Marginal Jobs and Job Surplus

A Test of the Efficiency of Separations

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Macro Perspectives

Two Views of Jobs and Separations

- Coasean view of jobs and separations:
  - Efficient bargaining, exploiting all gains from trade

  $\Rightarrow$ Joint job surplus allocative (firm + worker surplus)

  $$\text{Joint Job Surplus} = \text{Inside Values} - \text{Outside Values}$$

  $\Rightarrow$ Separations efficient: joint surplus < 0

- Frictional ("non-Coasean") views of jobs and separations
  - Unilateral worker *and* firm surpluses are allocative
  - Separations can be inefficient

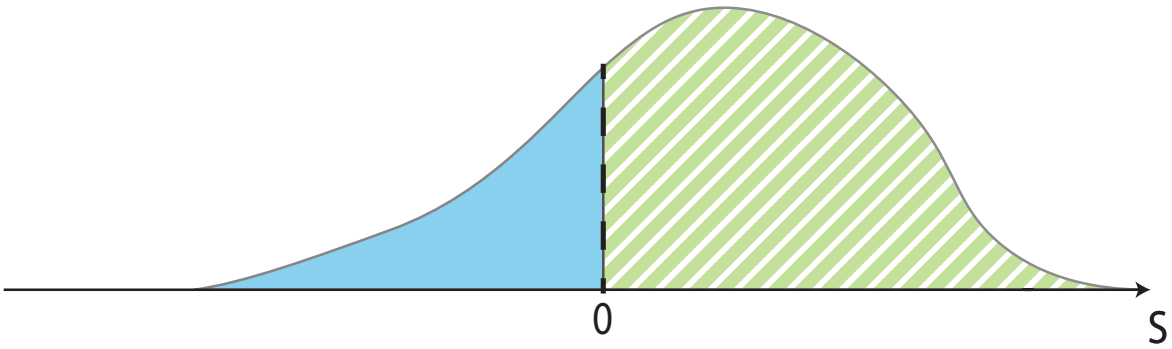
    Ex: Firm surplus < 0 while worker surplus $\gg 0$, so joint surplus > 0

- Our paper: empirical test to adjudicate b/w Coasean and frictional views at the separations margin

Testing Between Coasean and Alternative Views

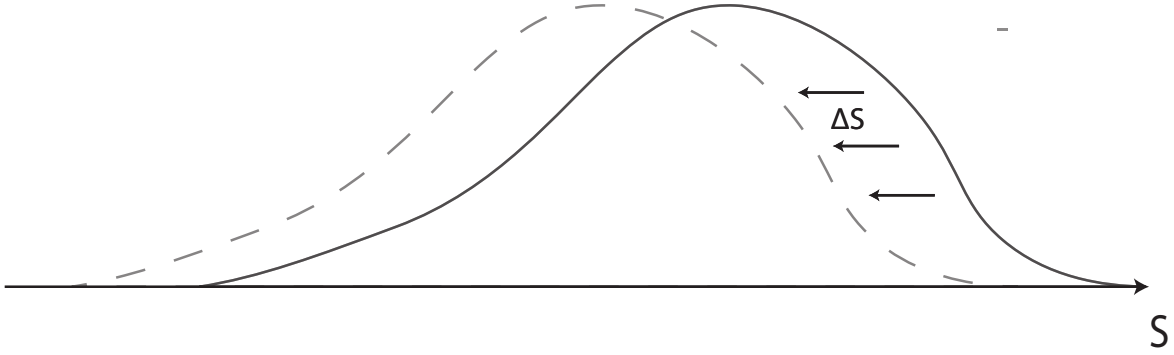
- We study a separations effects of large UIB extension (job surplus $\downarrow$)
- Quasi-experiment: UI benefit extension in Austria (REBP)
  - Large increase in maximum benefit duration: $1 \rightarrow 4$ years, starting in 1988
  - Treatment and control regions
  - Sharp age eligibility cutoff (50+)
- **Abolished in 1993**
- Prediction of Coasean view: Post-abolition, surviving matches more resilient in response to any surplus shocks
- Prediction of other view: Post-abolition resilience to worker surplus shifts, but not firm surplus shifts

Coasean View: Separation and Resilience Effects



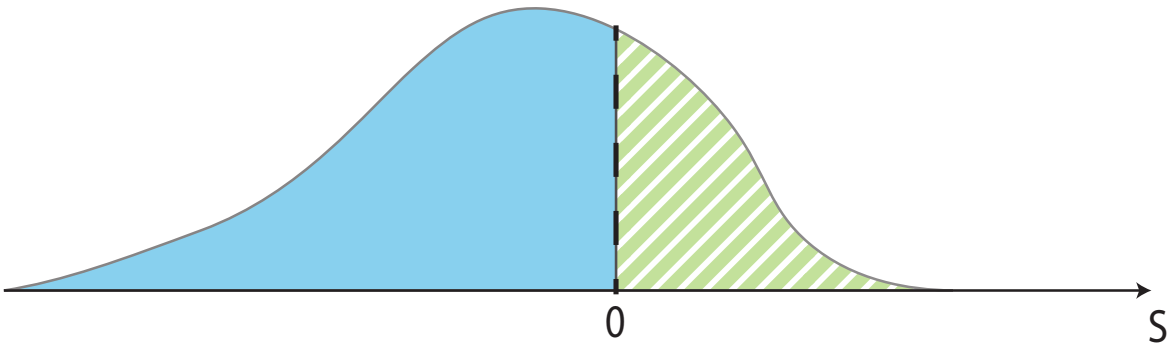
Jobs: Matches with positive surplus

Coasean View: Separation and Resilience Effects



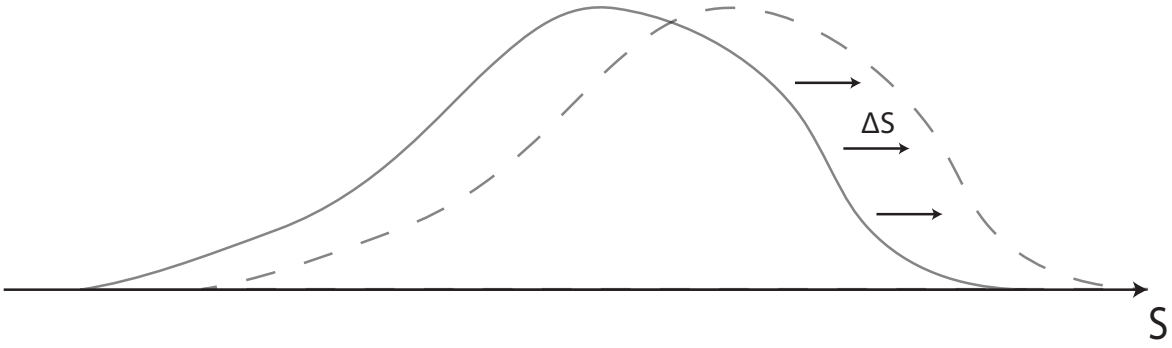
Benefit increase reduces surplus

Coasean View: Separation and Resilience Effects



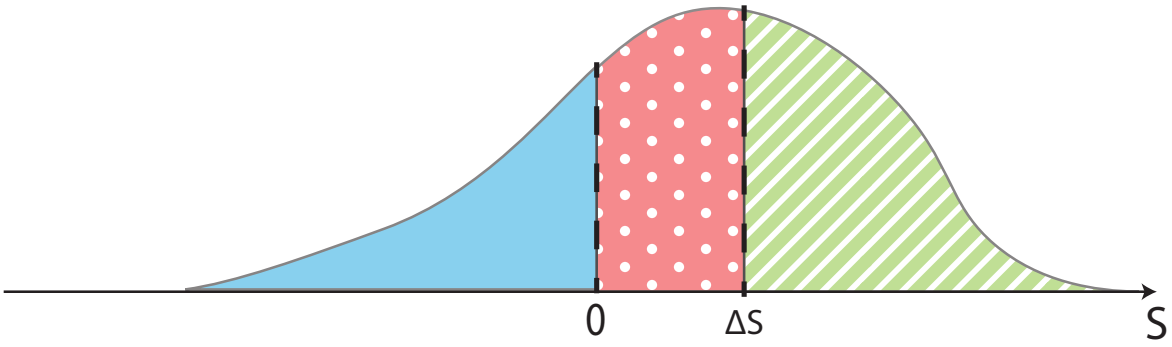
Surplus of surviving matches during reform

Coasean View: Separation and Resilience Effects



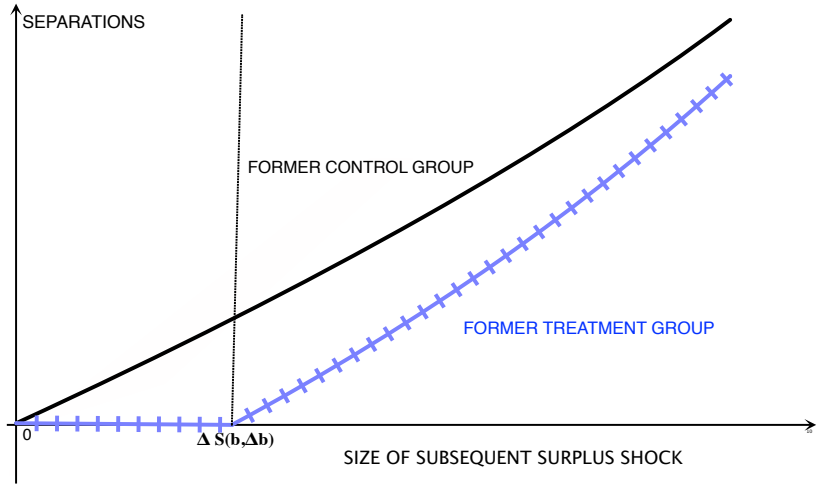
Abolishing the reform

Coasean View: Separation and Resilience Effects



Abolishing the reform missing mass of marginal matches (with low joint surplus)

Coasean View: Separation and Resilience Effects



Post-abolition resilience to shocks

Preview of Results

I. Does UI-induced boost of nonemployment option lead to separations of marginal matches?

- 11ppt increase in separations among initially employed (39ppt base)

II. Which matches were dissolved by the policy? *(Complier analysis in paper, today just summary)*

- Evidence consistent with low-surplus jobs at the margin (but not definitely informative)
- Pre-separation attributes: blue-collar jobs in shrinking industries and firms, with freq't sickness
- Survey: significant share of worker-sided quits

III. Core test of Coasean vs. alternative view

- Exploit **abolition** of reform in 1993
- Prediction of Coasean view: surviving matches are more resilient
  - Provided some degree of persistence in idiosyncratic surplus
- Yet, in the data: same resilience among survivors in treatment and control

$\Rightarrow$ **Inefficient separations** — or efficient, but full "reshuffling" of surplus distribution even after 1 year

One non-Coasean story: wage rigidity + high initial worker surplus, post-abol'n sep's from firm surplus

Outline

Context: Austria & REBP

- No experience rating
- Voluntary quitters eligible for UI (and extension)
  - Four week wait period
- Replacement rate: 41-48% of gross income; UIBs untaxed
- Level bounded at minimum and maximum amount

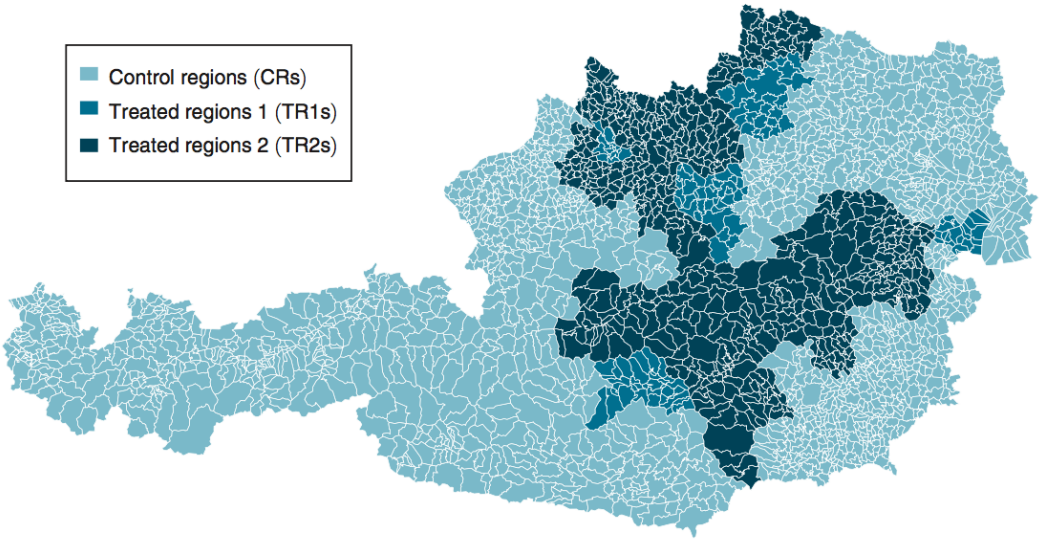
1988 Policy Change: Regional Extended Benefit Program (REBP)

- UI benefit extension from max 52 weeks to max 209 weeks
- Active June 1988 to July 1993
- Targeted 28 (out of 100) labor market districts

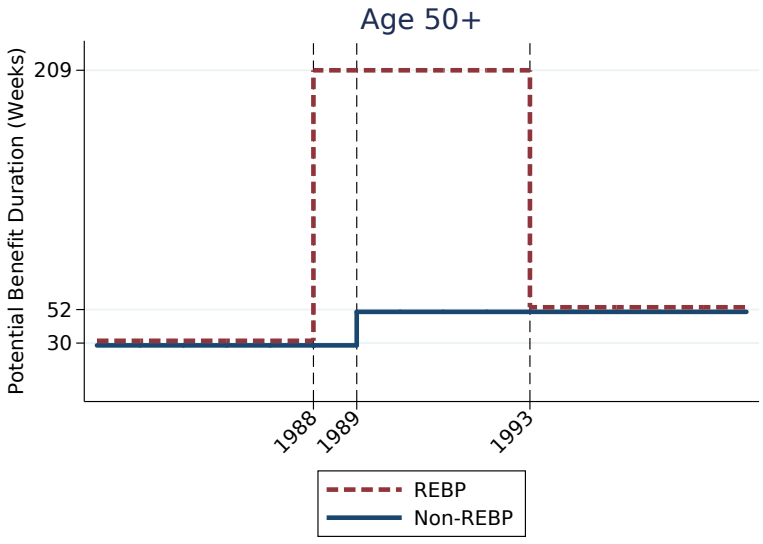
- Eligibility criteria (at unemployment entry):
  - Residence in REBP district $\geq$ 6 months
  - Older than age 50
  - More than 15 years of work experience in last 25 years

- Context and policy objectives:
  - Original goal: mitigate job loss from steel sector restructuring
  - Reform affected all – incl. non-steel – workers in REBP regions
  - We exclude steel workers from analysis

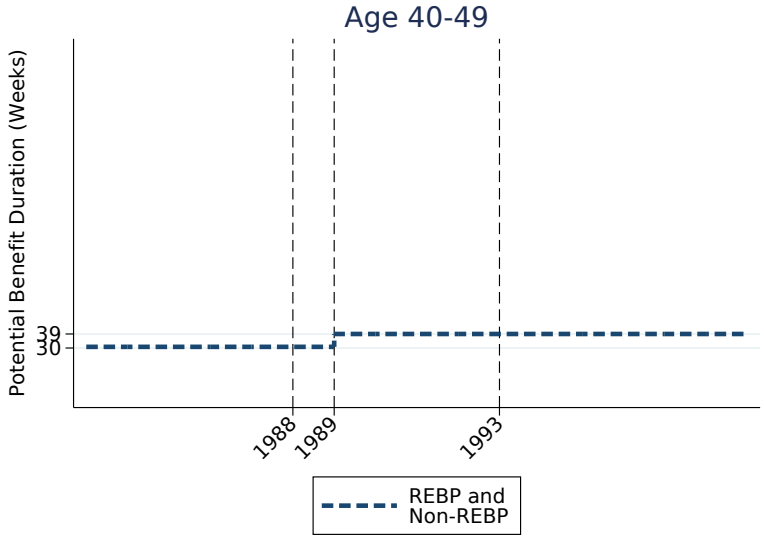
The Regional Benefit Extension Program (REBP)



REBP Extended Benefit Duration for Age 50+



Second Control Group: Workers Age <50

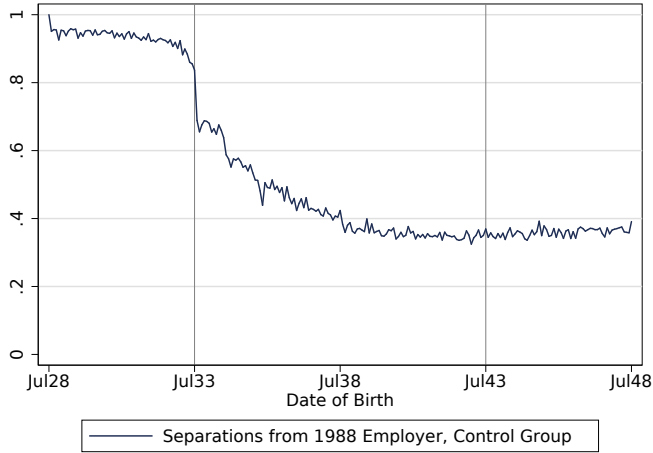


Data and Sample

- Population of matched employer-employee data from Austria
  - Universe of Austrian Social Security Register (ASSD)
- Primary sample: male workers aged 45 to 55, 1987 to 1998

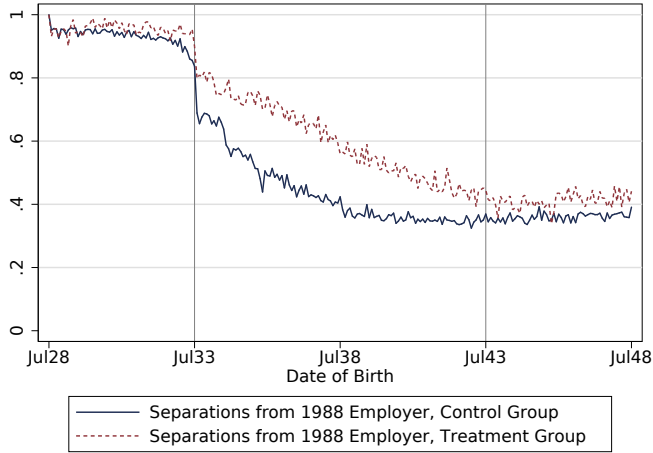
Outline

Control: Fraction Separated from 1988 Job by 1993



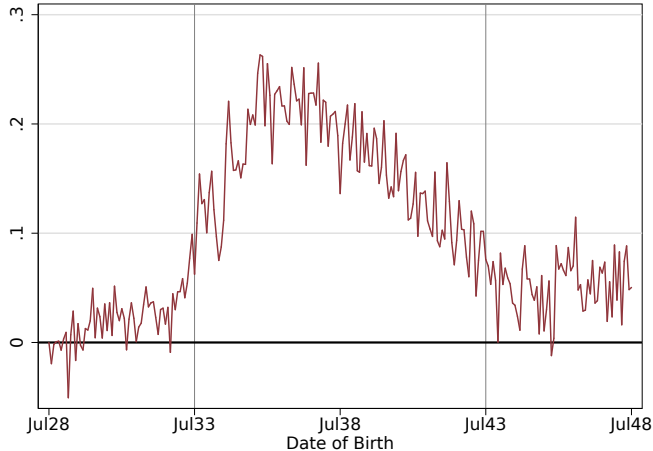
Sample: Individuals with job in 1988.

REBP vs. Control: Fraction Separated from '88 Job by '93



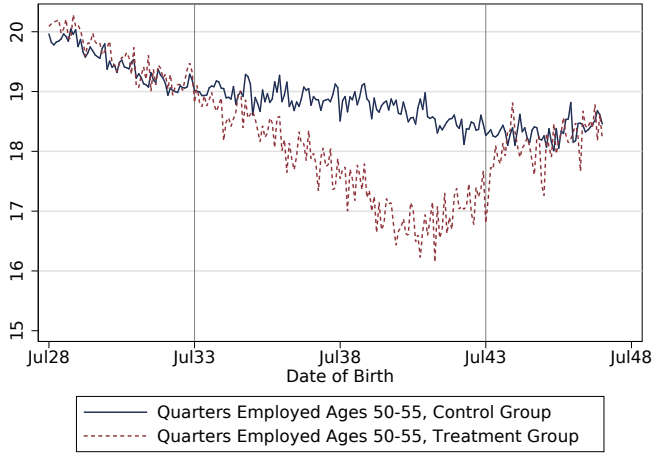
Sample: Individuals with job in 1988.

Treatment Effect: Differences



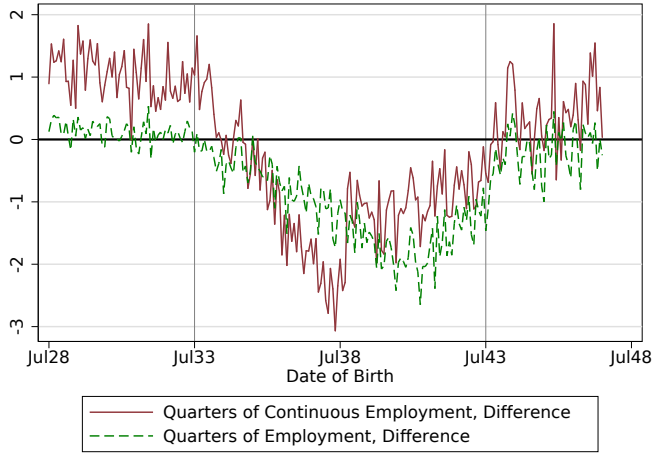
Sample: Individuals with job in 1988.

Quarters Employed 50–55: Differences



Sample: Individuals with job at 49.

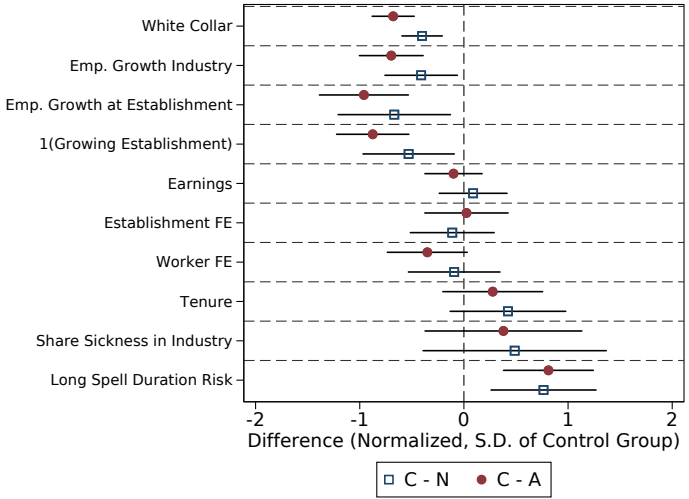
Continuous Employment ↓ ≃ Overall Employment ↓



Sample: Individuals with job at 49.

Outline

Complier Analysis: Attributes of Incremental REBP Separators



Differences Between Compliers and Always-Separators, and Compliers and Never-Separators

Partition

Outline

Conceptual Framework

Job is **feasible** if worker surplus S^W and firm surplus S^F:

$$S^W(\mathbf{V}^W, w) = V^W_{\mathsf{In}} + w - V^W_{\mathsf{Out}} \geq 0 \qquad S^F(\mathbf{V}^F, w) = V^F_{\mathsf{In}} - w - V^F_{\mathsf{Out}} \geq 0$$

$\mathbf{V}^W = (V^W_{\mathsf{In}}, V^W_{\mathsf{Out}})$: worker inside job value (e.g. amenities), outside value (e.g. value of unemployment)

$\mathbf{V}^F = (V^F_{\mathsf{In}}, V^F_{\mathsf{Out}})$: firm inside job value (e.g. productivity), outside value (e.g. vacancy)

Coasean bargaining Illustration

Parties agree on $w \in [\underline{w}^W, \overline{w}^F]$, which implements bilaterally efficient allocation

$\Rightarrow$ **Joint surplus** is the allocative surplus concept

$$S(\mathbf{V}) = \overbrace{V^W_{\mathsf{In}} + V^F_{\mathsf{In}} - V^W_{\mathsf{Out}} - V^F_{\mathsf{Out}}}^{S^W(\mathbf{V}^W, w) + S^F(\mathbf{V}^W, w)}$$

Coasean separation probability for a job $\mathbf{V}$:

$$\mathbb{d}(\mathbf{V}) = \int_{\mathbf{V}'} \mathbf{1}\{S(\mathbf{V}') < 0\} k(\mathbf{V}'|\mathbf{V}) d\mathbf{V}'$$

$k(.|.)$: Markov process guiding evolution of $\mathbf{V}$

REBP-Induced Separations

REBP shock hits treatment group ($Z = 1$), but not control group ($Z = 0$)

$$\varepsilon_b^W = V_{\text{Out}}^W(b_0 + \Delta b) - V_{\text{Out}}^W(b_0) > 0$$

Surplus level gross of aggregate shock ε':

$$\widetilde{S}(\mathbf{V}') = S(\mathbf{V}', \varepsilon') - \varepsilon'$$

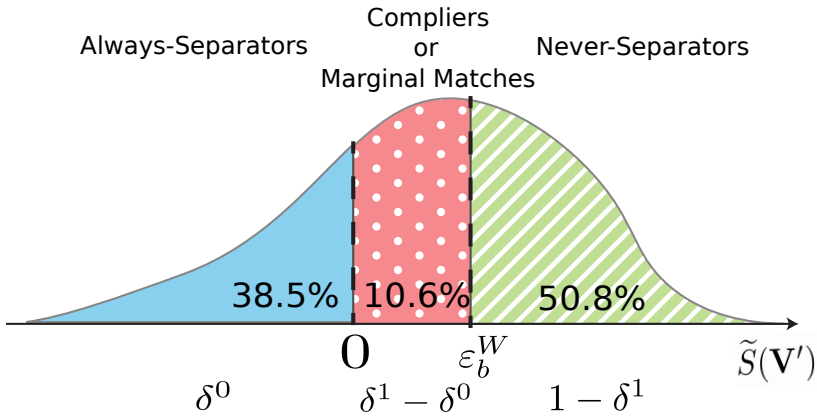
Separation share:

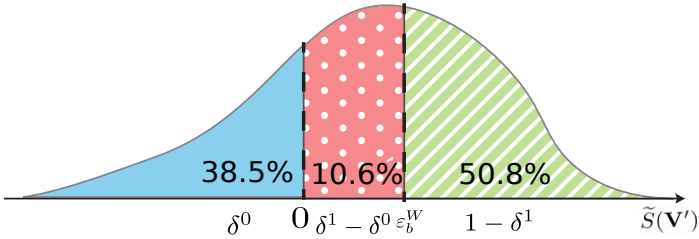
$$\delta^Z = \int_{\mathbf{V}} \underbrace{\int_{\mathbf{V}'} \mathbf{1}\{\widetilde{S}(\mathbf{V}') < Z \times \varepsilon_b^W\} k(\mathbf{V}'|\mathbf{V}) d\mathbf{V}'}_{\widetilde{\mathrm{d}}(\mathbf{V}, Z \times \varepsilon_b^W)} f_{\text{pre}}^Z(\mathbf{V}) d\mathbf{V}$$

f_{pre}^Z: distribution of job values pre-REBP — Assume $f_{\text{pre}}^1 = f_{\text{pre}}^0$

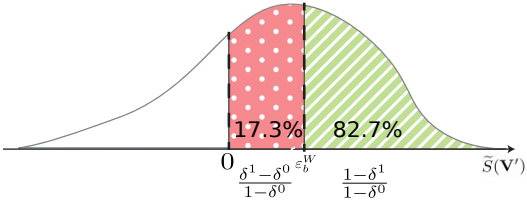
Treatment effect:

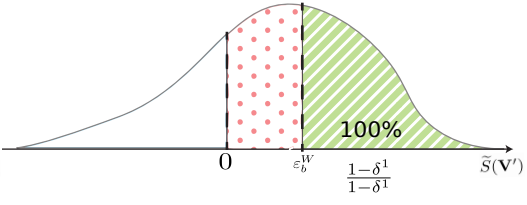
$$\delta^1 - \delta^0 = \int_{\mathbf{V}} \int_{\mathbf{V}'} \underbrace{\mathbf{1}\{0 \leq \widetilde{S}(\mathbf{V}') < \varepsilon_b^W\}}_{\text{Marginal jobs, } M} k(\mathbf{V}'|\mathbf{V}) d\mathbf{V}' f_{\text{pre}}^0(\mathbf{V}) d\mathbf{V}$$

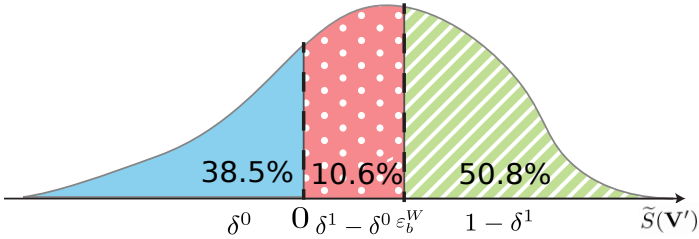

Always-Separators
Compliers
or
Marginal Matches
Never-Separators
38.5%
10.6%
50.8%
0
ε_b^W
$\widetilde{S}(\mathbf{V}')$
δ^0
$\delta^1 - \delta^0$
$1 - \delta^1$



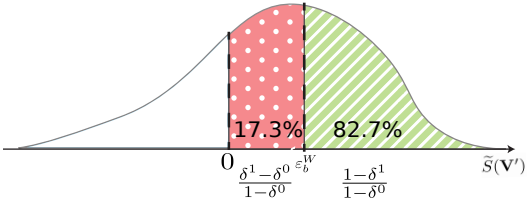
Surplus distribution at the end of REBP

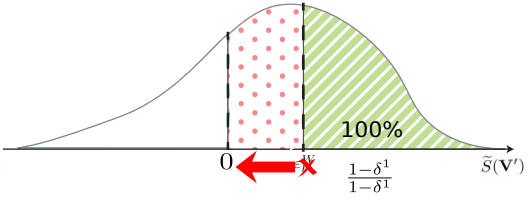






Surplus distribution RIGHT ATFER ABOLITION OF REBP





Post-REBP Separations

Separation share:

$$\Delta^Z = \int_{\mathbf{V}'} \underbrace{\int_{\mathbf{V}''} \mathbf{1}\{\widetilde{S}(\mathbf{V}'') < \varepsilon''\} k(\mathbf{V}''|\mathbf{V}') d\mathbf{V}''}_{\widetilde{\mathrm{d}}(\mathbf{V}';\varepsilon'')} f^Z(\mathbf{V}') d\mathbf{V}'$$

Now $f^1(\mathbf{V}') \neq f^0(\mathbf{V}')$ due to REBP!

Difference in separation rates driven by composition differences from extraction of marginal jobs:

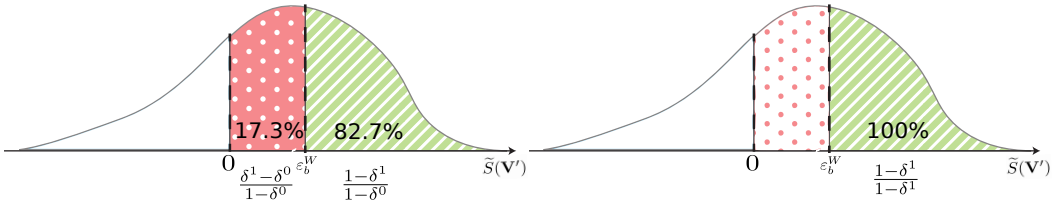
$$\Delta^1 - \Delta^0 = \int_{\mathbf{V}'} \widetilde{\mathrm{d}}(\mathbf{V}';\varepsilon'') \left[f^1(\mathbf{V}') - f^0(\mathbf{V}') \right] d\mathbf{V}'$$

Post-REBP Resilience: General Case

- To assess data, we construct benchmark model for **predicted** separations:

$$
\begin{aligned}
\Delta^1 &= \int_{\mathbf{V}'} \widetilde{\mathbb{d}}(\mathbf{V}', \varepsilon'') f^1(\mathbf{V}') d\mathbf{V}' \\
&= \int_{\mathbf{V}' \in M} \widetilde{\mathbb{d}}(\mathbf{V}', \varepsilon'') f^1(\mathbf{V}') d\mathbf{V}' + \int_{\mathbf{V}' \notin M} \widetilde{\mathbb{d}}(\mathbf{V}', \varepsilon'') f^1(\mathbf{V}') d\mathbf{V}' \\
&= 0 + \int_{\mathbf{V}' \notin M} \widetilde{\mathbb{d}}(\mathbf{V}', \varepsilon'') f^0(\mathbf{V}') d\mathbf{V}' * \left[\frac{1-\delta^0}{1-\delta^1} \right] \\
&= \frac{1-\delta^0}{1-\delta^1} \left[\int_{\mathbf{V}' \notin M} \widetilde{\mathbb{d}}(\mathbf{V}', \varepsilon'') f^0(\mathbf{V}') d\mathbf{V}' \pm \int_{\mathbf{V}' \in M} \widetilde{\mathbb{d}}(\mathbf{V}', \varepsilon'') f^0(\mathbf{V}') d\mathbf{V}' \right] \\
&= \frac{1-\delta^0}{1-\delta^1} \left[\Delta^0 - \int_{\mathbf{V}' \in M} \widetilde{\mathbb{d}}(\mathbf{V}', \varepsilon'') f^0(\mathbf{V}') d\mathbf{V}' \right]
\end{aligned}
$$

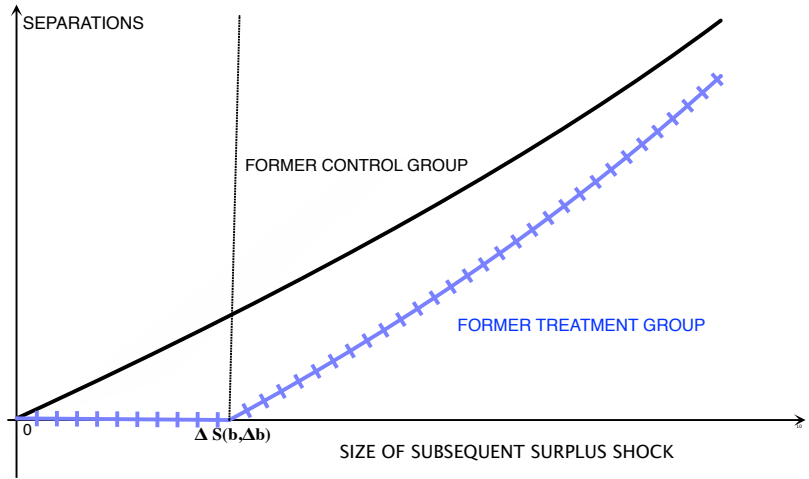
Post-REBP Resilience: Case of No Idiosyncratic Shocks



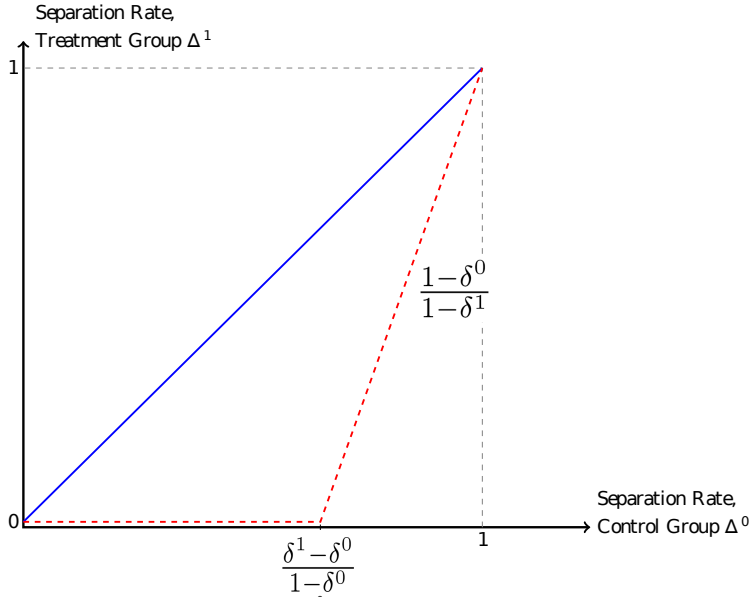
$$\Delta^1(\varepsilon'') = \begin{cases} 0 & \text{if } \varepsilon'' \leq \varepsilon_b^W \\ \frac{1-\delta^0}{1-\delta^1}\left[\Delta^0(\varepsilon'') - \frac{\delta^1-\delta^0}{1-\delta^0}\right] & \text{if } \varepsilon'' > \varepsilon_b^W \end{cases}$$

$$\Delta^1 = \max\left\{0, \frac{1-\delta^0}{1-\delta^1}\left[\Delta^0 - \frac{\delta^1-\delta^0}{1-\delta^0}\right]\right\}$$

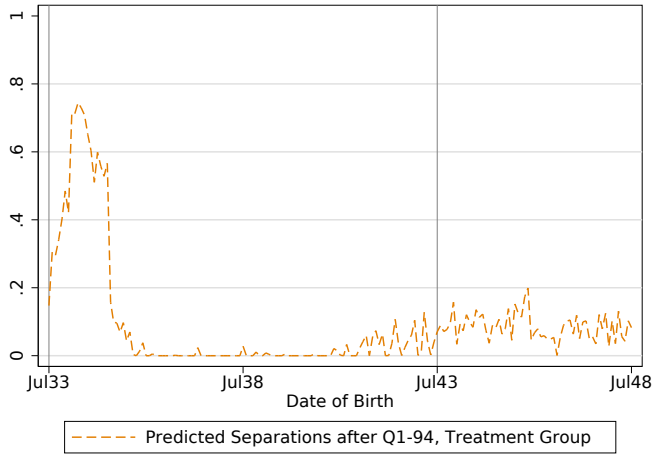
Post-REBP Resilience: Case of No Idiosyncratic Shocks



Predicted Post-REBP Comovement of Separation Rates — By Cohort

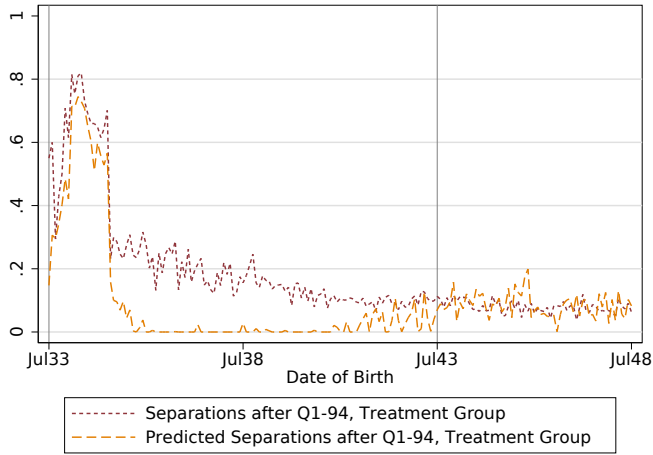


Predicted Separations by 1995 for 1988-93 Job Stayers



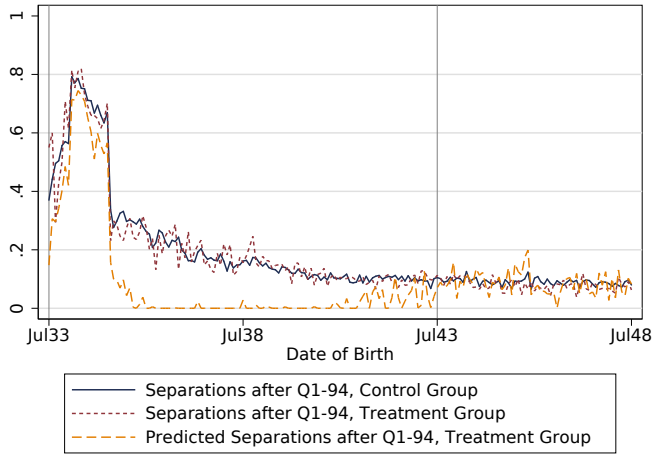
Stayer definition: in same establishment from 1988 through 1994
Track separations through 1995

Predicted vs. Actual Separations by 1995 for 1988-94 Job Stayers



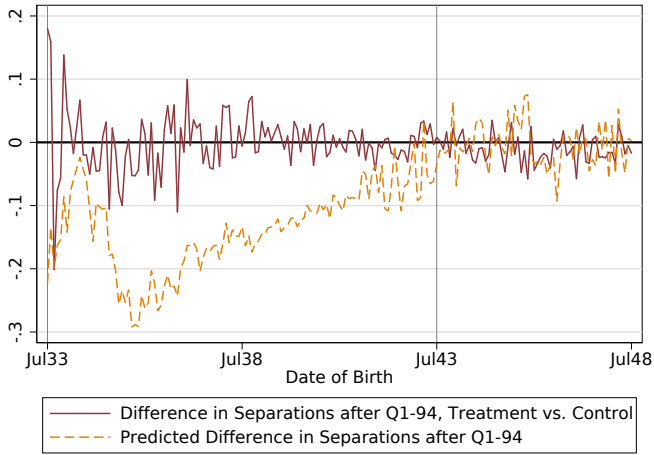
Stayer definition: in same establishment from 1988 through 1994
Track separations through 1995

Predicted vs. Actual vs. Control Sep's by 1995 for 1988-94 Job Stayers



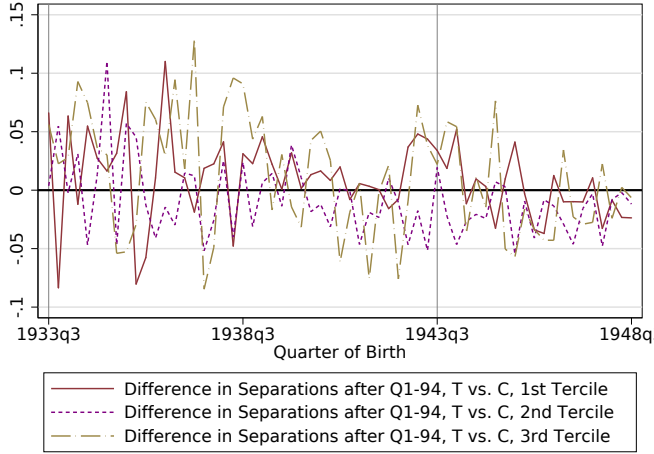
Stayer definition: in same establishment from 1988 through 1994
Track separations through 1995

Differences: Predicted vs. Actual in 1995 for 1988-94 Job Stayers



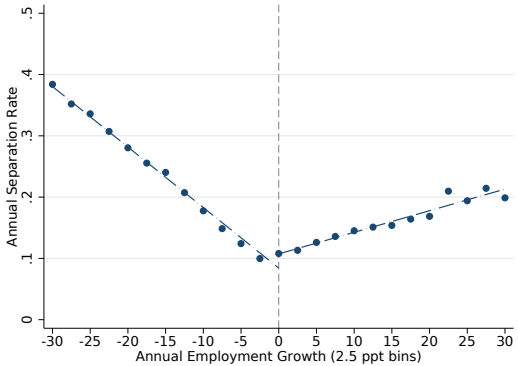
Stayer definition: in same establishment from 1988 through 1994
Track separations through 1995

Labor Demand Shocks: Difference by Tercile of Industry Emp. Growth

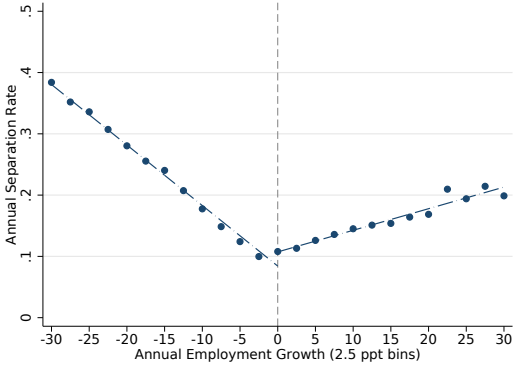


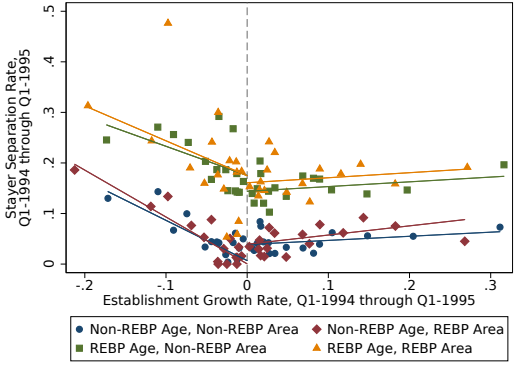
Stayer definition: in same establishment from 1988 through 1994
Track separations through 1995
Two-digit NACE

Labor Demand Shocks: Establishment-Level "Hockey-Sticks"



Labor Demand Shocks: Establishment-Level "Hockey-Sticks"

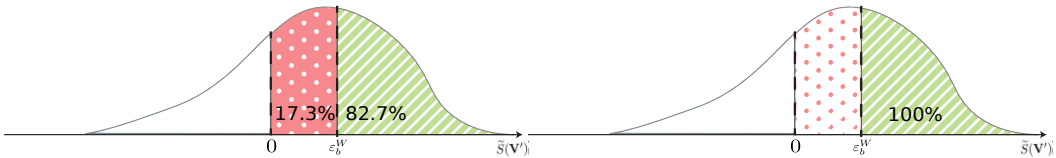




Battery of Other Tests

- Controlling for shifts of **within-cohort** age composition
- Comparing distribution of the age of separators during **mass lay-offs** in each region
- Estimating relationship of separations and **industry growth rates** (Austria, also instrumenting with German rates)
- Comparing ages at first separation and months of continuous employment
- Using placebos for pre-REBP period
- Cell-based analysis of industry-occupation-specific shocks

Reconciling Patterns — $\Delta_1(\varepsilon'') = \Delta_0(\varepsilon'')\forall\varepsilon''$ — with Coasean Model



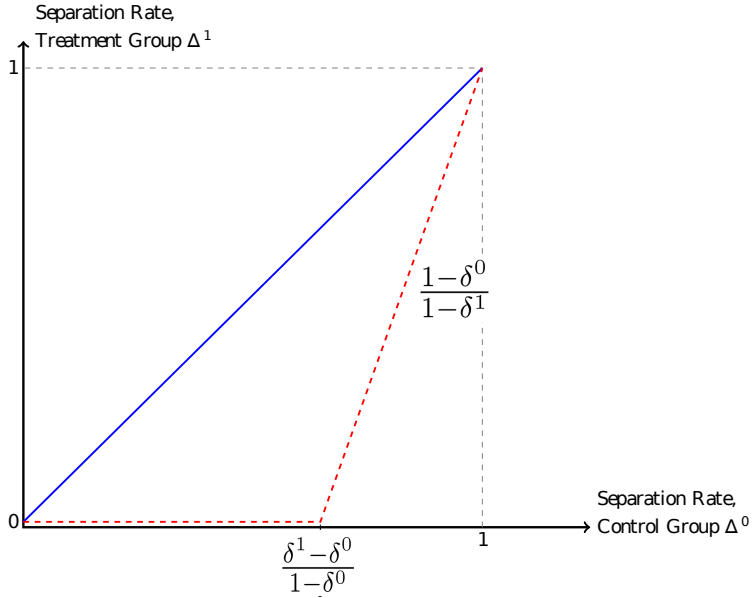
$$\Delta_1(\varepsilon'') = \Delta_0(\varepsilon'')$$

$$\Leftrightarrow \int_{\mathbf{V}'\in M} \widetilde{\mathrm{d}}(\mathbf{V}',\varepsilon'') \underbrace{f^1(\mathbf{V}')}_{=0} d\mathbf{V}' + \int_{\mathbf{V}'\notin M} \widetilde{\mathrm{d}}(\mathbf{V}',\varepsilon'') \underbrace{f^1(\mathbf{V}')}_{\frac{1-\delta^0}{1-\delta^1} f^0(\mathbf{V}')} d\mathbf{V}' = \int_{\mathbf{V}'\in M} \widetilde{\mathrm{d}}(\mathbf{V}',\varepsilon'') f^0(\mathbf{V}') d\mathbf{V}' + \int_{\mathbf{V}'\notin M} \widetilde{\mathrm{d}}(\mathbf{V}',\varepsilon'') f^0(\mathbf{V}') d$$

$$\Leftrightarrow \underbrace{\int_{\mathbf{V}'\in M} \widetilde{\mathrm{d}}(\mathbf{V}',\varepsilon'') f^0(\mathbf{V}') \left[\frac{1-\delta^0}{\delta^1-\delta^0}\right] d\mathbf{V}'}_{\text{Av. sep. rate for the marginals}} = \underbrace{\int_{\mathbf{V}'\notin M} \widetilde{\mathrm{d}}(\mathbf{V}',\varepsilon'') f^0(\mathbf{V}') \left[\frac{1-\delta^0}{1-\delta^1}\right] d\mathbf{V}'}_{\text{Av. sep. rate for the inframarginals}}$$

$$\Leftrightarrow \underbrace{\int_{\mathbf{V}'\in M} \int_{\mathbf{V}''} \mathbf{1}\{\widetilde{S}(\mathbf{V}'') < \varepsilon''\} k(\mathbf{V}''|\mathbf{V}') d\mathbf{V}'' \tilde{f}^0(\mathbf{V}') d\mathbf{V}'}_{\text{Av. sep. rate for the marginals}} = \underbrace{\int_{\mathbf{V}'\notin M} \int_{\mathbf{V}''} \mathbf{1}\{\widetilde{S}(\mathbf{V}'') < \varepsilon''\} k(\mathbf{V}''|\mathbf{V}') d\mathbf{V}'' \tilde{f}^0(\mathbf{V}') d\mathbf{V}'}_{\text{Av. sep. rate for the inframarginals}}$$

Predicted Post-REBP Comovement of Separation Rates



Horse Race: Structural Estimation

- Let the data put weight on these two extreme models
- Structural relationship between cell-level separation rates in formerly treated and control regions:

$$\Delta_i^1 = (1-\kappa) \times \underbrace{\Delta_i^0}_{\text{Reshuffling}} + \kappa \times \underbrace{\max\left\{0, \frac{1-\delta_i^0}{1-\delta_i^1} \cdot \Delta_i^0 - \frac{\delta^1 - \delta_i^0}{1-\delta_i^1}\right\}}_{\text{Persistence}}$$

κ: weight on persistence model – "which fraction of cells follow which model?"

- where δ_i^0, δ_i^1 are cell-specific REBP-period measured separation rates

Δ_i^0: younger cohorts in REBP region in the same industry-occupation (blue/white collar) cell

- Not treated by REBP
- Still contain marginal matches
- Exposed to similar industry-occupation-level surplus shocks

- Non-linear model with measurement error (due to idiosyncratic shocks). Solution: GMM using procedure from Schennach (2012) to resolve measurement error.

Horse Race: Results

	2-Digit Industry × Occupation Cells				4-Digit Industry × Occupation Cells			
	1995	1996	1997	1998	1995	1996	1997	1998
$\hat{\kappa}$	**-0.0464**	**-0.123**	**-0.184**	**-0.302**	**0.033**	**-0.0367**	**-0.074**	**-0.168**
	(0.087)	(0.077)	(0.088)	(0.081)	0.046	(0.055)	(0.063)	(0.064)
95% CI (Upper Limit)	**0.127**	**0.029**	**-0.010**	**-0.141**	**0.124**	**0.072**	**0.050**	**-0.041**
N	109	109	109	109	275	275	275	275

Alternative Interpretation: Non-Coasean Setting

- Which frictional model consistent with the data?
  - Like Tolstoy's unhappy families: each frictional setting is inefficient in its own way
  - Wage rigidity in response to (nonemployment) outside option shifts (Jäger, Schoefer, Young, Zweimüller 2018)

  $\Rightarrow$ Prevents efficient (re-)bargaining

Conceptual Framework — Non-Coasean Setting

Job is **feasible** if worker surplus S^W and firm surplus S^F:

$$S^W(\mathbf{V}^W, w) = V^W_{\mathsf{In}} + w - V^W_{\mathsf{Out}} \geq 0 \qquad S^F(\mathbf{V}^F, w) = V^F_{\mathsf{In}} - w - V^F_{\mathsf{Out}} \geq 0$$

~~Coasean Bargaining~~ Friction: Wage Rigidity

~~Parties agree on $w \in [\underline{w}^W, \overline{w}^F]$, which implements bilaterally efficient allocation~~

$\Rightarrow$ ~~Joint surplus~~ Unilateral surpluses are the allocative surplus concepts

$$S^W(\mathbf{V}^W, w) + S^F(\mathbf{V}^W, w)$$

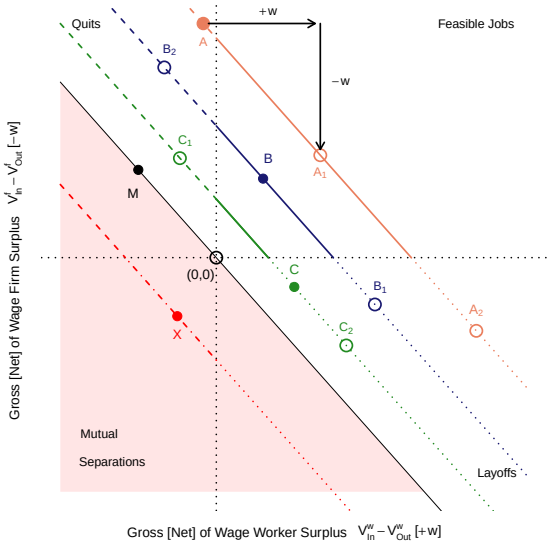
$$S(V) = V^W_{\mathsf{In}} + V^F_{\mathsf{In}} - V^W_{\mathsf{Out}} - V^F_{\mathsf{Out}}$$

Non-Coasean separation probability for a job $\mathbf{V}$:

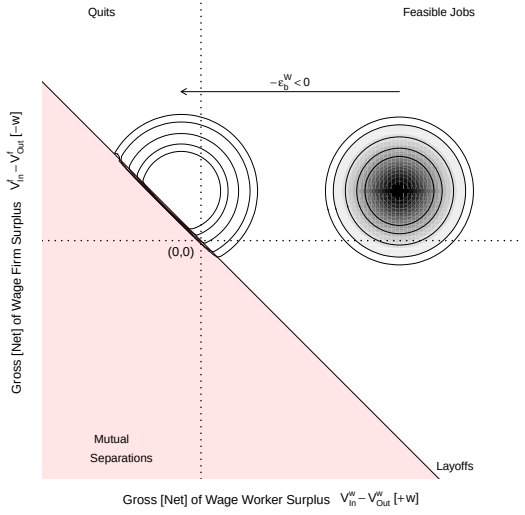
$$\widetilde{\mathrm{d}}(\mathbf{w}, \mathbf{V}, \varepsilon') = \int_{(w', \mathbf{V}')} \mathbb{1}\Big(\underbrace{\widetilde{S}^W(w', \mathbf{V}') < \varepsilon^{W\prime}}_{\mathsf{Quit}} \vee \underbrace{\widetilde{S}^F(w', \mathbf{V}') < \varepsilon^{F\prime}}_{\mathsf{Layoff}} \Big) k((w', \mathbf{V}')|(w, \mathbf{V})) d(w', \mathbf{V}')$$

$k(.|.)$: Markov process guiding evolution of $(w, \mathbf{V})$

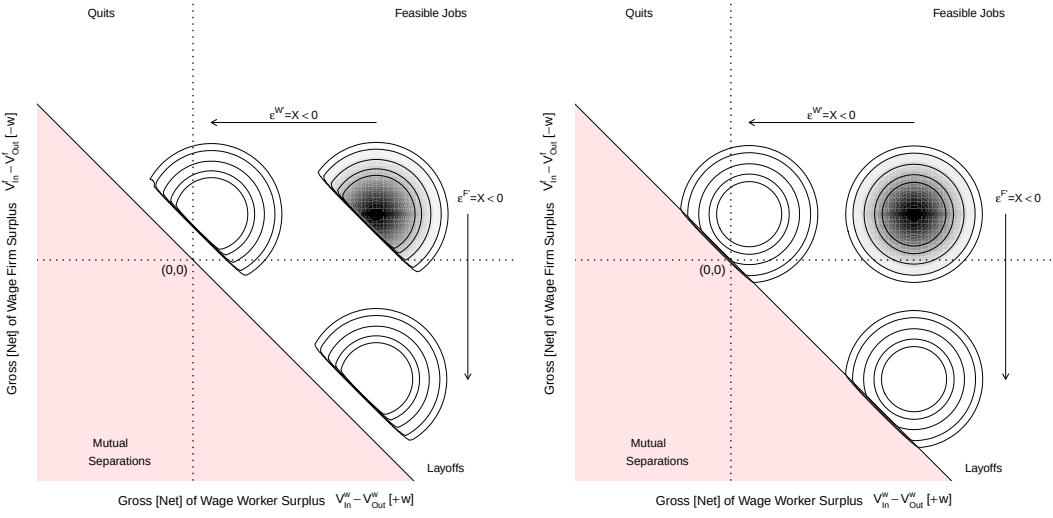
Coasean Bargaining



Initial REBP Effect — Coasean Model

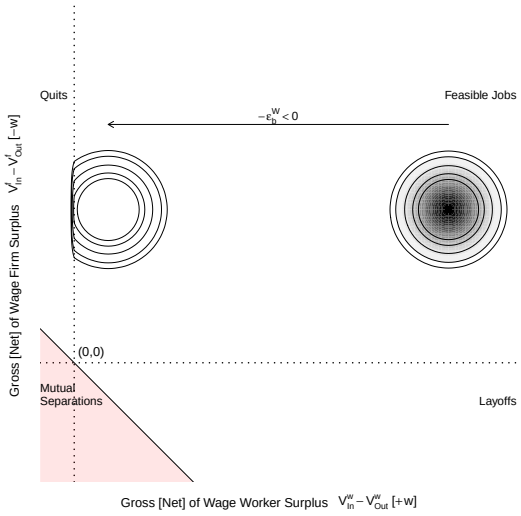


Post-REBP — Coasean Model

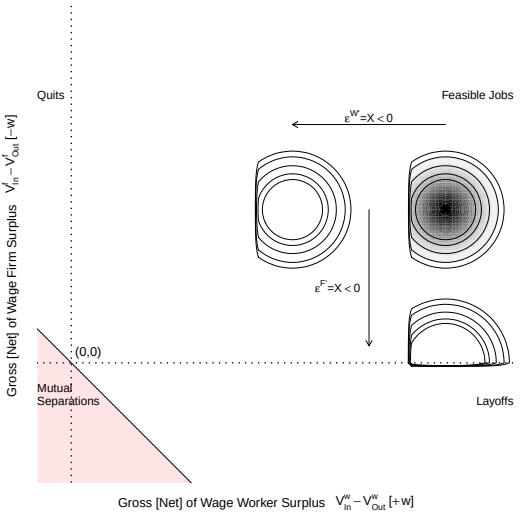


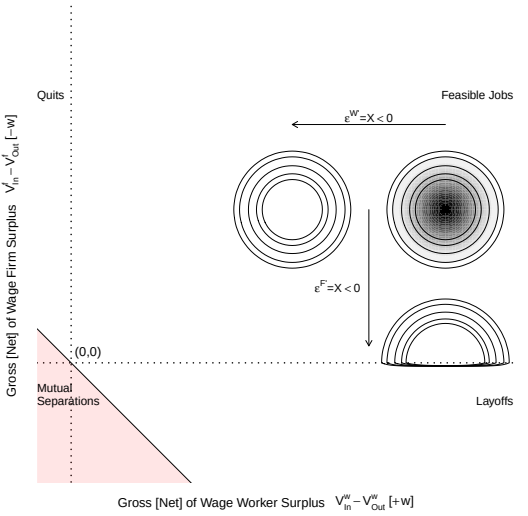
Former Treatment Group **Former Control Group**

Initial REBP Effect: — Non-Coasean Model: Initially High Worker Surplus



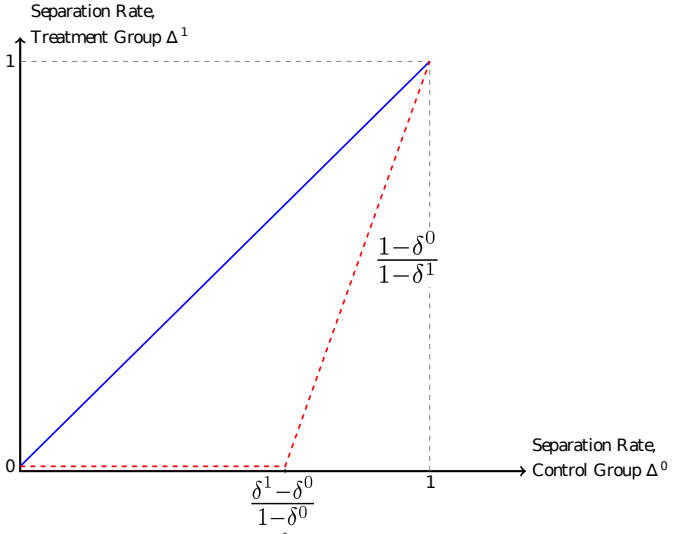
Post-REBP — Non-Coasean Model: Largely Firm Surplus Shocks





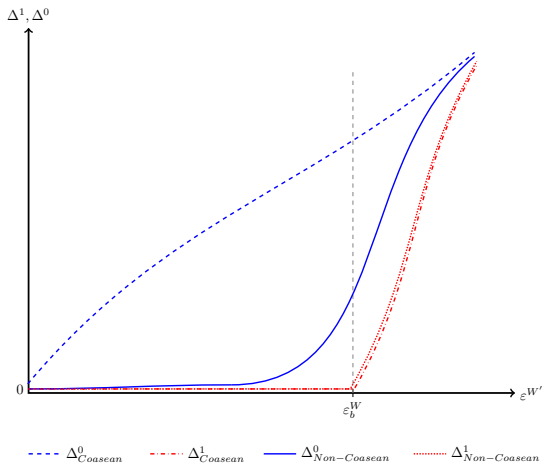
Former Treatment Group **Former Control Group**

Predicted Post-REBP Comovement of Separation Rates

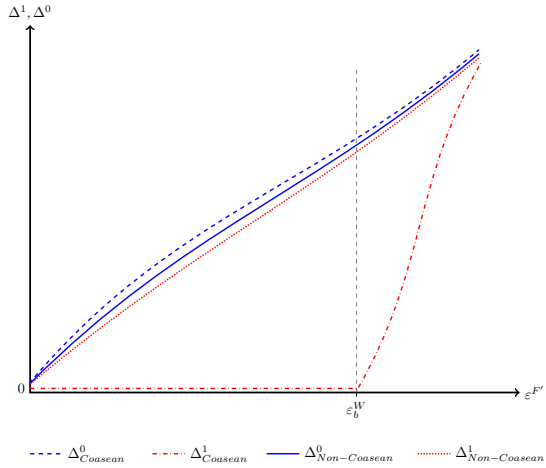


Predicted Post-REBP Comovement of Separation Rates

WORKER Surplus Shocks



FIRM Surplus Shocks



Horse Race: Two Interpretations

$$\Delta_i^1 = (1-\kappa) \times \underbrace{\Delta_i^0}_{\substack{\text{Coasean \& Reshuffling} \\ \text{OR} \\ \text{Non-Coasean \& Firm Shocks}}} + \kappa \times \underbrace{\max\left\{0, \frac{1-\delta_i^0}{1-\delta_i^1} \cdot \Delta_i^0 - \frac{\delta_i^1 - \delta_i^0}{1-\delta_i^1}\right\}}_{\substack{\text{Persistence} \\ \text{OR} \\ \text{Non-Coasean \& Worker Shocks}}}$$

κ: weight on persistence Coasean model or Non-Coasean/Firm Shocks

Horse Race: Two Interpretations

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	1995	1996	1997	1998	1995	1996	1997	1998
$\hat{\kappa}$	**-0.0464**	**-0.123**	**-0.184**	**-0.302**	**0.033**	**-0.0367**	**-0.074**	**-0.168**
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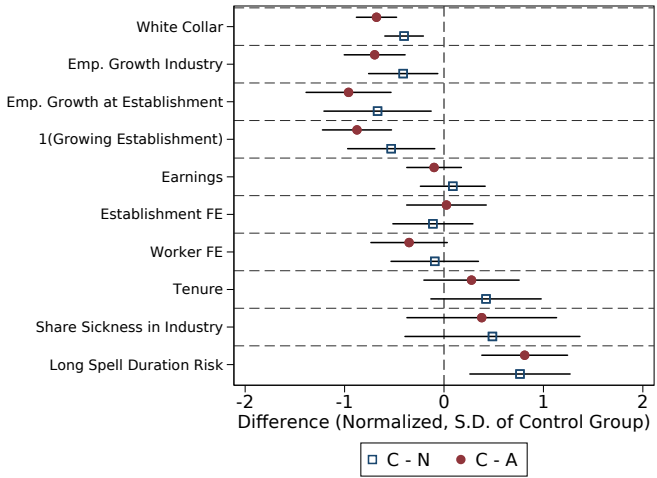
N	109	109	109	109	275	275	275	275

Complier Analysis: Attributes of Incremental REBP Separators



Differences Between Compliers, Always-Separators, and Never-Separators

Conclusion

I. Does UI-induced boost of nonemployment value lead to separations among marginal jobs?

- 11ppt increase in separations among initially employed (39ppt base)

II. Which matches were dissolved by the policy? (More in paper)

- Evidence consistent with low-surplus jobs at the margin, but not definitely informative
- Pre-separation attributes: blue-collar jobs in shrinking industries and firms, with freq't sickness
- Survey: significant share of worker-sided quits

III. Core test of Coasean vs. alternative view

- Exploit **abolition** of reform in 1993
- Prediction of Coasean view: surviving matches are more resilient
  - Provided some degree of persistence in idiosyncratic surplus
- Yet, in the data: same resilience among survivors in treatment and control

$\Rightarrow$ **Inefficient separations** — or efficient, but full "reshuffling" of surplus distribution even after 1 year

One non-Coasean story: wage rigidity + high initial worker surplus, post-abol'n sep's from firm surplus