Technological Progress: The Short, the Medium, and the Long Run
Chapter 13
13-1 Productivity, Output, and Unemployment in the Short Run

\[ Y = AN \]  
\[ N = \frac{Y}{A} \]
13-1 Productivity, Output, and Unemployment in the Short Run

Figure 13-1  Aggregate Supply and Aggregate Demand for a Given Level of Productivity

Price level, $P$

Output, $Y$

Employment $N = Y/A$

$AS$ for a given level of $A$

$AD$ for a given level of $A$
13-1 Productivity, Output, and Unemployment in the Short Run

Figure 13-2 The Effects of an Increase in Productivity on Output in the Short Run
13-1 Productivity, Output, and Unemployment in the Short Run

Figure 13-3  Labor Productivity and Output Growth. United States, since 1960

Price setting \[ P = (1 + m) \frac{W}{A} \] (13.3)

Wage setting \[ W = A^e P^e F(u, z) \] (13.4)
13-2 Productivity and the Natural Rate of Unemployment

\[
\frac{W}{P} = \frac{A}{1 + m} \tag{13.5}
\]

\[
\frac{W}{P} = A F(u, z) \tag{13.6}
\]
13-2 Productivity and the Natural Rate of Unemployment

**Figure 13-4** The Effects of an Increase in Productivity on the Natural Rate of Unemployment
13-2 Productivity and the Natural Rate of Unemployment

Figure 13-5  Productivity Growth and Unemployment. Average by Decade, 1890–2009

Source: Data prior to 1950: Historical Statistics of the United States. Data after 1950: See Figure 13-3.
13-2 Productivity and the Natural Rate of Unemployment

Figure 13-6 The Effects of a Decrease in Productivity Growth on the Unemployment Rate When Expectations of Productivity Growth Adjust Slowly
Focus: Job Destruction, Churning, and Earnings Losses

Figure 1  Earnings Losses of Workers Who Experience a Mass Layoff

13-3 Technological Progress, Churning, and Distribution Effects

Figure 13-7  Evolution of Relative Wages, by Education Level, 1973–2007

Source: Economic Policy Institute
Datazone. www.epinet.org
13-4 Institutions, Technological Progress, and Growth

Figure 13-8 Protection from Expropriation and GDP per Person

Focus: The Importance of Institutions: North and South Korea

Figure 1  PPP GDP per Person, North and South Korea, 1950–1998

![Graph showing PPP GDP per person for North and South Korea from 1950 to 1998. The graph illustrates a much higher GDP per capita for South Korea compared to North Korea.](image)