INTERMEDIATE MACROECONOMICS
MATCHING MODEL OF UNEMPLOYMENT
18. EQUILIBRIUM OF THE MATCHING MODEL

Pascal Michaillat

pascalmichaillat.org/c4/

# MODELING WAGES IN PRACTICE

- can model wages using unions, minimum wage, efficiency wage theories, or bargaining theories

- rigid wage: wage that does not respond to tightness or productivity

- flexible wage: wage that responds a lot to tightness or productivity

- some of these approaches yield very rigid wages

  - unions, minimum wage, efficiency wages based on well-being or morale

- some of these approaches yield very flexible wages

  - bargaining , efficiency wages based on based on turnover or shirking

- in practice, wages are very rigid: we model the wage as a parameter $W < a$

LABOR MARKET EQUILIBRIUM

- equilibrium condition: labor supply= labor demand

  - the number of workers that firms want to hire equals the number of workers who actually find a job through the matching process

- if labor supply ≠ labor demand, then firms would end up with too many or too few workers

  - they would adjust their vacancies until supply = demand

EQUILIBRIUM DIAGRAM

tightness

$L^d(W,\theta)$ $L^s(\theta)$ H

θ^*

U^*
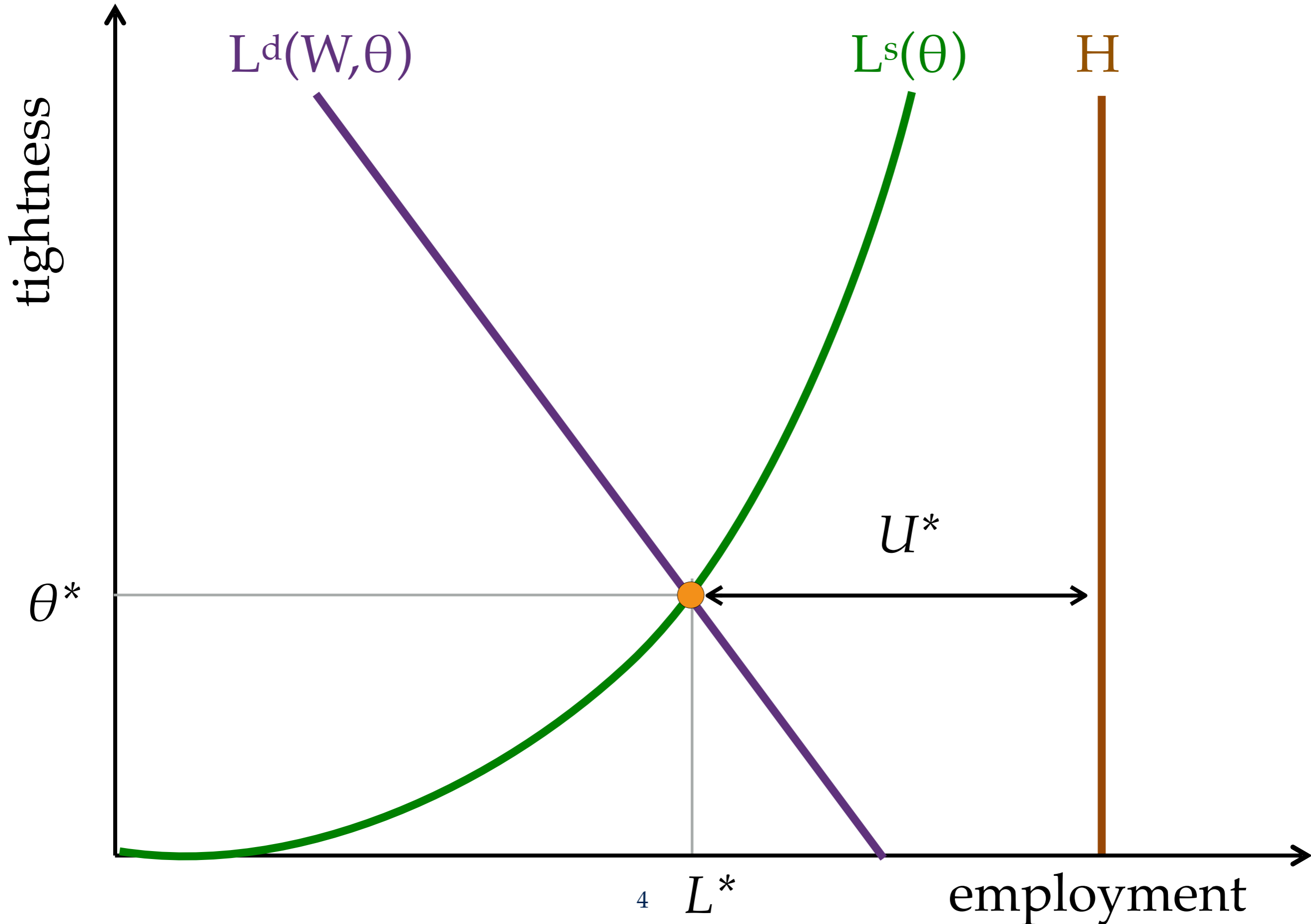
L^* employment

EQUILIBRIUM TIGHTNESS

- since the wage is a parameter W, in equilibrium tightness θ adjusts so that labor demand = labor supply:

  - $L^s(\theta^*) = L^d(W, \theta^*) = L^*$

- equilibrium employment is L*, equilibrium tightness is θ*

- in equilibrium there is some unemployment: $U^* = H - L^*$

  - the unemployment rate is $u^* = 1 - L^*/H$

- from θ* we can compute the job-finding rate $f(\theta^*)$ and recruiter-producer ratio $\tau(\theta^*)$
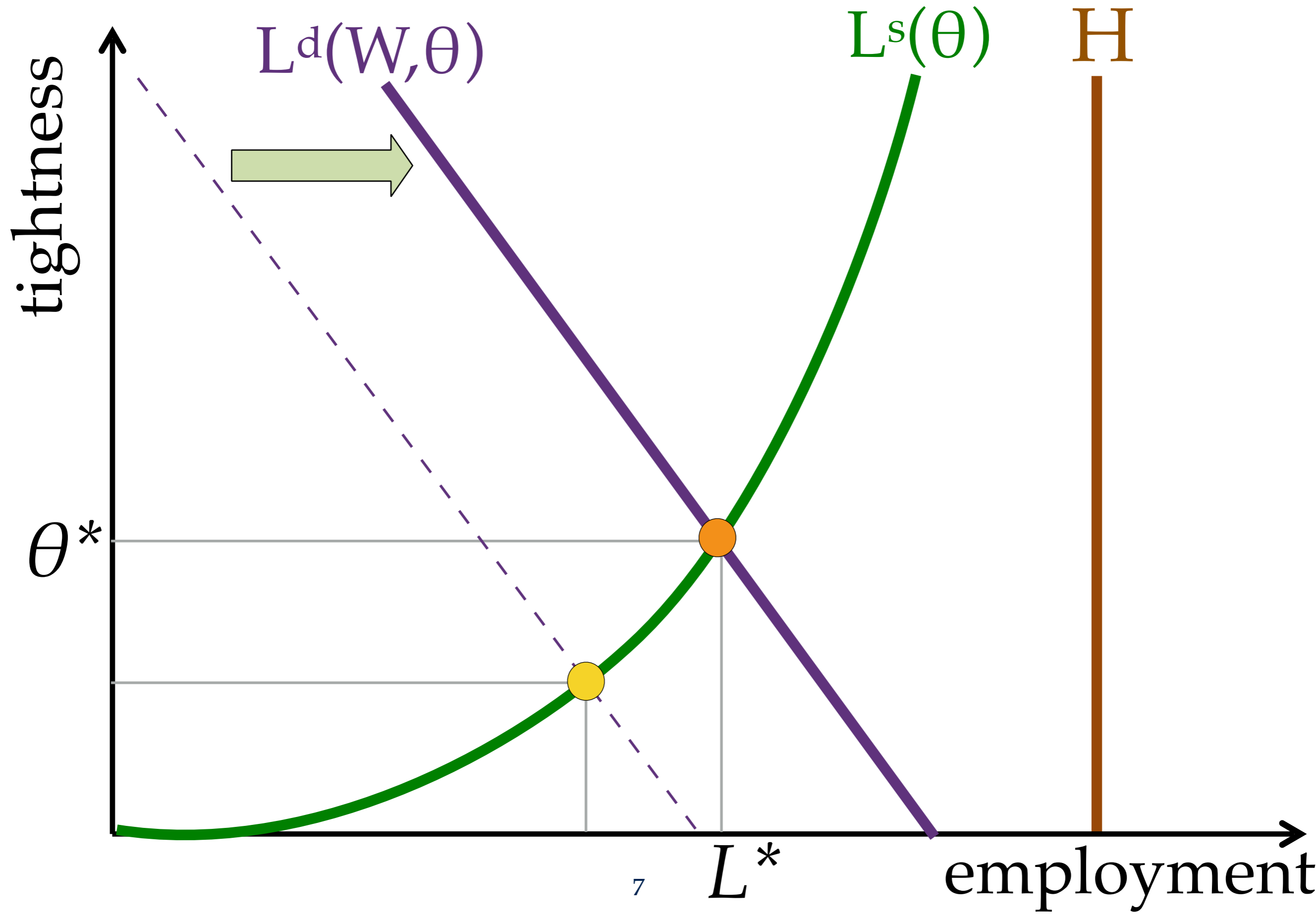
LABOR DEMAND SHOCKS

- labor demand shocks: changes in the value of a parameter shifting labor demand

- expression for labor demand:

$$L^d(\theta, W) = \left[\frac{\alpha \cdot a}{W \cdot (1 + \tau(\theta))^\alpha} \right]^{1/(1-\alpha)}$$

- increase in productivity a: higher labor demand

  - could be better production technology

  - could be higher demand for firm's output

INCREASE IN PRODUCTIVITY

tightness

$L^d(W,\theta)$

$L^s(\theta)$

H

θ^*

L^*

employment

INCREASE IN PRODUCTIVITY

- a higher productivity leads to

  - higher employment

  - higher labor market tightness

  - lower unemployment rate

  - lower unemployment

- it is important that the wage is fixed

HIGHER PRODUCTIVITY WITH FLEXIBLE WAGE

- a flexible wage moves with productivity: W=a × w

- the expression for the labor demand is

$$L^d(\theta, W) = \left[\frac{\alpha \cdot a}{W \cdot (1 + \tau(\theta))^\alpha} \right]^{1/(1-\alpha)}$$

- so the labor demand becomes

$$L^d(\theta) = \left[\frac{\alpha}{w \cdot (1 + \tau(\theta))^\alpha} \right]^{1/(1-\alpha)}$$

- the labor demand is now independent of productivity so productivity shocks have no effect
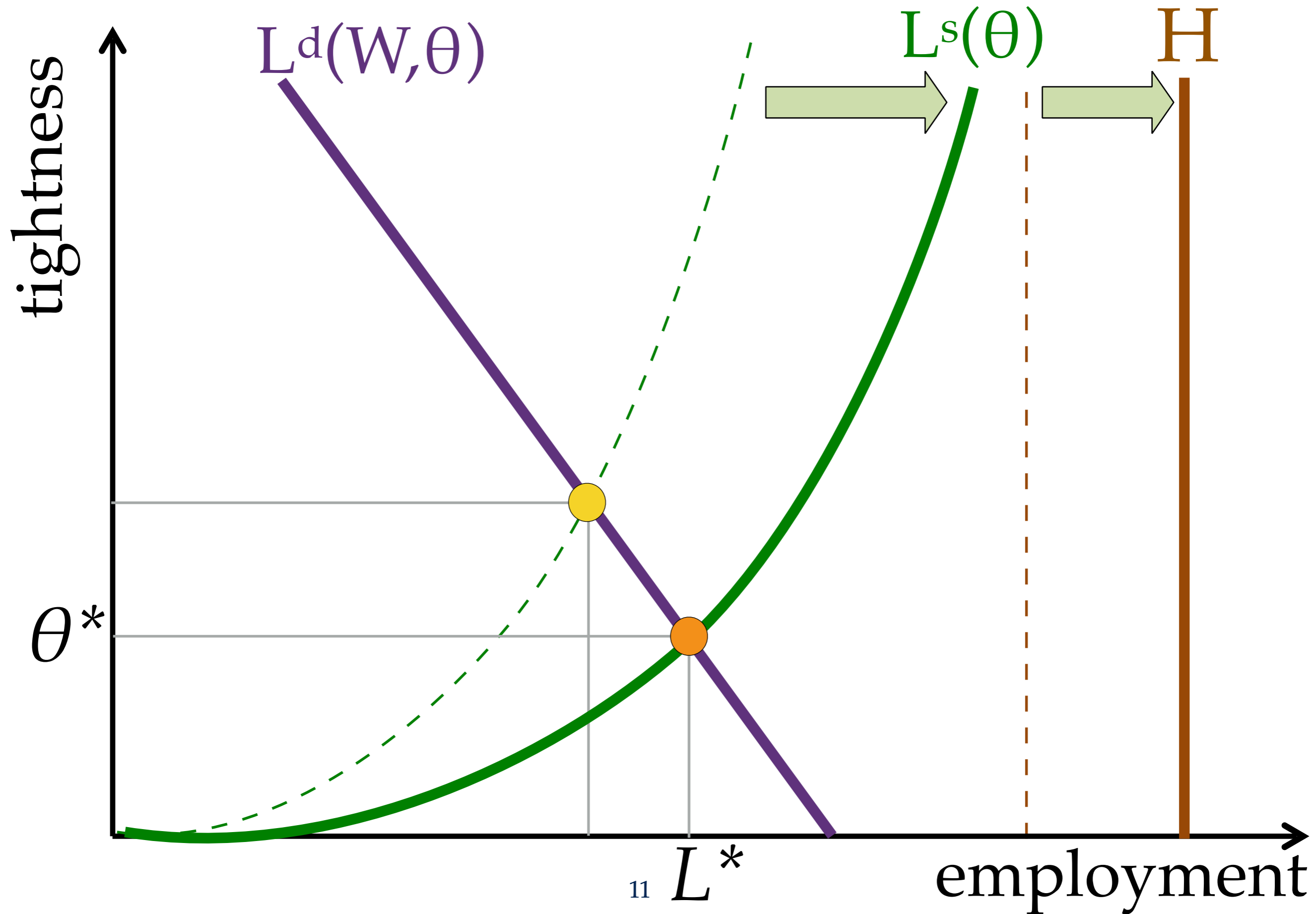
LABOR SUPPLY SHOCKS

- labor supply shocks: changes in the value of a parameter shifting labor supply

- expression for the labor supply:

$$L^s(\theta) = \frac{f(\theta)}{s + f(\theta)} \cdot H$$

- increase in labor force H: higher labor supply

  - could be an increase in immigration

  - could be higher participation rate from segments of the population (for instance, women in the 1970s)
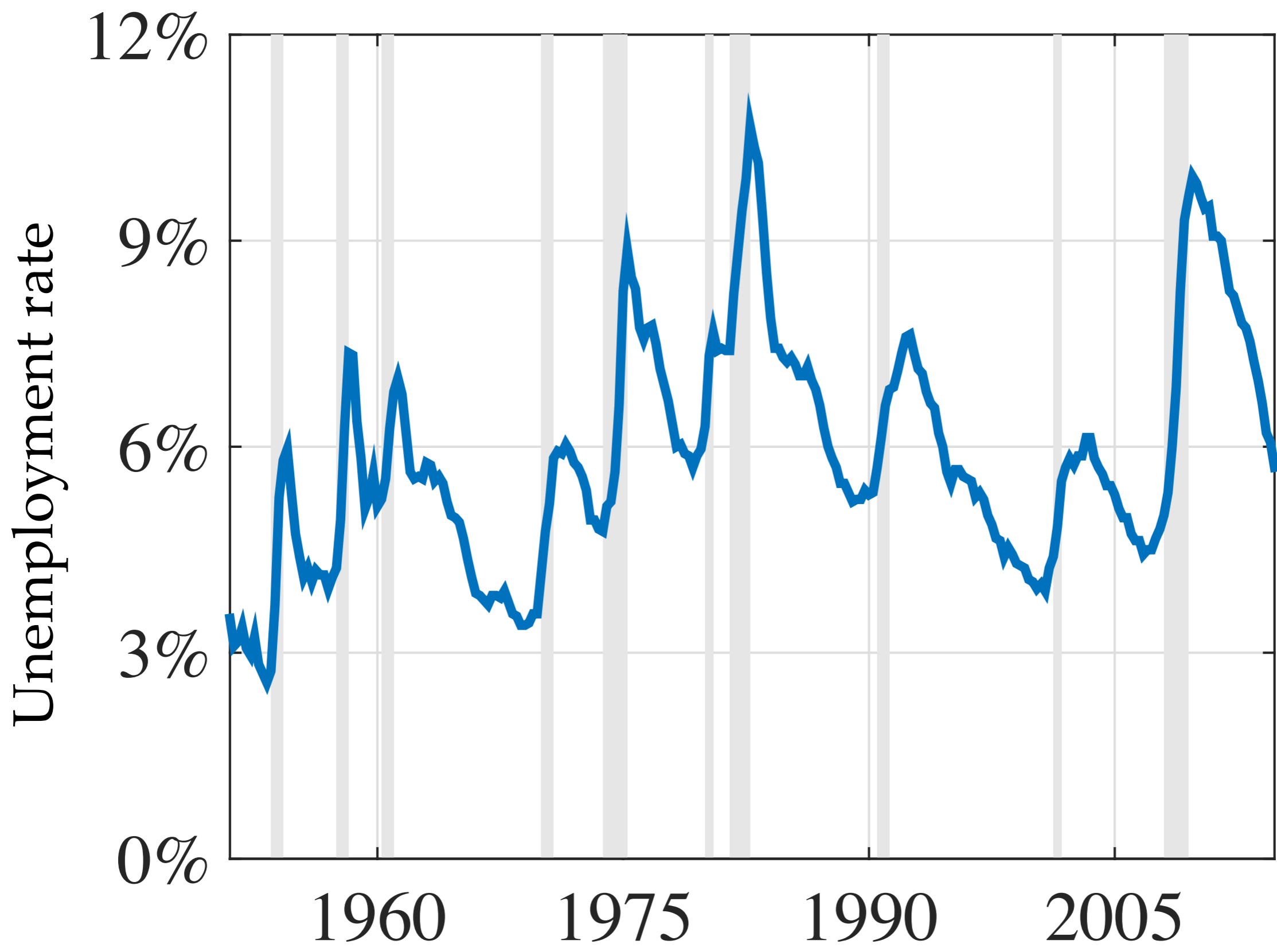
INCREASE IN LABOR FORCE

INCREASE IN LABOR FORCE

- a larger labor force leads to

  - higher employment

  - lower labor market tightness

  - higher unemployment rate: $u(\theta) = s \; / \; (s + f(\theta))$

  - higher unemployment $(U = u(\theta) \times H)$

- the result may explain why there is so much opposition to immigration in bad times, when unemployment is already high

US UNEMPLOYMENT RATE IS COUNTERCYCLICAL

US LABOR MARKET TIGHTNESS IS PROCYCLICAL
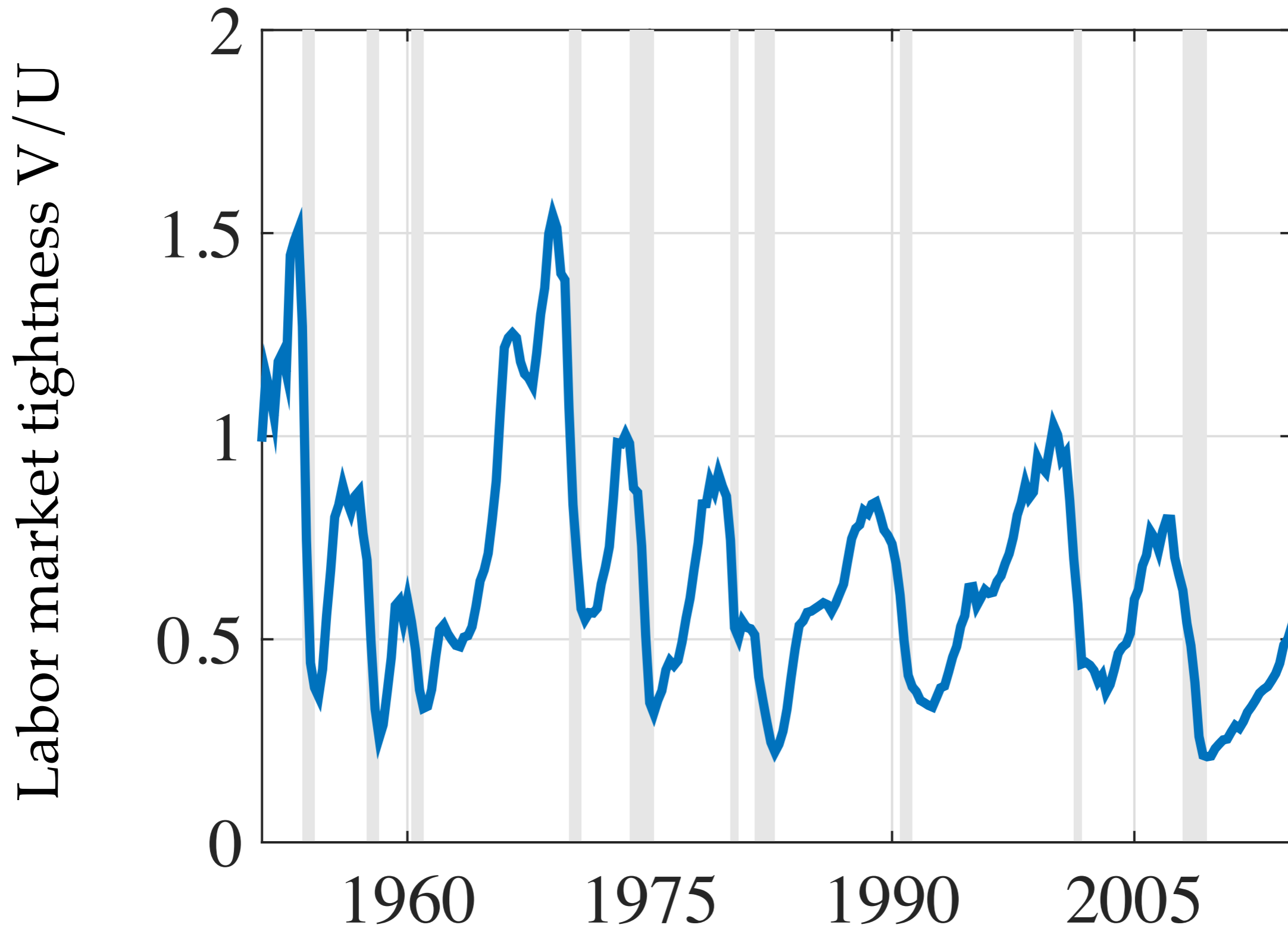
LABOR DEMAND SHOCKS SEEM TO DRIVE LABOR MARKET FLUCTUATIONS

- based on the data, labor demand shocks – not labor supply shocks – are the most likely source of labor market fluctuations in the US

- indeed we see that labor market tightness is procyclical (moves with employment)

- and we see that the unemployment rate is countercyclical (moves counter to employment)