Chapter 6: 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 unemployment in the U.S., 1960-2009
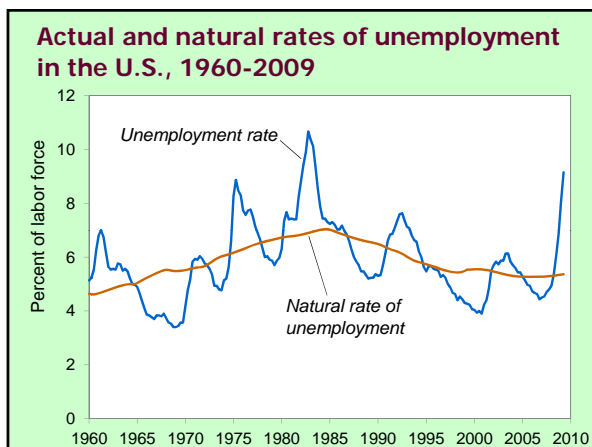

A first model of the natural rate

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**,
   the 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

$s \times E$

Employed

Unemployed

$f \times U$
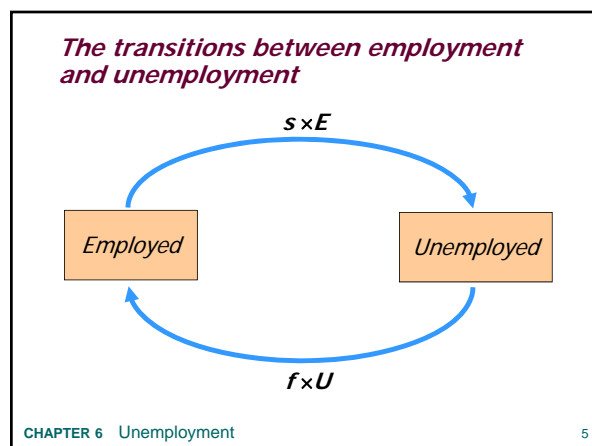
The steady state condition

- 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

$$f \times U = s \times E$$
$$= s \times (L - U)$$
$$= s \times L - s \times U$$

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:

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

Policy implication

- A policy will reduce the natural rate of unemployment only if it lowers **s** or increases **f**.

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
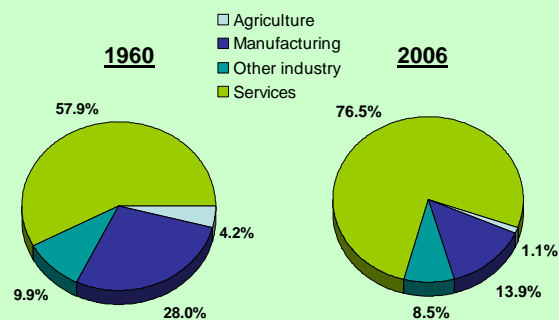 - flow of information about vacancies and job candidates is imperfect

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
- These scenarios result in frictional unemployment

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CASE STUDY:
Structural change over the long run

- Agriculture
- Manufacturing
- Other industry
- Services

1960   **2006**

57.9%   76.5%

4.2%   1.1%

9.9%   13.9%

28.0%   8.5%

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%   2007: 16.2%

*In our dynamic economy,
smaller sectoral shifts occur frequently,
contributing to frictional unemployment.*

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Public policy and job search

Govt programs affecting unemployment include:

- *Govt 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.

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Unemployment insurance (UI)

- 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
  - the urgency of finding work
  - *f*
- Studies: The longer a worker is eligible for UI, the longer the duration of the average spell of unemployment.

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Benefits of UI

- 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.

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Why is there unemployment?

The natural rate of unemployment: $\dfrac{U}{L} = \dfrac{s}{s+f}$
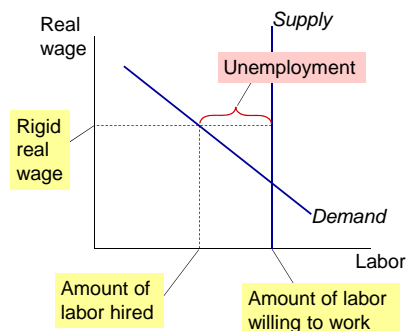
- Two reasons why $f < 1$:

DONE ✓ **1.** job search

Next ➔ **2.** wage rigidity

Unemployment from real wage rigidity

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

Real wage · *Supply* · Unemployment · Rigid real wage · *Demand* · Labor

Amount of labor hired

Amount of labor willing to work

Unemployment from real wage rigidity

If real wage is stuck above its 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.

Reasons for wage rigidity

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

1. The minimum wage

- The min. wage may exceed the eq'm wage of unskilled workers, especially teenagers.
- Studies: a 10% increase in min. wage reduces teen unemployment by 1-3%
- But, the min. wage cannot explain the majority of the natural rate of unemployment, as most workers' wages are well above the min. 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.

Union membership and wage ratios by industry, 2008

industry	# employed (1000s)	U % of total	wage ratio
Private sector (total)	108,073	7.6%	123.2
Government (total)	21,305	36.8	120.5
Construction	7,652	15.6	151.8
Mining	776	6.9	102.1
Manufacturing	15,131	11.4	108.6
Retail trade	14,987	5.2	106.6
Transportation	4,639	21.3	126.3
Finance, insurance	6,536	1.3	88.7
Professional services	11,967	2.1	97.4
Education	3,657	13.8	117.1
Health care	15,184	8.0	116.0

wage ratio = 100×(union wage)/(nonunion wage)   slide 24

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3. Efficiency wage theory

- 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.
- Result: structural unemployment.

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NOW YOU TRY:
Question for Discussion

- Use the material we've just covered to come up with a policy or policies
  to try to reduce the natural rate of unemployment.
- Note whether your policy targets frictional or structural unemployment.
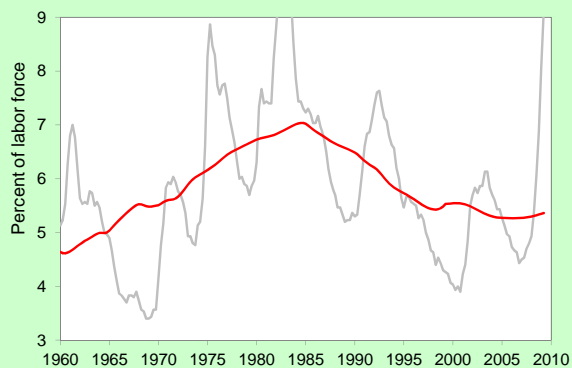

The duration of U.S. unemployment,
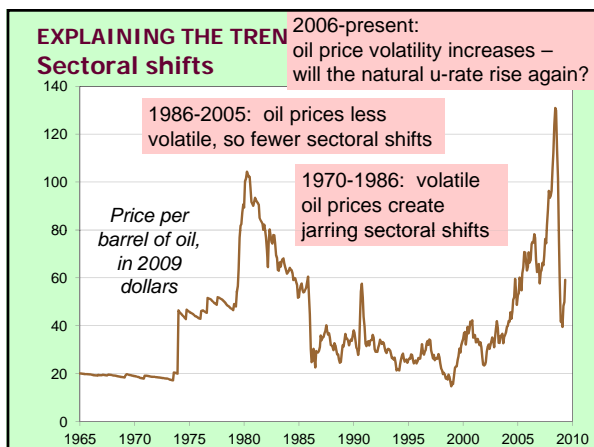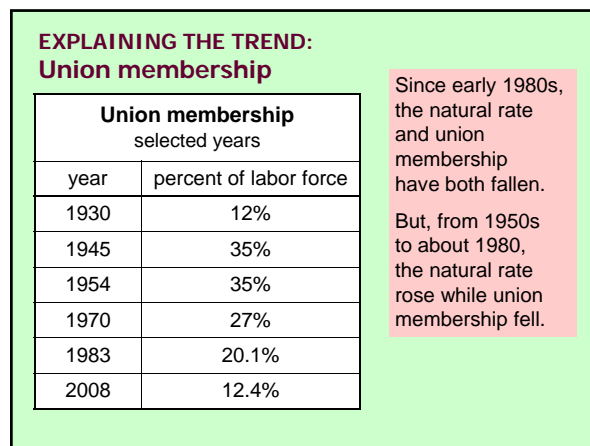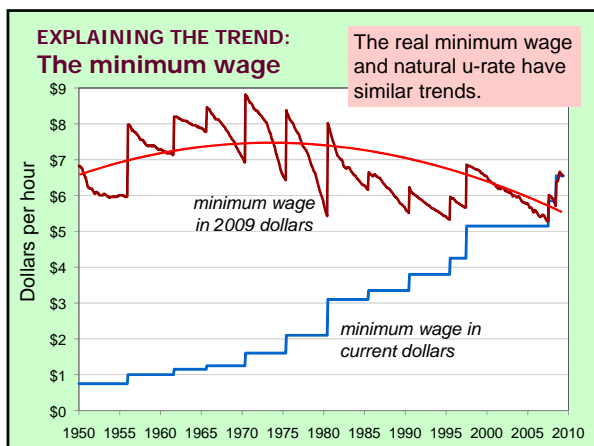*average, Jan 1960 – June 2009*

# of weeks unemployed	# of unemployed persons in group (% of all unemployed persons)	time spent unemployed by this group (% of time spent unemployed by all groups)
1-4	42%	8.1%
5-14	30%	21.5%
15 or more	27%	70.4%

The duration of unemployment

- The data:
  - More spells of unemployment are short-term than medium-term or long-term.
  - Yet, most of the total time spent unemployed is attributable to the long-term unemployed.
- This long-term unemployment is probably structural and/or due to sectoral shifts among vastly different industries.
- Knowing this is important because it can help us craft policies that are more likely to work.

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TREND: The natural rate rises over 1960-84, then falls over 1985-2005

EXPLAINING THE TREND:
The minimum wage

The real minimum wage and natural u-rate have similar trends.

minimum wage in 2009 dollars

minimum wage in current dollars

EXPLAINING THE TREND:
Union membership

Union membership selected years	
year	percent of labor force
1930	12%
1945	35%
1954	35%
1970	27%
1983	20.1%
2008	12.4%

Since early 1980s, the natural rate and union membership have both fallen.

But, from 1950s to about 1980, the natural rate rose while union membership fell.

EXPLAINING THE TREN
Sectoral shifts

2006-present: oil price volatility increases – will the natural u-rate rise again?

1986-2005: oil prices less volatile, so fewer sectoral shifts

1970-1986: volatile oil prices create jarring sectoral shifts

*Price per barrel of oil, in 2009 dollars*

EXPLAINING THE TREND:
Demographics

- 1970s:
  The Baby Boomers were young.
  Young workers change jobs more frequently (high value of *s*).

- Late 1980s through today:
  Baby Boomers aged. Middle-aged workers change jobs less often (low *s*).

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Unemployment in Europe, 1960-2008

Percent of labor force

— France
— Germany
— Italy
— U.K.
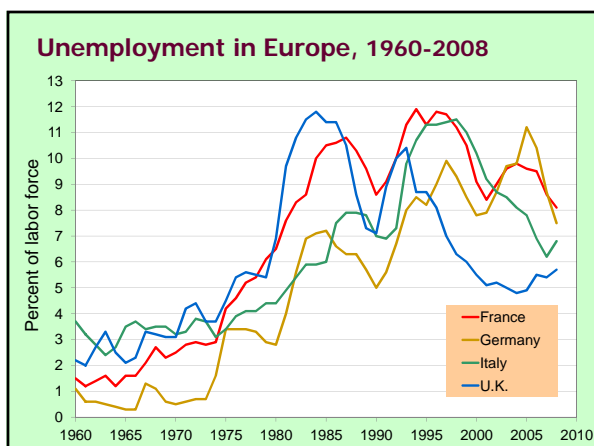
Why unemployment rose in Europe but not the U.S.

Shock
Technological progress has shifted labor demand from unskilled to skilled workers in recent decades.

Effect in United States
An increase in the "skill premium" – the wage gap between skilled and unskilled workers.

Effect in Europe
Higher unemployment, due to generous govt benefits for unemployed workers and strong union presence.

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Percent of workers covered by collective bargaining, selected countries

United States	18%
United Kingdom	47
Switzerland	53
Spain	68
Sweden	83
Germany	90
France	92
Austria	98

Chapter Summary

1. The natural rate of unemployment
   - definition: 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
   - caused by: minimum wage, unions, efficiency wages
4. Duration of unemployment
   - most spells are short term
   - but most weeks of unemployment are attributable to a small number of long-term unemployed persons

Chapter Summary

5. Behavior of the natural rate in the U.S.
   - rose from 1960 to early 1980s, then fell
   - possible explanations:
     trends in real minimum wage,
     union membership, prevalence of sectoral shifts, and aging of the Baby Boomers

Chapter Summary

6. European unemployment
   - has risen sharply since 1970
   - probably due to generous unemployment benefits, strong union presence, and a technology-driven shift in demand away from unskilled workers