Macroeconomics from the Ground up: Lecture 2

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Today I'll talk about the labor market

- Why labor market?
  - The labor income is the most important source of income for a large part of population. The share of labor income in total income is 60%-70% in the United States.
  - Unemployment can be very painful for many.
  - Labor is one of the most important production resources.
- Basic data and facts, and some theory.

Labor market data

- The dataset that I will refer to most frequently: Current Population Survey (CPS): http://www.bls.gov/cps/
  - Monthly survey of households conducted by the Bureau of Census for the Bureau of Labor Statistics.
  - Provides data on the labor force, employment, unemployment, persons not in the labor force, hours of work, earnings, and other demographic and labor force characteristics.
  - Some panel aspect: 4-8-4 structure.
- Other micro-level dataset that are helpful for labor market study
  - Panel Study of Income Dynamics (PSID): annual panel survey.
  - National Longitudinal Surveys (NLS)
  - Survey of Income and Program Participation (SIPP)
  - Census data/American Community Survey (ACS)
  - Tomorrow I will talk about other firm/establishment-based datasets.

Basic data and facts

- Basic concepts in the labor market
    - Three states for the workers (16+): employed (E), unemployed (U), and not in the labor force (N).
        - E: people who is working
        - U: among the nonemployed, either (i) on temporary layoff, or (ii) have actively looked for work in the past 4 weeks
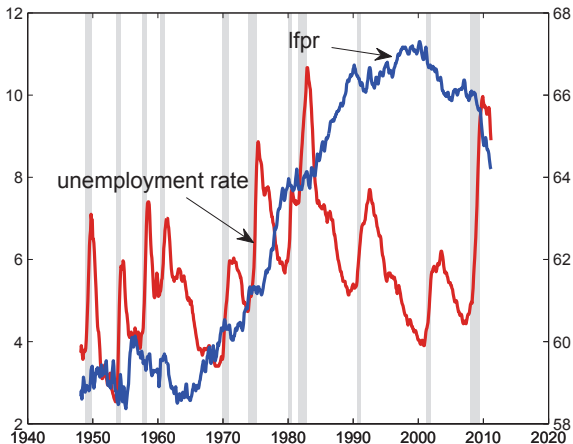   - N: the rest of the nonemployed.
    - Unemployment rate:
$$u = \frac{U}{E + U}.$$
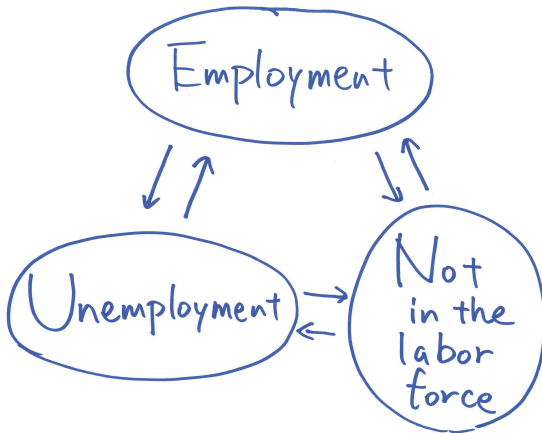   - Labor force participation rate:
$$lfpr = \frac{E + U}{E + U + N}.$$

From CPS

- Unemployment rate is countercyclical.
- Labor force participation has a strong trend (female participation), and it is weakly procyclical. Note a large decline recently.

Flow approach

▶ Behind a small net change, there are large gross flows.

▶ There is also a large flow of job-to-job transition (directly switching jobs without intervening nonemployment).
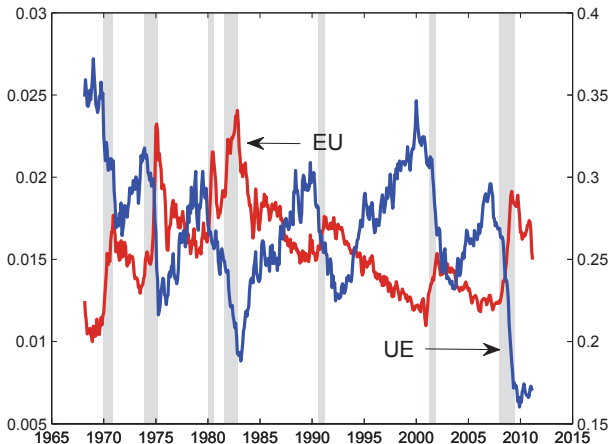
Flow approach

- ▶ Why do we care about flows?
- ▶ A simple example: suppose that there are only employment and unemployment.
    - ▶ In country A, the job loss probability ($E \rightarrow U$) is 4% per month, and the job finding probability ($U \rightarrow E$) is 60% per month (on average it takes 1.7 months to find a job).
    - ▶ In country B, the job loss probability ($E \rightarrow U$) is 0.4% per month, and the job finding probability ($U \rightarrow E$) is 6% per month. (on average it takes 17 months to find a job)
- ▶ Both countries have 6% unemployment rate, but the individual experience is very different.
- ▶ People move around more frequently in country A—easier to reallocate (move around) resources to where they are needed. (I'll talk more about reallocation tomorrow).

Monthly worker flows: U.S. data (CPS)

U.S.

E

27.0%   1.6%   3.0%   4.8%

U   22.2%   N

2.7%
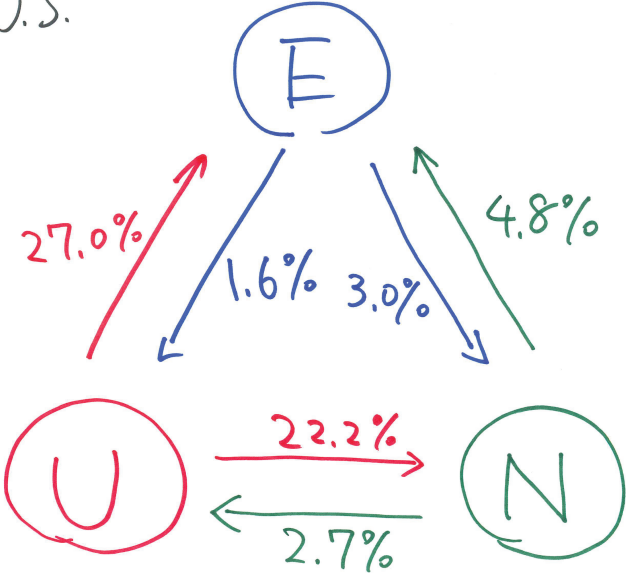
Focus on E and U, for a moment

- EU flow is countercyclical, and UE flow is procyclical.
- Since Shimer (2005), the fluctuations of job-finding process (UE flow) is mainly analyzed in the recent literature.

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, (ignoring the N state) the stock of employment follows

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

where σ is the probability of losing a job.

▶ When $E_t + U_t$ is constant, this can be rewritten as ($u_t = U_t/(E_t + U_t)$ and $v_t = V_t/(E_t + U_t)$)

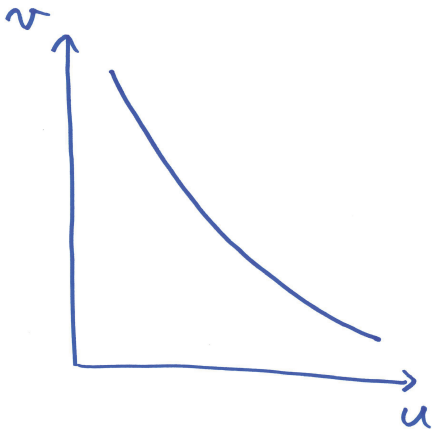$$u_{t+1} = \left(1 - \lambda\left(\frac{v_t}{u_t}\right)\right) u_t + \sigma(1 - u_t),$$

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

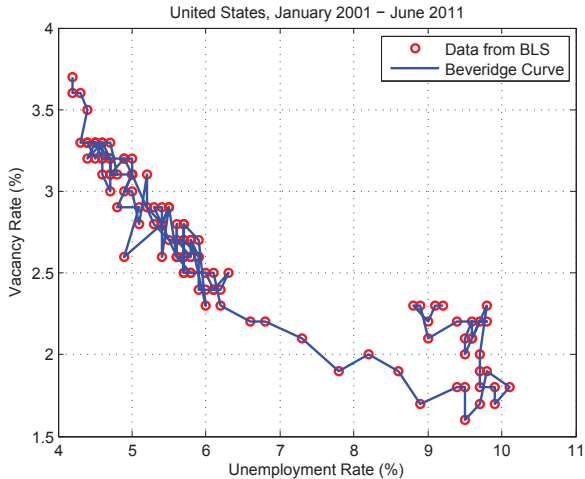$$u = \frac{\sigma}{\lambda(v/u) + \sigma}.$$

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 model).

Beveridge curves in the United States

United States, January 2001 − June 2011

# Beveridge curves in the United States in each decade
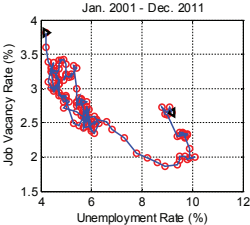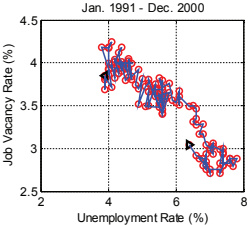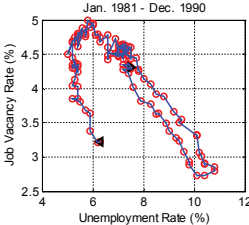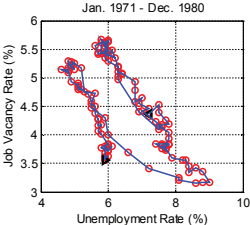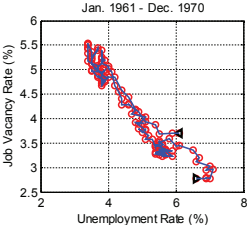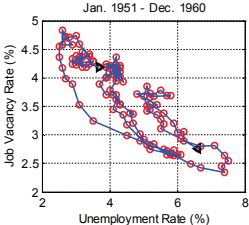
- ► So, this theory fits the data very well.
- ► Two questions:
    1. Why does V_t fluctuate so much over the business cycle?
    2. Why does the Beveridge curve tend to follow a counter-clockwise pattern?

    - ► The first question generated a large literature, starting from Shimer (2005), called "unemployment volatility puzzle" or "Shimer puzzle." The basic underlying question is "why is firm's profit from hiring a worker so volatile?"
        - ► The real wages are rigid.
        - ► Some other reasons.

    - ► The second tends to be focused on the recent deviation from the previous Beveridge curve.
        - ► Unemployment insurance extensions.
        - ► Geographical mismatch and "house lock" hypothesis.
        - ► Occupational mismatch.
        - ► Other reasons.

Incorporating three states: E, U, and N

- Krusell, Mukoyama, Şahin, and Rogerson (2012): Modeling gross flows across three states in the labor market in the business cycle context.
- Labor force participation decision($\{E, U\} \leftrightarrow N$) is driven by the workers' labor supply decision. The fluctuations of the related flows are driven by the workers' desire to work.
- The flows between E and U is driven by the labor demand side (fluctuations in job-finding probability)
- Krusell et al. (2012) find that this style of model, characterized by these two elements, can account for the cyclical behavior of gross worker flows in the U.S. labor market.

Another worker flow: Job-to-job flow

- ▶ There are many people who switch jobs without any intervening nonemployment.
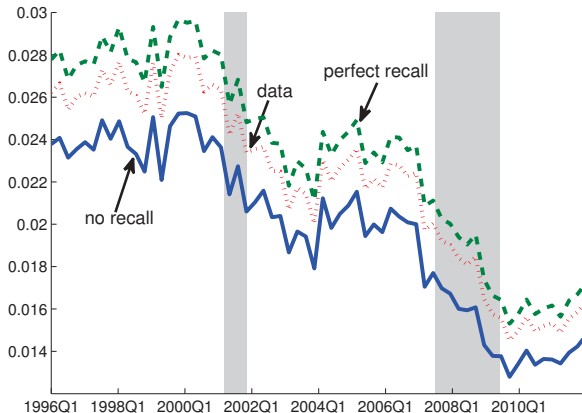
Source: Mukoyama (2013)

Another worker flow: Job-to-job flow

- ▶ Recall that *EU* flow was 1.6% of *E*.
- ▶ The number of job-to-job transition is in the similar order to *UE* flow and *NE* flow.
- ▶ Job-to-job transition rate is procyclical.
- ▶ There has been a downward trend since early 2000s.
- ▶ Job-to-job transition is an important source of wage growth, especially for young workers (Topel and Ward 1992).
- ▶ This implies that it plays an important role in reallocating workers to an appropriate job.
- ▶ Mukoyama (2013) constructs a job-ladder model and evaluate the productivity loss from the recent decline of the job-to-job transition. From 2009 to 2011, the model accounts for about 0.5%–0.7% annual decline in TFP.

Main takeaways

- "The flow approach to the labor market": analyze gross flows behind the net changes.
- The matching function approach is very popular but there still are some issues.
- Two recent developments:
  - Three state models of labor market.
  - Analysis of job-to-job transition.

References

► Krusell, Per, Toshihiko Mukoyama, Ayşegül Şahin, and Richard Rogerson (2012). "Gross Worker Flows over the Business Cycle," mimeo.

► Mukoyama, Toshihiko (2013). "The Cyclicality of Job-to-Job Transition and Its Implications for Aggregate Productivity," mimeo.
`https://sites.google.com/site/toshimukoyama/jobtojob.pdf`

► Shimer, Robert (2005). "The Cyclical Behavior of Equilibrium Unemployment and Vacancies" *American Economic Review* 95, 25-49.

► Topel, Robert H. and Michael P. Ward (1992). "Job Mobility and the Careers of Young Men," *Quarterly Journal of Economics* 107, 439-479.