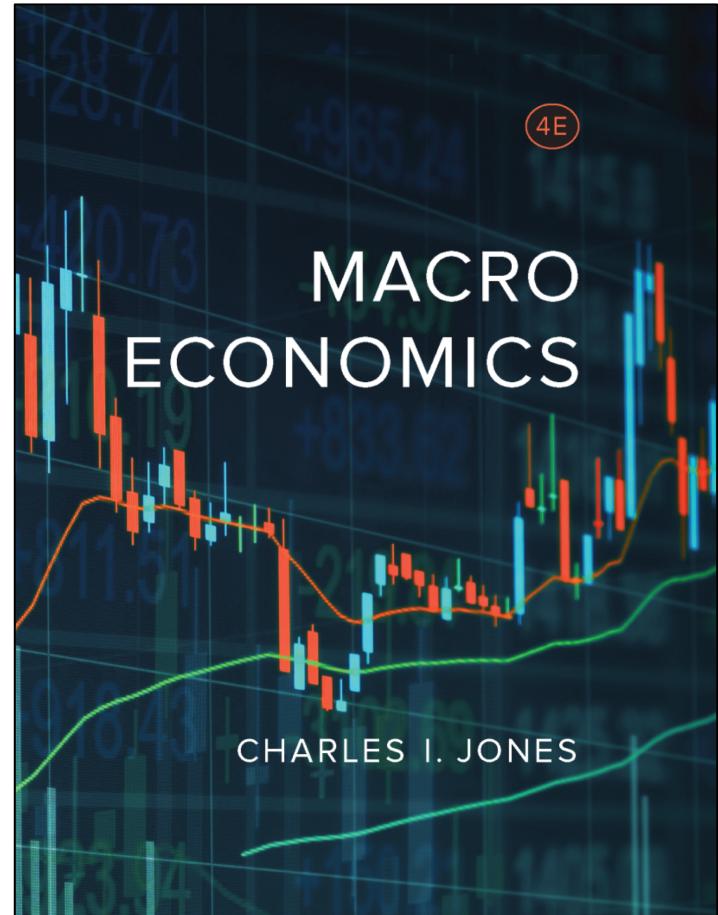


Chapter 7

The Labor Market, Wages, and Unemployment



Emily Marshall, Dickinson College
Revised, Expanded, and Updated by Simeon Alder
U of Wisconsin - Madison

7.1 Introduction

- In this chapter, we learn:
 - How a supply-and-demand model helps us understand the labor market
 - What the bathtub model of unemployment is
 - Why the return to a college education has risen enormously over the last half-century

7.2 The U.S. Labor Market

- In the U.S. labor market
 - Wages account for two-thirds of per capita GDP
 - Average wages have grown 2 percent per year for the last century
 - The employment-population ratio:
 - Fraction of the civilian population over the age of 16 that is working
 - has been increasing over time (woman ↑ work) -
 - decreases during recessions
- medium wage not ↑
↑ income share
distribution.

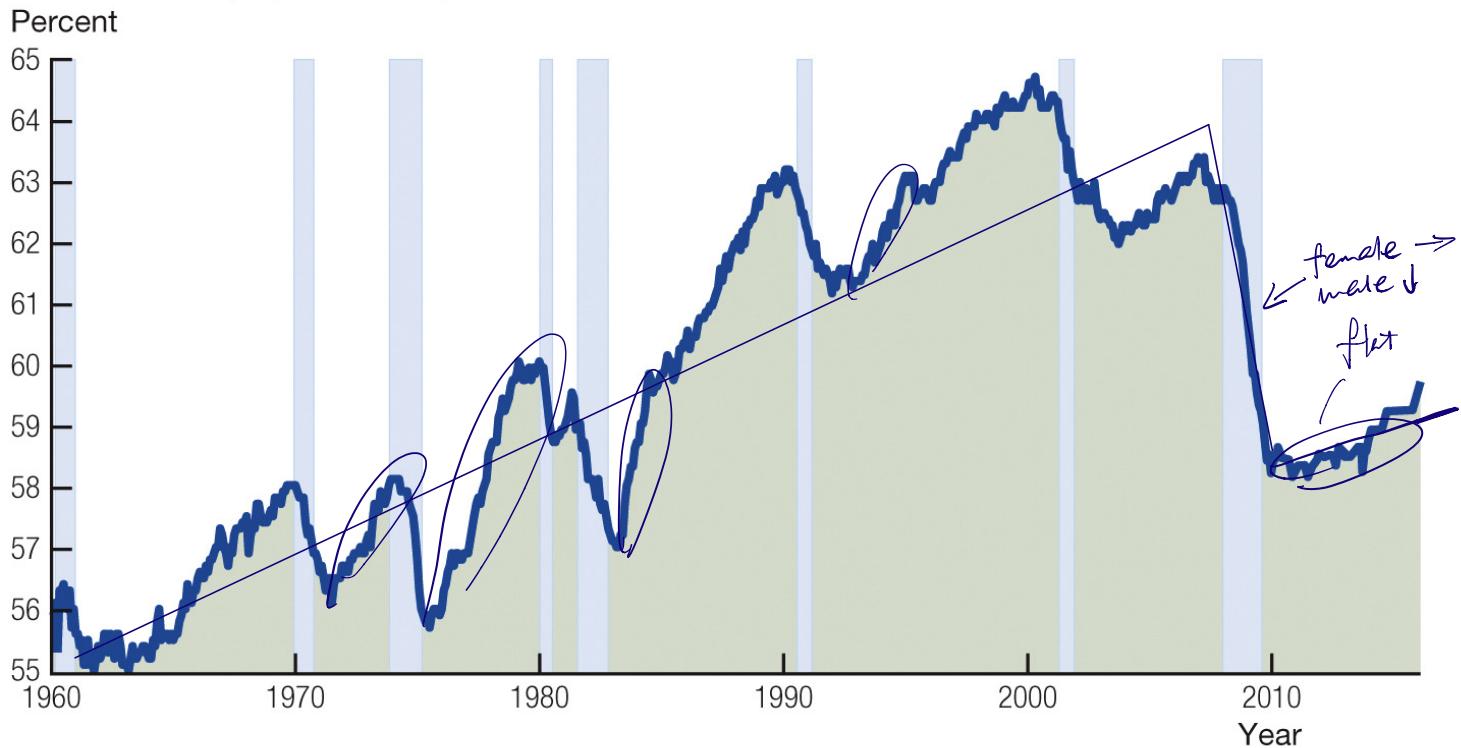
$$\frac{\text{employment}}{\text{population}} = \frac{\text{emp}}{\text{W.A.P}} \cdot \frac{\text{W.A.P}}{\text{pop}} = \frac{\text{emp}}{\text{labour force}} \cdot \frac{\text{labour force}}{\text{W.A.P}} \cdot \frac{\text{W.A.P}}{\text{pop}}$$

↑
change reason: ~~would~~ be ↑ woman in jobs.

positively working.

Ratio of Employment to Population in the United States, 1960–2016

The Ratio of Employment to Population in the United States, 1960–2016



The Composition of the U.S. Labor Force, September 2018

Table 7.1

The U.S. Labor Market

- The unemployment **rate** is the fraction of the labor force that is unemployed:

$$\text{unemployment rate} = \frac{\# \text{ of unemployed}}{\text{labor force}} \times 100$$

- A person is unemployed if she:

- does not have the job that pays a wage or salary.
- has actively looked for a job in the last 4 weeks
- is currently be available to work.

- Unemployment rate is based on survey of 60,000 households

(Current Population Survey by U.S. Census Bureau)

U.S. Labor Market Statistics

- Released monthly by Bureau of Labor Statistics (BLS)
- “Employment Situation” reports:
 - Employment status
 - Unemployment rate
 - ...
- URL:
<https://www.bls.gov/news.release/empsit.toc.htm>

Unemployment Rate(s) in the U.S.

UNITED STATES DEPARTMENT OF LABOR
BUREAU OF LABOR STATISTICS

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Economic News Release

Table A-15. Alternative measures of labor underutilization

HOUSEHOLD DATA

Table A-15. Alternative measures of labor underutilization

[Percent]

Measure	Not seasonally adjusted				Seasonally adjusted				
	Sept. 2017	Aug. 2018	Sept. 2018	Sept. 2017	May 2018	June 2018	July 2018	Aug. 2018	Sept. 2018
U-1 Persons unemployed 15 weeks or longer, as a percent of the civilian labor force	1.6	1.3	1.3	1.7	1.3	1.4	1.5	1.4	1.4
U-2 Job losers and persons who completed temporary jobs, as a percent of the civilian labor force	1.9	1.8	1.5	2.1	1.8	1.9	1.9	1.8	1.7
U-3 Total unemployed, as a percent of the civilian labor force (official unemployment rate)	4.1	3.9	3.6	4.2	3.8	4.0	3.9	3.9	3.7
U-4 Total unemployed plus discouraged workers, as a percent of the civilian labor force plus discouraged workers	4.3	4.2	3.8	4.4	4.0	4.3	4.2	4.1	3.9
U-5 Total unemployed, plus discouraged workers, plus all other persons marginally attached to the labor force, as a percent of the civilian labor force plus all persons marginally attached to the labor force	5.0	4.8	4.5	5.1	4.6	4.9	4.8	4.7	4.6
U-6 Total unemployed, plus all persons marginally attached to the labor force, plus total employed part time for economic reasons, as a percent of the civilian labor force plus all persons marginally attached to the labor force	8.0	7.4	7.1	8.3	7.6	7.8	7.5	7.4	7.5

NOTE: Persons marginally attached to the labor force are those who currently are neither working nor looking for work but indicate that they want and are available for a job and have looked for work sometime in the past 12 months. Discouraged workers, a subset of the marginally attached, have given a job-market related reason for not currently looking for work. Persons employed part time for economic reasons are those who want and are available for full-time work but have had to settle for a part-time schedule. Updated population controls are introduced annually with the release of January data.

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U.S. Bureau of Labor Statistics | Division of Labor Force Statistics, PSB Suite 4675, 2 Massachusetts Avenue, NE Washington, DC 20212-0001

www.bls.gov/CPS | Telephone: 1-202-691-6378 | [Contact CPS](#)

U.S. Bureau of Labor Statistics | Division of Current Employment Statistics, PSB Suite 4860, 2 Massachusetts Avenue, NE Washington, DC 20212-0001

www.bls.gov/CES | Telephone: 1-202-691-6555 | [Contact CES](#)

Unemployment Rate(s) in the U.S.

U-1

U-2

U-3

U-4

U-5

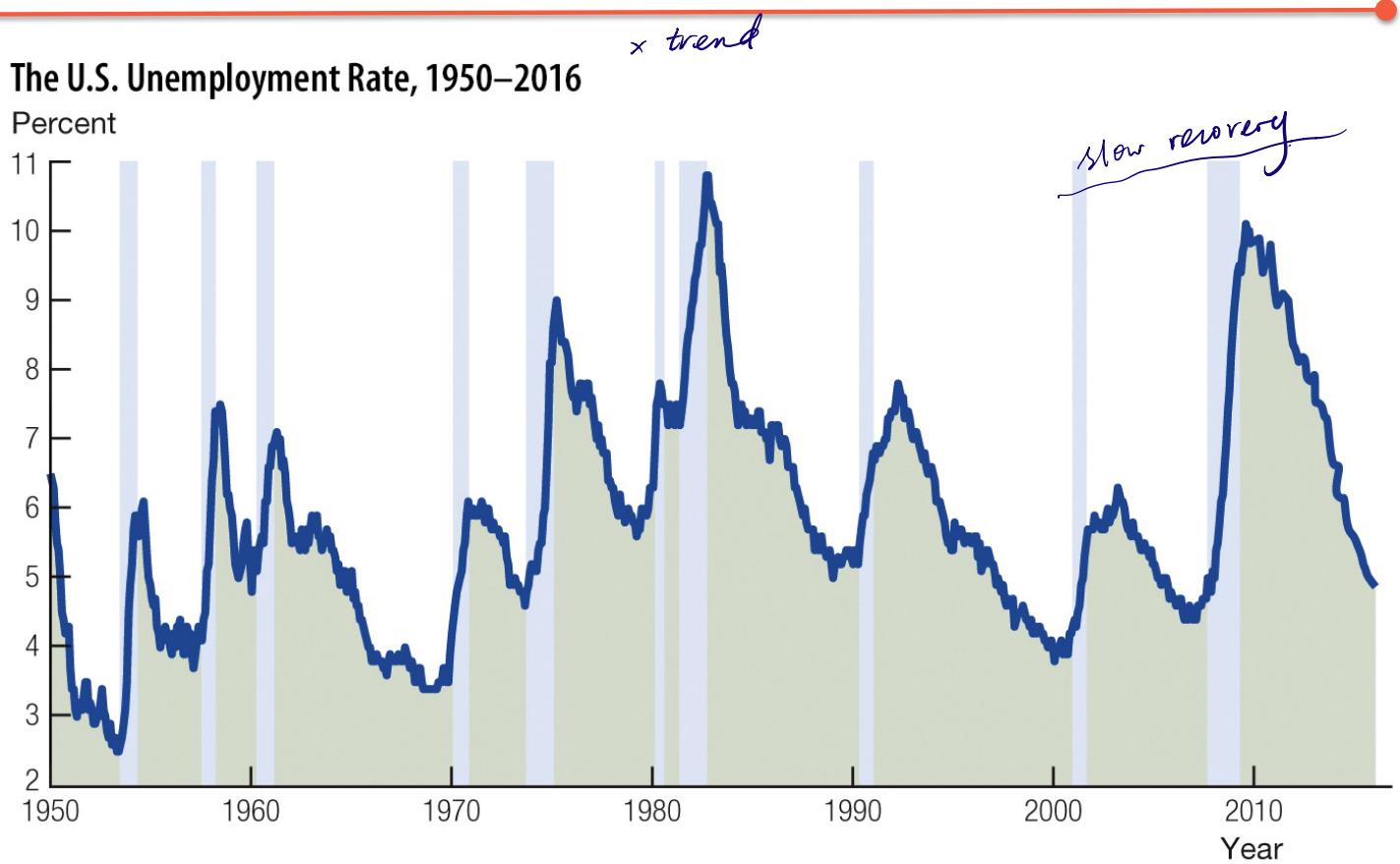
U-6

unemployment rate.

Unemployment Rate(s) in the U.S.

- **The** unemployment rate is one of many rates released by Bureau of Labor Statistics / Census
- Technically, it's called **U-3**
- Other rates are more comprehensive:
 - **U-4:** Total unemployed plus **discouraged workers**, as a percent of the civilian labor force plus discouraged workers
 - ↓ subset of *(know why stop looking)*
 - x look for work in past 4 weeks*
 - **U-5:** Total unemployed, plus discouraged workers, plus all other persons **marginally attached** to the labor force, as a percent of the civilian labor force plus all persons marginally attached to the labor force
 - don't know why stop working - previous month*
 - but look for ... in 12 month*
 - **U-6:** Total unemployed, plus all persons marginally attached to the labor force, plus total **employed part time for economic reasons**, as a percent of the civilian labor force plus all persons marginally attached to the labor force

U.S. Unemployment Rate, 1950–2016



The Dynamics of the Labor Market

- 1) For most people, periods of unemployment are relatively short.
- 2) However, at any point in time a significant fraction unemployed workers have been out of work for more than 6 months!

The Dynamics of the Labor Market

How can ① ② both true?

Numerical E.g.

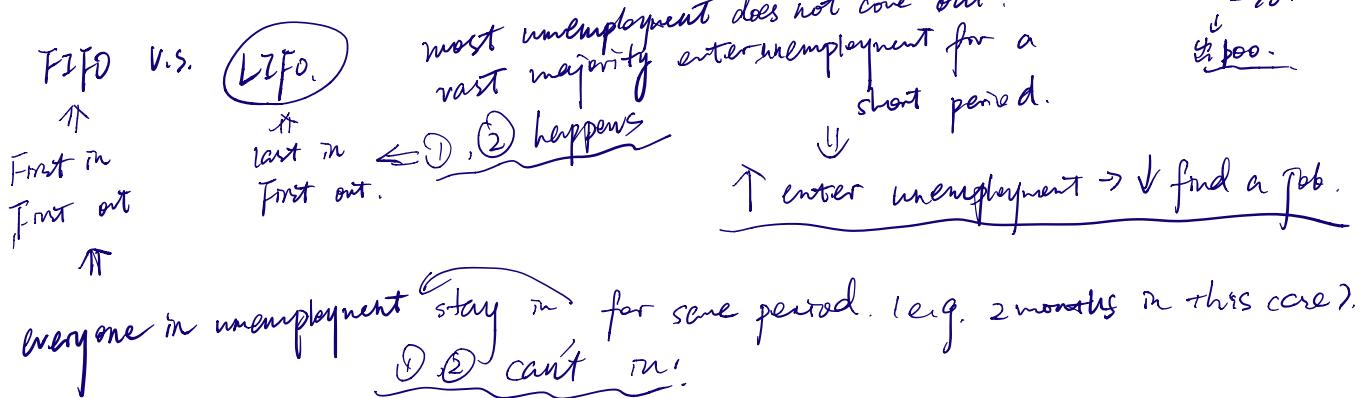
Each month, 100 workers enter unemployment.

→ 50% of all unemployed find a job. \Rightarrow rate \downarrow stock \uparrow .

average number of unemployed workers \rightarrow inflow = outflow.

$$\text{eg. } 20 + 100, \underline{\underline{30 + 100}}.$$

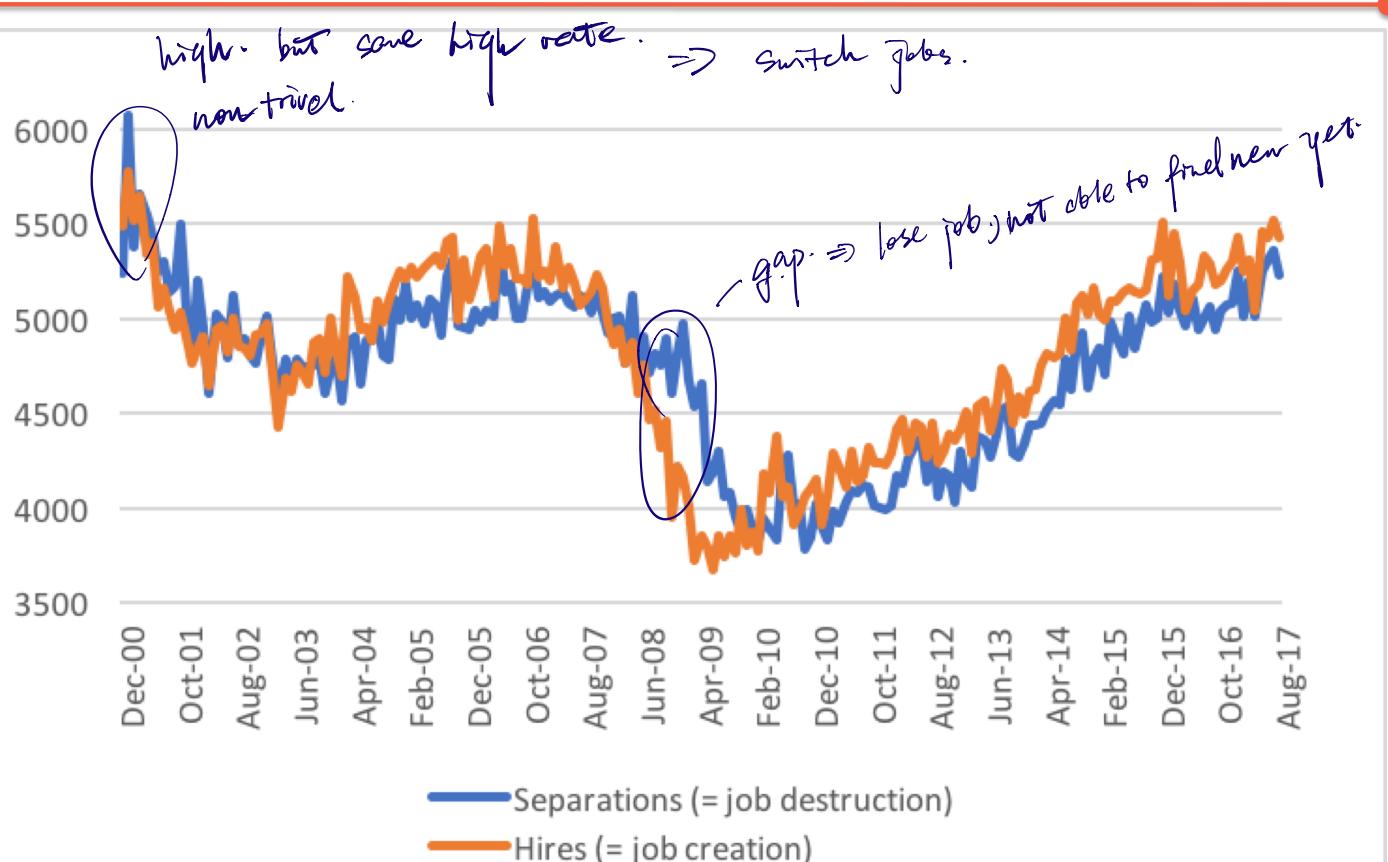
$$\begin{array}{c} \downarrow \\ -50\% \\ \hline \underline{\underline{50}} \end{array}$$



The Dynamics of the Labor Market

- Many countries have developed social safety nets (e.g. unemployment insurance)
- Job creation and job destruction occur each month in the United States

Job Creation and Destruction in the U.S. (in thousands)



Case Study: Supply and Demand Shocks in the U.S. Labor Market

- Rise in employment-population ratio
 - Increase in female workers
*(WW II) → men on duty
US + industry*
women
married, have children.
young women
in labor before
2nd job, 3rd job
- Supply shocks:
 - Changes in social norms.
(especially for role of married women).
- Demand shock:
 - Reduced discrimination against women
- Rising unemployment in the 1960s and 1970s
 - Baby boomer generation entering the workforce
(on average, younger labor force)
tend to change jobs, turn over.
 - Supply shock:
 - Younger workers have higher unemployment rates
 - Change in age composition leads to rise in unemployment, followed by gradual decline.

Case Study: Supply and Demand Shocks in the U.S. Labor Market

future?

4 long-term trends

→ driving changes in the employment-population ratio

1. Rise in female labor force participation ($\frac{\text{employment}}{\text{population}}$)

2. slow and steady decline in male participation (video game 22%)

3. Retire of baby boomers

4. Demographic transition (drop in fertility and mortality rates),

immigration.

↑

long term trend.

↑ rich → ↓ fertility, mortality.

Different Kinds of Unemployment

- Cyclical unemployment:
 - Associated with short-run fluctuations in output
- The natural rate of unemployment:
 - Rate that would prevail with no cyclical unemployment
 - Frictional unemployment: workers between jobs in the dynamic economy
lose a job for a short period of time by topic of turning in economic institutional
 - Structural unemployment: labor market failure to match workers and firms.

actual employment = frictional + structural + cyclical

7.4 Bathtub Model of Unemployment

- Bathtub model
 - states how employment and unemployment evolve over time:

$$E_t + U_t = \bar{L}$$

where

- E_t : employment
- U_t : unemployment
- \bar{L} : labor force , constant over time.

Bathtub Model of Unemployment—1

where

$$\Delta U_{t+1} = \bar{s}E_t - \bar{f}U_t$$

unemployed people find their jobs.
employed people
who lose their jobs.

- ΔU_{t+1} : change in unemployment
- \bar{s} : job separation rate
- \bar{f} : job-finding rate

Bathtub Model of Unemployment—2

- Solving the model: steady state

- Set the change in unemployment to zero:

$$\begin{aligned} 0 &= \bar{s}E_t - \bar{f}U_t \\ &= \beta(\bar{L} - U_t) - \bar{f}U_t \\ &= \bar{s}\bar{L} - (\bar{f} + \bar{s})U_t. \end{aligned}$$

- Solve the equation for U:

$$U^* = \frac{\bar{s}\bar{L}}{\bar{f} + \bar{s}}$$

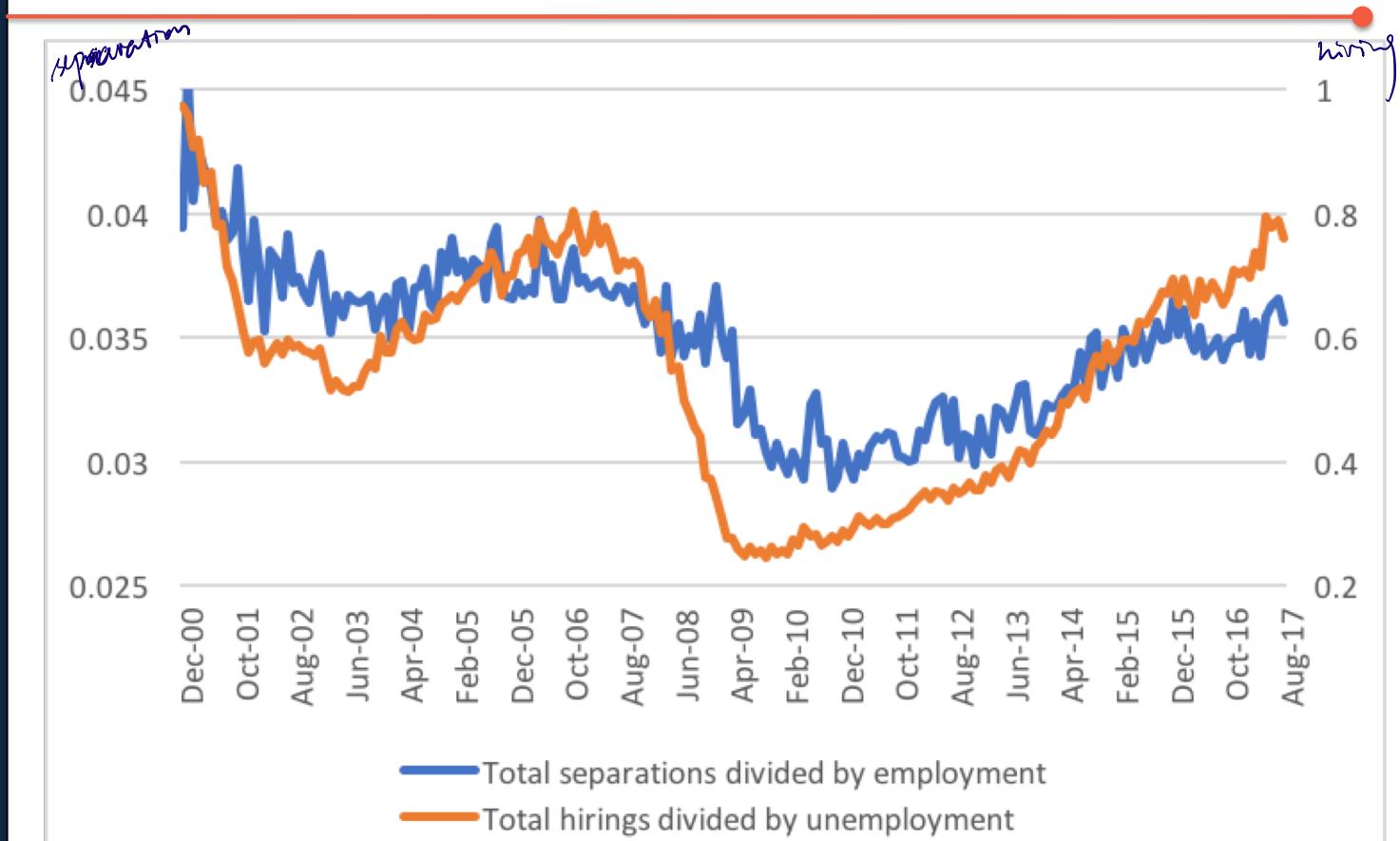
Bathtub Model of Unemployment—3

- The unemployment rate is:
 - the fraction of the labor force that is unemployed

$$u^* \equiv \frac{U^*}{\bar{L}} = \frac{\bar{s}}{\bar{f} + \bar{s}}$$

- To alter the natural rate of unemployment:
 - change the job-finding rate $f \uparrow$ $u^* \downarrow$
 - change the job separation rate. $\bar{s} \uparrow$ $u^* \uparrow$
- Policies along these lines can have unintended consequences

Job Creation and Destruction Rates in the U.S.



Using the Bathtub Model to Predict Future Unemployment

Alternate version of Bathtub model.

$$\Delta U_{t+1} = S_t E_t - f_t U_t$$

Flow consistent Unemployment ($F_C - U$) $F_C - U_t = \frac{f_t}{S_t + f_t}$
unemployment rate balance the inflow and outflow

↓
dip → turn around of unemployment rate.
recovery.

Sachin and Patterson

negative gaps between $F_C - U$
and U → indicator of
turnaround.

turnaround

Using the Bathtub Model to Predict Future Unemployment

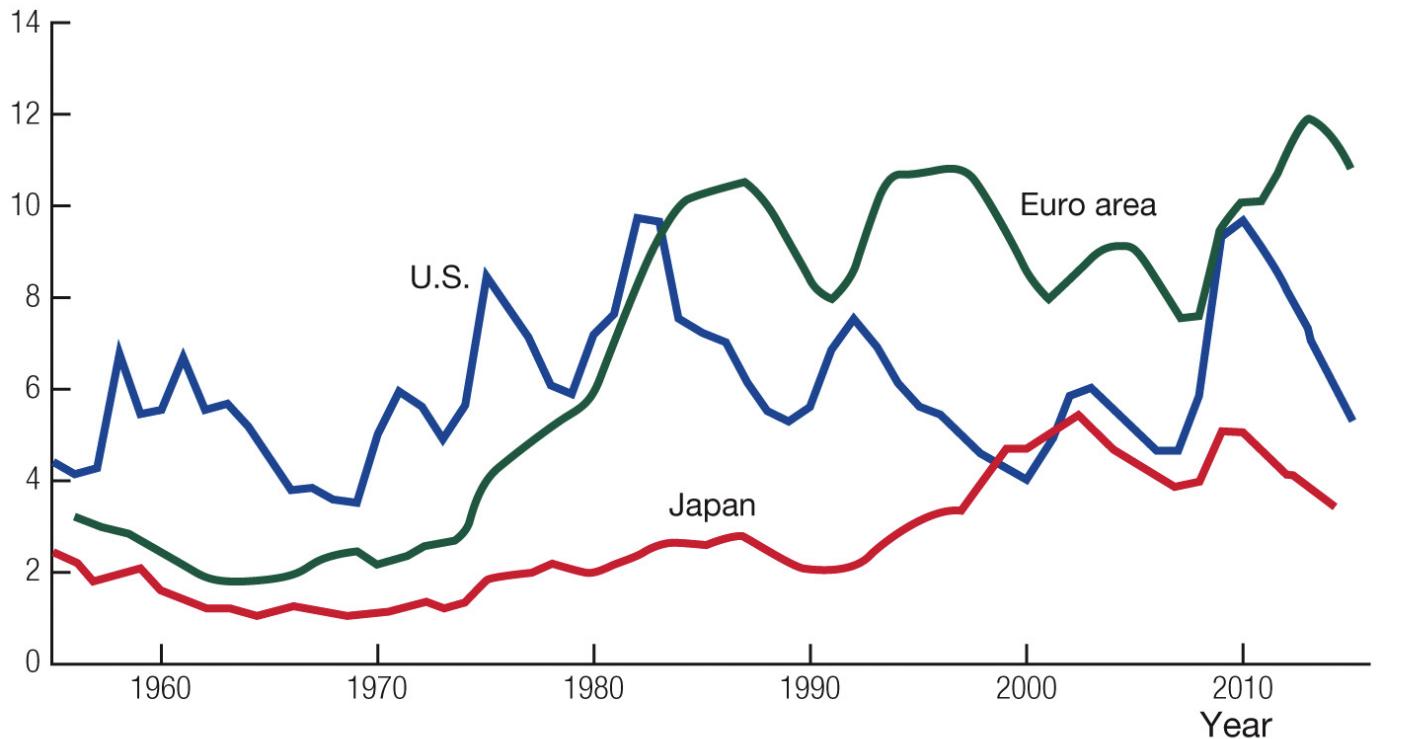
7.5 Labor Markets around the World

- Since 1980:
 - Unemployment in Europe is well above the rate in the United States
- European unemployment has increased because:
 - Adverse shocks (productivity slowdown, oil prices)
 - Inefficient labor market institutions. \Rightarrow ? unengaged workers.
 - generous welfare benefits.
 - more long-term unemployment.

Unemployment in the United States, Europe, and Japan, 1955–2015

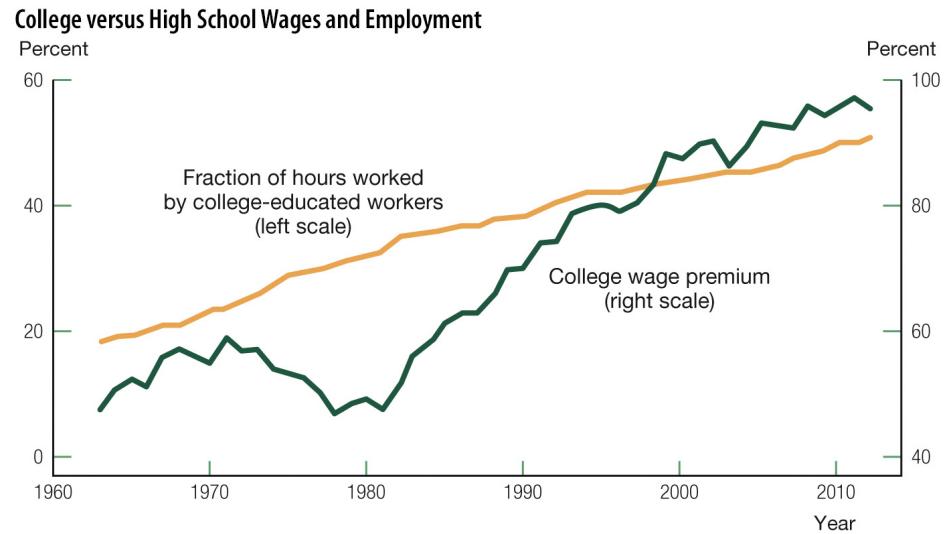
Unemployment in the United States, Europe, and Japan, 1955–2015

Percent



7.7 The Rising Return to Education

- The premium to having a college degree:
 - Has been rising rapidly over the last forty years
 - Far outweighs the forgone wages and tuition costs



The Rising Return to Education

Understanding the Rising Return to Education

Case Study: Income Inequality

- Is rising college premium cause of rising income inequality?
- Early 1900s
 - Top income mostly from capital income (e.g. Carnegie, Rockefeller, Vanderbilt, J.P. Morgan,...)
- Recently
 - Top income mostly from salaries and business income (e.g. CEO compensation, other superstar markets)

Income Inequality in the United States and France

Income Inequality in the United States and France

Income share of
top 0.1 percent

