· Growth is about the long run.
· Now we return to the short run and the study of business cycles.
· The central framework is the aggregate demand - aggregate supply (or AD-AS) model.
(aggregate price level)

\[ P \]

\[ Y_p \]

("potential output")

\[ AD \]

\[ Y \]

(aggregate output, or GDP)

\[ AS \] (in the long run)

\[ AS \] (in the short run)
• Growth is mainly about how potential output changes through increases in an economy's productive capacity.

• In the long run, shifts in the AD curve change the price level but not output.

• In the short run, shifts in the AD curve move the price level and output (and in the same direction).
• These short-run movements in output are driven mainly by movements in employment (and especially movements in the unemployment rate).

• Before studying what underlies these short-run movements, let’s look at the data on employment more carefully...
Table 3.4 Employment Status of the U.S. Adult Population, February 2003

<table>
<thead>
<tr>
<th>Category</th>
<th>Number (millions)</th>
<th>Share of labor force (percent)</th>
<th>Share of adult population (percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employed workers</td>
<td>137.4</td>
<td>94.2</td>
<td>62.4 (employment ratio)</td>
</tr>
<tr>
<td>Unemployed workers</td>
<td>8.5</td>
<td>5.8</td>
<td>3.9 (unemployment rate)</td>
</tr>
<tr>
<td>Labor force (employed + unemployed workers)</td>
<td>145.9</td>
<td>100.0</td>
<td>66.3 (participation rate)</td>
</tr>
<tr>
<td>Not in labor force</td>
<td>74.3</td>
<td></td>
<td>33.7</td>
</tr>
<tr>
<td>Adult population</td>
<td>220.2</td>
<td></td>
<td>100.0</td>
</tr>
</tbody>
</table>

*Note: Figures may not add up because of rounding.*

*Source: The Employment Situation, February 2003, Table A.*
Figure 3.15 Changes in employment status in a typical month

- **NOT IN LABOR FORCE**: 74.3 million
- **UNEMPLOYED**: 8.5 million
- **EMPLOYED**: 137.4 million

Flow rates:
- 2% from NOT IN LABOR FORCE to UNEMPLOYED
- 13% from NOT IN LABOR FORCE to EMPLOYED
- 2% from UNEMPLOYED to NOT IN LABOR FORCE
- 1% from UNEMPLOYED to EMPLOYED
- 3% from EMPLOYED to NOT IN LABOR FORCE
- 22% from EMPLOYED to UNEMPLOYED
<table>
<thead>
<tr>
<th>Age</th>
<th>White</th>
<th>Black</th>
</tr>
</thead>
<tbody>
<tr>
<td>16–17</td>
<td>15.2</td>
<td>31.1</td>
</tr>
<tr>
<td>18–19</td>
<td>11.1</td>
<td>27.8</td>
</tr>
<tr>
<td>20–24</td>
<td>6.9</td>
<td>16.2</td>
</tr>
<tr>
<td>25–34</td>
<td>4.1</td>
<td>8.1</td>
</tr>
<tr>
<td>35–44</td>
<td>3.2</td>
<td>6.4</td>
</tr>
<tr>
<td>45–54</td>
<td>2.8</td>
<td>4.8</td>
</tr>
<tr>
<td>55–64</td>
<td>2.9</td>
<td>3.9</td>
</tr>
<tr>
<td>65–69</td>
<td>2.9</td>
<td>4.8</td>
</tr>
<tr>
<td>70–74</td>
<td>2.8</td>
<td>3.1</td>
</tr>
<tr>
<td>Over 75</td>
<td>2.8</td>
<td>3.3</td>
</tr>
</tbody>
</table>

TABLE 31-4. Unemployment Rates at Different Ages, 2001
Figure 1.1 Output of the U.S. economy, 1869–2002

[Graph showing the output of the U.S. economy from 1869 to 2002, with key events such as World War II, the Great Depression, World War I, and economic recessions labeled.]
Figure 1.3  The U.S. unemployment rate, 1890–2002
Figure 8.1  A business cycle

![Diagram of a business cycle with phases of expansion and contraction.](image-url)
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>
</thead>
<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>
</tr>
<tr>
<td>June 1861</td>
<td>46 (Civil War)</td>
<td>Apr. 1865</td>
<td>32</td>
</tr>
<tr>
<td>Dec. 1867</td>
<td>18</td>
<td>June 1869</td>
<td>18</td>
</tr>
<tr>
<td>Dec. 1870</td>
<td>34</td>
<td>Oct. 1873</td>
<td>65</td>
</tr>
<tr>
<td>Mar. 1879</td>
<td>36</td>
<td>Mar. 1882</td>
<td>38</td>
</tr>
<tr>
<td>May 1885</td>
<td>22</td>
<td>Mar. 1887</td>
<td>13</td>
</tr>
<tr>
<td>Apr. 1888</td>
<td>27</td>
<td>July 1890</td>
<td>10</td>
</tr>
<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>18</td>
</tr>
<tr>
<td>Dec. 1900</td>
<td>21</td>
<td>Sept. 1902</td>
<td>23</td>
</tr>
<tr>
<td>Aug. 1904</td>
<td>33</td>
<td>May 1907</td>
<td>13</td>
</tr>
<tr>
<td>June 1908</td>
<td>19</td>
<td>Jan. 1910</td>
<td>24</td>
</tr>
<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>
</tr>
<tr>
<td>Mar. 1919</td>
<td>10</td>
<td>Jan. 1920</td>
<td>18</td>
</tr>
<tr>
<td>July 1921</td>
<td>22</td>
<td>May 1923</td>
<td>14</td>
</tr>
<tr>
<td>July 1924</td>
<td>27</td>
<td>Oct. 1926</td>
<td>13</td>
</tr>
<tr>
<td>Nov. 1927</td>
<td>21</td>
<td>Aug. 1929</td>
<td>43 (Depression)</td>
</tr>
<tr>
<td>Mar. 1933</td>
<td>50</td>
<td>May 1937</td>
<td>13 (Depression)</td>
</tr>
<tr>
<td>June 1938</td>
<td>80 (WWII)</td>
<td>Feb. 1945</td>
<td>8</td>
</tr>
<tr>
<td>Oct. 1945</td>
<td>37</td>
<td>Nov. 1948</td>
<td>11</td>
</tr>
<tr>
<td>Oct. 1949</td>
<td>45 (Korean War)</td>
<td>July 1953</td>
<td>10</td>
</tr>
<tr>
<td>May 1954</td>
<td>39</td>
<td>Aug. 1957</td>
<td>8</td>
</tr>
<tr>
<td>Apr. 1958</td>
<td>24</td>
<td>Apr. 1960</td>
<td>10</td>
</tr>
<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>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 8.6  Cyclical behavior of civilian employment
Figure 8.7 Cyclical behavior of the unemployment rate
<table>
<thead>
<tr>
<th>Labor market group</th>
<th>Unemployment Rate of Different Groups (% of labor force)</th>
<th>Distribution of Total Unemployment across Different Groups (% of total unemployed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>By age:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16–19</td>
<td>23.2</td>
<td>13.3</td>
</tr>
<tr>
<td></td>
<td>18.5</td>
<td>20.2</td>
</tr>
<tr>
<td>20 years and older</td>
<td>8.6</td>
<td>3.3</td>
</tr>
<tr>
<td></td>
<td>81.5</td>
<td>80.0</td>
</tr>
<tr>
<td>By race:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>8.6</td>
<td>3.6</td>
</tr>
<tr>
<td></td>
<td>77.2</td>
<td>77.6</td>
</tr>
<tr>
<td>Black and other</td>
<td>17.3</td>
<td>7.3</td>
</tr>
<tr>
<td></td>
<td>22.8</td>
<td>22.4</td>
</tr>
<tr>
<td>By sex (adults only):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>8.8</td>
<td>3.8</td>
</tr>
<tr>
<td></td>
<td>58.5</td>
<td>50.5</td>
</tr>
<tr>
<td>Female</td>
<td>8.3</td>
<td>4.3</td>
</tr>
<tr>
<td></td>
<td>41.5</td>
<td>49.5</td>
</tr>
<tr>
<td>All workers</td>
<td>9.7</td>
<td>4.1</td>
</tr>
</tbody>
</table>

**TABLE 31-3. Unemployment by Demographic Group**
Figure 3.16  Okun’s law in the United States: 1951–2002

OKUN’S LAW:

\[
\frac{\Delta Y}{Y} = 3 - 2 \Delta u
\]
What Are the Sources of Unemployment?

1. Frictional unemployment: it takes time for workers and firms to find each other (there is a lot of churning in the labor market: every month, thousands of jobs are created and destroyed).

In addition, every month, thousands of workers enter the labor force for the first and thousands more leave it for the last time (retirement).

Search (of workers for firms and firms for workers) and matching (of workers and firms) is an imperfect process.
Figure 6.4
The Unemployment Rate and the Proportion of Unemployed Finding Jobs, 1968–1999

When unemployment is high, the proportion of unemployed finding jobs is low. Note that the scale on the right is an inverse scale.
Figure 6-5

The Unemployment Rate and the Monthly Separation Rate from Employment, 1968–1999

When unemployment is high, a higher proportion of workers lose their jobs.
2. Structural unemployment: wages do not adjust to clear the labor market

Why?
(a) Minimum wage laws (the “living” wage).
(b) Unions (wages set through bargaining).
(c) Efficiency wages (pay workers more than the market wage so they will exert more effort and be less likely to quit, thereby reducing turnover costs, i.e., costs of finding and training new workers).
A Non-Clearing Labor Market

( the real wage )

W/p

\( \overline{W}/p \)

excess supply of labor

Supply of labor by individuals

\( \bar{L} \)

\( L^* \)

Demand for labor by firms

L (labor supply and demand) measured in, say, hours of work

( the market-clearing real wage, at which supply of labor = demand for labor )