Flow Approach to the Labor Market

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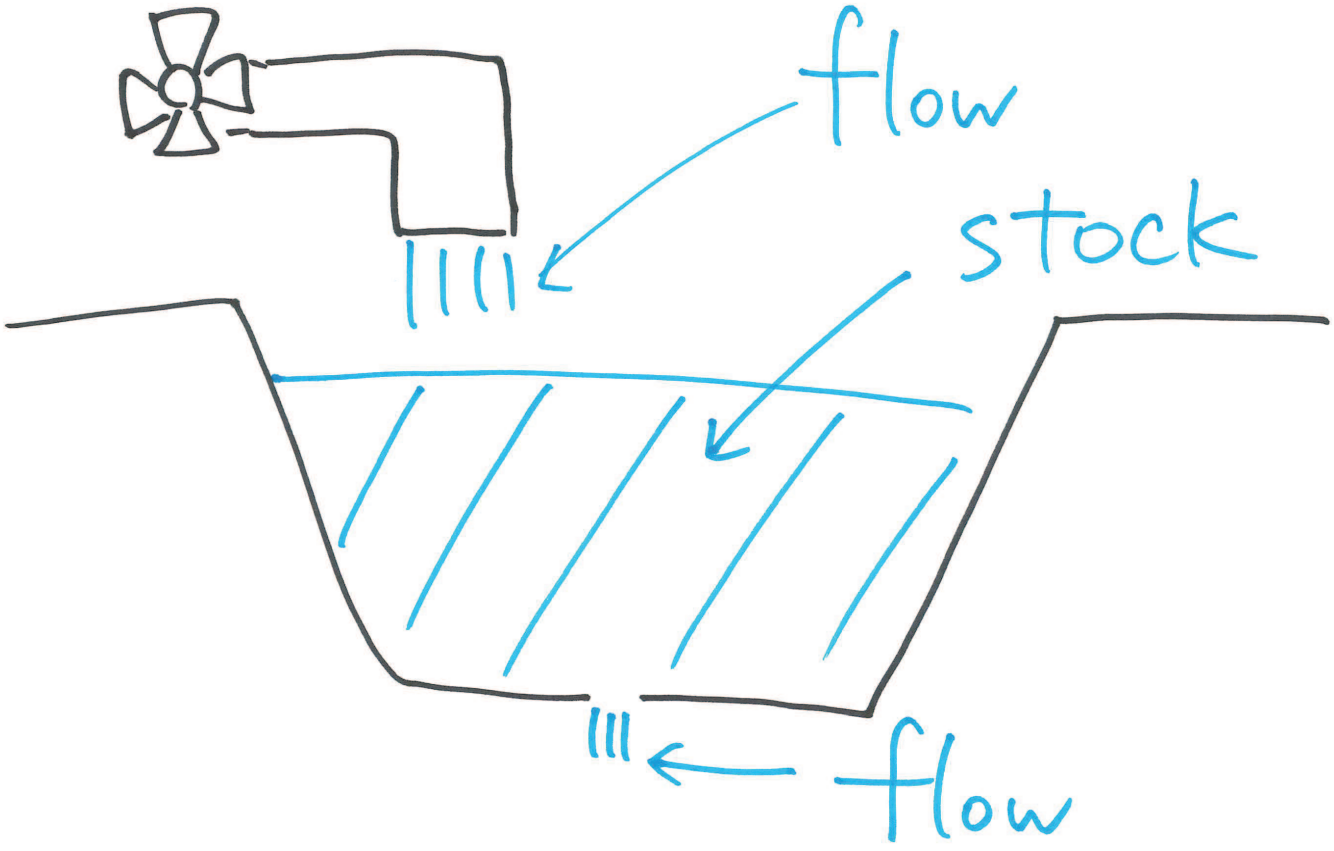
Keio Lecture 1

Flows and stocks

- Traditional (pre-1980s) approach to the aggregate labor market $\cdots$ emphasize the determination of **stocks**: employment, unemployment, labor force participation, etc.
- New (post-1980s) approach to the aggregate labor market $\cdots$ emphasize the determination of **gross flows**: worker flows, job flows.

- The emphasis of gross flows is also related to the recognition of the general importance of **reallocation** of productive factors, such as capital and labor.

Flows and stocks

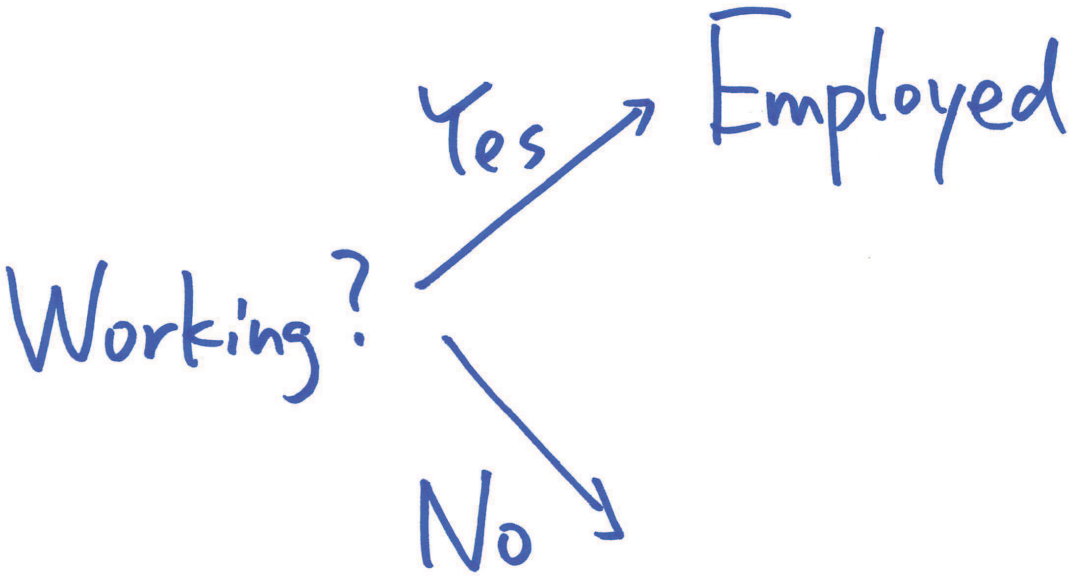


Three labor market states we will look at today

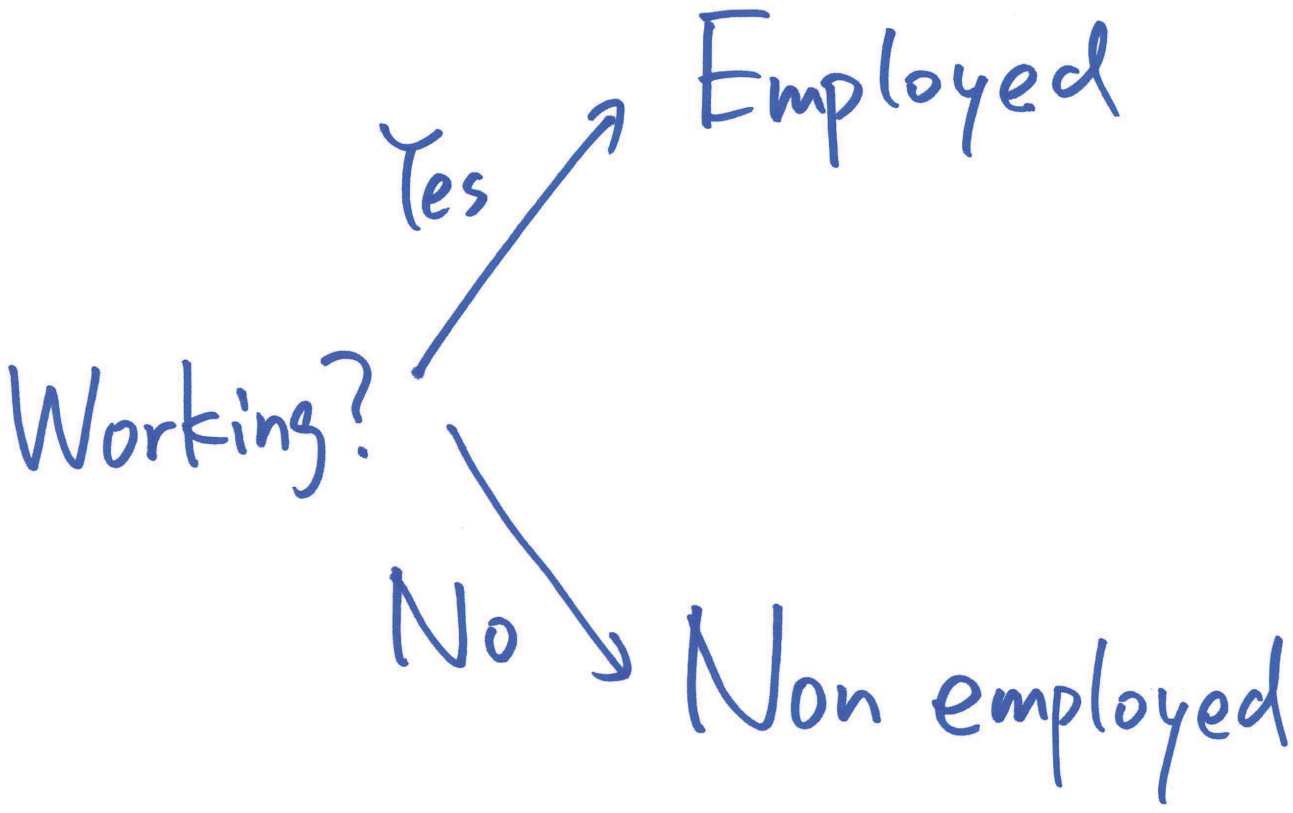
- Employment (E)
- Unemployment (U)
- Not in the labor force (N)

We can also look at the flows across locations, industries, occupations, firms, and establishments. But not today.

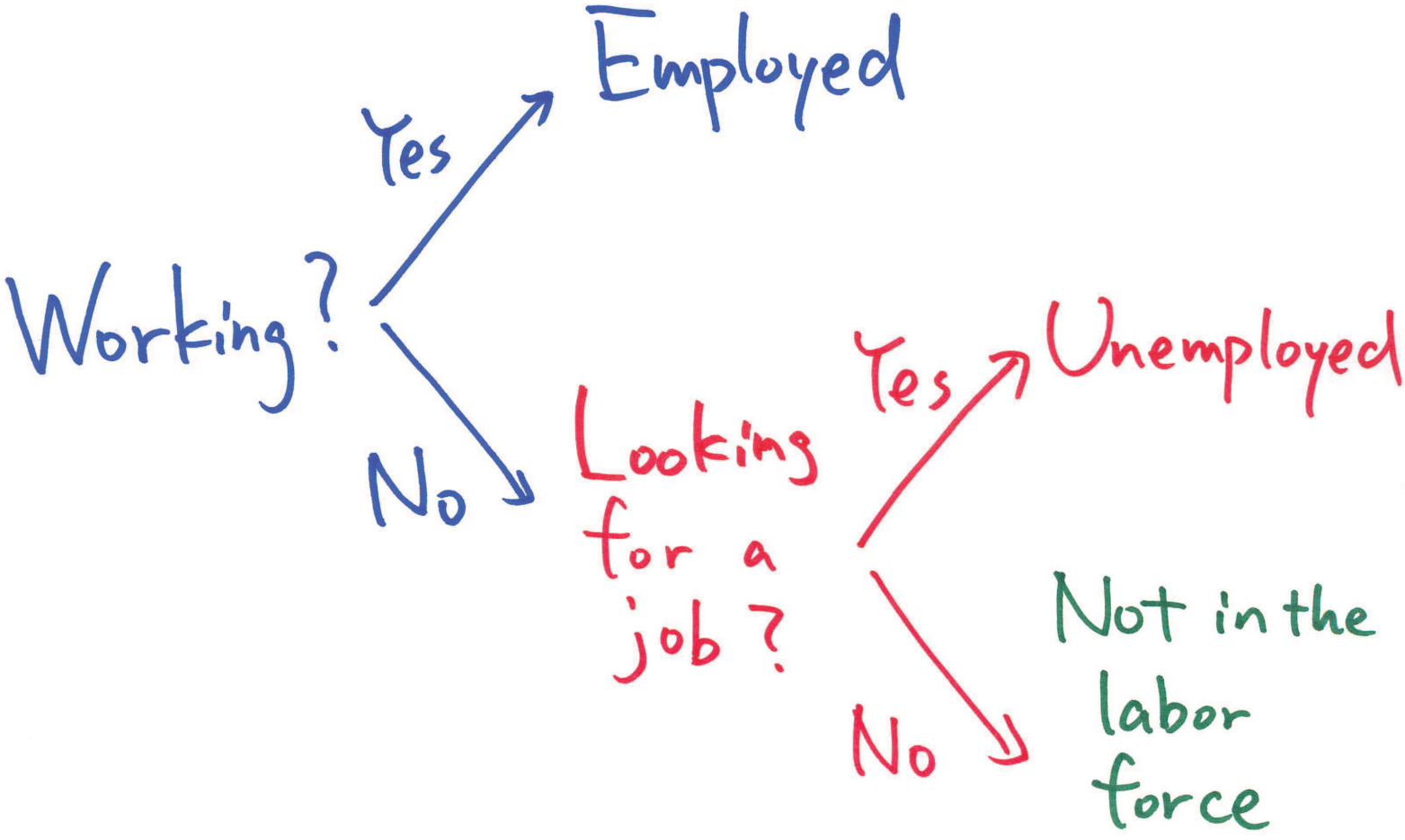
Three labor market states we will look at



Three labor market states we will look at



Three labor market states we will look at



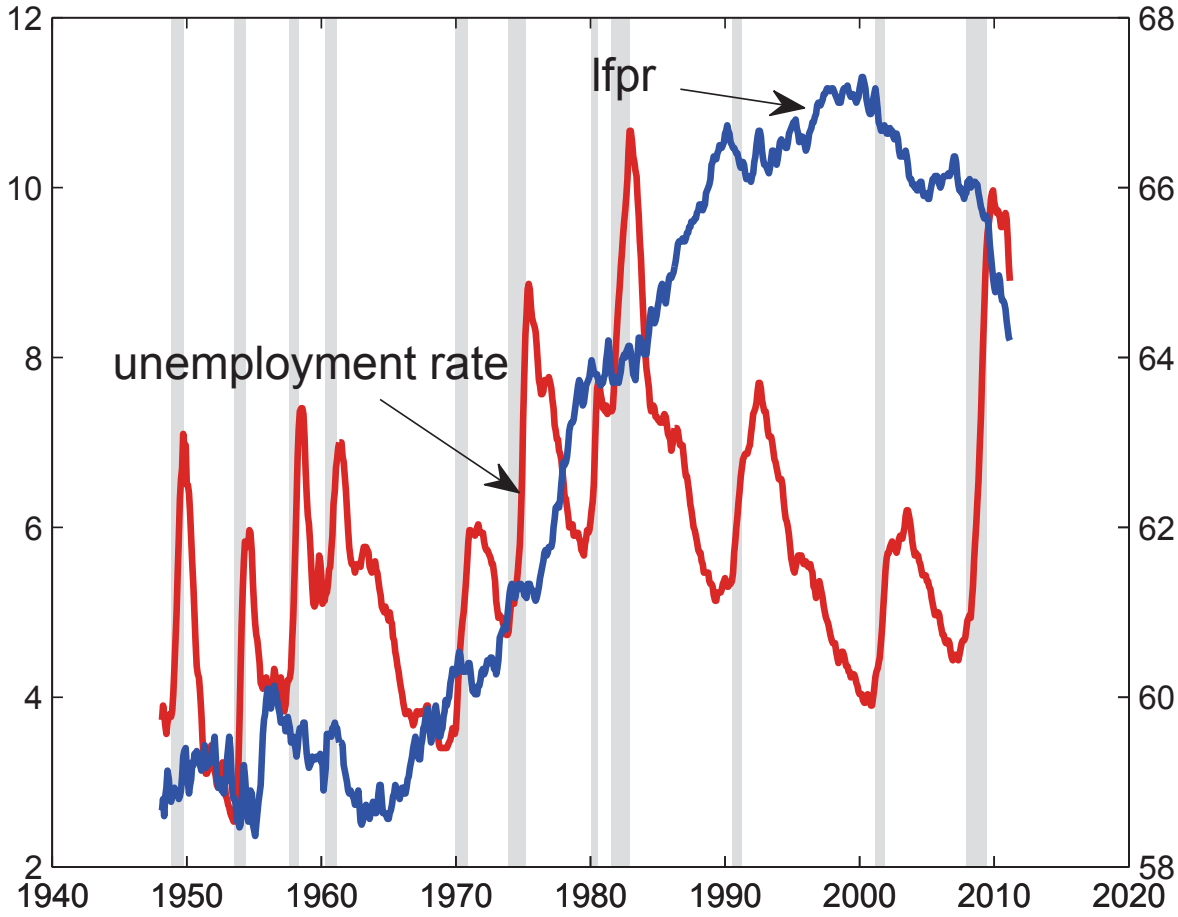
Earlier approaches looked at these stocks.

$$\text{unemployment rate} = \frac{U}{E+U}$$

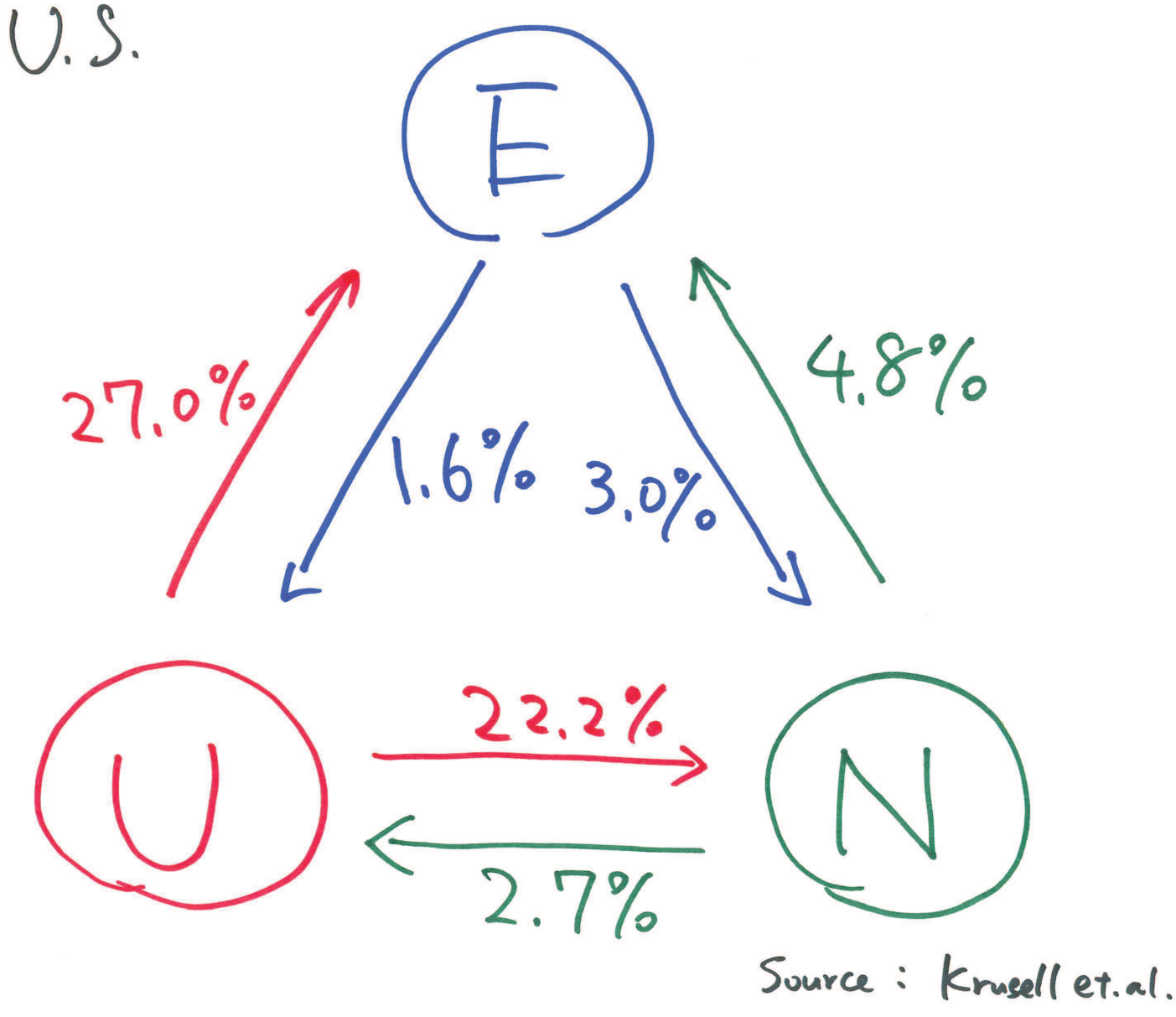
Earlier approaches looked only at these stocks.

$$\text{labor force participation rate} = \frac{E+U}{E+U+N}$$

Stocks and business cycles



Worker flows (monthly transition probabilities)



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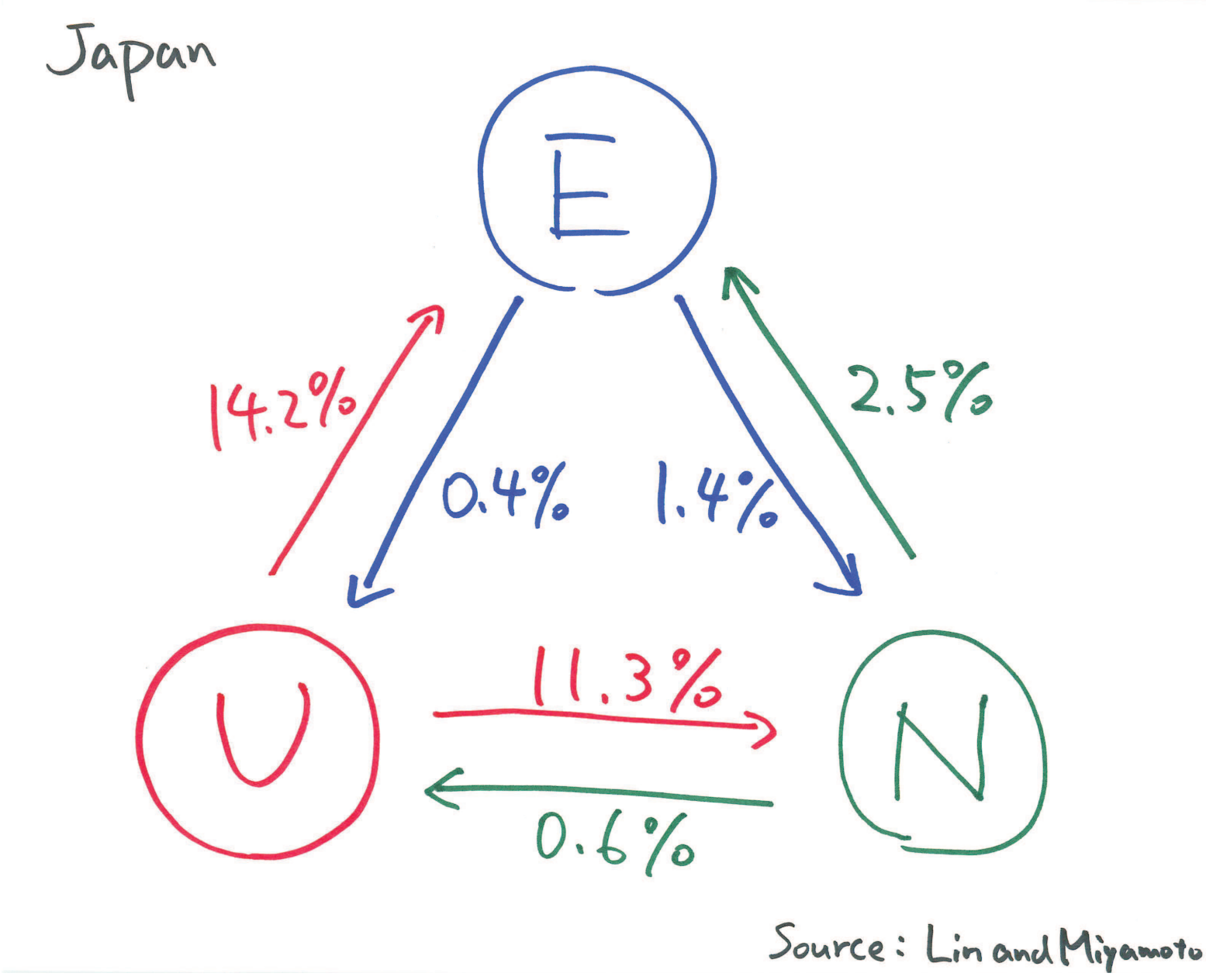
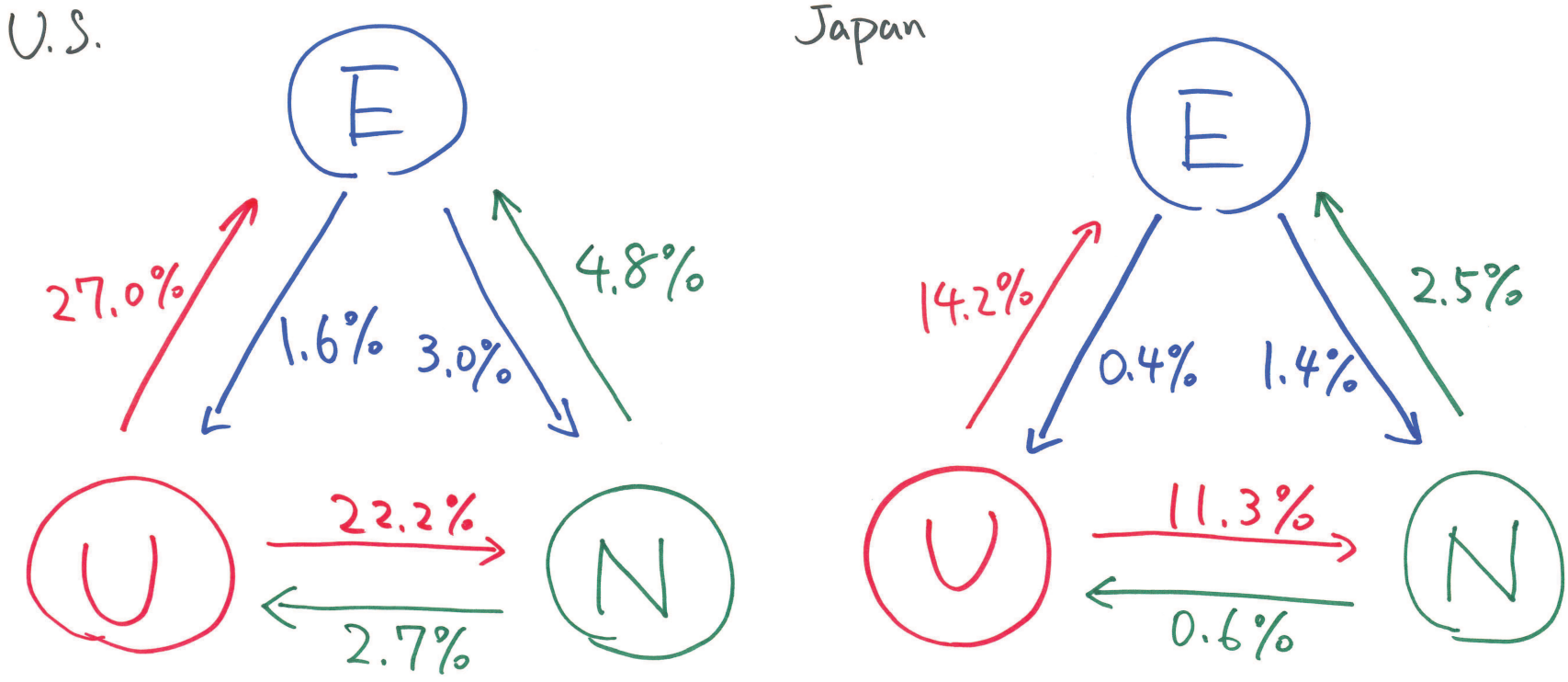
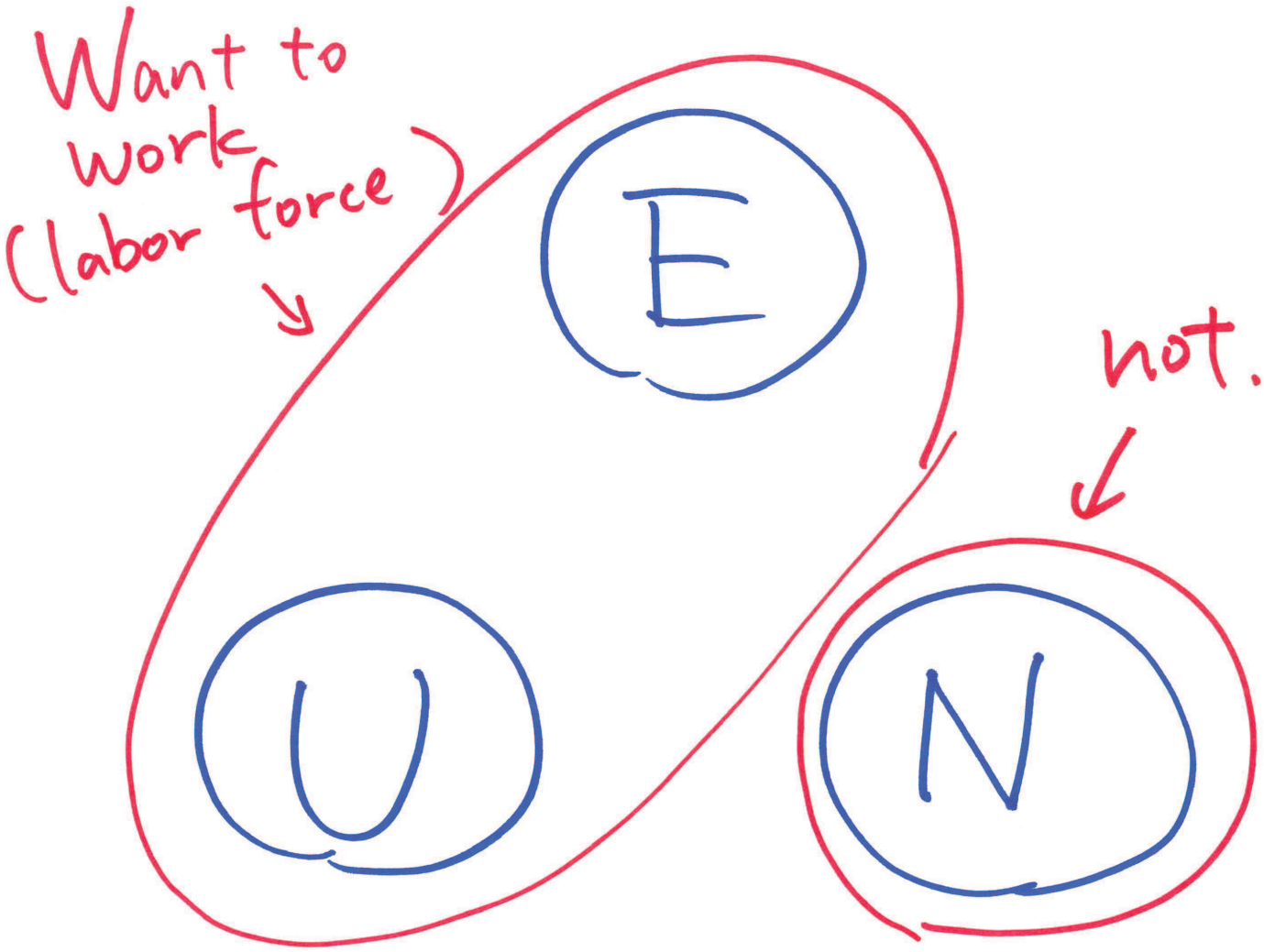


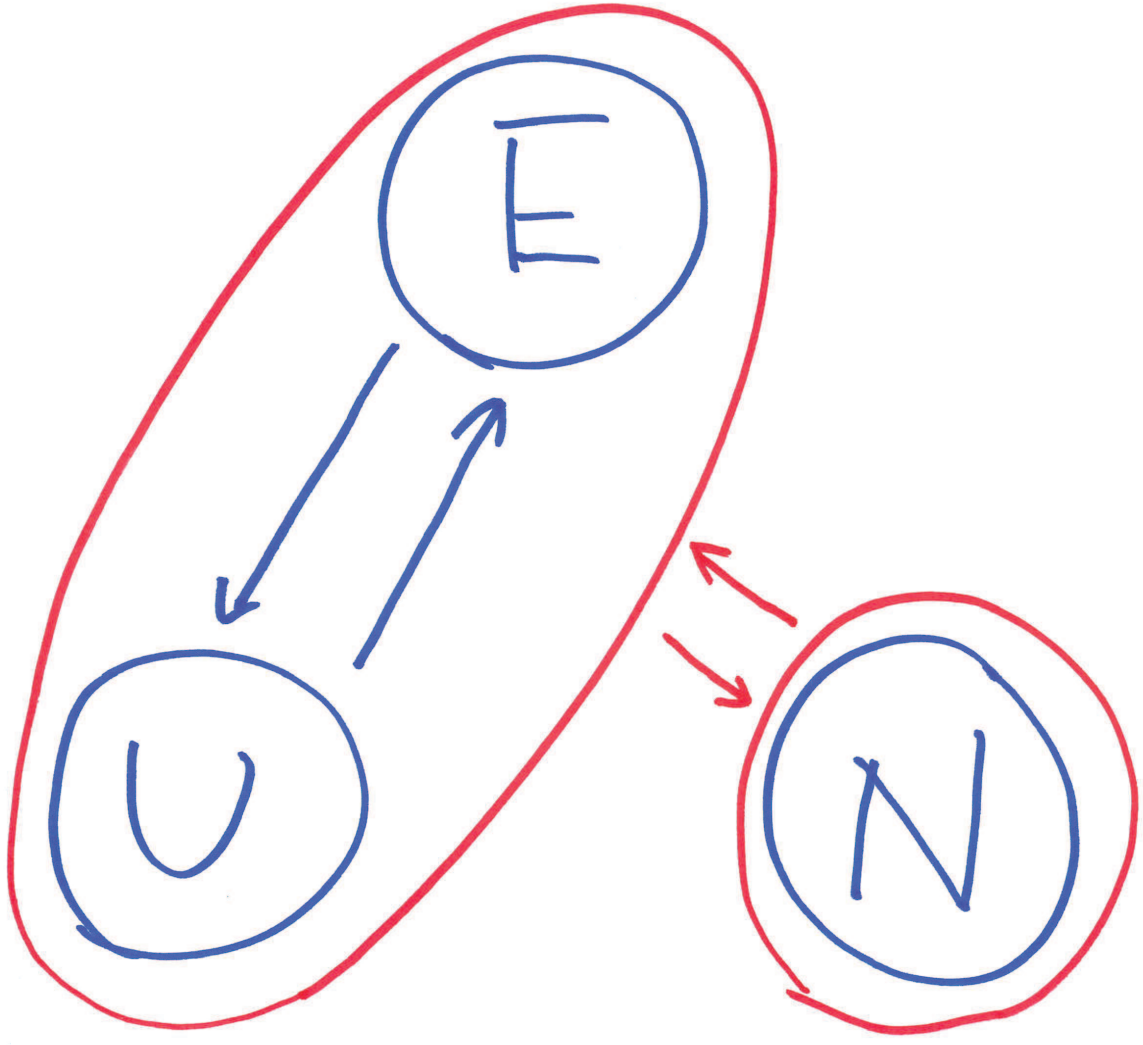
Comparison



Theoretical framework



The three state model: Krusell et al. (2011)



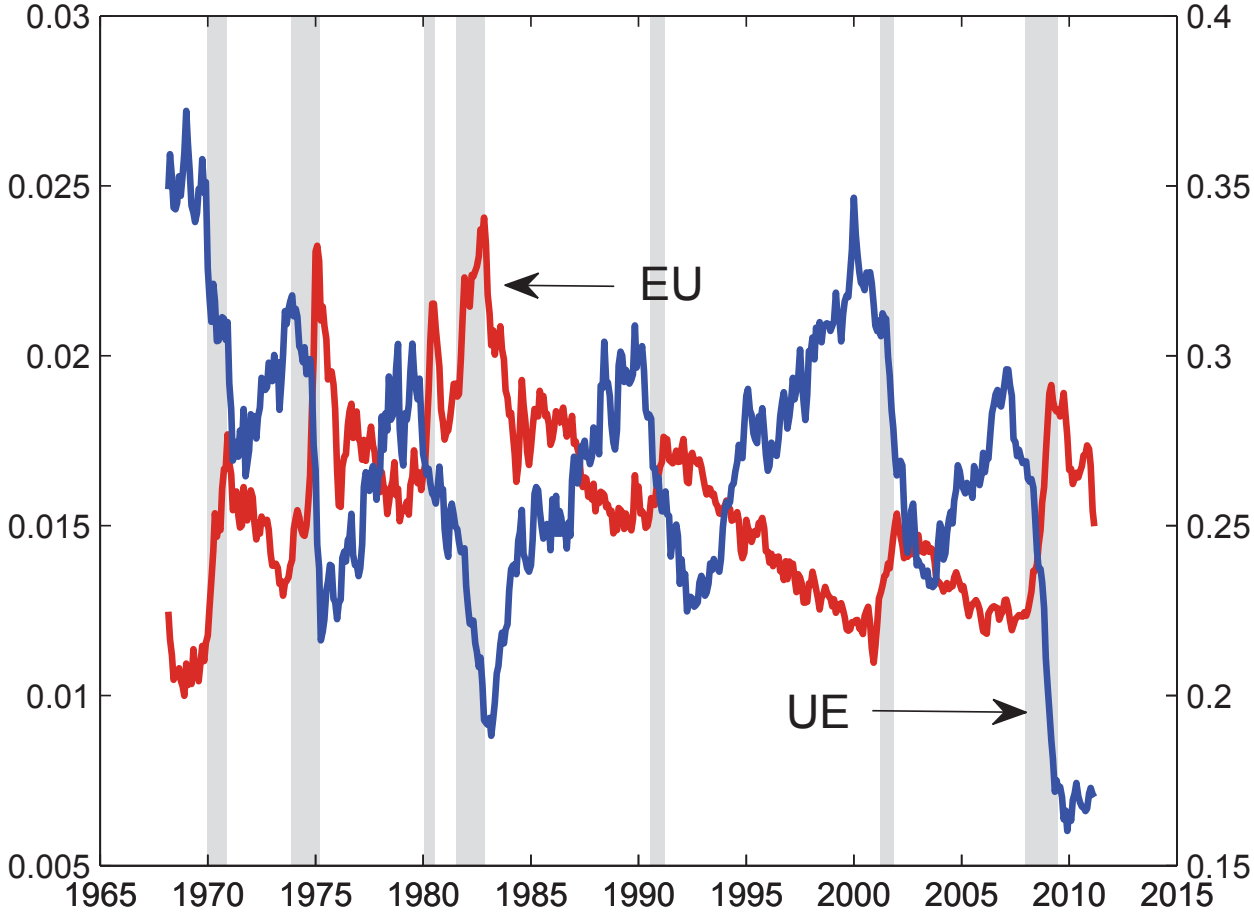
The three state model: Krusell et al. (2011)

- Flows between (E and U) and N is mainly driven by the choice of the workers (labor supply).
- Flows between E and U is driven by the frictions (labor demand).

- The model evolved into the business cycle analysis in Krusell et al. (2017).

- For the rest of today, we will focus on the flows between E and U and ignore N. "How to ignore N" is different across studies: some bunch E and N together and analyze "inflow into U" and "outflow from U". Here, I will take a more direct approach of focusing on EU and UE flows. Somewhat surprisingly, a model with only these two flows (assuming there are no flows in and out of labor force) can reproduce the unemployment rate dynamics similar to the data.

EU and UE flows



The theory of UE flows: the matching function approach

- Firms and unemployed workers meet through a matching function (a "black box"):
  - Firms post vacancies $V_t \geq 0$.
  - Unemployed workers $U_t \geq 0$.
  - $\rightarrow$ Then, $M(V_t, U_t) \geq 0$ numbers of matches are created at time $t+1$.
  - $M(V_t, U_t)$ is increasing in V_t and U_t.
- We assume that the matching function has the following properties:

$$M(V_t, U_t) \leq V_t,$$

$$M(V_t, U_t) \leq U_t,$$

and

$$M(\mu V_t, \mu U_t) = \mu M(V_t, U_t) \text{ for any } \mu > 0.$$

The theory of UE flows: the matching function approach

- Then, the stock of employment follows

$$E_{t+1} = M(V_t, U_t) + (1 - \sigma)E_t.$$

- In terms of the unemployment rate, this can be rewritten as

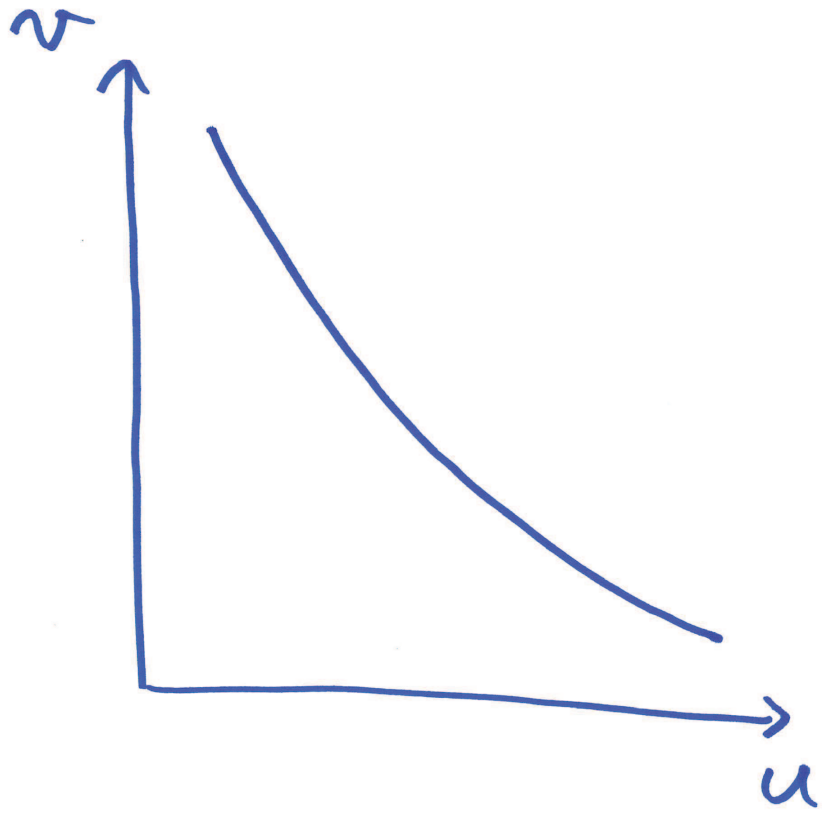
$$u_{t+1} = \left(1 - \lambda\left(\frac{v_t}{u_t}\right)\right) u_t + \sigma(1 - u_t),$$

  where $\lambda(v_t/u_t) \equiv M(v_t/u_t, 1)$.
- When v_t is constant, this converges to a steady state. The steady-state unemployment rate satisfies

$$u = \frac{\sigma}{\lambda(v/u) + \sigma}.$$

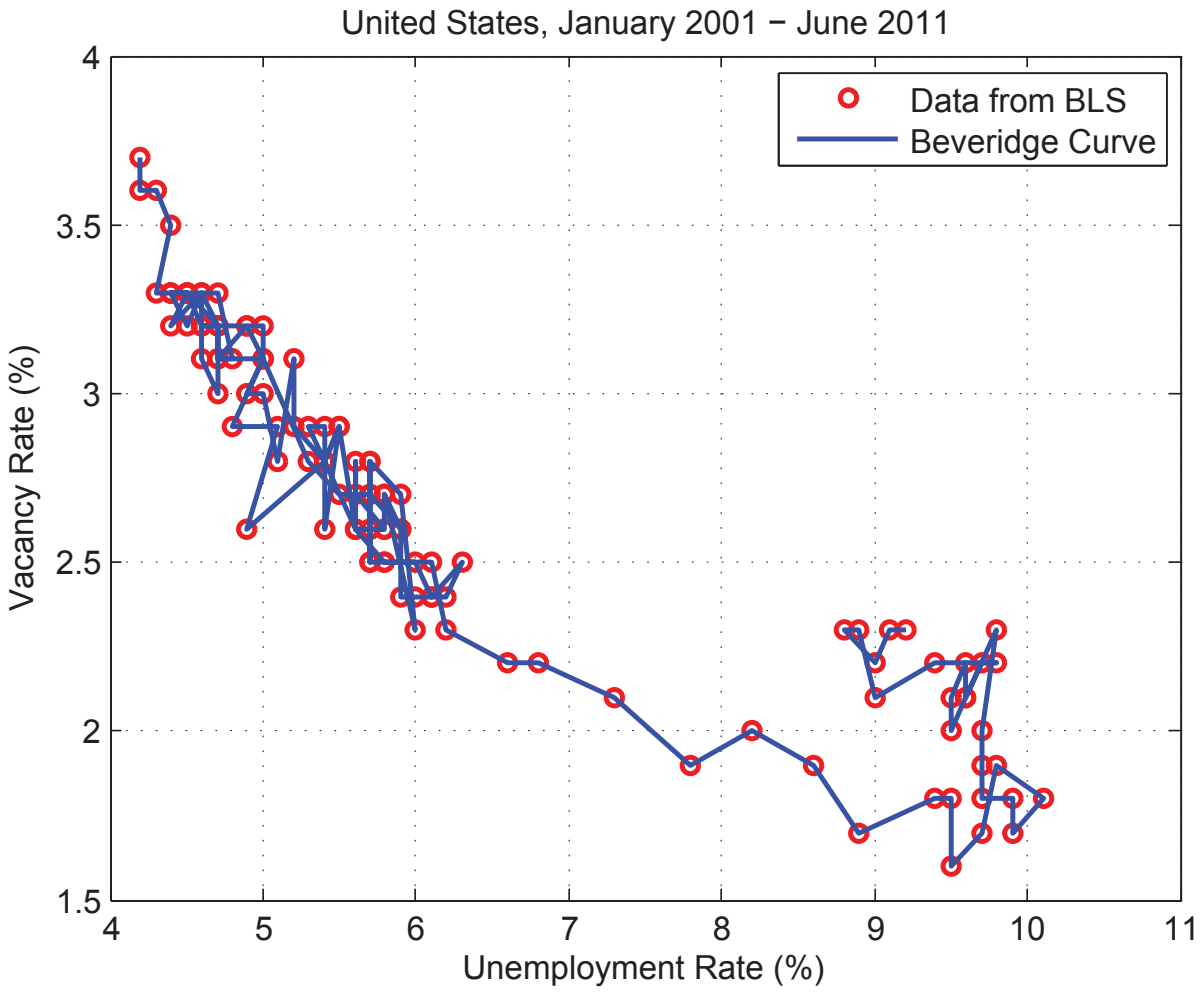
  u is decreasing in v.

The steady state relationship between v and u



- Over the business cycle, v moves around (v is high in booms and low in recessions) and u changes following this relationship. Off-the-steady-state behavior turns out to be not too important in the U.S. context (except for a large recession like the Great Recession).

Beveridge curves in the United States



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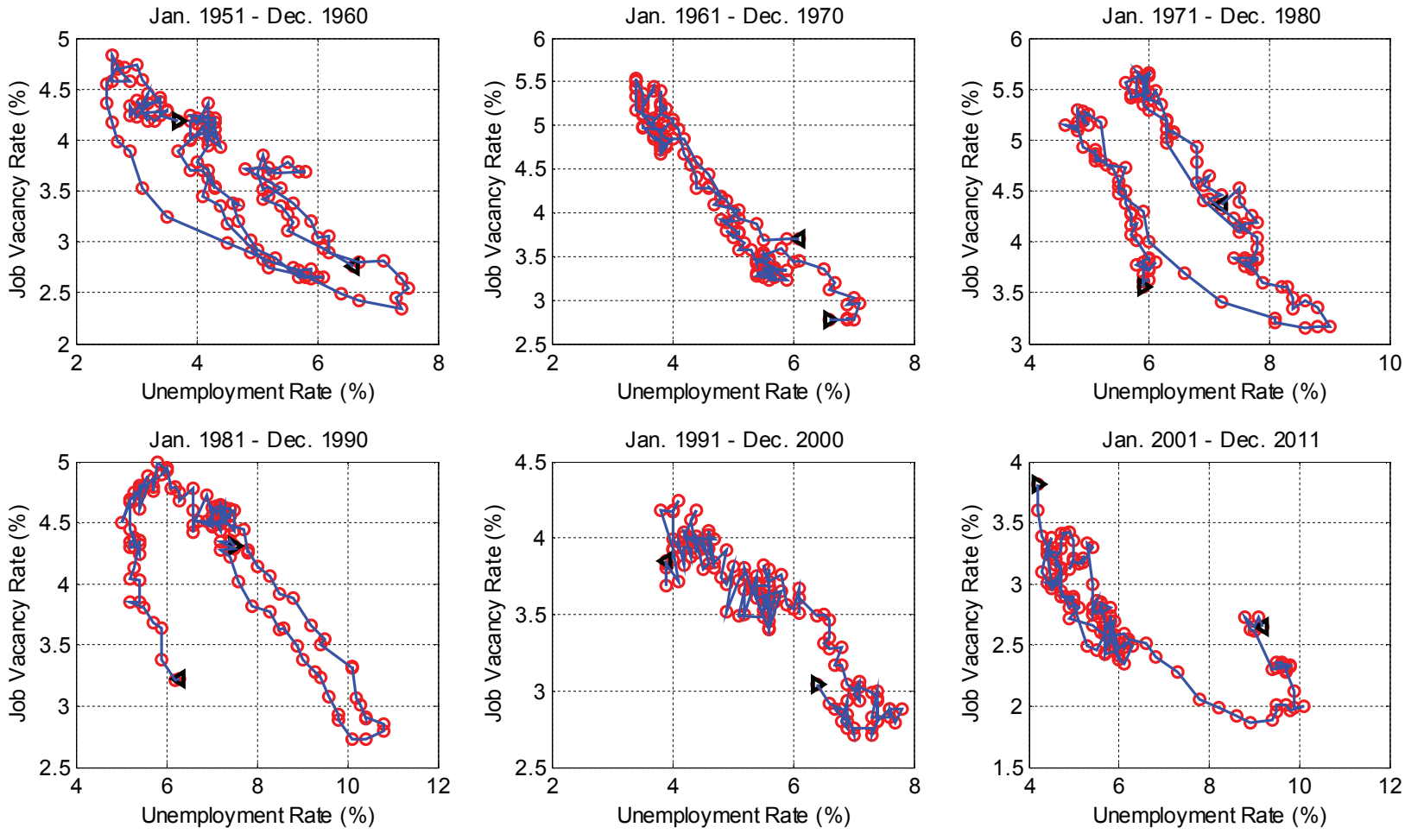

Theory vs. Data

- The theory fits the data very well.
- Why does v move around over the business cycle?
- This is what the Diamond-Mortensen-Pissarides model (Pissarides, 2000) explicitly consider.

References

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