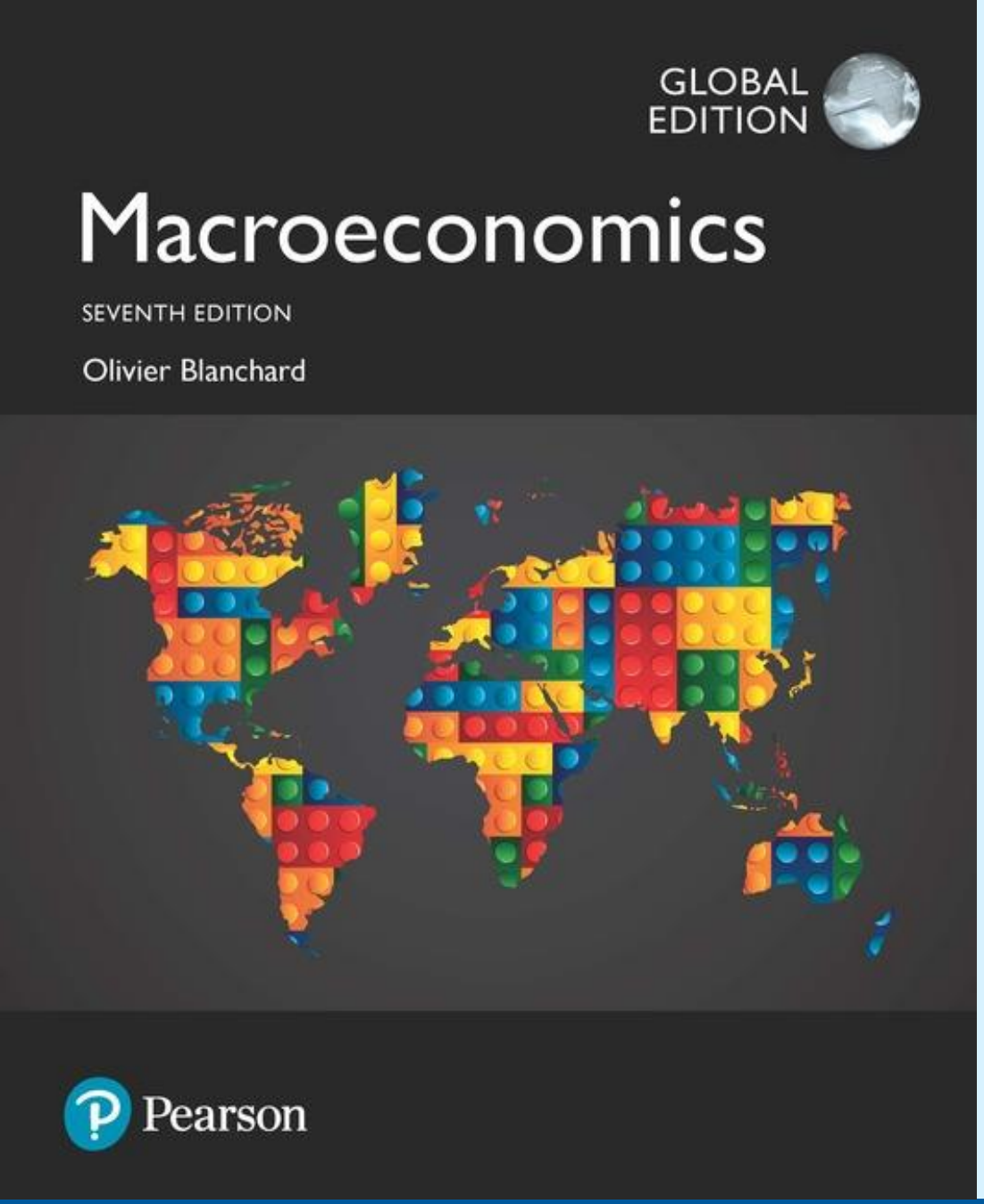


The Labor Market

Chapter 7

Chapter 7 Outline

The Labor Market

7-1	A Tour of the Labor Market
7-2	Movements in Unemployment
7-3	Wage Determination
7-4	Price Determination
7-5	The Natural Rate of Unemployment
7-6	Where We Go from Here
APPENDIX	Wage- and Price-Setting Relations versus Labor Supply and Labor Demand

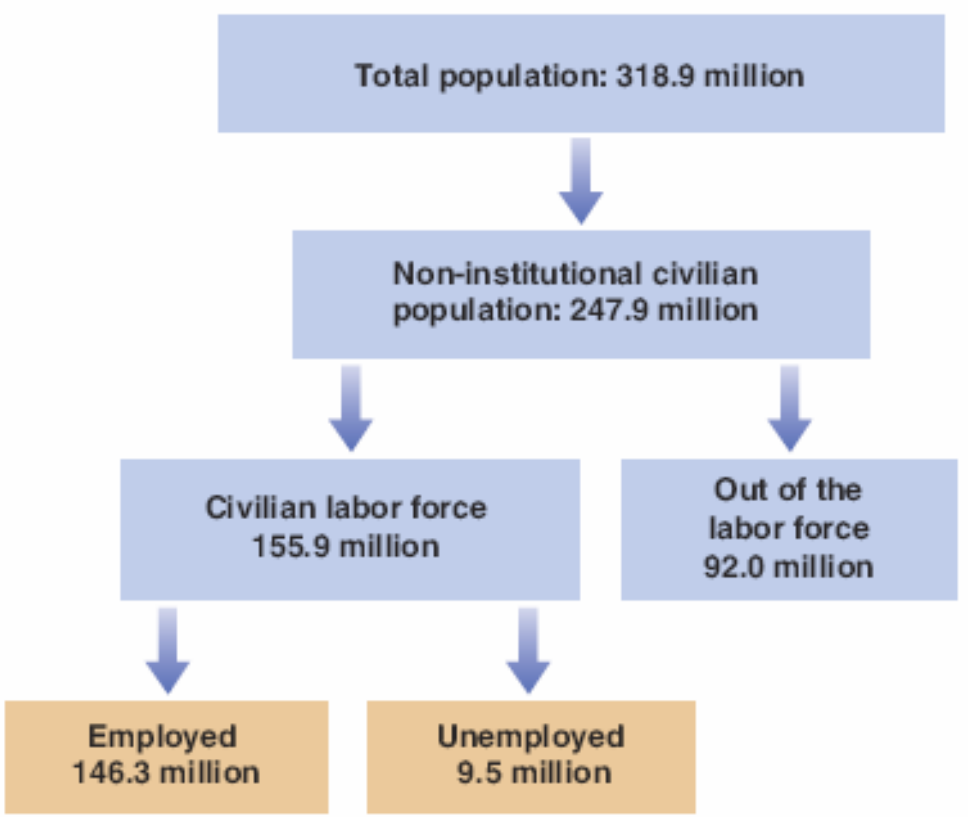
The Labor Market

- We have focused on the *short run* by assuming a constant price level in the IS-LM model.
- We now turn to the *medium run* and explore how prices and wages adjust over time, and how this in turn affects output.
- The *labor market* is the center of that sequence of events.

7-1 A Tour of the Labor Market

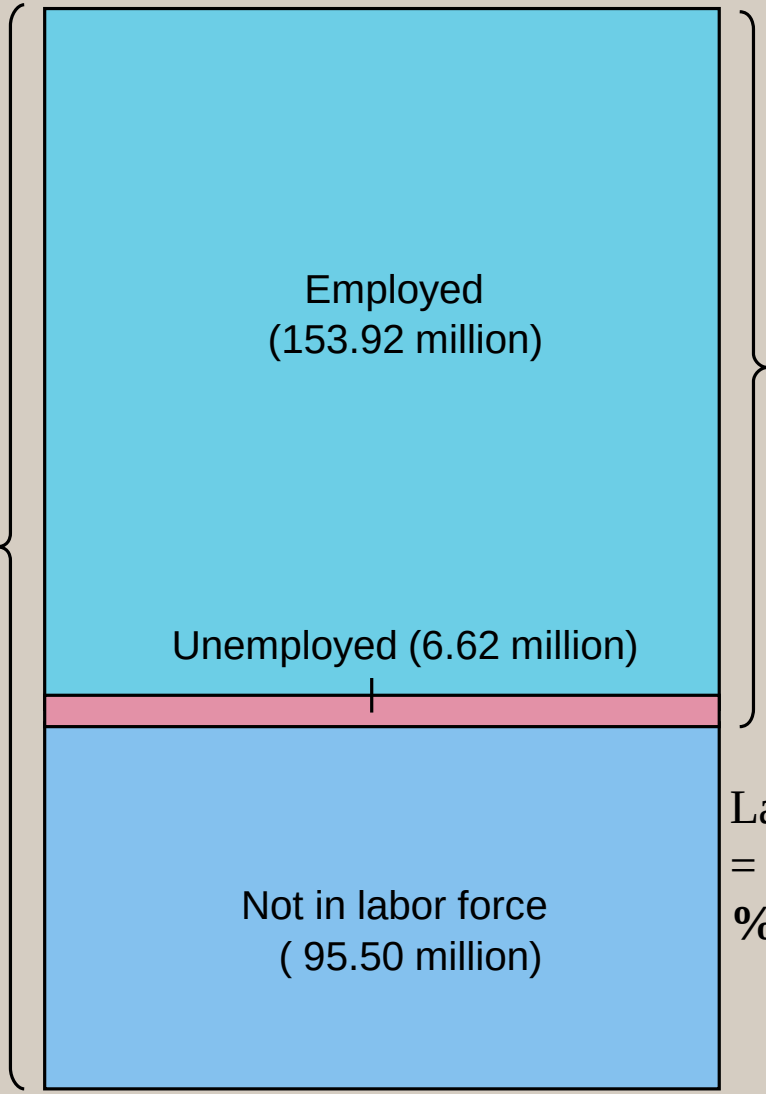
Figure 7-1 Population, Labor Force, Employment, and Unemployment in the United States (in millions), 2014

- The unemployment rate is the ratio of the unemployed to the labor force, was 9.5/155.9 = 6.1%.



Source: Current Population Survey http://www.bls.gov/cps/.

The Breakdown of the Population, in USA in 2017, November



Adult Population (256.03 million)

Labor Force (160.53 million)

Unemployment rate =6.62/ 160.53 x100= %4.12

Labor force participation rate = 160.53 /256.03 x100= **%62.70**

The Labor Market

U: unemployed (işsiz)

N: employed (istihdamda olanlar, çalışamlar)

L=U+N= Labor force (işgücü)

- **Unemployment rate (işsizlik oranı):** ratio of the unemployed to the labor force

$$\text{Unemployment rate} = \frac{\text{Number unemployed}}{\text{Labor force}} \times 100$$

u= U/L =(U /(U+N)) x 100 =(U/L) x 100

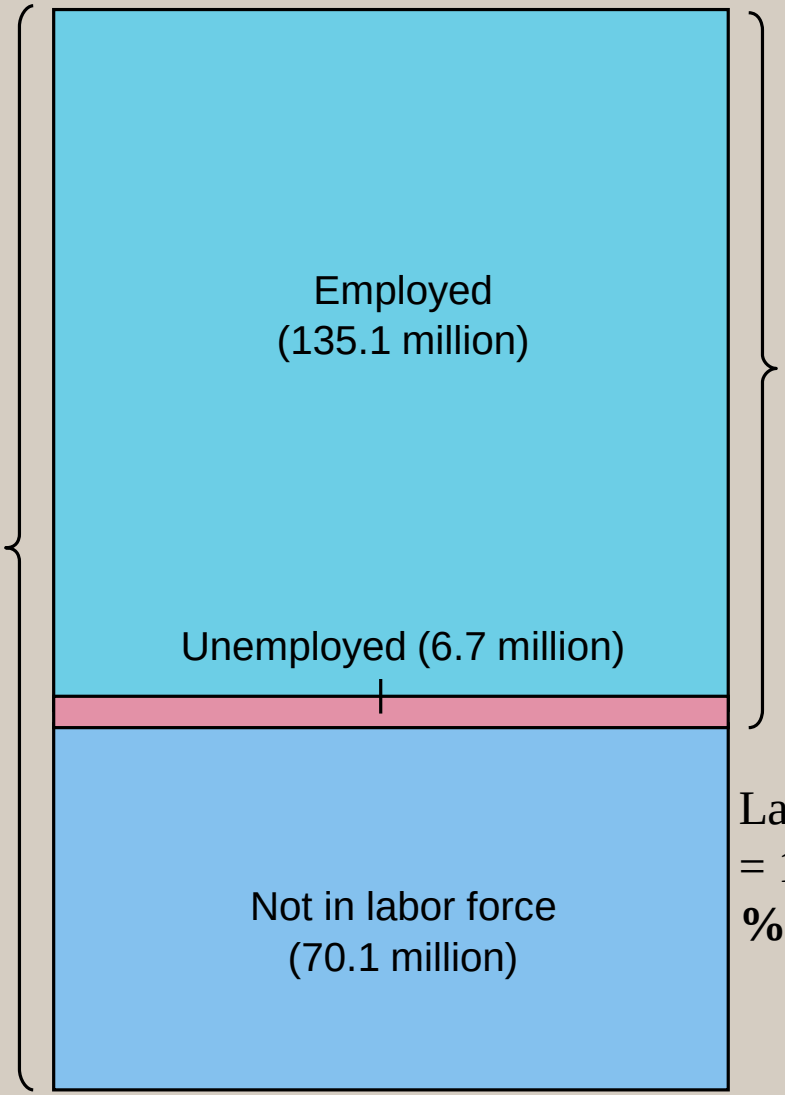
- **Employment rate:** ratio of the employed to the population available to work
- = (N/ working age population) x 100

- **labor-force participation rate :** percentage of the adult population that is in the labor force.

$$\text{Labor force participation rate} = \frac{\text{Labor force}}{\text{Adult population}} \times 100$$

- Because the higher the unemployment rate the higher the number of people out of the labor force, the lower the unemployment ate

The Breakdown of the Population in 2001 USA



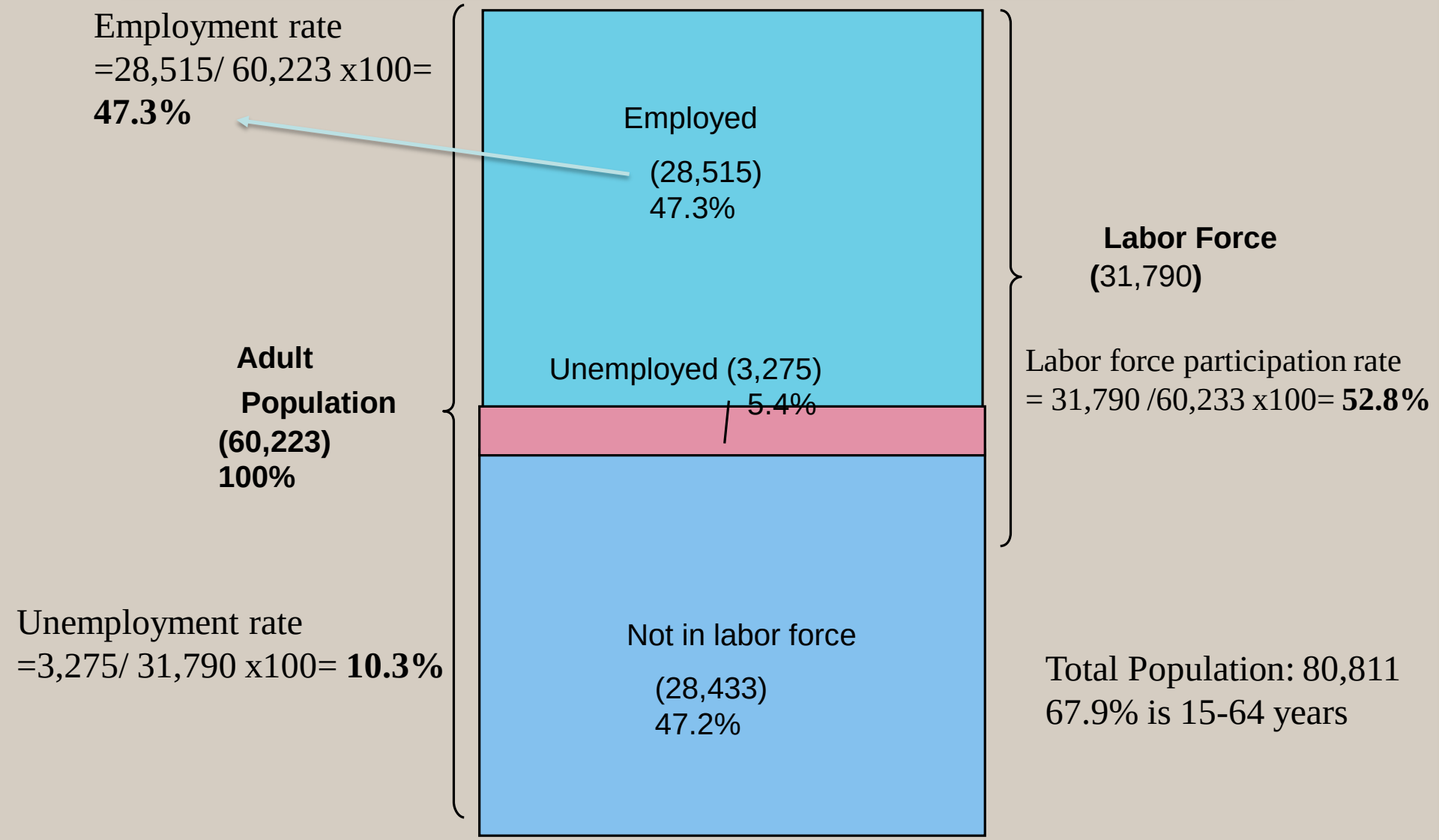
Adult Population (211.9 million)

Labor Force (141.8 million)

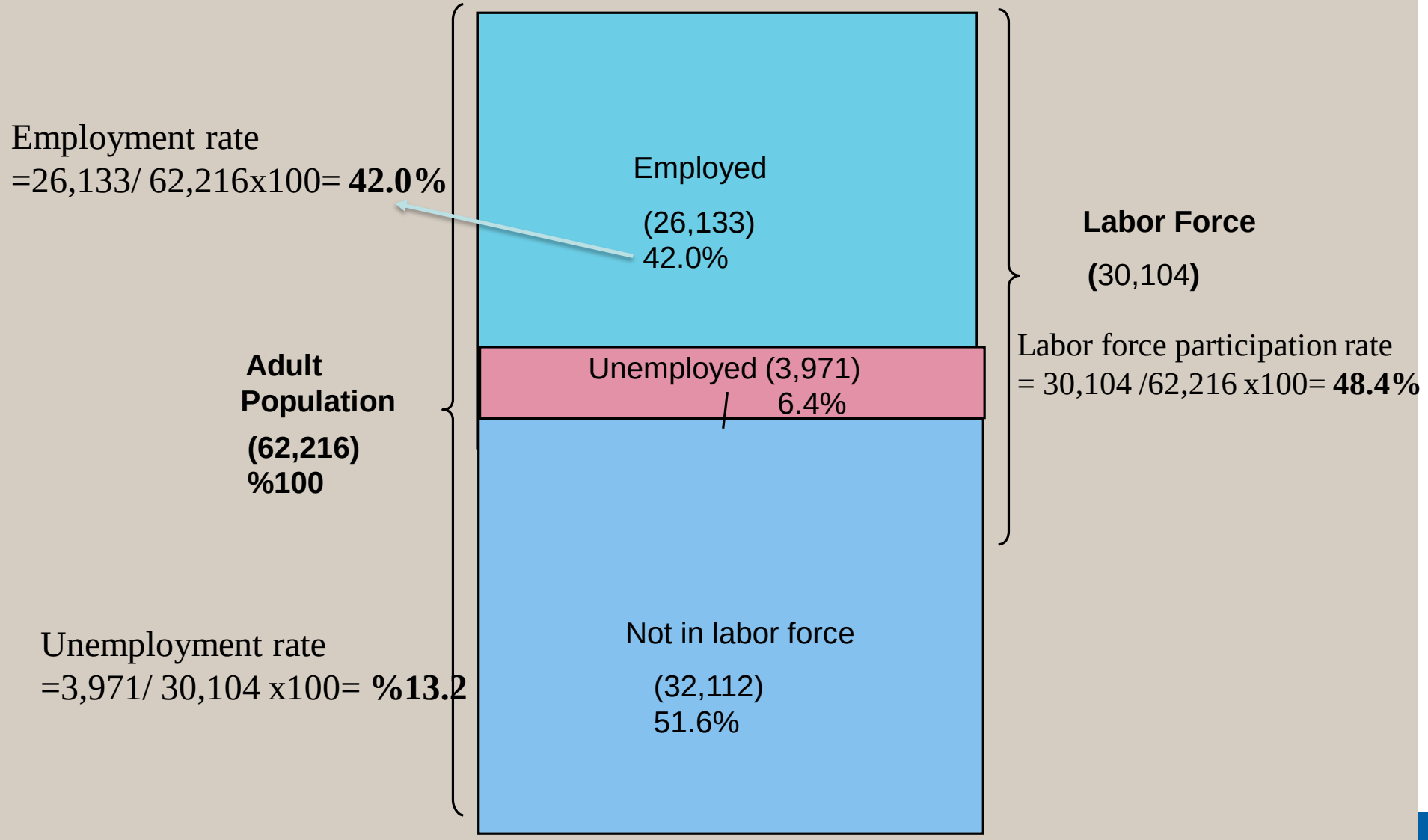
Unemployment rate =6.7/ 141.8 x100= %4.72

Labor force participation rate = 141.8 /211.9 x100= **%66.91**

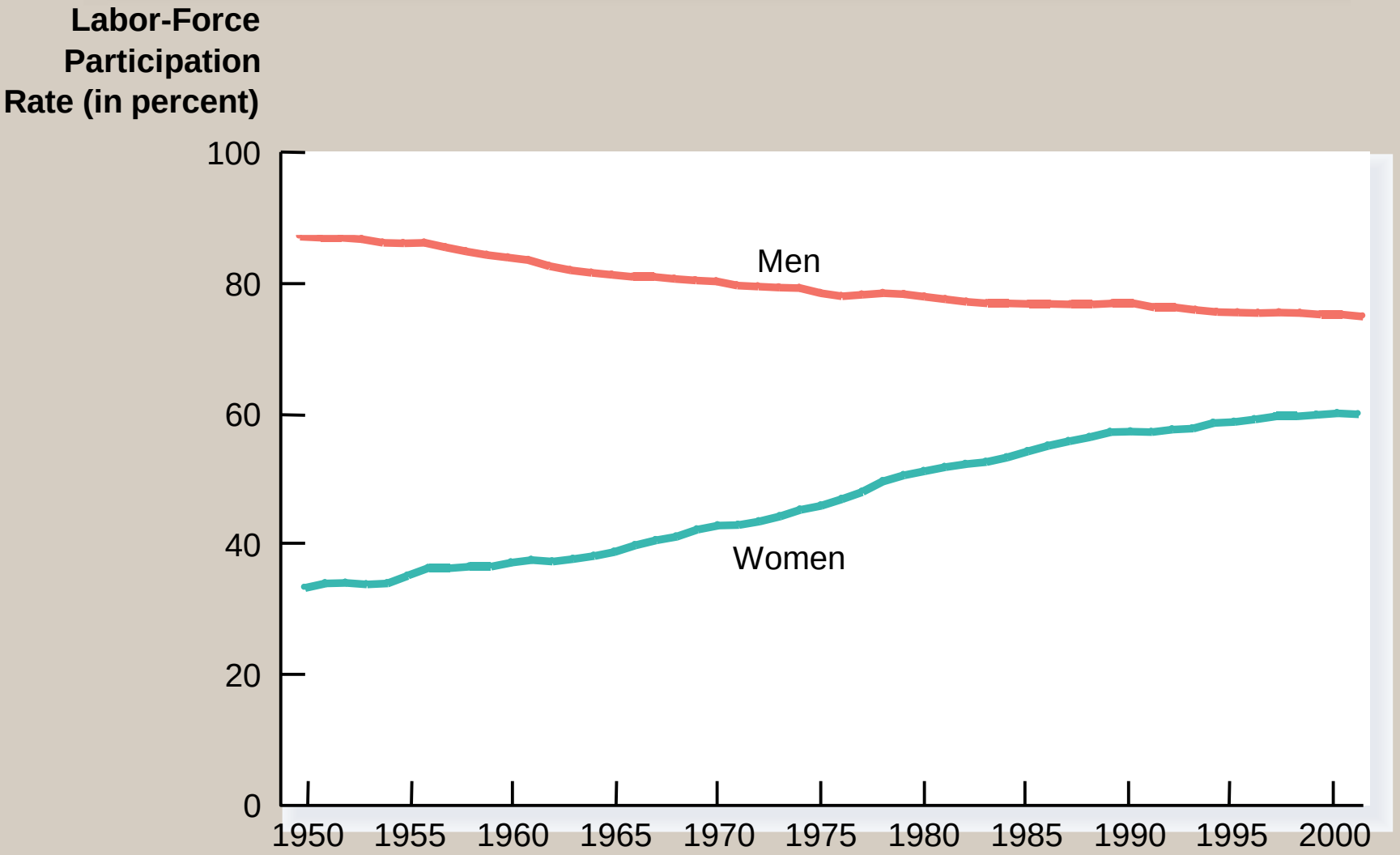
The Breakdown of the Population in Turkey 2017, November (Thousand)



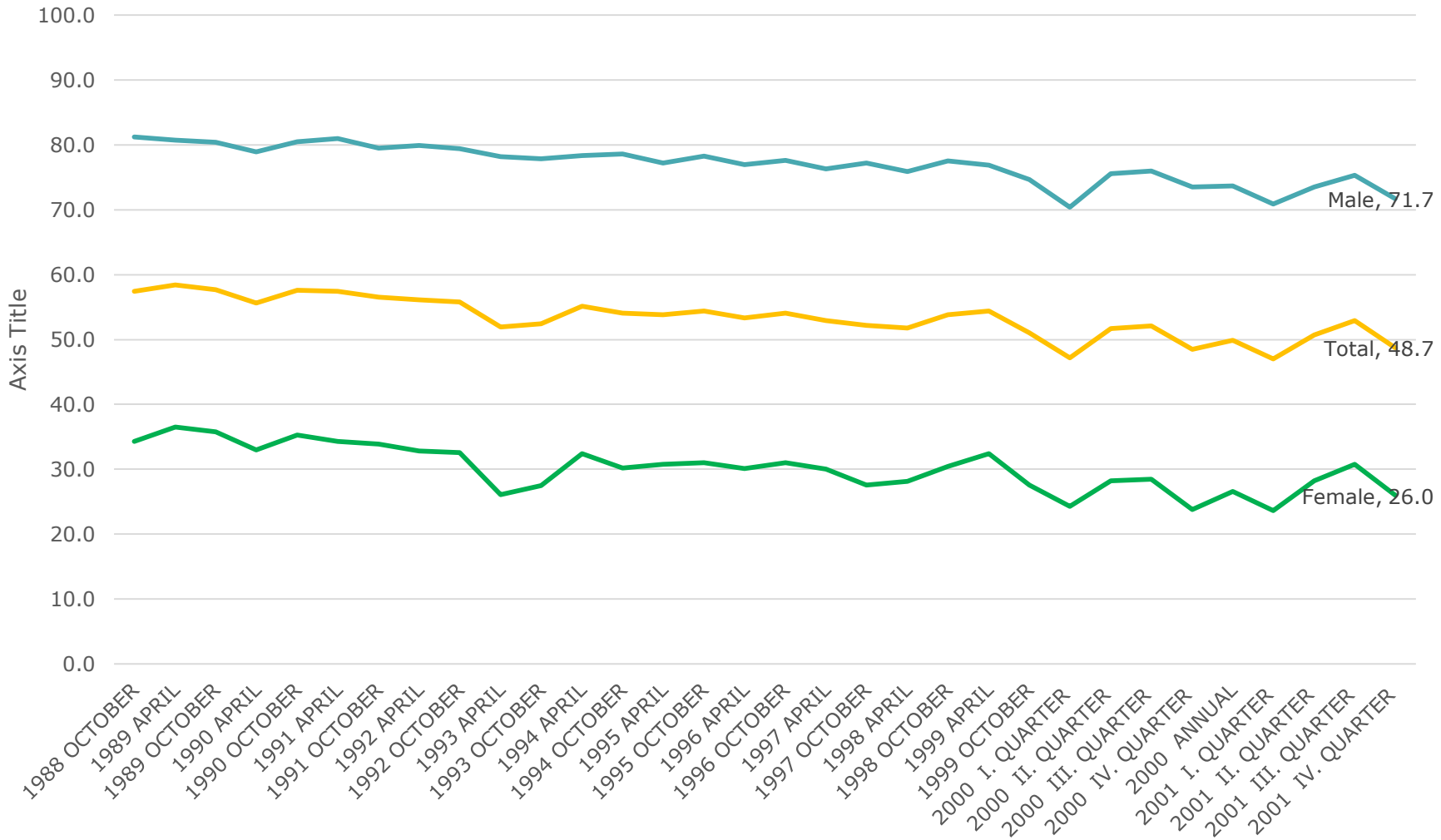
The Breakdown of the Population in Turkey 2020, March (Thousand)



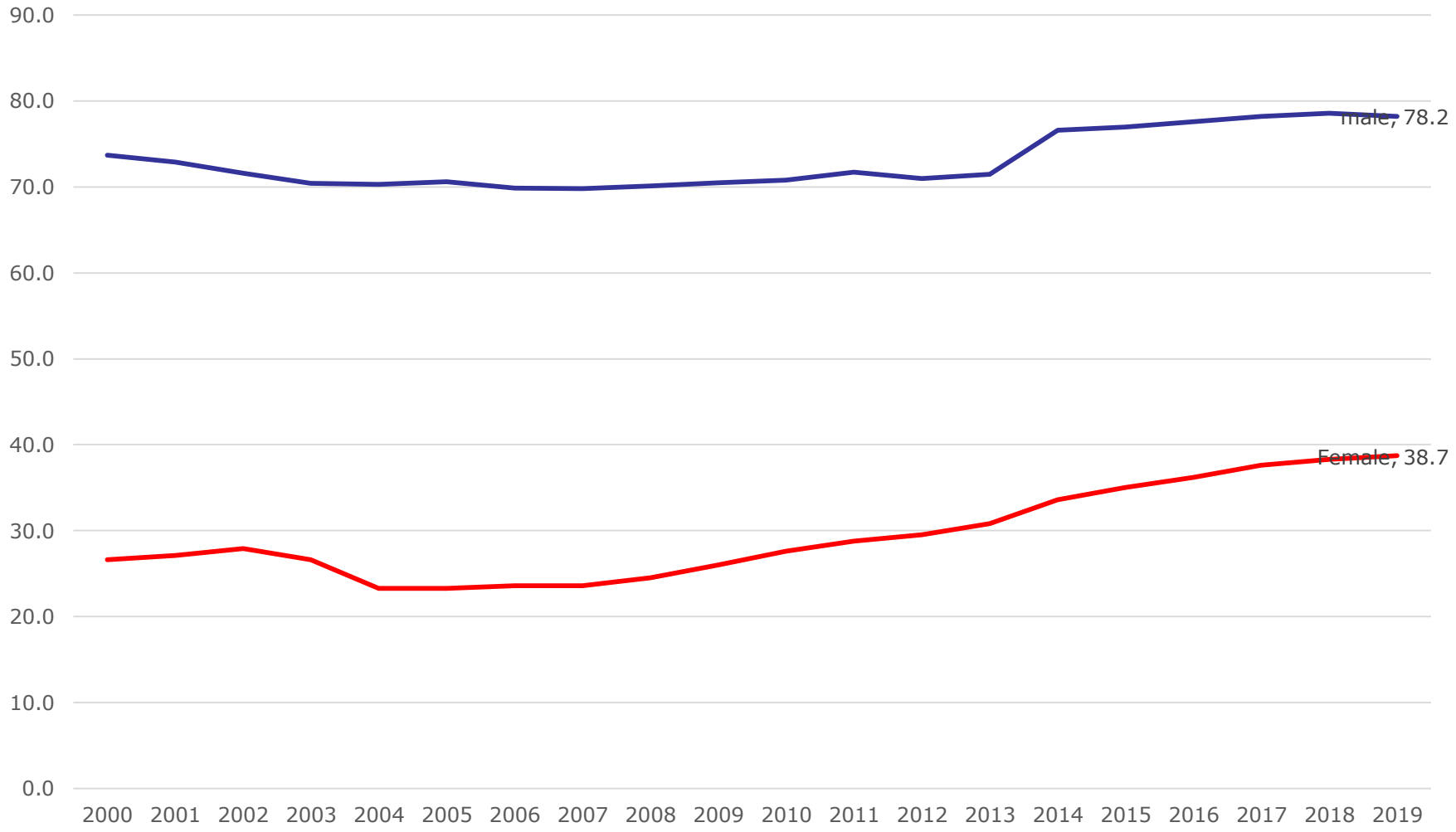
Labor Force Participation Rates for Men and Women Since 1950 in the USA



Labor Force Participation Rates for Men and Women in the Turkey



Labor Force Participation Rates for Men and Women in Turkey (%)



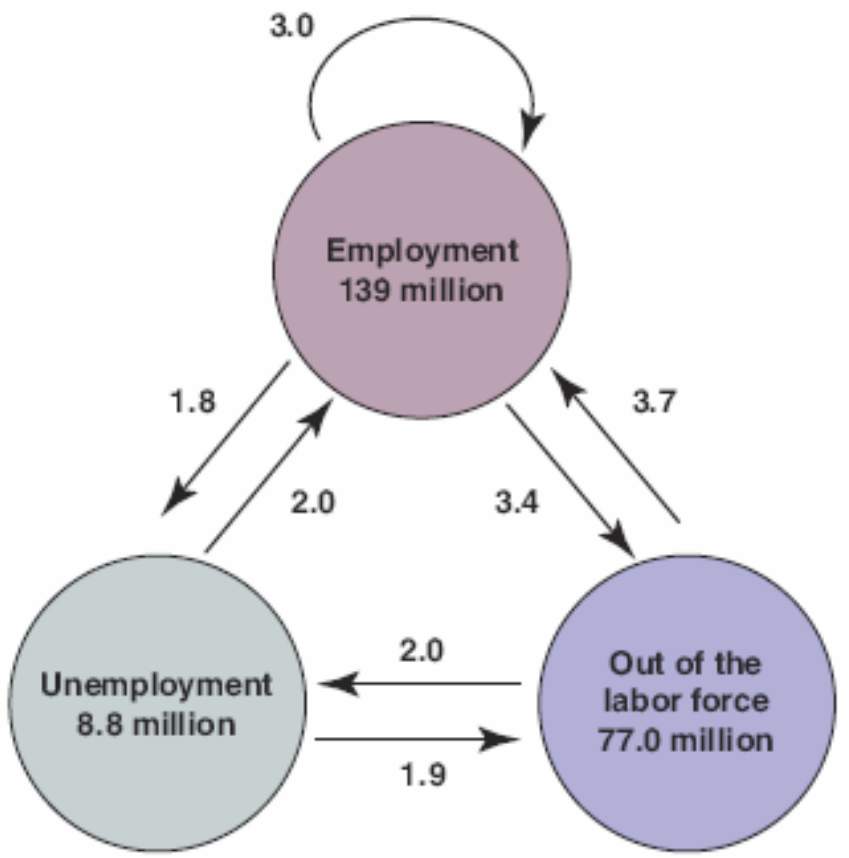
7-1 A Tour of the Labor Market

Figure 7-2 Average Monthly Flows between Employment, Unemployment, and Nonparticipation in the United States, 1996 to 2014 (millions)

(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.



Source: Calculated from the series constructed by Fleischman and Fallick, http://www.federalreserve.gov/econresdata/researchdata/feds200434.xls.

7-1 A Tour of the Labor Market

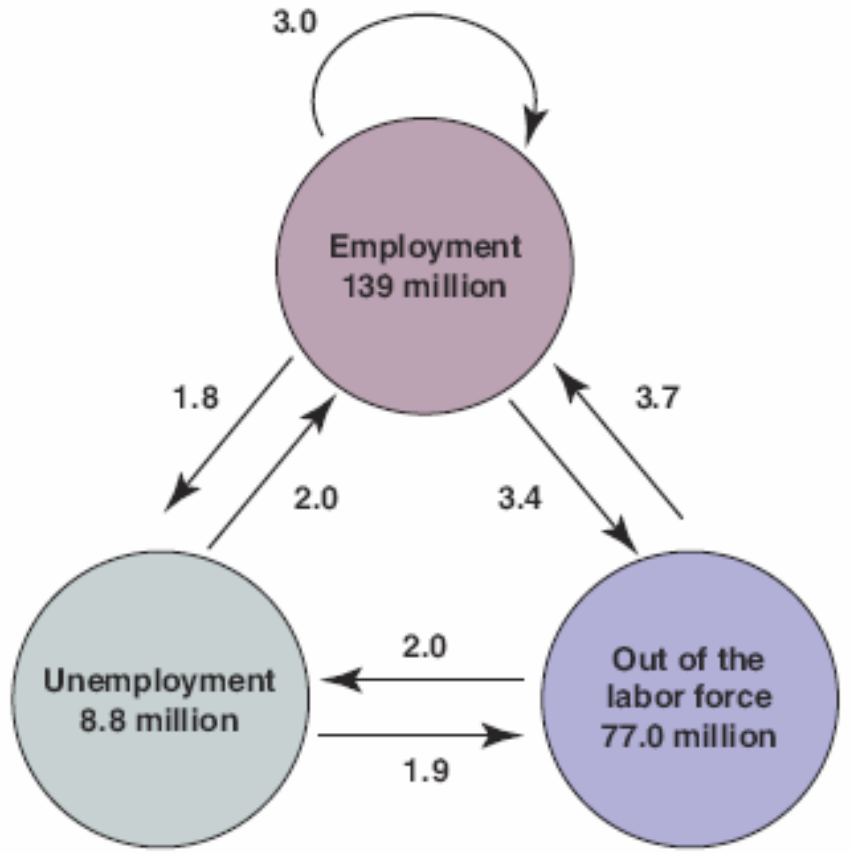
Figure 7-2 Average Monthly Flows between Employment, Unemployment, and Nonparticipation in the United States, 1996 to 2014 (millions)

Average monthly flow out of unemployment: 3.9 (=2.0+1.9) million each month

Proportionally about 3.9/8.8= 44% of unemployed leave unemployment each month.

Hence average duration of unemployment is 2-3 months.

But US is unusual in this respect and average duration of unemployment is much longer in Europe.

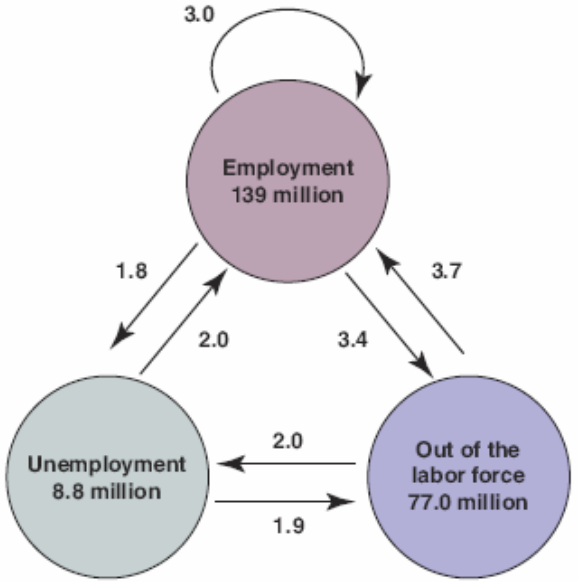


Source: Calculated from the series constructed by Fleischman and Fallick, http://www.federalreserve.gov/econresdata/researchdata/feds200434.xls.

7-1 A Tour of the Labor Market

Each month 5.3 (=1.9+3.4) million workers drop out of labor force and 5.7 (=2.0+3.7) million join the labor force.

Each month about 450,000 new people enter the labor force and about 350,000 retire. But the actual flows in and out of labor force are 11.2 million, so about 14 times larger.



- Many who are classified as "out of the labor force" are in fact **discouraged workers (cesareti kırılmış işçiler)** —not actively looking for a job but will take it if they find one.

- So, rather than the unemployment rate, economists sometimes focus on the **employment rate**—the ratio of employment to the population.

7-1 A Tour of the Labor Market

- A given unemployment rate may reflect either:
  - An active labor market: Many **separations** and **hires**, i.e, many workers entering and exiting unemployment
  - A sclerotic labor market: Few separations and hires, and a stagnant unemployment pool

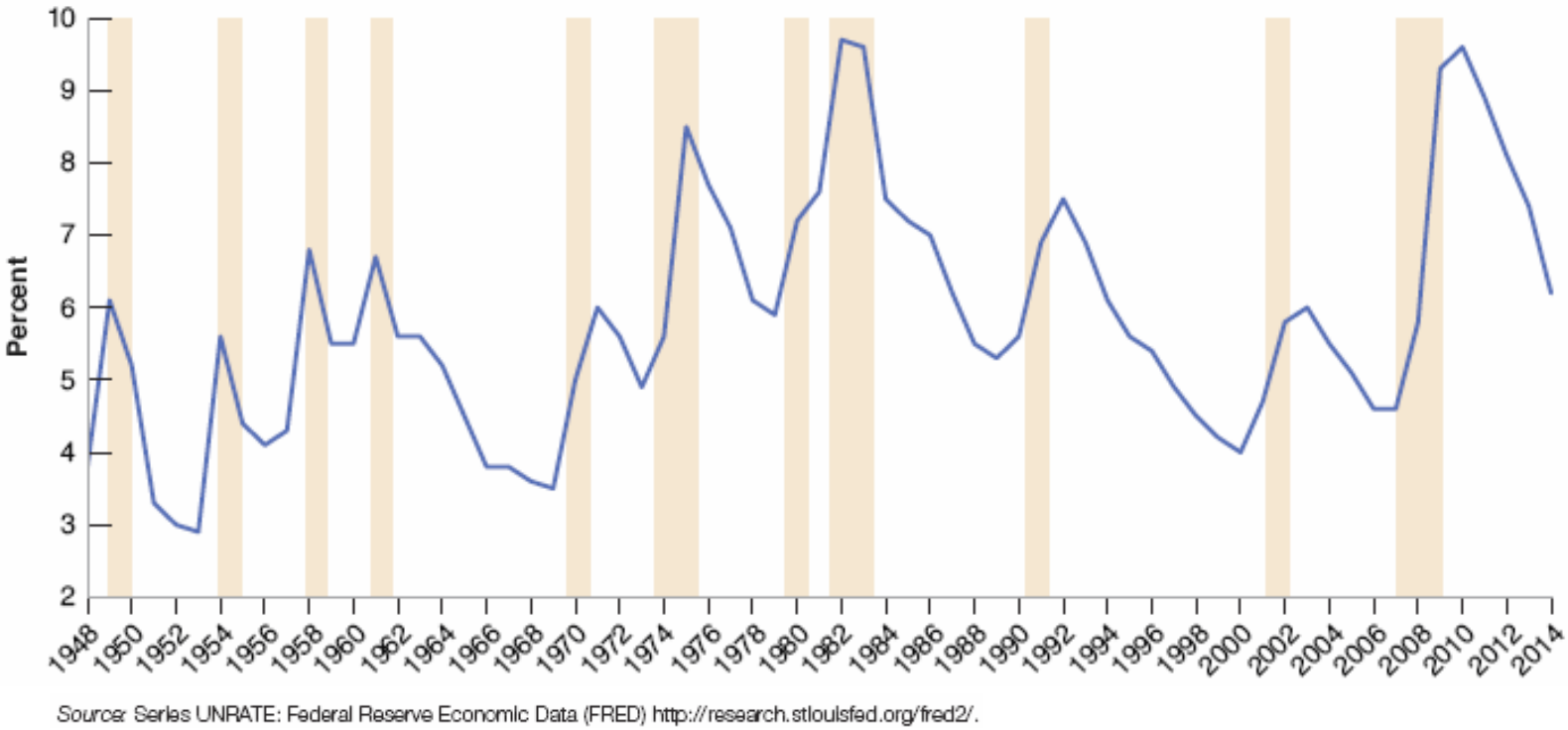
- The **Current Population Survey (CPS)** shows the average monthly flows.

- Separations include quits and layoffs.

- The **average duration of unemployment**—the length of time people spend unemployed—is 2 to 3 months.

7-2 Movements in Unemployment

Figure 7-3 Movements in the U.S. Unemployment Rate, 1948–2014

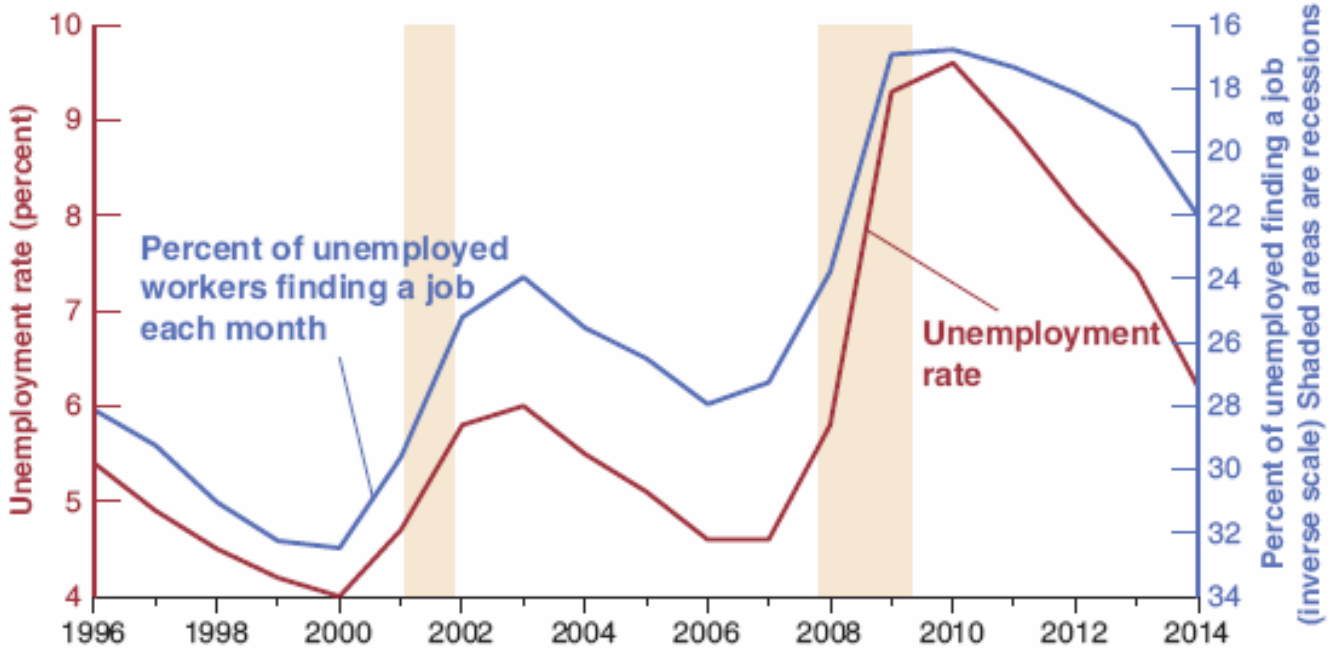


Source: Series UNRATE: Federal Reserve Economic Data (FRED) http://research.stlouisfed.org/fred2/.

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

7-2 Movements in Unemployment

Figure 7-4 The Unemployment Rate and the Proportion of Unemployed Finding Jobs, 1996–2014

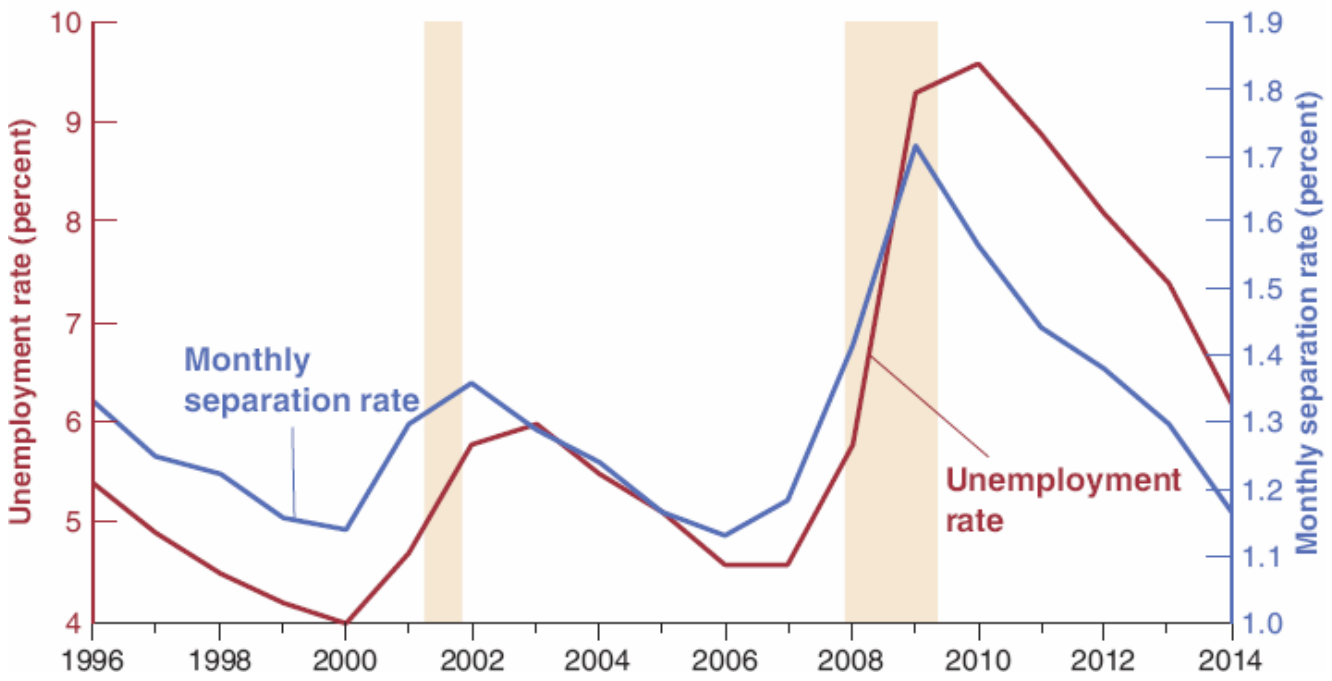


Sources: Series UNRATE: Federal Reserve Economic Data (FRED) http://research.stlouisfed.org/fred2/. Series constructed by Fleischman and Fallick, http://www.federalreserve.gov/econresdata/researchdata/.

When unemployment is higher, the proportion of unemployed finding jobs within one month is lower. Note that the scale on the right is an inverse scale.

7-2 Movements in Unemployment

Figure 7-5 The Unemployment Rate and the Monthly Separation Rate from Employment, 1996–2014



Sources: Series UNRATE: Federal Reserve Economic Data (FRED) http://research.stlouisfed.org/fred2/.
Series constructed by Fleischman and Fallick, http://www.federalreserve.gov/econresdata/research data/feds200434.xls.

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

7-2 Movements in Unemployment

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

1. Employed workers face a higher probability of losing their job.

2. Unemployed workers face a lower probability of finding a job; or they can expect to remain unemployed for a longer time.

7-3 Wage Determination

- Sometimes wages are set by **collective bargaining**—a bargaining between unions and firms.
- Slightly more than 10% of U.S. workers' wages are set by collective bargaining.
- The higher the skills needed to do the job, the more likely there is to be bargaining between employers and individual employees.
- Collective bargaining plays an important role in Japan and most European countries.

7-3 Wage Determination

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

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

- Workers' **bargaining power** depends on:
  - How costly for the firm to find other workers
  - How hard for workers to find another job if they were to leave the firm

7-3 Wage Determination

- **Efficiency wage theories** link the productivity of the efficiency of workers to the wage they are paid.
- Firms may want to pay a wage above the reservation wage in order to decrease workers' turnover and increase productivity.
- Firms that see employee morale and commitment as essential to the quality of workers' work will pay more than those whose activities are routine.
- When unemployment is low, firms that want to avoid an increase in quits will increase wages to induce workers to stay with the firms.

FOCUS: Henry Ford and Efficiency 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

Source: Dan Raff and Lawrence Summers, "Did Henry Ford Pay Efficiency Wages?" *Journal of Labor Economics* 1987 5 (No. 4 Part 2): pp. S57–S87.

- In 1914, Henry Ford, the builder of Model-T, announced that his company would pay all qualified employees a minimum of $5.00 a day for an eight-hour day, compared to previously an average $2.30 for a nine-hour day.
- The turnover rate plunged from 370% in 1913 to 16% in 1915.
- The layoff rate collapsed from 62% to nearly 0%.

7-3 Wage Determination

- The aggregate nominal wage W depends on:
  - the expected price level P^e
  - the unemployment rate u
  - a catch-all variable z

$$W = P^e F(u, z) \qquad (7.1)$$
$$(-,+)$$

7-3 Wage Determination

- Both workers and firms care about real wages (W/P), not nominal wages.
- The nominal wage depends on the *expected price level* (rather than the *actual price level*) because when nominal wages are set, the relevant price levels are not yet known.

7-3 Wage Determination

- An increase in the unemployment rate *decreases* wages.
- Higher unemployment either weakens worker' bargaining power, or allows firms to pay lower wages and still keep workers willing to work.
- z stands for all the factors that affect wages given the expected price level and the unemployment rate, for example:
  - **unemployment insurance** as the payment of unemployment benefits to workers who lose their jobs
  - **employment protection** makes it more expensive for firms to lay off workers

7-4 Price Determination

- The prices set by firms depends on their costs, which in turn depends on the nature of the **production function:**

$$Y = AN$$

  where Y is output, N is employment and A is **labor productivity** (output per worker).
- The production function is the relation between the inputs used in production and the quantity of output produced, and on the prices of these inputs.

7-4 Price Determination

- Assume that A is constant and $A = 1$, then:

$$Y = N \tag{7.2}$$

  which implies that the cost of producing one more unit of output is the cost of employing one more worker at W.
- The marginal cost of production is equal to W.
- Now assume firms set their price according to a **markup** m over the cost so that:

$$P = (1 + m)W \tag{7.3}$$

7-5 The Natural Rate of Unemployment

- Now divide both sides of the price-determination equation (7.3) by the nominal wage:

$$\frac{P}{W} = 1 + m \tag{7.5}$$

- Inverting both sides gives the implied real wage, or the **price-setting relation**:

$$\frac{W}{P} = \frac{1}{1 + m} \tag{7.6}$$

- *Price-setting decisions determine the real wage paid by firms.*

7-5 The Natural Rate of Unemployment

- Assume that W depends on the actual price level (P) rather than the expected price level (P^e), equation (7.1) becomes:

$$\frac{W}{P} = F(u, z) \qquad (7.4)$$

$$(-, +)$$

- *The higher the unemployment rate, the lower the real wage chosen by wage setters.*
- The wage-setting relation is the relation between the real wage and the rate of unemployment.

7-5 The Natural Rate of Unemployment

Wage Setting (WS) Relation

$$W = P^e F(u, z) \qquad (7.1)$$
$$(-,+)$$

Assume $P=P^e \rightarrow$ W/P= $F(u,z)$ (7.4)

Price Setting (PS) Relation

$P = (1+m)\ W$ (7.3)

$W = P / (1+m) \rightarrow$ W/P= 1 / (1+m) (7.6)

*** Equate real wage (*W/P)* from PS and WS

W/P = $F(u,z)$ = $F(u,z)$ = 1 / (1+m)

7-5 The Natural Rate of Unemployment

- The equilibrium unemployment rate u_n can be derived by eliminating W/P between equations (7.4) and (7.6):

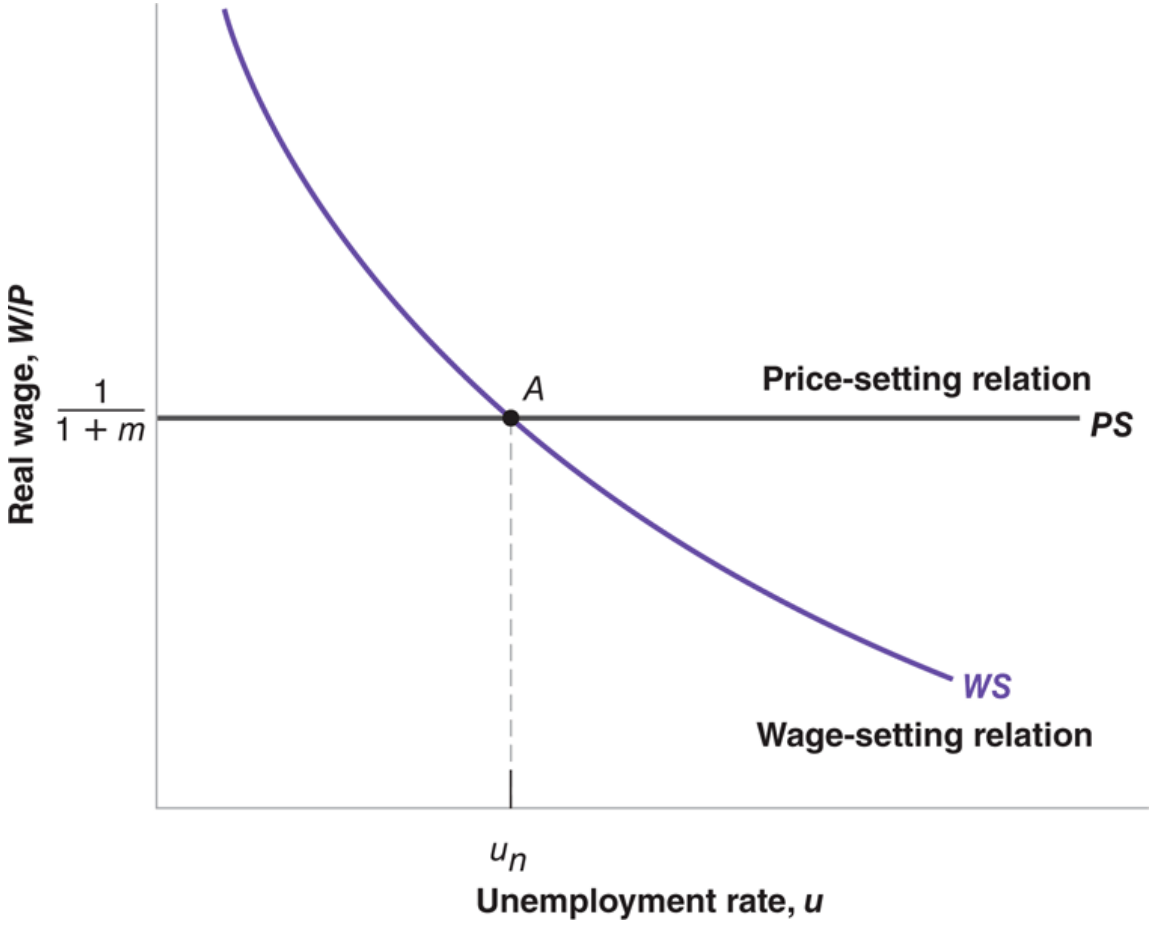
$$F(u_n, z) = \frac{1}{1 + m} \qquad (7.7)$$

- u_n depends on z and m.
- u_n is also called the **natural rate of unemployment** or the **structural rate of unemployment.**
- *Equilibrium in the labor market characterizes the natural rate of unemployment, the rate of unemployment to which the economy tends to return in the medium run.*
- *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.*

7-5 The Natural Rate of Unemployment

Figure 7-6 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.



7-5 The Natural Rate of Unemployment

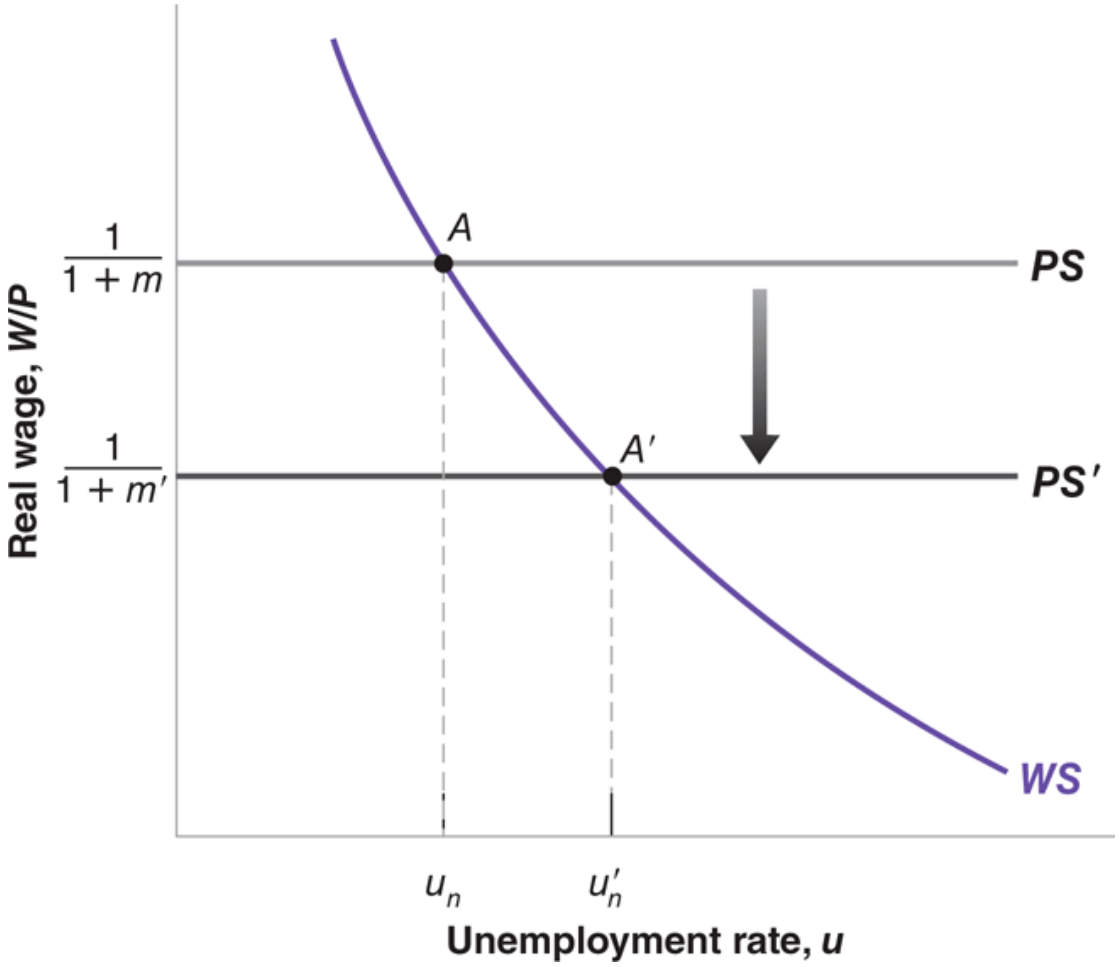
Figure 7-7 Unemployment Benefits and the Natural Rate of Unemployment

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

7-5 The Natural Rate of Unemployment

Figure 7-8 Markups and the Natural Rate of Unemployment

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



7-6 Where We Go from Here

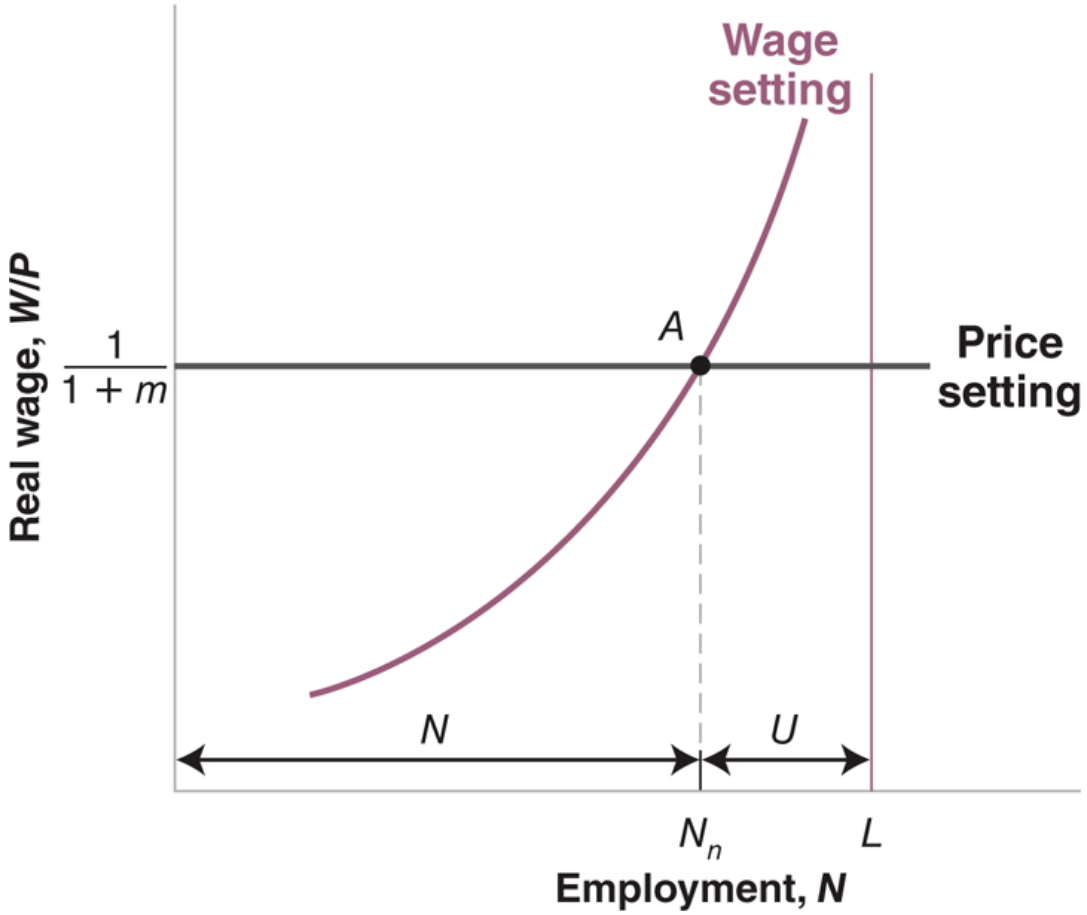
- We have assumed that the price level is equal to the expected price level.
- *In the short run*, the price level may well turn out to be different from what is expected when nominal wages are set, so that unemployment is not necessarily equal to the natural rate or output equal to its natural level.
- Because expectations are unlikely to be systematically wrong, *in the medium run*, output tends to return to its natural level.
- The next chapter will relax the assumption that the price level is equal to the expected price level.

APPENDIX: Wage- and Price-Setting Relations versus Labor Supply and Labor Demand

- The representation of labor-market equilibrium in terms of labor supply and labor demand in microeconomics is similar to the representation of the labor market in terms of wage setting and price setting.
- To see this, we redraw Figure 7-6 in terms of the real wage on the vertical axis and the level of employment (N) on the horizontal axis.
- Unemployment U is the labor force (L) minus employment N, i.e., $U = L - N$.

APPENDIX: Wage- and Price-Setting Relations versus Labor Supply and Labor Demand

Figure 1 Wage and Price Setting and the Natural Level of Employment



APPENDIX: Wage- and Price-Setting Relations versus Labor Supply and Labor Demand

- The wage-setting relation is now *upward sloping*: Higher employment implies a higher real wage.
- The price-setting relation is still a horizontal line.
- The equilibrium is given by point A, with "natural" employment N_n.
- The *price-setting relation* looks like a flat labor-demand relation.

Figure 2 Unemployment Rate Since 1960