Corporate Leverage and Employees’ Rights in Bankruptcy

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Motivation

- Conflict between labor and capital (shareholders, creditors) over the surplus $S$ produced by the firm
- For a start, take an all-equity firm with revenue $R$
- If $W_0$ is the reservation wage, and the labor force is standardized to 1, the firm’s surplus is

$$S = R - W_0 = \underbrace{R - W}_{\text{profits}} + \underbrace{W - W_0}_{\text{quasi-rents}}$$

- With Nash bargaining and union’s bargaining power $\alpha$, the wage is:

$$W = W_0 + \alpha (R - W_0)$$
Strategic Value of Leverage

- With debt, surplus $S$ is divided in **three** cash flows:
  - shareholders (residual claimants)
  - creditors
  - workers
- If the firm issues debt $D$ and pays its value $V_D$ to shareholders before bargaining with unions, it reduces the surplus $S$ on the bargaining table $\Rightarrow$ reduces the wage:

\[ W = W_0 + \alpha (R - W_0 - D) \]

$\Rightarrow$ the greater unions’ power, the greater debt’s strategic value: Baldwin (1983), Bronars & Deere (1991), Perotti and Spier (1993), Matsa (2010), etc.
Key Tacit Assumptions So Far

- All previous work in this area tacitly assumes that

1. employees’ claim to unpaid wages, severance pay and social security contributions are junior to other debt in bankruptcy liquidation procedures: otherwise their claim could not be diluted by issuing debt (at least not entirely)

2. workers cannot renegotiate this claim with creditors if the firm is restructured rather than liquidated: again, if they have any bargaining power in such ex post renegotiation, their claim would not be diluted by ex ante debt issuances

- Yet these assumptions are not universally true: the legal standing of employees in bankruptcy differs a lot across countries. This is the starting point of our work
Corporate Leverage and Employees' Rights in Bankruptcy

**Employee Seniority in a Strategic Debt Model**

**Time line:**

- **Stage 1:** Debt $D$ is chosen
- **Stage 2:** Workers are hired, expecting $E(W) \geq W_0$
- **Stage 3:** Hired workers (re)negotiate wage $W$
- **Stage 4:** Revenue $R$ is realized
- **Stage 5:**
  - Solvency:
    - (i) Creditors are fully repaid,
    - (ii) Workers are paid the agreed wage $W$,
    - (iii) Shareholders receive profits
  - Insolvency:
    - (i) Bankruptcy costs $C$ are paid,
    - (ii) Workers and creditors split $R+A$ based on seniority
Key Assumptions

- All players are risk neutral, with no discounting.

- At wage bargaining stage \((t = 3)\), negotiation occurs via take-it-or-leave-it offers, according to the random proposer model: with prob. \(\alpha\) union sets set \(W = W_u\), with prob. \(1 - \alpha\) firm sets \(W = W_f\).

- At final stage \((t = 4)\), when creditors and workers are to be paid,
  - in solvency states, workers are paid the agreed wage \(W\).
  - in default states, workers are senior to other creditors for a fraction \(\theta\) of the wage, junior for fraction \(1 - \theta\).
Revenue, Wages and Bankruptcy

- Revenue is uniformly distributed: $\tilde{R} \sim U(0, \bar{R}) \Rightarrow E(\tilde{R}) = \bar{R} / 2$

- Production is efficient: $E(\tilde{R}) - W_0 > 0$

- Bankruptcy occurs if $A + \tilde{R} < D + W$, and entails cost $C$

- The firm sets $W_f$ so that in expectation it equals $W_0 \Rightarrow$ just meets the workers’ participation constraint (PC)

- The union sets $W_u$ so as to maximize the expected income of employees, in both solvency and bankruptcy states
Workers’ Income with Union-set Wage ($W_u$)

Graph showing the workers’ income ($\tilde{Y}_u$) with different wage levels ($W_u$) and their associated income levels ($\theta W_u$). The graph is divided into an Insolvency region and Solvency region, with firm’s resources $\tilde{X} = A + \tilde{R}$.
Response of Leverage to Changes in the Value of Assets or Expected Revenue

- Optimal leverage will balance debt’s strategic value with the expected bankruptcy costs.
- If $\theta < 1$, the firm will raise its debt more in response to increases in $A$ and in $E(R)$ if:
  1. workers’ seniority ($\theta$) is high
  2. union power ($\alpha$) is high
- Intuition:
  - If the available surplus increases, workers bargain more aggressively for a share of it if they have high seniority or unions are strong.
  - The firm wants to issue more debt in response to the increase in surplus if it is in a country where workers have high seniority or unions are strong.
Allowing for Debt Renegotiation

- In the baseline model, in bankruptcy creditors are assumed to simply cash the firm’s value, net of bankruptcy costs $C$ and of the senior portion of workers’ wages $\theta W$.

- But if creditors are not dispersed, they have the incentive to restructure the firm, avoiding the bankruptcy cost $C$.

- To do so, they may have to renegotiate with workers: the split of the bankruptcy cost saving will depend on the workers’ bargaining power $\beta$ at renegotiation stage.

- Higher $\beta \Rightarrow$ workers expected to take more surplus from creditors in bankruptcy $\Rightarrow$ lower firm’s debt capacity $\Rightarrow$ lower debt (while $\alpha$ raises debt issuance for strategic reasons).
Suppose employees have no seniority but are protected by public insurance: they receive a fraction $\gamma$ of the agreed salary $W$ in bankruptcy states.

Then the optimal salary set by the union is increasing in $\gamma$.

Additional motive to issue strategic debt: the optimal debt level is increasing in insured fraction $\gamma$ and in union power $\alpha$, consistently with Agrawal and Matsa (2010).

Moreover, the sensitivity of optimal debt to the firm’s expected revenue is increasing in the insured fraction $\gamma$ of the wage: again, important for our empirical tests.
Testable Predictions of the Strategic Debt Model

- Focus on predictions of this model concerning the sensitivity of leverage to the firm’s asset value and/or revenue (relevant for our empirical strategy)

- This sensitivity is larger when employees have:
  - stronger seniority rights $\theta$
  - greater bargaining power $\alpha$ in wage negotiations
  - lower bargaining power $\beta$ in firm restructuring
  - better public insurance $\gamma$ in bankruptcy

- How specific are these predictions to the strategic debt model? To answer this question, we consider an alternative model...
Alternative Model: Non-Strategic Debt Issuance by Constrained Firms

- Suppose that debt is issued:
  - after wage bargaining ⇒ cannot be used strategically
  - to fund a profitable and scalable investment whose revenue cannot be pledged ⇒ firm can pledge only existing assets $A$ and revenue $R$ to fund it

- The firm invests all the money it can raise = choose the face value of debt $D$ to maximize the market value of debt $V_D$

- In this situation, higher employee seniority and/or bargaining power lowers the firm’s debt capacity

- So higher $\theta$ and $\alpha$ lower the response of $D$ to changes in asset value or revenue: **opposite to strategic debt model!**
Workers’ Protection in Bankruptcy around the World

- There is considerable cross-country variation in
  - workers’ seniority in bankruptcy law ($\theta$)
  - protection of their rights in reorganization procedures ($\beta$)
  - government guarantees ($\gamma$)

- We collect data on these items via
  - questionnaires to Lex Mundi law firms (mainly for OECD countries)
  - information drawn from the web (mainly for non-OECD countries)

- Important: these indicators have low correlation with EPL, which we use as a proxy of union power $\alpha$ (as done by Simintzi et al., 2015)
Measuring $\theta$: Worker Seniority in Bankruptcy

- Worker seniority in liquidation differs across countries.
- We looked at the rank of workers’ claims relative to the following claim classes:
  - secured debt (e.g. real estate mortgage loans)
  - expenses of the bankruptcy procedure
  - post-petition credit extended to debtor
  - unpaid taxes
  - unsecured debt
- Define workers’ seniority from 1 to 5, so that 1 = they are treated as unsecured creditors, 5 = they are the most senior.
Measuring $\theta$: Worker Seniority in Bankruptcy

Significant cross-country variation in ranking of workers in the case of bankruptcy procedures: first in France, Mexico, Brazil, last in Finland and Germany.
Measuring $\beta$: Workers’ Rights in Debt Renegotiation

- Two different measures. The first is based on the following summary question: “Can the reorganization plan impair the claims of employees without their consent?”

- The second measure is based on a series of detailed questions:
  1. Can collective bargaining agreements previously entered into by the debtor be modified by the reorganization plan?
  2. Must employees’ representatives be informed of the plan?
  3. Must the plan be proposed to employees’ representatives for approval?
  4. If the employees do not approve the plan, can it still be carried out if authorized by court (possibly in a modified version)?
## Employee Seniority and Rights in Bankruptcy around the World

<table>
<thead>
<tr>
<th>Country</th>
<th>Workers’ Seniority</th>
<th>Government Insurance Fund (Salary)</th>
<th>Impairment of Workers’ Rights in Reorganization</th>
<th>Workers’ Rights in Reorganization</th>
<th>Ease of Renegotiation</th>
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Empirical Analysis

- We use these data to estimate the following specification:

\[ D_{ijt} = \lambda_0 S_{ijt-1} + \lambda_1 \theta_c S_{ijt-1} + \lambda_2 \beta_c S_{ijt-1} + \lambda_3 \alpha_c S_{ijt-1} \]
\[ + \delta' X_{ijt-1} + \phi' X_{ct} + \mu_i + \mu_t + \varepsilon_{ijt} \]

where \( S_{ijt-1} \) = firm j’s “surplus” = variable capturing assets’ value or cash flow of firm i in industry j at time \( t-1 \)

- Recall that the strategic debt model predicts:

\[ \lambda_1 > 0, \ \lambda_2 < 0, \ \lambda_3 > 0 \]

- Instead, the debt-constrained investment model predicts:

\[ \lambda_1 < 0, \ \lambda_2 < 0, \ \lambda_3 < 0 \]
Measuring the Firm’s Surplus $S$

- **Market value of the firm’s real estate:**
  1. Land only: historical cost valuation of land of each firm in the first year in which it appears in our data set
  2. Land and buildings: also includes the valuation of buildings adjusted for their accumulated depreciation

- **Firm profitability:** for a subset of 928 firms that operate in extraction and mining, we instrument their ROA with the price index of the commodity that they produce, to avoid endogeneity (similar to Bertrand and Mullainatdahn, 2001)
Company and Price Data

- Merge these indicators of workers’ protection in bankruptcy with company-level data from Worldscope (non-US companies) and from Compustat (US companies) in 1988-2013

- Exclude financials and utilities; require at least 9 years of data

- Left with data for 12,445 firms from 28 countries \( \Rightarrow 205,192 \) firm-year observations

- Real estate prices are from the BIS database and commodity are from Bloomberg
Leverage and Workers’ Rights in Bankruptcy: Real Estate Value

As real estate becomes more valuable, leverage increases more in countries with high workers’ rights.

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<tbody>
<tr>
<td>Real Estate Valuation × Workers’ Seniority</td>
<td>0.2311***</td>
<td>0.2162**</td>
<td>0.2803***</td>
<td>0.2508***</td>
<td>0.2007***</td>
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<td>(2.81)</td>
<td>(2.56)</td>
<td>(3.90)</td>
<td>(3.72)</td>
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<td>Real Estate Valuation × Workers’ Bargaining Power</td>
<td>0.1805**</td>
<td>0.1618**</td>
<td>0.2219**</td>
<td>0.1990**</td>
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<td>(2.09)</td>
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<tr>
<td>Real Estate Valuation × Workers’ Rights in Reorganization</td>
<td>-0.1380*</td>
<td>-0.1109</td>
<td>-0.1490**</td>
<td>-0.1328*</td>
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<td></td>
<td>(-1.82)</td>
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<td>Real Estate Valuation × Government-provided Insurance</td>
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<td>(0.98)</td>
<td>(1.42)</td>
<td>(1.35)</td>
<td>(1.18)</td>
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Workers’ Seniority: 0.0302** (1.77)
Workers’ Bargaining Power: -0.0206** (-2.37)
Workers’ Rights in Reorganization: -0.0140 (-1.02)
Real Estate Valuation: 0.2531*** (3.73)

Firm-level Controls: Yes
Country-level Controls: Yes
Fixed Effects: Industry-Year
Year Fixed Effects: Yes
R²: 0.45
Number of Observations: 205,192
Leverage and Workers’ Rights in Bankruptcy: Profits in Mining and Extraction Firms

As profitability (instrumented with commodity prices) increases, leverage increases more in countries with high workers’ rights.

<table>
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<td>Profitability × Workers’ Seniority</td>
<td>0.1683***</td>
<td>0.1780***</td>
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Conclusions

- Workers’ rights in bankruptcy differ widely around the world
- The strength of these rights should
  - increase the strategic value of debt ⇒ increase responsiveness of debt to increases in firms’ asset value and profitability
  - reduce the debt capacity of constrained firms ⇒ lower responsiveness of debt to increases in asset value and profitability
- Empirically, we find that:
  - firms’ real estate gains are associated with a greater increase in leverage in countries where employees have stronger seniority in liquidation and weaker rights in debt renegotiation
  - in a subsample of mining and extraction companies, changes in profitability arising from changes in commodity prices are associated with a similar differential response of leverage depending on workers’ rights in bankruptcy