Labor Force Participation

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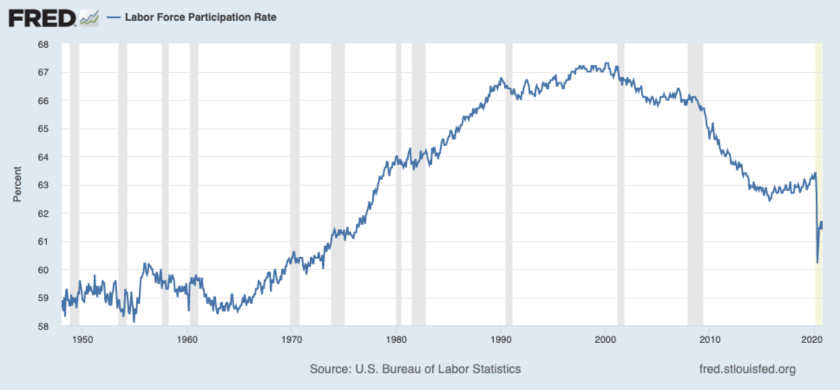
So far

- We have discussed movements between U and E
  - how firms and workers match $p(\theta)$
  - when workers stop searching, or how many times they search
  - can also think about job destruction δ, why matches end
- We have seen data on
  - unemployment u
  - vacancies v
  - job finding rate $p(\theta)$, job destruction rate δ
  - job filling rate $q(\theta)$

Now let's think about participation

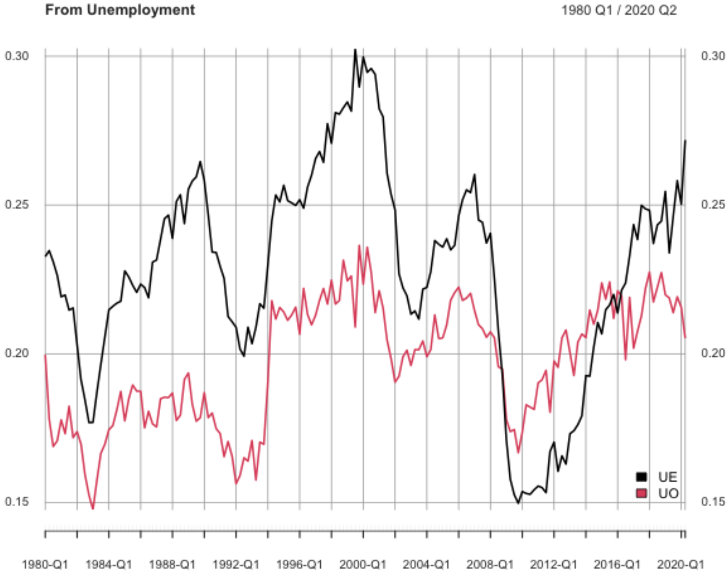
- What is labor force participation?
  - labor force = U + E
  - how has this changed over time, trend and cycle?
- How important is it for understanding trends and cyclical patterns in E, U, total hours, wages, output?
  - let's look at the flows
- What do people's decisions to participate depend on?
  - do labor market frictions matter?

Labor force participation rate

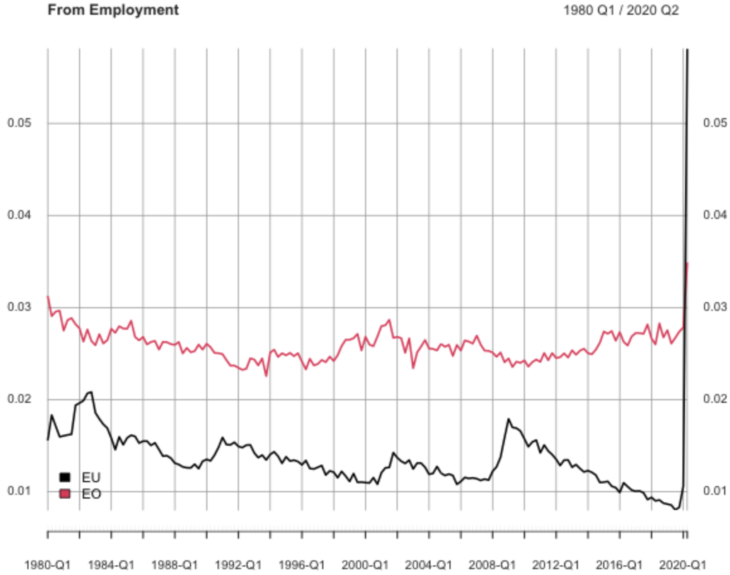


- large movements in trend
  - 1970's - 2000's women entered labor force
  - 2000's - current: aging population & young men not participating
- cyclical patterns: a-cyclical, pro-cyclical?

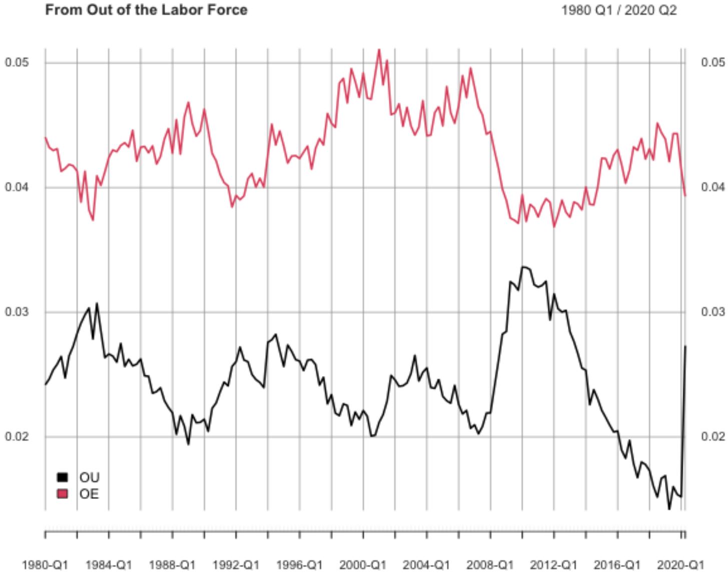
Flows between U, E, and O



Flows between U, E, and O



Flows between U, E, and O



Three facts from the flows

1) Unemployed people are equally likely to leave unemployment for employment or inactivity

2) Employed workers are more likely to leave employment for inactivity than unemployment

3) People who are out of the labor force are more likely to find a job than move to unemployment

How important is the participation margin?

Table 3
Three-state variance decomposition of changes in the unemployment rate by classification error adjustment.

Class. error adjustment	Start of sample	Share of variance						
		EU	*UE*	*NU*	*UN*	*EN*	*NE*	residual
Unadjusted	1967	24.9	34.9	9.5	23.9	−0.3	1.0	6.0
De*NU*nified	1967	–	–	–	–	–	–	–
Abowd–Zellner	1967	29.6	41.7	−0.7	26.7	−1.3	2.1	1.8
Unadjusted	1978	22.3	35.1	13.2	22.3	−0.7	1.5	6.3
De*NU*nified	1978	25.2	42.5	11.6	17.1	−0.8	1.1	3.3
Abowd–Zellner	1978	25.6	44.4	3.9	26.4	−1.7	2.3	−0.9

- Elsby, Hobijn, Sahin (2015): three state (E, U, N) variance decomposition of the unemployment rate.
    - $\sim$ 30% of the variation in the unemployment rate is attributed to movements between U and N
    - robust to measurement issue

Participation in the simple DMP model

- Consider the simple DMP model
- Let's add a third state the worker can be in O
- If the worker is out of the labor force he gets b forever

$$rO = b$$

- Worker chooses to participate by comparing O and U

$$rU \geq rO \Rightarrow \text{ they participate}$$

Participation in the simple DMP model

- The value of unemployment

$$rU = \frac{r+\delta}{r+\delta+p(\theta)}b + \frac{p(\theta)}{r+\delta+p(\theta)}w$$

- As long as $w \geq b$ we have that $rU \geq rO$
- $w \geq b$ as long as productivity is high enough, regardless of the wage setting mechanism, i.e. $y \geq b$
  - y: output of job

Participation in the simple DMP model

- Changes in participation i.e. movements between U and O can only be driven by changes in y or b
  - frictions do not matter for labor supply, only employment
  - if $y > b$ without frictions we have full employment
  - if $y < b$ we have no employment
- Garibaldi and Wasmer (2005)
  - model linear utility, shocks to the value of non-participation
  - can not match large flows between U and O

When do frictions matter for labor supply?

$$\max_{\{c_t\},\{h_t\}} \sum_{t=0}^{\infty} \beta^t [\ln(c_t) + \alpha \ln(1 - h_t)] \quad , \quad h_t \in \{0, h\}$$

- Consider a simple indivisible labor model, Rogerson (1988) or Hansen (1985), workers are risk adverse and markets are incomplete
- models have interior solutions to labor supply, i.e. fraction of worker's life employed $\in (0, 1)$
- do not have frictions, no sense of unemployment
- α determines steady state employment
  - high $\alpha \rightarrow$ value leisure a lot $\rightarrow$ low emp.
  - low $\alpha \rightarrow$ do not value leisure $\rightarrow$ high emp.

Krusell, Mukoyama, Rogerson, Sahin (2008)

- Environment
  - Risk averse workers: $U(c_t, h_t) = log(c_t) - d(h_t)$
  - Incomplete markets
    - can save assets at rate r
  - To start, no frictions, choose $h_t \in \{0, 1\}$
- When do frictions matter for the labor supply decision?

Value Functions

- No borrowing, $a' > 0$
- Budget constraint
  - working: $c + a' = (1+r)a + w$
  - not working: $c + a' = (1+r)a$
- Value of working

$$W(a) = \max_{a'} log[(1+r)a + w - a'] - d(1) + \beta V(a')$$

- Value of not working

$$N(a) = \max_{a'} log[(1+r)a - a'] - d(0) + \beta V(a')$$

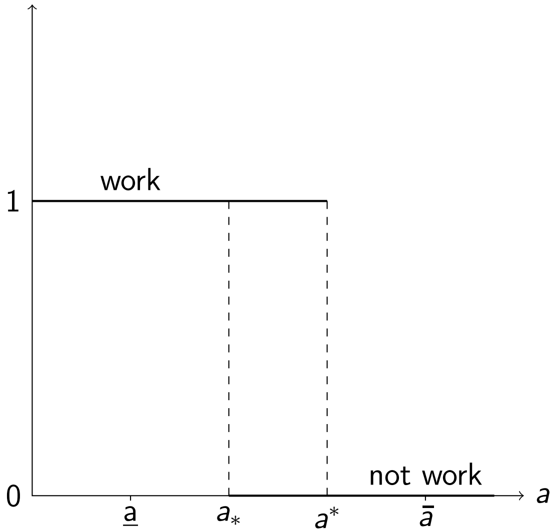
- Total Value function

$$V(a) = \max\{W(a), N(a)\}$$

Steady State Solution

- Work region: $a \leq \underline{a}$
  - c_t and a_t constant over time, always work
  - absorbing state
- Leisure region: $a \geq \bar{a}$
  - c_t and a_t constant over time, never work
  - absorbing state
- Indifference region: $a \in [a_*, a^*]$
  - indifferent between working and not working
  - c_t is constant over time
  - a_t is decreasing if not working
  - a_t is increasing if working

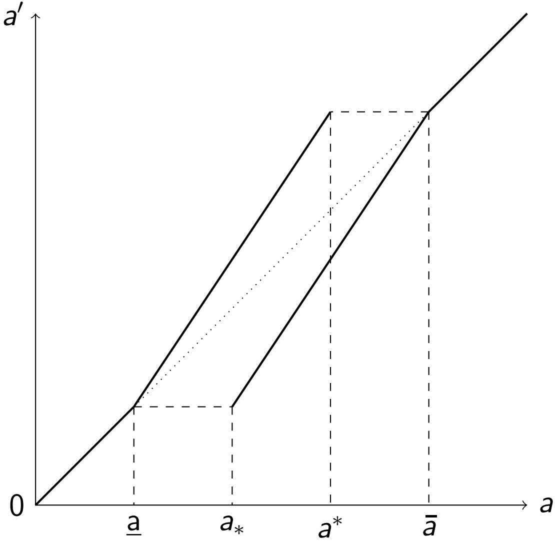
Work Policy Function



Steady State Solution

- Buffer regions: $a \in [\underline{a}, a_*]$ or $a \in [a^*, \bar{a}]$
  - c_t is constant over time, equal to indifference region
  - $a \in [\underline{a}, a_*]$: always working and a_t is increasing
    - moving towards indifference region from below
  - $a \in [a^*, \bar{a}]$: always not working and a_t is decreasing
    - moving towards indifference region from above
- Buffer + Indifference region, $a \in [\underline{a}, \bar{a}]$ is absorbing

Asset Policy Function



When do frictions matter for labor supply?

- Frictions $\rightarrow$ it takes time to find a job
- When indifference region is large
  - worker can go many periods being indifferent between working and not working
  - the length of time it takes to find a job is not so important
  - small changes in frictions have little impact on labor supply
- When the indifference region is small
  - worker goes fewer period being indifferent between working and not working
  - the length of time it takes to find a job is important
  - small changes in frictions can have large impact on labor supply

Taking the model to the data

- Krusell et al. have many variations of the model and different calibrations, see 2008, 2010, 2011, 2017
- Krusell et al. (2017)
  - idiosyncratic productivity shocks
  - shocks to the disutility of searching
  - shocks to unemployment benefits, b
- Need large shocks to disutility of searching to match UO flows