Chapter 7: Unemployment and the labor market

Prof. Dr. Georg Stadtmann
stadtmann@europa-uni.de

Chapter 7: LAbor MArket

1. Introduction
   - Some remarks

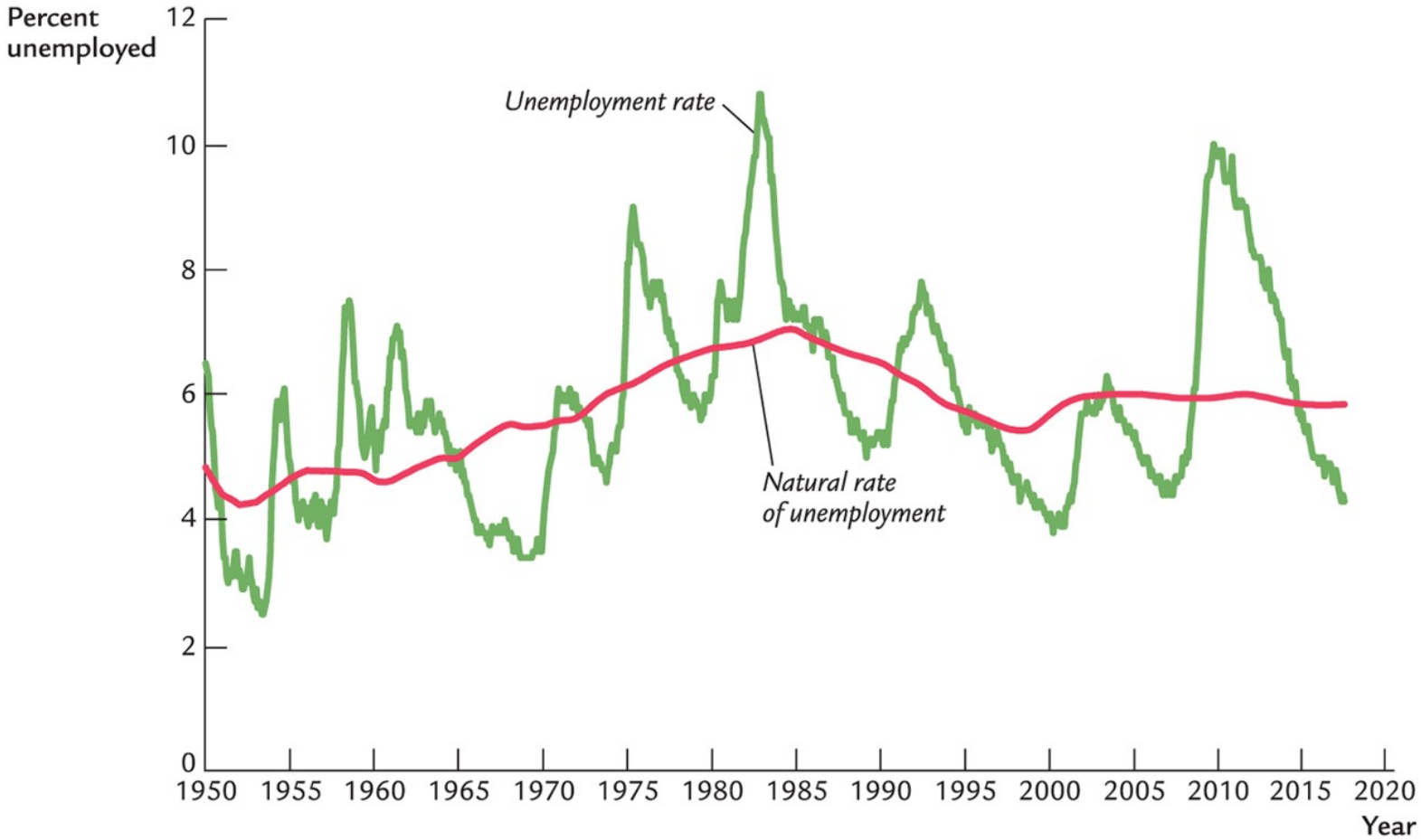
2. 7.1 Job loss, job finding, and the natural rate of unemployment

Introduction

Open economies

- There is always some unemployment: What determines its level?
- In this chapter we do NOT study year-to-year fluctuations of the unemployment rate.
- We examine the determinants of the natural rate of unemployment.

Unemployment rate and natural rate in the US



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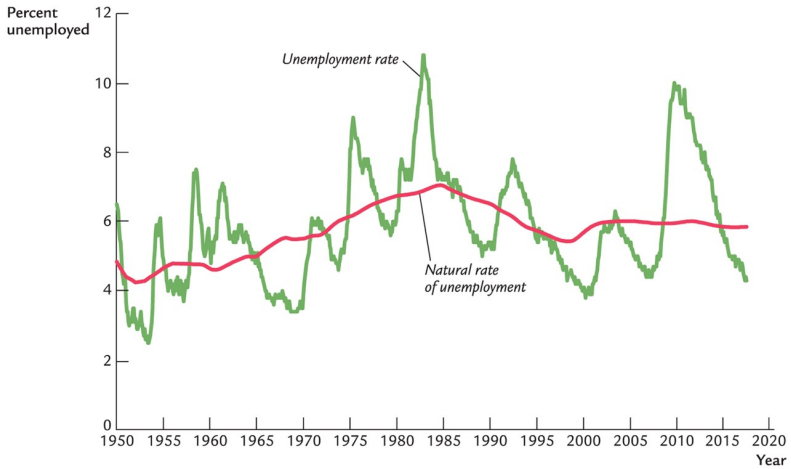
Unemployment rate and natural rate in the US



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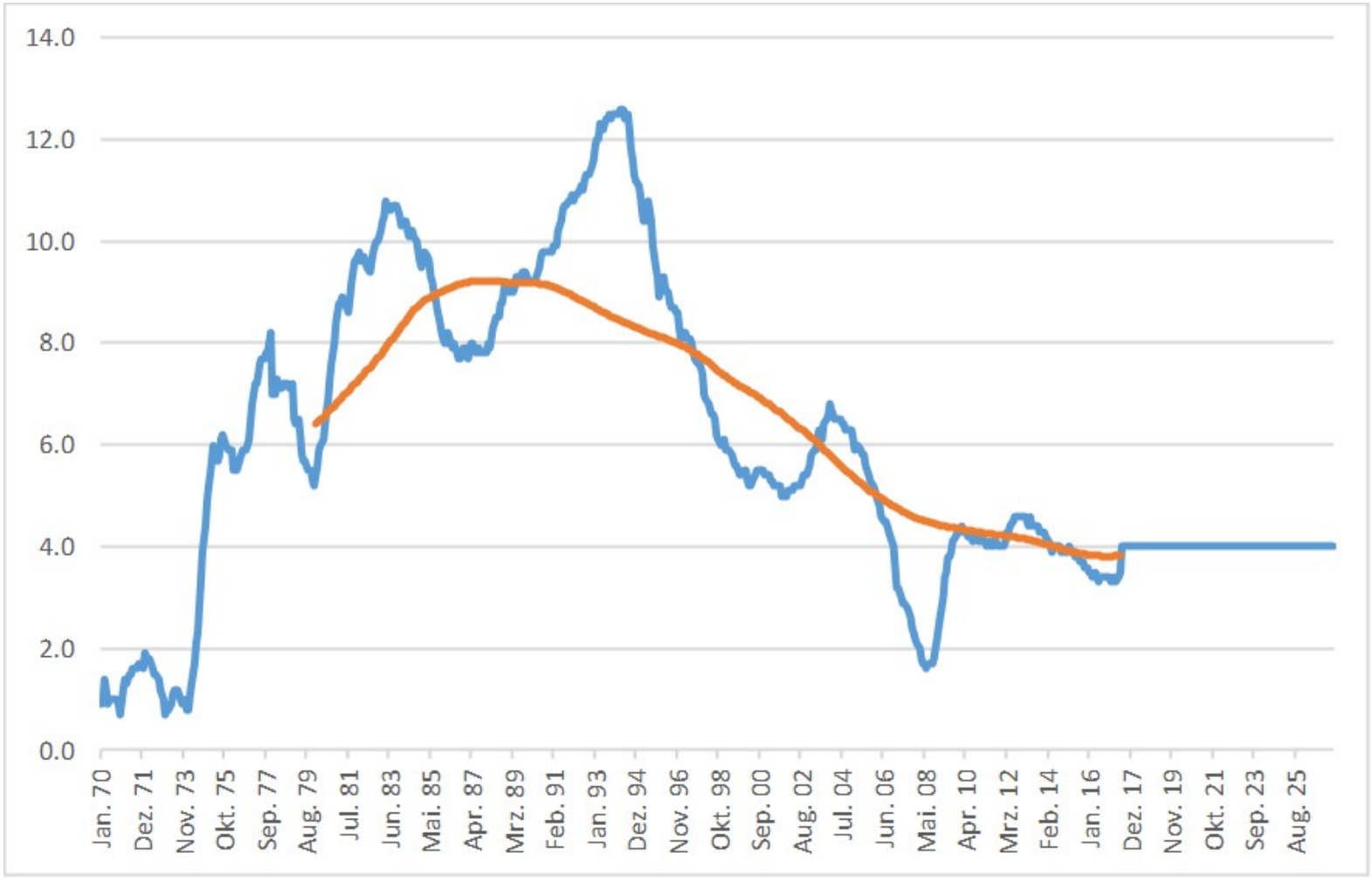
Notes:

- The natural rate for any particular moth is estimated here by averaging all the unemployment rates from ten years earlier to the years later.
- The first data point in Jan. 1950: Average between Jan. 1940 – Dec. 1959!?!
- The last data point in Dec. 2019: Average between Dec. 2009 – Nov. 2029 !?!
- Future employment rates are set at 5.5 %.

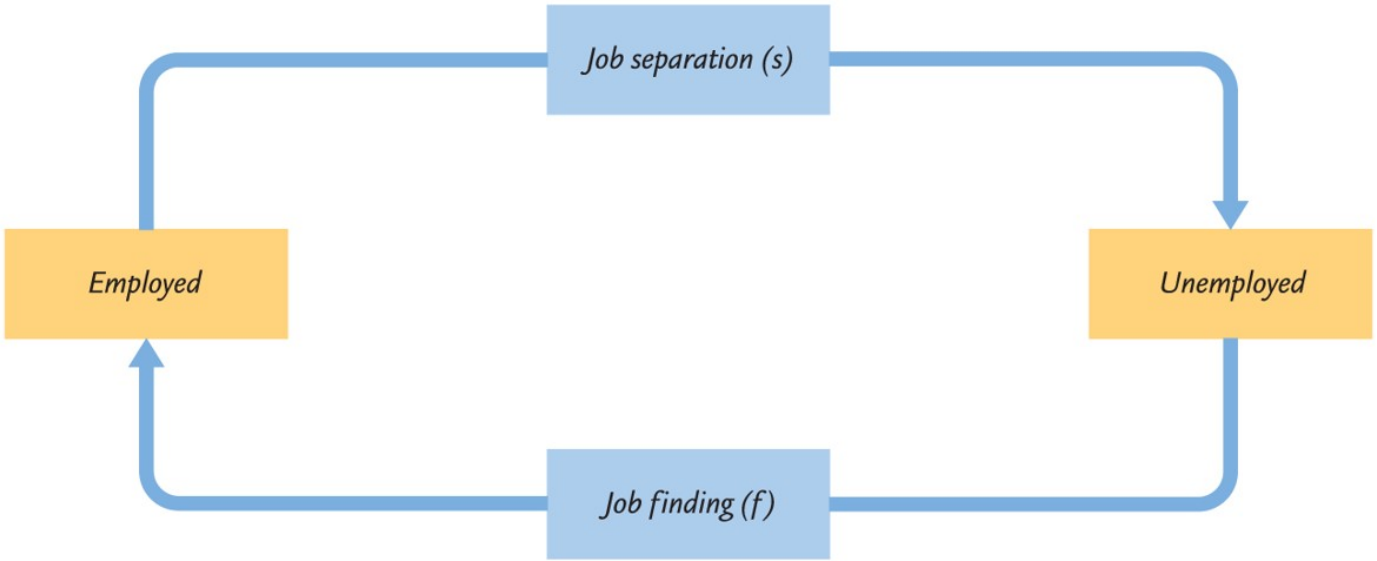
Unemployment rate and natural rate in the Denmark



Notes:

- Federal Reserve Economic Data `https://fred.stlouisfed.org`
- Registered Unemployment Rate for Denmark, Percent, Monthly, Seasonally Adjusted (LMUNRRTTDKM156S)
- Jan. 1970 – Jun. 2017

The transition between employment and unemployment



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Labor force and unemployment rate

$$L = E + U \tag{1}$$

- L: Labor force (Important assumption: Labor force is fixed)
- E: Number of employed workers
- U: Number of unemployed workers

Unemployment rate:

$$\frac{U}{L} = \frac{U}{E + U} \tag{2}$$

Rate of job separation

- The fraction of employed individuals who lose or leave their jobs each month *(rate of job separation)*:

$$s \cdot E \tag{3}$$

- When $s = 0.01 = 1\%$
- 1% of the employed loose their jobs each month.
- The average spell of employment last $1/0.01 = 100$ months ≈ 8 years.

Rate of job finding

- The fraction of unemployed individuals who find a job each month *(rate of job finding)*:

$$f \cdot U \tag{4}$$

- When $f = 0.2 = 20\%$
- 20% of the unemployed find a job each month.
- The average spell of unemployment last $1/0.2 = 5$ months.

Steady state

- When the unemployment rate is neither rising or falling, the labo market has reached its *steady state*.
- The number of people finding a job each month ($f \cdot U$) must equal
- the losing jobs ($s \cdot E$).

$$f \cdot U = s \cdot E \tag{5}$$

Steady state unemployment rate

$$f \cdot U = s \cdot E$$

under consideration of $L = E + U \quad \rightarrow \quad E = L - U$, we get:

$$f \cdot U = s \cdot (L - U) \tag{6}$$

Dividing both sides by L, yields:

$$f \cdot \frac{U}{L} = s \cdot \left(1 - \frac{U}{L}\right) \tag{7}$$

Solve for U/L!

$$f \cdot \frac{U}{L} + s\frac{U}{L} = s \tag{8}$$

Steady state unemployment rate

$$f \cdot \frac{U}{L} = s \cdot \left(1 - \frac{U}{L}\right)$$

Solve for U/L!

$$f \cdot \frac{U}{L} + s\frac{U}{L} = s \tag{9}$$

$$(s + f) \cdot \frac{U}{L} = s \tag{10}$$

$$\frac{U}{L} = \frac{s}{s + f} \tag{11}$$

Equation (11) could also be written as:

$$\frac{U}{L} = \frac{s}{s + f} \quad \Big| \cdot \frac{\frac{1}{s}}{\frac{1}{s}} \quad \Rightarrow \quad \frac{U}{L} = \frac{1}{1 + \frac{f}{s}} \tag{12}$$

Steady state unemployment rate

We work with equation (11)!

$$\frac{U}{L} = \frac{s}{s+f} = \frac{0.01}{0.01+0.2} = 0.04762 \tag{13}$$

The steady state unemployment rate is 4.762 % which is about 5%.

Steady state unemployment rate

$$\frac{U}{L} = \frac{s}{s+f} = \frac{0.01}{0.01+0.2} = 0.04762$$

- Any policy aimed at lowering the natural rate of unemployment must either
  - reduce the rate of job separation or
  - increase the rate f job finding.
- Any policy that affects
  - rate of job separation or
  - the rate of job finding
- also changes the natural rate of unemployment.

But why is there unemployment in the *first* place?