

**ECON 3010**  
**Intermediate Macroeconomics**

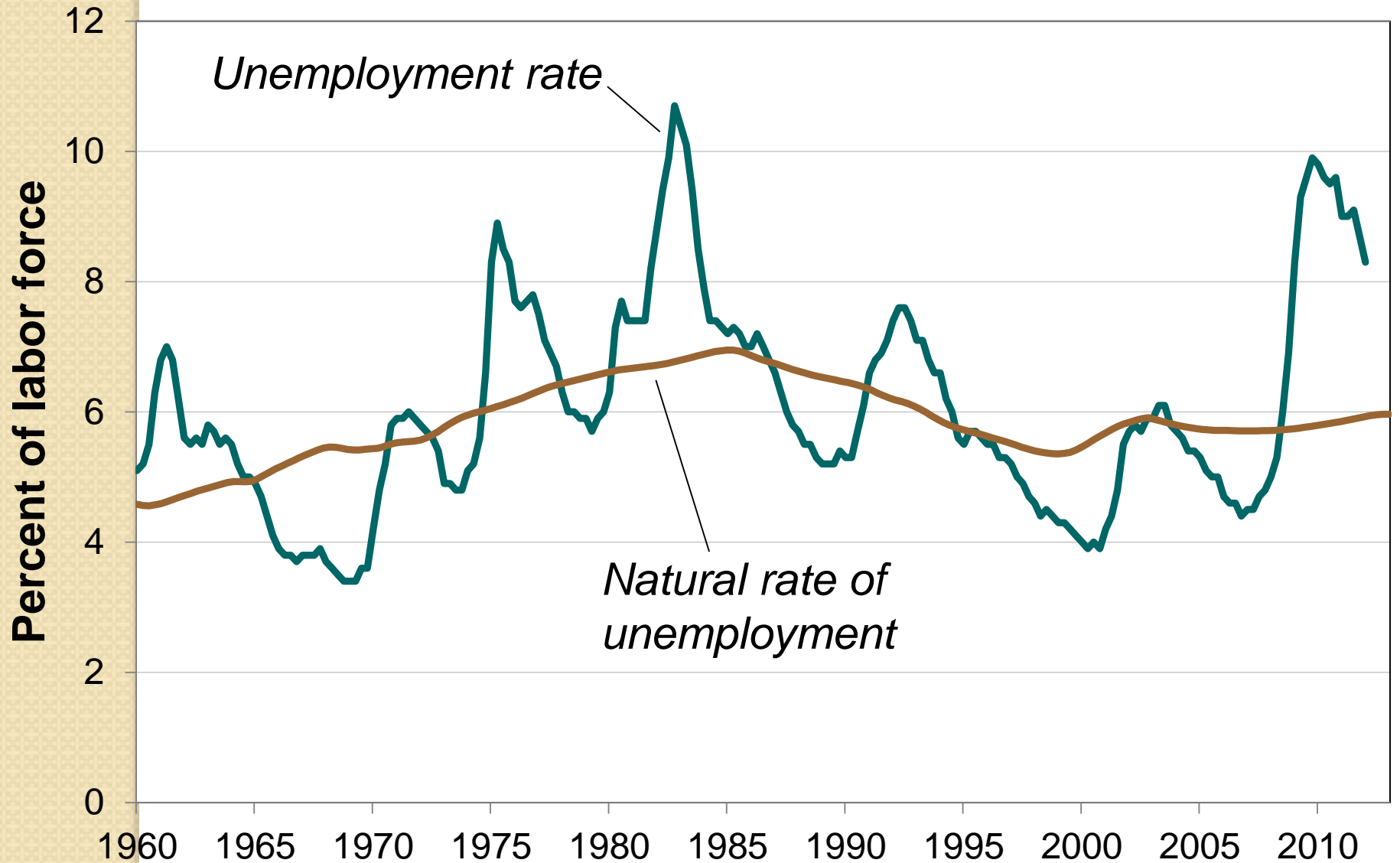
**Chapter 7**

Unemployment

# 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.

# Actual and natural rates of U.S. unemployment



# 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

# Assumptions:

1.  $L$  is exogenously fixed.

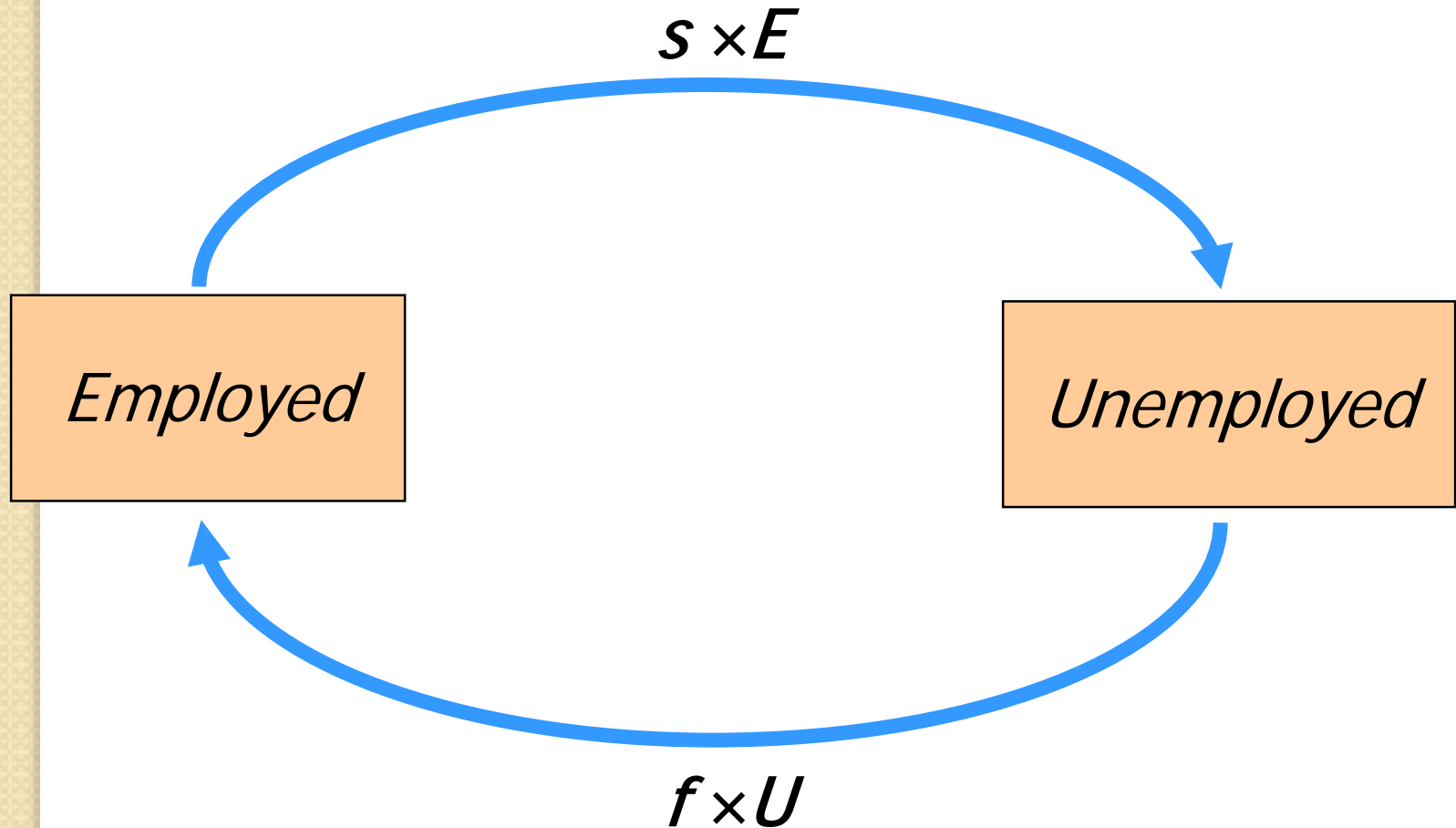
2. During any given month,

$s$  = **rate of job separations**,  
fraction of employed workers  
that become separated from their jobs

$f$  = **rate of job finding**,  
fraction of unemployed workers  
that find jobs

$s$  and  $f$  are exogenous

# The transitions between employment and unemployment



# The 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*

# Finding the “equilibrium” $U$ rate

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

Solve for  $U/L$ :

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

so,

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



# Example:

- Each month,
  - 1% of employed workers lose their jobs ( $s = 0.01$ )
  - 19% of unemployed workers find jobs ( $f = 0.19$ )
- Find the natural rate of unemployment:

$$\frac{U}{L} = \frac{s}{s + f} = \frac{0.01}{0.01 + 0.19} = 0.05, \text{ or } 5\%$$

# 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  $f < 1$ :
  1. job search
  2. wage rigidity

# 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
- 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

# Public policy and job search

Government programs affecting unemployment include:

- ***Government employment agencies*** disseminate info about job openings to better match workers & jobs.
- ***Public job training programs*** help workers displaced from declining industries get skills needed for jobs in growing industries.

# Unemployment insurance (UI)

- UI pays part of a worker's former wages for a limited time after the worker loses his/her job.
- UI increases search unemployment, because it reduces
  - the urgency of finding work &
  - the rate of job finding,  $f$
- Studies: The longer a worker is eligible for UI, the longer the average spell of unemployment.

# Benefits of UI

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

# Why is there unemployment?

The natural rate of unemployment:  $\frac{U}{L} = \frac{s}{s + f}$

- Two reasons why  $f < 1$ :

*DONE* ✓

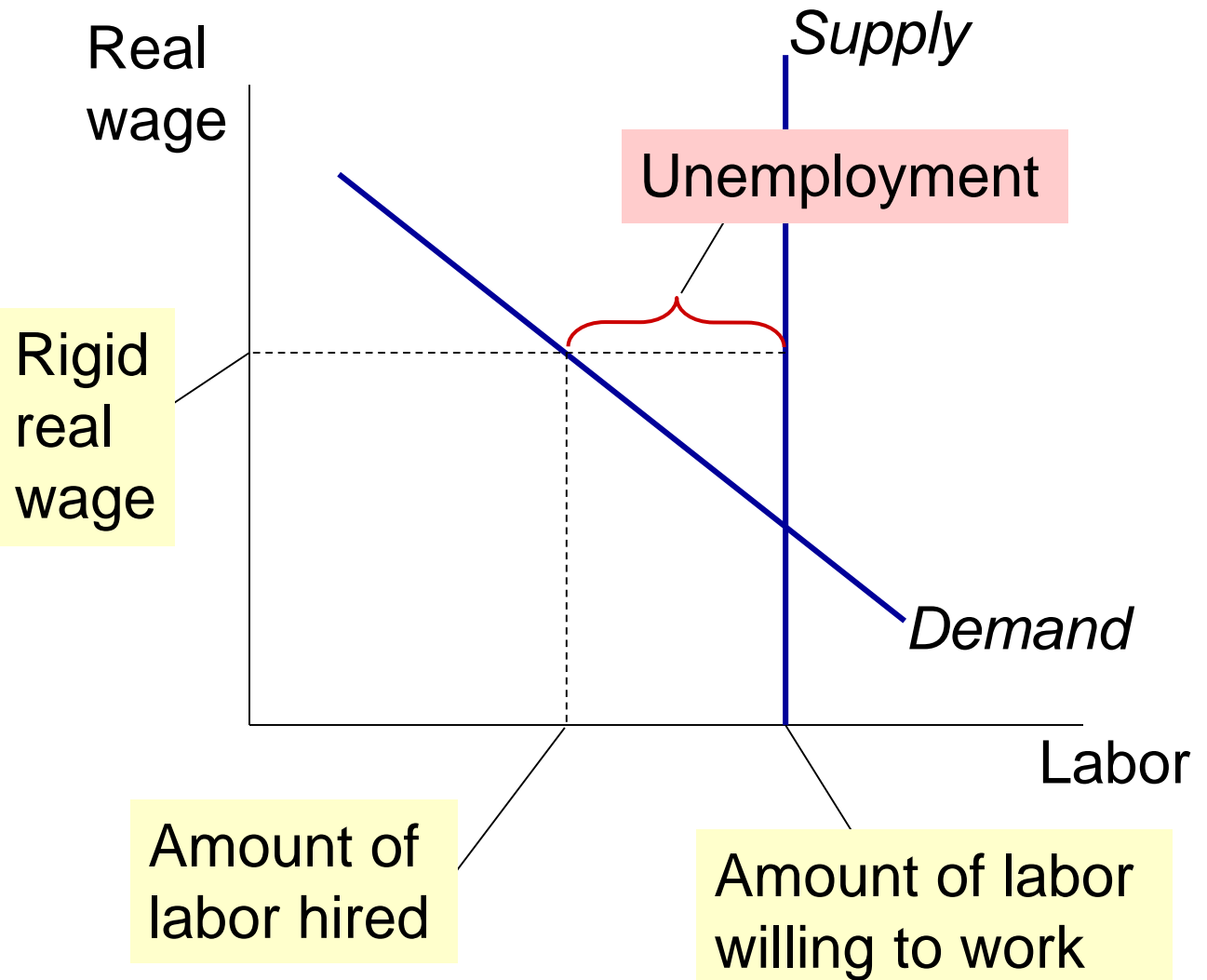
1. job search

*Next* →

2. wage rigidity

# Unemployment from real wage rigidity

This leads to job rationing and is called **structural unemployment**.





# Reasons for wage rigidity

1. Minimum wage laws
2. Labor unions
3. Efficiency wages

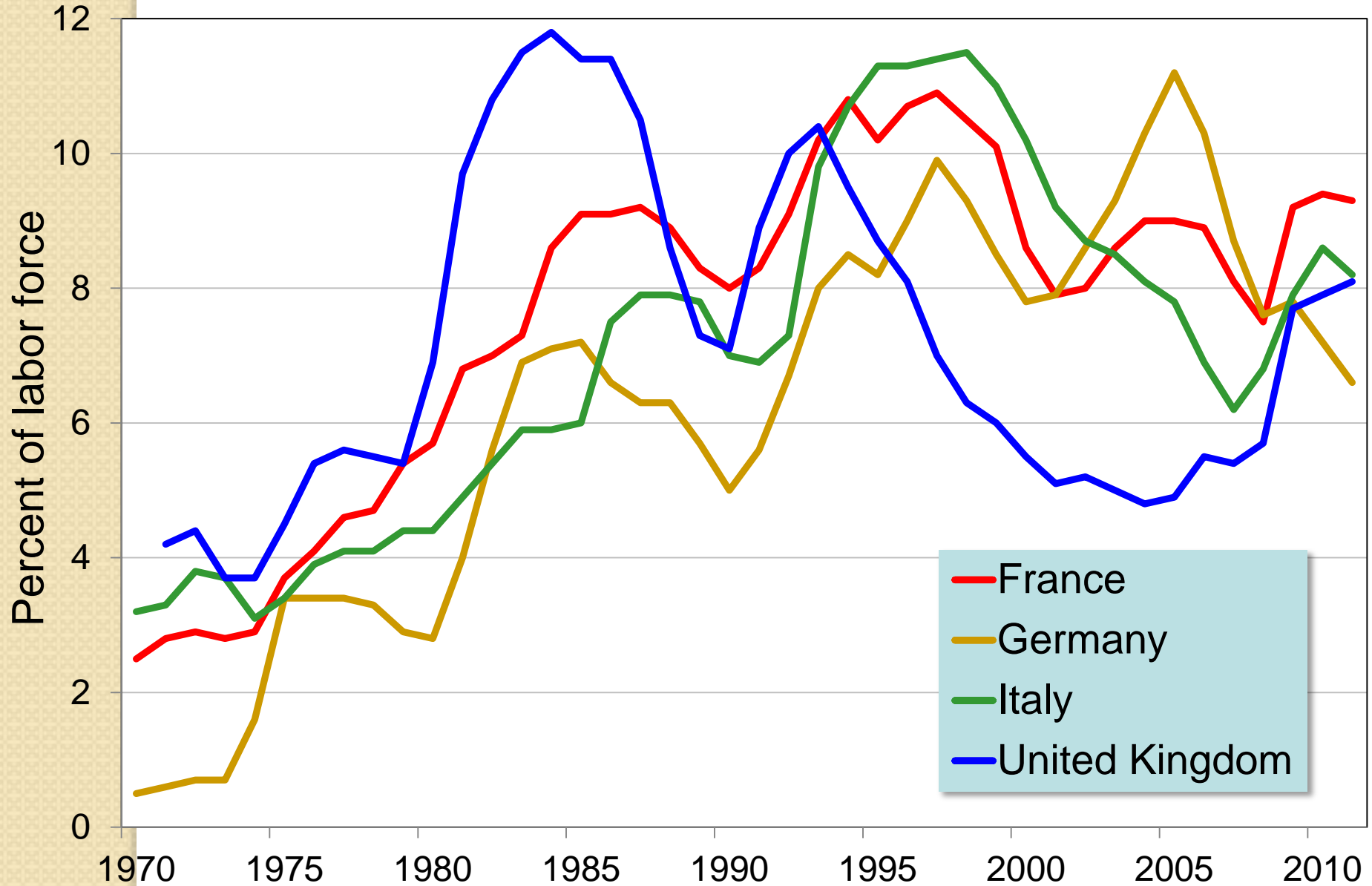
# I. The minimum wage

- The minimum wage may exceed the eq'm wage of unskilled workers, especially teenagers.
- But, the minimum wage cannot explain the majority of the natural rate of unemployment, as most workers' wages are well above the minimum wage.

## 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.
- **Insiders:** Employed union workers whose interest is to keep wages high.
- **Outsiders:** Unemployed non-union workers who prefer eq'm wages, so there would be enough jobs for them.

# Unemployment in Europe, 1960–2011



## Percent of workers covered by collective bargaining, selected countries

United States	13%
United Kingdom	35
Switzerland	48
Spain	80
Sweden	92
Germany	63
France	95
Greece	85

### 3. Efficiency wages

- Theories in which higher wages increase worker productivity by:
  - attracting higher quality job applicants
  - increasing worker effort, reducing “shirking”
  - reducing turnover, which is costly to firms
  - improving health of workers  
*(in developing countries)*
- Firms willingly pay above-equilibrium wages to raise productivity.

# Why is there unemployment?

- Higher rates of job separation,  $s$ , will also lead to more long-run unemployment.
- What would cause  $s$  to increase?
- One answer: sectoral shifts!!

# Sectoral shifts

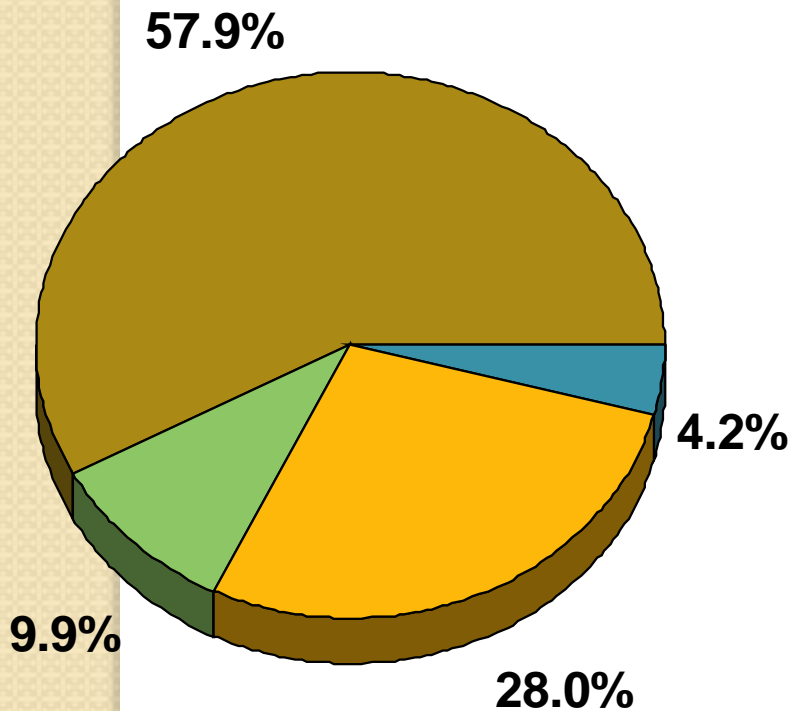
- def: Changes in the composition of demand among industries or regions.
- *example: Technological change*  
more jobs repairing computers,  
fewer jobs repairing typewriters
- *example: A new international trade agreement*  
labor demand increases in export sectors,  
decreases in import-competing sectors



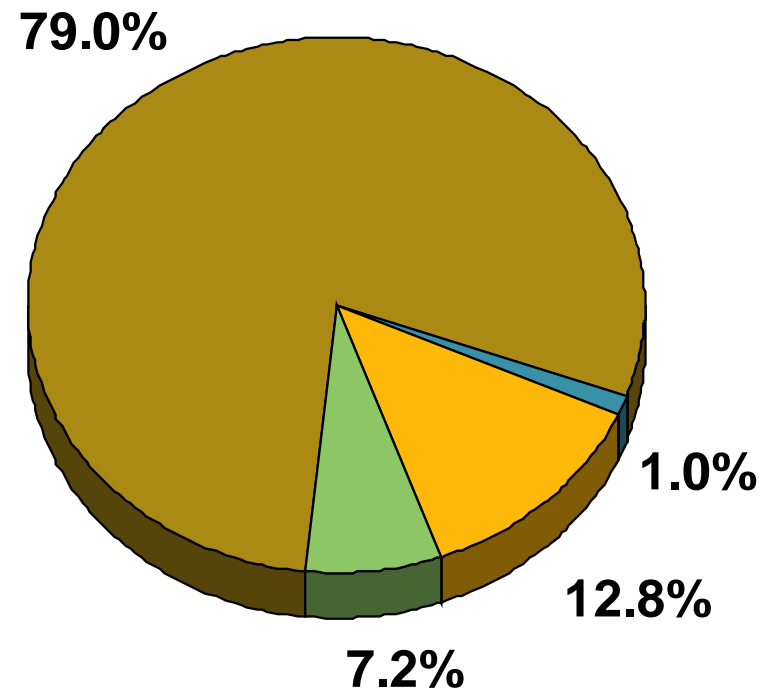
# CASE STUDY: Structural change over the long run

- Agriculture
- Manufacturing
- Other industry
- Services

**1960**



**2009**



# More examples of sectoral shifts

- Industrial revolution (1800s): agriculture declines, manufacturing soars
- Energy crisis (1970s): demand shifts from larger cars to smaller ones
- Health care spending as % of GDP:

1960: 5.2	2000: 13.8
1980: 9.1	2010: 17.9