Chapter 8

Business Cycles
Chapter Outline

• What is a Business Cycle?
• The American Business Cycle: The Historical Record
• Business Cycle Facts
• Business Cycle Analysis: A Preview
What Is a Business Cycle?

• 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 studies
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 and contractions
  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
What Is a Business Cycle?

• Expansions and contractions
  – Aggregate economic activity declines in a *contraction* or *recession* until it reaches a *trough* (Fig. 8.1)
Figure 8.1 A business cycle
What Is a Business Cycle?

• Expansions and contractions
  – After a trough, activity increases in an expansion or boom until it reaches a peak
  – 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
  – Peaks and troughs are turning points
  – Turning points are officially designated by the NBER Business Cycle Dating Committee
What Is a Business Cycle?

- The business cycle is recurrent, but not periodic
  - Recurrent means the pattern of contraction–trough–expansion–peak occurs again and again
  - Not being periodic means that it doesn't occur at regular, predictable intervals
What Is a Business Cycle?

• The business cycle is persistent
  – Declines are followed by further declines; growth is followed by more growth
  – Because of persistence, forecasting turning points is quite important
What Is a Business Cycle?

- 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)
- Why? Data revisions; need to be sure of turning point, not temporary movement
What Is a Business Cycle?

For latest cycle determination, go to http://www.nber.org/cycles/cyclesmain.html
Table 8.1 NBER Business Cycle Turning Points and Durations of Post–1854 Business Cycles

<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>
</tr>
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<tbody>
<tr>
<td>Dec. 1854</td>
<td>30</td>
<td>June 1857</td>
<td>18</td>
</tr>
<tr>
<td>Dec. 1858</td>
<td>22</td>
<td>Oct. 1860</td>
<td>8</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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<tr>
<td>Dec. 1867</td>
<td>18</td>
<td>June 1869</td>
<td>16</td>
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<tr>
<td>Dec. 1870</td>
<td>34</td>
<td>Oct. 1873</td>
<td>65</td>
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<tr>
<td>Mar. 1879</td>
<td>36</td>
<td>Mar. 1882</td>
<td>36</td>
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<tr>
<td>May 1885</td>
<td>22</td>
<td>Mar. 1887</td>
<td>13</td>
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<tr>
<td>Apr. 1888</td>
<td>27</td>
<td>July 1890</td>
<td>10</td>
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<tr>
<td>May 1891</td>
<td>20</td>
<td>Jan. 1893</td>
<td>17</td>
</tr>
<tr>
<td>June 1894</td>
<td>18</td>
<td>Dec. 1895</td>
<td>18</td>
</tr>
<tr>
<td>June 1897</td>
<td>24</td>
<td>June 1899</td>
<td>16</td>
</tr>
<tr>
<td>Dec. 1900</td>
<td>21</td>
<td>Sept. 1902</td>
<td>23</td>
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<tr>
<td>Aug. 1904</td>
<td>33</td>
<td>May 1907</td>
<td>13</td>
</tr>
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<td>June 1908</td>
<td>19</td>
<td>Jan. 1910</td>
<td>24</td>
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<tr>
<td>Jan. 1912</td>
<td>12</td>
<td>Jan. 1913</td>
<td>23</td>
</tr>
<tr>
<td>Dec. 1914</td>
<td>44 (WWI)</td>
<td>Aug. 1918</td>
<td>7</td>
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<td>Mar. 1919</td>
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<td>Jan. 1920</td>
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<td>22</td>
<td>May 1923</td>
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<td>July 1924</td>
<td>27</td>
<td>Oct. 1926</td>
<td>13</td>
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<tr>
<td>Nov. 1927</td>
<td>21</td>
<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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<tr>
<td>June 1938</td>
<td>80 (WWII)</td>
<td>Feb. 1945</td>
<td>8</td>
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<td>Oct. 1945</td>
<td>37</td>
<td>Nov. 1948</td>
<td>11</td>
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<tr>
<td>Oct. 1949</td>
<td>45 (Korean War)</td>
<td>July 1953</td>
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<tr>
<td>May 1954</td>
<td>39</td>
<td>Aug. 1957</td>
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<tr>
<td>Apr. 1958</td>
<td>24</td>
<td>Apr. 1960</td>
<td>10</td>
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<tr>
<td>Nov. 1970</td>
<td>36</td>
<td>Nov. 1973</td>
<td>16</td>
</tr>
<tr>
<td>July 1980</td>
<td>12</td>
<td>July 1981</td>
<td>16</td>
</tr>
<tr>
<td>Nov. 1982</td>
<td>92</td>
<td>July 1990</td>
<td>8</td>
</tr>
<tr>
<td>Mar. 1991</td>
<td>120</td>
<td>Mar. 2001</td>
<td>8</td>
</tr>
<tr>
<td>Nov. 2001</td>
<td></td>
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</tr>
</tbody>
</table>

What Is a Business Cycle?

- Should we even care about the business cycle?
- Robert Lucas (University of Chicago): NO
What Is a Business Cycle?

- In *Models of Business Cycles*, Lucas says:
  - Cost of business cycle instability since World War II is very low
  - The cost is one-fifth the cost of having an inflation rate of 10%
  - So if faced with the choice of eliminating all recessions and having a 10% inflation rate, or having recessions the size we've had since 1945 and having no inflation at all, Lucas argues we should take the latter
  - He suggests that we should move toward a microeconomic view of the business cycle
The American Business Cycle: The Historical Record

- Pre–World War I period
- Recessions were common from 1865 to 1917
  - 338 months of contraction and 382 months of expansion [compared with 518 months of expansion and 96 months of contraction from 1945 to 1996]
  - Longest contraction on record was 65 months, from October 1873 to March 1879
The American Business Cycle: The Historical Record

• 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 American Business Cycle: The Historical Record

- The Great Depression and World War II
  - There were really two business cycles in the Great Depression
    - A contraction from August 1929 to March 1933, followed by an expansion that peaked in May 1937
    - 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 American Business Cycle: The Historical Record

• The Great Depression and World War II
  – 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
The American Business Cycle: The Historical Record

- 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 caused a sharp recession, with real GDP declining 3%, the unemployment rate rising to 9%, and inflation rising to over 10%
The American Business Cycle: The Historical Record

- 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
The American Business Cycle: The Historical Record

• The "long boom"
  – From 1982 to the present, 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
The American Business Cycle: The Historical Record

- 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
  - Romer's 1986 article 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:
The Historical Record

• Have American business cycles become less severe?
  – New research has focused on the reasons for the decline in the volatility of U.S. output
    • Stock and Watson’s research showed that the decline came from a sharp drop in volatility around 1984 for many economic variables; dubbed the Great Moderation
    • They found that the change from manufacturing to services was not a major cause of the reduction in volatility
The American Business Cycle: The Historical Record

- Have American business cycles become less severe?
  - Stock and Watson showed that evidence that changes in how firms managed their inventories, which some researchers thought was the main source of the drop in volatility, was sensitive to the empirical method used, and thus not a convincing explanation.
  - Improvements in housing markets may have contributed to the decline in volatility, but cannot explain the sudden drop in volatility, as those changes occurred gradually over time.
  - Reduced volatility in oil prices was also not an important factor in reducing the volatility of output.
The American Business Cycle: The Historical Record

• Have American business cycles become less severe?
  – After showing that many theories for the reduced volatility in output were not convincing, Stock and Watson found no factors that were convincing

• The reduction in output’s volatility remains unexplained—some unknown form of good luck in terms of smaller shocks to the economy
Business Cycle Facts

• All business cycles have features in common
  – The cyclical behavior of economic variables—direction and timing
    • 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
Business Cycle Facts

• All business cycles have features in common
  – The cyclical behavior of economic variables—direction and timing
    • What is the *timing* of a variable's movements relative to aggregate economic activity?
      – *Leading*: in advance
      – *Coincident*: at the same time
      – *Lagging*: after
Business Cycle Facts

- In touch with the macroeconomy—leading indicators
  - Leading indicators are designed to help predict peaks and troughs
  - The first index was developed by Mitchell and Burns of the NBER in 1938, was later produced by the U.S. Commerce Department, and now is run by the Conference Board
  - A decline in the index for two or three months in a row warns of recession danger
Business Cycle Facts

• Problems with the leading indicators
  – 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
Business Cycle Facts

• Problems with the leading indicators
  – Research by Diebold and Rudebusch showed that the index does not help forecast industrial production in real time
  – In real time, the index sometimes gave no warning of recessions
Business Cycle Facts

- Problems with the leading indicators
  - Stock and Watson attempted to improve the index by creating some new indexes based on newer statistical methods
    - But the results were disappointing as the new index failed to predict the recessions that began in 1990 and 2001
    - They gave up the indexes after that
  - Because recessions may be caused by sudden shocks, the search for a good index of leading indicators may be fruitless
Business Cycle Facts

- Cyclical behavior of key macroeconomic variables
  - Procyclical
    - Coincident: industrial production, consumption, business fixed investment, employment
    - Leading: residential investment, inventory investment, average labor productivity, money growth, stock prices
    - Lagging: inflation, nominal interest rates
    - Timing not designated: government purchases, real wage
## The Cyclic Behavior of Key Macroeconomic Variables (The Business Cycle Facts)

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

*Timing is not designated by The Conference Board.

{Designated as "unclassified" by The Conference Board.

**Source:** Business Cycle Indicators, April 2003. Industrial production: series 47 (industrial production); consumption: series 57 (manufacturing and trade sales, constant dollars); business fixed investment: series 86 (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 (civilians unemployed rate); money supply: series 106 (money supply M2, constant dollars); inflation: series 120 (CPI for services, change over six-month span); stock prices: series 16 (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).
**Figure 8.2** Cyclical behavior of the index of industrial production
Figure 8.3 Cyclical behavior of consumption and investment
Figure 8.4 Cyclical behavior of civilian employment
Figure 8.5 Cyclical behavior of the unemployment rate
Figure 8.6 Cyclical behavior of average labor productivity and the real wage
Figure 8.7 Cyclical behavior of nominal money growth and inflation
Figure 8.8 Cyclical behavior of the nominal interest rate
Business Cycle Facts

• Cyclical behavior of key macroeconomic variables
  – Countercyclical: unemployment (timing is unclassified)
  – Acyclical: real interest rates (timing is not designated)
  – Volatility: durable goods production is more volatile than nondurable goods and services;
Business Cycle Facts

- Cyclical behavior of key macroeconomic variables
  - Volatility
    - Durable goods production is more volatile than nondurable goods and services
    - Investment spending is more volatile than consumption
Business Cycle Facts

• 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
  – Fig. 8.9 illustrates common cycles for Japan, Canada, the United States, France, Germany, and the United Kingdom
  – In addition, each economy faces small fluctuations that aren't shared with other countries
Figure 8.9 Industrial production indexes in six major countries
Business Cycle Facts

• Box 8.1: the seasonal cycle and the business cycle
  – Output varies over the seasons: highest in the fourth quarter, lowest in the first quarter
  – Most economic data are seasonally adjusted to remove regular seasonal movements
  – Barsky and Miron's 1989 study shows that the movements of variables across the seasons are similar to the movements of variables over the business cycle
Business Cycle Facts

- **Box 8.1: the seasonal cycle and the business cycle**
  - A surprising discovery by Barsky and Miron: there is little production smoothing
  - Economic theory suggests that even if demand changes over the seasons, production needn't
  - Firms could instead produce steadily through the year, building up inventories of goods in the first three quarters of the year and selling them off in the fourth quarter
  - But Barsky and Miron find that this doesn't happen; production and sales tend to move together
Business Cycle Facts

• Box 8.1: the seasonal cycle and the business cycle
  – If the seasonal cycle is like the business cycle, and the seasonal cycle represents desirable responses to various factors (Christmas, the weather) for which government intervention is inappropriate, should government intervention be used to smooth out the business cycle?
Business Cycle Facts

• Box 8.1: the seasonal cycle and the business cycle
  – Some economists challenge the need for the Fed to change the money supply over the seasons
  – If the Fed did not increase the money supply in the fall, for example, the seasonal demand for currency due to holiday shopping would cause interest rates to rise
  – Some economists see the rise in interest rates as a natural phenomenon that the Fed should not prevent
  – But the case for seasonal monetary policy is based on preventing bank panics (as occurred frequently from 1890 to 1910) and reducing transactions costs (which arise because people expend effort to reduce money balances when interest rates rise)
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
  – Study both theories in aggregate demand-aggregate supply (AD-AS) framework
Business Cycle Analysis

• Aggregate demand and aggregate supply: a brief introduction
  – The model (along with the building block IS-LM model) will be developed in chapters 9-11
  – The model has 3 main components; all plotted in \((P, Y)\) space
    • aggregate demand curve
    • short-run aggregate supply curve
    • long-run aggregate supply curve
Business Cycle Analysis

• Aggregate demand and aggregate supply: a brief introduction
  – Aggregate demand curve
    • 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; reasons why discussed in chapter 9
Business Cycle Analysis

• Aggregate demand and aggregate supply: a brief introduction
  – Aggregate demand curve
    • An increase in aggregate demand for a given $P$ shifts the aggregate demand curve up and to the right; and vice-versa
      – Example: a rise in the stock market increases consumption, shifting the aggregate demand curve up and to the right
      – Example: a decline in government purchases shifts the aggregate demand curve down and to the left
Business Cycle Analysis

• Aggregate demand and aggregate supply: a brief introduction
  – Aggregate supply curve
    • The aggregate supply curve shows how much output producers are willing to supply at any given price level
    • The short-run aggregate supply curve is horizontal; prices are fixed in the short run
Business Cycle Analysis

• Aggregate demand and aggregate supply: a brief introduction
  – Aggregate supply curve
    • The long-run aggregate supply curve is vertical at the full-employment level of output
    • Equilibrium
      – 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
Figure 8.10 The aggregate demand–aggregate supply model
Business Cycle Analysis

• Aggregate demand shocks
  – An aggregate demand shock is a change that shifts the aggregate demand curve
  – Example: a negative aggregate demand shock (like text Fig. 8.11)
    • The aggregate demand curve shifts down and to the left
    • Short-run equilibrium occurs where the aggregate demand curve intersects the short-run aggregate supply curve; output falls, price level is unchanged
    • Long-run equilibrium occurs where the aggregate demand curve intersects the long-run aggregate supply curve; output returns to its original level, price level has fallen
Figure 8.11 An adverse aggregate demand shock
Business Cycle Analysis

• 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
      – So the government can fight recessions by taking action to shift the aggregate demand curve
Business Cycle Analysis

- Aggregate supply shocks
  - Classical view aggregate supply shocks as the main cause of fluctuations in output
  - An aggregate supply shock is a shift of the long-run aggregate supply curve
  - Factors that cause aggregate supply shocks are things like changes in productivity or labor supply
Business Cycle Analysis

• Aggregate supply shocks
  – Example: a negative aggregate supply shock (like text Fig. 8.12)
    • Aggregate supply shock reduces full-employment output, causing long-run aggregate supply curve to shift left
    • New equilibrium has lower output and higher price level
    • So recession is accompanied by higher price level
  – Keynesians also recognize the importance of supply shocks; their views are discussed further in chapter 11
Figure 8.12 An adverse aggregate supply shock

[Diagram showing the impact of an adverse aggregate supply shock on the economy, with LRAS1 and LRAS2 representing different levels of long-run aggregate supply.]