Labor Market Flows and Unemployment

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Current Population Survey

- **Basic Monthly**

    - Sample is at the address level

    - All people living at the address are in the sample

    - Called 4 months in a row ("in")

    - Not called for 8 months ("out")

    - Called for 4 months ("in")

    - Out forever

Current Population Survey

- **Outgoing Rotation Group**

    - Addresses in the 4th month of begin "in"

    - Asked more specific questions about work

        - wages

        - hours

- **March Supplement**

    - All addresses that are "in" in March

    - Asked about all income sources of previous calendar year

Current Population Survey

- Labor Market Status

    - Employed: working for pay

    - Unemployed: <u>one active</u> effort to find job in past 4 weeks & available to work

        - going to an interview, filling out job applications, going to employment agency, asking friends and relatives, ect..

    - Out of the Labor Force: everyone else

        - discouraged workers

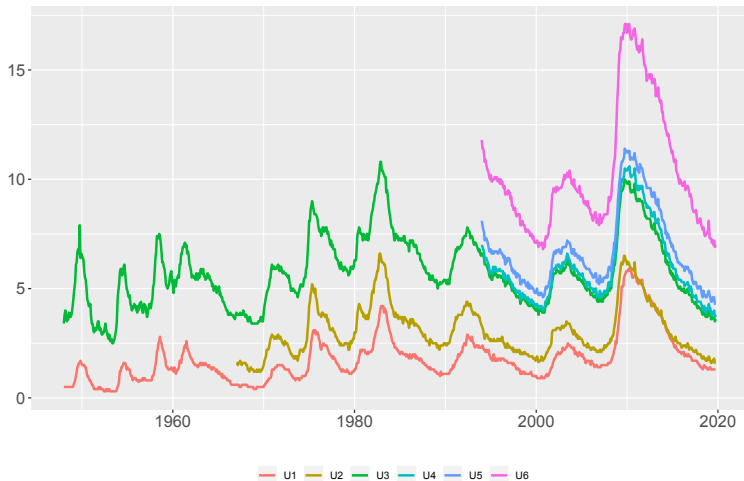   - marginally attached

Current Population Survey
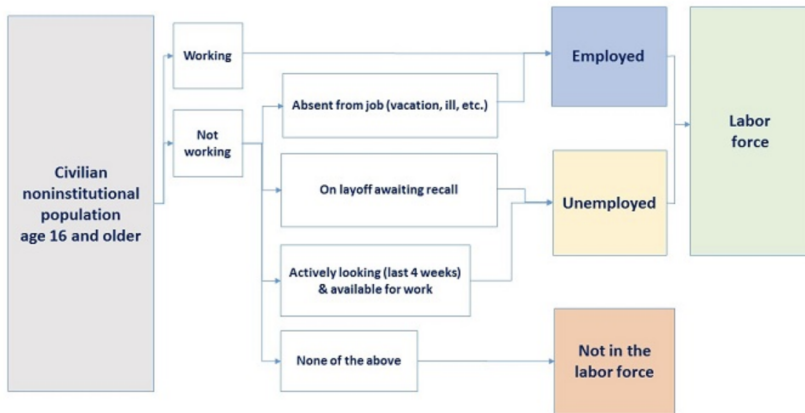
Current Population Survey
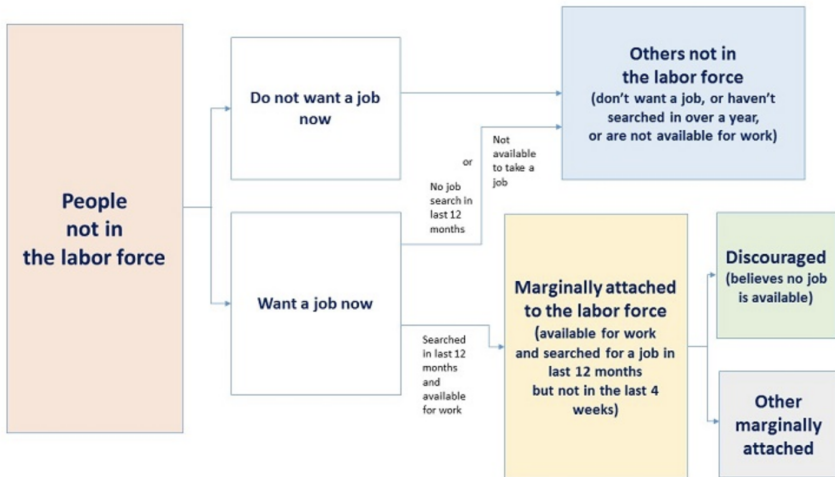
How Is Unemployment Measured?

- U1: unemployed for at least 15 weeks

- U2: unemployed b/c lost job or end of temp job

- U3: standard unemployment rate (all unemployed)

- U4: U3 + discouraged workers

- U5: U4 + marginally attached

- U6: U5 + working part time for economic reasons

How Is Unemployment Measured?

- level differences
- cyclical properties are similar

How are Flows Measured?

- Can match individuals in households over months in CPS

    - maximum of 3/4 of sample matched each month

    - reality: 2/3 of sample matched

- Potentially up to 4 months

- Can track changes in labor force status

How are Flows Measured?

- For example the UE flow, f_{UE}, is measured by counting number of individuals who when from U to: U, E, O, M(issing)

$$f_{UE} = \frac{UE}{UE + UU + UO + UM}$$

- These are very noisy

  - seasonally adjust

  - take quarterly averages

Measurement Error in Labor Force Status

- Reinterview Surveys (stopped in the 90's), Abowd & Zellner (1985), Poterba & Summers (1986)

Abowd and Zellner (1985) estimates of classification errors (%).

Original interview status	Status determined on reinterview		
	Employed	Unemployed	Non-participant
Employed	98.78	1.91	0.50
Unemployed	0.18	88.57	0.29
Non-participant	1.03	9.52	99.21

- Use this matrix to correct flows, time invariant and on an aggregate level
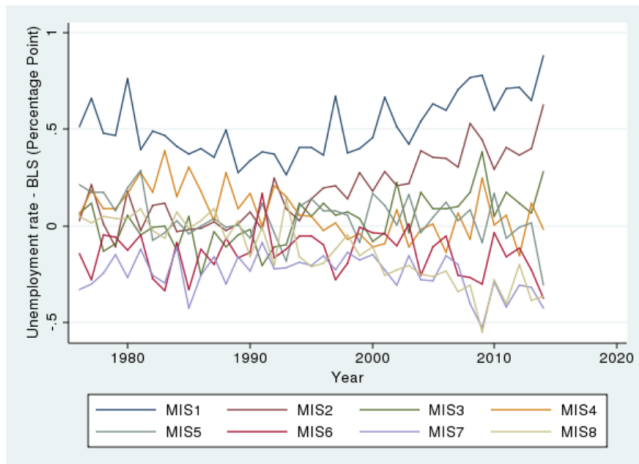
# Measurement Error in Labor Force Status

- Krueger, Mas, and Niu (2017) show that if we calculate the unemployment rate by month in sample, significantly different values, "rotation group bias"
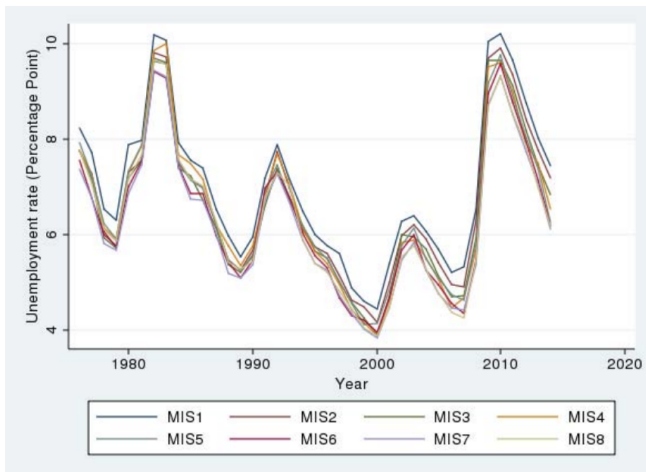
Measurement Error in Labor Force Status

- Krueger, Mas, and Niu (2017) show that if we calculate the unemployment rate by month in sample, significantly different values, "rotation group bias"

Measurement Error in Labor Force Status

- Ahn & Hamilton (WP2019) match individuals in CPS and show 2/3 of people who are NU say they have been looking for work for 5+ weeks.

Figure 3. Reported and predicted unemployment durations in rotation 2 for individuals who were not in the labor force in rotation 1 and unemployed in rotation 2.
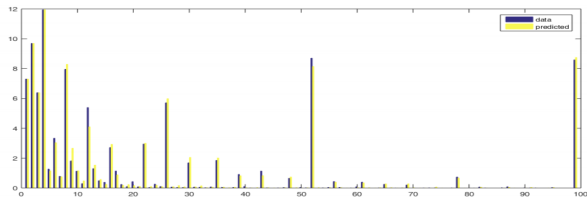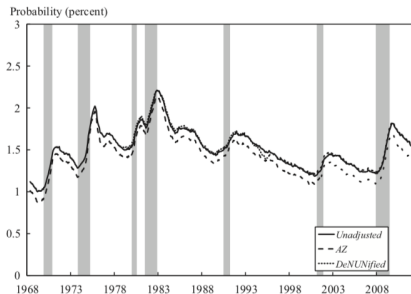
Correcting for Measurement Error

- Unemployment rate
  - Feng & Hu (2013): structural model of misclassification error, 2.1 percentage point increase in unemployment rate
  - Shibata (WP2019): slightly different assumptions about misclassification error, 0.8 percentage point increase in unemployment rate
  - Ahn & Hamilton (WP2019): 2.2 percentage point increase in unemployment rate

- Labor Market Flows
  - Abowd & Zellner (1985): decreases UN flow by about 1/2, other flows mostly the same
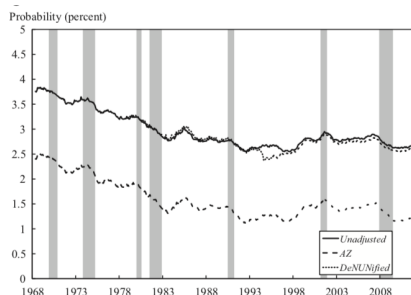 - Elsby, Hobjin, and Sahin (2015): de"NUN"ification decreases UN flow by 1/2

Correcting for Measurement Error

Employment to

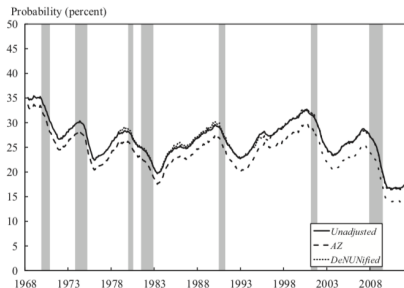Unemployment   Out of the Labor Force

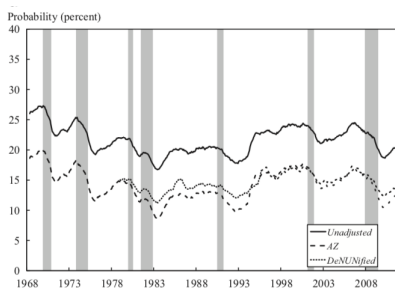Source: Elsby, Hobjin, Sahin (2015)

Correcting for Measurement Error

Unemployment

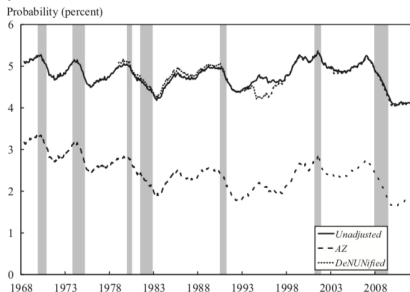Employment

Out of the Labor Force

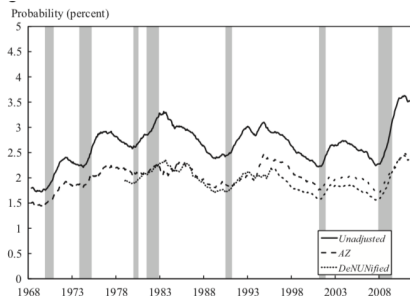

Source: Elsby, Hobjin, Sahin (2015)

Correcting for Measurement Error

Out of the Labor Force

Employment

Unemployment

Source: Elsby, Hobjin, Sahin (2015)

My Recent Research

- Problem with the way we measure unemployment
  - everyone counts the same, discrete measure
  - as long as you search 1 time you are in

- What I propose
  - continuous approach to unemployment
  - weighted average of all non-employed people
  - weighted by a measure of labor force attachement

- We already do this for employment
  - part time vs full time
  - total hours
  - full time equivalents

What I Show

- Using data from American Time Use Survey, show that people classified as out of the labor force

  - 25% between age 25-55 search for work

  - conditional on search, spend about 2 hours per day

  - 95% of time spend on active search activities

- Continuous approach

  - dampens cyclical properties of labor market

    - volatility of unemployment decreases by $\sim 40\%$

  - decreases flows between U and O

  - decreases the importance of participation margin in accounting for fluctuations in unemployment rate

Data

- American Time Use Survey 2003-2017

    - Interviews CPS respondents 2-5 months after CPS

    - Asks about labor force status again

        - categorizes identically to CPS

    - Asks people what, where, with whom, and how long they did activities throughout the day

        - job search activities

Who is Searching?

Search Effort by Labor Force Status

	Age 16+		
	Daily Probability	Monthly Probability	Minutes Per Day
Employed	0.6	16.8	113.4
Unemployed	17.1	99.6	145.8
Out of the Labor Force	0.4	11.9	132.9
N	189,314	189,314	2,122

	Age 25-55		
	Daily Probability	Monthly Probability	Minutes Per Day
Employed	5.6	15.5	123.2
Unemployed	23.0	99.9	155.2
Out of the Labor Force	9.7	25.4	136.3
N	108,505	108,505	1,506

What are they doing?

	Age 16+			Age 25-55		
Percent of Time by Activity						
	E	U	O	E	U	O
Active Job Search	81.8	91.1	85.8	82.2	92.8	89.7
Interviewing	14.9	6.8	9.7	14.2	5.1	5.4
Other	3.2	2.1	4.5	3.6	2.1	4.9
N	579	1,344	199	421	959	126

Predicting Search Probability

- **Selection Model**: ex. misclassification

  $$P(S_i = j) = \Phi(\beta_0 + \beta_1 Economy_{sm} + \beta_2 Demographics_i + \gamma_d^1)$$

- **Extensive Job Search**

  $$P(search_i = 1) = \Phi(\delta_0 + \delta_1 Economy_{sm} + \delta_2 Demographics_i + \gamma_d^2 + \rho\tilde{\lambda}_i)$$

- **Variables**
  - S_i: labor market state $j \in \{E, U, O\}$
  - $search_i$: indicator, 1 if person searched for work
  - Demographics: female, age, educ., married, race, child
  - γ_d: day of the week FE
  - Economy: Philly Fed Coincidence Index per capita
    - payroll employment, average hours worked, the unemployment rate, and wage

Predicted Probabilities

- Data: CPS 1980-2017
- Contains all the same demographic variables
- Predicted search probabilities
  - Daily probability

$$\hat{p}_d \text{ for Monday -Sunday}$$

  - Weekly probability

$$\hat{p}_i^w = 1 - \prod_{d=1}^{7}(1 - \hat{p}_d)$$

  - Monthly probability

$$\hat{P}_i = 1 - (1 - \hat{p}_i^w)^{4.17}$$

Total Number of Searchers
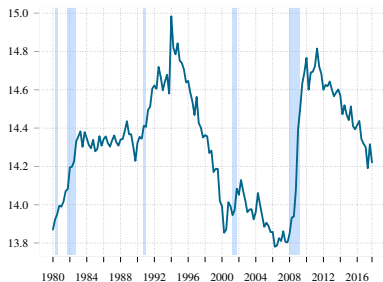
- Total number of searchers per BLS defined group

$$E_t^s = \sum_{i \in E_t} weight_{it} \times \hat{P}_{it}$$

$$U_t^s = \sum_{i \in U_t} weight_{it} \times \hat{P}_{it}$$

$$O_t^s = \sum_{i \in I_t} weight_{it} \times \hat{P}_{it}$$

Fraction of Searchers

Employed

Unemployed
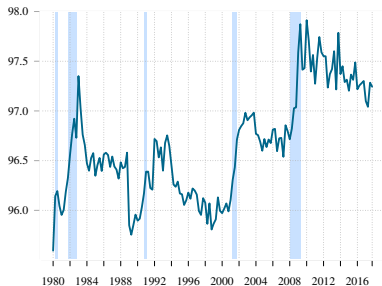
Fraction of Searchers

Out of the Labor Force
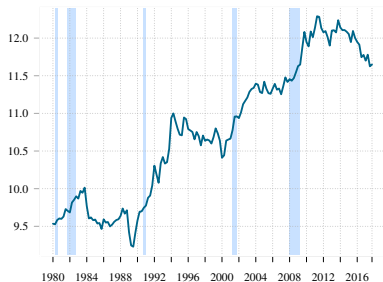
Total Population
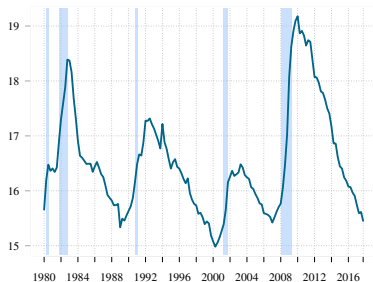
Fraction of Searchers

- Standard Unemployment Rate

$$U = \frac{U}{U + E}$$

- Standard Participation Rate

$$P = \frac{U + E}{U + O + E}$$

- Continuous Unemployment Rate

$$\tilde{U} = \frac{U^s + O^s}{U + O + E}$$
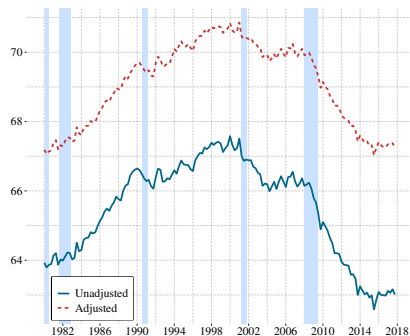
- Continuous Participation Rate

$$\tilde{P} = \frac{U^s + O^s + E}{U + O + E}$$

Unemployment and Participation
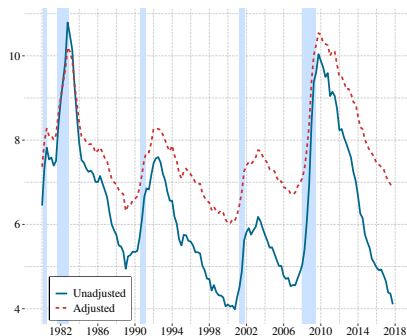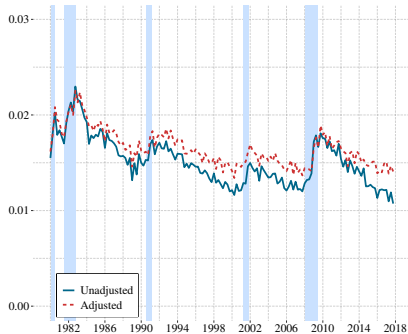

Unemployment Rate   Participation Rate
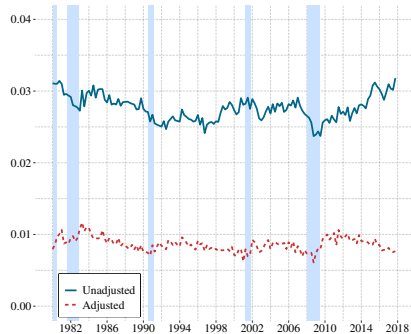
Labor Market Flows

- **New Calculation**: predict job search prop. $\hat{P}_{it}$ for $t = 1, 2$

  - Employment to

    - Unemployment: $weight_{it} \times \hat{P}_{i2}$

    - Out of the Labor Force: $weight_{it} \times (1 - \hat{P}_{i2})$

  - Not Employed

    - $U \to E$: $weight_{it} \times \hat{P}_{i1}$

    - $U \to O$: $weight_{it} \times \max\{\hat{P}_{i1} - \hat{P}_{i2}, 0\}$

    - $O \to U$: $weight_{it} \times \max\{\hat{P}_{i2} - \hat{P}_{i1}, 0\}$
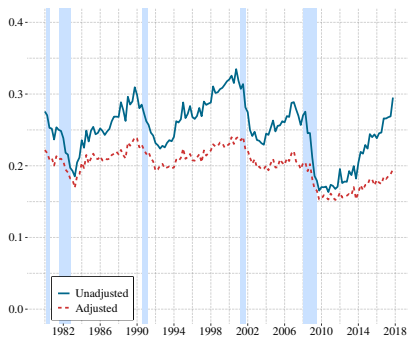
Flows

Employment to

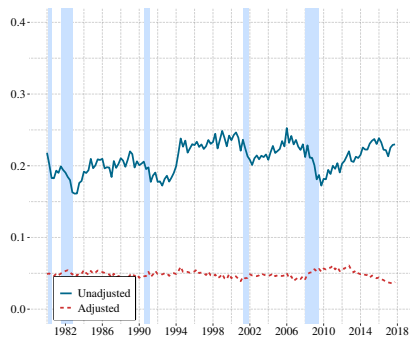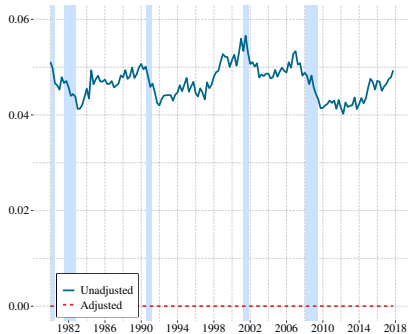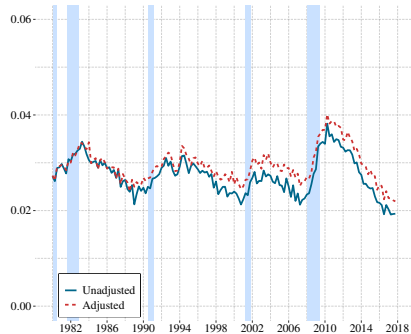Unemployment | Out of the Labor Force

Flows

Flows

Out of the Labor Force

Employment   Unemployment

Summing Up

- What we have seen

  - Wage distribution and search frictions built on "micro foundations"

  - Search frictions help standard RBC models fit data better along some dimensions

  - Labor market tightness variation and U/O margin hard to account for in search mode

- Lots of good stuff left to do!

  - Capital vs Labor

  - Search process for workers, screening process for firms

  - Assignment. Due 6th Dec.