The Global Economy

Labor Markets

NYU STERN

In the News: Antidumping

- China production of silicon solar panels
  - Three-fifths of global output
  - Shipped 95% of output to US
  - Prices/margins plunging: $1.20/watt vs $3.30 in 2008
  - Claim: "illegal subsidies"
    - Subsidized rates on $25b in loans
    - Filer: SolarWorld AG and others
      - Recently shut down Oregon plant with 150 workers
      - Oregon Senators appear at plaintiff news conference
    - Claim: sale price less than half of production cost
    - Request: "countervailing duty" on solar panels
  - Counterclaim: "protectionism"
  - Solar Energy Industries Assn. – "deeply divided"

PS1 and PS2 Grade Distributions

	PS1	PS2
Mean	83.2	91.0
Std. Dev.	15.5	6.6
Median	87.0	93.0
Top 10%	97.0	98.0
Top 35%	90.5	94.3

Exam 1

- Next class!
- First 90 minutes; "light" class to follow
  - Introduction to money and inflation
- For the exam
  - Calculator that can compute LN(x)
  - 8.5"x11" page of notes, both sides
  - No book, phones, other materials
  - Show your work!

Exam 1

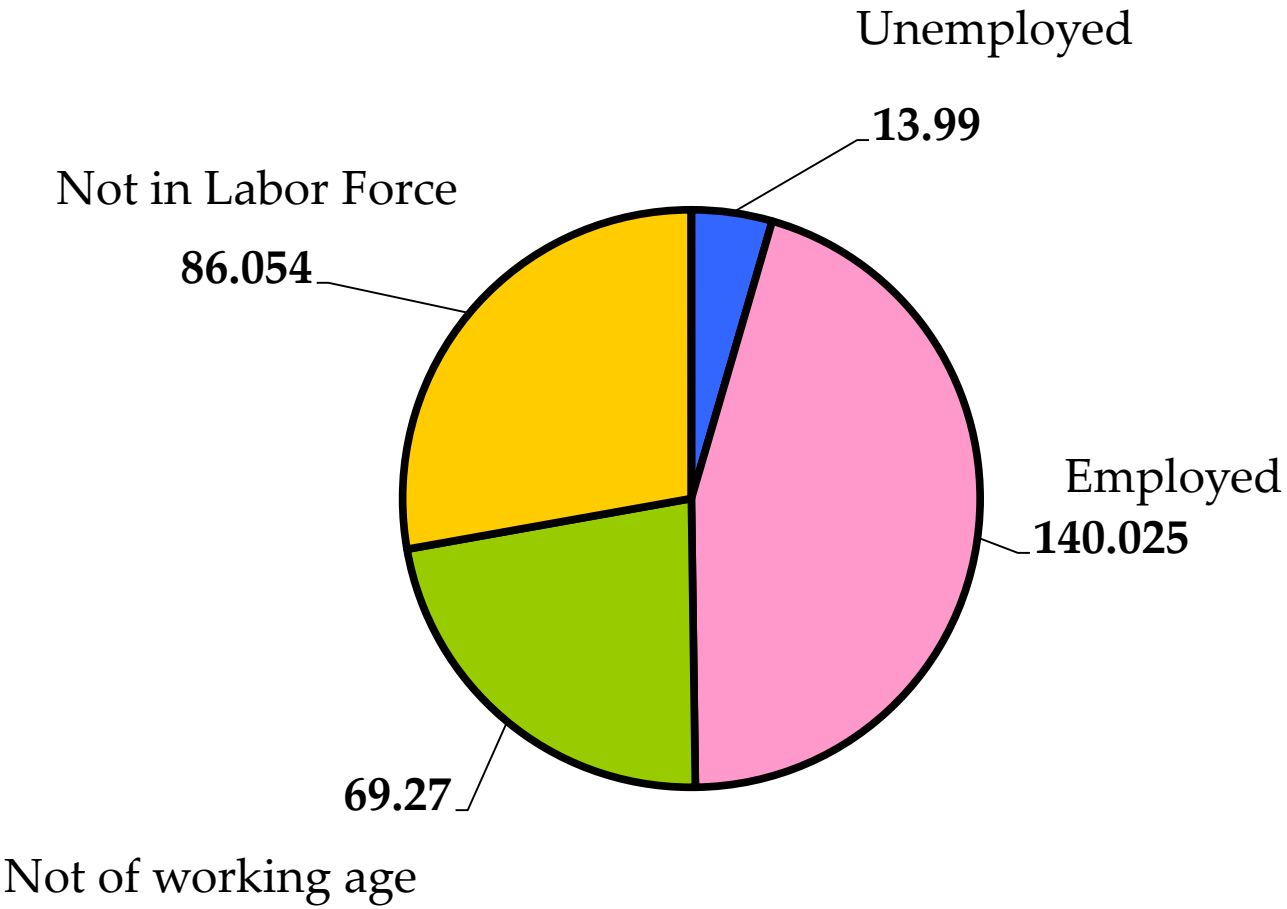
- All material covered in class is fair game
- How to study
  - Problem sets and practice problems
  - Slides
  - Notes
  - Try the practice midterm, timed
- This and more in Exam Strategies.pdf on Blackboard – Course by Session

Roadmap

- In the news
- Measuring labor markets
- Labor market institutions
- Dynamics of employment
- Volatility and labor markets

U.S. employment status

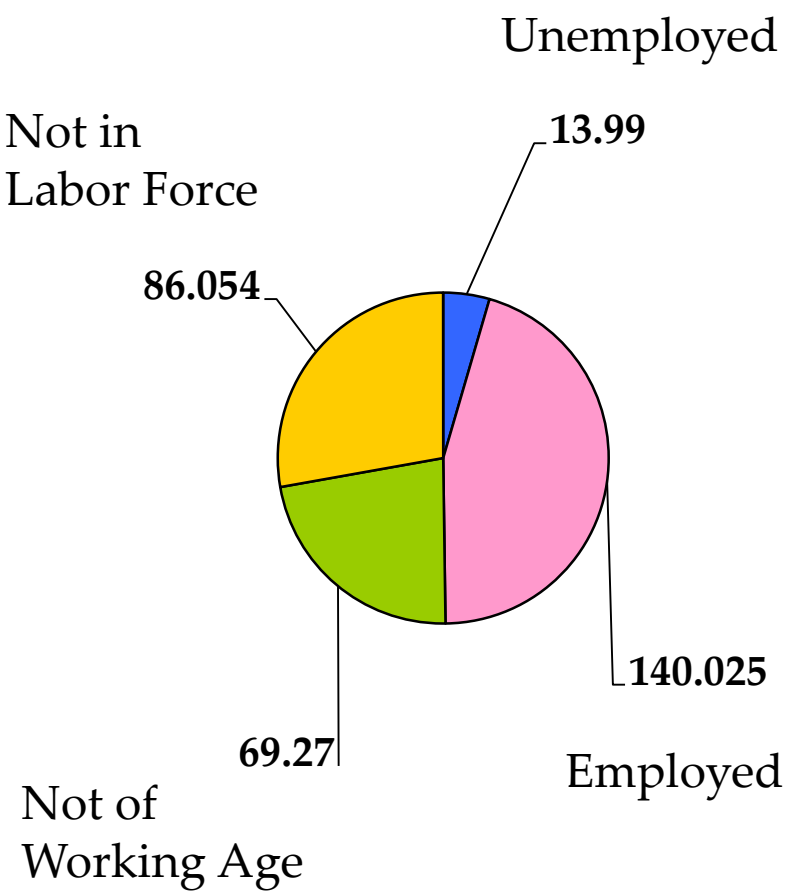
2011, in millions



Standard indicators

- Employment rate = employed/(working-age) population
- Labor force = employed + unemployed
- **Unemployment rate = unemployed/labor force**
- Participation rate = labor force/working-age population
- Hours worked = average hours worked of employed people

U.S. labor market indicators



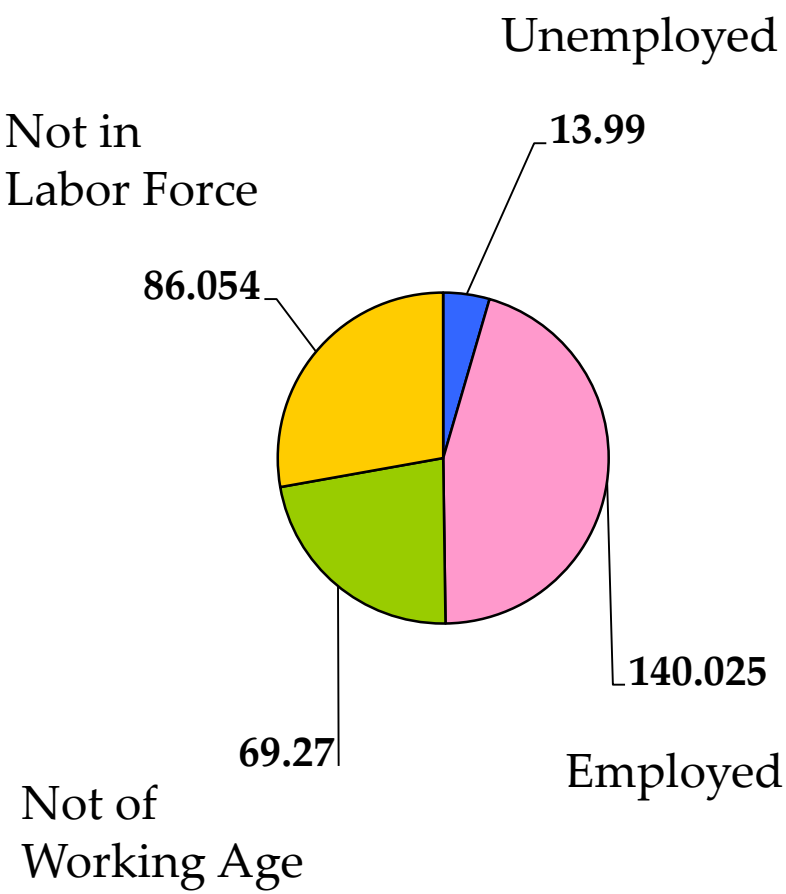
Labor force =

Employment rate =

Unemployment rate =

Participation rate =

U.S. labor market indicators



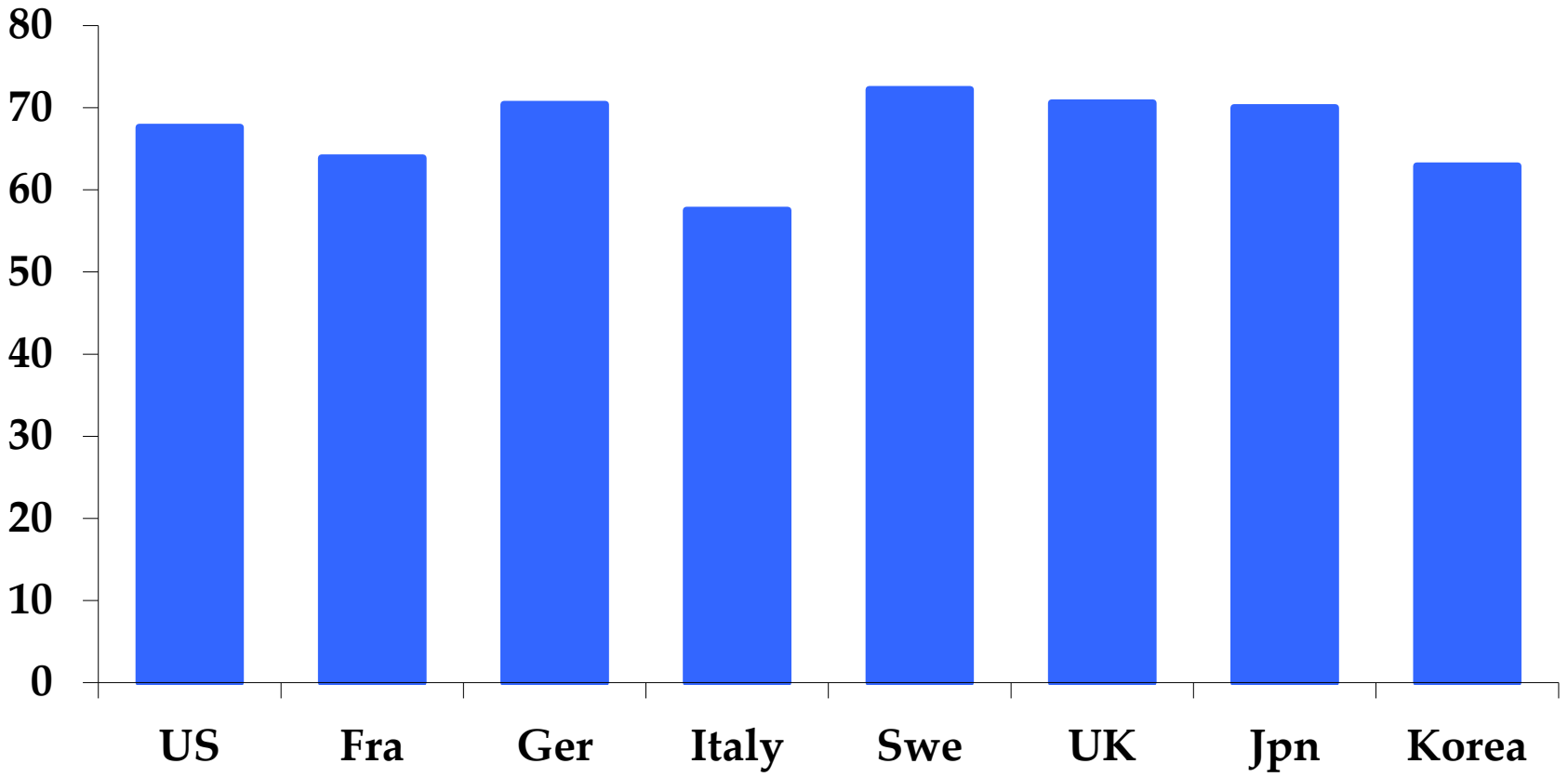
Labor force = 140.025+13.99

Employment rate = $\frac{140.025}{140.025+13.99+86.054}$

Unemployment rate = $\frac{13.99}{140.025+13.99}$

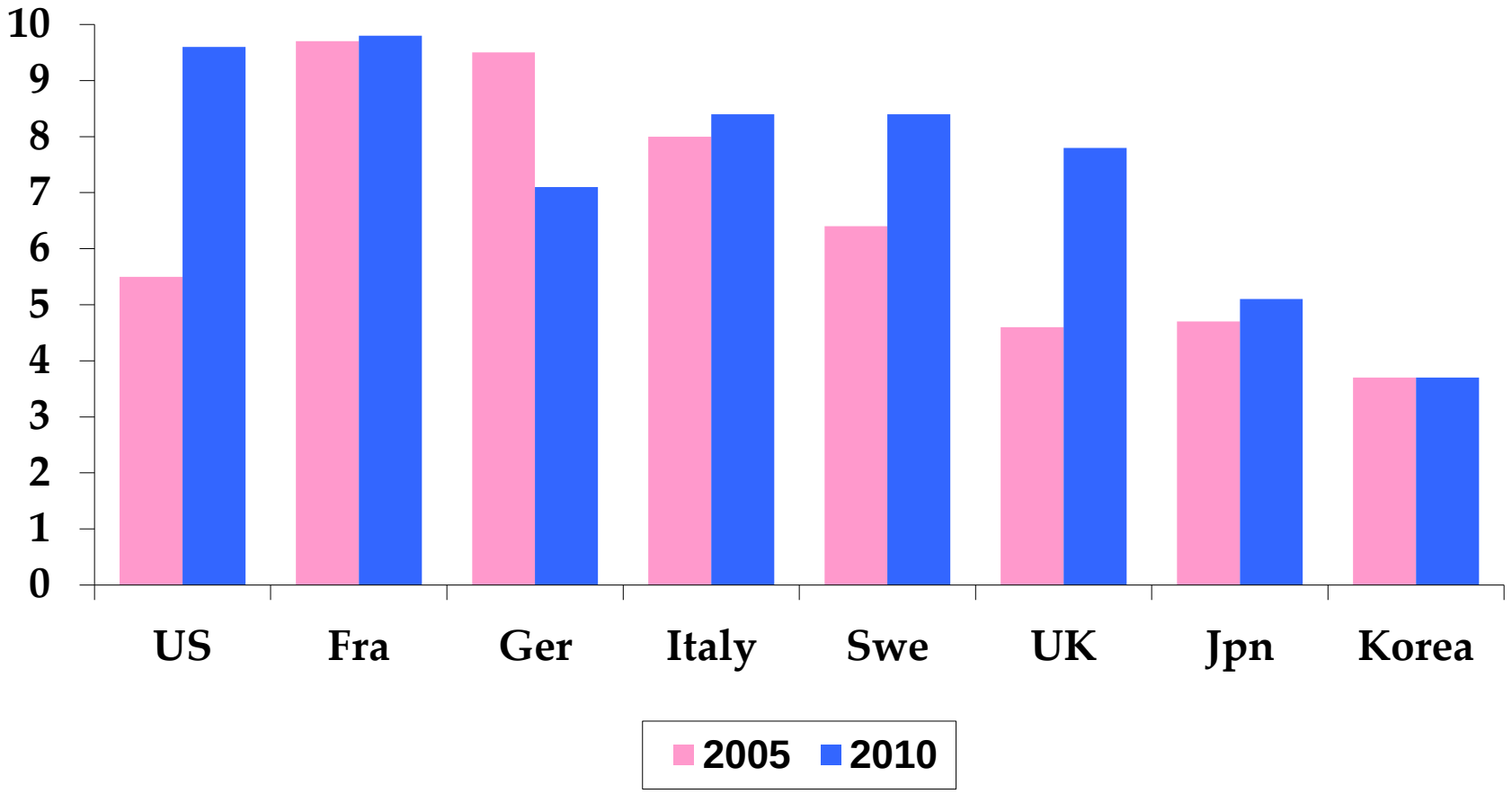
Particip. rate = $\frac{140.025+13.99}{140.025+13.99+86.054}$

Employment rate (% of 15-64)



Source: OECD, Employment Outlook, 2009.

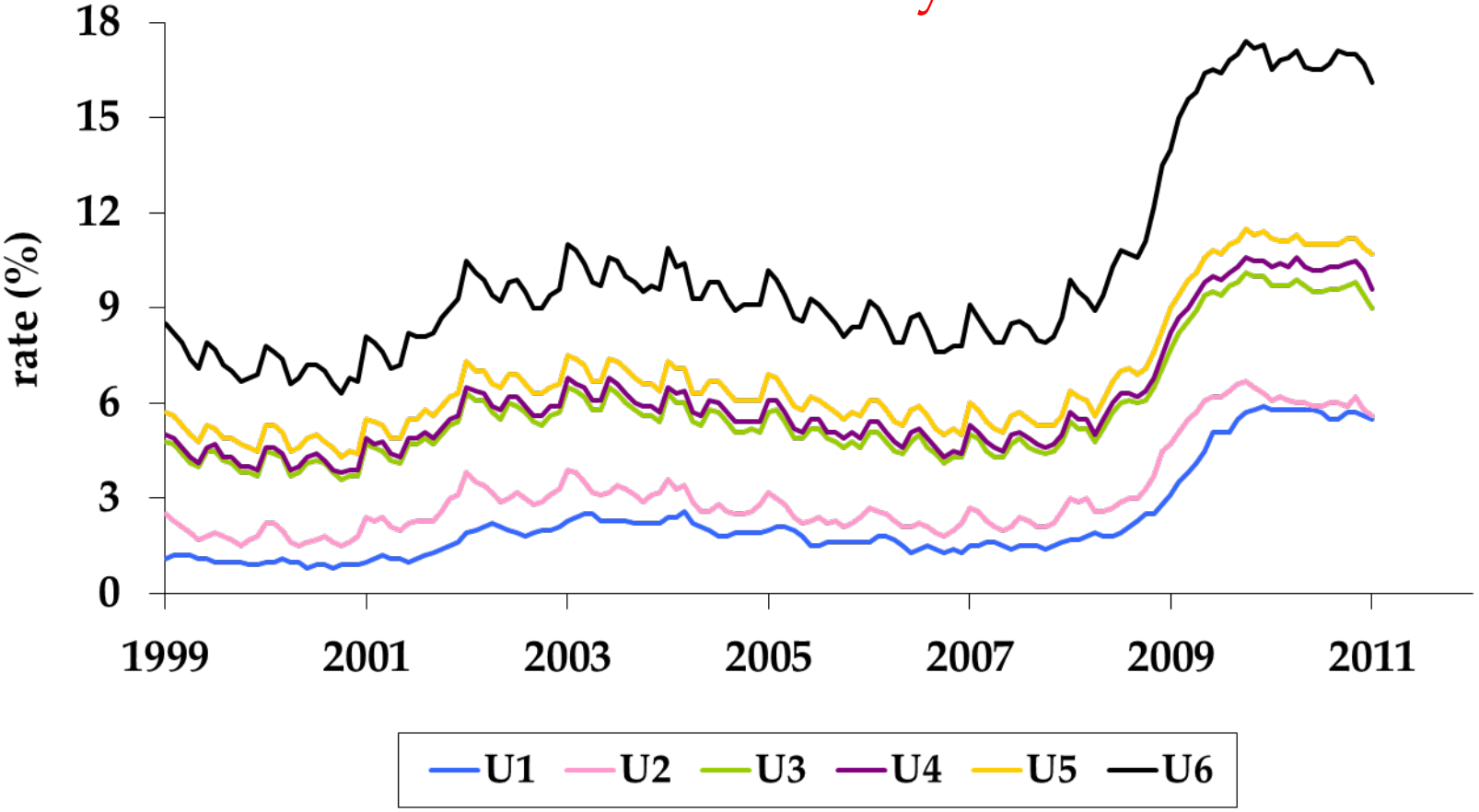
Unemployment rate (%)



Source: OECD, Employment Outlook. Standardized rates intended to be comparable across countries.

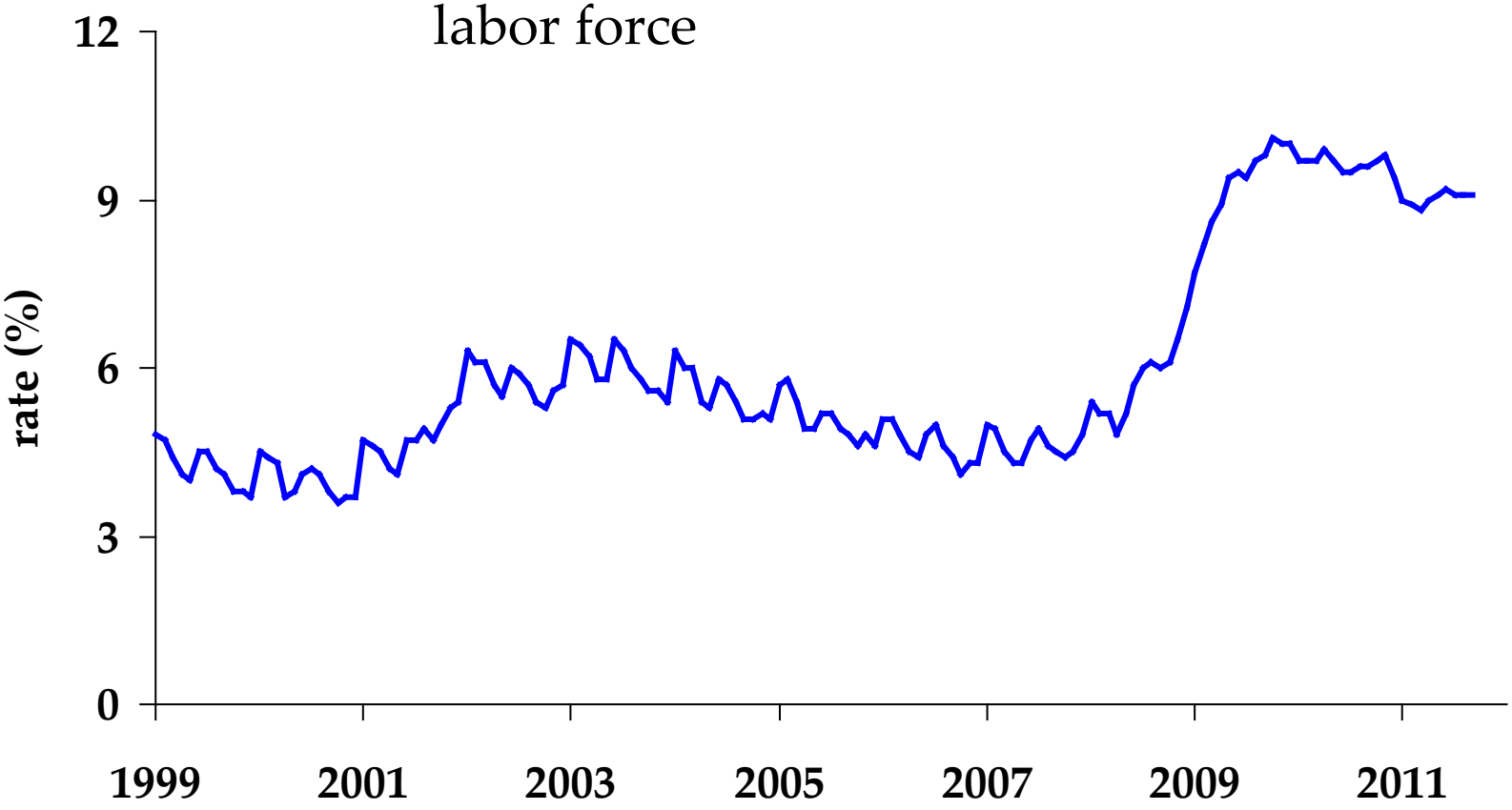
Alternative measures (U.S.)

What are these? Why do we care?



Official Unemployment Rate

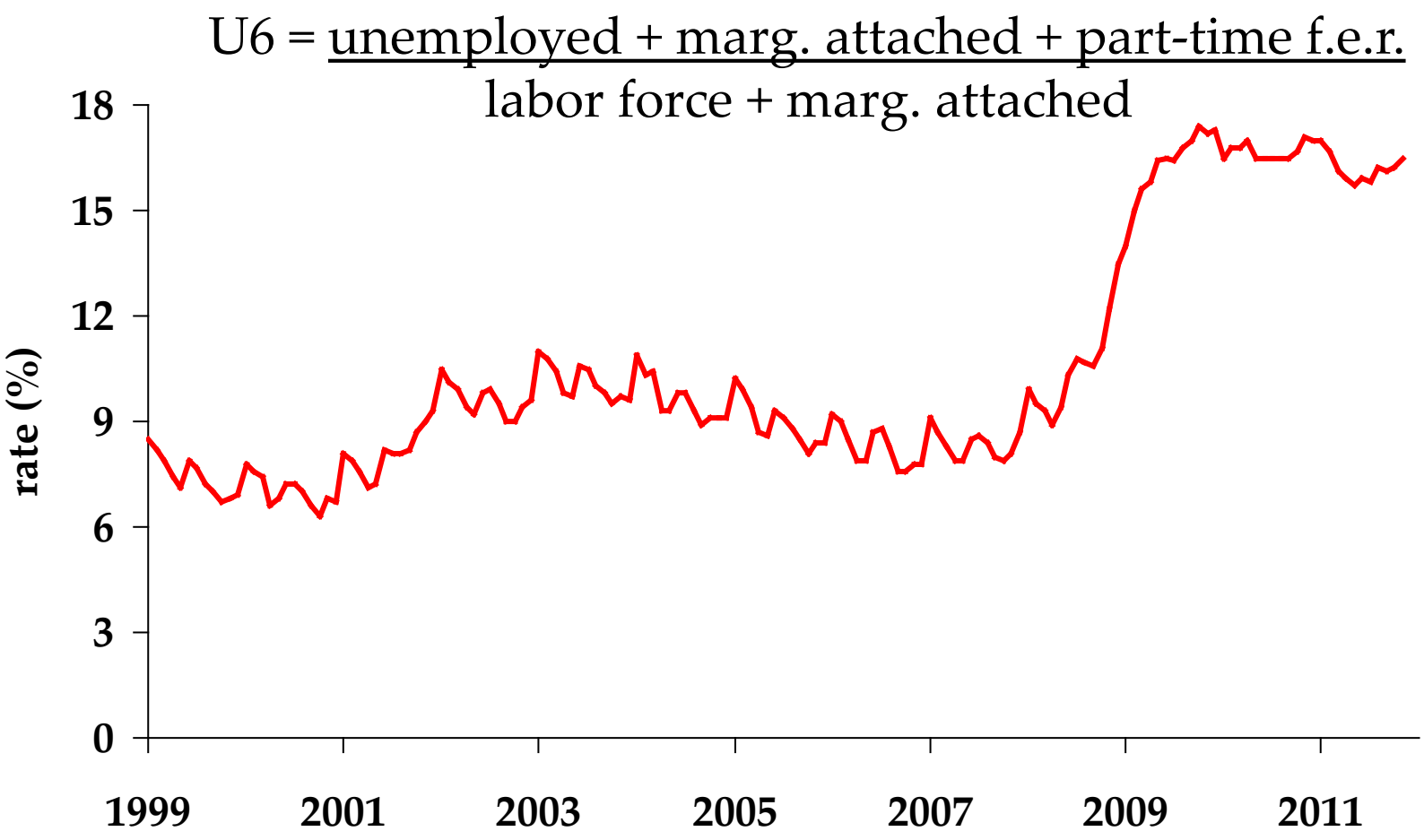
U3 = $\frac{\text{unemployed}}{\text{labor force}}$



Marginally Attached?

- Marginally attached workers are persons 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 recent past.
- Discouraged workers, a subset of the marginally attached, have given a job-market related reason for not looking currently for a job.
- 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.

Alternative measures (U.S.)



Unemployment: why?

- Institutions
  - Contracting policy, minimum wages, etc.
- Physics
  - It takes time to match workers and jobs

Labor Market Institutions

France and the US

	Y/POP	Y/L	Y/hL
US	34,875	67,865	37.58
France	25,664	56,909	37.12
Ratio	1.36	1.19	1.012

- Differences are mostly due to labor effort
- Can we tie labor effort to institutions?

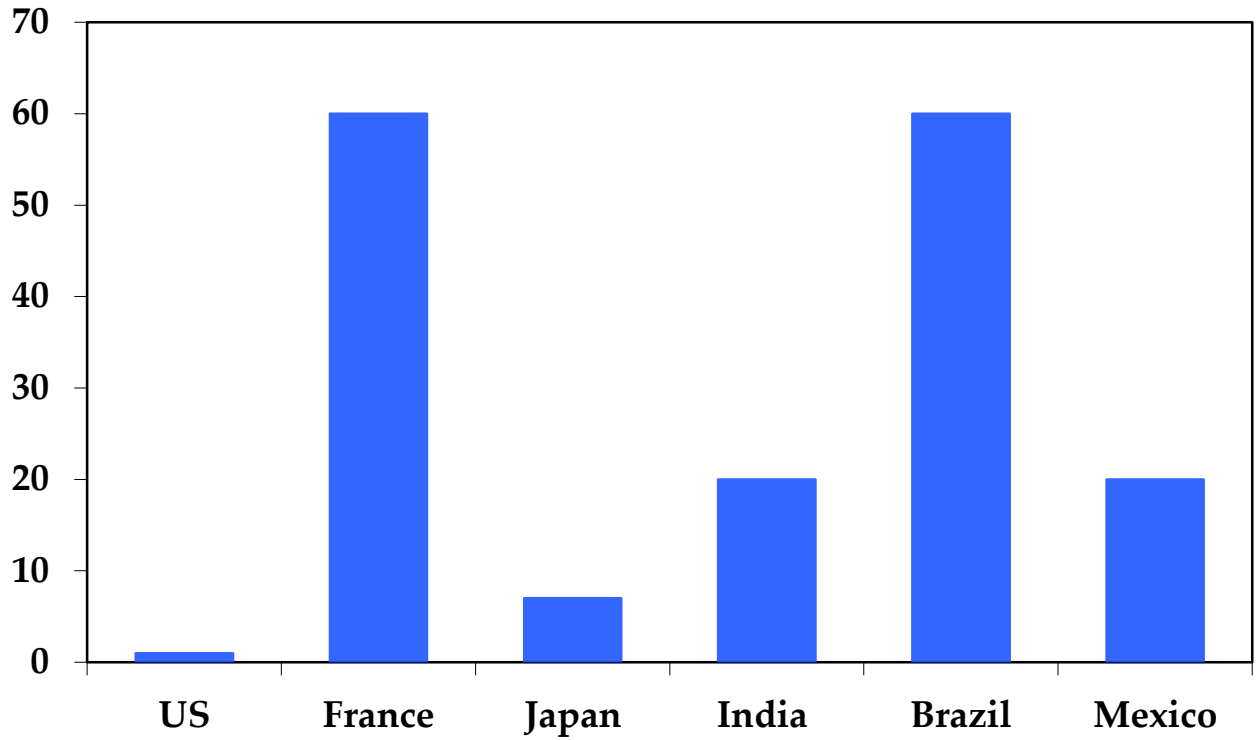
Source: Penn World Tables, version 6.2, and OECD, Employment Outlook.

Yogi vs. Tin Man

- According to WB *Doing Business* (2006)
  - Most flexible labor market = New Zealand
  - Least flexible labor market = Portugal

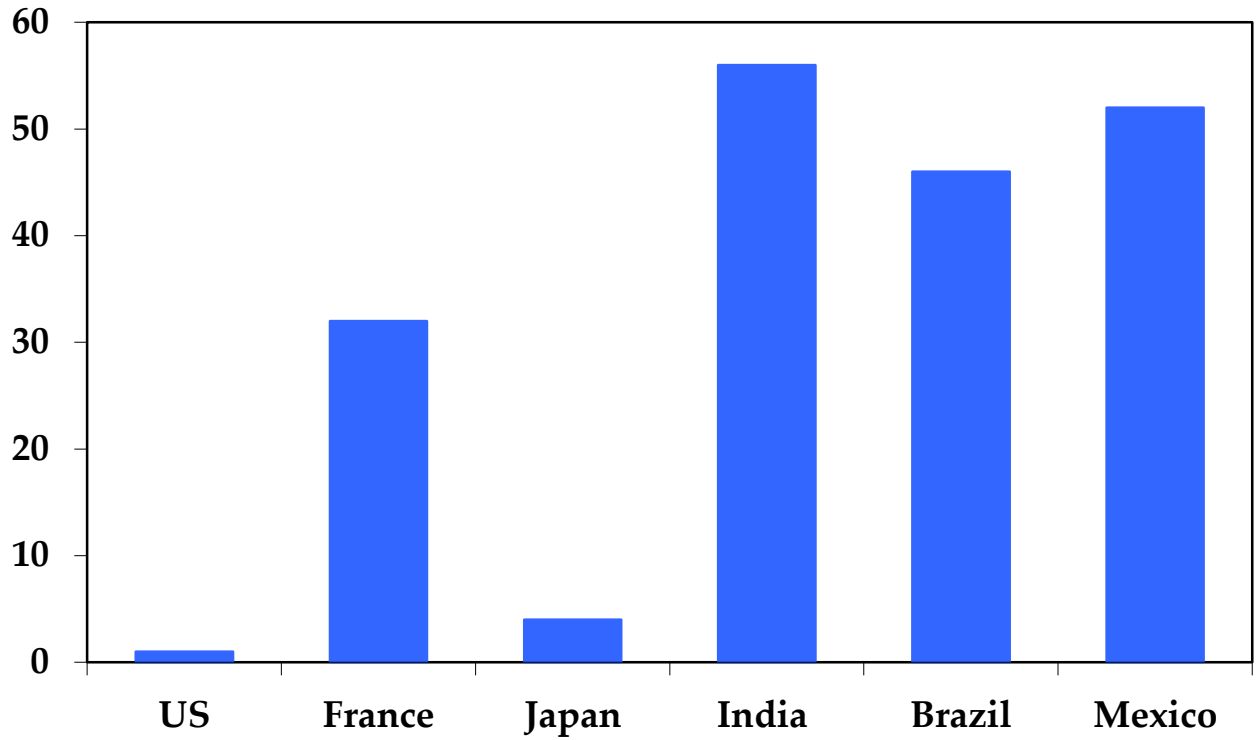
- Employment protection law (EPL)
  - Overtime compensation
  - Dismissal
  - Collective bargaining
  - Minimum wage

Rigidity of hours (index)



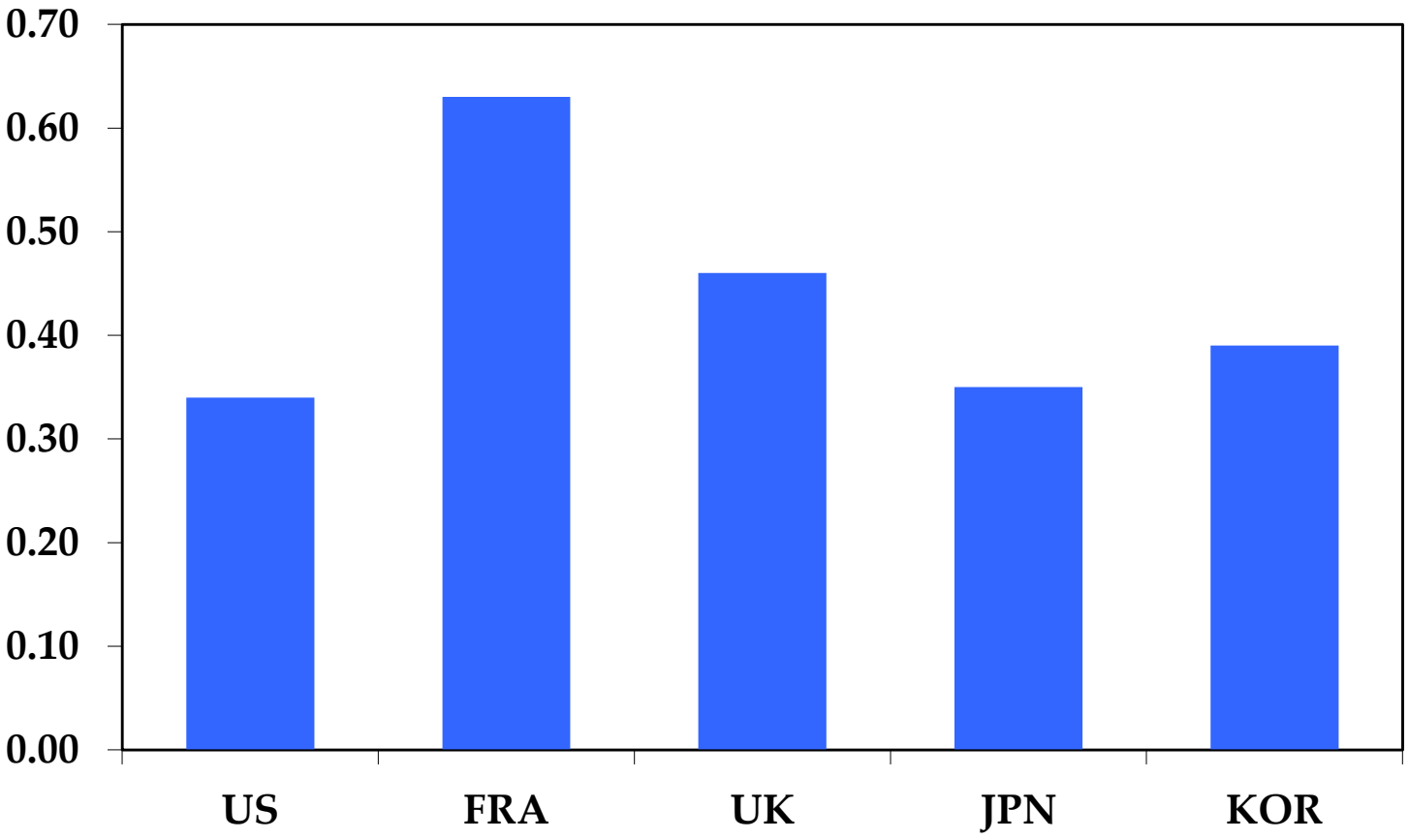
Source: World Bank, Doing Business.

Firing costs (weeks of wages)



Source: World Bank, Doing Business.

Minimum wage (ratio to median wage)



Source: OECD, employment database.

Minimum wages

- Meant to help low skilled workers
- Does it?

Labor Demand and Profits

- Profit maximization

$$\max_{K,L} \ \pi = pAK^{\alpha}L^{1-\alpha} - rK - wL$$

- First order conditions (marg. rev = marg. Cost)

$$\frac{d\pi}{dK} = p\alpha AK^{\alpha-1}L^{1-\alpha} - r = 0$$

$$\frac{d\pi}{dL} = p(1-\alpha)AK^{\alpha}L^{-\alpha} - w = 0$$

What drives labor demand?

- Solve for L using the second condition

$$(1-\alpha)pAK^{\alpha}L^{-\alpha} = w$$

- Divide each side by w and multiply by L^{α}

$$\frac{(1-\alpha)pAK^{\alpha}}{w} = L^{\alpha}$$

- Raise each side to the power of $\frac{1}{\alpha}$ to obtain:

$$L^{D}(w) = \left[\frac{(1-\alpha)pAK^{\alpha}}{w}\right]^{\frac{1}{\alpha}}$$

Labor market frictions: a simple model

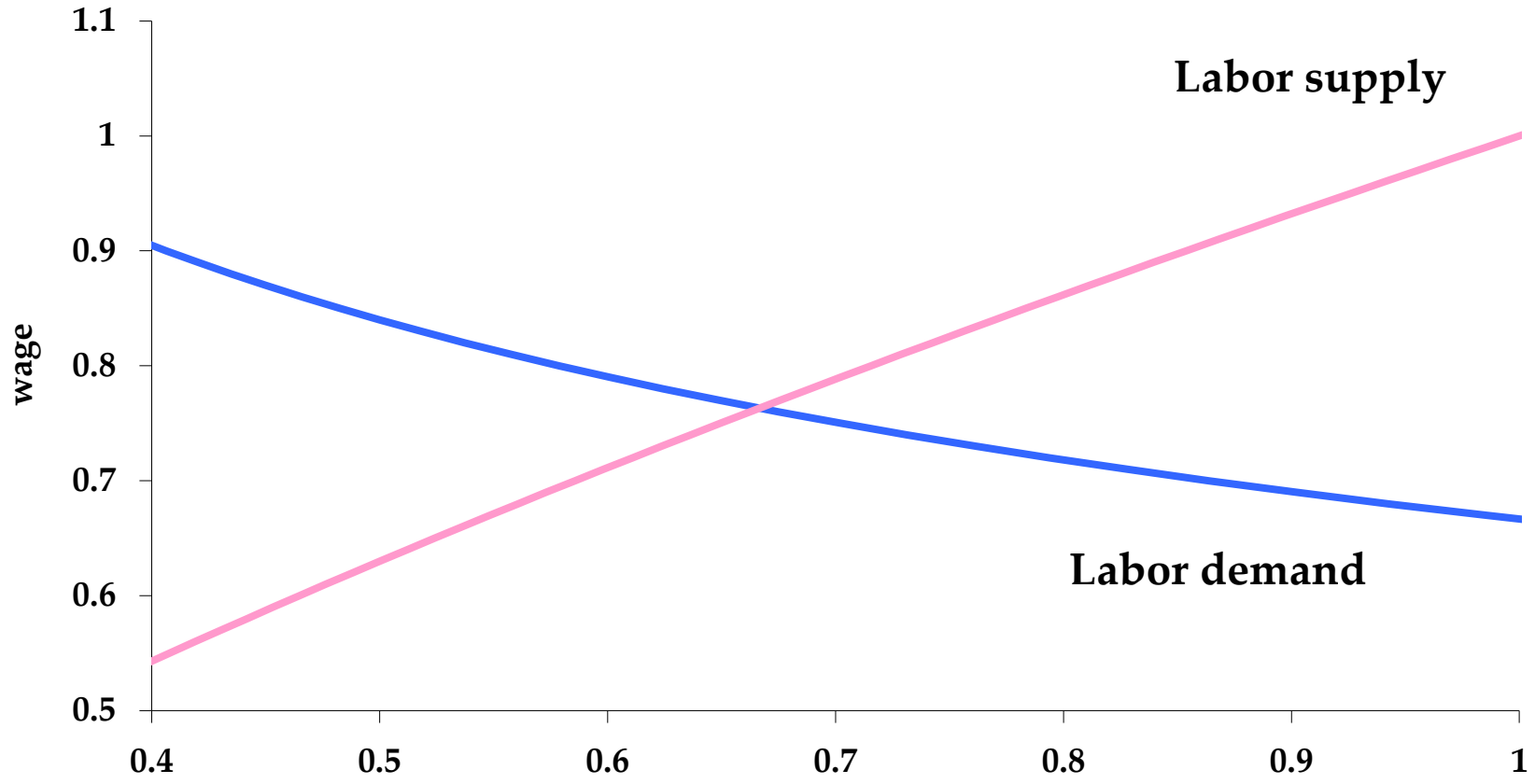
- Labor demand *function*
  - Firms hire labor to maximize profits

$$L^D(w) = \left[\frac{(1-\alpha)pAK^{\alpha}}{w}\right]^{\frac{1}{\alpha}}$$

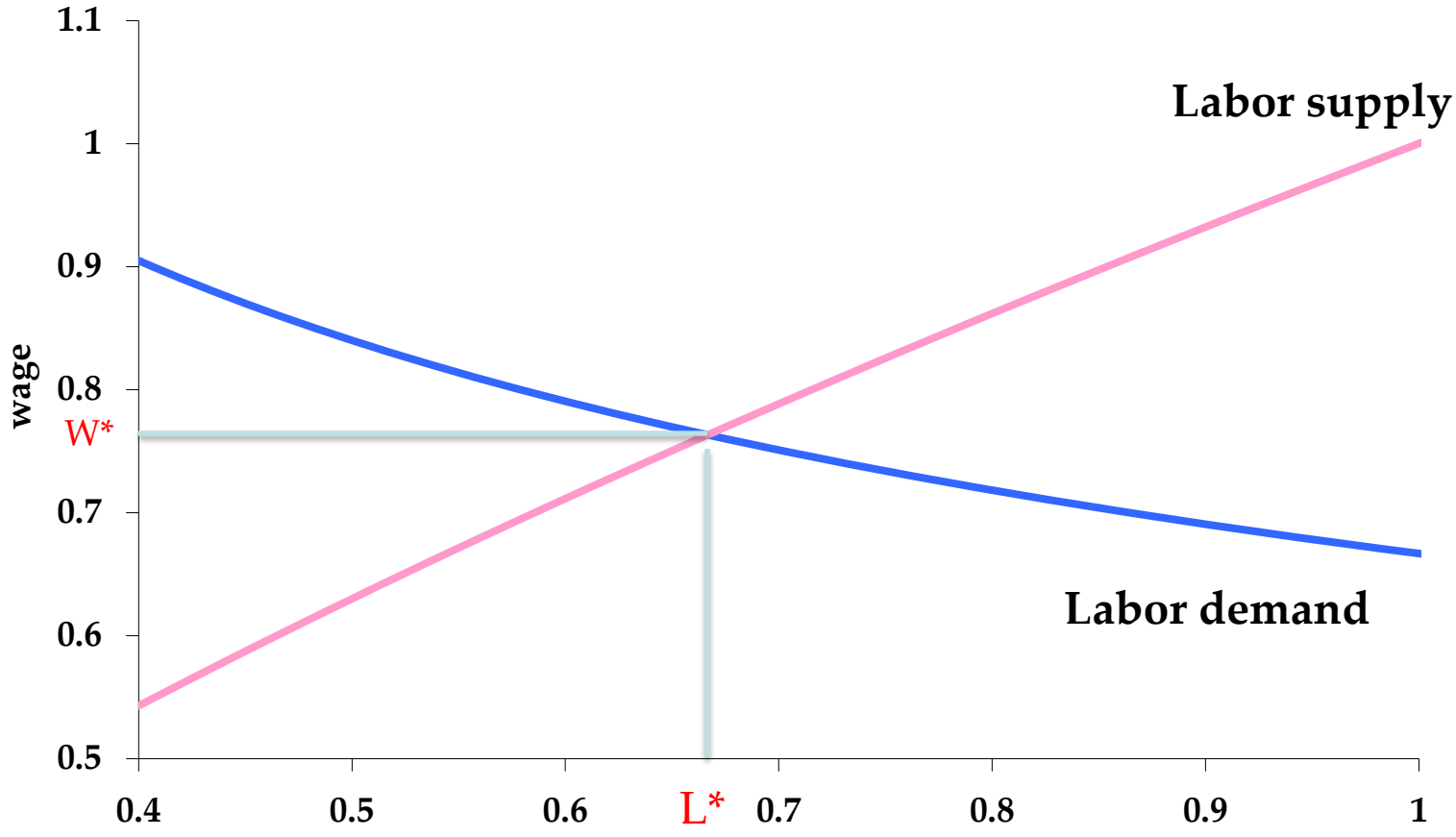
- Labor supply *function*
  - Individuals sell labor to maximize utility

$$L^S(w) = w^{\frac{3}{2}}$$

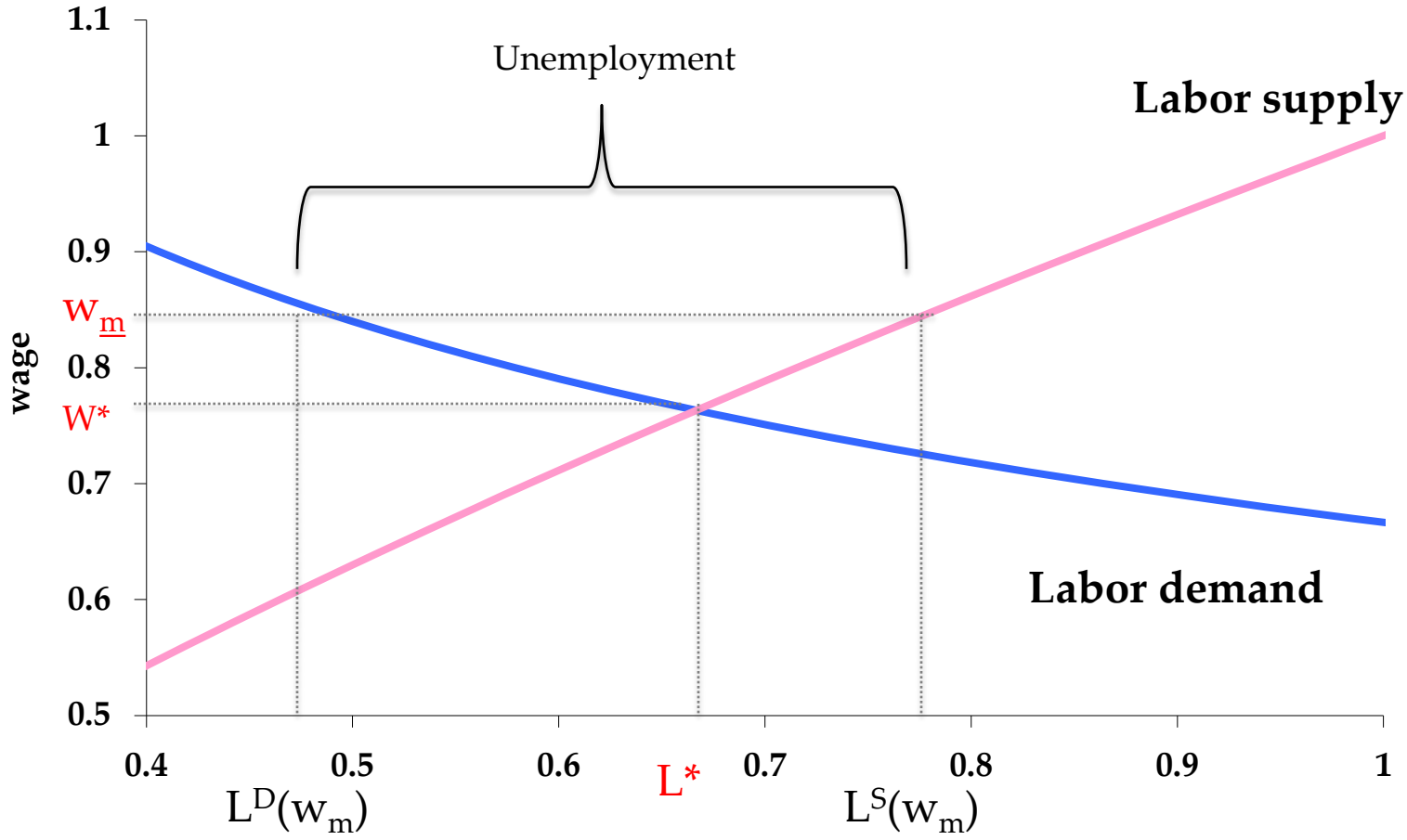
No frictions (p=A=K=1)



No frictions (p=A=K=1)



Minimum wage (p=A=K=1)



Minimum Wage: Numerical Example

- Solve for w* to obtain $L^D=L^S=L^*$

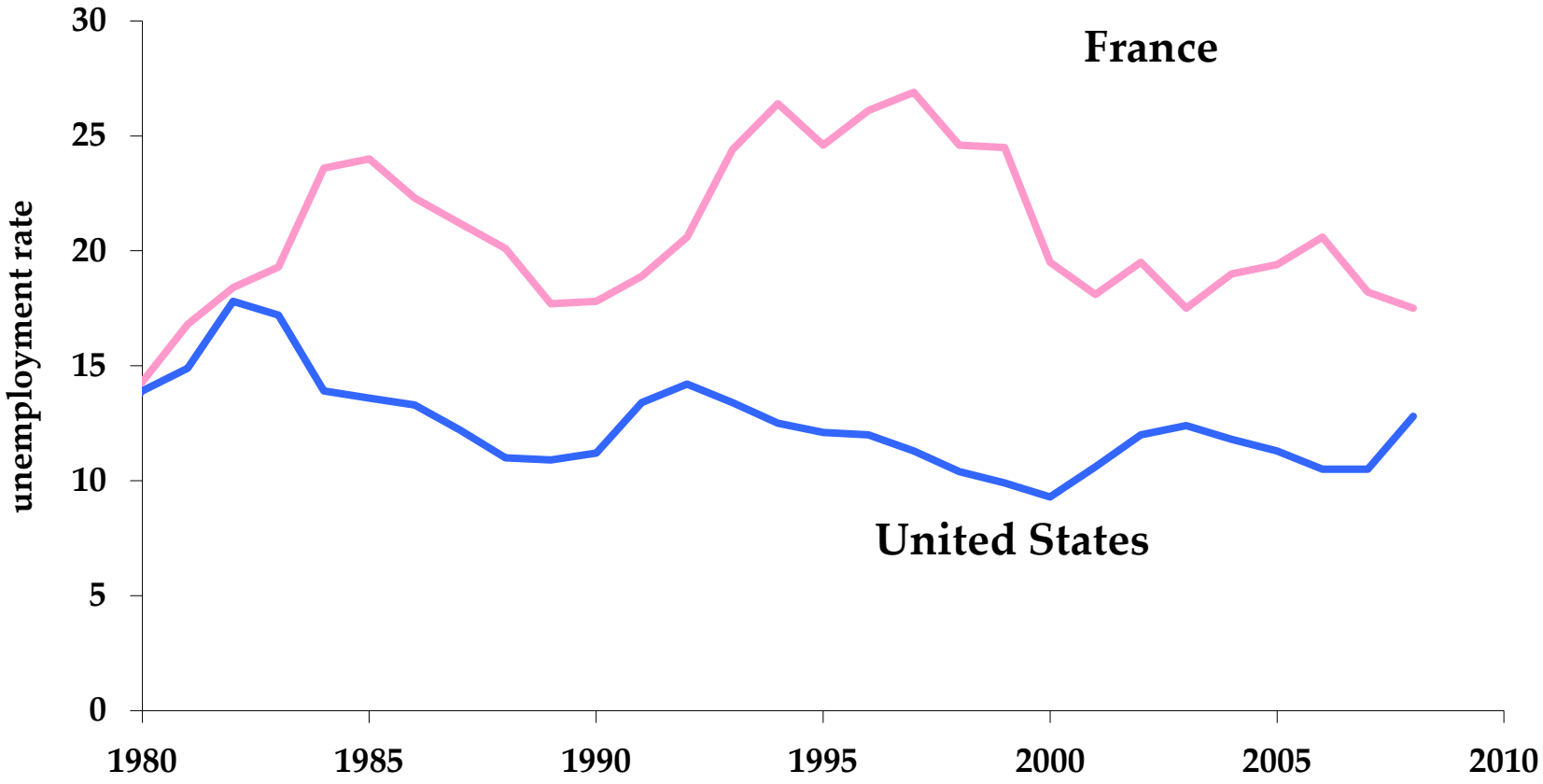
$$\left[\frac{1-\alpha}{w^*}\right]^{\frac{1}{\alpha}} = w^{*\frac{3}{2}} \quad \text{so} \quad \left[\frac{1-\frac{1}{3}}{w^*}\right]^3 = w^{*\frac{3}{2}}$$

$$w^* = 0.76 \quad \text{and } L^D=L^S=L^*=0.66$$

Now, suppose there is a minimum wage of $w_M=0.85$

Then, $L^D=0.48$ while $L^S = 0.78$, so the unemployment rate is (0.78-0.48)/0.78=0.38 (or 38%).

Youth unemployment rate



What's going on in France?

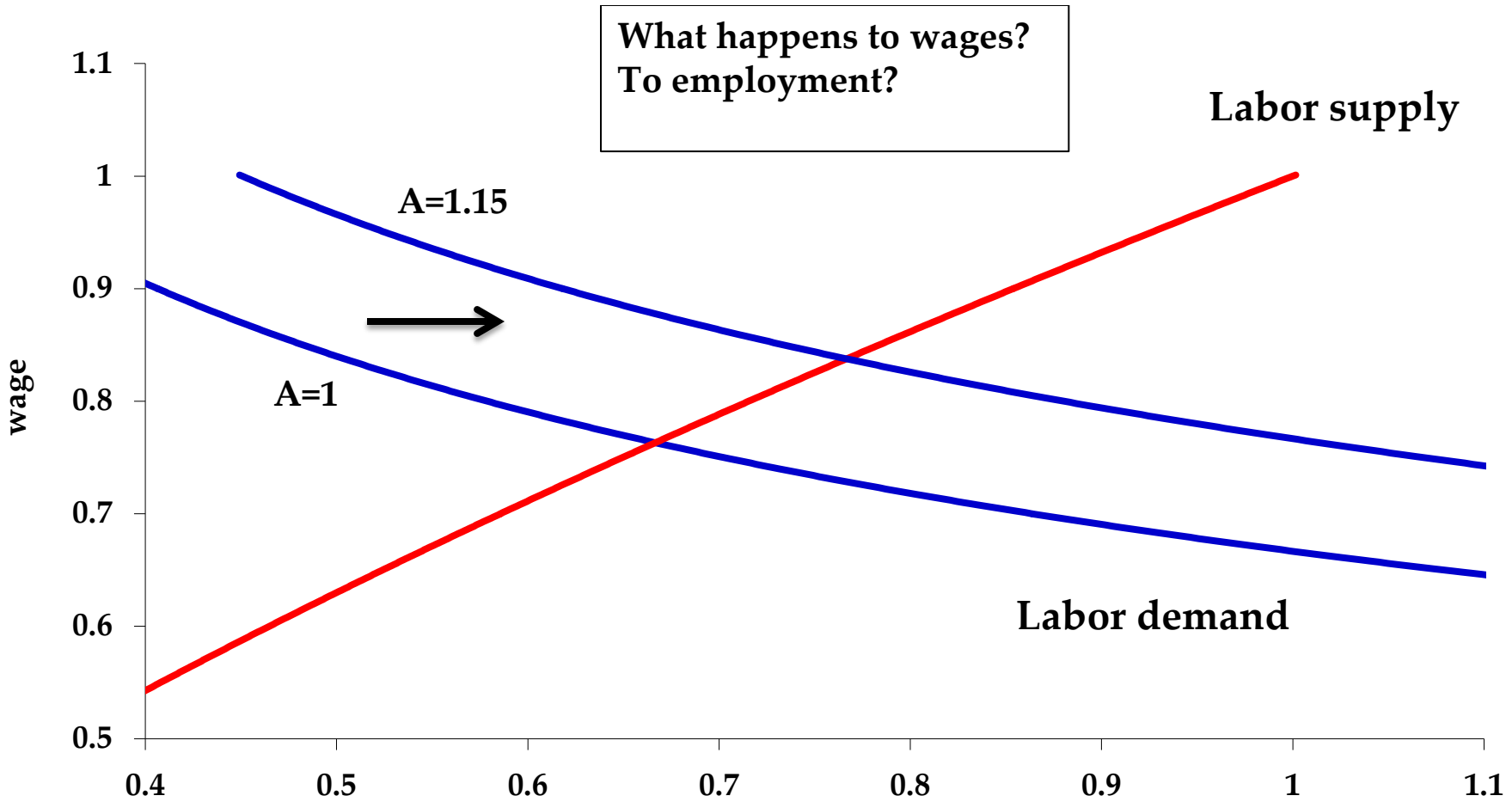
- Gary Becker: "Generous minimum wages and other rigidities of the French labor market caused unemployment rates that have remained stubbornly high since the early 1990's. Immigrants, youths, and other new entrants into the labor market have been hurt the most."

Labor Market Dynamics

Volatility and employment

- Demand for labor is volatile
  - How does labor market flexibility affect labor market outcomes?
  - What role do institutions play?
- Job market (like housing market) is a matching market involving search costs and unemployment even in equilibrium
- 2010 Nobel prize: search theory

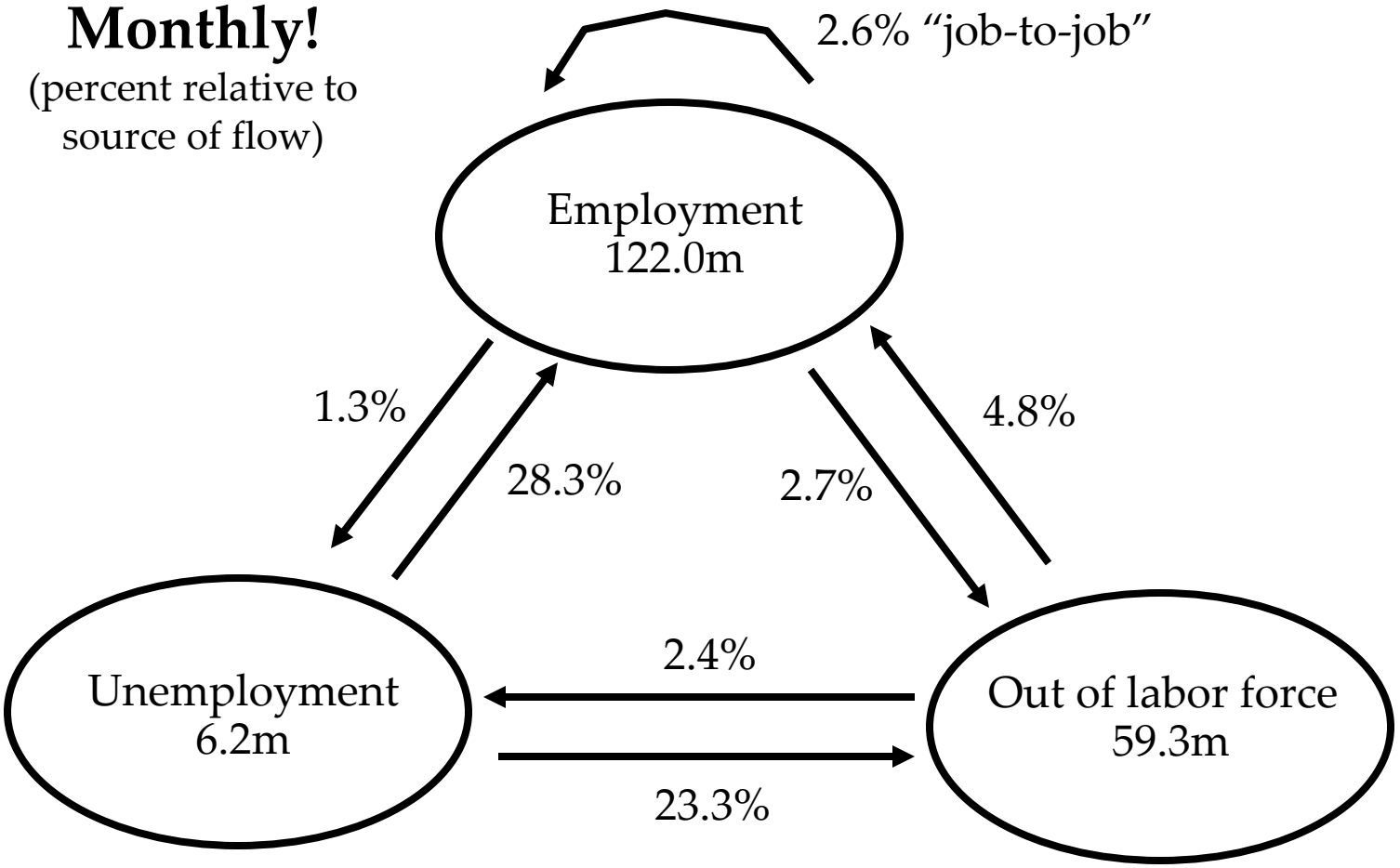
Demand for labor (p=K=1)



Labor market turnover

- Creation and destruction of jobs by firms
  - Creation: sum of all increases in number of employees by individual establishments
  - Destruction: sum of all decreases in number of employees by individual establishments
- Changes in job status by workers
  - Accessions: number of workers taking new jobs, whether their previous status was employed, unemployed, or not in labor force
  - Separations: number of workers leaving current jobs, whether they become employed, unemployed, or leave labor force
- Bottom line from both: enormous turnover

Labor market transitions (avg. 93-05)



Source: US data, monthly, reported in Davis, Faberman, and Haltiwanger, "Flow approach," 2005.

A model of employment dynamics

- Fixed labor force: L
  - unemployed agents: U
  - employed agents: E
- In rates
  - Unemployment rate: $u = U / L$
  - Employment rate: $e = E / L$
  - everyone is employed or unemployed: $u + e = 1$

Unemployment dynamics: assumptions

- Constant rate of separations per period

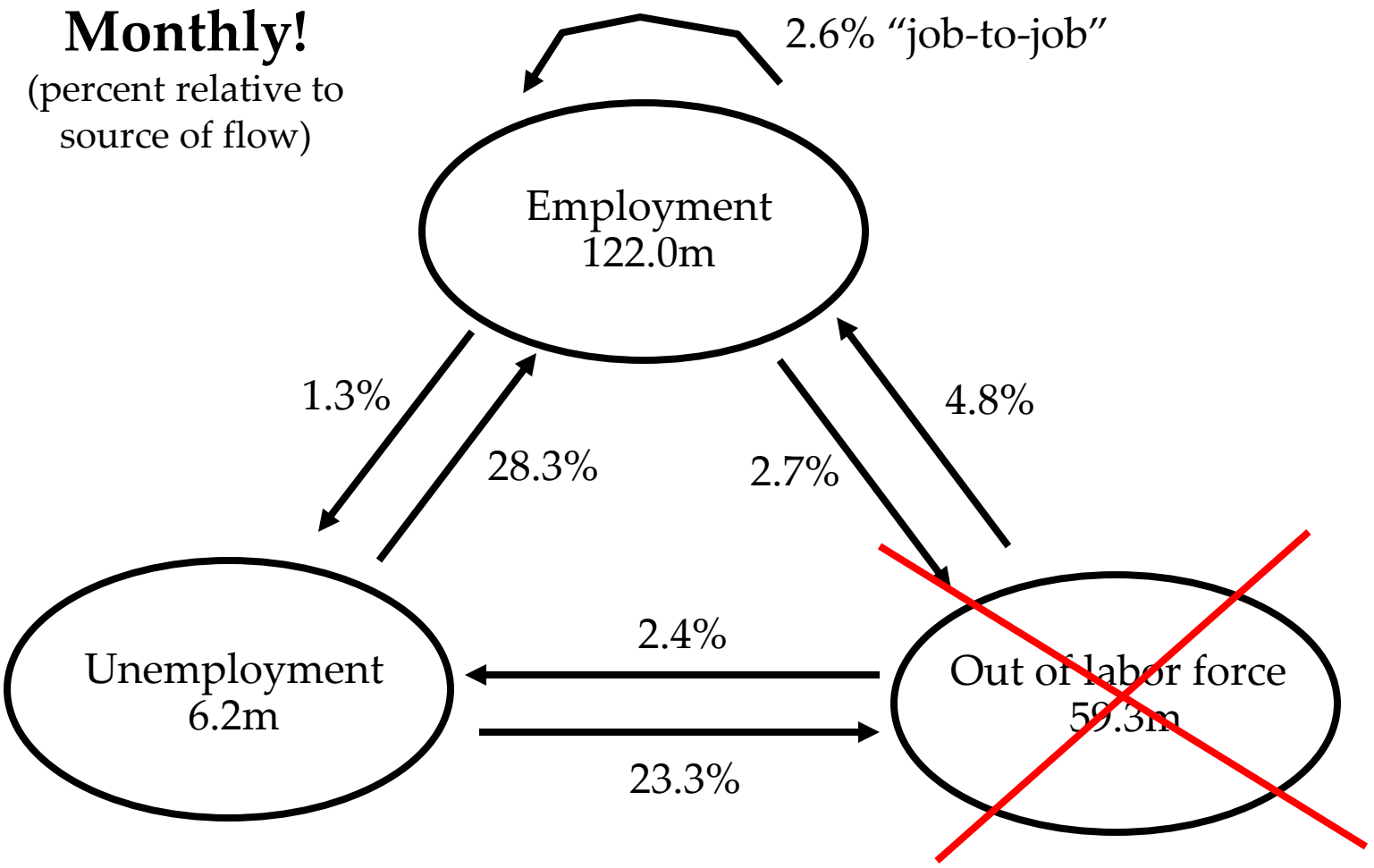
$$0 < s < 1$$

- Constant rate of accessions per period

$$0 < a < 1$$

- Stand-in for: need to match worker and firm
  - A simplification, could make a, s functions

Labor market transitions (avg. 93-05)



Source: US data, monthly, reported in Davis, Faberman, and Haltiwanger, "Flow approach," 2005.

Unemployment dynamics

$$U_{t+1} = U_t + sE_t - aU_t$$

$$\frac{U_{t+1}}{L} = \frac{U_t}{L} + \frac{sE_t}{L} - \frac{aU_t}{L}$$

$$u_{t+1} = u_t + se_t - au_t$$

$$u_{t+1} = u_t + s(1-u_t) - au_t$$

Unemployment dynamics

- Example: $a = 0.40$, $s = 0.02$, $u_t = 0.08$
- Use:

$$u_{t+1} = u_t + s(1 - u_t) - au_t$$

- Next period's unemployment rate is

$$u_{t+1} = 0.08 + 0.02 \times (1 - 0.08) - 0.40 \times 0.08 = 0.0664$$

Unemployment dynamics

- Two forces
  - Newly employed
  - Newly unemployed

$$u_{t+1} - u_t = s(1 - u_t) - au_t$$

- Remind you of Solow?

Steady state unemployment

- Set $u_{t+1} = u_t = u_{ss}$
- Solve for u_{ss}

$$0 = s\left(1 - u_{ss}\right) - a u_{ss}$$

$$u_{ss} = \frac{s}{a + s}$$

- Example continued

$$u_{ss} = \frac{0.02}{0.40 + 0.02} = 0.0476$$

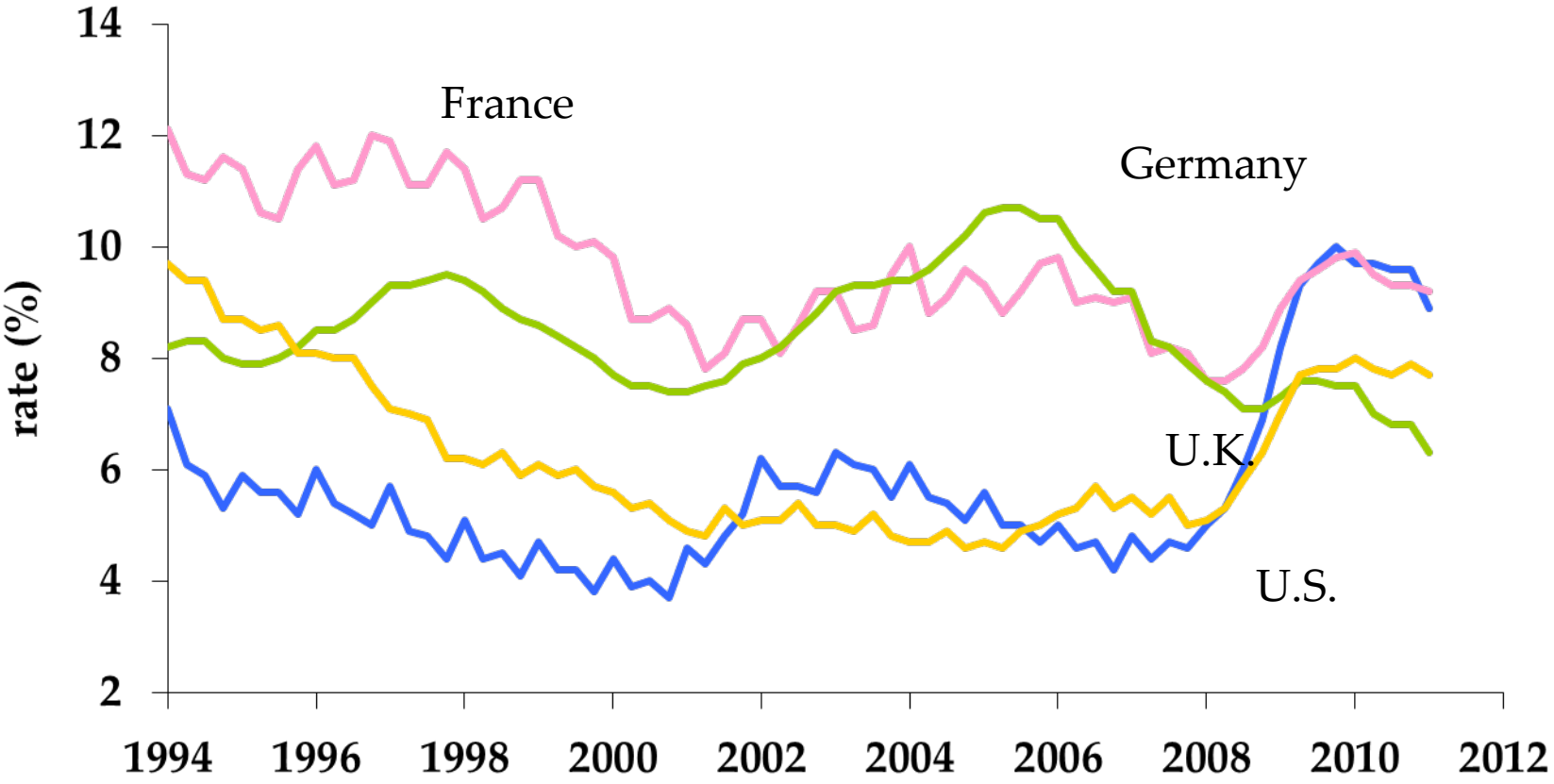
Steady state

- Steady state unemployment level

$$u_{ss} = \frac{s}{a+s}$$

  - What is the effect of a ?
  - What is the effect of s ?

Unemployment rates

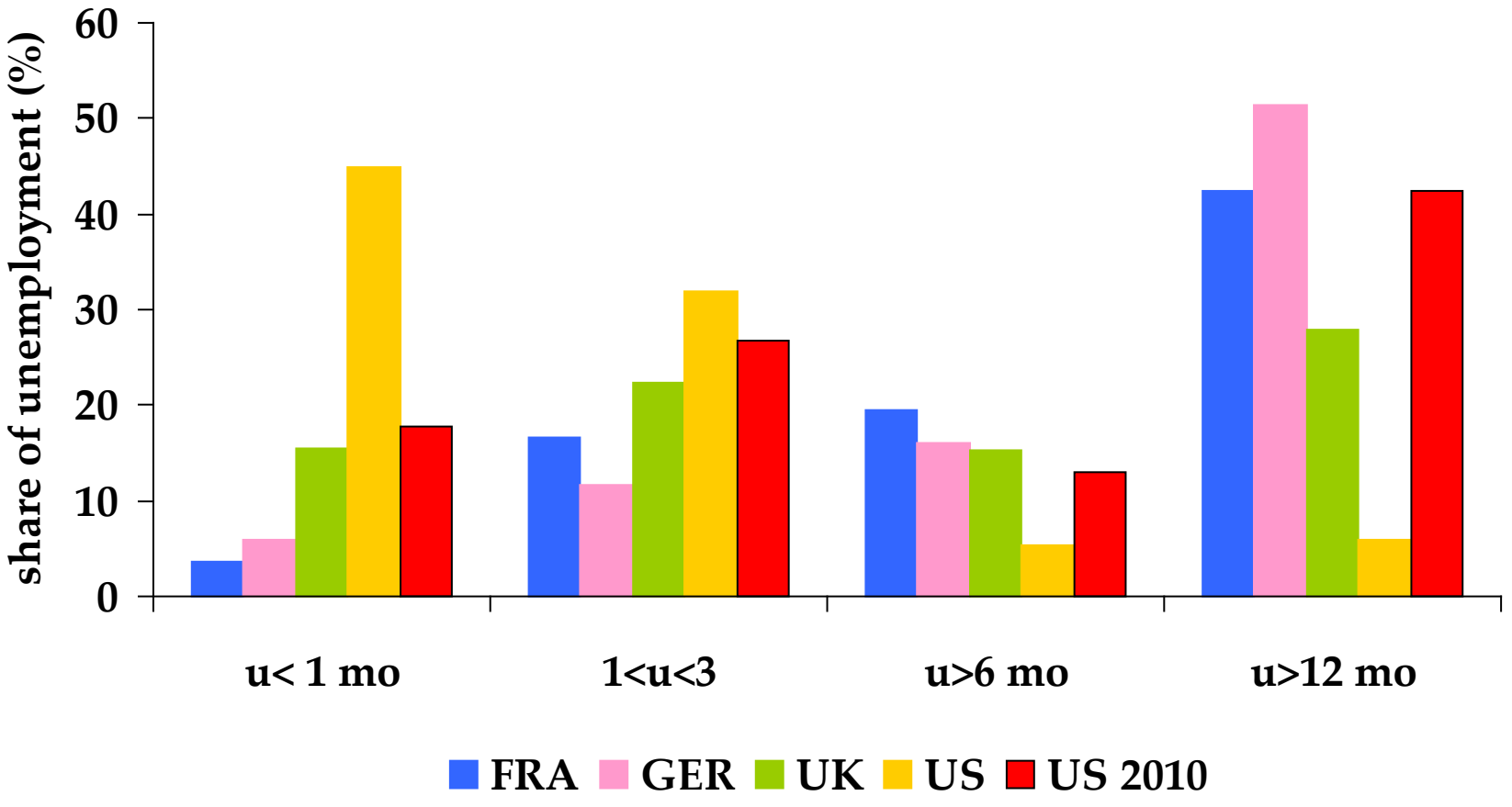


Duration

- It can be shown (we won't do it)
  - Average duration of unemployment is $1/a$
  - Average duration of employment is $1/s$

$$u_{ss} = \frac{\text{duration of } U}{\text{duration of U + duration of E}}$$

Unemployment duration (2000)



Turnover and employment

- High *a*
  - Easier to get a job
  - Lower "natural" unemployment rate
  - Shorter duration of unemployment: 1/a = duration of unemployment

- High *s*
  - Easier to lose a job
  - Higher "natural" unemployment rate
  - Shorter duration of employment: 1/s = duration of employment

Transitions in US and EU

		Workers and Jobs		
Country		Accessions	Separations	Reallocation
Denmark		29.0	29.0	**58.0**
France		28.9	30.7	**59.6**
Germany		31.6	30.4	**62.0**
Italy		34.5	33.6	**68.1**
Sweden		16.8	17.8	**34.6**
UK		37.2	37.6	**74.8**
USA		45.2	46.0	**91.2**

Source: OECD, Employment Report, 1994; numbers are annual percentages of labor force.

Institutions

- What influences *a* and *s*?
- Institutions
  - Employment protection
  - Unemployment benefits
  - Unions
  - Contract laws

Volatility

- How do economies respond to shocks?
- Use our model
  - Begin in steady state
  - "Displace" some workers: higher unemployment
  - How does the economy return to steady state?

From our example

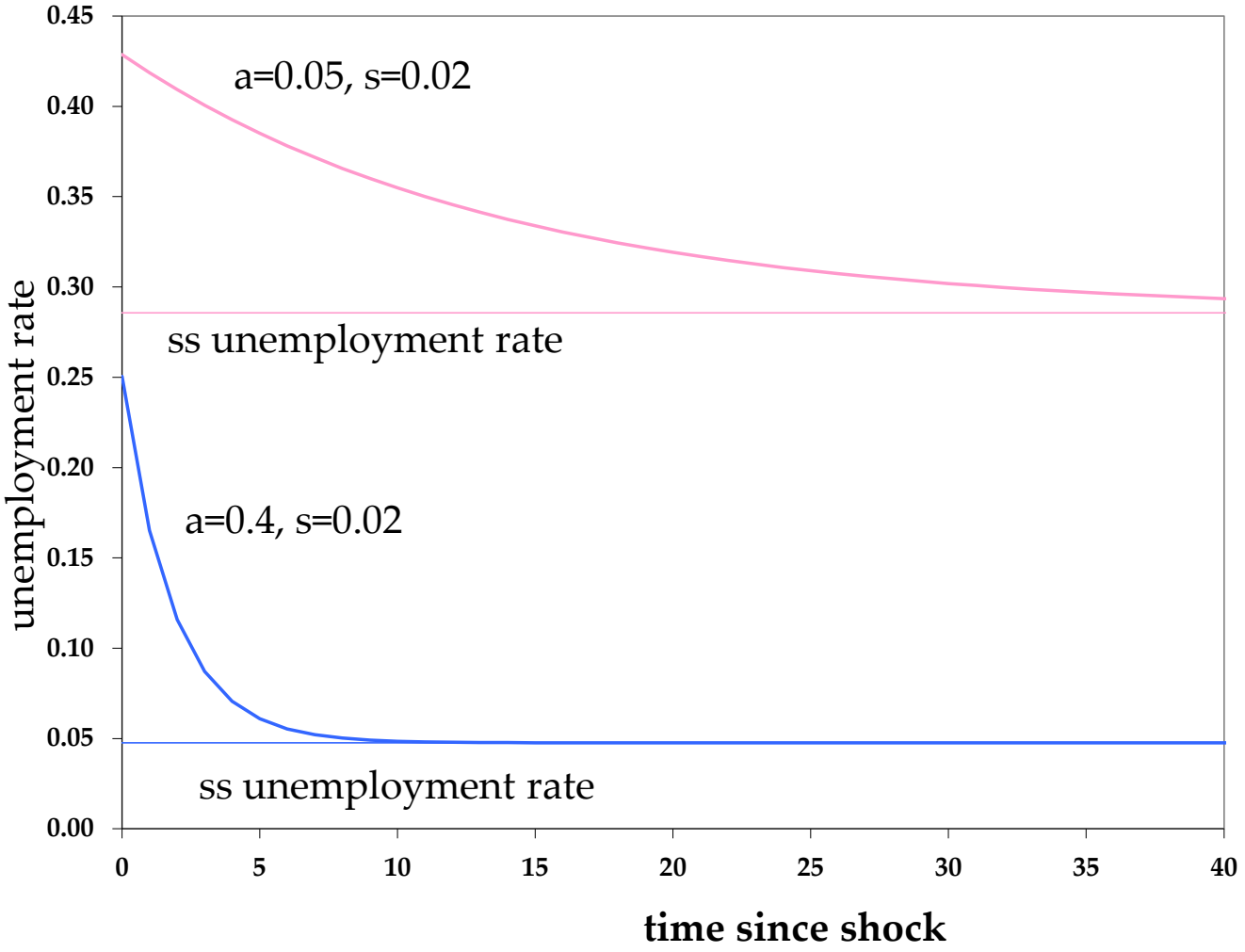
- Example: $a = 0.40,\ s = 0.02$
- Steady state unemployment is

$$u_{ss} = \frac{0.02}{0.40 + 0.02} = 0.0476$$

- Shock increases unemployment 50%

$$u_0 = 0.0714$$

Responding to shocks

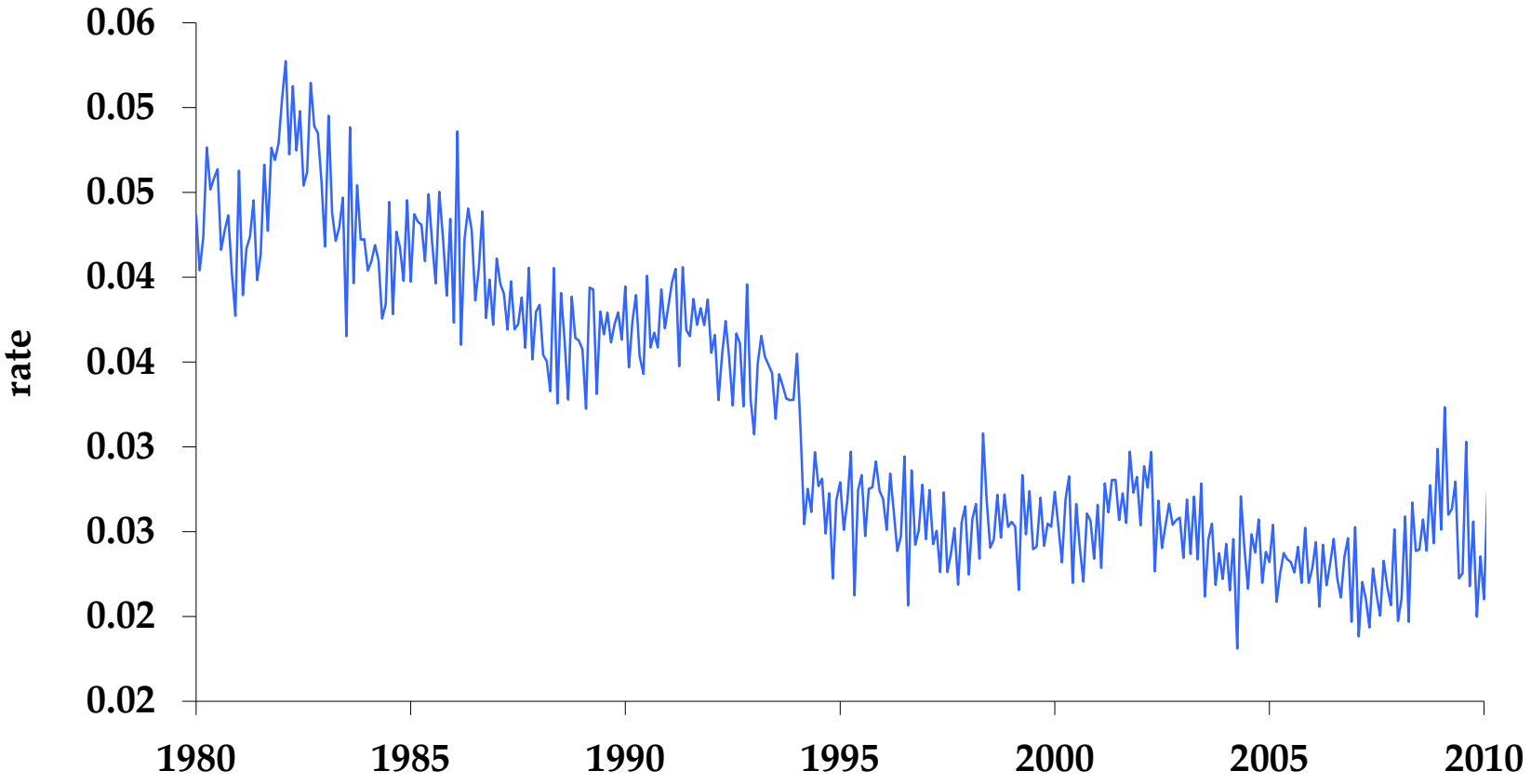


See DynamicUnempModel.xls for details

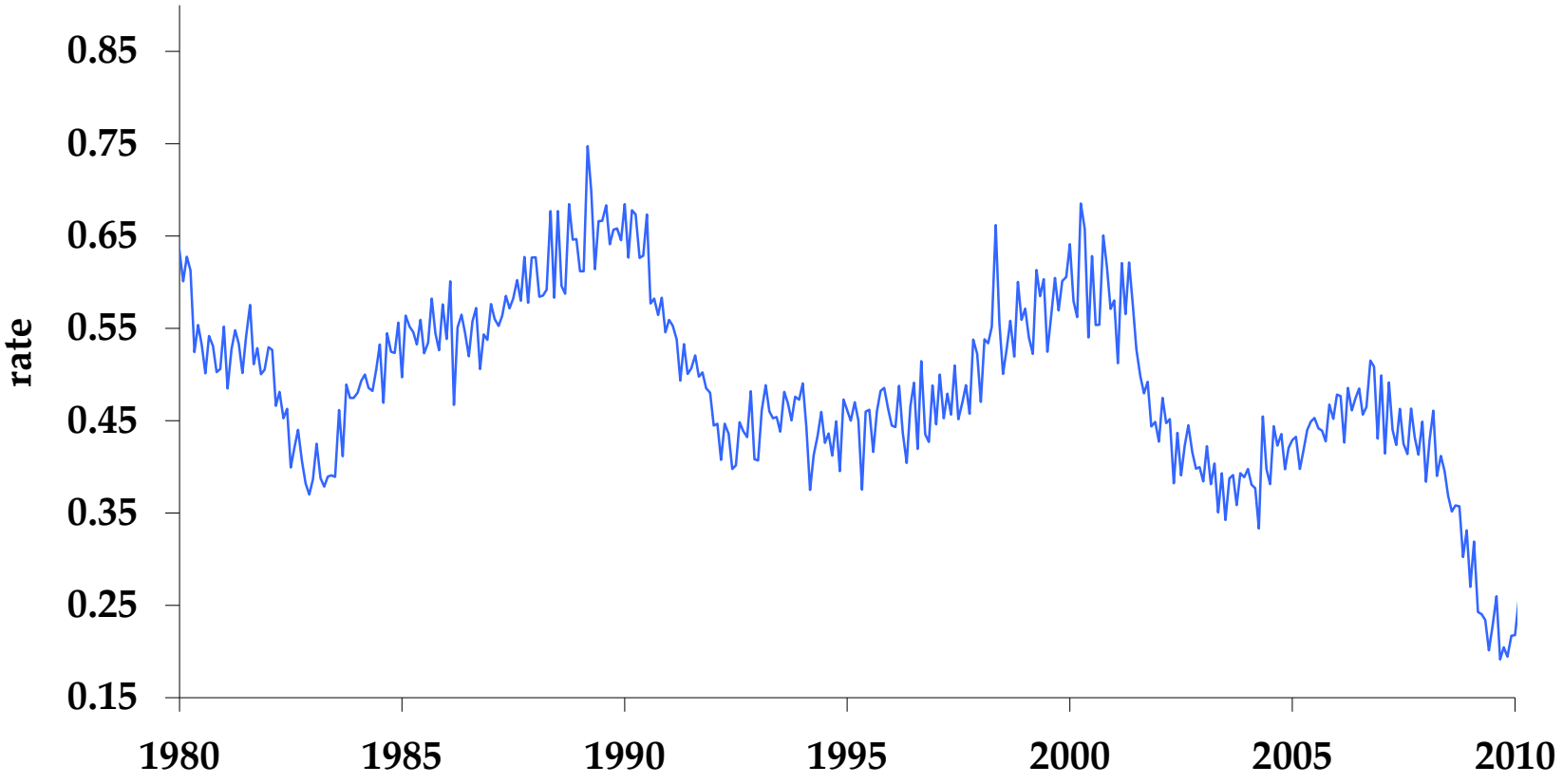
Labor market fluctuations

- a and s move over the business cycles
- U.S. numbers:
  - $a = 0.25$, long run average 0.57
  - $s = 0.027$, long run average 0.03
  - Implies steady state unemployment rate of 9.75 percent!
- Should a decline on trend?

U.S. separation rate



U.S. accession rate



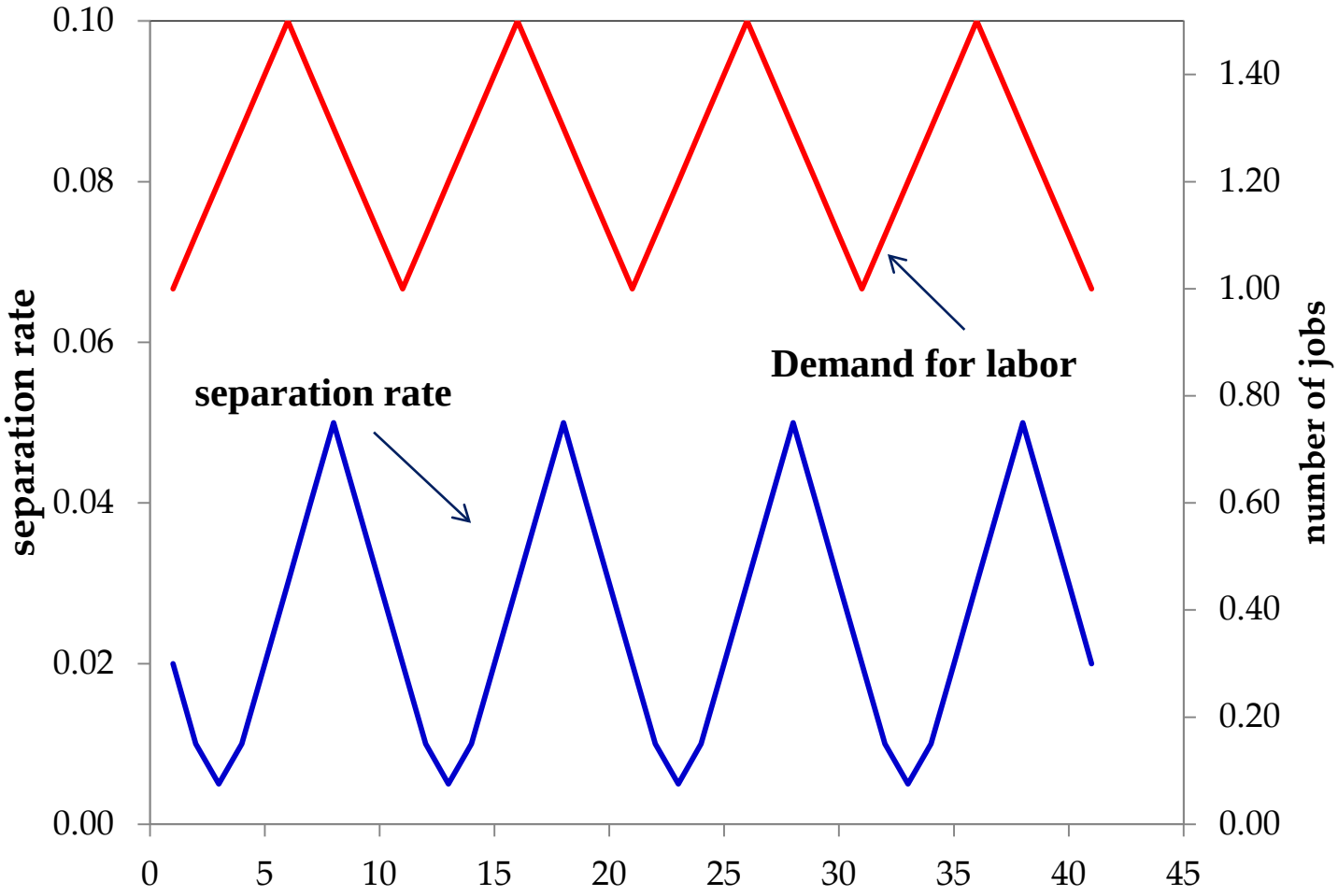
Extended model

- Labor demand moves over time
- Separation rate moves over time
- Probability of finding a job depends on
  - Unemployment rate, u
  - Vacancy rate, v

$$a = 0.4\left(\frac{v}{u}\right)^{0.2}$$

  - More vacancies, less unemployment makes it easier to find a job (v/u is measure of tightness)

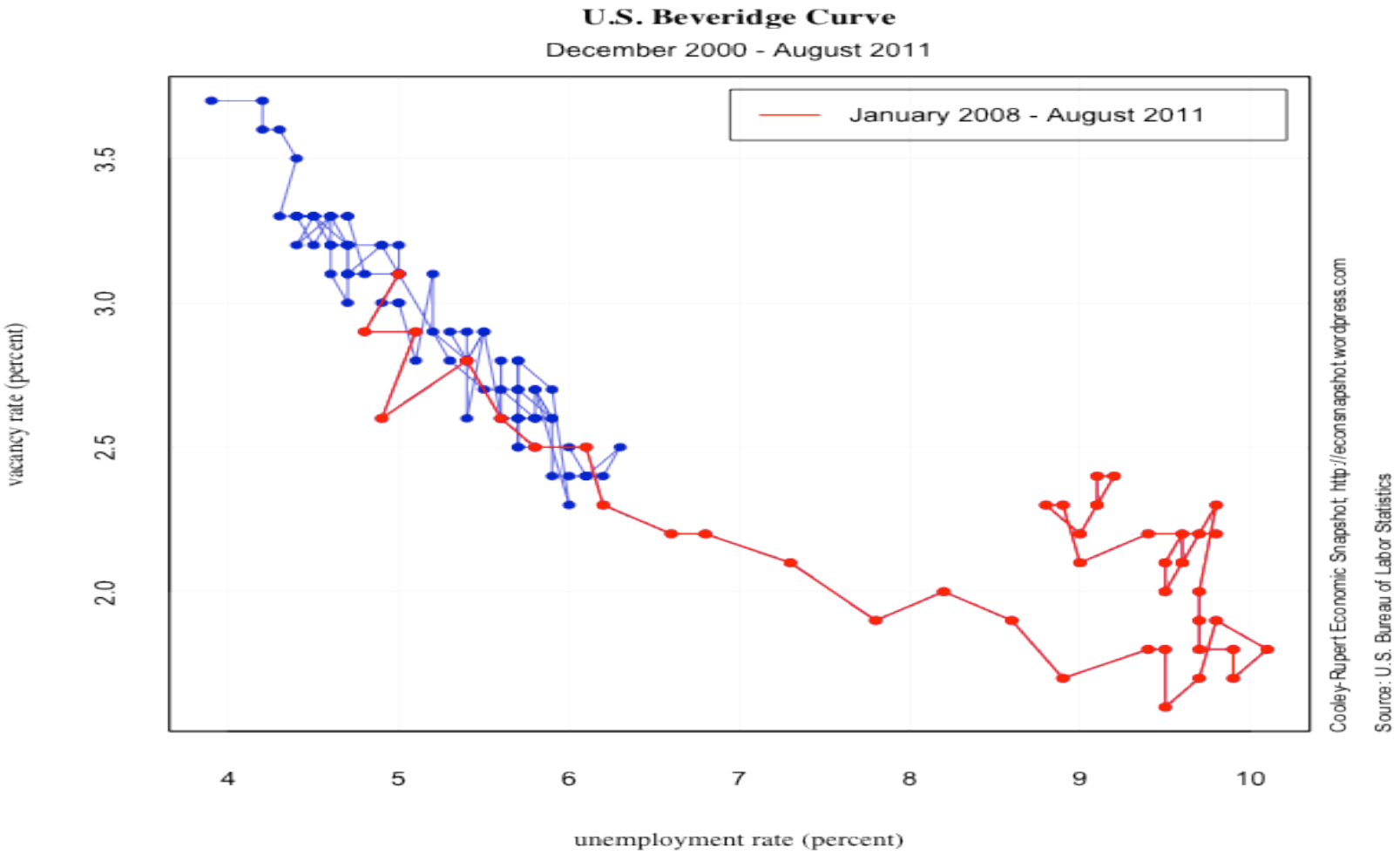
Driving forces



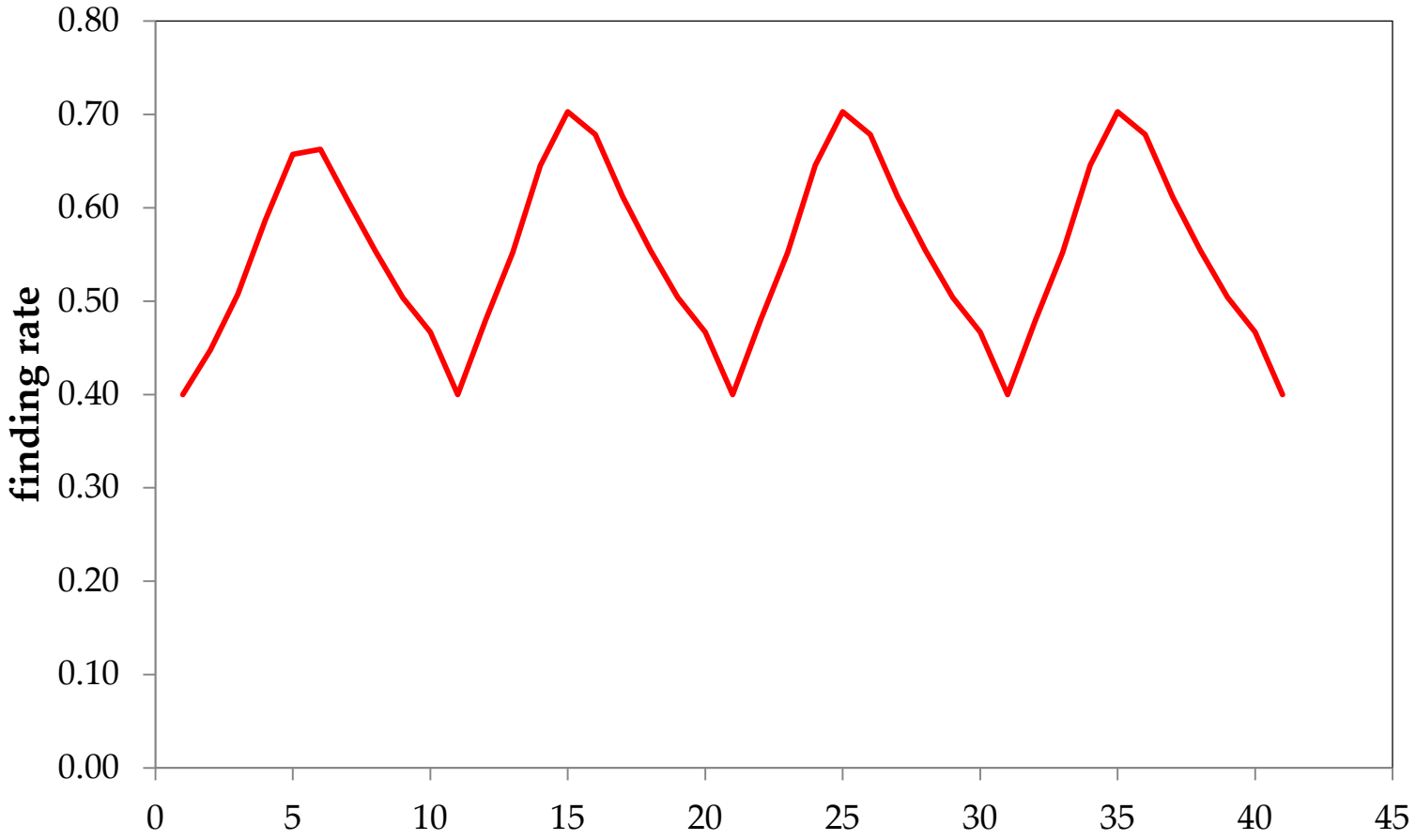
Beveridge curve

- When the supply of jobs decreases
  - Vacancy rate declines
- When separation rate increases
  - Unemployment increases
- Labor market weakens:
  - v/u falls
  - accession rate decreases

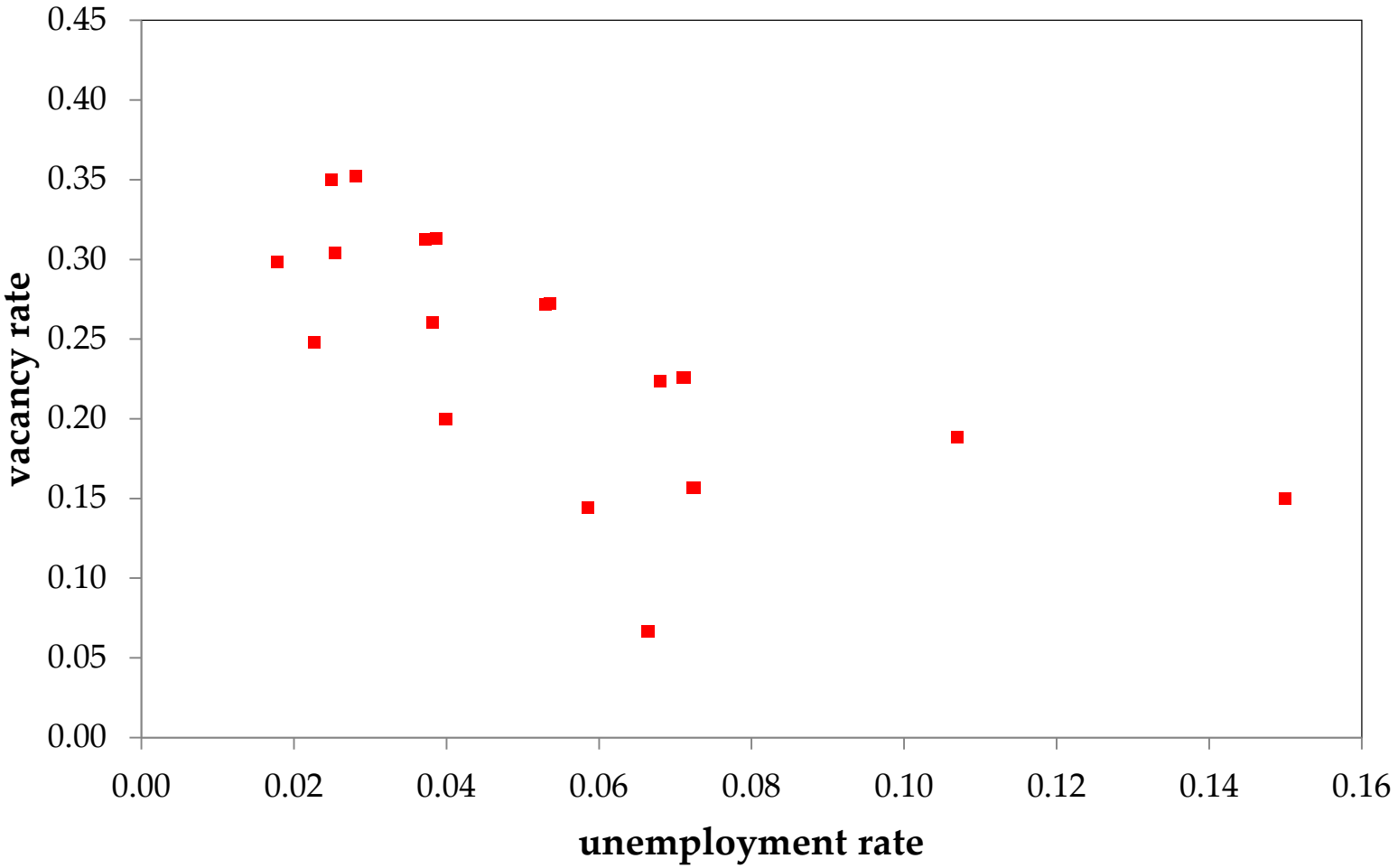
Beveridge curve



Accession rate



Beveridge curve



Mismatch

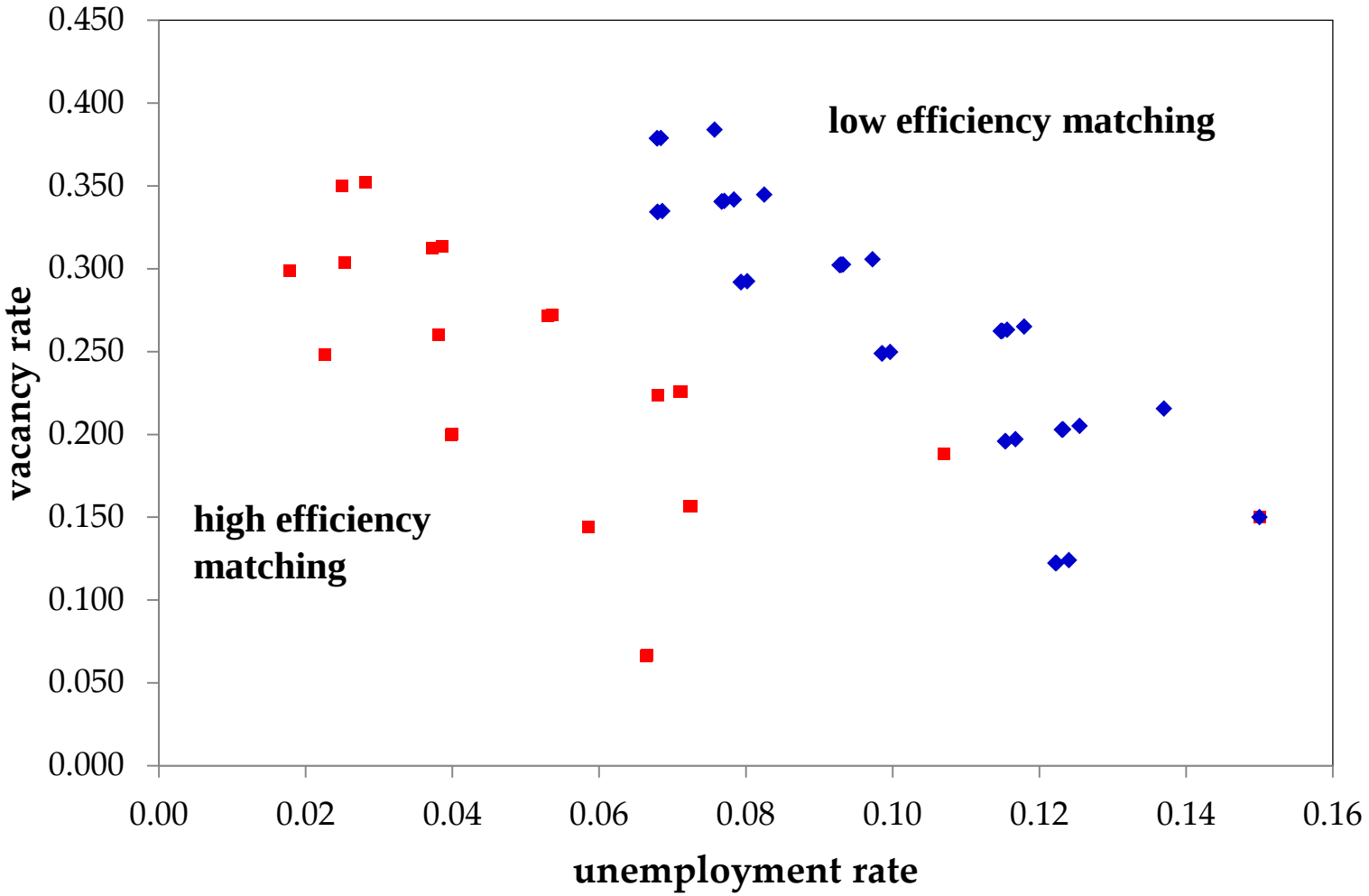
- Suppose it becomes harder to match workers and jobs: geography, skills…
- In the model: from this

$$a = 0.4\left(\frac{v}{u}\right)^{0.2}$$

- To this

$$a = 0.2\left(\frac{v}{u}\right)^{0.2}$$

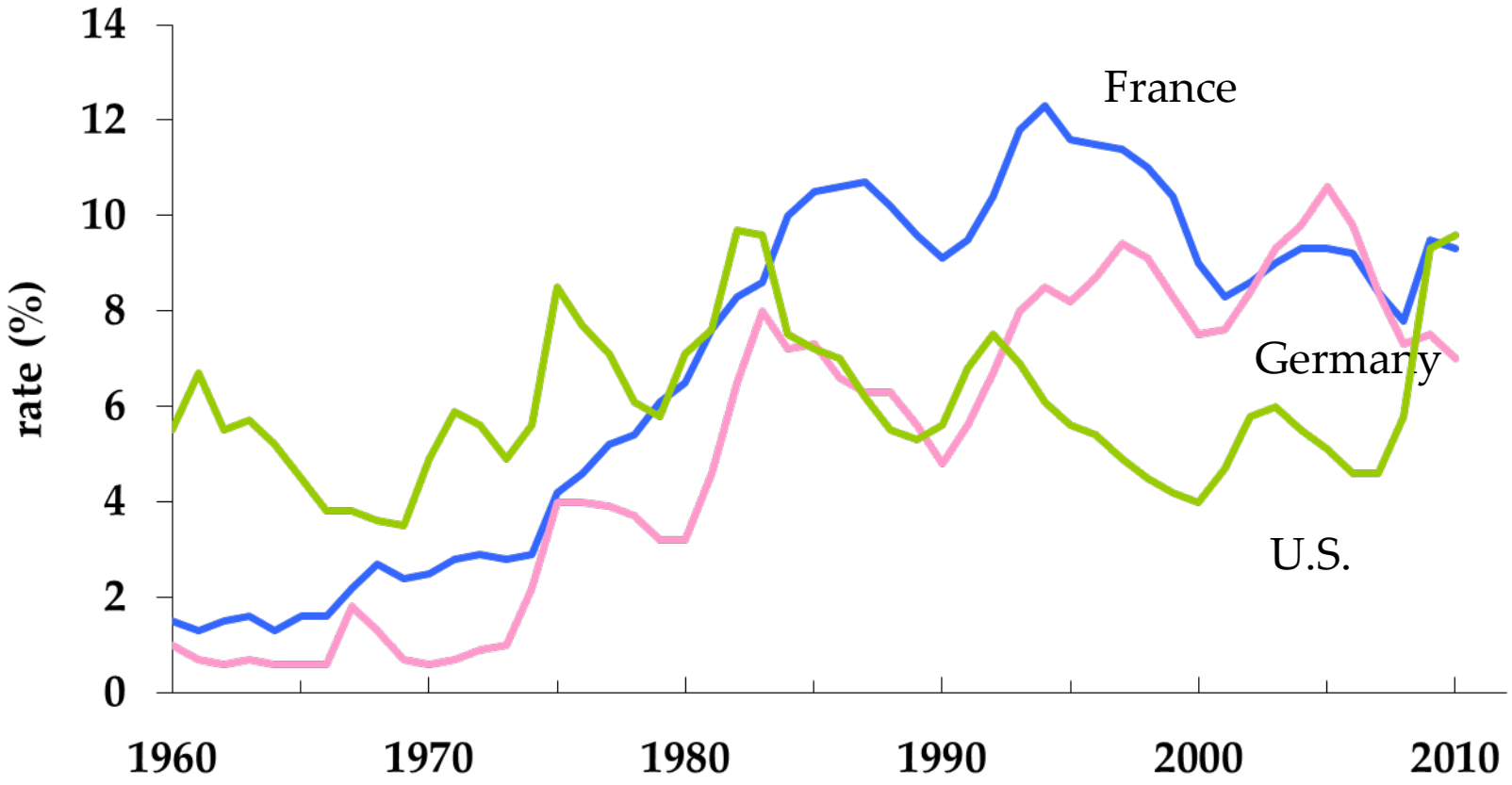
Shifting Beveridge curves



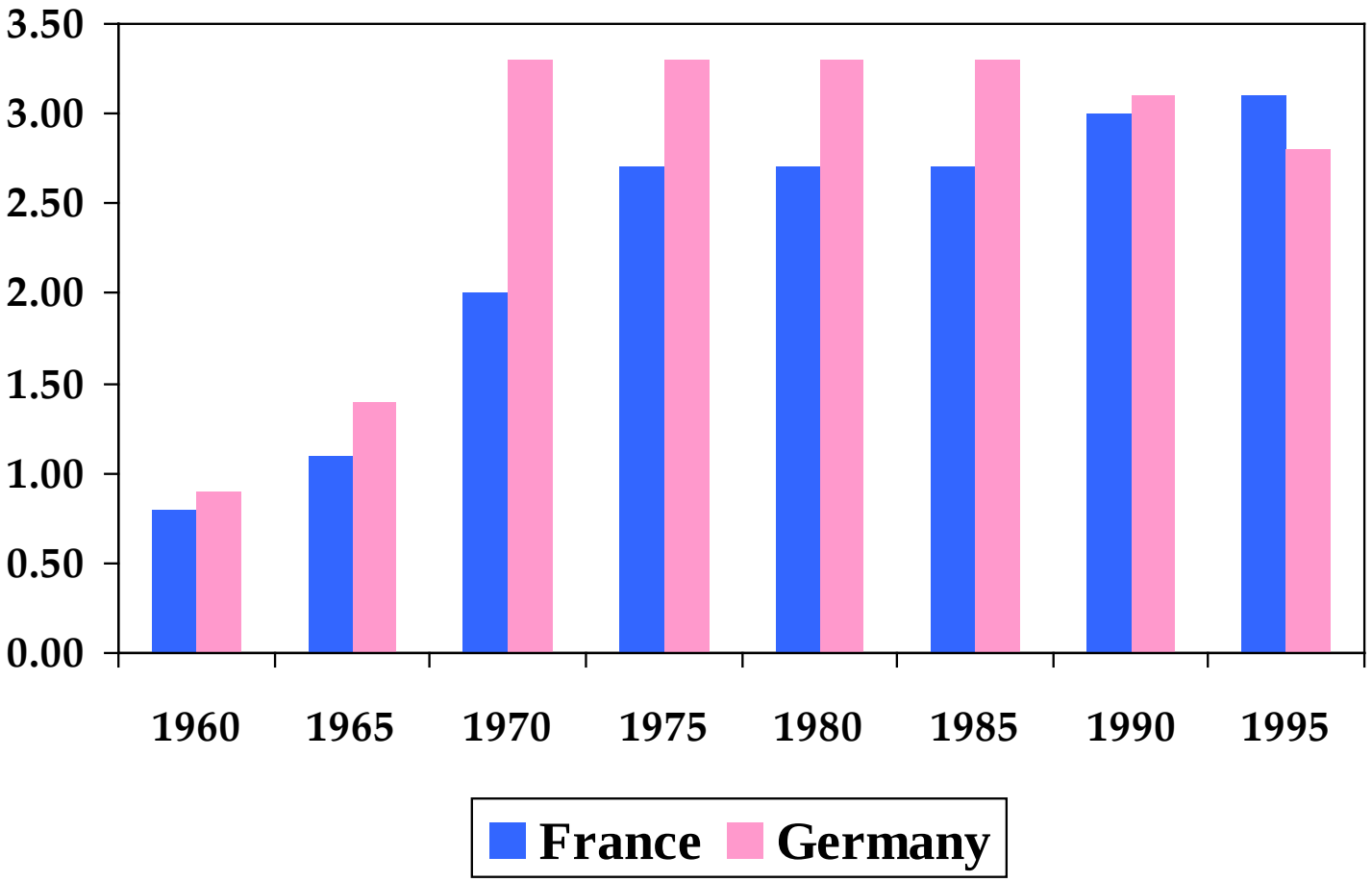
Back to France and the US

- Increase in volatility in 1970s
- Unemployment increases in US, France
- France responds by increasing EPL

Back to France and the U.S.



Employment protection in Europe



Source: Blanchard and Wolfers.

Takeaways

- Wide variation in labor market institutions
  - Connection between institutions and outcomes
- Dynamic model of unemployment
  - Key forces: how quickly firms and workers find each other
- Flexible labor markets
  - Lower steady state unemployment
  - Quicker response from shocks

For the ride home

- Milton Friedman argued that minimum wage laws discriminate *against* low-skilled workers
  - YouTube: http://goo.gl/jKuo
  - What about other employment protection laws?