Working to get fired?
Regression discontinuity effects of unemployment benefit eligibility on prior employment duration

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Outline

1. Introduction
2. Institutional background
3. Data
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Introduction

Motivation

Unemployment benefits (UBs): important labour market institution with multiple potential effects

- Income insurance, aggregate demand support, improved matches
- Moral hazard, longer unemployment spells, human capital erosion, lower employment from UI taxes
- Net effects probably depend on UB design (replacement ratios, etc) and activation practices
Motivation

This paper: evaluation of the effect of UB eligibility on the duration of employment spells *prior to unemployment*

- As soon as eligibility is met, unemployment outside option can be very attractive
- This will depend on several factors: replacement ratio, UB max duration, activation
- Implications in terms of firm performance, job duration, segmentation (job quality)
- Moral hazard of UBs both in unemployment and employment

New, replicable and intuitive approach (RDD), examining important, relatively ignored margin (empl to unempl transitions), using comprehensive administrative data
Eligibility: 'No employment or contribution requirements' (value 0.5), '1-10 months' (1), '11-13 months' (1.5), '14-24' (2), and 'More than 24 months' (2.5). Sanctions (quits): '0-4 weeks' (incl benefit reductions, value 0.5), '5-9 weeks' (1), '10-14 weeks' (1.5), 'More than 14 weeks' (2), and 'Ineligible' (2.5) [Venn, 2012]
Canada: working 10 weeks over previous year
France: 4 months over previous 28 (36 if 50+)
Germany, Italy, Japan, Portugal: 12 months over previous 24
Netherlands: 26 weeks over previous 36 weeks
Poland: 12 months over previous 18
UK: 6 months over previous two years
US: 6 months over previous year

Interrupted employment will be included considered
Theoretical remarks

- Firm-specific human capital
- Asymmetric information
- Layoffs, quits from shocks to productivity, reservation wages: continuous over employment spells
- Spikes at eligibility denote (employer and or employee) moral hazard
Significant increases in the employment hazard when the eligibility requirement is met:

- Canada (short UB eligibility requirement): Christofides and McKenna (JoLE 1996), Green and Riddell (EJ 1997), Baker and Rea (REStat 1998), Green and Sargent (CJE 1998)
- US: Jurajda (Jnl Electrics 2002)
- Spain: Rebollo-Sanz (LabEc 2012)
Institutional background

Labour market institutions in Portugal, 2005-2011

- Protected permanent contracts, flexible FTCs
  - Max duration of FTCs: 36 months (18 or 24 in some cases)
- Low levels of PES activation
- High tax wedges, no experience rating
- High (general and job-specific) minimum wages (extensions of collective agreements)
- Very differentiated UBs

Institutional setup that tends to promote segmentation (permanent vs temporary or informal workers), slow adjustment to shocks (esp in low inflation), long-term unemployment, and (possibly) low productivity
New law that came into force in Jan 2007 (DL 220/2006)

- Eligibility of 450 days of work over previous 24 months
  - Previous law (2003-2006): 270 days over the previous 12 months
  - Subsequent law (April 2012-): 360 days over previous 24 months
- Eligibility restricted to involuntary dismissals (incl non-renewal of fixed-term contracts) and mutually agreed terminations
- Conditionality on registration with PES, jobsearch and agreement to ALMPs
Unemployment benefits in Portugal, 2005-2011

- Replacement ratio from less than 65% (earnings above 4.6 MW) to 100% (less than 1.5 MW)
- UB duration from 9 months (unemployed of age 29 or younger who worked 2 years or less) to 38 months (age 45 or older who worked 20 years or more)
- Means-tested UB (MW or 80% of MW) for unemployed who worked 180 days or more over previous 12 months and with household income per capita below 80% of MW
Social security data set:

- Monthly records of employment and UBs from January 2005 up to March 2012
- All social-security related observations of a given 1% stratified random sample of individuals with social-security records over the period
- Over 9m individual-month observations; approximately 100k different individuals per month
- Variables: individual’s identifier, gender, date of birth, nationality, region of birth and residence, monthly earnings and contributions made by employers and employees, UBs, days of work, firm’s identifier and location
In a given month, an individual is defined to be...

- ... in empl. if there are at least one day of work contributions in that month
- ... in subsidised unempl. if there is a positive level of UBs and no empl. contributions
- ... in non-subsidised unempl. if the individual has no record of empl. contributions nor UBs
From the variables above, we create transitions from E to subsidised U, from E to non-subsidised U (and from E to U)

- We account for cases when the UBs are not paid immediately after the end of employment considering a two-month window:
  - Eg, the E to subsidised U dummy is one for individual $i$ in month $t$ if that $i$ is E in $t$ and receives UBs in either $t + 1$ or $t + 2$

Same information as the social security agency when UBs are processed, including previous E periods and salaries (unlike literature)
Definitions (3/3)

- Running variable: number of days worked over the previous 24 months (the UBs eligibility time window)
  - The period of reference will be different for each person over time (it moves by one month every month)
- Indicator if the previous 15 months include months without employment (eg 9E+5U+6E vs 9U+15E)
- Proxy for the replacement ratio (ratio between the highest unemployment benefit and mean salary)
Sample

- Use initially data from 2005:m1 to 2012:m3 to compute variables
- Main analysis on period 2007:m1 to 2011:m12
- Employed individuals aged 18-60
- Between 180 and 720 days of work over the previous two years
## Descriptive statistics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>StDev</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>.522</td>
<td>.499</td>
</tr>
<tr>
<td>Age</td>
<td>34.77</td>
<td>10.12</td>
</tr>
<tr>
<td>Foreigner</td>
<td>.096</td>
<td>.294</td>
</tr>
<tr>
<td>Salary</td>
<td>671.6</td>
<td>533.6</td>
</tr>
<tr>
<td>Mean (24-month) salary</td>
<td>476.4</td>
<td>338.3</td>
</tr>
<tr>
<td>Days worked</td>
<td>485.8</td>
<td>98.08</td>
</tr>
<tr>
<td>Mean unemployment benefits</td>
<td>288.3</td>
<td>397.4</td>
</tr>
<tr>
<td>Replacement ratio</td>
<td>.662</td>
<td>.861</td>
</tr>
<tr>
<td>Month number</td>
<td>53.41</td>
<td>17.07</td>
</tr>
<tr>
<td>Month of duration</td>
<td>15.75</td>
<td>3.23</td>
</tr>
<tr>
<td>Employment spells of 15 months or more</td>
<td>.636</td>
<td>.480</td>
</tr>
<tr>
<td>Discontinuous spells</td>
<td>.355</td>
<td>.478</td>
</tr>
<tr>
<td>Transition prob. (from empl.) to...</td>
<td></td>
<td></td>
</tr>
<tr>
<td>... unempl.</td>
<td>.041</td>
<td>.199</td>
</tr>
<tr>
<td>... subsidised unempl.</td>
<td>.021</td>
<td>.144</td>
</tr>
<tr>
<td>... non-subsidised unempl.</td>
<td>.020</td>
<td>.140</td>
</tr>
</tbody>
</table>

Obs: 976,034 (only about 10th to 20th month of continuous or interrupted duration); individuals: 119,560.
**RDD equation**

\[ T_{it} = \alpha + \beta D_{it} + S(\tilde{Z}_{it}) + \epsilon_{it}, \]  

1. \( T_{it} \) is a dummy variable that denotes for the transition to unemployment (all types, subsidised or non-subsidised unemployment).
2. \( D_{it} \) is a dummy variable equal to one if the employment spell is ongoing for 15 months or more.
3. \( S(\tilde{Z}_{it}) \) is a polynomial of the (centered) running variable (the month of the employment spell).
4. Benchmark specification: the (centered) running variable and the interaction of the (centered) running variable and the threshold dummy variable.
Unemployment probabilities, by empl. duration

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Unemployment benefit eligibility

19 November 2015
Subsidised unemployment probabilities, by employment duration
Results

Non-subsidised unemployment probabilities, by employment duration

Employment duration

Non-subsidised unemployment prob.
**Main results**

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Coeff</th>
<th>t-ratio</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transition to unemployment</td>
<td>.0047</td>
<td>5.13</td>
<td>0.000</td>
</tr>
<tr>
<td>Transition to subsidised unemployment</td>
<td>.0048</td>
<td>7.23</td>
<td>0.000</td>
</tr>
<tr>
<td>Transition to non-subsidised unemployment</td>
<td>-.0001</td>
<td>-0.16</td>
<td>0.873</td>
</tr>
</tbody>
</table>

No. of obs: 976,034. Linear splines.
## Alternative specifications

### Transitions to unemployment

<table>
<thead>
<tr>
<th>Specification</th>
<th>Coefficient</th>
<th>t-ratio</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linear</td>
<td>.0065</td>
<td>7.81</td>
<td>0.000</td>
</tr>
<tr>
<td>Quadratic</td>
<td>.0044</td>
<td>5.03</td>
<td>0.000</td>
</tr>
<tr>
<td>Quadratic spline</td>
<td>.0106</td>
<td>6.23</td>
<td>0.000</td>
</tr>
</tbody>
</table>

### Transitions to subsidised unemployment

<table>
<thead>
<tr>
<th>Specification</th>
<th>Coefficient</th>
<th>t-ratio</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linear</td>
<td>.0074</td>
<td>12.20</td>
<td>0.000</td>
</tr>
<tr>
<td>Quadratic</td>
<td>.0049</td>
<td>7.71</td>
<td>0.000</td>
</tr>
<tr>
<td>Quadratic spline</td>
<td>.0069</td>
<td>5.63</td>
<td>0.000</td>
</tr>
</tbody>
</table>

### Transitions to non-subsidised unemployment

<table>
<thead>
<tr>
<th>Specification</th>
<th>Coefficient</th>
<th>t-ratio</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linear</td>
<td>-.0008</td>
<td>-1.47</td>
<td>0.141</td>
</tr>
<tr>
<td>Quadratic</td>
<td>-.0004</td>
<td>-0.79</td>
<td>0.427</td>
</tr>
<tr>
<td>Quadratic spline</td>
<td>.0036</td>
<td>3.05</td>
<td>0.002</td>
</tr>
</tbody>
</table>
Results

Sample averages, different variables, by empl. duration

1. Female ratio
2. Mean age
3. Mean replacement ratio
4. Spell hole ratio

P Martins (QMUL) Unemployment benefit eligibility 19 November 2015
Sample averages, different variables, by emp. duration II
## Robustness checks (transitions to unemployment)

<table>
<thead>
<tr>
<th>Subsamples</th>
<th>Coefficient</th>
<th>t-ratio</th>
<th>p-value</th>
<th>observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Women</td>
<td>0.0044</td>
<td>3.51</td>
<td>0.000</td>
<td>510,332</td>
</tr>
<tr>
<td>Age below 30</td>
<td>0.0053</td>
<td>3.81</td>
<td>0.000</td>
<td>393,445</td>
</tr>
<tr>
<td>Period starting in 2009:m1</td>
<td>0.0059</td>
<td>4.71</td>
<td>0.000</td>
<td>559,784</td>
</tr>
<tr>
<td>Replacement ratio above 75%</td>
<td>0.0056</td>
<td>3.78</td>
<td>0.000</td>
<td>421,766</td>
</tr>
<tr>
<td>Interrupted employment spells</td>
<td>0.0104</td>
<td>6.50</td>
<td>0.000</td>
<td>347,161</td>
</tr>
</tbody>
</table>

Results
Conclusions (1/2)

- Evaluation of the impact of U eligibility on the duration of jobs prior to unemployment, using RDD
- Longitudinal social security data from Portugal, where the unemployed are required to work a relatively long period of time (in contrast with Canada)
- Monthly transitions from E to U increase by at least 10% as soon as the eligibility condition is met
- The results are driven entirely by transitions to subsidised U
The increase in transitions from E to (subsidised) U is even higher for individuals:
- subject to high replacement ratios
- who meet eligibility from multiple employment spells

Moral hazard in UBs: not only inefficiently increasing the duration of unemployment, also inefficiently reducing employment spells

Important evidence regarding optimal UB design
Future research

- Role of eligibility in the incentives to both formal work (when informal work is an alternative) and longer short jobs (so to meet UB eligibility)
- Bargaining between employers and employees to label separations as involuntary when this is a UB requirement
- Additional role of the replacement ratio
Considerable potential from more intensive activation of the unemployed that responded to the eligibility threshold

- Especially those that benefit from higher replacement ratios or that become unemployed following non-continuous employment spells
- Public dissemination of these targeted activation practices may also be relevant

Rethinking of optimal threshold for eligibility

- If the exogenous end of job matches (due to eligibility) is more costly at longer employment durations (firm-specific human capital), then lower eligibility thresholds (1 month?) may improve welfare
Conclusions

Policy implications (2/2)

- UB non-provision for voluntary separations may be circumvented in practice (perhaps at a cost in terms of firm performance): optimal UB sanction applicable in voluntary separations may involve a delay in UB provision rather than ineligibility.

- European debate on labour market segmentation, regarded as being driven essentially by labour demand: labour supply dimension potentially relevant too.