Marginal Jobs and Job Surplus
A Test of Coasean Job 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
  - Joint job surplus allocative (firm + worker surplus)
    \[ \text{Joint Job Surplus} = \text{Inside Values} - \text{Outside Values} \]
  - 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 ≫ 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 ↓)
- Quasi-experiment: UI benefit extension in Austria (REBP)
  - Large increase in maximum benefit duration: 1 → 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
Benefit increase reduces surplus
Coasean View: Separation and Resilience Effects

Surplus of surviving matches during reform
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

⇒ 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

1. Conceptual Framework

2. Reform, Empirical Strategy, and Data

3. The Causal Effect of Outside Options on Separations

4. Characterizing Jobs Destroyed by the Reform

5. Test of Coasean View: Post-Abolition Stability of Surviving Jobs
   5.1 Conceptual Framework for Coasean Setting
   5.2 Structural Estimation
   5.3 Alternative Non-Coasean Interpretation
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)
Second Control Group: Workers Age <50

Age 40-49

<table>
<thead>
<tr>
<th>Year</th>
<th>Potential Benefit Duration (Weeks)</th>
</tr>
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<tr>
<td>1988</td>
<td>REBP and Non-REBP</td>
</tr>
<tr>
<td>1989</td>
<td></td>
</tr>
<tr>
<td>1993</td>
<td></td>
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Potential Benefit Duration (Weeks)
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
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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.
Sample: Individuals with job at 49.
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1. Conceptual Framework

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3. The Causal Effect of Outside Options on Separations

4. **Characterizing Jobs Destroyed by the Reform** (More in Paper)

5. Test of Coasean View: Post-Abolition Stability of Surviving Jobs
   
   5.1 Conceptual Framework for Coasean Setting

   5.2 Structural Estimation

   5.3 Alternative Non-Coasean Interpretation
Complier Analysis: Attributes of Incremental REBP Separators

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

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

$S^W(V^W, w) = V^W_{in} + w - V^W_{out} \geq 0$

$S^F(V^F, w) = V^F_{in} - w - V^F_{out} \geq 0$

$V^W = (V^W_{in}, V^W_{out})$: worker inside job value (e.g. amenities), outside value (e.g. value of unemployment)

$V^F = (V^F_{in}, V^F_{out})$: firm inside job value (e.g. productivity), outside value (e.g. vacancy)

Coasean bargaining

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

⇒ Joint surplus is the allocative surplus concept

$S(V) = V^W_{in} + V^F_{in} - V^W_{out} - V^F_{out}$

Coasean separation probability for a job $V$:

$\xi(V) = \int_{V'} 1\{S(V') < 0\} k(V'|V) dV'$

$k(\cdot|\cdot)$: Markov process guiding evolution of $V$
REBP-Induced Separations

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

\[
\varepsilon^W_b = V^W_{\text{Out}}(b_0 + \Delta b) - V^W_{\text{Out}}(b_0) > 0
\]

Surplus level gross of aggregate shock \(\varepsilon'\):

\[
\tilde{S}(V') = S(V', \varepsilon') - \varepsilon'
\]

**Separation share**:

\[
\delta^Z = \int_{V} \int_{V'} 1\{\tilde{S}(V') < Z \times \varepsilon^W_b\} k(V'|V) dV' f^Z_{\text{pre}}(V) dV
\]

\(f^Z_{\text{pre}}\): distribution of job values pre-REBP — Assume \(f^1_{\text{pre}} = f^0_{\text{pre}}\)

**Treatment effect**:

\[
\delta^1 - \delta^0 = \int_{V} \int_{V'} 1\{0 \leq \tilde{S}(V') < \varepsilon^W_b\} k(V'|V) dV' f^0_{\text{pre}}(V) dV
\]

Marginal jobs, \(M\)
Always-Separators

Compliers
or
Marginal Matches

Never-Separators

38.5% 10.6% 50.8%

Always-Separators Never-Separators
      Compliers
            or
Marginal Matches
Surplus distribution at the end of REBP
Surplus distribution \textbf{RIGHT AFTER ABOLITION OF REBP}
Post-REBP Separations

Separation share:

$$\Delta^Z = \int_{V'} \int_{V''} 1\{\tilde{S}(V'') < \varepsilon''\} k(V''|V') dV'' f^Z(V') dV'$$

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

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

$$\Delta^1 - \Delta^0 = \int_{V'} \tilde{d}(V';\varepsilon'') \left[ f^1(V') - f^0(V') \right] dV'$$
Post-REBP Resilience: General Case

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

\[
\Delta^1 = \int_{V'} \tilde{d}(V', \varepsilon'') f^1(V') dV' \\
= \int_{V' \in M} \tilde{d}(V', \varepsilon'') f^1(V') dV' + \int_{V' \notin M} \tilde{d}(V', \varepsilon'') f^1(V') dV' \\
= 0 + \int_{V' \notin M} \tilde{d}(V', \varepsilon'') f^0(V') dV' \ast \left[ \frac{1 - \delta^0}{1 - \delta^1} \right] \\
= \frac{1 - \delta^0}{1 - \delta^1} \left[ \int_{V' \notin M} \tilde{d}(V', \varepsilon'') f^0(V') dV' \pm \int_{V' \in M} \tilde{d}(V', \varepsilon'') f^0(V') dV' \right] \\
= \frac{1 - \delta^0}{1 - \delta^1} \left[ \Delta^0 - \int_{V' \in M} \tilde{d}(V', \varepsilon'') f^0(V') dV' \right]
\]
Post-REBP Resilience: Case of No Idiosyncratic Shocks

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

\[ \Delta^1 = \max \left\{ 0, \frac{1-\delta^0}{1-\delta^1} \left[ \Delta^0 - \frac{\delta^1-\delta^0}{1-\delta^0} \right] \right\} \]
Post-REBP Resilience: Case of No Idiosyncratic Shocks

\[ \Delta S(b, \Delta b) \]

SIZE OF SUBSEQUENT SURPLUS SHOCK SEPARATIONS

FORMER TREATMENT GROUP

FORMER CONTROL GROUP
Predicted Post-REBP Comovement of Separation Rates — By Cohort

Separation Rate,
Treatment Group $\Delta^1$

$\frac{1-\delta^0}{1-\delta^1}$

Separation Rate,
Control Group $\Delta^0$
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

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”

![Graph showing the relationship between annual separation rate and employment growth for different age and area categories.](image-url)
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

\[ \Delta_1(\varepsilon'') = \Delta_0(\varepsilon'') \]

\[ \Leftrightarrow \int_{\mathbf{V}' \in M} \tilde{d}(\mathbf{V}', \varepsilon'') \frac{f^1(\mathbf{V}')}{\delta_0} d\mathbf{V}' + \int_{\mathbf{V}' \notin M} \tilde{d}(\mathbf{V}', \varepsilon'') \frac{f^1(\mathbf{V}')}{1 - \delta_0} d\mathbf{V}' = \int_{\mathbf{V}' \in M} \tilde{d}(\mathbf{V}', \varepsilon'') f^0(\mathbf{V}') d\mathbf{V}' + \int_{\mathbf{V}' \notin M} \tilde{d}(\mathbf{V}', \varepsilon'') f^0(\mathbf{V}') d\mathbf{V}' \]

Av. sep. rate for the marginals

Av. sep. rate for the inframarginals

\[ \Leftrightarrow \int_{\mathbf{V}' \in M} \int_{\mathbf{V}''} 1\{S(\mathbf{V}'') < \varepsilon''\} k(\mathbf{V}'', \mathbf{V}') d\mathbf{V}'' f^0(\mathbf{V}') d\mathbf{V}' = \int_{\mathbf{V}' \notin M} \int_{\mathbf{V}''} 1\{S(\mathbf{V}'') < \varepsilon''\} k(\mathbf{V}'', \mathbf{V}') d\mathbf{V}'' f^0(\mathbf{V}') d\mathbf{V}' \]

Av. sep. rate for the marginals

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:

  \[ \Delta^1_i = (1 - \kappa) \times \Delta^0_i + \kappa \times \max \left\{ 0, \frac{1 - \delta^0_i}{1 - \delta^1_i} \cdot \Delta^0_i - \frac{\delta^1_i - \delta^0_i}{1 - \delta^1_i} \right\} \]

  \( \kappa \): weight on persistence model – “which fraction of cells follow which model?”

  - where \( \delta^0_i, \delta^1_i \) are cell-specific REBP-period measured separation rates

\( \Delta^0_i \): 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

<table>
<thead>
<tr>
<th></th>
<th>2-Digit Industry × Occupation Cells</th>
<th>4-Digit Industry × Occupation Cells</th>
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<tbody>
<tr>
<td>( \hat{\kappa} )</td>
<td>-0.0464</td>
<td>-0.123</td>
</tr>
<tr>
<td></td>
<td>(0.087)</td>
<td>(0.077)</td>
</tr>
<tr>
<td>95% CI (Upper Limit)</td>
<td>0.127</td>
<td>0.029</td>
</tr>
<tr>
<td>( N )</td>
<td>109</td>
<td>109</td>
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</table>
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)

⇒ Prevents efficient (re-)bargaining
Conceptual Framework — Non-Coasean Setting

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

$$S^W(V^W, w) = V_{\text{In}}^W + w - V_{\text{Out}}^W \geq 0$$

$$S^F(V^F, w) = V_{\text{In}}^F - w - V_{\text{Out}}^F \geq 0$$

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

Non-Coasean separation probability for a job $V$:

$$\tilde{d}(w, V, \varepsilon') = \int_{(w', V')} \mathbb{1}\left(\tilde{S}^W(w', V') < \varepsilon^W' \vee \tilde{S}^F(w', V') < \varepsilon^F'\right) k((w', V')|(w, V))d(w', V')$$

$k(\cdot|\cdot)$: Markov process guiding evolution of $(w, V)$
Coasean Bargaining

\[ \text{Gross Net of Wage Worker Surplus} = V_{in} - V_{out} \]

\[ \text{Gross Net of Wage Firm Surplus} = V_{in} - V_{out} \]

\[ \text{Quits} \]

\[ \text{Layoffs} \]

\[ \text{Mutual Separations} \]

\[ \text{Feasible Jobs} \]
Initial REBP Effect — Coasean Model

Gross [Net] of Wage Worker Surplus

\[ V_{\text{in}} - V_{\text{out}} + w \]

Gross [Net] of Wage Firm Surplus

\[ V_{\text{in}} - V_{\text{out}} - w \]

Quits

Layoffs

Mutual Separations

Feasible Jobs

\[ -\epsilon_b < 0 \]

\[ W < 0 \]
**Post-REBP — Coasean Model**

\[
\begin{align*}
\text{Gross \[Net\] of Wage Worker Surplus} & = V_{in} - V_{out}^w (+w) \\
\text{Gross \[Net\] of Wage Firm Surplus} & = V_{in}^f - V_{out}^f (-w)
\end{align*}
\]

Quits

Feasible Jobs

(0,0)

Mutual Separations

Layoffs

\(\varepsilon W' = X < 0\)

\(\varepsilon F' = X < 0\)

Former Treatment Group

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

\[
\begin{align*}
\text{Gross [Net] of Wage Worker Surplus} & : V_{in} - V_{out} + w \\
\text{Gross [Net] of Wage Firm Surplus} & : V_{in} - V_{out} - w \\
(0,0) & : \text{Quits} \\
& \quad \quad \quad \text{Layoffs} \\
& \quad \quad \quad \text{Mutual Separations} \\
\end{align*}
\]
Post-REBP — Non-Coasean Model: Largely Firm Surplus Shocks

\[
\text{Gross } [\text{Net}] \text{ of Wage Worker Surplus} \quad V_{in} - V_{out} [+w]
\]

\[
\text{Gross } [\text{Net}] \text{ of Wage Firm Surplus} \quad V_{in} - V_{out} [-w]
\]

Feasible Jobs

Quits

Layoffs

Mutual Separations

Former Treatment Group

Former Control Group
Predicted Post-REBP Comovement of Separation Rates

\[ \text{Separation Rate, Treatment Group} \Delta^1 \]

\[ \text{Separation Rate, Control Group} \Delta^0 \]

\[ (C + N) \]

Non-Coasean, Firm Shock \( \epsilon_F^0 \)

Non-Coasean, Worker Shock \( \epsilon_W^0 \) = Coasean, Any Shock \( \epsilon_F^0, \epsilon_W^0 \)
Predicted Post-REBP Comovement of Separation Rates

**WORKER Surplus Shocks**

\[
\Delta^1, \Delta^0
\]

\[
\varepsilon_W', \varepsilon_W
\]

**FIRM Surplus Shocks**

\[
\Delta^1, \Delta^0
\]

\[
\varepsilon_F', \varepsilon_W
\]
**Horse Race: Two Interpretations**

\[ \Delta^1_i = (1 - \kappa) \times \underbrace{\Delta^0_i}_{\text{Coasean & Reshuffling OR Non-Coasean & Firm Shocks}} + \kappa \times \max \left\{ 0, \frac{1 - \delta^0_i}{1 - \delta^1_i} \cdot \Delta^0_i - \frac{\delta^1_i - \delta^0_i}{1 - \delta^1_i} \right\} \]

\( \kappa \): weight on persistence Coasean model or Non-Coasean/Firm Shocks
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<td>0.124 0.072 0.050 -0.041</td>
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Conclusion

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   • 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
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