Topic 8: Optimal Social Insurance: The Case of UI

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Spring, 2018
Unemployment Insurance

- Large literature studying unemployment insurance
- Great administrative data
- Straightforward binary models
  - Unemployed vs. employed instead of levels of income
Unemployment Insurance: Binary Model

- Setup (Baily 1978; Chetty 2006; Chetty and Finkelstein 2012 Handbook Chapter)

- Two states of the world: Employed and Unemployed
  - Consumption $c^u$ and $c^e$

- Individuals exert effort $p$ (= probability of unemployed or fraction of life in unemployed state)

- Utility $U(p, c^e, c^u)$ assumed to have a particular structure:

  $$(1 - p)v(c^e) + pu(c^u) - \psi(1 - p)$$

  where $\psi(\circ)$ is the cost of effort
Unemployment Insurance: Binary Model

- Consumption has constraints

\[ c^u \leq A + b \]

\[ c^e \leq A + w - \tau \]

where \( \tau \) are taxes and \( b \) are unemployment benefits; \( A \) is assets.

- Indirect utility

\[ V(\tau, b) = \max_p pu(A + b) + (1 - p) v(A + w - \tau) - \Psi(1 - p) \]

- Budget / resource constraint

\[ (1 - p) \tau = pb \]
Goal: What value of \( \tau \) and \( b \) maximize representative agent’s utility?

Maximization program

\[
\max_{\tau, b} V(\tau, b) \quad \text{s.t.} \quad pb \leq (1 - p) \tau
\]

or

\[
\max_b V(\tau(b), b)
\]

Or

\[
\frac{\partial V}{\partial \tau} \frac{d\tau}{db} + \frac{\partial V}{\partial b} = 0
\]

or

\[
\frac{\partial V}{\partial b} = -\frac{d\tau}{db}
\]

where \( \frac{d\tau}{db} \) captures the budget impact
Budget Impact

- Budget impact

\[ \tau = \frac{p}{1-p} b \]

- So

\[
\frac{d\tau}{db} = \frac{p}{1-p} + b \frac{dp}{db} \frac{(1-p)}{(1-p)^2} \\
= \frac{p}{1-p} + \frac{1}{(1-p)^2} b \frac{dp}{db} \\
= \frac{p}{1-p} \left( 1 + \frac{1}{1-p} \frac{b}{p} \frac{de}{db} \right) = \frac{p}{1-p} \left( 1 + \frac{\epsilon_{p,b}}{1-p} \right)
\]
Envelope Theorem

- Envelope theorem implies

\[ \frac{\partial V}{\partial \tau} = -(1 - p) \nu'(c^e) \]

\[ \frac{\partial V}{\partial b} = pu'(c^u) \]

- Optimality condition requires:

\[ \frac{\partial V}{\partial b} \frac{\partial V}{\partial \tau} = -\frac{d\tau}{db} \]

which implies

\[ \frac{p}{1 - p} \frac{u'(c^u)}{\nu'(c^e)} = \frac{p}{1 - p} \left( 1 + \frac{\epsilon_{p,b}}{1 - p} \right) \]
Dividing, yields the “Baily-Chetty” condition:

\[
\frac{u'(c^u) - v'(c^e)}{v'(c^e)} = \frac{\epsilon_{p,b}}{1 - p}
\]

where

\[
\epsilon_{p,b} = \frac{dp}{db} \frac{b}{p}
\]

Baily (1978); Chetty (2006)
What is $\frac{e_{p,b}}{1-p}$?

- Causal impact of simultaneous increase in benefits financed by increase in taxes on the cost of unemployment
  - Fiscal externality

- Generally assumed to be from increased unemployment duration

- But there could be other factors that generate fiscal externalities
  - Increased wages
  - Increased entry into unemployment
  - Impact of taxes on labor supply
  - Impact on “job creation”
Estimates of Duration Elasticity

- Early literature used cross-sectional variation in replacement rates

- Problem: comparisons of high and low wage earners confounded by other factors.

- Modern studies use exogenous variation from policy changes (e.g. Meyer 1990)
Estimates of Duration Elasticity

- Define hazard rate $h_t = \frac{\text{number that find a job at time } t}{\text{number unemployed at time } t}$

  - This is an estimate of the probability of finding a job at time $t$ conditional on being unemployed for at least $t$ weeks

- Standard specification of hazard model: Cox “proportional hazards”

  $$h_t = \alpha_t \exp(\beta X)$$

- Here $\alpha_t$ is the non-parametric “baseline” hazard rate in each period $t$ and $X$ is a set of covariates

- Semi-parametric specification – allow hazards to vary freely across weeks and only identify coefficients off of variation across spells
Estimates of Duration Elasticity

- Useful to rewrite expression as:
  \[ \log h_t = \log \alpha_t + \beta X \]

- Key assumption: effect of covariates proportional across all weeks
  \[ \frac{d \log h_t}{dX} = \beta = \frac{d \log h_s}{dX} \quad \forall t, s \]

- If a change in a covariate doubles hazard in week 1, it is forced to double hazard in week 2 as well

- Restrictive but a good starting point; can be relaxed by allowing for time varying covariates \( X_t \)
Estimates of Duration Elasticity

- Meyer includes log UI benefit level as a covariate:
  \[ \log h_t = \log \alpha_t + \beta_1 \log b + \beta_2 X \]

- In this specification,
  \[ \frac{d \log h_t}{d \log b} = \beta_1 = \varepsilon_{h_t,b} \]

- Note: in exponential survival (constant-hazard) models,
  \[ \varepsilon_{h_t,b} = -\varepsilon_{1-e,b} \]

- Meyer estimates \( \varepsilon_{h_t,b} = -0.9 \) using administrative data for UI claimants
  - Subsequent studies get smaller estimates; consensus: \( \varepsilon_{h_t,b} = -0.5 \) (Krueger and Meyer 2002)
    - Implies fiscal externality of
    \[ \frac{\epsilon}{1 - p} \approx \frac{0.5}{0.95} = 0.55 \]

  - Individuals need to be willing to pay a 55% markup for additional UI to be welfare-improving
Value of Insurance Benefits

- How much of a markup are individuals willing to pay, \( \frac{u'(c_u)}{v'(c_e)} \)?

- Five approaches:
  
  - Approach #1: Exploit impact of unemployment on consumption (Gruber 1997)
  
  - Approach #2: Exploit ex-ante impact of learning about unemployment on consumption (Hendren 2016)
  
  - Approach #3: Exploit liquidity vs. moral hazard benefit response (Chetty 2008)
  
  - Approach #4: Reservation wages (Shimer and Werning 2010)
  
  - Approach #5: Measure WTP directly (Nekoei et al. 2017)
Approach #1 (Baily 1978, Chetty 2006,...): Assume state dependence: \( u = \nu \)

This implies:

\[
\frac{u'(c_u)}{\nu'(c_e)} \approx 1 + \sigma \frac{\Delta c}{c}
\]

where

\[
\frac{\Delta c}{c} = \frac{c_e - c_u}{c_e} \approx \log(c_e) - \log(c_u)
\]

\( \sigma = \frac{u''(c)}{u'(c)} \) is relative risk aversion [Chetty 2006 has 3rd order adj.]

Generally implemented using first difference as proxy for \( \frac{\Delta c}{c} \)
Gruber (1997) estimates $\frac{\Delta c}{c}$ using first difference impact of unemployment on consumption expenditure (food expenditure) in PSID.

- Studies how it varies heterogeneously with benefit level.
- Uses this to solve for optimal benefits, $b^*$.
- Problem: ex-ante responses bias first difference estimates (Hendren, 2016).
Willingness to Pay for $1 of UI
First Difference Approach (Gruber 1997, Baily 1978)

Coefficient on Unemployment Indicator

Lead/Lag Relative to Unemployment Measurement

Willingness to Pay for $1 of UI
First Difference Approach (Gruber 1997, Baily 1978)

7.23%
Coefficient on Unemployment Indicator

Willingness to Pay for $1 of UI
First Difference Approach (Gruber 1997, Baily 1978)

\[
\frac{u'(c_u)}{v'(c_e)} = 1 + \sigma \times 7.23\%
\]
Problem: Some information about $U_t$ is revealed at $t-1$
Solution: Scale by amount of information about $U_t$ that is revealed between $t-1$ and $t$.
Proposition 1: Causal Effect given by:
\[
\frac{\Delta c}{c} = \frac{\Delta^{FD}}{1 - (E[P|U_t=1]-E[P|U_t=0])}
\]
Hendren (2016): Scale By Information Revealed

Proposition 1: Causal Effect given by:

\[
\frac{\Delta c}{c} = \frac{\Delta^{FD}}{1 - (E[P|U_t=1] - E[P|U_t=0])}
\]

Regress Z on U for \( E[P|U_t=1] - E[P|U_t=0] \)
Hendren (2016): Scale By Information Revealed

**Proposition 1:** Causal Effect given by:

\[
\frac{\Delta c}{c} = \frac{\Delta^FD}{1 - (E[P|U_t=1] - E[P|U_t=0])}
\]

\[E[P|U_t=1] - E[P|U_t=0] \approx 20\%\]
Proposition 1: Causal Effect given by:

\[ \frac{\Delta c}{c} = \frac{\Delta^{FD}}{80\%} = 1.25 \times \Delta^{FD} \]
Proposition 1: Causal Effect
given by:

$$\frac{\Delta c}{c} = \frac{\Delta^{FD}}{80\%} = 1.25 \times \Delta^{FD}$$

$$= 1.25 \times 7.23\%$$

$$= 9\%$$
Coefficient on Unemployment Indicator

Hendren (2016): Scale By Information Revealed

\[ u'(c_u) \]
\[ v'(c_e) = 1 + 0.09 \cdot \sigma \]
Hendren (2016): Scale By Information Revealed

\[
\frac{u'(c_u)}{v'(c_e)} = 1 + 0.09 \times \sigma \\
= 1 + 18\% \text{ for } \sigma = 2
\]
Coefficient on Unemployment Indicator

Hendren (2016): Scale By Information Revealed

\[ \frac{u'(c_u)}{v'(c_e)} = 1 + 0.09 \times \sigma \]

= 1 + 18% for \( \sigma = 2 \)

= 1 + 27% for \( \sigma = 3 \)
Large literature using consumption changes to proxy for marginal utilities
  - e.g. literature on impact of retirement on consumption
  - Suggests people 'under save' for retirement

Aguiar and Hurst (2005) critique this by noting that those who retire have more time to shop and find lower prices
  - Suggests that even if $u = v$ we would expect those with more time to have higher consumption for the same level of expenditure

More generally, many reasons not to like the state independence assumption
  - Maybe you value money more when unemployed because you have search expenditures that arise?

Bias could go either way...
  - Approaches 2-3 deal with this...
Approach #2: Exploit Ex-Ante Responses

- Approach #1 compares consumption across states of the world
  - Most common approach (e.g. Gruber (1997))
- Alternative approach: Compare ex-ante consumption within states of the world
- Euler Equation:

  \[ v'(c_{today}(p)) = pu'(c_u) + (1 - p)v'(c_e) \]

  Implies

  \[ \left( \frac{v''}{v'} \right) \left( \frac{1}{c_{today}} \right) \frac{dc_{today}}{dp} = \frac{u'(c_u) - v'(c_e)}{v'} \]
Hendren (2016): Exploit Ex-ante Responses

Coefficient on Unemployment Indicator

-4 -3 -2 -1 0 1 2 3 4

Lead/Lag Relative to Unemployment Measurement

Coeff 5%/95% CI

Hendren (2016): Exploit Ex-ante Responses
Proposition 2: WTP given by:
\[
\frac{u'(c_u)}{v'(c_e)} = 1 + \sigma \frac{d\log(c_{pre})}{dp}
\]
Hendren (2016): Exploit Ex-ante Responses

Proposition 2: WTP given by:

\[
\frac{u'(c_u)}{v'(c_e)} = 1 + \sigma \cdot \frac{d\log(c_{pre})}{dp} = 1 + \sigma \cdot \frac{\Delta_{-1}^{FD}}{\Delta_{-1}^{Beliefs}}
\]

\[
\Delta_{-1}^{Beliefs} = E[P_{t-1} | U_{t}=1] - E[P_{t-2} | U_{t}=1] - (E[P_{t-1} | U_{t}=0] - E[P_{t-2} | U_{t}=0])
\]
Hendren (2016): Exploit Ex-ante Responses

**Proposition 2:** WTP given by:

\[
\frac{u'(c_u)}{v'(c_e)} = 1 + \sigma \cdot \frac{d\log(c_{pre})}{dp} = 1 + \sigma \cdot \frac{2.7\%}{9.4\%}
\]

\(\Delta_1^{FD} = 2.7\%\)
Proposition 2: \(\text{WTP given by:}\)

\[
\frac{u'(c_u)}{v'(c_e)} = 1 + \sigma * \frac{d \log(c_{pre})}{dp}
\]

\[
= 1 + \sigma * \frac{2.7\%}{9.4\%}
\]

\[
= 1 + 58\% \text{ for } \sigma = 2
\]

\(\Delta_{1}^{FD} = 2.7\%\)
Hendren (2016): Exploit Ex-ante Responses

Proposition 2: WTP given by:

$$\frac{u'(c_u)}{v'(c_e)} = 1 + \sigma \cdot \frac{d\log(c_{pre})}{dp}$$

$$= 1 + \sigma \cdot \frac{2.7\%}{9.4\%}$$

$$= 1 + 58\% \text{ for } \sigma = 2$$

$$= 1 + 87\% \text{ for } \sigma = 3$$

$$\Delta_1^{FD} = 2.7\%$$
Hendren (2017): Can also use spousal labor supply

Assume disutility of labor additively separable:

\[
\frac{u'(c_u)}{v'(c_e)} \approx 1 + \frac{1}{\epsilon^{semi}} \frac{d[LFP^{Spouse}]}{dp}
\]

Scale labor supply responses by semi-elasticity of spousal labor supply to wages
Hendren (2017): Can also use spousal labor supply

Assume disutility of labor additively separable:

\[
\frac{u'(c_u)}{v'(c_e)} \approx 1 + \frac{1}{\epsilon^{semi}} \frac{d[LFP^{Spouse}]}{dp}
\]

- Scale labor supply responses by semi-elasticity of spousal labor supply to wages

Need to estimate \( \frac{dLFP^{Spouse}}{dp} \)

- Recall: \( \frac{dLFP}{dZ} = 0.025 \)
- Scale by signal-to-noise ratio, \( \frac{\text{var}(Z)}{\text{var}(P)} = \frac{\text{var}(Z)}{\text{cov}(U,Z)} = 11 \)
  - Roughly 10% of variance is signal
- Suggests WTP of 60% for semi-elasticity of 0.5.
Approach #3: Chetty 2008

- Chetty 2008 provides another method to get around state dependence issues
  - Assume separable effort function for employment
- Implies FOC

\[
v (c^e) - u (c^u) = \Psi' (e)
\]

where \( e = 1 - p \) (sorry for the notation change! If only papers were consistent :-) ).

- Note that the difference in levels of utility between employed and unemployed states is equated to the marginal disutility of effort
  - Relates levels of utility to 1st derivative of utility
- Key idea: take another derivative and relate 1st derivatives (WTP) to 2nd derivatives (elasticities)
Consider two comparative statics:
- Change assets, $A$, which increases consumption in both state of the world
- Change benefits, $b$, which increases consumption only when unemployed

**FOC for Assets**

$$\left[u'(c^e) - u'(c^u)\right] = \Psi''(e) \frac{de}{dA}$$

**FOC for benefits**

$$-u'(c^u) = \Psi''(e) \frac{de}{db}$$

So:

$$u'(c^e) = \Psi''(e) \left[\frac{de}{dA} - \frac{de}{db}\right]$$

Or

$$\frac{u'(c^u) - u'(c^e)}{u'(c^e)} = \frac{de}{dA} - \frac{de}{db}$$
So:

\[ u'(c^e) = \Psi''(e) \left[ \frac{de}{dA} - \frac{de}{db} \right] \]

Therefore, WTP For UI is given by:

\[
\frac{u'(c^u) - u'(c^e)}{u'(c^e)} = \frac{\frac{de}{dA}}{\frac{de}{dA} - \frac{de}{db}} = \frac{1}{1 - R}
\]

where

\[
R = \frac{de}{dA} \frac{de}{db}
\]

is the “fraction of the moral hazard effect, \( \frac{de}{db} \), that is due to a liquidity effect, \( \frac{de}{dA} \)”
Chetty (2008) provides evidence from the SIPP that most of the duration response to benefits is driven by those who are liquidity constrained.

- Evidence from the SIPP
First Quartile of Net Wealth (Chetty 2008)

Wilcoxon Test for Equality: $p = 0.01$

Mean rep. rate = .53
Mean rep. rate = .48

Average UI benefit below mean
Average UI benefit above mean
Third Quartile of Net Wealth (Chetty 2008)

Wilcoxon Test for Equality: $p = 0.69$

Mean rep. rate = .52

Mean rep. rate = .46

Fraction Unemployed

Weeks Unemployed

Avg. UI benefit below mean

Avg. UI benefit above mean
Highest Quartile of Net Wealth (Chetty 2008)

- Mean rep. rate = 0.52
- Mean rep. rate = 0.43
- Wilcoxon Test for Equality: p = 0.43

Fraction Unemployed

Weeks Unemployed

Avg. UI benefit below mean
Avg. UI benefit above mean
This suggests that $\frac{de}{db}$ is higher for those with low assets (i.e. $\frac{d}{dA} \frac{de}{db} > 0$)

But, it doesn’t provide an estimate of $\frac{de}{dA}$!

For this, look at impact of severance payments

- Causes increase in unemployment duration
- Despite the fact that benefits are paid regardless of duration
Severance (Chetty 2008)

The graph illustrates the fraction unemployed over weeks unemployed for two groups: employees with and without severance pay. The solid line represents employees without severance, while the dotted line represents those who received severance. The graph shows a decrease in the fraction unemployed over time for both groups, with the group that received severance having a slightly higher fraction unemployed at any given week.
Calibration

- Calibrating $\frac{de}{dA}$, finds that:
  
  $$R = 0.6$$

- Suggests that
  
  $$\frac{u'(c^u) - u'(c^e)}{u'(c^e)} = \frac{0.6}{0.4} = 1.5$$

- Suggests individuals are willing to pay a 150% markup for UI Problems?
  
  - Separability assumption valid?

- Nathan’s take: relies heavily on additive separability
  
  - Not a general result of being able to turn behavioral responses (2nd derivatives) into willingness to pay estimates (1st derivatives)
Approach #4: Reservation Wages

- Large empirical literature documenting how UI increases reservation wages
  - Often interpreted as “moral hazard”
  - People don’t take jobs because they have UI

- Shimer and Werning (2006) deliver a surprising result:
  - Optimal UI should maximize after-tax reservation wages

- Logic is quite straightforward (but math is not...)
Utility given by

\[ E \int_{0}^{\infty} e^{-\rho t} U(c(t)) \, dt \]

where \( \rho \) is a discount rate and \( c(t) \) is consumption at time \( t \)

- Note: no disutility of search or effort – utility is fully summarized by consumption
- Employed worker obtains wages \( w \) and pays tax \( t \).
- Unemployed worker obtains benefits \( b \) and receives job offers at Poisson arrival rate with wages drawn from distribution \( F(w) \)
  - If accepted, she becomes employed; otherwise waits for next offer

Define \( V_u \) to be the expected future lifetime utility for an unemployed worker

- Main Result:
  \[ V_u \propto U(\bar{w} - \tau) \]

where \( \bar{w} - \tau \) is the after-tax reservation wage.
Maximizing after tax reservation wage is equivalent to maximizing welfare.

If benefits cause people to forego good jobs, this is:
- Good because they can get even better future jobs
- Bad because it might increase taxes

After-tax reservation wage is the right balance between these two forces.

Issues:
- No disutility of effort
- Jobs are more than wages
- Little data on reservation wages
Approach #5: Measure WTP Directly

- Sweden has option to purchase UI through one’s union
- Exploited by A. Nekoei, Peter Nilsson, David Seim, & Johannes Spinnewijn
  - “Risk-based Selection in Unemployment Insurance: Evidence and Implications”
- 2007 reform changed prices
Approach #5: Measure WTP Directly

- Use estimates to back-out implied WTP
- Find large UI subsidies are optimal
- But full mandate is not optimal
  - Some people don’t want insurance and no need to force them to buy
- Very nice paper because it speaks to optimal social insurance using choice variation
Summary

- Five approaches yield different estimates

- Approach #1 suggests smaller WTP than approaches 2-3

- Potential explanations:
  - Correlated shocks
  - $u \neq v$
  - Others?

- Suggests higher benefits increase welfare if willing to pay 55% markup for UI
  - But still haven’t solved for optimal benefits
UI papers often go one step further: what is the optimal benefit level, $b^*$?

Write:

$$\sigma \frac{\Delta c}{c} (b^*) = \frac{\epsilon_{p,b}}{1 - p}$$

Assume $\epsilon$ is constant with respect to $b$ (good assumption)

Need to estimate $\frac{\Delta c}{c} (b)$: how does consumption impact vary with benefit level?

$$\frac{\Delta c}{c} (b) = \beta_1 + \beta_2 b$$

Imples

$$\sigma [\beta_1 + \beta_2 b] = \frac{\epsilon_{p,b}}{1 - p}$$

or

$$b^* = \frac{\beta_1 + \frac{1}{\sigma} \frac{\epsilon_{p,b}}{1 - p}}{\beta_2}$$
Gruber (1997) uses simulated instruments to generate variation in benefit levels, $b$
- Isolate variation in benefits due to policy variation across states

Estimates:

$$\Delta c = a + \gamma X_i + \beta_1 Unemp + \beta_2 \times b_i \times Unemp + \epsilon_i$$

where $X_i$ are individual characteristics and $b_i$ is the replacement rate (benefits / wages) for which an individual is ELIGIBLE
- 67% of people take up UI (Blank and Card 1991)
- Why not use observed UI replacement rate = benefits received / wage?

Finds $\beta_3 > 0$ so that UI reduces impact of unemployment on expenditure
- But suggests optimal $b^* = 0$ (problematic with $\epsilon$ constant?)
So far, talked about “benefits”

But, benefits has multiple dimensions:
- Duration of UI
- Generosity / replacement rate of UI

Key ingredients: need to know
- Differential behavioral response to changes in these two dimensions
- WTP for changing these two margins
Ganong and Noel (2016) estimates consumption path throughout UI spell

Use data from linked account information from major US financial institution

Define spell from UI deposits
  - Concerns?

Plot time path of expenditures through UI spell
  - Look at both onset of unemployment and impact of benefit exhaustion
Spending by Months Unemployed

Source: Ganong and Noel (2016)
Spending by Months Unemployed

Source: Ganong and Noel (2016)
Spending by Months Unemployed

Spending: Ratio to $t = -3$

Source: Ganong and Noel (2016)
Spending by Months Unemployed

Source: Ganong and Noel (2016)
Spending by Months Unemployed

Months Since First UI Check

Spending: Ratio to $t = -3$

1 month
2 months
3 months
4 months
5 months

Source: Ganong and Noel (2016)
Source: Ganong and Noel (2016)
Expenditure patterns follow duration of unemployment spell

Strong evidence though of consumption impact at benefit exhaustion
Source: Ganong and Noel (2016)
Source: Ganong and Noel (2016)
Ganong and Noel (2016)

- Consumption drops 11% at benefit exhaustion
  - Should be a known!

- Paper goes on to show traditional models do not do a good job of fitting the data
  - Permanent income model would suggest no drop at exhaustion
  - Hand-to-mouth consumption would suggest greater consumption fluctuations
  - Buffer-stock model doesn’t fit because people should accumulate more assets to help smooth the shock

- Question: does consumption drop at exhaustion suggest greater welfare benefit of extending benefits versus higher replacement rate?
Nekoei and Weber study impact of UI duration on job quality

- Exploit age-based discontinuity in UI rules in Austria
- Identification: Discontinuity at age 40
- Laid-off workers eligible for 39 instead of 30 weeks of UI as age crosses from 40 to 41
  - Implemented on August 1, 1989
UI Extension Effect on Non-Employment Duration

Nekoei and Weber (Forthcoming)
UI Extension Effect on Non-Employment Duration

Nekoei and Weber (Forthcoming)
UI Extension Effect on Wages

Wage change between jobs

30 35 40 45 50

Age at layoff

Nekoei and Weber (Forthcoming)
UI Extension Effect on Wages

Prob(New wage > 0.5 old wage)

30 35 40 45 50

Age at layoff

Nekoei and Weber (Forthcoming)
## Effect of UI Extension from 30 to 39 Weeks
### Discontinuity at age 40

<table>
<thead>
<tr>
<th>Covariates</th>
<th>Non-employment duration (1)</th>
<th>Find job within 39 weeks (2)</th>
<th>Wage change between jobs (3)</th>
<th>New wage &gt; UI benefit (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>1.932*** (0.526)</td>
<td>-0.0131*** (0.00164)</td>
<td>0.00449*** (0.00170)</td>
<td>0.00388*** (0.00105)</td>
</tr>
<tr>
<td>Yes</td>
<td>1.898*** (0.466)</td>
<td>-0.0119*** (0.00146)</td>
<td>0.00459*** (0.00146)</td>
<td>0.00386*** (0.00102)</td>
</tr>
<tr>
<td>Mean dep. var.</td>
<td>114.7</td>
<td>0.842</td>
<td>-0.0440</td>
<td>0.962</td>
</tr>
<tr>
<td>Observations</td>
<td>1,589,178</td>
<td>1,738,787</td>
<td>1,187,476</td>
<td>1,187,476</td>
</tr>
</tbody>
</table>

Nekoei and Weber (Forthcoming)
Additional UI duration causes significant increase in future wages
  - One of only papers finding that UI helps job match quality
  - Nice use of regression discontinuity design

Two implications:
  - Benefits of UI?
  - Costs of UI?
    - Significantly changes the FE associated with UI?
Literature generally focused on micro impact of UI on durations

But, UI can generate search externalities
- Allowing some workers to remain unemployed helps other workers find jobs

Lalive, Landais, and Zweimuller (2013) exploit large UI expansion in Austria
- Provided 209 weeks instead of 52 weeks as long as:
  - Age above 50
  - At least 15 years of continuous work history in past 25 years
  - Reside in particular subsets of regions
  - Unemployment spell began between June 1988 and Aug 1993
Figure 5: Difference in U duration between REBP and non-REBP regions: male 50-54 with more than 15 years of experience

Lalive, Landais, and Zweimuller (2013)
Figure 6: Difference in U duration between REBP and non REBP regions: male 50-54 with less than 15 years of experience

- Lalive, Landais, and Zweimuller (2013)
Figure 7: Relationship between previous work experience and unemployment duration: male 50-54, Before and after REBP

Lalive, Landais, and Zweimuller (2013)
Figure 7: Relationship between previous work experience and unemployment duration: male 50-54, during REBP

Lalive, Landais, and Zweimuller (2013)
Figure 7: Relationship between previous work experience and unemployment duration: male 50-54, **during REBP**

Lalive, Landais, and Zweimuller (2013)
Figure 7: Relationship between previous work experience and unemployment duration: male 50-54, during REBP

Lalive, Landais, and Zweimuller (2013)
Figure 7: Relationship between previous work experience and unemployment duration: male 50-54, during REBP

Excluded range

Lalive, Landais, and Zweimuller (2013)
Macro versus Micro

- Macro effects provide additional rationale for UI
- UI affects non-beneficiaries through search externalities
- Affects optimal UI calculations
Summary

- Large literature studying optimal UI
- Development of “sufficient statistic” approach for welfare analysis
  - Compare costs to benefits
- Evidence suggests
  - consumption expenditure drops upon unemployment (permanently)
  - UI increases duration of unemployment
- Open questions:
  - Impact of UI on unemployment incidence
  - Role of UI versus curvature in income tax schedule
    - UI for uber drivers?
    - Verifiability of unemployment