

# **Chapter 6**

# **Unemployment**

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## **Learning Objectives**

The natural rate of unemployment:

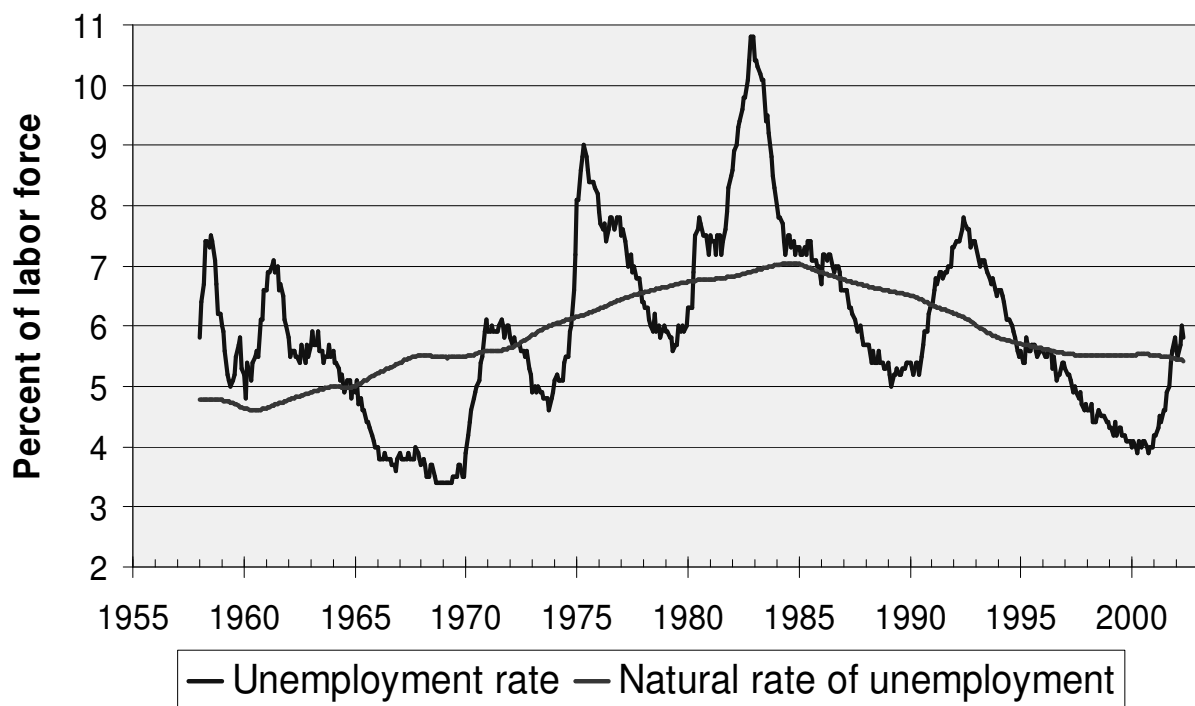
- what it means
- what causes it
- understanding its behavior in the real world

# **1. Natural Rate of Unemployment**

## **1.1 Defining natural rate of unemployment**

- **Natural rate of unemployment:**  
the average rate of unemployment around which the economy fluctuates.
- In a recession, the actual unemployment rate rises above the natural rate.
- In a boom, the actual unemployment rate falls below the natural rate.

# U.S. Unemployment, 1958-2002



# **1. Natural Rate of Unemployment**

## **1.2 A first model of the natural rate**

Notation:

**$L$**  = # of workers in labor force

**$E$**  = # of employed workers

**$U$**  = # of unemployed

**$U/L$**  = unemployment rate

# 1. Natural Rate of Unemployment

## Assumptions

1.  $L$  is exogenously fixed.
2. During any given month,  
 $s$  = fraction of employed workers that become separated from their jobs,  
 $f$  = fraction of unemployed workers that find jobs.

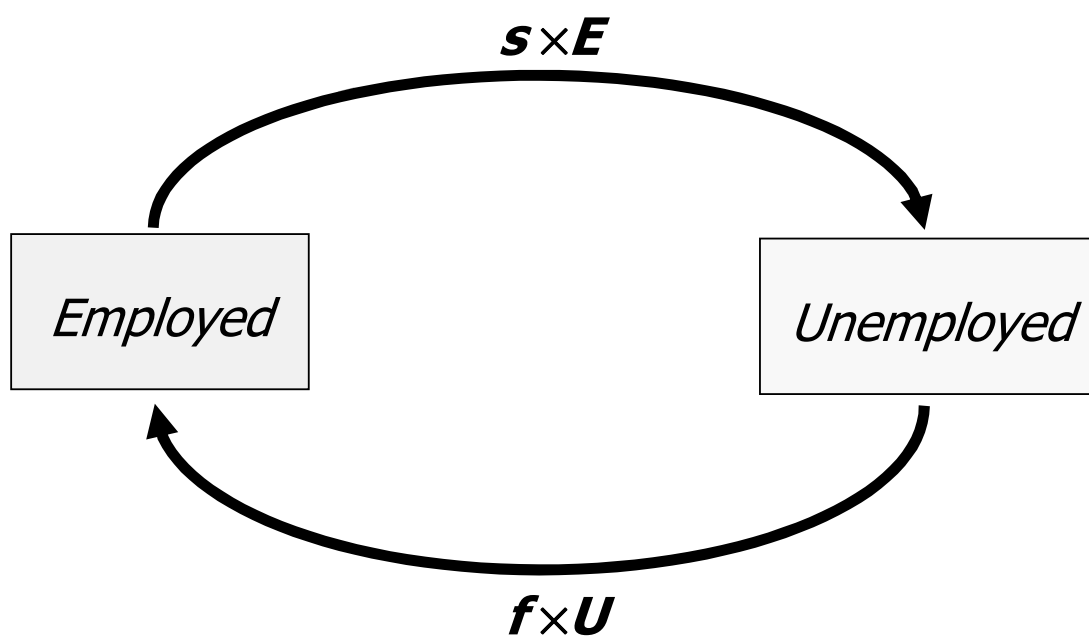
$s$  = rate of job separations

$f$  = rate of job finding

*(both exogenous)*

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*The transitions between  
employment and unemployment*



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# 1. Natural Rate of Unemployment

## Steady State Condition

- Definition: the labor market is in **steady state**, or long-run equilibrium, if the unemployment rate is constant.
- The steady-state condition is:

$$s \times E = f \times U$$

*# of employed people who lose or leave their jobs*

*# of unemployed people who find jobs*

# 1. Natural Rate of Unemployment

*Solving for the equilibrium unemployment*

$$\begin{aligned}f \times U &= s \times E \\ &= s \times (L - U) \\ &= s \times L - s \times U\end{aligned}$$

Solve for  $U/L$ :

$$(f + s) \times U = s \times L \rightarrow$$

$$\frac{U}{L} = \frac{s}{s + f}$$

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# 1. Natural Rate of Unemployment

## 1.3 Policy Implication

- A policy that aims to reduce the natural rate of unemployment will succeed only if it lowers  $s$  or increases  $f$ .

## 2. Why Is There Unemployment?

- If job finding were instantaneous ( $f = 1$ ), then all spells of unemployment would be brief, and the natural rate would be near zero.
- There are two reasons why  $f < 1$ :
  - 2.1. job search (frictional unemployment)
  - 2.2. wage rigidity (structural unemployment)

## **2. Why Is There Unemployment?**

### **2.1. Job Search & Frictional Unemployment**

- **frictional unemployment:** caused by the time it takes workers to search for a job
- occurs even when wages are flexible and there are enough jobs to go around

## **2. Why Is There Unemployment?**

occurs because

- workers have different abilities, preferences
- jobs have different skill requirements
- geographic mobility of workers not instantaneous
- flow of information about vacancies and job candidates is imperfect
- sectoral shifts

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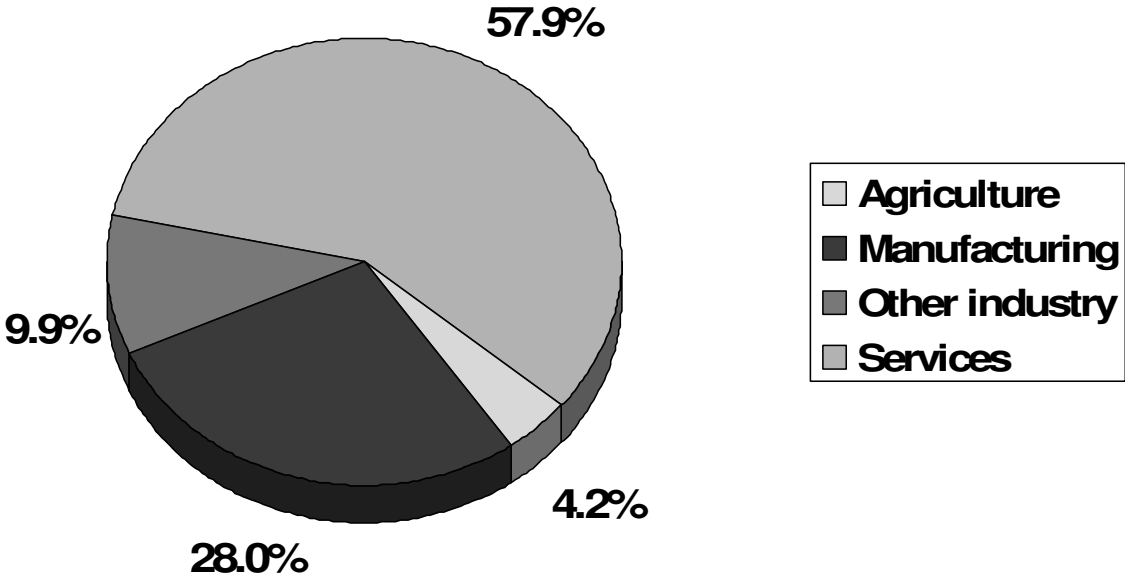
## **2. Why Is There Unemployment?**

### Sectoral Shift

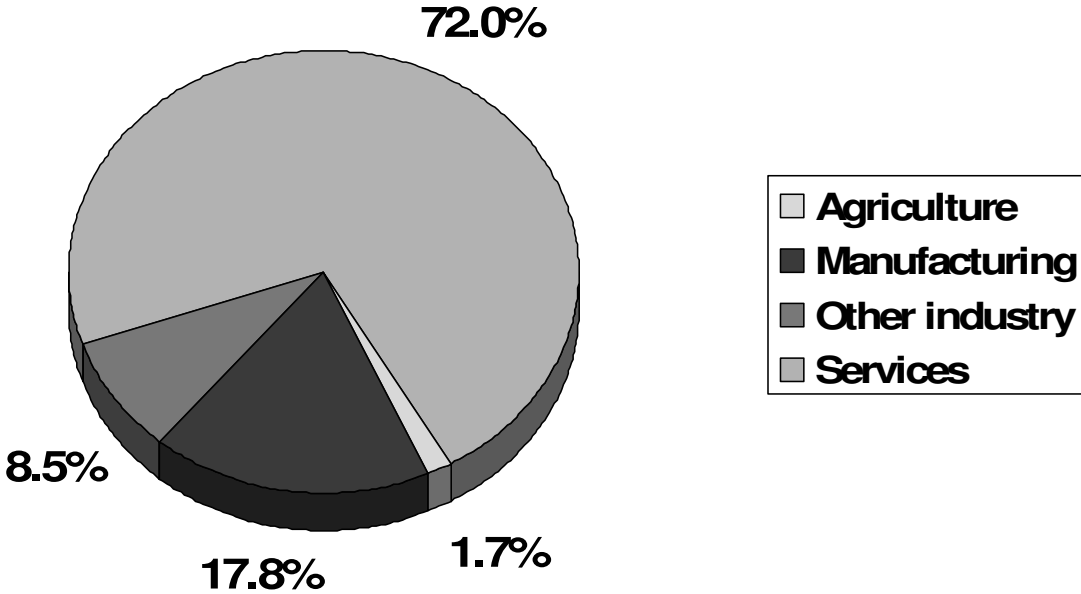
- def: changes in the composition of demand among industries or regions
- *example:* Technological change increases demand for computer repair persons, decreases demand for typewriter repair persons
- *example:* A new international trade agreement causes greater demand for workers in the export sectors and less demand for workers in import-competing sectors.

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# Industry shares in U.S. GDP, 1960



# Industry shares in U.S. GDP, 1997



## **2. Why Is There Unemployment?**

- Many public policies seek to decrease natural rate of unemployment by reducing frictional unemployment.
- Govt programs decreasing unemployment
  1. *Govt employment agencies:*  
disseminate info about job openings to better match workers & jobs
  2. *Public job training programs:*  
help workers displaced from declining industries get skills needed for jobs in growing industries

## **2. Why Is There Unemployment?**

- Govt programs increasing unemployment
  1. *Unemployment Insurance*
    - UI pays part of a worker's former wages for a limited time after losing his/her job.
    - UI increases search unemployment, because it:
      - reduces the opportunity cost of being unemployed
      - reduces the urgency of finding work
    - hence, reduces  $f$

## **2. Why Is There Unemployment?**

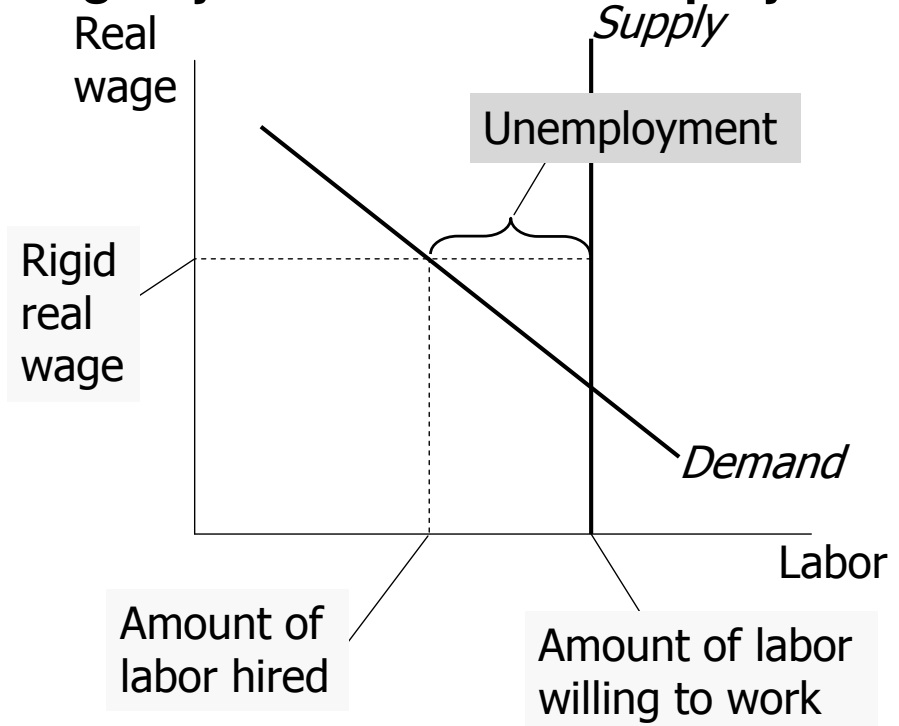
– UI increases search unemployment, because it:  
reduces likelihood of finding a stable job  
reduces likelihood of bargaining for job security  
→ hence, increases  $s$

- (Benefit) By allowing workers more time to search, UI may lead to better matches between jobs and workers, which would lead to greater productivity and higher incomes.

## 2. Why Is There Unemployment?

### 2.2. Real-Wage Rigidity & Structural Unemployment

If the real wage is stuck above the eq'm level, then there aren't enough jobs to go around.



## 2. Why Is There Unemployment?

- If the real wage is stuck above the eq'm level, then there aren't enough jobs to go around.
- Then, firms must ration the scarce jobs among workers.
- **Structural unemployment:** the unemployment resulting from real wage rigidity and job rationing.

## **2. Why Is There Unemployment?**

### **Reasons for Real-Wage Rigidity**

**2.2.1. Minimum wage laws**

**2.2.2. Labor unions**

**2.2.3. Efficiency wages**

## **2. Why Is There Unemployment?**

### 2.2.1. Minimum wage laws

- The minimum wage is well below the eq'm wage for most workers, so it cannot explain the majority of natural rate unemployment.
- However, the minimum wage may exceed the eq'm wage of unskilled workers, especially teenagers.
- If so, then we would expect that increases in the minimum wage would increase unemployment among these groups.

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## 2. Why Is There Unemployment?

- In Sept 1996, the minimum wage was raised from \$4.25 to \$4.75. Here's what happened:

Unemployment rates, before & after		
	3 <sup>rd</sup> Q 1996	1 <sup>st</sup> Q 1997
Teenagers	16.6%	17.0%
Single mothers	8.5%	9.1%
All workers	5.3%	5.3%

- Other studies: A 10% increase in the minimum wage increases teenage unemployment by 1-3%. <sup>23</sup>

## **2. Why Is There Unemployment?**

- Advocates of min wage
  - means of raising the income of the working poor
- Opponents of min wage
  - not the best way to help working poor because over 1/3 of min wage earners are teenagers from middle income families
  - instead use tax credits

## 2. Why Is There Unemployment?

### 2.2.2. Labor unions

- Unions exercise monopoly power to secure higher wages for their members.
- When the union wage exceeds the eq'm wage, unemployment results.
- Employed union workers are **insiders** whose interest is to keep wages high.
- Unemployed non-union workers are **outsiders** and would prefer wages to be lower (so that labor demand would be high enough for them to get jobs).

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### Union membership and wage ratios by industry, 2001

industry	#employed (1000s)	U % of total	RBU % of total	wage ratio
mining	531	12.3%	12.9%	103.4
construction	6,881	18.4	19.0	151.0
manufacturing	18,149	14.6	15.5	105.9
transportation	4,441	24.1	25.4	127.8
comm. and pub util	2,981	22.6	23.7	104.2
wholesale trade	4,540	5.5	5.9	105.8
retail trade	20,505	4.5	5.0	117.8
fin, insu, and real est	7,648	2.1	2.8	90.1
services	34,261	5.9	6.8	103.3
government	19,155	37.4	41.8	121.1
<b>all</b>	<b>119,092</b>	<b>13.6%</b>	<b>15.0%</b>	<b>118.0</b>

*RBU = nonunion workers represented by a union*

*wage ratio =  $100 \times (\text{union} + \text{RBU wage}) / (\text{nonunion wage})$*

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## **2. Why Is There Unemployment?**

### 2.2.3. Efficiency wages

- Theories in which high wages increase worker productivity:
  - attract higher quality job applicants (reduce *adverse selection*)
  - increase worker effort and reduce “shirking” (reduce *moral hazard*)
  - reduce turnover, which is costly
  - improve health of workers (*in developing countries*)
- The increased productivity justifies the cost of paying above-equilibrium wages.
- The result: unemployment

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## **Chapter summary**

1. The natural rate of unemployment
  - the long-run average or “steady state” rate of unemployment
  - depends on the rates of job separation and job finding
  
2. Frictional unemployment
  - due to the time it takes to match workers with jobs
  - may be increased by unemployment insurance

## **Chapter summary**

### 3. Structural unemployment

- results from wage rigidity - the real wage remains above the equilibrium level
- causes: minimum wage, unions, efficiency wages