What Drives Wage Effects of Unemployment Benefits? Evidence from Natural Experiments

Patrick Arni, University of Bristol and IZA

Preliminary

6th AMSE-BdF Labor Market Conference
Banque de France, Paris, November 30
How Generous Should Unemployment Insurance Be?

Policy debate: pros and cons
- substantial expenses on unemployment insurance (UI)
- insure against job losses: due to business cycles, structural changes,...
- also: means of economic and social policy to absorb shocks

⇒ (How) Do the individuals benefit?

Causal wage effects of UI
⇒ measure of individual “welfare” (i.e. income) impacts of staying unemployed
⇒ ... income can be in the objective function of policy makers
⇒ trade-off of different effects on individual income
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Wage Effects of UI: Countervailing Forces

How does potential benefit duration (PBD) affect the individual?

\[ UI \text{ wage effect} = \text{selectivity effect} + \text{duration (dependence) effect} \]

Theory: PBD ↑ ⇒ reservation wage ↑

1. \( w \uparrow \)
2. UE duration ↑ ⇒ \( F(w) \downarrow \) ⇒ \( w \downarrow \)

What is the relative importance of the effects?

⇒ different policy interpretations

Which behaviors are behind the UI benefits effects?

⇒ crucially shape policy conclusions
Wage Effects of UI: Countervailing Forces

How does potential benefit duration (PBD) affect the individual?

\( \sim \) Countervailing forces!

\[
\text{UI wage effect} = \underbrace{\text{selectivity effect}}_{\text{positive force}} + \underbrace{\text{duration (dependence) effect}}_{\text{negative force}}
\]

Theory: PBD \( \uparrow \) \( \Rightarrow \) reservation wage \( \uparrow \\
\text{1. } w \uparrow \\
\text{2. UE duration } \uparrow \Rightarrow F(w) \downarrow \Rightarrow w \downarrow \\

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〜 Countervailing forces!

\[ UI \text{ wage effect} = selectivity \text{ effect} + duration (dependence) \text{ effect} \]

\[ \text{positive force} \rightarrow \text{reservation wage} \]

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Debate in Literature

Different empirical results on UI wage effects

Not different from zero

Negative
- Schmieder et al. (2015)

Positive
- Nekoei and Weber (2015)

Surveyed reservation wages, e.g.
- Feldstein and Poterba (1984)
- Krueger and Mueller (2014); Addison, Centeno and Novo (2008); Arni (2015)

Reservation wages and register data
- Le Barbanchon et al. (2016, ongoing)

Structural approach: indirect estimation of reservation wage effects
- e.g. Van den Berg (1990)
**Debate in Literature**

**Different empirical results on UI wage effects**

Not different from zero
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This Paper (up to now)

- Estimation of reservation wage effects and earnings effects and duration effects within the same natural experiments
- Are there reservation wage effects?
- Relative importance of impacts?
- Heterogeneity of effects by age
- Drivers of heterogeneity of reservation wage effects

Road map:
1. reservation wage effects (by age)
   - properties of surveyed reservation wages
2. comparison all outcomes \( \sim \) elasticities
3. analysis of heterogeneity
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Road map:
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   - properties of surveyed reservation wages
2. comparison all outcomes $\leadsto$ elasticities
3. analysis of heterogeneity
The quasi-experiments on potential benefit durations

- contribution threshold

\[ \leftrightarrow \text{Diff-in-Diff or RD around thresholds (adding trends)} \]

- eligibility threshold

\[ \leftrightarrow \text{Diff-in-Diff around threshold (adding trends)} \]

- ...plus conditions on contribution and family composition
Swiss Unemployment Insurance

Income support:
- potential benefit duration (PBD): normally 400 days
- replacement rate (RR): 70 or 80 % (family situation, income ceiling)
- median unemployment duration 4 to 6 months, ue rate 3-4%
- average daily benefit: 130-140 CHF [1 CHF = 1.10 USD = 0.959 EUR]
- social assistance for the non-eligible (means-tested, ~68% of UB)
- regular caseworker meetings, intense monitoring
- ALMPs
The Natural Experiments: PBD Changes at Thresholds

Quasi-experiment on contribution threshold, around 18 months:

<table>
<thead>
<tr>
<th>months of UI contribution</th>
<th>(for age 25-55) benefit days</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 18</td>
<td>260</td>
</tr>
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<td>18 – 24</td>
<td>400</td>
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frame for UI contributions: 24 mt

Quasi-experiment on potential benefit durations (working days), age 25:

<table>
<thead>
<tr>
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<th>with children</th>
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<td>&lt; 25</td>
<td>200 400</td>
</tr>
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Data & Sampling

Register data

- full coverage of Switzerland, daily precision
- Rich set of socio-demographic and benefit-related covariates
- Linked data: UI register and social security register → earnings and employment
- Inflow period: September 2012 to March 2014
- Sampling: basic eligibility for UI; min. first meeting (after 3 weeks, median) // positive earnings before UI entry

Reservation earnings: surveyed

- linked to register data
- collected in the context of an experimental test of a profiling system
- reservation earnings (monthly gross earnings) were recorded by the caseworker in the first meeting with the job seeker
- high response rates (0.8-0.95)
- collected in canton of Fribourg: well representative for Switzerland
In total N=8886 obs with surveyed reservation earnings (up to age 61.5).
Mean 4120 (s.d. 1744), median 4000 CHF. [1 CHF = 0.84 EUR = 0.786 GBP]
Ratio reservation earnings / earnings last job: mean 1.04, median 0.98.

→ very close to Feldstein & Poterba (1984) and Krueger & Mueller (2014)
### Reservation Earnings: Empirical Properties

#### Correlation to UE exit: indicative regressions

<table>
<thead>
<tr>
<th></th>
<th>(1) Cox 50 days</th>
<th>(2) Cox 180 days</th>
<th>(3) Cox 50 days</th>
<th>(4) Cox 180 days</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>UE exit within</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>res. earnings</td>
<td>-0.0165 (0.0428)</td>
<td>-0.0022 (0.0149)</td>
<td>-1.249* (0.724)</td>
<td>-0.202* (0.121)</td>
</tr>
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<td>ratio $w^r/w^p$</td>
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<td>-1.082 (0.761)</td>
</tr>
<tr>
<td>indiv. FE</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td></td>
</tr>
<tr>
<td>observations</td>
<td>7,049</td>
<td>7,049</td>
<td>865</td>
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</tbody>
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Note: reservation earnings in 1000 CHF; ratio trimmed at top (1.5); X variables incl.

#### How can empirical reservation wage be explained?
- Reservation earnings are meaningfully correlated to observables
- Correlations to age, gender, education, experience
- Past (insured) earnings is a very strong predictor: delivers $R^2 = 0.60$
## Reservation Earnings: Empirical Properties

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<td></td>
<td></td>
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</tr>
<tr>
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Reservation Earnings: Contribution Threshold, Ages 28–50

reservation earnings by RD groups, polynomial smoother, full sample

ages 28–35 and 35–50
Reservation Earnings: Contribution Threshold, Ages 35–54

reservation earnings by RD groups, polynomial smoother, full sample

ages 35–50 and 50–54

[Graph showing reservation earnings over months of contribution for ages 35–50 and 50–54]
Empirical Specifications

RD: contribution 18 mt threshold

\[ y_i = \alpha + x_i' \beta + \delta D_i^{RD} + \pi' f(cmt_i^{pre,post}) + \eta_t + \mu_r + \varepsilon_i \tag{1} \]

whereby
- \( D_i^{RD} \) is indicator for full eligibility (400 days PBD)
- \( x \) socio-demographic and benefit-related covariates
- \( \eta_t \) calendar time dummies (month, year), \( \mu_r \) regional dummies (PES, cantons)

Specification trend forcing variable
- linear
- step function (per mt of contribution)
Empirical Specifications

RD: contribution 18 mt threshold

\[ y_i = \alpha + x_i' \beta + \delta D_{RD} + \pi' f(cmt_{pre,post}^i) + \eta_t + \mu_r + \epsilon_i \]  
\hspace{1cm} (1)

whereby

- \( D_{RD} \) is indicator for full eligibility (400 days PBD)
- x socio-demographic and benefit-related covariates
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# Effects on Reservation Wages: Contribution Threshold

<table>
<thead>
<tr>
<th>age</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>29-35</td>
<td>reservation earnings (CHF, monthly)</td>
<td>reservation earnings (CHF, monthly)</td>
<td>reservation earnings (CHF, monthly)</td>
</tr>
<tr>
<td>35-45</td>
<td>outcome</td>
<td>reservation earnings (CHF, monthly)</td>
<td>reservation earnings (CHF, monthly)</td>
</tr>
<tr>
<td>45-54</td>
<td>outcome</td>
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<th>(3)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>threshold effect</strong></td>
<td>161.6**</td>
<td>193.1**</td>
<td>253.3*</td>
</tr>
<tr>
<td>(63.42)</td>
<td>(64.11)</td>
<td>(118.9)</td>
<td></td>
</tr>
<tr>
<td><strong>Δ PBD (in days)</strong></td>
<td>140</td>
<td>140</td>
<td>140</td>
</tr>
<tr>
<td>per month of dP</td>
<td>0.59%</td>
<td>0.66%</td>
<td>0.82%</td>
</tr>
<tr>
<td><strong>elasticity</strong></td>
<td>0.11</td>
<td>0.12</td>
<td>0.15</td>
</tr>
<tr>
<td><strong>covariates</strong></td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td><strong>age trend</strong></td>
<td>1 step</td>
<td>1 step</td>
<td>1 step</td>
</tr>
<tr>
<td><strong>outcome mean</strong></td>
<td>4242</td>
<td>4527</td>
<td>4808</td>
</tr>
<tr>
<td><strong>observations</strong></td>
<td>1,192</td>
<td>1,537</td>
<td>1,125</td>
</tr>
<tr>
<td><strong>$R^2$</strong></td>
<td>0.454</td>
<td>0.519</td>
<td>0.581</td>
</tr>
</tbody>
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Cluster robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; 1 CHF=0.79 GBP=0.96 USD=0.84 EUR
Reservation Earnings: Age Threshold 25

Reservation earnings by DID groups, polynomial smoother

- younger, w/o kids
- older, w/o kids
- younger, w/ kids
- older, w/ kids
Empirical Specifications

Diff-in-Diff: age 25 threshold

\[ y_i = \alpha + x_i'\beta + \gamma^1 I_{i\text{post}} + \gamma^2 I_{i\text{treat}} + \delta D_{i\text{DID}} + \eta_t + \mu_r + \varepsilon_i \]

whereby
- \(x\) socio-demographic and benefit-related covariates
- \(\eta_t\) calendar time dummies (month, year), \(\mu_r\) regional dummies (PES, cantons)

Test for age trends (if sign.)
- flexible linear RD trends
- step function (per year of age)
Empirical Specifications

Diff-in-Diff: age 25 threshold

\[ y_i = \alpha + x_i' \beta + \gamma_1^{\text{post}} I_{i}^{\text{post}} + \gamma_2^{\text{treat}} I_{i}^{\text{treat}} + \delta D_{i}^{\text{DID}} + \pi' f (\text{age}_{i}^{\text{pre}, \text{post}, c, t}) + \eta_t + \mu_r + \varepsilon_i \]

whereby
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Test for age trends (if sign.)
- flexible linear RD trends
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## Results: Effects on Reservation Wages: Age Threshold 25

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<tbody>
<tr>
<td><strong>outcome</strong></td>
<td>4y win</td>
<td>4y win</td>
<td>6y win</td>
</tr>
<tr>
<td><strong>reservation earnings (CHF, monthly)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>threshold effect</td>
<td>279.1***</td>
<td>219.6**</td>
<td>218.5**</td>
</tr>
<tr>
<td></td>
<td>(61.94)</td>
<td>(75.97)</td>
<td>(88.64)</td>
</tr>
<tr>
<td>Δ PBD (in days)</td>
<td>200</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td>per month of dP</td>
<td>0.79%</td>
<td>0.62%</td>
<td>0.61%</td>
</tr>
<tr>
<td>elasticity</td>
<td>0.15</td>
<td>0.11</td>
<td>0.11</td>
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<td>yes</td>
<td>yes</td>
</tr>
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<td>no</td>
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<td>step</td>
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<tr>
<td>outcome mean</td>
<td>3832</td>
<td>3832</td>
<td>3876</td>
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<tr>
<td>observations</td>
<td>1,067</td>
<td>1,067</td>
<td>1,612</td>
</tr>
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<td>$R^2$</td>
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PBD effect elasticity: $\eta_{PBD} = \frac{dy}{y} \frac{dp}{p}$
Considered Labor Market Outcomes

Non-employment duration
- duration from registration at the UI until take-up of job, as measured by positive social security earnings
- (different from entry/exit into/from UI)

Earnings- and employment path after unemployment
1. total generated earnings per month, sum over first six months after unemployment exit
2. decompose into...
   1. earnings while employed (positive earnings), sum over first six months after UE
   2. probability (or proportion) of being employed over the first six months after UE
Non-Employment Duration, Age Threshold 25

Comparison Outcomes

non-employment duration in days, full sample

You can see the graph showing the non-employment duration in days for different age groups and whether they have kids or not. The graph distinguishes between younger individuals without kids, older individuals without kids, younger individuals with kids, and older individuals with kids.
Total Earnings, Age Threshold 25

total employment earnings per mt, avg 6 mt post-ue, full sample

![Graph showing total employment earnings per mt, avg 6 mt post-ue, full sample for different age categories: younger, older, with and without kids.](image-url)
Comparison Outcomes

Earnings while Employed, Age Threshold 25

earnings while employed, per mt, avg 6 mt post-ue, full sample

![Graph showing earnings trends](image_url)
Comparison Outcomes

Employment Stability, Age Threshold 25

probability to be employed, avg 6 mt post-ue, full sample

![Graph showing probability to be employed vs. age at UE entry for different groups: younger, without kids, older, without kids, younger, with kids, older, with kids. The graph indicates an upward trend in probability with increasing age for all groups.](attachment:image.png)
### Effects on Earnings & Durations: Age Threshold 25

<table>
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<th>(4)</th>
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<tbody>
<tr>
<td>DiD income</td>
<td>DiD wage</td>
<td>DiD empl.</td>
<td>DiD duration</td>
<td>DiD dur: Cox</td>
<td></td>
</tr>
<tr>
<td>threshold effect</td>
<td>159.5***</td>
<td>130.2**</td>
<td>0.0002</td>
<td>30.79***</td>
<td>0.193***</td>
</tr>
<tr>
<td>(60.91)</td>
<td>(55.33)</td>
<td>(-0.0083)</td>
<td>(6.479)</td>
<td>(0.0332)</td>
<td></td>
</tr>
<tr>
<td>∆ PBD (in days)</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>200</td>
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<tr>
<td>per month of dP</td>
<td>0.46%</td>
<td>0.35%</td>
<td>0.00%</td>
<td>1.84%</td>
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<td>0.00</td>
<td>0.34</td>
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<td>yes</td>
<td>yes</td>
<td>yes</td>
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<td>24,544</td>
<td>24,544</td>
<td>24,544</td>
<td>31,803</td>
<td>31,803</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.237</td>
<td>0.280</td>
<td>0.030</td>
<td>0.152</td>
<td></td>
</tr>
</tbody>
</table>

Robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; 1 CHF=0.96 USD=0.84 EUR
## Effects on Earnings & Durations: Contribution Threshold

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Income</th>
<th>Wage</th>
<th>Employment</th>
<th>Duration</th>
<th>Duration: Cox</th>
<th>Obs</th>
</tr>
</thead>
<tbody>
<tr>
<td>age 28-35</td>
<td>172.4***</td>
<td>165.1***</td>
<td>0.0047</td>
<td>10.53***</td>
<td>-0.0568***</td>
<td>41,687</td>
</tr>
<tr>
<td></td>
<td>(54.77)</td>
<td>(51.27)</td>
<td>(0.00581)</td>
<td>(1.951)</td>
<td>(0.0109)</td>
<td></td>
</tr>
<tr>
<td>per month of dP</td>
<td>0.71%</td>
<td>0.56%</td>
<td>0.08%</td>
<td>0.76%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>age 35-45</td>
<td>249.2***</td>
<td>208.8***</td>
<td>0.0135**</td>
<td>10.45***</td>
<td>-0.0466***</td>
<td>44,143</td>
</tr>
<tr>
<td></td>
<td>(57.10)</td>
<td>(51.75)</td>
<td>(0.0060)</td>
<td>(1.951)</td>
<td>(0.0112)</td>
<td></td>
</tr>
<tr>
<td>per month of dP</td>
<td>0.82%</td>
<td>0.65%</td>
<td>0.23%</td>
<td>0.65%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>age 45-54</td>
<td>64.75</td>
<td>82.49</td>
<td>0.0025</td>
<td>14.99***</td>
<td>-0.0669***</td>
<td>31,922</td>
</tr>
<tr>
<td></td>
<td>(64.78)</td>
<td>(58.78)</td>
<td>(0.0069)</td>
<td>(2.355)</td>
<td>(0.0137)</td>
<td></td>
</tr>
<tr>
<td>per month of dP</td>
<td>0.21%</td>
<td>0.25%</td>
<td>0.04%</td>
<td>0.86%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Covariates</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td></td>
</tr>
<tr>
<td>Trend</td>
<td>step</td>
<td>step</td>
<td>step</td>
<td>step</td>
<td>step</td>
<td></td>
</tr>
</tbody>
</table>

Robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; 1 CHF=0.96 USD=0.84 EUR
## Comparison: Elasticities w.r.t. Benefit Changes ($P$)

<table>
<thead>
<tr>
<th>age group</th>
<th>reservation earnings</th>
<th>income</th>
<th>earnings wage</th>
<th>earnings employment</th>
<th>non-employment duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>around age 25</td>
<td>0.11</td>
<td>0.08</td>
<td>0.06</td>
<td>0.00</td>
<td>0.34</td>
</tr>
<tr>
<td>age 28-35</td>
<td>0.11</td>
<td>0.13</td>
<td>0.10</td>
<td>0.01</td>
<td>0.14</td>
</tr>
<tr>
<td>age 35-45</td>
<td>0.12</td>
<td>0.15</td>
<td>0.12</td>
<td>0.04</td>
<td>0.12</td>
</tr>
<tr>
<td>age 45-54</td>
<td>0.15</td>
<td>0.04</td>
<td>0.05</td>
<td>0.01</td>
<td>0.16</td>
</tr>
</tbody>
</table>

Elasticities: percentage change in outcome, as a ratio of percentage change in potential benefit duration $P$: \( \eta_{PBD} = \frac{\frac{dy}{y}}{\frac{dp}{p}} \)
## Effects on Expected Earnings

<table>
<thead>
<tr>
<th>outcome</th>
<th>reservation earnings</th>
<th>expected earnings</th>
<th>realized earnings</th>
<th>predictions, rw effect</th>
<th>realized earnings</th>
<th>w effect</th>
<th>reservation earnings</th>
</tr>
</thead>
<tbody>
<tr>
<td>around age 25</td>
<td>0.11</td>
<td>0.10</td>
<td>0.06</td>
<td>0.08</td>
<td>0.08</td>
<td></td>
<td>0.08</td>
</tr>
<tr>
<td>age 28-35</td>
<td>0.11</td>
<td>0.08</td>
<td>0.10</td>
<td>0.07</td>
<td>0.16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>age 35-45</td>
<td>0.12</td>
<td>0.12</td>
<td>0.12</td>
<td>0.08</td>
<td>0.18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>age 45-54</td>
<td>0.15</td>
<td>0.14</td>
<td>0.05</td>
<td>0.10</td>
<td>0.08</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Are Reservation Wage Reactions too High/Low?

Simulation, by age group

- approximate lognormal distribution of wage offers (by information on last wages)
- calculate realized wage effect ($E[w|w > \phi]$), given reservation wage effect
- calculate reservation wage effect, given realized wage effect
- compare predictions to realized effects
## Effects on Expected Earnings

<table>
<thead>
<tr>
<th>outcome</th>
<th>reservation earnings</th>
<th>expected earnings</th>
<th>realized earnings</th>
<th>predictions, rw effect</th>
<th>realized earnings</th>
<th>predictions, w effect</th>
<th>reservation earnings</th>
</tr>
</thead>
<tbody>
<tr>
<td>around age 25</td>
<td>0.11</td>
<td>0.10</td>
<td>0.06</td>
<td>0.08</td>
<td>0.08</td>
<td>0.08</td>
<td></td>
</tr>
<tr>
<td>age 28-35</td>
<td>0.11</td>
<td>0.08</td>
<td>0.10</td>
<td>0.07</td>
<td>0.16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>age 35-45</td>
<td>0.12</td>
<td>0.12</td>
<td>0.12</td>
<td>0.08</td>
<td>0.18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>age 45-54</td>
<td>0.15</td>
<td>0.14</td>
<td>0.05</td>
<td>0.10</td>
<td>0.08</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Reservation Wage Path over (Earlier) Spell

Second observation of reservation earnings 2-3 months after initial meeting

<table>
<thead>
<tr>
<th>FE regression</th>
<th>reservation earnings (CHF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>weeks in UI, up to age 28</td>
<td>0.671 (3.415)</td>
</tr>
<tr>
<td>weeks in UI, age 28-35</td>
<td>-2.264 (5.257)</td>
</tr>
<tr>
<td>weeks in UI, age 28-35</td>
<td>-3.166 (4.856)</td>
</tr>
<tr>
<td>weeks in UI, age 28-35</td>
<td>-4.428 (5.152)</td>
</tr>
<tr>
<td>Constant</td>
<td>4,136*** (15.72)</td>
</tr>
</tbody>
</table>

Observations 10,225

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1; 1 CHF=0.96 USD=0.84 EUR
## Heterogeneity by Past UE Experience

### Past unemployment duration (in previous 3 years)

<table>
<thead>
<tr>
<th></th>
<th>Res'wage</th>
<th>Wage</th>
<th>UE duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>baseline: 0 past ue dur</td>
<td>295.3***</td>
<td>140.5***</td>
<td>16.04***</td>
</tr>
<tr>
<td></td>
<td>(74.10)</td>
<td>(32.62)</td>
<td>(3.098)</td>
</tr>
<tr>
<td>past ue dur, 1st quintile</td>
<td>1.198</td>
<td>7.773</td>
<td>-10.90***</td>
</tr>
<tr>
<td></td>
<td>(132.8)</td>
<td>(32.94)</td>
<td>(3.242)</td>
</tr>
<tr>
<td>past ue dur, 2nd quintile</td>
<td>-400.7***</td>
<td>58.42*</td>
<td>-12.70***</td>
</tr>
<tr>
<td></td>
<td>(132.0)</td>
<td>(30.65)</td>
<td>(3.040)</td>
</tr>
<tr>
<td>past ue dur, 3rd quintile</td>
<td>-225.4**</td>
<td>64.33**</td>
<td>-14.10***</td>
</tr>
<tr>
<td></td>
<td>(109.5)</td>
<td>(29.76)</td>
<td>(2.943)</td>
</tr>
<tr>
<td>past ue dur, 4th quintile</td>
<td>-447.1***</td>
<td>-30.83</td>
<td>-16.49***</td>
</tr>
<tr>
<td></td>
<td>(111.9)</td>
<td>(30.82)</td>
<td>(3.007)</td>
</tr>
</tbody>
</table>

Control Variables: Yes, Yes, Yes

Observations:
- Res'wage: 4,894
- Wage: 141,433
- UE duration: 206,230

R-squared:
- Res'wage: 0.487
- Wage: 0.495
- UE duration: 0.157
### Heterogeneity by Occupation

#### Occupation groups (last job)

<table>
<thead>
<tr>
<th></th>
<th>Res'wage</th>
<th>Wage</th>
<th>UE duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>baseline: blue collar jobs</td>
<td>240.6***</td>
<td>219.5***</td>
<td>10.65***</td>
</tr>
<tr>
<td></td>
<td>(63.25)</td>
<td>(33.71)</td>
<td>(3.455)</td>
</tr>
<tr>
<td>white collar</td>
<td>505.4*</td>
<td>73.96</td>
<td>1.584</td>
</tr>
<tr>
<td></td>
<td>(233.4)</td>
<td>(58.43)</td>
<td>(4.399)</td>
</tr>
<tr>
<td>technicians, engineers</td>
<td>130.6</td>
<td>64.34</td>
<td>-26.34***</td>
</tr>
<tr>
<td></td>
<td>(122.9)</td>
<td>(79.58)</td>
<td>(6.383)</td>
</tr>
<tr>
<td>construction</td>
<td>-98.38</td>
<td>-86.36***</td>
<td>-11.33***</td>
</tr>
<tr>
<td></td>
<td>(82.94)</td>
<td>(28.19)</td>
<td>(3.061)</td>
</tr>
<tr>
<td>sales (incl tourism)</td>
<td>-31.55</td>
<td>-15.01</td>
<td>-4.133</td>
</tr>
<tr>
<td></td>
<td>(125.6)</td>
<td>(38.72)</td>
<td>(3.829)</td>
</tr>
<tr>
<td>low-sk. service (gastronomy, cleaning)</td>
<td>-211.4*</td>
<td>-172.5***</td>
<td>10.34***</td>
</tr>
<tr>
<td></td>
<td>(88.66)</td>
<td>(27.22)</td>
<td>(3.116)</td>
</tr>
<tr>
<td>administration</td>
<td>-339.3</td>
<td>94.07*</td>
<td>-27.96***</td>
</tr>
<tr>
<td></td>
<td>(221.1)</td>
<td>(50.94)</td>
<td>(4.326)</td>
</tr>
<tr>
<td>health &amp; social</td>
<td>-475.7*</td>
<td>-32.47</td>
<td>-20.38***</td>
</tr>
<tr>
<td></td>
<td>(216.2)</td>
<td>(59.78)</td>
<td>(5.553)</td>
</tr>
</tbody>
</table>

Control Variables: Yes, Yes, Yes  
Observations: 4,879, 141,398, 206,178  
R-squared: 0.450, 0.490, 0.155
Conclusion: Preliminary Insights

- Evidence for reservation wage effects
- Reservation wage/selectivity effects seem to matter quantitatively
- Decomposition of earnings effect of UI: both dimensions – duration and reservation wages – are economically relevant
  \[\Rightarrow\] trade-off decision for policy makers

- Age heterogeneity
  - ...in relative weight of reservation wage-, earnings- and duration effects
  - PBD effect on reservation wages increases (up to age 50)

- Drivers of reservation wage effects
  - Past unemployment experience
  - Skills, occupations, demand (offers)
  - Stringency/pressure of caseworker policy
  - (No impact of language region)
Appendix

Expectations and Reservation Wage Effects

- Expectations on $E(\tilde{w})$ could affect reservation wage reaction
  - through direct effect of $E(\tilde{w})$
  - through adaptation of willingness to compromise
- Construction of bias in wage expectations, based on survey item and register
- Bias of the form $E(\tilde{w}) - E(\hat{w}|t_u)$
- Estimated/predicted based on neighboring cantons and non-participants in survey (register data)

Result: reservation wage effects by optimists/realists/pessimists

<table>
<thead>
<tr>
<th>Age</th>
<th>Pessimist effect relative to realist</th>
<th>Optimist</th>
</tr>
</thead>
<tbody>
<tr>
<td>28-35</td>
<td>++</td>
<td>+</td>
</tr>
<tr>
<td>35-45</td>
<td>- -</td>
<td>-</td>
</tr>
<tr>
<td>45-54</td>
<td>++</td>
<td>-</td>
</tr>
</tbody>
</table>
Expectations and Reservation Wage Effects

- Expectations on $E(\tilde{w})$ could affect reservation wage reaction
  - through direct effect of $E(\tilde{w})$
  - through adaptation of willingness to compromise
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Result: reservation wage effects by optimists/realists/pessimists

<table>
<thead>
<tr>
<th>age</th>
<th>pessimist effect relative to realist</th>
<th>optimist</th>
<th>pessimist</th>
<th>optimist</th>
</tr>
</thead>
<tbody>
<tr>
<td>28-35</td>
<td>++</td>
<td>+</td>
<td>--</td>
<td>-</td>
</tr>
<tr>
<td>35-45</td>
<td>-</td>
<td>-</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>45-54</td>
<td>++</td>
<td>-</td>
<td>--</td>
<td></td>
</tr>
</tbody>
</table>
In tendency, older job seekers earn more

More variation in wages; potentially more influence

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>mean</th>
<th>s.d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>25-30</td>
<td>18287</td>
<td>4018.9</td>
<td>1305.8</td>
</tr>
<tr>
<td>30-35</td>
<td>16519</td>
<td>4689.0</td>
<td>1714.5</td>
</tr>
<tr>
<td>35-40</td>
<td>13300</td>
<td>4928.1</td>
<td>2017.8</td>
</tr>
<tr>
<td>40-45</td>
<td>12036</td>
<td>5045.3</td>
<td>2137.3</td>
</tr>
<tr>
<td>45-50</td>
<td>11670</td>
<td>5228.7</td>
<td>2185.2</td>
</tr>
<tr>
<td>50-55</td>
<td>9094</td>
<td>5192.4</td>
<td>2134.0</td>
</tr>
</tbody>
</table>
Determinants of Reservation Wage Effects?

Heterogeneity by past earnings (benefit level)

- 3 levels, split at p33 and p66
- low: significantly negative effect; mid: stat. zero (sign +); high: significantly positive effect
Determinants of Reservation Wage Effects? 2

Heterogeneity by education level

- 3 levels: compulsory / vocational / tertiary
- the higher the education level, the higher the r.w. effect
Decomposing Effects of UI

According to Schmieder et al. (2015) formula

\[
\frac{dE[w^e(t; P)]}{dP} = \left[ \frac{\partial w^e}{\partial \phi} \frac{\partial \phi}{\partial P} \right] + \left[ \frac{\partial w^e}{\partial \phi} \frac{\partial \phi}{\partial t} + \frac{\partial w^e}{\partial \mu} \frac{\partial \mu}{\partial t} \right] dD \frac{dP}{dD}
\]

For young job seekers, in earnings (CHF) per month:

<table>
<thead>
<tr>
<th>earnings effect</th>
<th>res’wage effect</th>
<th>duration effect</th>
<th>n-e on wage effect</th>
<th>( \frac{dD}{dP} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.13</td>
<td>18.30</td>
<td>0.772</td>
<td>23.71</td>
<td>-4.18</td>
</tr>
</tbody>
</table>

- Calculation of \( \frac{\partial w^e}{\partial \phi} \): reservation earnings are predicted into earnings sample; then regression of realized earnings on predicted \( \phi \) and covariates (per age group)
- \( \frac{\partial \phi}{\partial t} \): is set to zero, following Krueger et al. (2016)
Decomposing Effects of UI

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\]

For young job seekers, in earnings (CHF) per month:

<table>
<thead>
<tr>
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<td>23.71</td>
<td>-4.18</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-37.87</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.110</td>
</tr>
</tbody>
</table>

- Calculation of \( \frac{\partial w^e}{\partial \phi} \): reservation earnings are predicted into earnings sample; then regression of realized earnings on predicted \( \phi \) and covariates (per age group)
- \( \frac{\partial \phi}{\partial t} \): is set to zero, following Krueger et al. (2016)
Next Steps

- Decomposition of effects by job offer arrival rate versus job acceptance rate
  \[ \theta = \lambda [1 - F(\phi)] \]

- Model the joint distribution of \( t \) and \( w \) as (following Eckstein & Van den Berg 2007)
  \[ Pr(t, w) = g(t)f(w|w > \phi) = (1 - F(\phi))e^{-\lambda(1-F(\phi))t} \lambda \frac{f(w)}{(1 - F(\phi))} \]

- Assuming that \( \phi \) is result of optimization, we can plug in

- Express treatment effect as function of job offer arrival and job acceptance rate, respectively

- Direct link of reservation wage- and linked dataset
Next Steps

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\]

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  \[
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  \]

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