Advanced Macroeconomics II

Economic Fluctuations and the Labor Market

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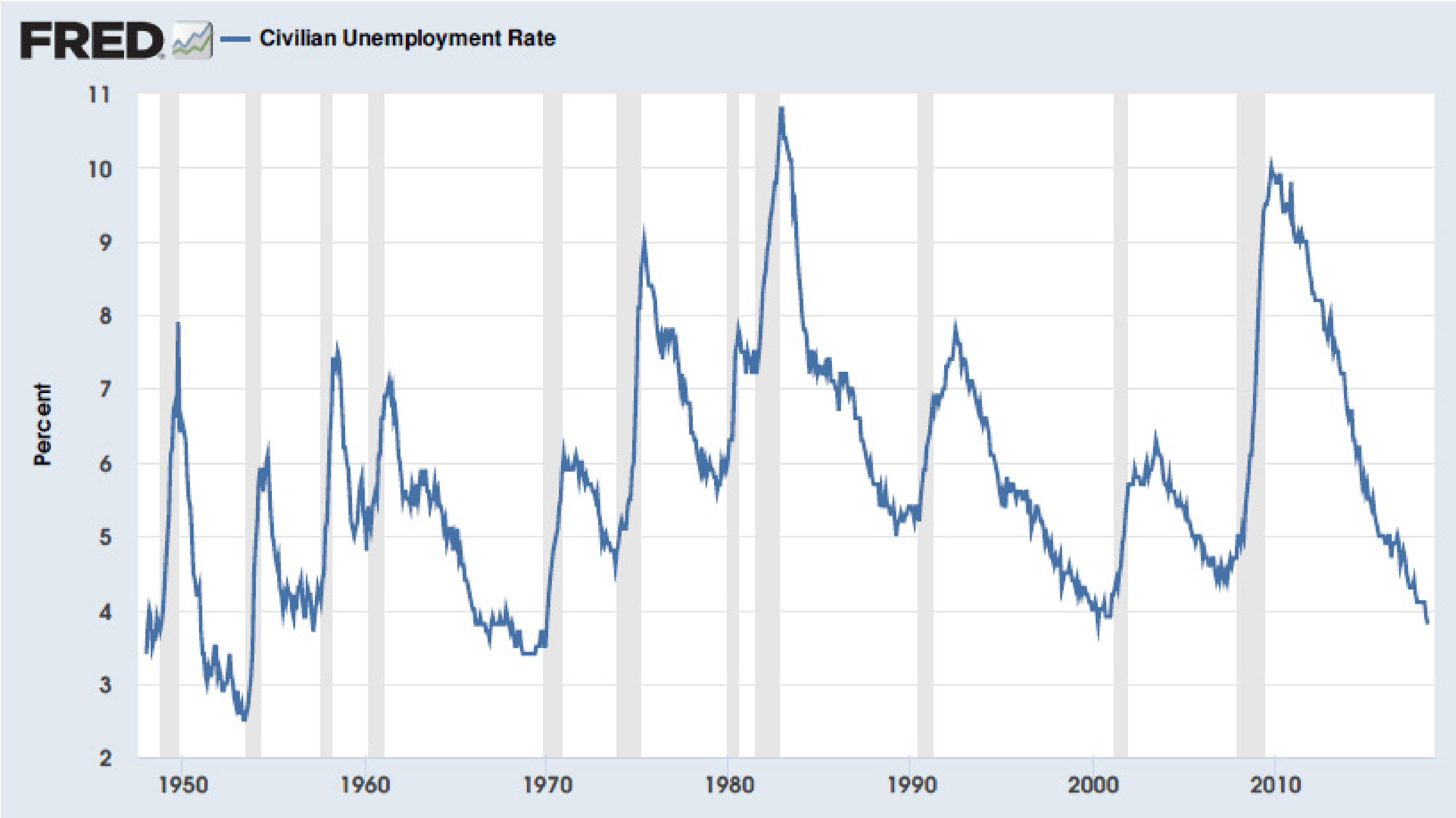
Unemployment Rate: U.S.



Shaded areas indicate U.S. recessions **Source: U.S. Bureau of Labor Statistics** **myf.red/g/k32S**

Unemployment and Labor Market Imperfections

- Perfectly competitive labor market:

$$w_t = \sigma c_t + \varphi n_t \equiv mrs_t$$

$$\Longrightarrow \text{no involuntary unemployment}$$

- Imperfect competition and/or other frictions:

$$w_t = \mu_t^w + \sigma c_t + \varphi n_t$$

  where $\mu_t^w > 0$ is the "wage markup".

- Labor supply:

$$w_t = \sigma c_t + \varphi l_t$$

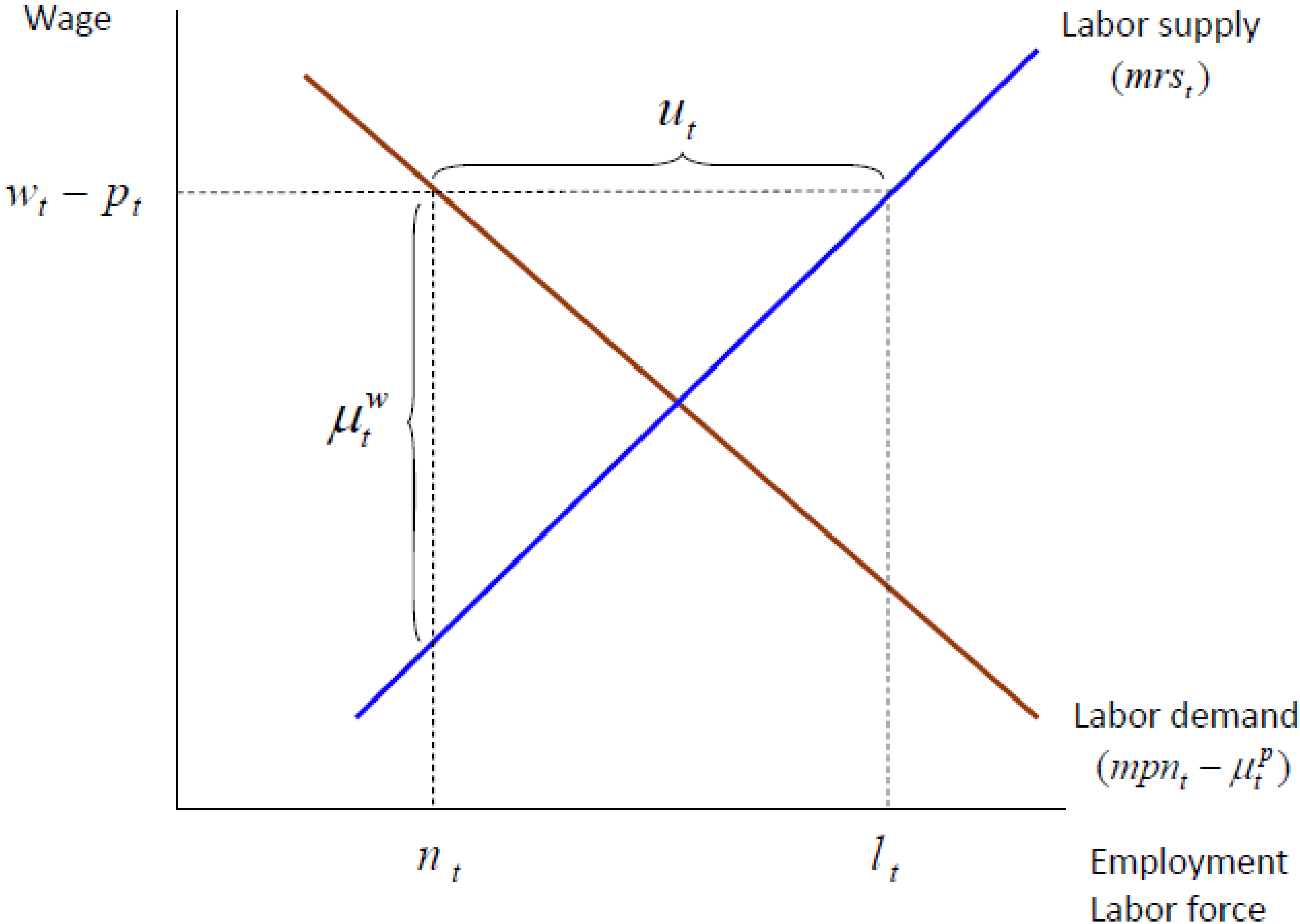
- Unemployment:

$$u_t \equiv l_t - n_t$$

- Unemployment and the wage markup:

$$\mu_t^w = \varphi u_t$$

Figure 1. The Wage Markup and the Unemployment Rate



Example (I): Monopoly union

$$\max_{W_t} U(C_t, N_t)$$

subject to:

$$C_t = W_t N_t + \Pi_t$$

$$N_t = W_t^{-\epsilon_w} X_t$$

Optimal wage setting:

$$W_t = \frac{\epsilon_w}{\epsilon_w - 1} \; MRS_t$$

Define $\mu^w \equiv \log \frac{\epsilon_w}{\epsilon_w - 1}$ and assuming $MRS_t = C_t^{\sigma} N_t^{\varphi}$

$$w_t = \mu^w + \sigma c_t + \varphi n_t$$

$$u_t = \frac{\mu^w}{\varphi} \equiv u$$

$\Longrightarrow$ constant unemployment rate

Example (II): Wage rigidities

"Target" vs. actual wages:

$$w_t^* = \mu^w + \sigma c_t + \varphi n_t$$

$$w_t = \mu_t^w + \sigma c_t + \varphi n_t$$

Implication:

$$w_t - w_t^* = \varphi(u_t - u^*)$$

where $u^* = \frac{\mu^w}{\varphi}$ ("natural rate of unemployment").

Example:

$$w_t = \gamma w_{t-1} + (1-\gamma) w_t^*$$

Thus,

$$u_t - u^* = \gamma(u_{t-1} - u^*) - (\gamma/\varphi)\Delta w_t^*$$

Assuming $Y_t = C_t = N_t$:

$$u_t - u^* = \gamma(u_{t-1} - u^*) - (\gamma/\varphi)\left(\sigma + \varphi\right)\Delta y_t$$

$\Rightarrow$ persistent, countercyclical fluctuations in unemployment

Example (III): Hysteresis (Blanchard-Summers)

Assumption: Wage set in advance, with an employment target n_t^*

$$E_{t-1}\{n_t\} = n_t^*$$

"Insider-outsider" assumption: $n_t^* = n_{t-1}$

Implication:

$$n_t = n_{t-1} + \varepsilon_t$$

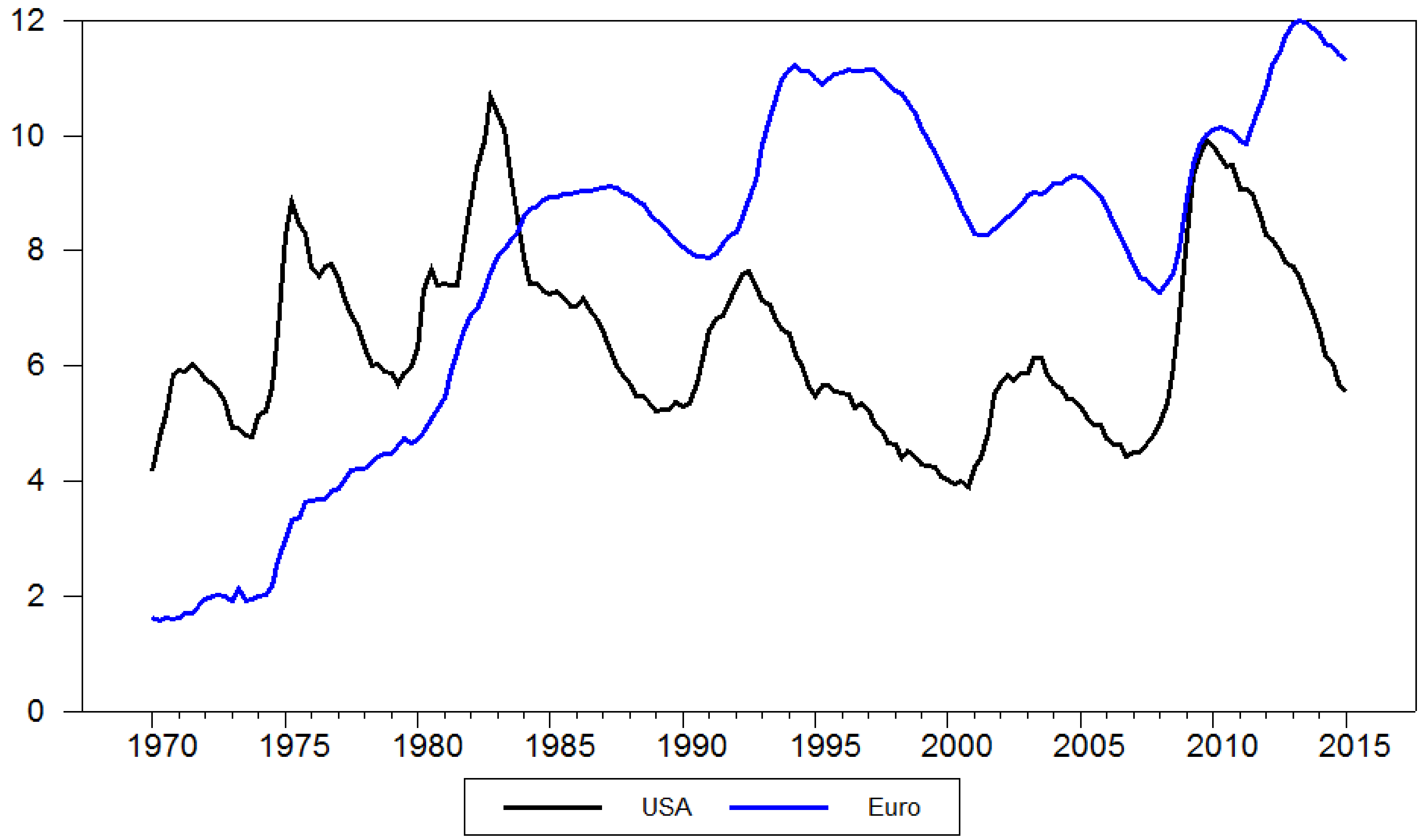
Assuming a constant labor supply $l_t = l$:

$$u_t = u_{t-1} - \varepsilon_t^a$$

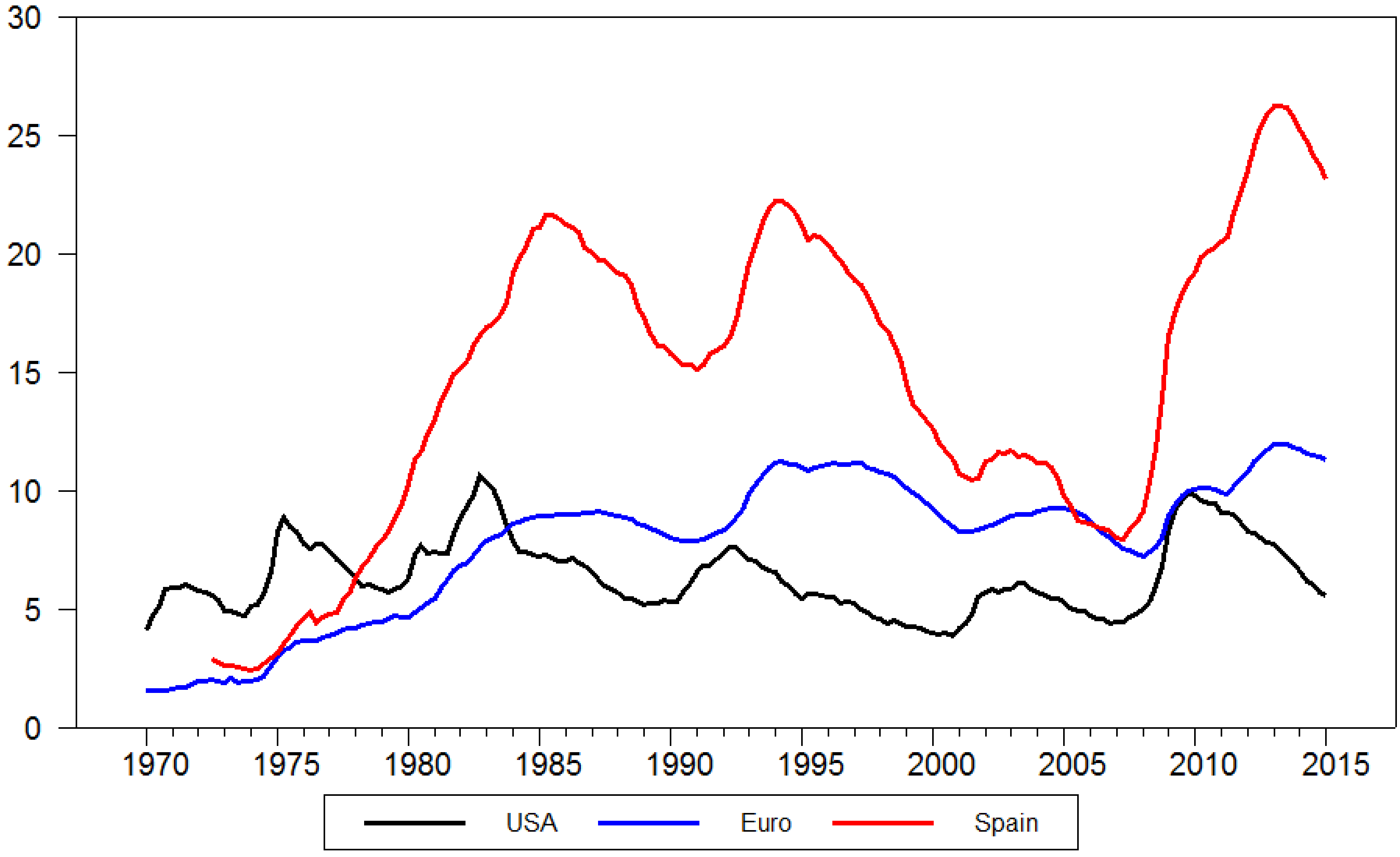
$\Longrightarrow$ permanent effect on unemployment of any shock!

A model for Europe?

Unemployment rate: U.S. vs Euro Area



Unemployment rate: U.S. , Euro Area and Spain



Search and Matching Models of Unemployment

- Diamond-Mortensen-Pissarides (Nobel Prize 2010)
- Labor market frictions: "matching function"

$$H_t = Z_t V_t^{\theta} U_t^{1-\theta}$$

- Evolution of employment:

$$N_{t+1} = (1-\delta)N_t + H_t$$

- Unemployment rate:

$$U_t = 1 - N_t$$

- Vacancy posting cost: k

- Job finding rate:

$$\frac{H_t}{U_t} = Z_t \left(\frac{V_t}{U_t}\right)^{\theta} = Z_t x_t^{\theta}$$

where $x_t \equiv V_t/U_t$ is an index of "labor market tightness"

- Vacancy filling rate:

$$\frac{H_t}{V_t} = Z_t \left(\frac{V_t}{U_t}\right)^{-(1-\theta)} = Z_t x_t^{-(1-\theta)}$$

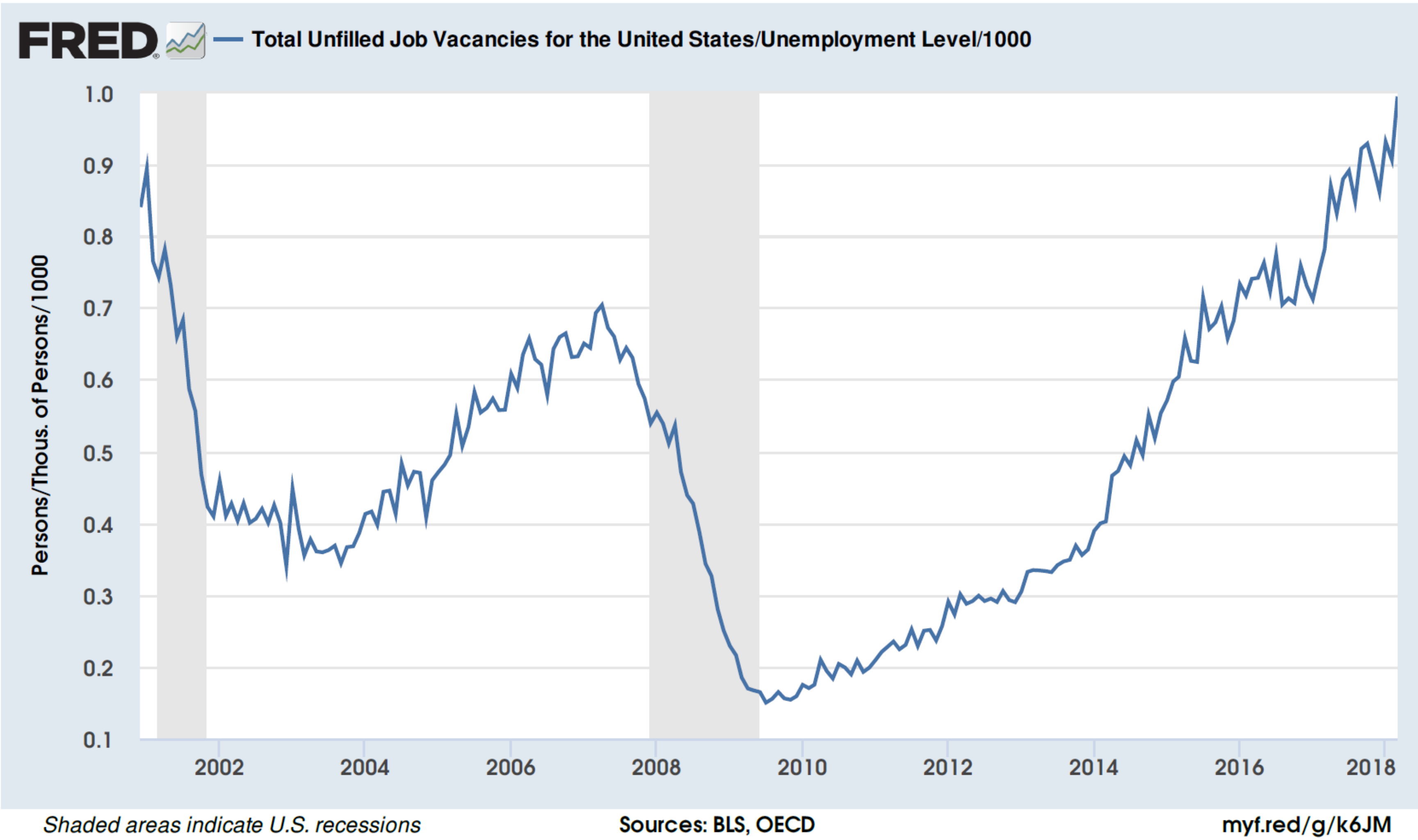
- *Beveridge curve*

$$\begin{aligned} Z_t V_t^{\theta} U_t^{1-\theta} &= \delta N_t + \Delta N_{t+1} \\ &= \delta(1 - U_t) - \Delta U_{t+1} \end{aligned}$$

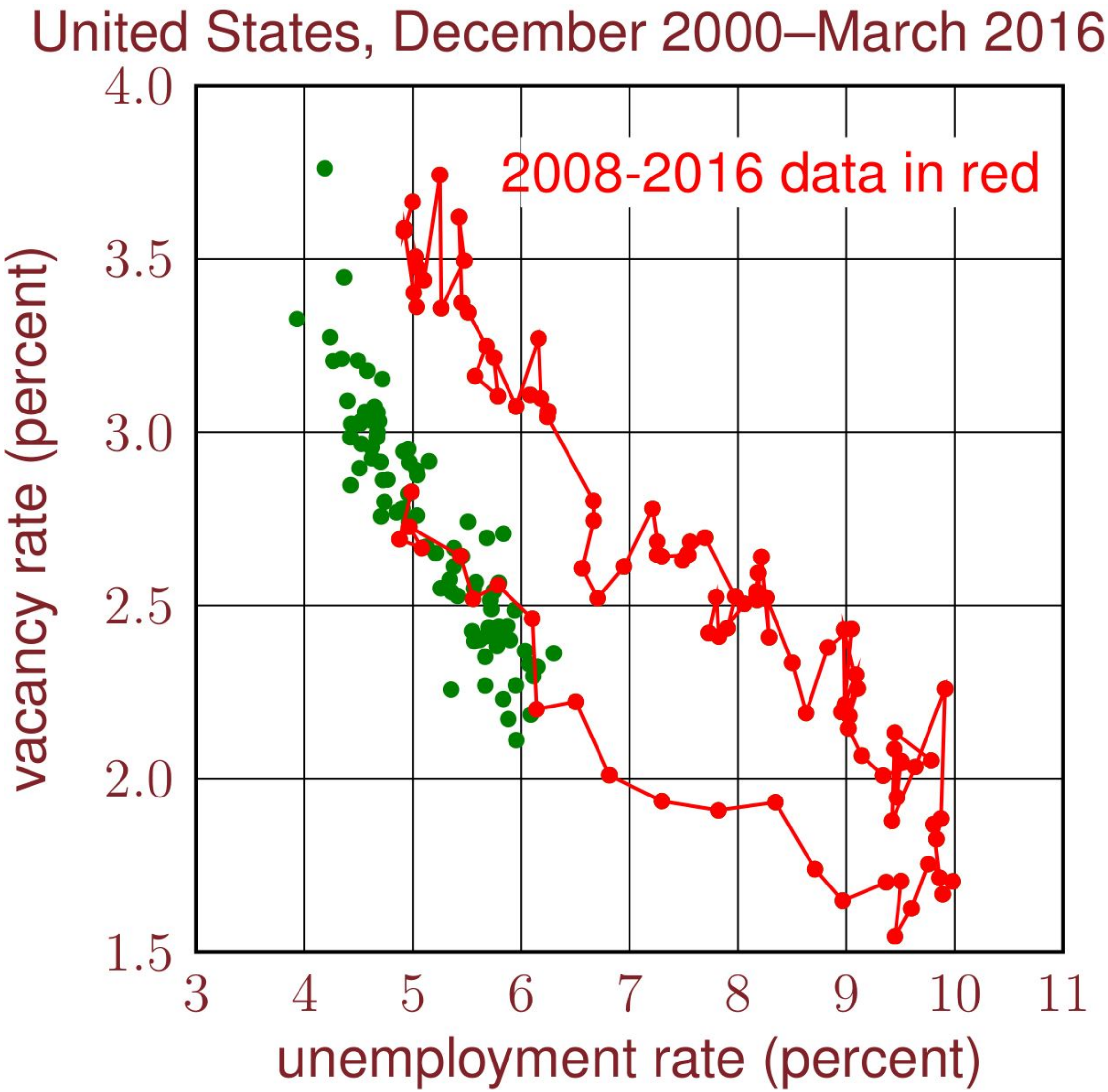
In steady state:

$$V^{\theta} = \frac{\delta(1 - U)}{ZU^{1-\theta}}$$

Labor Market Tightness



The Beveridge Curve



Font: Rob Shimer

- Employment and unemployment dynamics

$$N_{t+1} = (1-\delta)N_t + Z_t x_t^{\theta} U_t$$

$$U_{t+1} = \delta + \left(1 - \delta - Z_t x_t^{\theta}\right) U_t$$

- Steady state:

$$U = \frac{\delta}{\delta + Z x^{\theta}}$$

- Firm's *surplus* from an existing employment relation (assuming $Y_t = A_t N_t$)

$$\mathcal{S}_t^F = A_t - W_t + \beta(1-\delta)E_t\{\mathcal{S}_{t+1}^F\}$$

- Optimal hiring policy:

$$k = Z_t x_t^{-(1-\theta)} \beta E_t\{\mathcal{S}_{t+1}^F\}$$

- Steady state

$$\mathcal{S}^F = \frac{A - W}{1 - \beta(1 - \delta)}$$

$$\Rightarrow x^{1-\theta} = \left(\frac{Z}{k}\right)\left(\frac{\beta(A - W)}{1 - \beta(1 - \delta)}\right)$$

- Implications:

$$\uparrow A \Longrightarrow \uparrow x \Longrightarrow \downarrow U$$

$$\uparrow W \Longrightarrow \downarrow x \Longrightarrow \uparrow U$$

$$\uparrow k \Longrightarrow \downarrow x \Longrightarrow \uparrow U$$

$$\uparrow \delta \Longrightarrow \downarrow x \Longrightarrow \uparrow U$$

$$\uparrow Z \Longrightarrow \uparrow x \Longrightarrow \downarrow U$$