The Medium Run

6-1 A Tour of the Labor Market

The **noninstitutional civilian population** are the number of people potentially available for civilian employment.

The civilian labor force is the sum of those either working or looking for work.

Those who are neither working nor looking for work are **out of the labor force**.

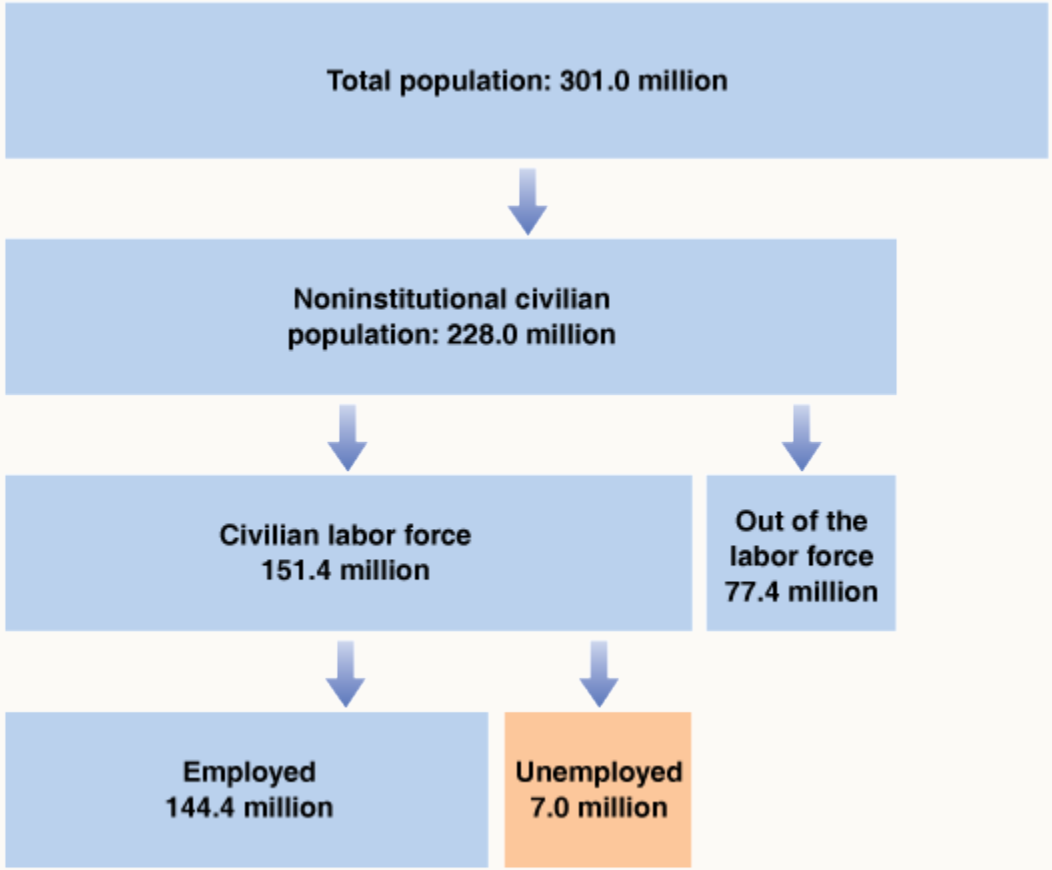
The **participation rate** is the ratio of the labor force to the noninstitutional civilian population.

The **unemployment rate** is the ratio of the unemployed to the labor force.

6-1 A Tour of the Labor Market

Figure 6 - 1

Population, Labor Force, Employment, and Unemployment in the United States (in millions), 2006



The Large Flows of Workers

An unemployment rate may reflect two very different realities.

It may reflect an active labor market, with many **separations** and many **hires**, or it may reflect a sclerotic labor market, with few separations, few hires, and a stagnant unemployment pool.

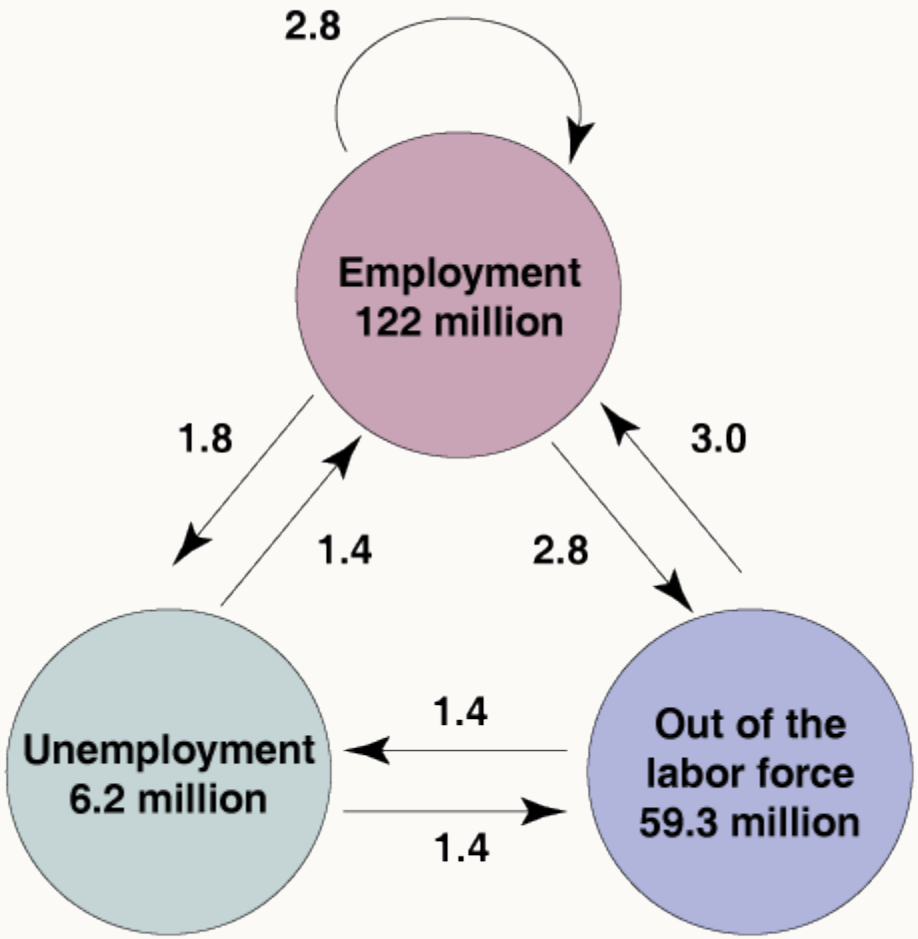
The **Current Population Survey (CPS)** produces employment data, including the movements of workers.

The Large Flows of Workers

Figure 6 - 2

Average Monthly Flows Between Employment, Unemployment, and Nonparticipation in the United States, 1996–2003

(1) The flows of workers in and out of employment are large. (2) The flows in and out of unemployment are large relative to the number of unemployed. (3) There are also large flows in and out of the labor force, much of it directly to and from employment.



The Large Flows of Workers

From the CPS data we conclude that:

- The flows of workers in and out of employment are large. Separations consist of: **Quits**, or workers leaving their jobs for a better alternative, and **layoffs**, which come from changes in employment levels across firms.

- The flows in and out of unemployment are large in relation to the number of unemployed. The average **duration of unemployment** is about three months.

- There are large flows in and out of the labor force, much of them directly to and from employment. **Discouraged workers** are classified as "out of the labor force" but they may take a job if they find it. The **non-employment rate** is the ration of population minus employment to population.

The Current Population Survey

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The Current Population Survey (CPS) is the main source of statistics on the labor force, employment, participation, and earnings in the United States.

Economists use these data, which are available in large computer files, in two ways:

- The first way economists use these data is to get snapshots of how things are at various points in time.
- The second way is to exploit the fact that the survey follows people through time.

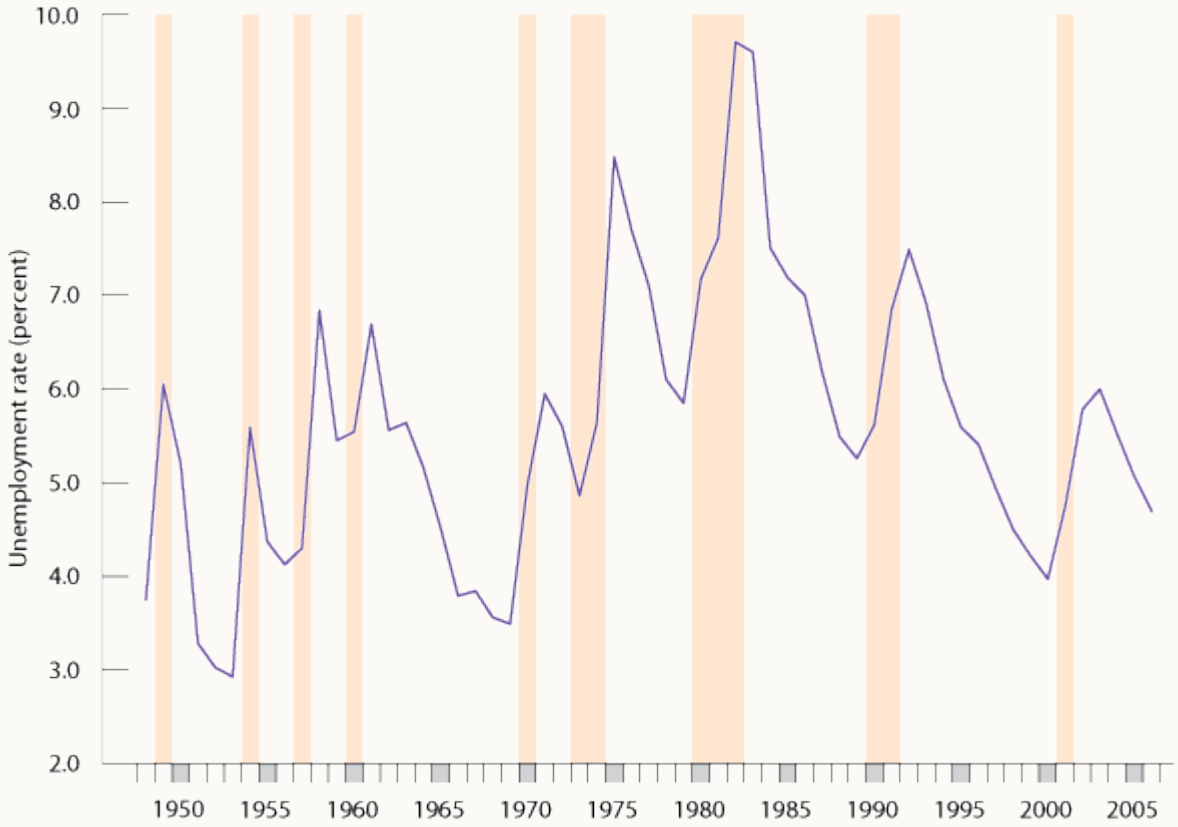
For more on the CPS, go to www.bls.gov/cps/

6-2 Movements in Unemployment

Figure 6 - 3

Movements in the U.S. Unemployment Rate Since 1948

Since 1948, the average yearly U.S. unemployment rate has fluctuated between 3% and 10%.



6-2 Movements in Unemployment

How fluctuations in the *aggregate unemployment rate* affect *individual workers* is important because the answer determines two effects:

- The effect of movements in the aggregate unemployment rate on the welfare of individual workers
- The effect of the aggregate unemployment rate on wages

There are implications for both employed and unemployed workers:

- If the adjustment takes place through fewer hires, the chance that an unemployed worker will find a job diminishes.
- If the adjustment takes place instead through higher layoffs, then employed workers are at a greater risk of losing their jobs.

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.

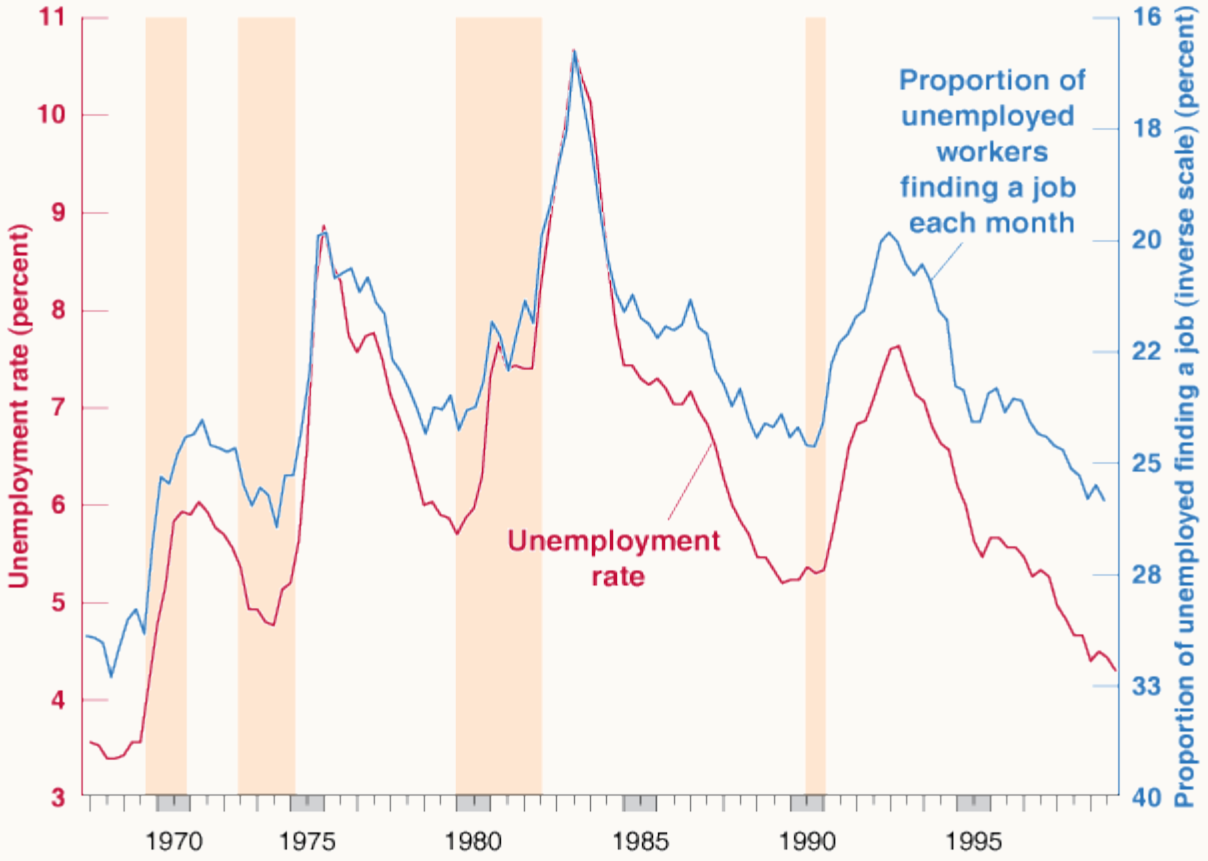
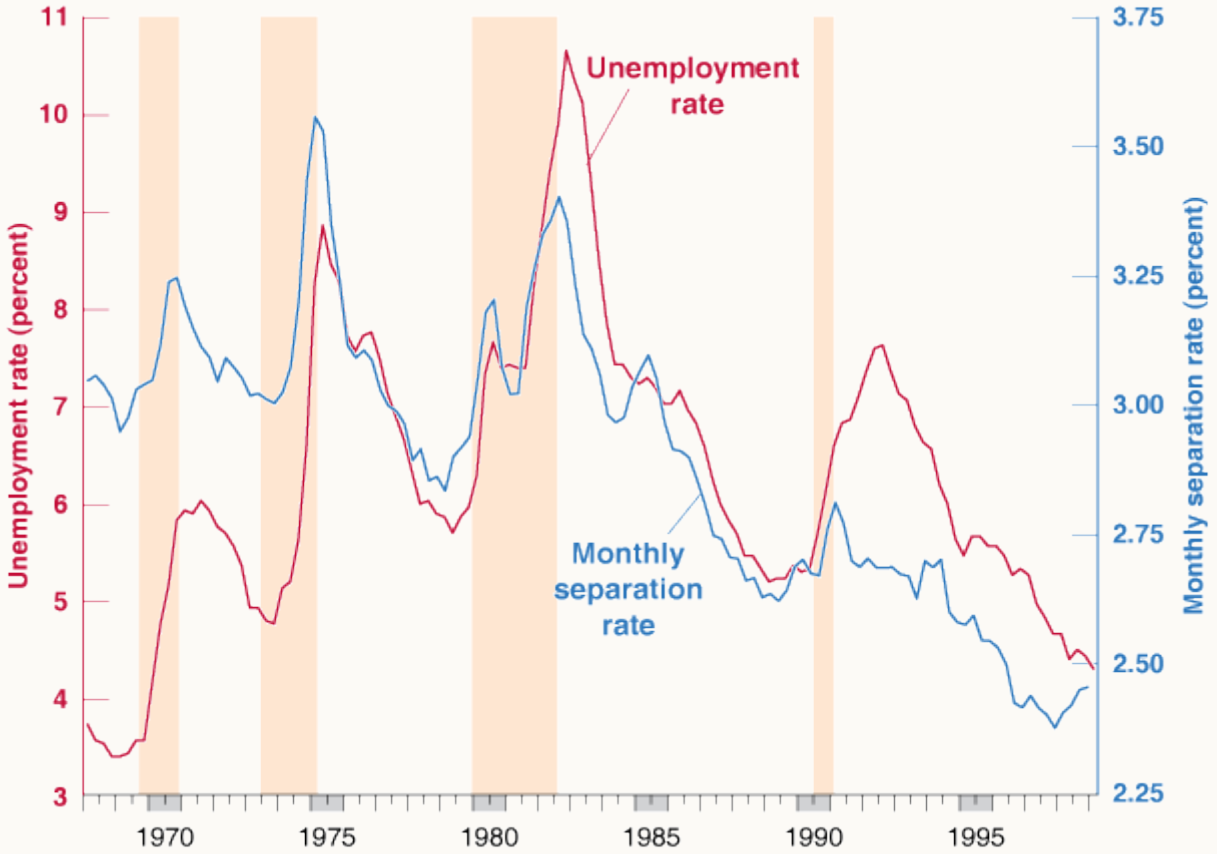


Figure 6 - 5

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

When unemployment is high, a higher proportion of workers lose their jobs.



6-2 Movements in Unemployment

When unemployment is high, workers are worse off in two ways:

- Employed workers face a higher probability of losing their jobs.
- Unemployed workers face a lower probability of finding a job; equivalently, they can expect to remain unemployed for a longer time.

6-3 Wage Determination

Collective bargaining is bargaining between firms and unions.

Common forces at work in the determination of wages include:

- Workers are typically paid a wage that exceeds their **reservation wage**, the wage that would make them indifferent between working or being unemployed.

- Wages typically depend on labor market conditions. The lower the unemployment rate, the higher the wages.

Bargaining

How much bargaining power a worker has depends on two factors.

- How costly it would be for the firm to replace him—the nature of the job.
- How hard it would be for him to find another job—labor market conditions.

Efficiency Wages

Economists call the theories that link the *productivity* or the *efficiency* of workers to the wage they are paid **efficiency wage theories**.

These theories also suggest that wages depend on both the nature of the job and on labor-market conditions:

- Firms that see employee morale and commitment as essential to the quality of their work, will pay more than firms in sectors where workers' activities are more routine.
- Labor market conditions will affect the wage.

Henry Ford and Efficiency Wages

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In 1914,Henry Ford decided his company would pay every qualified employee a minimum of $5 per day for an eight-hour day. While the effects support efficiency wage theories, Ford probably had other objectives as well for raising his wages.

Table 1 Annual Turnover and Layoff Rates (%) at Ford, 1913-1915

	1913	1914	1915
Turnover Rate	370	54	16
Layoff Rate	62	7	0.1

Wages, Prices, and Unemployment

$$W = P^e F(u, z)$$
$$(-,+)$$

The aggregate nominal wage, W, depends on three factors:

- The expected price level, P^e
- The unemployment rate, u
- A catchall variable, z, that stands for all other variables that may affect the outcome of wage setting.

Wages, Prices, and Unemployment

The Expected Price Level

Both workers and firms care about *real wages (W/P),* not nominal *wages (W).*

- Workers do not care about how many dollars they receive but about how many goods they can buy with those dollars. They care about *W/P*.
- Firms do not care about the nominal wages they pay but about the nominal wages, *W*, they pay relative to the price of the goods they sell, *P*. They also care about *W/P*.

Wages, Prices, and Unemployment

The Unemployment Rate

Also affecting the aggregate wage is the unemployment rate, *u*.

If we think of wages as being determined by bargaining, then higher unemployment weakens workers' bargaining power, forcing them to accept lower wages. Higher unemployment allows firms to pay lower wages and still keep workers willing to work.

Wages, Prices, and Unemployment

The Other Factors

The third variable, z, is a catchall variable that stands for all the factors that affect wages, given the expected price level and the unemployment rate.

Unemployment insurance is the payment of unemployment benefits to workers who lose their jobs.

6-4 Price Determination

The **production function** is the relation between the inputs used in production and the quantity of output produced.

Assuming that firms produce goods using only labor, the production function can be written as:

$$Y = AN$$

Y = output
N = employment
A = **labor productivity,** or output per worker

Further, assuming that one worker produces one unit of output—so that $A = 1$, then, the production function becomes:

$$Y = N$$

6-4 Price Determination

Firms set their price according to:

$$P = (1 + \mu)W$$

The term u is the **markup** of the price over the cost of production. If all markets were perfectly competitive, $\mu = 0$, and $P = W$.

6-5 The Natural Rate of Unemployment

In this section we will look at the implications of wage and price determination for unemployment.

Let's assume that nominal wages depend on the actual price level, P, rather than on the expected price level, P^e.

Wage setting and price setting determine the equilibrium rate of unemployment.

The Wage-Setting Relation

Since P^e equals P, then:

$$W = PF(u,z)$$

We can divide both sides by the price level:

$$\frac{W}{P} = \underset{(-,+)}{F(u,z)}$$

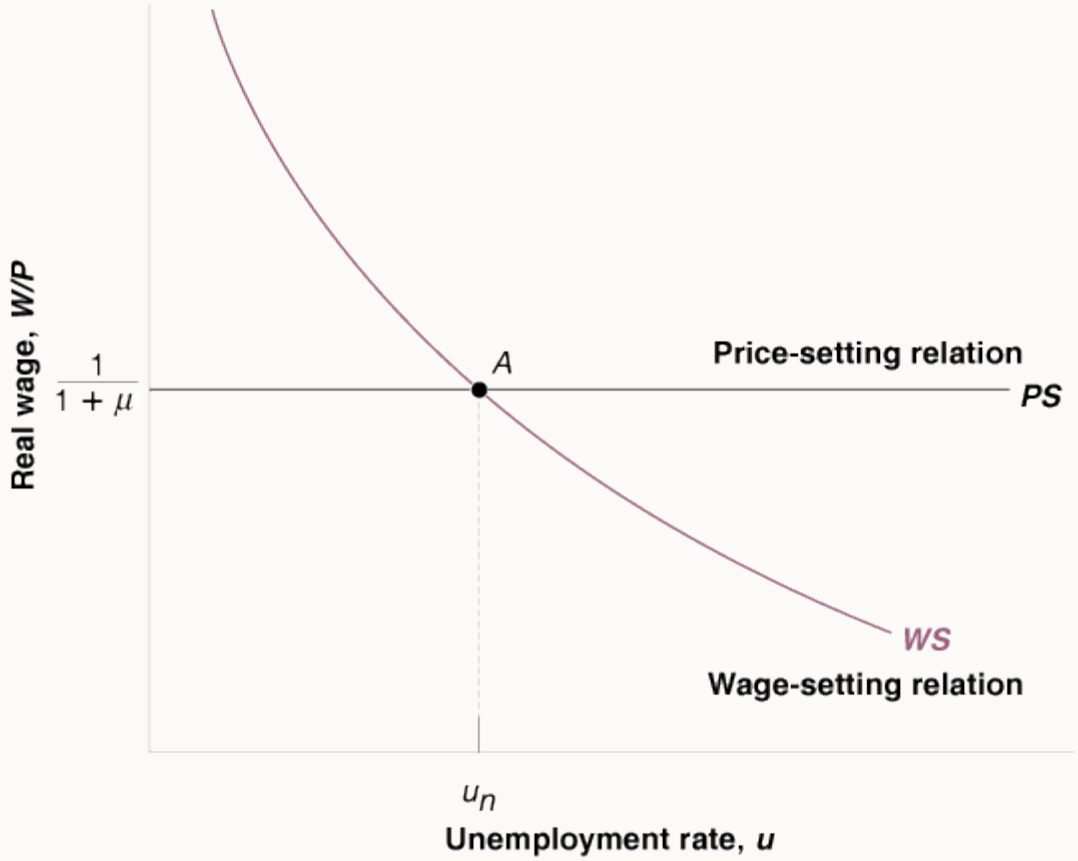
This relation between the real wage and the rate of unemployment—**wage-setting relation**.

The Wage-Setting Relation

Figure 6 - 6

Wages, Prices, and the Natural Rate of Unemployment

The natural rate of unemployment is the unemployment rate such that the real wage chosen in wage setting is equal to the real wage implied by price setting.



The Price-Setting Relation

The price-determination equation is:

$$P = (1 + \mu)W$$

If we divide both sides by W, we get:

$$\frac{P}{W} = (1 + \mu)$$

To state this equation in terms of the wage rate, we invert both sides:

$$\frac{W}{P} = \frac{1}{(1 + \mu)}$$

The price-setting relation

The Price-Setting Relation

The price-setting relation in equation (6.6) is drawn as the horizontal line PS (for price setting) in Figure 6-6.

The real wage implied by price setting is $1/(1 = \mu)$; it does not depend on the unemployment rate.

Equilibrium Real Wages and Unemployment

Eliminating *W/P* from the wage-setting and the price-setting relations, we can obtain the equilibrium unemployment rate, or natural rate of unemployment, u_n:

$$F(u_n, z) = \frac{1}{1+\mu}$$

The equilibrium unemployment rate (u_n) is called the **natural rate of unemployment**.

Equilibrium Real Wages and Unemployment

The positions of the wage-setting and price-setting curves, and thus the equilibrium unemployment rate, depend on both z and μ.

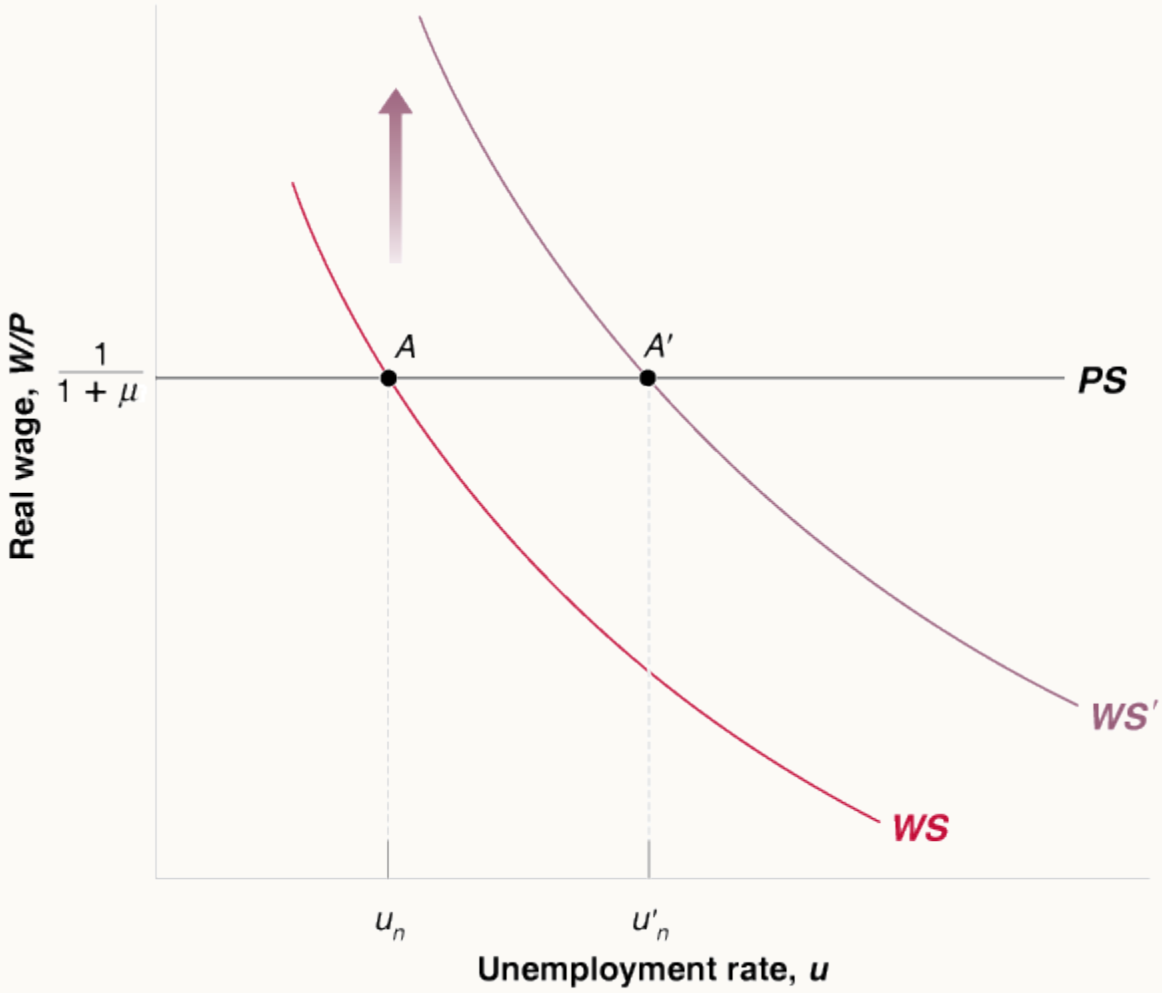
- At a given unemployment rate, higher unemployment benefits lead to a higher real wage. A higher unemployment rate is needed to bring the real wage back to what firms are willing to pay.
- By letting firms increase their prices given the wage, less stringent enforcement of antitrust legislation leads to a decrease in the real wage.

Equilibrium Real Wages and Unemployment

Figure 6 - 7

Unemployment Benefits and the Natural Rate of Unemployment

An increase in unemployment benefits leads to an increase in the natural rate of unemployment.

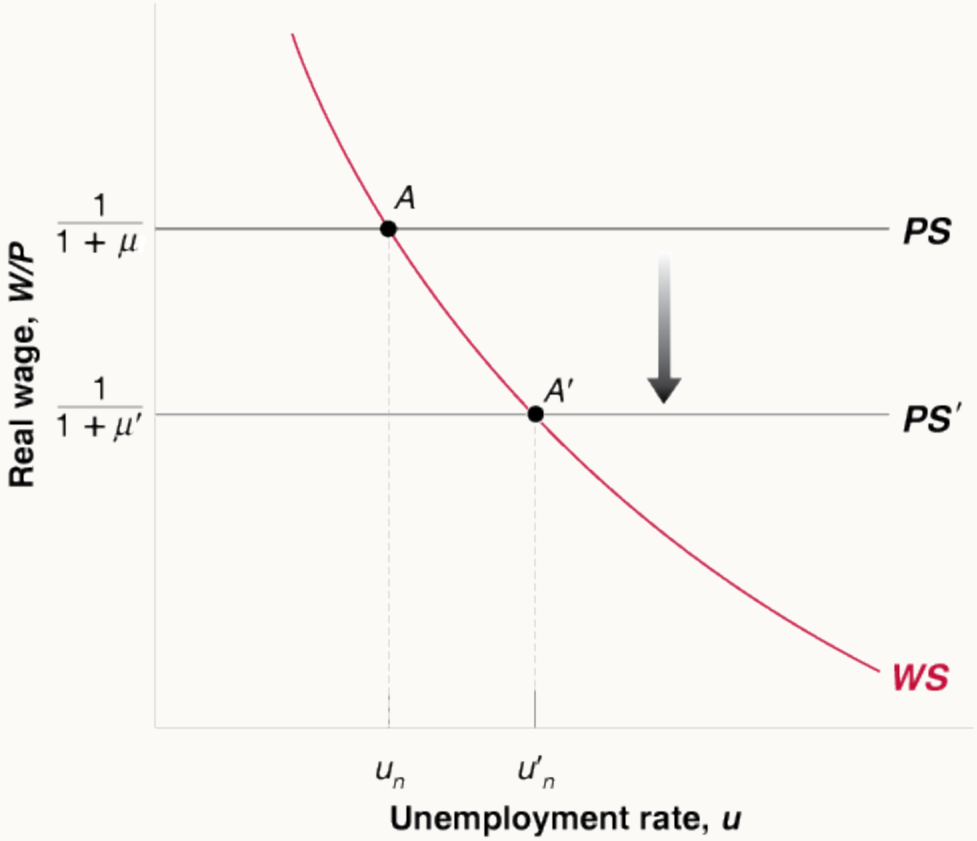


Equilibrium Real Wages and Unemployment

Figure 6 - 8

Markups and the Natural Rate of Unemployment

An increase in markups decreases the real wage and leads to an increase in the natural rate of unemployment.



Equilibrium Real Wages and Unemployment

Because the equilibrium rate of unemployment reflects the structure of the economy, a better name for the natural rate of unemployment is the **structural rate of unemployment**.

From Unemployment to Employment

Associated with the natural rate of unemployment is a **natural level of employment.**

$$u = \frac{U}{L} = \frac{L - N}{L} = 1 - \frac{N}{L}$$

Employment in terms of the labor force and the unemployment rate equals:

$$N = L(1 - u)$$

The natural level of employment, N_n, is given by:

$$N_n = L(1 - u_n)$$

From Employment to Output

Associated with the natural level of employment is the **natural level of output**, and since (Y=N):

$$Y_n = N_n = L(1 - u_n)$$

The natural level of output satisfies the following:

$$F\left(1 - \frac{Y_n}{L}, z\right) = \frac{1}{1 + \mu}$$

In words, the natural level of output is such that, at the associated rate of unemployment, $u_n = 1 - \frac{Y_n}{L}$, the real wage chosen in wage setting is equal to the real wage implied by price setting.

