Macroeconomics

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Unemployment and the Labor Market

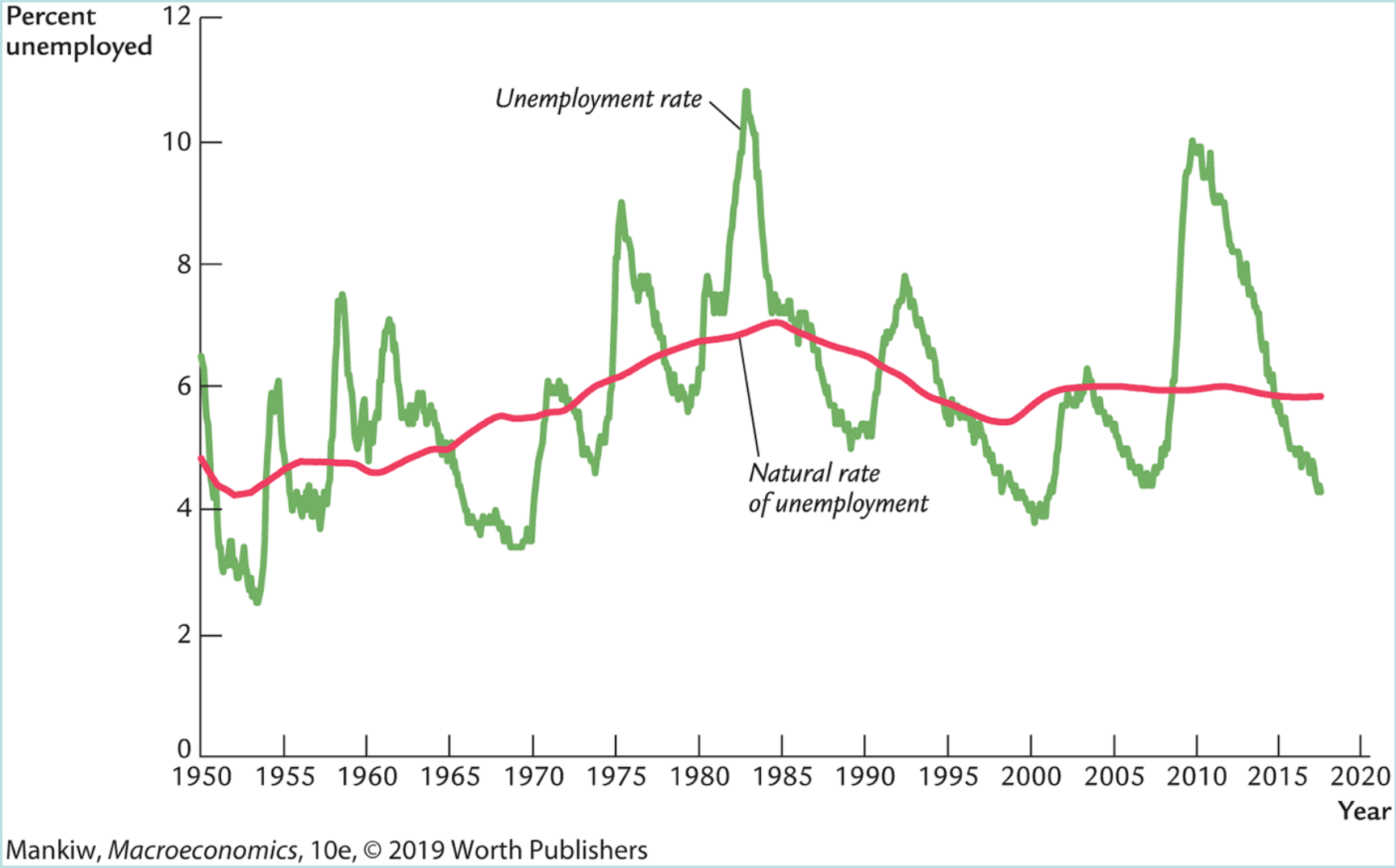
Presentation Slides

IN THIS CHAPTER, YOU WILL LEARN:

…about the natural rate of unemployment:

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

Actual and natural rates of unemployment, U.S., 1950–2017



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7.1 Job Loss, Job Finding, and the Natural Rate of 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.

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.

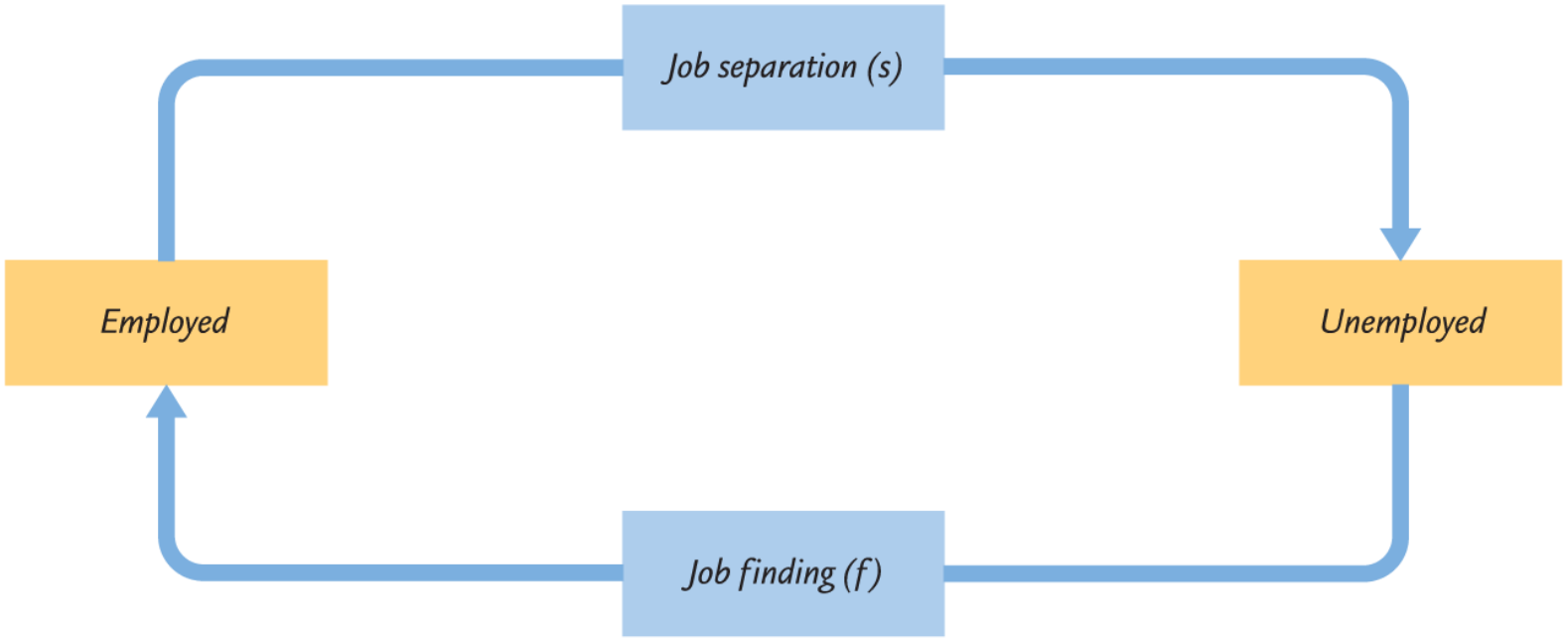
2. During any given month,

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

   f = **rate of job finding**, 找到工作的比例
   fraction of unemployed workers
   that find jobs

   s and ***f*** are exogenous

The transitions between employment and unemployment



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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***.

$$P(X=k)=(1-p)^{k-1}\cdot p$$

- The idea of average duration of unemployment

(Hint: Geometric distribution with parameter ***f***)

- Suppose f=0.2, then the average duration of unemployment is 5-month.

7.2 Job Search and Frictional Unemployment

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

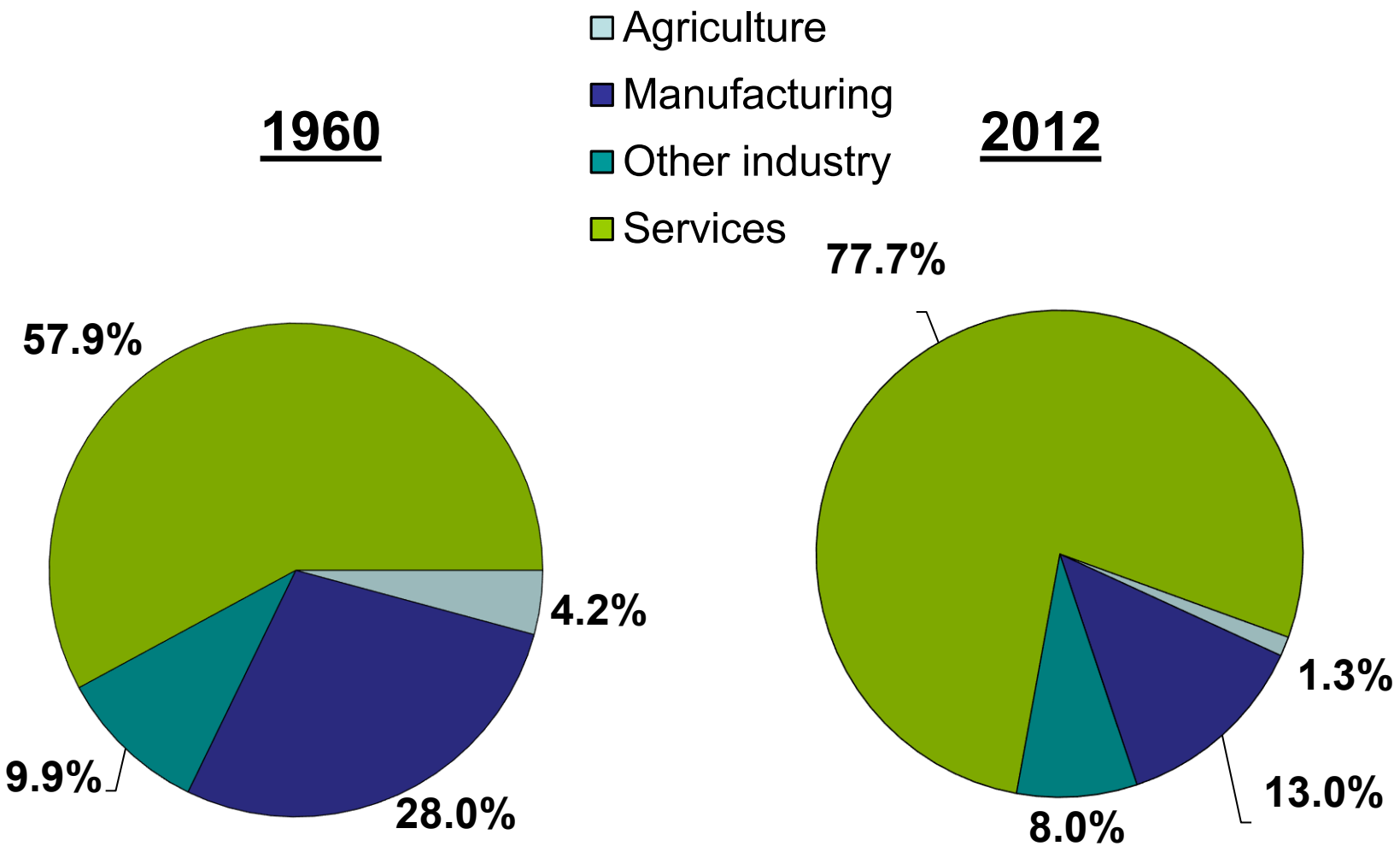
Job search & frictional unemployment

- **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

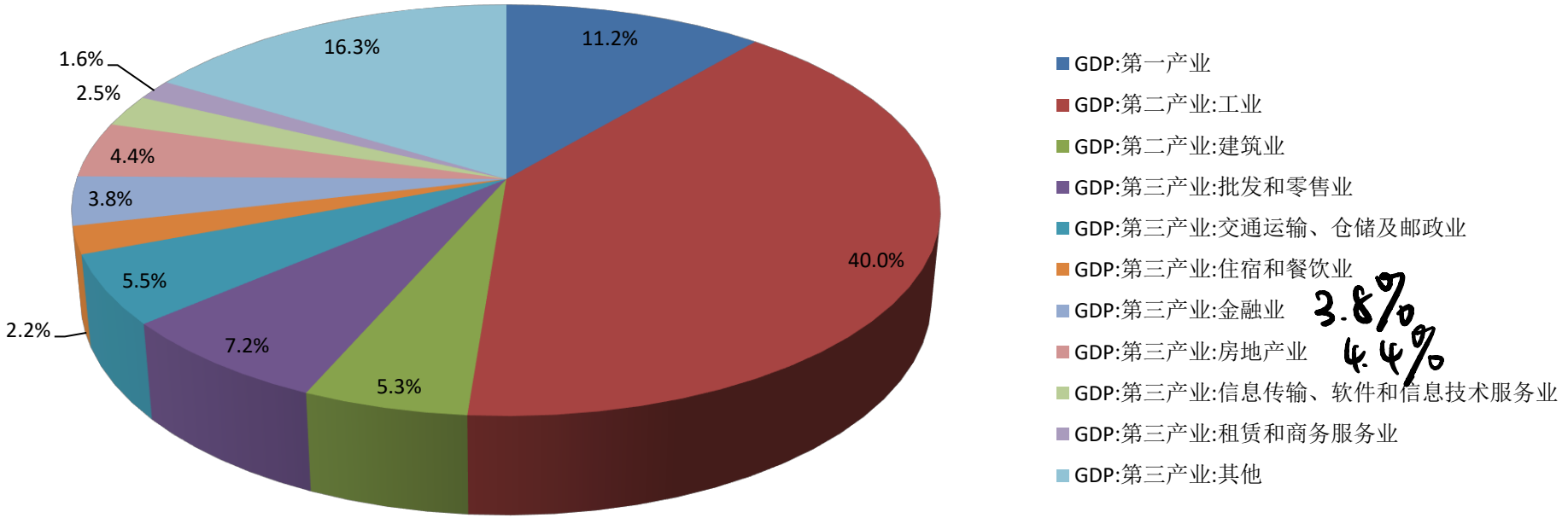
Sectoral shifts

- 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

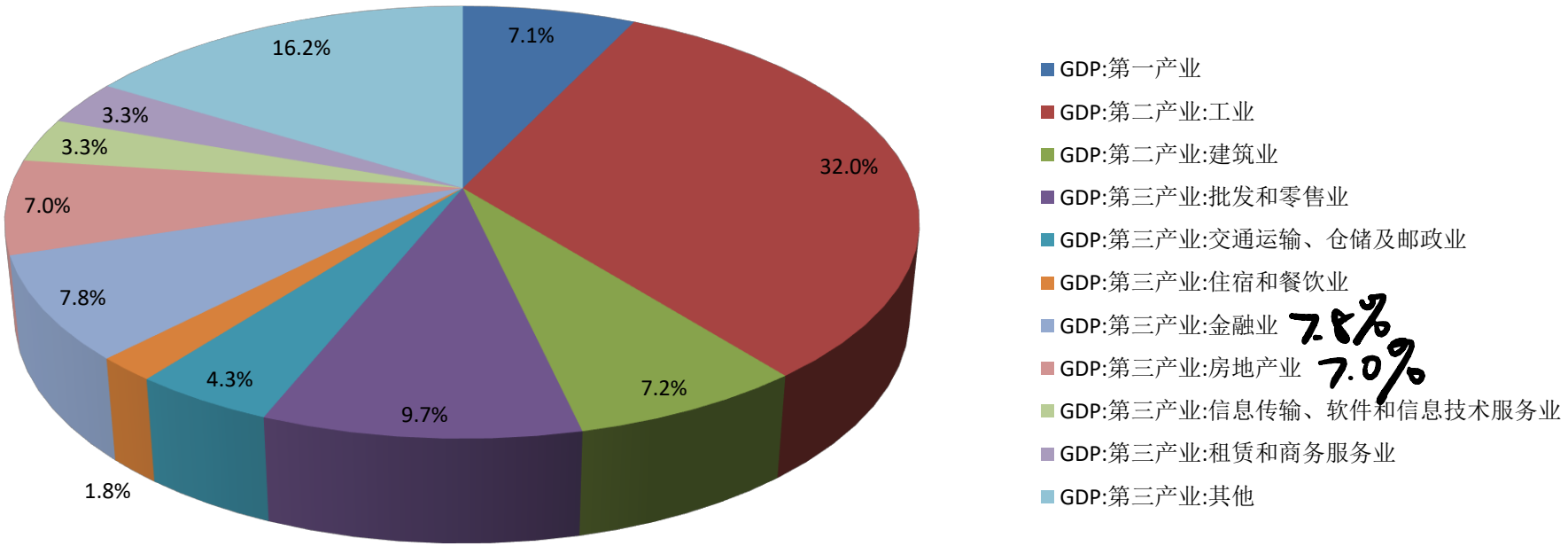
US GDP:
Structural change over the long run



China's GDP in 2005



China's GDP in 2019



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

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

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.

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 frictional 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 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 would lead 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 $f < 1$:

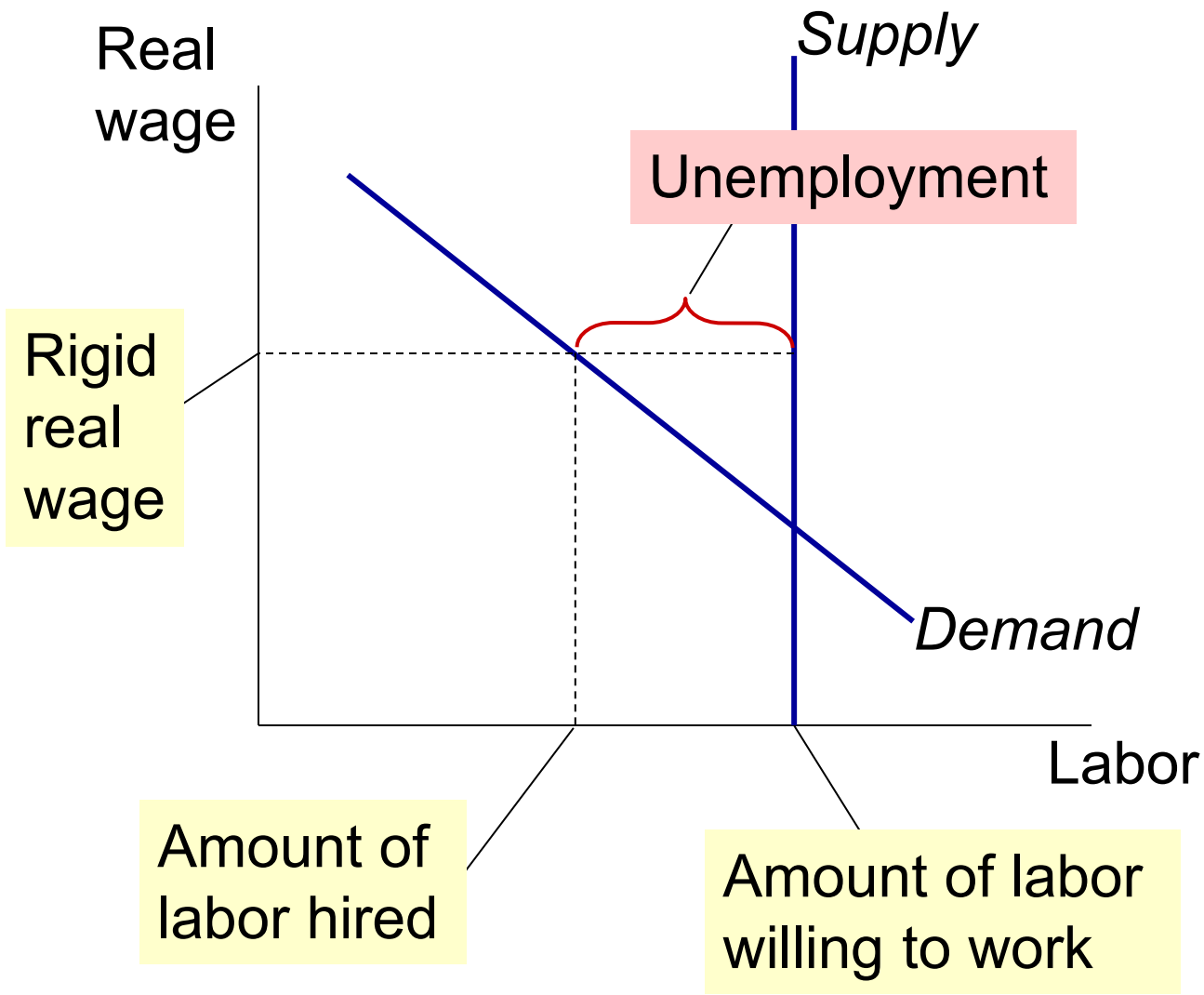
DONE ✓ **1.** job search

Next ➔ **2.** wage rigidity

7.3 Real-Wage Rigidity and Structural Unemployment

Unemployment from real wage rigidity

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



Unemployment from real wage rigidity

If real wage is stuck above its eq'm level, 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. Minimum-wage laws

- The min. wage may exceed the eq'm wage of unskilled workers, especially teenagers.
- Studies: a 10% increase in min. wage reduces teen employment 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, 2013

industry	*# employed (1000s)*	*U % of total*	*wage ratio*
Private sector (total)	104,737	6.9	122.6
Government (total)	20,450	37.0	121.1
Construction	6,244	14.0	151.7
Mining	780	7.2	96.4
Manufacturing	13,599	10.5	107.2
Retail trade	14,582	4.9	102.4
Transportation	4,355	20.4	123.5
Finance, insurance	6,111	1.1	90.2
Professional services	12,171	2.1	99.1
Education	4,020	13.0	112.6
Health care	15,835	7.5	114.9

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

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.
- Result: structural unemployment.

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.

Exercise

- **6.** Suppose that a country experiences a reduction in productivity—that is, an adverse shock to the production function.
- **a.** What happens to the labor demand curve?
- **b.** How would this change in productivity affect the labor market—that is, employment, unemployment, and real wages—if the labor market is always in equilibrium?
- **c.** How would this change in productivity affect the labor market if unions prevent real wages from falling?

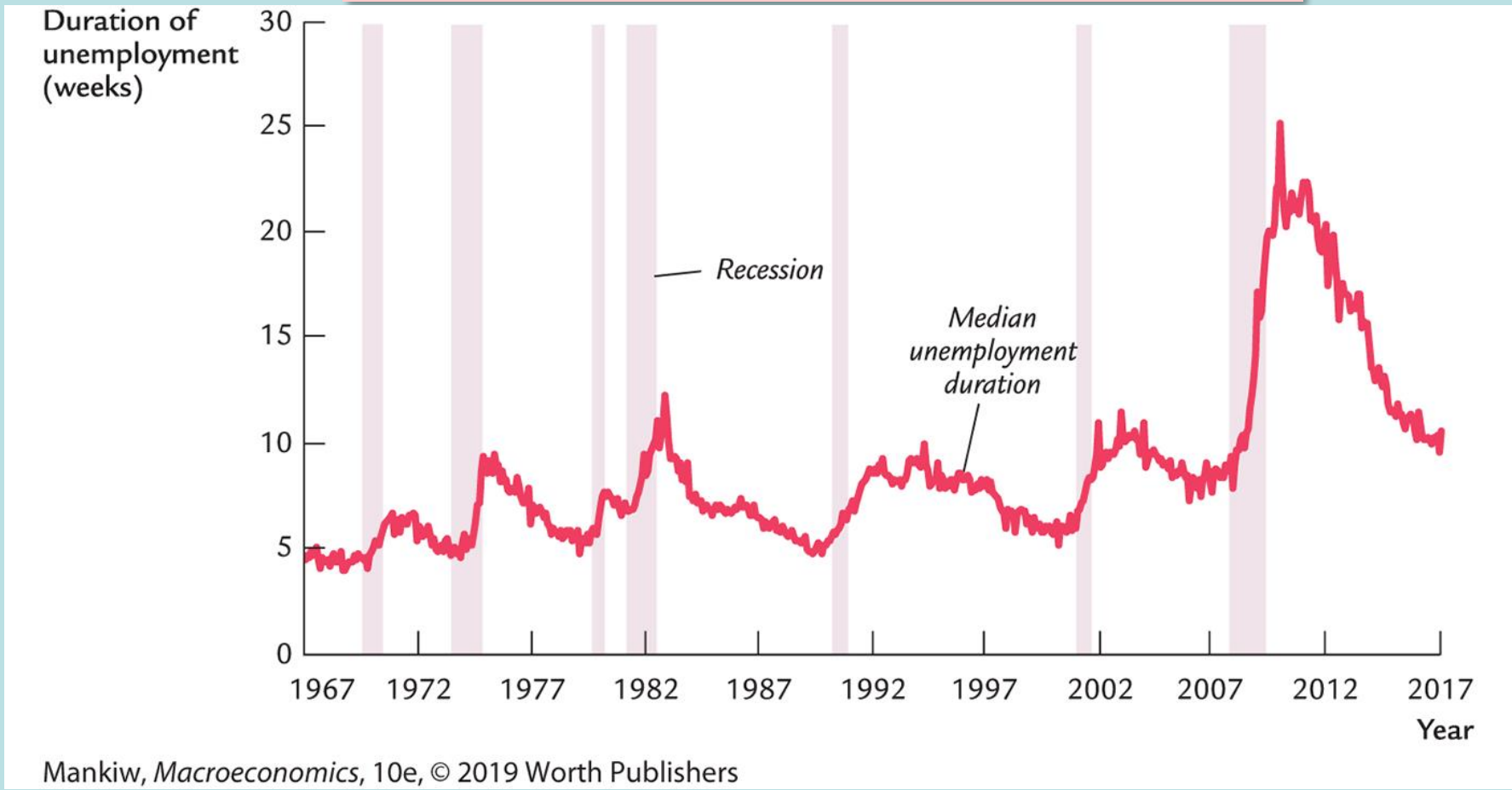
7.4 Labor-Market Experience: The United States

Labor market in the US

- The duration of unemployment
- Trend of the natural rate of unemployment
- Variation in the unemployment rate across demographic groups
- Transitions into and out of the labor force

The Median Duration of Unemployment

The duration of unemployment typically rises in recessions—but its rise in 2008–2010 is unprecedented.



Variation in the Unemployment Rate Across Demographic Groups

Table 7-2 Unemployment Rate by Demographic Group, 2016

Age	White Men	White Women	Black Men	Black Women
16–19	14.9	13.2	30.9	22.8
20–24	8.0	6.3	17.0	12.3
25–54	3.6	3.7	7.3	7.0

Data from: Bureau of Labor Statistics.

Discouraged workers

- **discouraged workers**: workers who have given up on looking for a job and are considered out of the labor force

- **marginally attached workers**: persons *not* in the labor force who want and are available for work and who have looked for a job but have not *recently* looked for work
  - Discouraged workers are included in marginally attached workers.

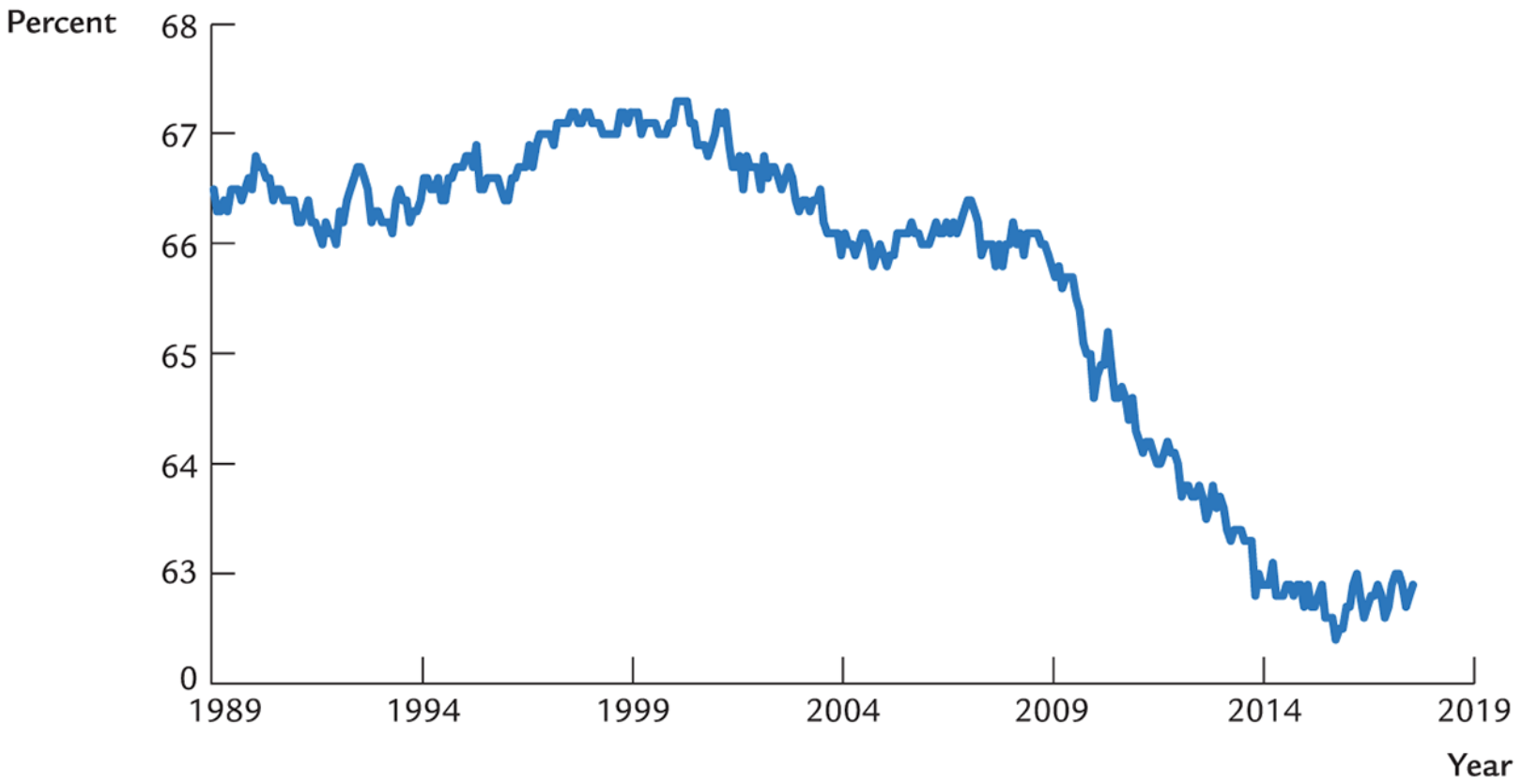
Transitions Into and Out of the Labor Force

- The model of the natural rate of unemployment assumes that the labor force is fixed.
- In fact, movements into and out of the labor force are important.
- About one-third of the unemployed have only recently entered the labor force.
- In addition, not all unemployment ends with job finding: almost half of all spells of unemployment end in the unemployed person's withdrawal from the labor market.

Other measures of unemployment

Variable	Description	Rate
U-1	Persons unemployed 15 weeks or longer, as a percent of the civilian labor force (includes only very long-term unemployed)	1.7
U-2	Job losers and persons who have completed temporary jobs, as a percent of the civilian labor force (excludes job leavers)	2.1
U-3	Total unemployed, as a percent of the civilian labor force (official unemployment rate)	4.3
U-4	Total unemployed, plus discouraged workers, as a percent of the civilian labor force plus discouraged workers	4.7
U-5	Total unemployed plus all marginally attacehd workers, as a percent of the civilian labor force plus all marginally attached workers	5.3
U-6	Total unemployed, plus all marginally attached workers, plus total employed part time for economic reasons, as a percent of the civilian labor force plus all marginally attached workers	8.6

Labor force participation



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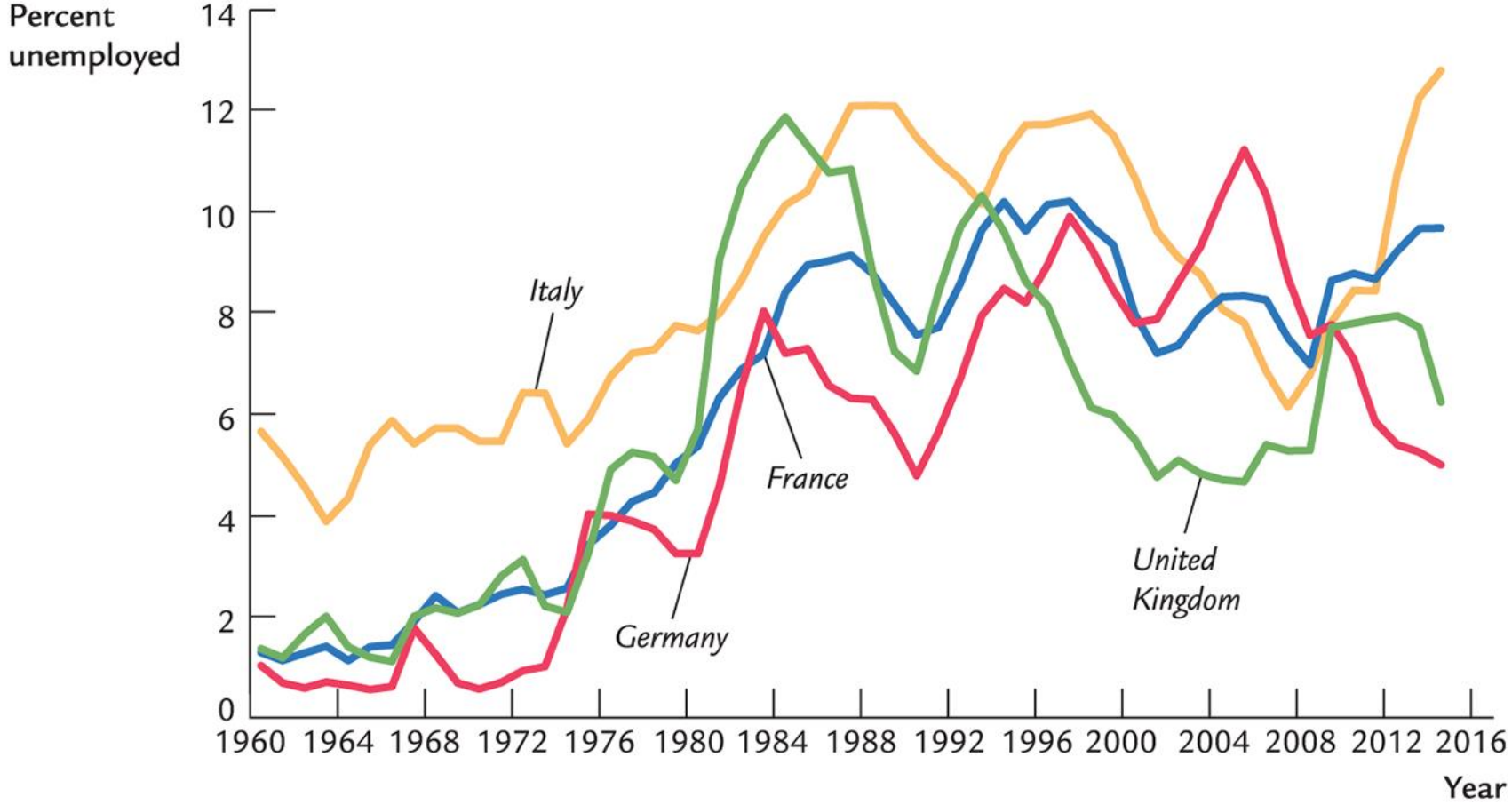
7.5 Labor-Market Experience: Europe

Labor market in Europe

- The Rise in European Unemployment
- Unemployment Variation Within Europe
- The Rise of European Leisure

Unemployment in Europe, 1960–2013



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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.

Percent of workers covered by collective bargaining, selected countries

Turkey	7%
South Korea	12
United States	12
Poland	15
Japan	17
Israel	26
Canada	29
United Kingdom	30
Greece	42
Switzerland	49
Germany	58
Australia	60
Spain	78
Italy	80
Netherlands	85
Sweden	89
Belgium	96
France	98

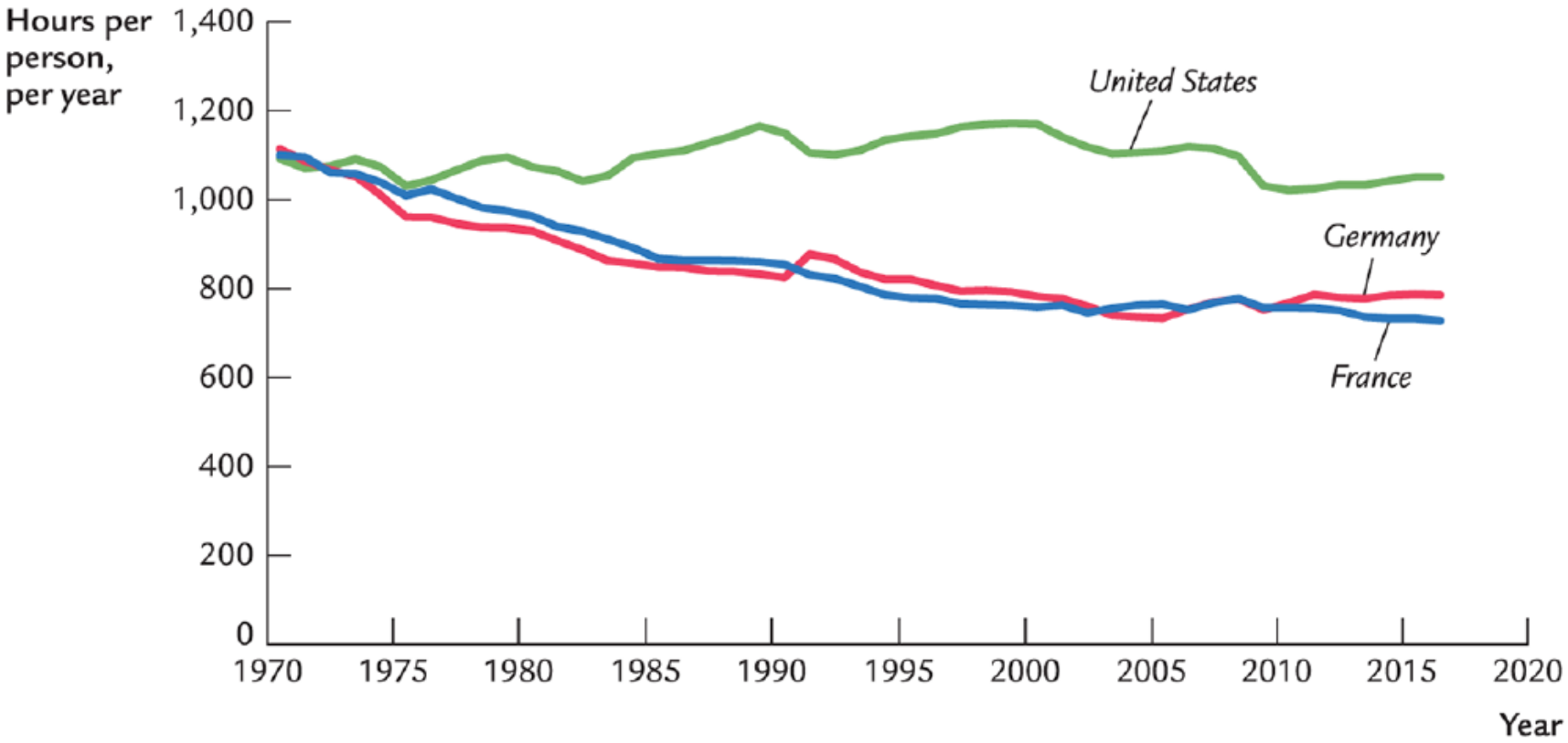

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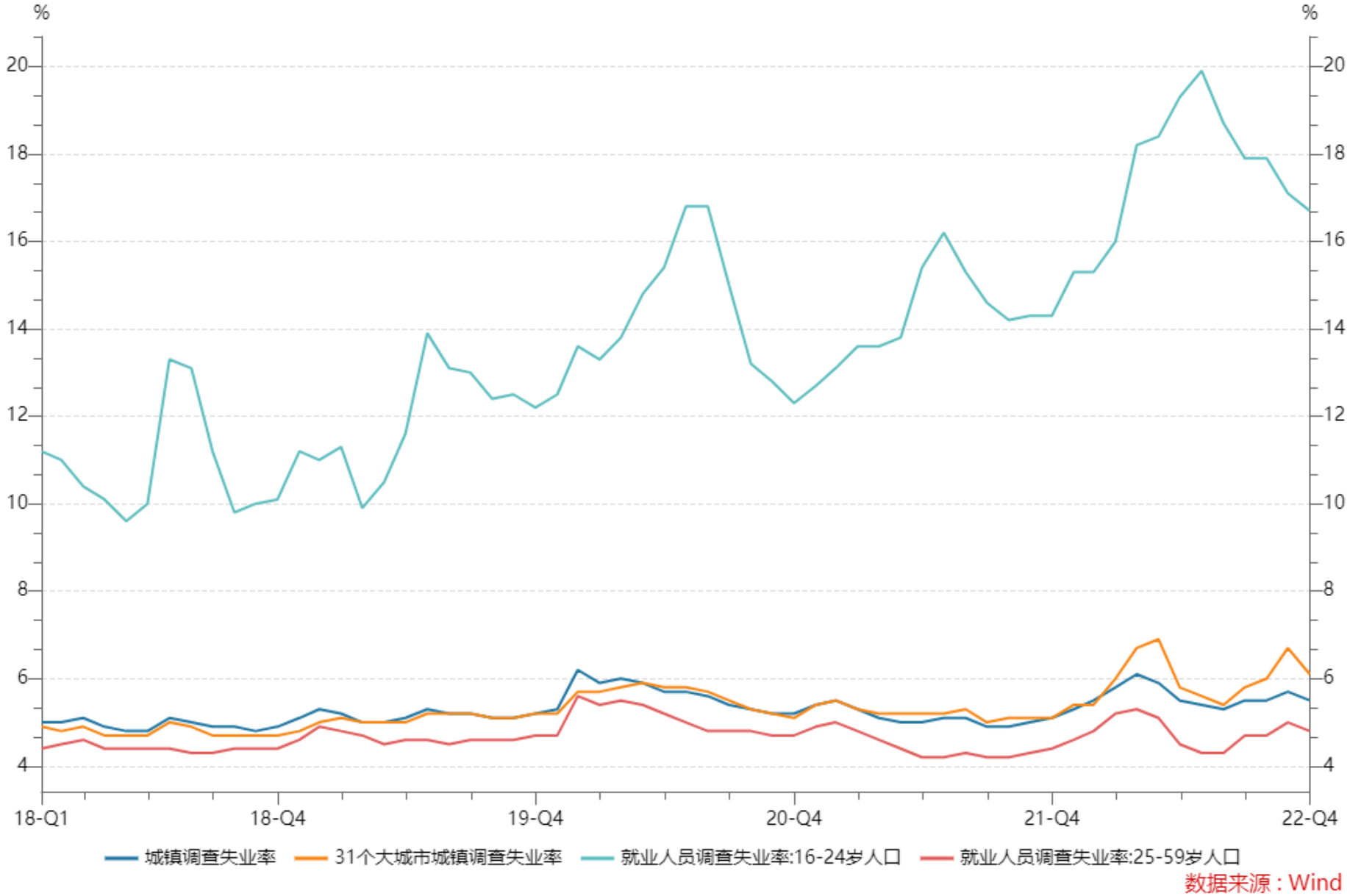
FIGURE 7-7 Annual Hours Worked per Person Over time, many Europeans have substantially reduced the number of hours they work, while typical Americans have not.

Data from: OECD and Bureau of Labor Statistics. Calculated as the average annual hours actually worked per employed person multiplied by the employment rate.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18-Q1
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19-Q4
20-Q4
21-Q4
22-Q4
城镇调查失业率
31个大城市城镇调查失业率
就业人员调查失业率:16-24岁人口
就业人员调查失业率:25-59岁人口

数据来源：Wind

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