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Unemployment Insurance as a Subsidy to Risky Firms

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The views expressed in this work are those of the authors and do not necessarily reflect those of the Banco Central or its members.
Motivation:

- Risk-taking in pursuit for profitable investment opportunities is essential for growth
  - Macro view: firms' idiosyncratic risk is irrelevant in the aggregate
  - Risk-averse worker's view: firm-specific risk is highly relevant

- A wedge in optimal risk-level between the micro (risk-averse) and the macro (risk neutral) views
  - Extensive literature on the manager-shareholder conflict
  - Limited evidence on workers' risk tolerance (despite labor being a key input): One mechanism: unemployment insurance (UI)

- This paper: UI affects labor allocation between safe and risky firms
  - Risky firms hire fewer workers and pay a risk premium with weaker insurance (lower labor supply)
  - Risky firms do worse when UI coverage weakened (UI as a subsidy)
Empirical Challenge:

- **Endogeneity**: How to randomize a firm's risk for a sample of workers?
  - Firm-worker selection – risk preferences or risk compensation (supply vs demand)
- Ideal experiment: multiple firms, shock to a subset of workers (more unemployment risk)

Solution:

- Shock: unanticipated UI reform
  - A subset of workers less insured against unemployment risk
Data:

- Entire population of formal private employment contracts in Brazil – RAIS (Ministry of Labor)
- History of all UI benefit payments (Ministry of Labor)
- Credit registry data on all Brazilian firms (CBB)
- Firms’ cash inflows and outflows at the transaction-level (CBB)
- Natural disasters data (Ministry of Integration)
- Stock Exchange data (Bovespa)
UI System in Brazil

- **Financing**: payroll taxes + taxes on sales and profits (by industry)

- **Eligibility**: depends on the tenure

- **Duration**: 3 - 5 months, depending on the tenure

- **Value of payments**:
  - At least the minimum wage
    - Worker with average salary would receive 70% of the gross wage

- **Penalty**: 10-20% of expected benefits
  - 80% allocated to the worker
Unemployment Benefits Reform

• Sudden announcement: 30-Dec-2014 (Measure MP 665)
Unemployment Benefits Reform

- Important:
  - Nothing changed on the firm's side (taxes, penalties, etc.)
  - Benefit size did not change as well
Identification: Within-Firm:

- **Within-Firm variation**: Control for all firm level shocks
- **Identification**: compare insured vs less insured within the same firm and month
Employment and Wages

Employment

Total Employees

Month

Wages

Wage Growth

Month

- UI Unchanged
- UI Tightened
\[ employment_{igt} = \delta \cdot Affected_{gt} \times Reform_t + \tau_{it} + \tau_{ig} + \epsilon_{igt} \]

### Employment, Hiring, and Wages

<table>
<thead>
<tr>
<th>Dep. Var.:</th>
<th>Employed Workers</th>
<th>Hired Workers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>EmployRate I</td>
<td>HiringRate III</td>
</tr>
<tr>
<td></td>
<td>ln(wage) II</td>
<td>ln(wage) IV</td>
</tr>
</tbody>
</table>

#### Panel A: Basic Tests

<table>
<thead>
<tr>
<th></th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
</tr>
</thead>
<tbody>
<tr>
<td>( Affected_{gt} \times Reform_t )</td>
<td>-0.0295*** (0.0006)</td>
<td>0.0143*** (0.0006)</td>
<td>-0.0046*** (0.0001)</td>
<td>0.0126*** (0.0008)</td>
<td>0.0054*** (0.0007)</td>
</tr>
<tr>
<td>Firm*Affected FE</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Firm*Month FE</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Clustered SE</td>
<td>firm</td>
<td>firm</td>
<td>firm</td>
<td>firm</td>
<td>firm</td>
</tr>
<tr>
<td>Observations</td>
<td>2,926,080</td>
<td>2,855,855</td>
<td>2,926,080</td>
<td>2,159,088</td>
<td>1,853,115</td>
</tr>
<tr>
<td>( R^2 )</td>
<td>0.276</td>
<td>0.984</td>
<td>0.734</td>
<td>0.722</td>
<td>0.238</td>
</tr>
</tbody>
</table>
Firm Risk and Labor Supply

Employment

Wages

Hiring

Hiring Wages

Month

Month

Month

Month

Total Employees

Wage Growth

Hired Workers/Total Workers

Hiring Wage Growth

-0.01

0.01

-0.02

0.00

-0.03

0.00

-0.04

0.00

-0.05

0.00

201401 201407 201501 201507

Month

-0.005

0.005

-0.01

0.015

-0.015

0.015

-0.025

0.025

-0.035

0.035

201401 201407 201501 201507

Month

-0.005

0.005

-0.01

0.01

-0.015

0.015

-0.02

0.02

-0.025

0.025

201401 201407 201501 201507

Month

Safe Firms
Risky Firms
\[ \text{employment}_{igt} = \delta \cdot \text{Affected}_{gt} \cdot \text{Reform}_t + \mu \cdot \text{Risk}_i \cdot \text{Affected}_{gt} \cdot \text{Reform}_t + \tau_{it} + \tau_{ig} + \epsilon_{igt}, \]

**Firm Risk and Labor Supply - Employment**

<table>
<thead>
<tr>
<th>Risk Measure:</th>
<th>Credit Spread</th>
<th>Default Provisions</th>
<th>Layoff Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dep. Var.:</td>
<td>EmployRate I</td>
<td>ln(wage) II</td>
<td>EmployRate III</td>
</tr>
<tr>
<td><strong>Panel A: Main Tests</strong></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>\text{Affected}_{gt} \cdot \text{Reform}_t</td>
<td>-0.0143*** (0.0015)</td>
<td>0.0104*** (0.0013)</td>
<td>-0.0197*** (0.0016)</td>
</tr>
<tr>
<td>\text{Affected}_{gt} \cdot \text{Reform}_t \cdot \text{Risk}_i</td>
<td>-0.0032*** (0.0002)</td>
<td>0.0012*** (0.0002)</td>
<td>-0.0017*** (0.0003)</td>
</tr>
<tr>
<td>Firm*Affected FE</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Firm*Month FE</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Clustered SE</td>
<td>firm</td>
<td>firm</td>
<td>firm</td>
</tr>
<tr>
<td>Observations</td>
<td>2,274,624</td>
<td>2,238,801</td>
<td>2,274,624</td>
</tr>
<tr>
<td>R²</td>
<td>0.926</td>
<td>0.984</td>
<td>0.926</td>
</tr>
</tbody>
</table>
\[
\text{employment}_{igt} = \delta \cdot \text{Affected}_{gt} \cdot \text{Reform}_t + \mu \cdot \text{Shocked}_{it} \cdot \text{Affected}_{gt} \\
+ \gamma \cdot \text{Shocked}_{it} \cdot \text{Affected}_{gt} \cdot \text{Reform}_t + \tau_{it} + \tau_{ig} + \epsilon_{igt},
\]

**Exogenous Shocks to Firm Risk**

<table>
<thead>
<tr>
<th>Dep. Var.:</th>
<th>Employed Workers</th>
<th>Hired Workers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>EmployRate</td>
<td>ln(wage)</td>
</tr>
<tr>
<td></td>
<td>I</td>
<td>II</td>
</tr>
<tr>
<td><strong>Panel A: Worker Age Groups</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( \text{Affected}_{gt} \cdot \text{Reform}_t )</td>
<td>-0.0044***</td>
<td>0.0067***</td>
</tr>
<tr>
<td></td>
<td>(0.0001)</td>
<td>(0.0007)</td>
</tr>
<tr>
<td>( \text{Affected}<em>{gt} \cdot \text{Shocked}</em>{it} )</td>
<td>0.0006***</td>
<td>-0.0030***</td>
</tr>
<tr>
<td></td>
<td>(0.0001)</td>
<td>(0.0011)</td>
</tr>
<tr>
<td>( \text{Affected}_{gt} \cdot \text{Reform}<em>t \cdot \text{Shocked}</em>{it} )</td>
<td>-0.0021***</td>
<td>0.0093***</td>
</tr>
<tr>
<td></td>
<td>(0.0002)</td>
<td>(0.0017)</td>
</tr>
<tr>
<td>Firm*Affected FE</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Firm*Month FE</td>
<td>yes</td>
<td>yes</td>
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<tr>
<td>Age Group*Month FE</td>
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<tr>
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<td>firm</td>
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<tr>
<td>Observations</td>
<td>17,556,480</td>
<td>14,013,251</td>
</tr>
<tr>
<td>( R^2 )</td>
<td>0.520</td>
<td>0.772</td>
</tr>
</tbody>
</table>
\[ \Delta \text{firm risk}_{jt} = \delta \cdot \text{Affected}_{jt} \cdot \text{Reform}_t + \tau_{it} + \tau_{ig} + \epsilon_{jt} \]

Firm Risk and Labor Supply - Job Transitions

<table>
<thead>
<tr>
<th>Dep. Var.: ( \Delta \text{firm risk} )</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
<th>VI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk Measure:</td>
<td>Credit Spreads</td>
<td>Default Provisions</td>
<td>Layoff Risk</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>( \text{Affected}_{jt} \cdot \text{Reform}_t )</td>
<td><img src="value" alt="Value" /></td>
<td><img src="value" alt="Value" /></td>
<td><img src="value" alt="Value" /></td>
<td><img src="value" alt="Value" /></td>
<td><img src="value" alt="Value" /></td>
<td><img src="value" alt="Value" /></td>
</tr>
<tr>
<td>( \text{Affected}_{jt} \cdot \text{Reform}_t \cdot \text{Risk}_i )</td>
<td><img src="value" alt="Value" /></td>
<td><img src="value" alt="Value" /></td>
<td><img src="value" alt="Value" /></td>
<td><img src="value" alt="Value" /></td>
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<tr>
<td>Firm*Treated FE</td>
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<td>yes</td>
</tr>
<tr>
<td>Firm*Month FE</td>
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<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Clustered SE</td>
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<td>firm</td>
<td>firm</td>
<td>firm</td>
<td>firm</td>
<td>firm</td>
</tr>
<tr>
<td>Observations</td>
<td>629,128</td>
<td>629,128</td>
<td>629,128</td>
<td>629,128</td>
<td>765,557</td>
<td>765,557</td>
</tr>
<tr>
<td>( R^2 )</td>
<td>0.704</td>
<td>0.704</td>
<td>0.707</td>
<td>0.707</td>
<td>0.711</td>
<td>0.711</td>
</tr>
</tbody>
</table>
Cumulative Abnormal Returns by Firm Risk

Credit Spread

Default Provisions

Layoff Risk

\( CAR_i \)

- black: above median
- gray: below median
\[ CAR_i = \alpha + \delta \cdot Risk_i + \epsilon_i \]

### Unemployment Insurance and Firm Value

<table>
<thead>
<tr>
<th>Risk Measure:</th>
<th>I (Credit Spread)</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
<th>VI</th>
<th>VII</th>
<th>VIII</th>
<th>IX</th>
</tr>
</thead>
<tbody>
<tr>
<td>( Risk_i )</td>
<td>-1.72*** (0.48)</td>
<td>-1.72** (0.54)</td>
<td>-2.02** (0.69)</td>
<td>-1.19 (0.93)</td>
<td>-1.23 (0.86)</td>
<td>-2.35** (0.95)</td>
<td>-1.83*** (0.52)</td>
<td>-2.07*** (0.62)</td>
<td>-2.38** (0.85)</td>
</tr>
<tr>
<td>Observations</td>
<td>140</td>
<td>127</td>
<td>111</td>
<td>140</td>
<td>127</td>
<td>111</td>
<td>155</td>
<td>140</td>
<td>121</td>
</tr>
<tr>
<td>( R^2 )</td>
<td>0.031</td>
<td>0.031</td>
<td>0.042</td>
<td>0.012</td>
<td>0.013</td>
<td>0.044</td>
<td>0.028</td>
<td>0.036</td>
<td>0.046</td>
</tr>
</tbody>
</table>
Conclusion

In this paper we examine the role of unemployment insurance for the allocation of labor

• **UI and employment:**
  • Workers with weaker insurance are employed (hired) by 3 (.5) percent less
  • Salaries increase by roughly 1.5 percent for workers with less generous insurance

• **Firm Risk:** riskiest firms vs safest firms
  • Employ by 2.2 percent fewer workers and pay by 1.8 percent higher wages
  • Hire by 4.5 percent less and pay by 0.7 percent more in hiring wages

• **Real effects:** after the reform, riskier firms:
  • Have lower cash flows
  • Employ fewer workers
  • Have more delinquent debt

• **Policy implications:** safe firms subsidize risky firms through UI (experience rating mechanism?)