# Unemployment Insurance and Reservation Wages
## Evidence from Administrative Data

Thomas Le Barbanchon (Bocconi University, CEPR and IGIER)
Roland Rathelot (Warwick University and CEPR)
Alexandra Roulet (Harvard University)

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# Motivation

- Reservation wage: key concept of job search models

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- Very few **direct** empirical evidence on its main determinants, esp. unemployment insurance
    - Feldstein and Poterba (1984), Kruger and Mueller (2016), Koenig, Manning and Petrongolo (2016)

# Our paper

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  - At the beginning of their claim, job-seekers state their reservation wage, their desired hours worked, commuting time and type of jobs (temporary/permanent)

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- 2 identification strategies:
  - Difference-in-difference leveraging a French UI reform
  - Regression discontinuity based on an age-threshold (50 years)

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- 2 identification strategies:
  - Difference-in-difference leveraging a French UI reform
  - Regression discontinuity based on an age-threshold (50 years)

- Comparison of elasticity estimates with predictions of a canonical non-stationary job search model

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5. Calibrated job search model with endogenous search effort predicts elasticities of reservation wage around 0.03

# Website of the Public Employment Service at registration



**Métier recherché**

Recherche par ⦿ **Mots-clés** ◯ **Code Rome**

Les métiers que vous recherchez [                    ] **Rechercher**
(2 métiers maximum)

Quel salaire minimum brut demandez-vous ? [0] € [        ▼]

Souhaitez-vous créer ou reprendre une entreprise ? ◯ **Oui** ⦿ **Non**

Acceptez-vous de travailler avec des horaires ◯ **Oui** ⦿ **Non**
décalés (week-end, nuit, horaires postés) ?

# Institutions

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  - truthful declaration

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  - truthful declaration

- Controlling/monitoring search effort: compare **posted wage** of vacancies to **past wage** (not reservation wage)

# Distribution of reservation wages over past wages
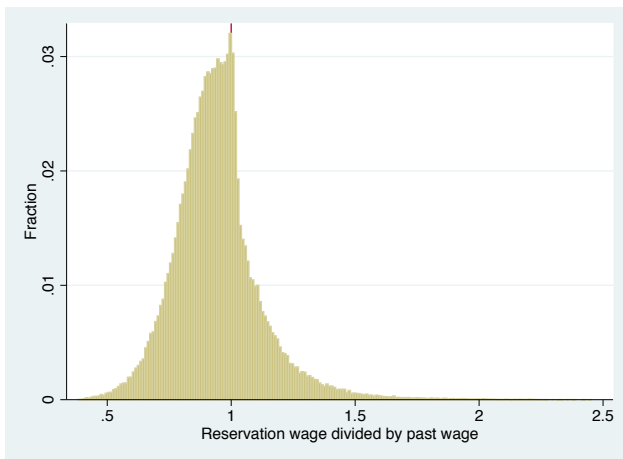


70% of job-seekers accept a wage-cut

Median of reservation wage rate (over past wage): 0.93 ⤏ Details

Table: Socio-demographic determinants of reservation wages

|  | Monthly reservation wage (in €) | |
|  | Log | Ratio / past wage |
| --- | --- | --- |
| Dummies for 20 equal sized bins of past wage | x | x |
| Female | -0.0282*** | -0.0289*** |
|  | (0.000919) | (0.000904) |
| Married × female | -0.0131*** | -0.0129*** |
|  | (0.00112) | (0.00107) |
| Married × male | 0.0227*** | 0.0220*** |
|  | (0.00112) | (0.00111) |
| Age | 0.00138*** | 0.00148*** |
|  | (5.64e-05) | (5.53e-05) |
| Experience (in years) | 0.00494*** | 0.00456*** |
|  | (9.34e-05) | (9.16e-05) |
| Education (in years) | 0.0149*** | 0.0141*** |
|  | (0.000136) | (0.000138) |
| Obs. | 180,637 | 180,637 |
| R-squared | 0.454 | 0.237 |

Table: Unemployment duration and reservation wage

|  | Log actual benefit duration | |
|---|---|---|
|  | (1) | (2) |
| Log reservation wage | -0.155*** | 0.277*** |
|  | (0.0149) | (0.0337) |
| Time FE | yes | yes |
| Indiv. Controls | yes | yes |
| Indiv. FE | no | yes |
| Obs. | 180,637 | 180,637 |
| R-squared | 0.063 | 0.091 |

# 2009 reform in France: simplification of UI rules



Potential benefit duration schedule

Reservation wage

Actual duration of benefits
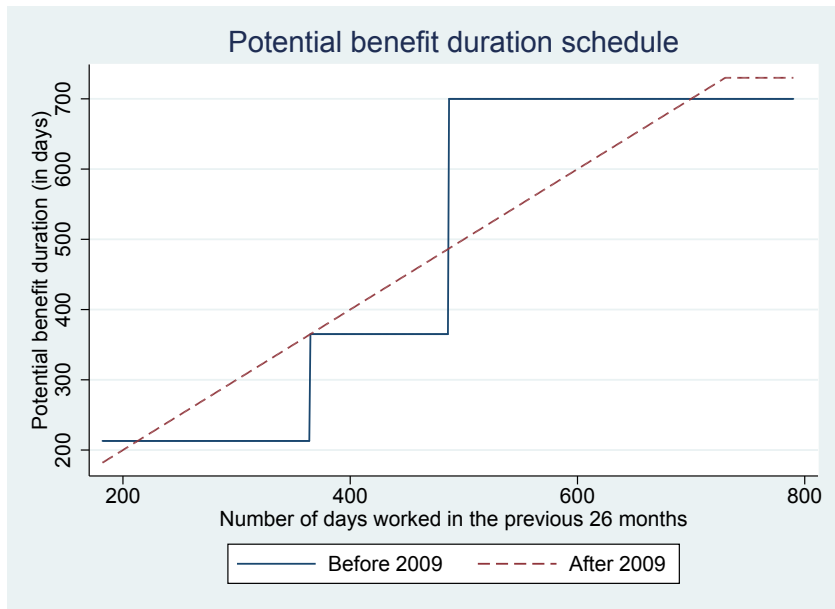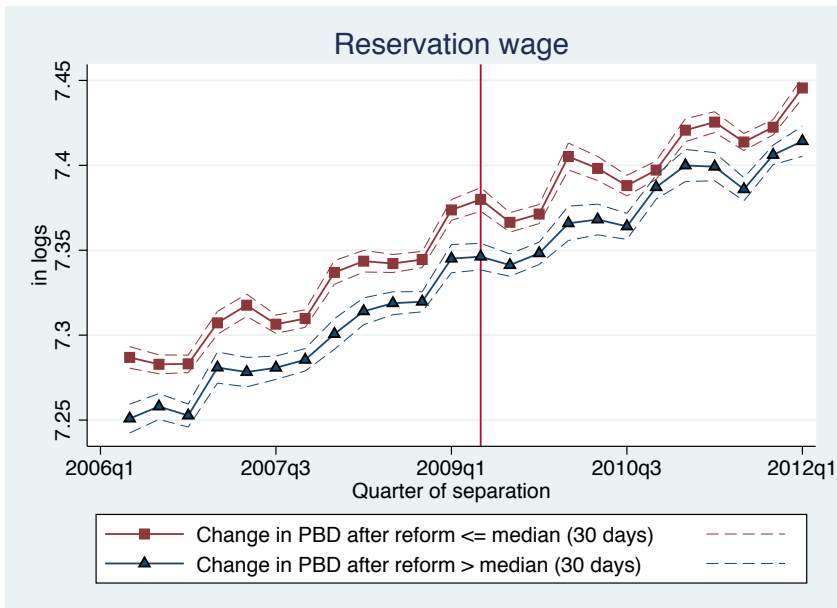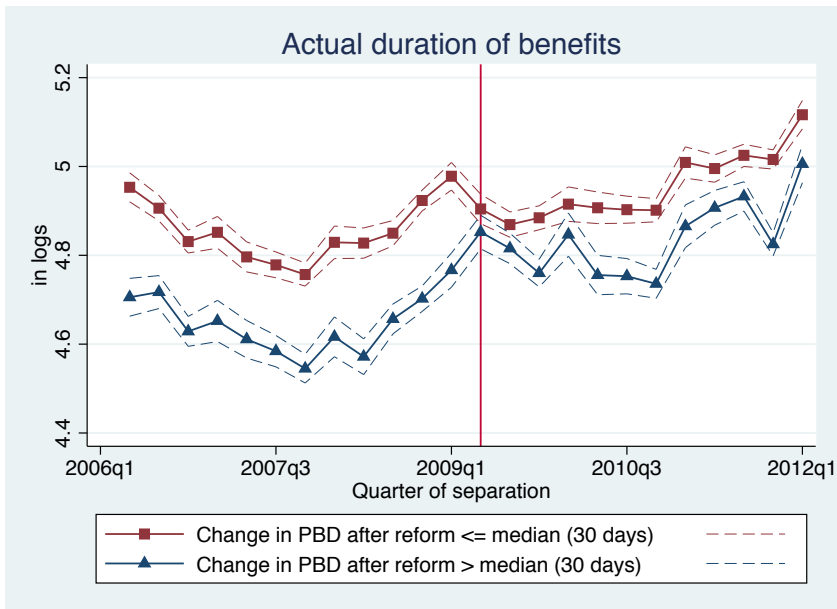
# Econometric model

$$\log Y_{i,n} = Indiv.F.E._i + \alpha \log PBD_{i,n} + \sum_{\substack{j=6 \\ \text{excl.7,12,23}}}^{26} \delta_j D(Tenure_{i,n} = j)$$

$$+ \gamma X_{i,n} + Year \times QuarterF.E. + \epsilon_{i,n}$$

where $D(Tenure_{i,n} = j)$ indicates whether the past tenure of individual $i$ before her $n$th claim is $j$ months

$\rightarrow$ we instrument $PBD$ by the set of tenure group dummies interacted with the reform dummy $After_{i,n}$

Table: Elasticity of the reservation wage and benefit duration with respect to PBD

|  | OLS (1) | IV (2) | FE (3) | FE,IV (4) |
|---|---|---|---|---|
|  | Log of reservation wage | | | |
| $\log$ PBD | 0.000954 | 0.00473 | -0.000132 | -0.000535 |
|  | (0.00854) | (0.00691) | (0.00310) | (0.00318) |
| Obs. | 180,637 | 180,637 | 180,637 | 180,637 |
| R-squared | 0.474 | 0.474 | 0.340 |  |
|  | Log of actual benefit duration | | | |
| $\log$ PBD | 0.227*** | 0.232*** | 0.314*** | 0.306*** |
|  | (0.0274) | (0.0257) | (0.0317) | (0.0325) |
| Obs. | 180,637 | 180,637 | 180,637 | 180,637 |
| R-squared | 0.062 | 0.062 | 0.095 |  |
| Indiv. FE | no | no | yes | yes |

Standard errors clustered by monthly tenure group in Col (1) and (2) ▸ Placebos

Table: Heterogeneity analysis

|  | Tenure | |
|  | Low tenure | High tenure |
|  | (1) | (2) |
| --- | --- | --- |
|  | Log of Reservation wage | |
| log PBD | 0.00964** | -0.00272 |
|  | (0.00379) | (0.00557) |
|  | Log of Actual Benefit duration | |
| log PBD | 0.514*** | 0.202*** |
|  | (0.0399) | (0.0558) |
| Obs. | 90,364 | 90,273 |
| Indiv. F.E. | yes | yes |

Low tenure: below the median tenure (13 months)  ⟿ Other dimensions

# Regression Discontinuity Design: jump in potential benefit duration at age 50
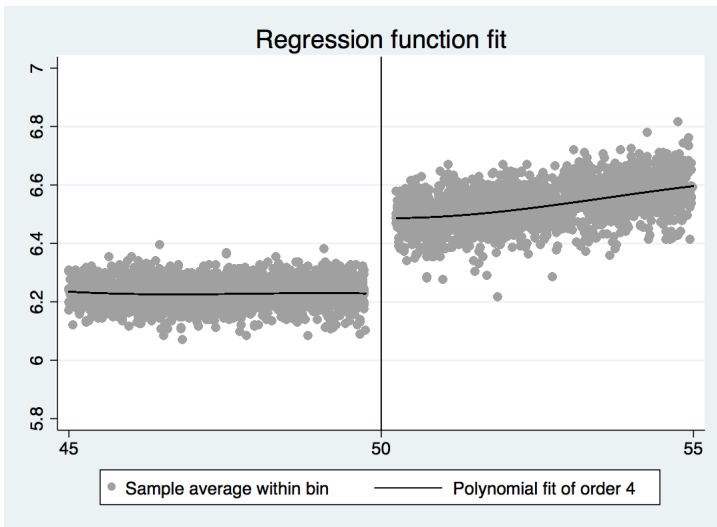
# Regression Discontinuity Design: density around the cutoff
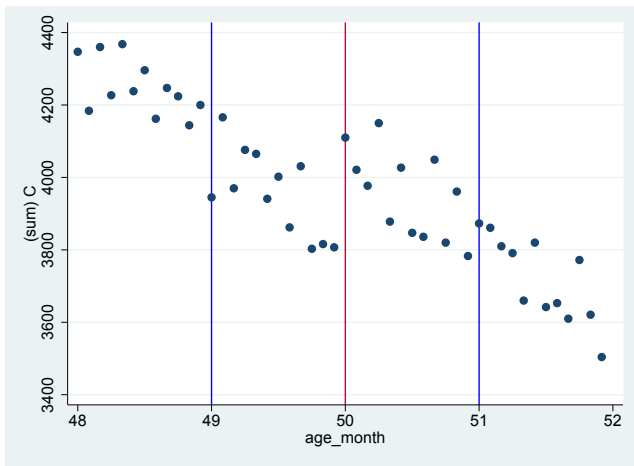
# Regression Discontinuity Design: log of reservation wage



Regression function fit
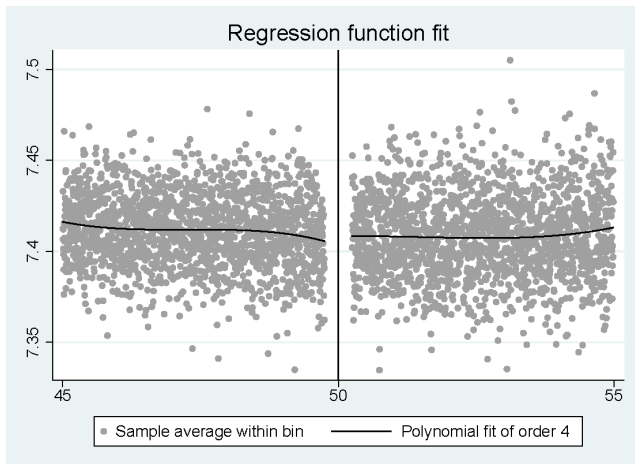
# Regression Discontinuity Design: log of actual benefit duration



Regression function fit

Sample average within bin — Polynomial fit of order 4
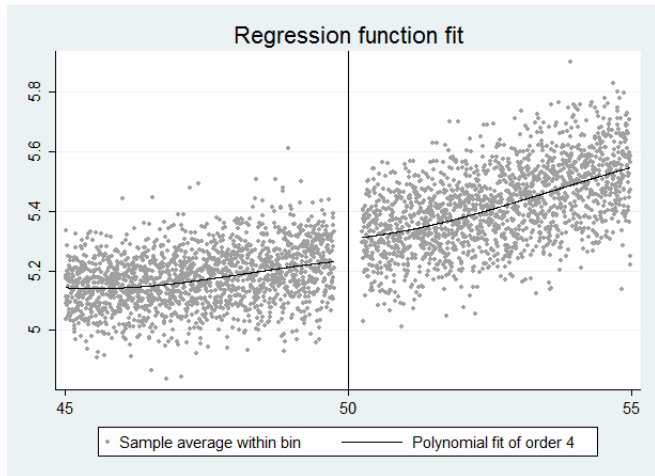
Table: RDD estimates of elasticities wrt PBD

| Age excluded | (1) $[49.9, 50.1]$ | (2) $[49.75, 50.25]$ | (3) $[49.5, 50.5]$ |
|---|---|---|---|
| | Log of Reservation wage | | |
| log PBD | 0.0116 | 0.0172 | 0.00457 |
| | (0.0149) | (0.0162) | (0.0141) |
| | Log of Actual benefit duration | | |
| log PBD | 0.211*** | 0.242*** | 0.175** |
| | (0.0786) | (0.0669) | (0.0692) |
| Obs. | 470,082 | 456,280 | 432,431 |

# Non-stationary job search model with endogenous search effort

- Job-seekers draw benefits until $T$, then on welfare
- Stationary job offer distribution $F(.)$ (logarithmic)

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- Job-seekers draw benefits until $T$, then on welfare
- Stationary job offer distribution $F(.)$ (logarithmic)
- Intertemporal value of unemployment $U_t$ writes:

$$\rho U_t = u(vb_t) - c(e_t) + e_t \int_{\phi_t}^{\infty} [W(w) - U_t] dF(w) + \dot{U}_t$$

- $u(.)$ log utility and $v$ depreciation associated to non-pecuniary aspects of unemployment
- $c(.)$ quadratic cost of effort that delivers job offers at rate $e$

    $\rightarrow \phi_t$ is the reservation wage

# Calibration of the job search model

- Calibrate according to the behavior of our DiD sample

- 2 targets:
  1. average unemployment duration: 6 months (PBD=12 months)
  2. elasticity of unemployment duration to PBD: 0.33

- Other parameters set at institutional values (replacement rates) or consensus estimates (discount rate)

  $\rightarrow$ Simulation of the model

# Theoretical predictions: Evolution of the elasticities of the reservation wage along the unemployment spell
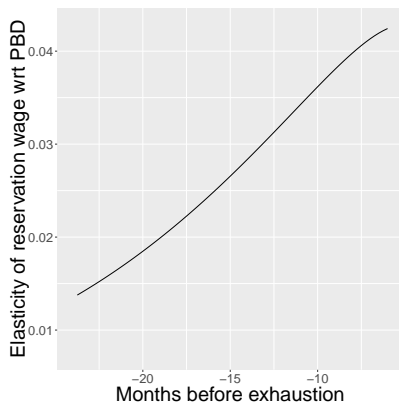


95% CI around point estimates rule out:
→ average elasticity above 0.006
→ elasticity for low tenure group above 0.017

# Conclusion

- Reservation wages at the beginning of the job search spell do not respond to UI generosity, while U duration does

- Results suggest that UI is too generous in France
  - Shimer and Werning (2007)

- Effect of UI on accepted wages?
  - Card et al (2007), Schmieder et al (2012), Nekoei and Weber (2014)

- Lack of responsiveness at odds with standard job search theory: Further explorations?
  1. Reference-dependence: Koenig et al (2016), Della Vigna et al (2016)
  2. Over-optimistic job seekers: Spinnewijn (2015)

# Contributions

1. Precise quasi-experimental evidence of the UI effect on reservation wages
   - Feldstein and Poterba (1984), Kruger and Mueller (2016), Koenig, Manning and Petrongolo (2016)

2. Results suggest that UI is too generous in France
   - Shimer and Werning (2007)

3. Effect of UI on accepted wages?
   - Card et al (2007), Schmieder et al (2012), Nekoei and Weber (2014)

Table: Summary statistics

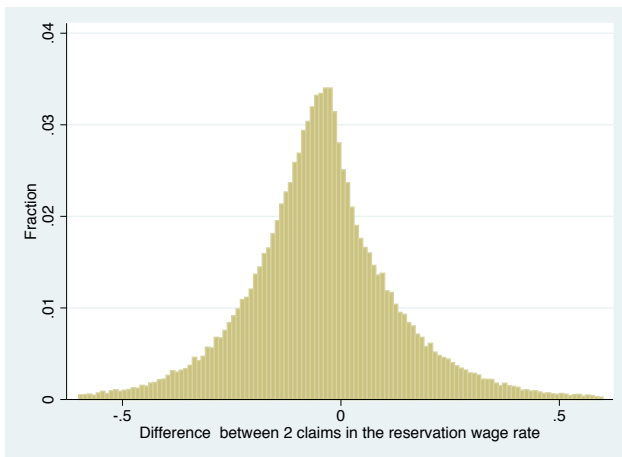| Variable | Mean | Std. Dev. |
|---|---|---|
| Male | 0.599 | 0.49 |
| Foreign born | 0.111 | 0.314 |
| Age | 31.301 | 7.873 |
| Married | 0.353 | 0.478 |
| Divorced | 0.068 | 0.252 |
| Has a child | 0.363 | 0.481 |
| Education (in years) | 11.59 | 3.272 |
| Occupational Experience (in years) | 4.628 | 5.149 |
| Past Contract is long-term | 0.353 | 0.478 |
| Sum of past tenures over the last 2 years (in days) | 427.708 | 218.351 |
| Past tenure at last employer (in days) | 393.648 | 573.158 |
| Potential Benefit Duration (in days) | 413.156 | 208.855 |
| Actual Benefit Duration (in days) | 192.403 | 163.184 |
| Past Monthly Wage (gross, in euros) | 1721.631 | 388.383 |

# Distribution of nominal monthly reservation wages



Note: Vertical line is minimum wage level in 2009.
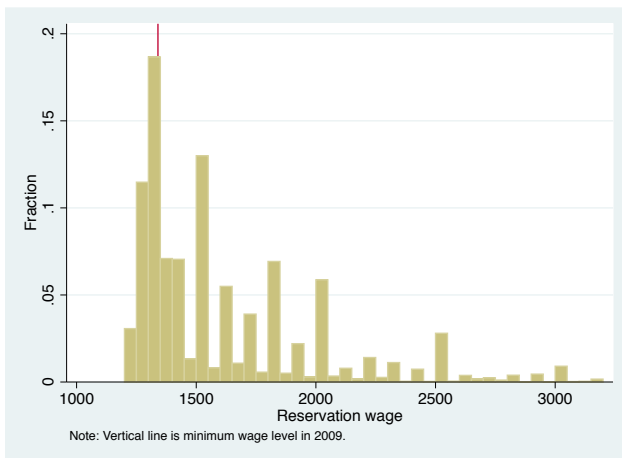
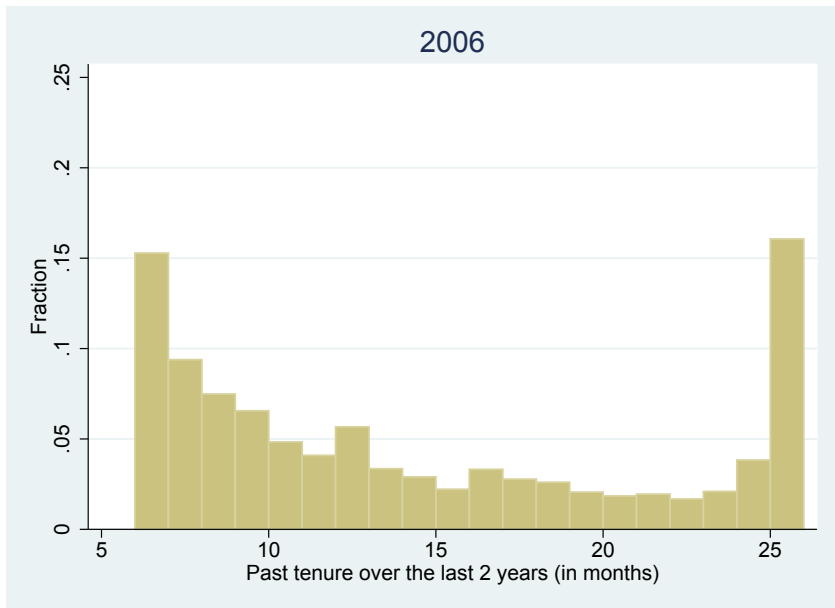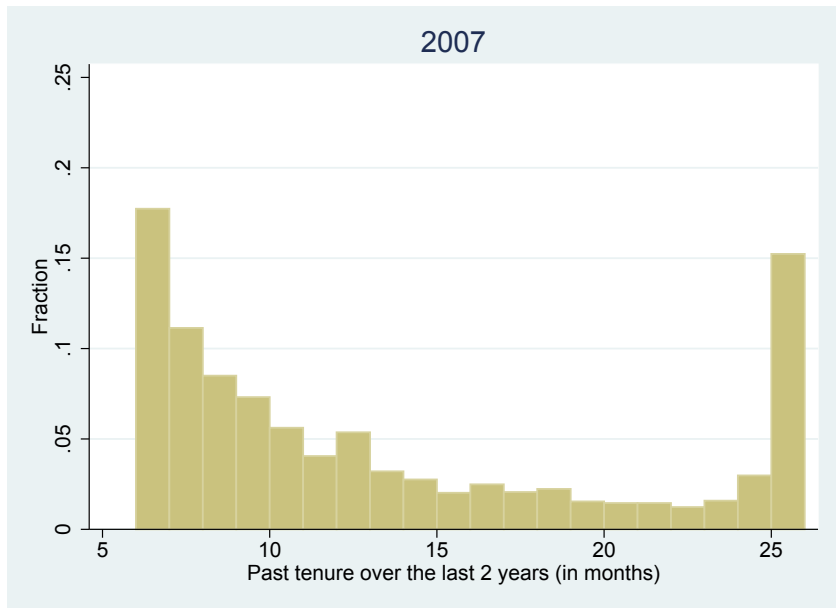# Distribution of reservation wages over minimum wage
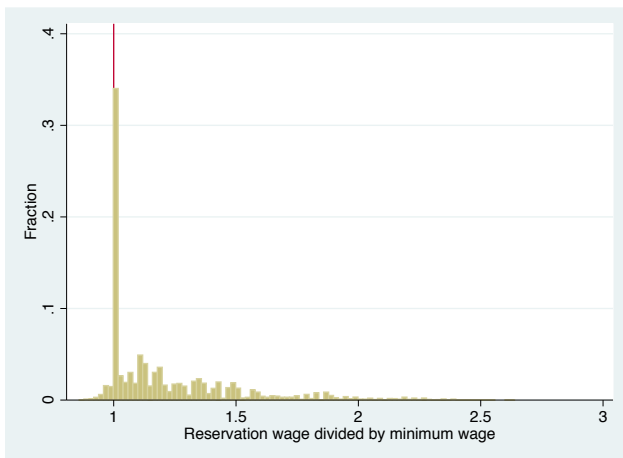
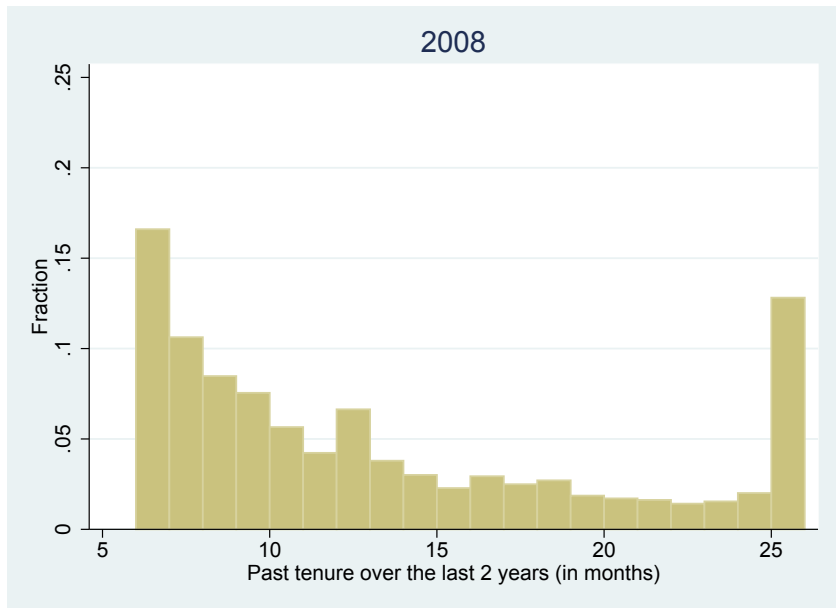# Distribution of change in reservation wage rates (over past wages) across claims
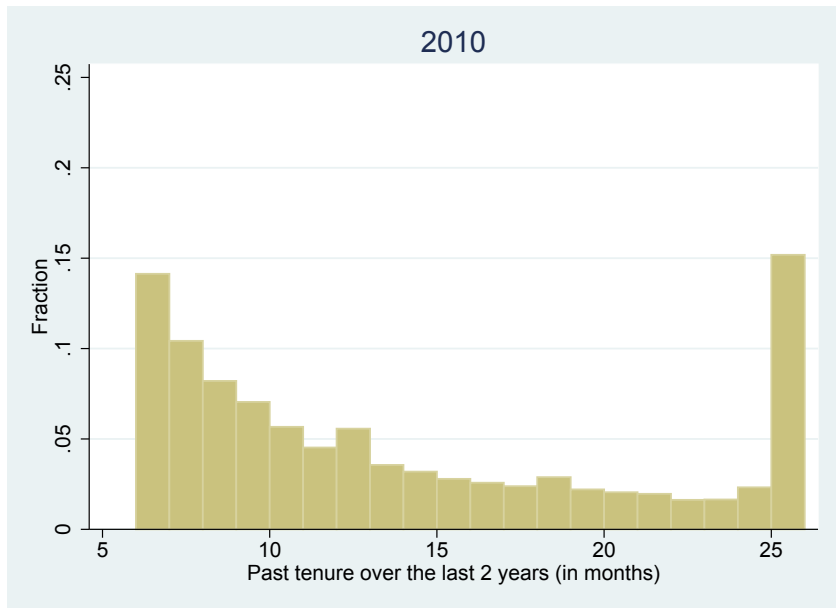
# Other dimensions of job selectivity

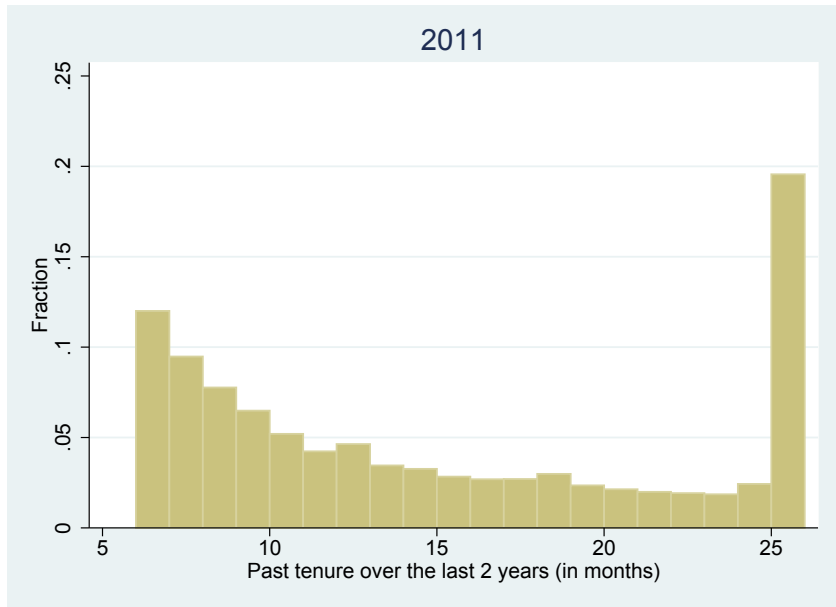| Variable | Mean | Std. Dev. |
|---|---|---|
| Looking for a long-term contract | 0.895 | 0.307 |
| Looking for a full-time job | 0.971 | 0.167 |
| Maximum commute time accepted (in minutes) | 44 | 20 |
| Maximum commute distance accepted (in kilometers) | 32 | 24.4 |
| No geographical constraint | 0.02 | 0.138 |

2006

Fraction — Past tenure over the last 2 years (in months)

2007

Fraction (y-axis)
Past tenure over the last 2 years (in months) (x-axis)

2008

Fraction — Past tenure over the last 2 years (in months)

2009

Fraction (y-axis)

Past tenure over the last 2 years (in months)

2010

2011
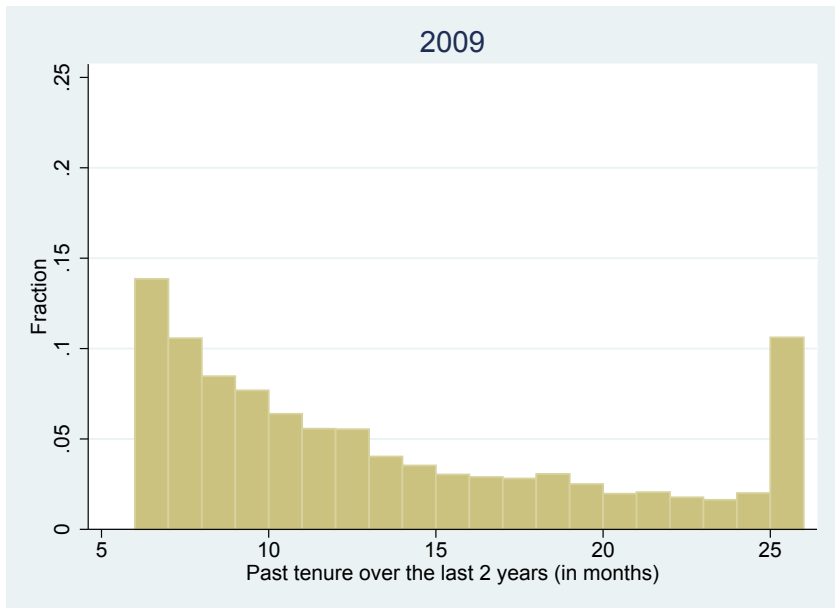
# Reduced-form equation

$$\log Y_{i,n} = \sum_{j=6,excl.7,12,23}^{26} \beta_j D(Tenure_{i,n} = j) \times After_{i,n}$$

$$+ \sum_{j=6,excl.7,12,23}^{26} \delta_j D(Tenure_{i,n} = j)$$

$$+ \gamma X_{i,n} + Year \times Quarter F.E. + Indiv.F.E._{\cdot i} + \nu_{i,n}$$

↦ Back

Reduced form effect
for the reservation wage (in logs)
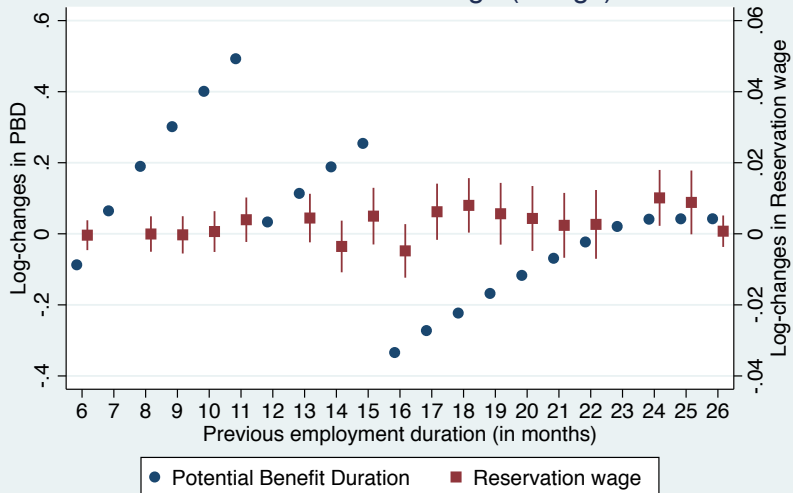
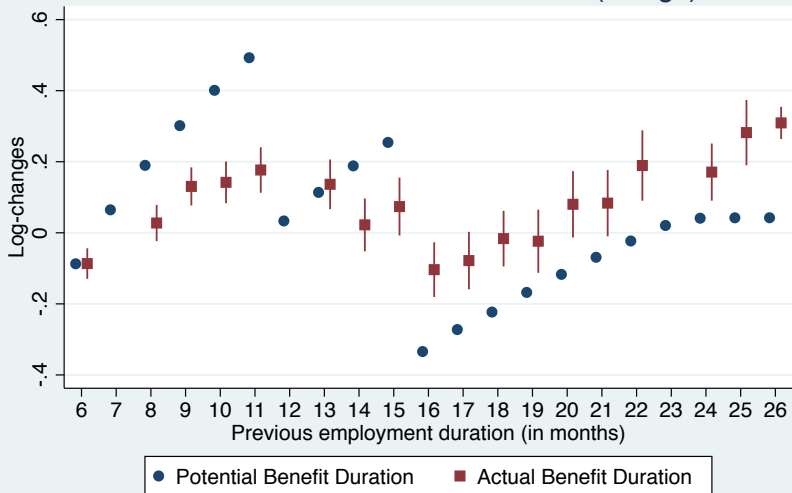Reduced form effect
for the actual duration of benefits (in logs)

Table: Effect of PBD on other dimensions of job selectivity

| | Looking for a | | Max. commuting |
| | long-term contract | full-time job | time/distance (log) |
| | (1) | (2) | (3) |
| --- | --- | --- | --- |
| log PBD | -0.00462 | 0.000111 | -0.000931 |
| | (0.00825) | (0.00496) | (0.0132) |
| Indiv. FE | yes | yes | yes |
| IV | yes | yes | yes |
| Obs. | 180,637 | 180,637 | 163,192 |

## Table: Heterogeneity analysis - DiD

|  | Gender | | Past wage level | |
|  | Female | Male | Low wage | High wage |
|  | (1) | (2) | (3) | (4) |
| --- | --- | --- | --- | --- |
|  | Log of Reservation wage | | | |
| log PBD | 0.00156 | -0.00245 | 0.00323 | -0.00285 |
|  | (0.00454) | (0.00435) | (0.00340) | (0.00543) |
|  | Log of Actual Benefit duration | | | |
| log PBD | 0.332*** | 0.292*** | 0.321*** | 0.291*** |
|  | (0.0508) | (0.0423) | (0.0448) | (0.0473) |
| Obs. | 72,472 | 108,165 | 90,203 | 90,434 |
| Indiv. F.E. | yes | yes | yes | yes |

Table: Placebo elasticities - DiD strategy

| VARIABLES | (1)<br>2007 | (2)<br>2008 | (3)<br>2010 | (4)<br>2011 |
|---|---|---|---|---|
| | | Log of reservation wage | | |
| Log PBD | 0.00979<br>(0.00655) | 0.00709<br>(0.00654) | 0.00755<br>(0.00582) | 0.00512<br>(0.00566) |
| Obs. | 30,603 | 30,603 | 36,422 | 36,422 |
| Indiv. F.E. | yes | yes | yes | yes |

Back

Table: Estimates of discontinuities in reservation wage at placebo age cutoff

| Placebo Age cutoff | 47 | 48 | 49 | 51 | 52 | 53 |
|---|---|---|---|---|---|---|
| | 0.00194 | 0.00149 | -0.000106 | -0.000254 | 0.0123** | -0.00552 |
| | (0.00327) | (0.00329) | (0.00365) | (0.00396) | (0.00591) | (0.00417) |
| Obs. | 521,034 | 499,192 | 478,334 | 441,441 | 427,481 | 412,624 |

# Theoretical predictions: Evolution of the reservation wage along the unemployment spell
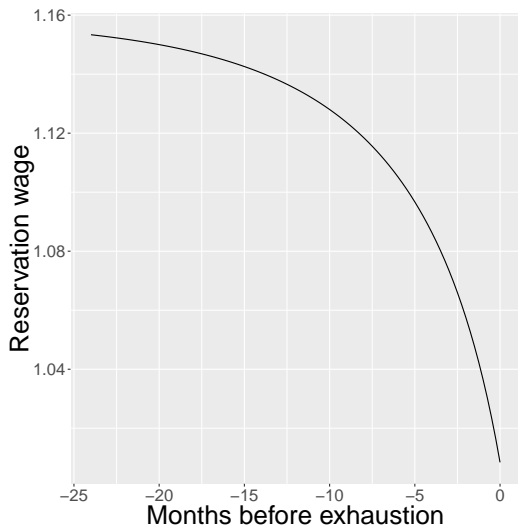
# Theoretical predictions: Evolution of the search effort along the unemployment spell
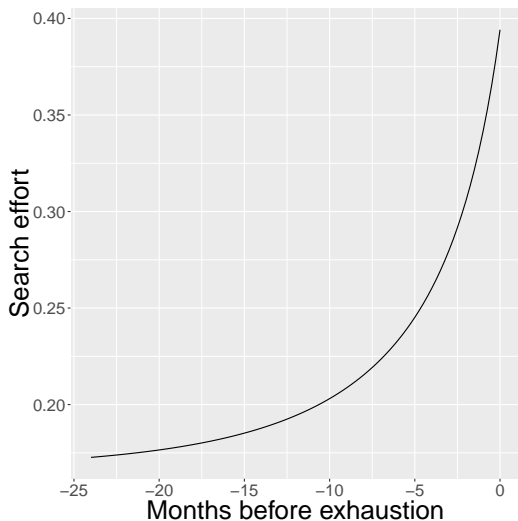
# Theoretical predictions: Evolution of the elasticities of the hazard rate along the unemployment spell