104 months of contraction from 1945 to 2007]
- Longest contraction on record was 65 months, from October 1873 to March 1879
The Great Depression and World War II

- The worst economic contraction was the Great Depression of the 1930s
- Real GDP fell nearly 30% from the peak in August 1929 to the trough in March 1933
- The unemployment rate rose from 3% to nearly 25%
- Thousands of banks failed, the stock market collapsed, many farmers went bankrupt, and international trade was halted
The Great Depression and World War II

- There were really two business cycles in the Great Depression:
  1. A contraction from August 1929 to March 1933, followed by an expansion that peaked in May 1937
  2. A contraction from May 1937 to June 1938
- By May 1937, output had nearly returned to its 1929 peak, but the unemployment rate was high (14%)
- In 1939 the unemployment rate was over 17%
- The Great Depression ended with the start of World War II: Wartime production brought the unemployment rate below 2%
- Real GDP almost doubled between 1939 and 1944
Post-World War II Business Cycles

- From 1945 to 1970 there were five mild contractions.
- The then-longest expansion on record was 106 months, from February 1961 to December 1969.
- Some economists thought the business cycle was dead.
- But the OPEC oil shock of 1973 preceded a sharp recession, with real GDP declining 3%, the unemployment rate rising to 9%, and inflation rising to over 10%.
Post-World War II Business Cycles

- The 1981-1982 recession was also severe, with the unemployment rate over 11%, but inflation declining from 11% to less than 4%.
- The 1990-1991 and 2001 recessions were mild and short, but the recoveries were slow and erratic.
- From 1982 to 2007, only two brief recessions, one from July 1990 to March 1991, the other from March 2001 to November 2001.
- Expansion from 1991 to 2001 was longest in U.S. history.
Post-World War II Business Cycles

The Great Recession

- The longest and deepest recession since the Great Depression began in December 2007
- Began with a housing crisis
- Followed by a financial crisis that rivaled that of the Great Depression
- Unemployment rose above 10% for the first time since 1982
- Fed reduced interest rates to near zero
- Sluggish economic growth even after the recession ended in 2009
The American Business Cycle

Have American business cycles become less severe?

- Economists believed that business cycles weren’t as bad after World War II as they were before.
- The average contraction before 1929 lasted 21 months compared to 11 months after 1945.
- The average expansion before 1929 lasted 25 months compared to 50 months after 1945.
- A 1986 article by C. Romer sparked a strong debate, as it argued that pre-1929 data was not measured well, and that business cycles weren’t that bad before 1929.
The American Business Cycle Historically

![Graph of real GDP percentage deviation from HP-filtered trend from 1880 to 2000](image)
The American Business Cycle

New research has focused on the reasons for the decline in the volatility of U.S. output since 1980’s
The American Business Cycle

A plot of the standard deviation of GDP growth
Great Moderation

Recent research by Stock and Watson showed that the decline came from a sharp drop in volatility around 1984 for many economic variables; dubbed the Great Moderation:

1. They found that the change from manufacturing to services was not a major cause of the reduction in volatility
2. Changes in how firms managed their inventories is not convincing either empirically
3. Improvements in housing markets occurred too gradually over time to explain sudden drop in volatility
4. Reduced volatility in oil prices was also not important

No explanation is convincing, many believe it was just good luck, although some of it can be explained by better monetary policy.
Business Cycle Facts

All business cycles have features in common:

- The cyclical behavior of economic variables: direction, timing and volatility
- What **direction** does a variable move relative to aggregate economic activity?
  - *Procyclical*: in the same direction
  - *Countercyclical*: in the opposite direction
  - *Acyclical*: with no clear pattern
- What is the **timing** of a variable’s movements relative to aggregate economic activity?
  - *Leading*: in advance
  - *Coincident*: at the same time
  - *Lagging*: after

Some variables are more volatile than others
Short-Run Fluctuations: Private Consumption

![Graph showing cyclical component of real GDP and consumption](image-url)
Short-Run Fluctuations: Private Fixed Investment

The graph shows the cyclical component of real GDP, real nondur consumption expenditures, real dur consumption expenditures, and real fixed investment expenditures from 1950 to 2010.
Short-Run Fluctuations: Employment
Real Wage and Labor Productivity
Money and Inflation

M2 growth and inflation (% per year)

PT PT PT PT PT PT PT PT

M2 GROWTH

INFLATION

Year

Nominal Interest Rate
<table>
<thead>
<tr>
<th>Variable</th>
<th>Direction</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Production</strong></td>
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<tr>
<td>Industrial production</td>
<td>Procyclical</td>
<td>Coincident</td>
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<tr>
<td><strong>Expenditure</strong></td>
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<tr>
<td>Consumption</td>
<td>Procyclical</td>
<td>Coincident</td>
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<tr>
<td>Business fixed investment</td>
<td>Procyclical</td>
<td>Coincident</td>
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<td>Residential investment</td>
<td>Procyclical</td>
<td>Leading</td>
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<tr>
<td>Inventory investment</td>
<td>Procyclical</td>
<td>Leading</td>
</tr>
<tr>
<td>Government purchases</td>
<td>Procyclical</td>
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<tr>
<td><em>Durable goods industries are more volatile than nondurable goods and services</em></td>
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<tr>
<td><strong>Labor Market Variables</strong></td>
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<td>Employment</td>
<td>Procyclical</td>
<td>Coincident</td>
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<td>Unemployment</td>
<td>Countercyclical</td>
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<td>Average labor productivity</td>
<td>Procyclical</td>
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<tr>
<td>Real wage</td>
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<td><strong>Money Supply and Inflation</strong></td>
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<td>Money supply</td>
<td>Procyclical</td>
<td>Leading</td>
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<td>Inflation</td>
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<td>Lagging</td>
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<td><strong>Financial Variables</strong></td>
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<td>Stock prices</td>
<td>Procyclical</td>
<td>Leading</td>
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<td>Nominal interest rates</td>
<td>Procyclical</td>
<td>Lagging</td>
</tr>
<tr>
<td>Real interest rates</td>
<td>Acyclical</td>
<td></td>
</tr>
</tbody>
</table>

* Timing is not designated by The Conference Board.

* Designated as “unclassified” by The Conference Board; leading at peaks and lagging at troughs.

* Source: Business Cycle Indicators, September 2008. Industrial production: series 47 (industrial production); consumption: series 57 (manufacturing and trade sales, constant dollars); business fixed investment: series 98 (gross private nonresidential fixed investment); residential investment: series 29 (new private housing units started); inventory investment: series 30 (change in business inventories, constant dollars); employment: series 41 (employees on nonagricultural payrolls); unemployment: series 43 (civilian unemployment rate); money supply: series 106 (money supply M2, constant dollars); inflation: series 120 (CPI for services, change over six-month span); stock prices: series 19 (index of stock prices, 500 common stocks); nominal interest rates: series 119 (Federal funds rate), series 114 (discount rate on new 91-day Treasury bills), series 109 (average prime rate charged by banks).
Leading Indicators

- Can we use the leading aggregates to help predict peaks and troughs?
- The first **index of leading indicators** was developed by Mitchell and Burns of the NBER in 1938, was later produced by the U.S. Commerce Department.
- Now published monthly by the Conference Board.
- Aims to forecast changes in economic activity 6-9 months into the future.
- Used in planning by businesses and government.
- A decline in the index for two or three months in a row warns of recession danger.
The Index of Leading Indicators

Components:

- Average workweek in manufacturing
- Initial weekly claims for unemployment insurance
- New orders for consumer goods and materials
- New orders, nondefense capital goods
- Vendor performance
- New building permits issued
- Index of stock prices
- M2
- Yield spread (10-year minus 3-month) on Treasuries
- Index of consumer expectations
Leading Indicators: Problems

- Data are available promptly, but often revised later, so the index may give misleading signals.
- The index has given a number of false warnings.
- The index provides little information on the timing of the recession or its severity.
- Structural changes in the economy necessitate periodic revision of the index.
- Research has showed that the index does not help forecast industrial production in real time.
- In real time, the index sometimes gave no warning of recessions.
- Because recessions may be caused by sudden shocks, the search for a good index of leading indicators may be fruitless.
Chicago Fed National Activity Index, 1967-2012
ADS Business Conditions Index, 1967-2012
International Aspects of the Business Cycle

- The cyclical behavior of key economic variables in other countries is similar to that in the United States.
- Major industrial countries frequently have recessions and expansions at about the same time.
- Common cycles for Japan, Canada, the United States, France, Germany, and the United Kingdom.
- International comovement during the 2007-2009 recessions is remarkable given origins in the US.
- Each economy also faces fluctuations that are not shared with other countries.
Note: Scales differ by country

Index of industrial production

Year


- UNITED STATES
- UNITED KINGDOM
- GERMANY
- JAPAN
- CANADA
- FRANCE
Business Cycle Analysis: A Preview

What explains business cycle fluctuations?

- 2 major components of business cycle theories
  - A description of the shocks
  - A model of how the economy responds to shocks

- 2 major business cycle theories
  - Classical theory
  - Keynesian theory

We can study both theories in **aggregate demand-aggregate supply (AD-AS)** framework.
AD/AS: A brief introduction

The model (along with the building block IS-LM model) will be fully developed next in the next few classes.

The model has 3 main components; all plotted in \((P, Y)\) space:

- aggregate demand (AD) curve
- short-run aggregate (SRAS) supply curve
- long-run (LRAS) aggregate supply curve
Aggregate Demand

- Shows quantity of goods and services demanded $Y$ for any price level $P$.
- Higher $P$ means less aggregate demand (lower $Y$), so the aggregate demand curve slopes downward.
- An increase in aggregate demand for a given $P$ shifts the aggregate demand curve up and to the right; and vice-versa
  - e.g. a rise in the stock market increases consumption, shifting the aggregate demand curve up and to the right.
  - e.g. a decline in government purchases shifts the aggregate demand curve down and to the left.
Aggregate Supply

- The aggregate supply curve shows how much output producers are willing to supply at any given price level.
- The SRAS curve is horizontal; prices are fixed in the short run.
- The LRAS curve is vertical at the full-employment level of output.

**Short-run equilibrium:** the aggregate demand curve intersects the short-run aggregate supply curve.

**Long-run equilibrium:** the aggregate demand curve intersects the long-run aggregate supply curve.
Aggregate Demand Shocks

- An aggregate demand shock is a change that shifts the aggregate demand curve
- Negative AD shock shifts AD curve to the left
- Positive AD shock shifts AD curve to the right
- Short-run equilibrium occurs where the AD curve intersects the SRAS curve; output changes, price level is unchanged
- Long-run equilibrium occurs where the AD curve intersects the LRAS curve; output returns to its original level, price level has changed
Aggregate Demand Shocks

How long does it take to get to the long run?

**Classical theory**
- prices adjust rapidly,
- so recessions are short-lived,
- no need for government intervention

**Keynesian theory:**
- prices (and wages) adjust slowly
- adjustment may take several years
- government can fight recessions by taking action to shift the aggregate demand curve
1. A fall in aggregate demand ...

2. ... lowers output in the short run ...

3. ... but in the long run affects only the price level.
1. A rise in aggregate demand ...

2. ... raises output in the short run ...

3. ... but in the long run affects only the price level.
Aggregate Supply Shocks

- Classicals view aggregate supply shocks as the main cause of fluctuations in output.
- An aggregate supply shock is a shift of the SRAS or LRAS curve.
- Factors that cause aggregate supply shocks are things like changes in productivity or labor supply.
1. An adverse supply shock shifts the short-run aggregate supply curve upward, ...

2. ... which causes the price level to rise ...

3. ... and output to fall.