Labor in the Boardroom

Simon Jäger       Benjamin Schoefer       Jörg Heining

NBER Corporate Finance

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Shareholder vs. Stakeholder Control of Firms: Worker Representation

- Liberal market economies (Hall and Soskice, 2001):
  - Owners (e.g., shareholders) control firms
  - Example: United States
    - Shareholders elect board of directors
      - Runs firm, fiduciary duty to shareholders
  - Alternative model: owners and stakeholders – e.g. workers – share governance of firms
    - Ex: Germany, Finland, Sweden
      - Formal control rights: workers have votes on corporate boards alongside owners
    - Differs from, e.g., employee ownership (no claim to profits)

- Recent policy proposals in the United States
  - Accountable Capitalism Act (40% of worker-elected directors)
  - Reward Work Act (1/3 worker-elected directors)

- This paper: assess empirical effects of shared governance
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Potential Effects of Shared Governance

- **Worker voice**
  - Information exchange, productivity ↑, turnover ↓
  - Ability to enforce implicit contracts, e.g., through better information

- **Ideal experiment:** randomly assign firms to shared governance

- Existing evidence compares large vs. small firms (Gorton and Schmid, 2004, Lin et al., 2018, and Kim et al., 2018)
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  ⇒ Worker bargaining power ↑ ⇒ wages ↑ and investment ↓
  Grout (1984)

  ⇒ Shareholder values view: codetermination as agency cost leading to disinvestment
  Jensen and Meckling (1979)
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Overview

• Basic Model of Hold-Up, and Beyond
• Institutions, Reform, and Research Design
• Empirical Results
• Discussion
Basic Idea of Hold-Up

Essence of hold-up: (i) wage bill $W$ is endogenous to $K$ and (ii) capital $K$ is sunk when setting wages!

$$\max_{K} F(K, \bar{L}) - W(\bar{L}, K) - cK \quad \Rightarrow \quad F_{K}(K^{*}, \bar{L}) = c + \frac{\partial W(\bar{L}, K)}{\partial K^{*}}$$
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Stage 2: Wage bargaining, e.g. Nash with worker bargaining power $\phi$ and outside option $b\bar{L}$:

Workforce Surplus $= W - b\bar{L}$

Firm Surplus $= F(K, \bar{L}) - W$

$\Rightarrow W^*(\bar{L}, K) = b\bar{L} + \phi (F(K, \bar{L}) - b\bar{L})$

$\Rightarrow \frac{\partial W^*(\bar{L}, K)}{\partial K} = \phi F_K$
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$$\max_K F(K, \bar{L}) - W(\bar{L}, K) - cK \quad \Rightarrow \quad F_K(K^*, \bar{L}) = c + \frac{\partial W(\bar{L}, K)}{\partial K^*}$$

Stage 2: Wage bargaining, e.g. Nash with worker bargaining power $\phi$ and outside option $b\bar{L}$:

Workforce Surplus = $W - b\bar{L}$ \quad Firm Surplus = $F(K, \bar{L}) - W$

$$\Rightarrow W^*(\bar{L}, K) = b\bar{L} + \phi (F(K, \bar{L}) - b\bar{L}) \quad \Rightarrow \quad \frac{\partial W^*(\bar{L}, K)}{\partial K} = \phi F_K$$

Stage 1: anticipating wage bargaining, owners select lower $K^*$ than a wage-taking firm ($\phi = 0$):

$$\Rightarrow F_K(K^*, \bar{L}) = c \cdot \left(1 + \frac{\phi}{1 - \phi}\right)$$

Hold-up view of shared governance: $\phi \uparrow \Rightarrow K^* \downarrow$
Firm-level hold-up:

Upon gaining control of the firm the workers will begin “eating it up” by transforming the assets of the firm into consumption or personal assets.

Macro consequences:

It will become difficult for the firm to obtain capital in the private capital markets. [...] The result of this process will be a significant reduction in the country’s capital stock, increased unemployment, reduced labor income, and an overall reduction in output and welfare.
Overview

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- Empirical Results
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Governance Without Worker Representation
Shared Governance With Worker Representation
Governance With and Without Worker Representatives
Worker Representation for Shareholder Corporations (Pre-Reform)

Note: rules for shareholder corporations \( \leq 500 \) employees. \( 1/3 \) for both groups above 500 employees.

Incorporation Date

Worker Share on Board

Abolition in new corporations

Note: rules for shareholder corporations ≤500 employees. 1/3 for both groups above 500 employees.
1994 Reform: Lock-in of Shared Gov. in Old Corporations

Permanent lock-in
Abolition in new corporations

Worker Share on Board

Incorporation Date


08/10/94 Incorporation Date

Note: rules for shareholder corporations ≤500 employees. 1/3 for both groups above 500 employees.
1994 Reform: Last-Minute Political Compromise

- **Permanent lock-in**
- Abolition in new corporations

**Overview**

- **June 1994**
- **01/3 Worker Share on Board**

**Incorporation Date**

- 08/10/94

**Note:** rules for shareholder corporations ≤ 500 employees. 1/3 for both groups above 500 employees.
Research Design: Shareholder Corps. Incorporated Before/After

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Research Design: Non-Shareholder Corporations As Control Group

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Research Design: Non-Shareholder Corporations As Control Group

Note: rules for shareholder corporations ≤500 employees. 1/3 for both groups above 500 employees.
Research Design: Difference-in-Differences

\[ \Delta \text{DiD} = \Delta \text{Shareholder} \Delta \text{Old-Young} - \Delta \text{Non-Sh.} \Delta \text{Old-Young} \]

Note: rules for shareholder corporations \( \leq 500 \) employees. \( 1/3 \) for both groups above 500 employees.
Difference-in-Difference Design: Regression Specification

\[ Y_{ft} = \alpha + \beta \cdot 1(\text{IncDate}_f < 8/10/94) + \gamma \cdot \text{ShareholderC}_f \]

\[ + \phi_Y \cdot 1(\text{IncDate}_j < 8/10/94) \times \text{ShareholderC}_f + X'_{ft} \delta + \epsilon_{ft} \]

Locked Into Shared Governance

\( \phi_Y \): effect of shared governance: 1/3 vs. 0 share

- Placebo reforms in 1998 and 2002

\( X_{jt} \): Year, industry, \textbf{industry-by-year} effects

- Main specification: two-year bandwidth (robustness: one, three)
- Standard errors: clustered, firm level
- Winsorization: 1\% level (robustness: other no/wider)
Data

1. Bureau van Dijk’s Orbis Historical
   - Corporate financial and production data based on official registers and company reports
   - See firms during "adult years"

2. Universe of German social security records
   - Matched employee-employee data matched to Orbis

   Additional data sources:
   - Mannheim Enterprise Panel (all incorporations and exits for our legal forms starting 1991)
     - Document no effects on survival/exit/attrition
     - Can then confidently study "adult" outcomes using BvD data with future years
     - Next: assess selection

   - Hoppenstedt Aktienführer (listed corporations)
McCrory Test of Incorporations of Shareholder Corporations

Incorporation Date Relative To August 10, 1994 (Months)

Discontinuity estimate: 0.2610 (0.4385)
No Differential Selection Into Shareholder Corporations

Incorporation Date Relative To August 10, 1994 (Months)

Proportion AG (Percentage Points)
No Detectable Effects on Industry Composition ($p = 0.97$)
Worker Representation by Incorporation Date

Note: only listed firms (Hoppenstedt Aktienführer) with fewer than 500 employees.
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Roadmap for Empirical Results

1. Supervisory and Executive Board Composition
2. Production and Capital Effects
3. Workforce Composition
4. Wages
5. Financial Outcomes
6. Profitability
7. Firm Survival
Roadmap for Results

1. Supervisory and Executive Board Composition
2. Production and Capital Effects
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Share of Nobility Titles among Supervisory Board Members

Old Shareholder

Share Nobility in Supervisory Board (%)
Presence of Nobility Titles among Supervisory Board Members

<table>
<thead>
<tr>
<th>Share Nobility in Supervisory Board (%)</th>
<th>Old Shareholder</th>
<th>Young Shareholder</th>
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<tbody>
<tr>
<td>0.51</td>
<td>1.5</td>
<td></td>
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<tr>
<td>1.5</td>
<td></td>
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<tr>
<td>2</td>
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</tr>
</tbody>
</table>
Lower Presence of Nobility Titles among Supervisory Board Members

![Bar chart showing share nobility in supervisory board across different categories: Old Shareholder, Old Non-Sh., Young Shareholder, Young Non-Sh.]

- Old Shareholder: Low share nobility
- Old Non-Sh.: Moderate share nobility
- Young Shareholder: High share nobility
- Young Non-Sh.: Moderate share nobility

The chart illustrates a disparity in the presence of nobility titles among supervisory board members, with younger shareholders showing a higher proportion compared to older shareholders.
Composition of Supervisory Board

- Nobility (x10) vs. Share (x10)
  - Supervisory Board: 0.023, 0.083, 0.125, 0.350, 0.231, 0.570
Composition of Supervisory Board and Executive Board (C-Suite)

- Share Nobility (x10)
- Share Women
- Share PhD/Profs

<table>
<thead>
<tr>
<th>Supervisory Board</th>
<th>Executive Board</th>
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<tr>
<td>0.023</td>
<td>0.083</td>
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<tr>
<td>0.125</td>
<td>0.350</td>
</tr>
<tr>
<td>0.231</td>
<td>0.570</td>
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Roadmap for Results

1 Supervisory and Executive Board Composition

2 Production and Capital Effects

3 Workforce Composition

4 Wages

5 Financial Outcomes

6 Profitability

7 Firm Survival
Firm Scale

Log Revenue

1994 Reform

Ctrl Mean 14.018
Firm Scale

Log Revenue

Log Val. Added

1994 Reform

Ctrl Mean 14.018

14.978
Firm Scale

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<th>Ctrl Mean-1-.50.51 Log Revenue Log Val. Added Log Emp (Orbis)</th>
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1994 Reform
<table>
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<tr>
<th>Metric</th>
<th>1994 Reform</th>
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<tr>
<td>Log Revenue</td>
<td>14.018</td>
</tr>
<tr>
<td>Log Val. Added</td>
<td>14.978</td>
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<tr>
<td>Log Emp (Orbis)</td>
<td>4.288</td>
</tr>
<tr>
<td>Log Fixed Assets</td>
<td>13.726</td>
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</table>


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<tr>
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<th>1994 Reform</th>
<th>1998 Placebo Reform</th>
<th>2002 Placebo Reform</th>
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<tr>
<td>Log Tang. Assets</td>
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Ctl Mean: 14.018
More Assets Per Worker

<table>
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<th></th>
<th>Ctrl Mean</th>
<th>-0.5</th>
<th>-0.5</th>
<th>0</th>
<th>0.5</th>
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<tr>
<td>Fixed Assets</td>
<td>10.022</td>
<td>8.119</td>
<td>9.170</td>
<td>9.863</td>
<td>6.849</td>
<td>0.300</td>
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<tr>
<td>EUR 10k per</td>
<td></td>
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<tr>
<td>Worker Fixed</td>
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Ctrl Mean 10.022

9.170
Higher Value Added Per Worker

1994 Reform

Ctrl Mean 10.022 8.119 9.170 9.863 6.849 0.300 0.435

No Detectable Effect on TFP

1994 Reform

Ctrl Mean: 10.022, 8.119, 9.170, 9.863, 6.849
**Higher Capital Share**

<table>
<thead>
<tr>
<th></th>
<th>Ctrl Mean</th>
<th>1994 Reform</th>
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<tbody>
<tr>
<td>Fixed Assets / Emp.</td>
<td>10.022</td>
<td>8.119</td>
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<td>VA / Emp.</td>
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<td>Log VA / Emp.</td>
<td>9.863</td>
<td>6.849</td>
</tr>
<tr>
<td>TFP (Fixed A.)</td>
<td>6.849</td>
<td>0.300</td>
</tr>
<tr>
<td>Capital Share</td>
<td>0.300</td>
<td>0.435</td>
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</tbody>
</table>

![Graph showing the impact of the 1994 Reform on various economic indicators such as Fixed Assets, VA, Log FA, Log VA, TFP, and Capital Share. The graph compares the control mean values with the reform values, indicating changes in these indicators post-reform.](image-url)
Inhouse Share of Production (Value Added Divided by Revenue)

Ctrl Mean
-0.5
0
0.5
1

EUR 10k per Worker

Fixed Assets / Emp.
VA / Emp.
Log FA / Emp.
Log VA / Emp.
TFP (Fixed A.)
Capital Share / Revenue

1994 Reform

Ctrl Mean 10.022 8.119 9.170 9.863 6.849 0.300 0.435
Production: Actual Reform and Placebo Reforms: 1998 and 2002

<table>
<thead>
<tr>
<th>Variable</th>
<th>1994 Reform</th>
<th>1998 Placebo Reform</th>
<th>2002 Placebo Reform</th>
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Ctrl Mean 10.022

1994 Reform 8.119

1998 Placebo Reform 9.170

2002 Placebo Reform 9.863

TFP (Fixed A.) 6.849

Capital Share 0.300

VA / Revenue 0.435
Roadmap for Results

1. Supervisory and Executive Board Composition
2. Production and Capital Effects
3. Workforce Composition
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6. Profitability
7. Firm Survival
More on the Production Function: Workforce Composition

<table>
<thead>
<tr>
<th>Workforce Category</th>
<th>Ctrl Mean</th>
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<tbody>
<tr>
<td>Outsource-able (FSCL)</td>
<td>0.023</td>
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<tr>
<td>% Qualified Manual</td>
<td>0.171</td>
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<tr>
<td>Low-Skilled %</td>
<td>0.127</td>
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<tr>
<td>Med-Skilled %</td>
<td>0.593</td>
</tr>
<tr>
<td>High-Skilled %</td>
<td>0.261</td>
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</tbody>
</table>
Roadmap for Results

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Wages

Ctrl Mean: 4.712

Log Mean Wage

-0.05 0.05 0.1 0.15

Wages
Wages

Log Mean Wage
AKM Firm Effects

Ctrl Mean:  4.712
0.528
4.400
4.618
4.833
0.129
Wages: No Evidence for Pay Compression

<table>
<thead>
<tr>
<th>Metric</th>
<th>Ctrl Mean</th>
<th>AKM Firm Effects</th>
<th>Log Wage, 25th Pct</th>
<th>Log Median Wage</th>
<th>Log Wage, 75th Pct</th>
<th>% Above SS Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Log Mean Wage</td>
<td>4.712</td>
<td>0.528</td>
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</table>
Rent-Sharing: Firm Effects and Value Added

Slope: 0.088 (SE 0.004)

\[ \text{Firm FE (ln Wages)} \]

\[ \text{ln(Value Added / Worker)} \]
No Differential Rent-Sharing

DiD Estimate: 0.002 (SE 0.024)

Firm FE (ln Wages)

ln(Value Added / Worker)

Old Shareholder Corp.
New Shareholder Corp.
Old Non-Shareholder Corp.
New Non-Shareholder Corp.
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Financial Outcomes

<table>
<thead>
<tr>
<th>Liab./Total A.</th>
<th>Leverage</th>
<th>Cost of Debt</th>
<th>Long-term Debt/Total Debt (Log)</th>
<th>Cash/Total A.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.570</td>
<td>0.278</td>
<td>0.167</td>
<td>0.733</td>
<td>0.175</td>
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1994 Reform

Ctrl Mean 0.570

0.278

0.167

0.733

0.175

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<td>Long-term Debt</td>
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<tr>
<td>Cash /Total A.</td>
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Cost of Debt: 1994 Reform = 0.733, 1998 Placebo Reform = 0.175
Roadmap for Results

1. Supervisory and Executive Board Composition
2. Production and Capital Effects
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7. Firm Survival
No Detectable Effect on Profits

<table>
<thead>
<tr>
<th></th>
<th>EBITDA/Rev</th>
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<th>EBITDA/Equity (/10)</th>
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<td>1994 Reform</td>
<td>0.019</td>
<td>-0.024</td>
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<td>0.003</td>
<td>0.085</td>
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<td>Ctrl Mean</td>
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No Detectable Effect on Profits

Ctrl Mean -0.10.1.2

EBITDA/Rev
EBIT/Rev
EBITDA/Equity (/10)
EBIT/Equity (/10)
EBITDA/Total A.
EBIT/Total A.

1994 Reform
1998 Placebo Reform
2002 Placebo Reform

Ctrl Mean 0.019
-0.024
0.019
0.003
0.085
0.051
Overview

• Basic Model of Hold-Up, and Beyond
• Institutions, Reform, and Research Design
• Empirical Results
• Discussion
Effects of Shared Governance: Summary

- Increases capital stock and capital intensity
- Moderate shift towards higher-skilled and technical occupations
- Higher VA per worker, but no shift in TFP
- No evidence for large wage increases
- No evidence for effects on leverage, profitability
Interpretation

Hold-up hypothesis – disinvestment – empirically rejected for this specific institution, in this specific context, and “on net"

What may account for positive effects on investment?

- Model variant: bargaining over wages and investment
  See paper; also Manning (1987)

- Worker reps may have long horizons and preference for investment

- Shared governance may lead to more cooperative solutions
  Lancaster (1973), van der Ploeg (1987)
Worker Representative Views

Hold-up hypothesis e.g. Jensen and Meckling (1979):

Upon gaining control of the firm the workers will begin “eating it up” by transforming the assets of the firm into consumption or personal assets.

Berthold Huber, IG Metall (Metalworker’s Union), 2004:
Worker Board Representative, Deputy Chairman Siemens:

"[...] shared governance per se opposes short-term shareholder interests. The focus is on the long-term security of the company through investments and innovations involving the employees [...]"
IG Metall vermisst weiter Investitionen bei Opel

Opel und IG Metall sind sich einig: In Kaiserslautern soll es eine Batteriefertigung geben. Uneinig sind sich beide Seiten in der Frage, wie hinreichend die Investitionen bei Opel sind. Der Autobauer rügt zudem die Arbeitnehmervertreter.

Von THORSTEN WINTER

⇒ Union representatives pushing for higher investment, insourcing at car manufacturer Opel
Basic Idea of Hold-Up (e.g., Grout 1984)

Essence of hold-up: wage bill $W$ is endogenous to $K$!

$$\max_K F(K, \bar{L}) - W(\bar{L}, K) - cK \quad \Rightarrow \quad F_K(K^*, \bar{L}) = c + \frac{\partial W(\bar{L}, K)}{\partial K^*}$$

Stage 2: Wage bargaining, e.g. Nash with worker bargaining power $\phi$ and outside option $b\bar{L}$, and firm’s outside option is to resell $K$ and $c' < c$:

Workforce Surplus = $W - b\bar{L}$  
Firm Surplus = $F(K, \bar{L}) - W - c'K$

$$\Rightarrow W^*(\bar{L}, K) = b\bar{L} + \phi \left( F(K, \bar{L}) - b\bar{L} - c'K \right) \quad \Rightarrow \quad \frac{\partial W^*(\bar{L}, K)}{\partial K} = \phi(F_K - c')$$

Stage 1: Anticipating wage bargaining, the firm selects less capital than a wage-taking firm ($\phi = 0$):

$$\Rightarrow F_K(\bar{L}, K^*) = c + (c - c') \left( \frac{\phi}{1 - \phi} \right) > 0 \quad \frac{\phi}{1 - \phi} > 0$$

Hold-up view of shared governance: $\phi \uparrow \Rightarrow K^* \downarrow$
Hold-Up: Beyond Wage Bargaining

Now: firm and workforce bargain over capital in first stage (Manning, 1987)

\[
\max_K \{ \nu \log (W^* - b\bar{L}) + (1 - \nu) \log (F(K, \bar{L}) - W^* - cK) \}
\]

Stage 2: Wage bargaining, e.g. Nash with worker bargaining power \(\phi\) and outside option \(b\bar{L}\):

\[
W^*(\bar{L}, K) = b\bar{L} + \phi S(\bar{L}, K)
\]

Total Surplus \(S(\bar{L}, K) = F(K, \bar{L}) - b\bar{L} - c'K\)

Stage 1: Firm and workforce bargain. Equilibrium level of \(K\) will depend relative bargaining power:

\[
\Rightarrow F_K(K^*, \bar{L}) = c + (c - c') \times g(K^*, \bar{L}; \nu, \phi, c, c')
\]

- No worker control: \(\nu = 0 \Rightarrow g = \frac{\phi}{1 - \phi} \Rightarrow \text{underinvestment}\)
- Full worker control: \(\nu = 1 \Rightarrow g = 1 \Rightarrow \text{overinvestment}\)
Appendix
Worker Representation in Shareholder Corporations

Note: chairperson (shareholder representative) breaks ties in large firms.
Worker Representation in Non-Shareholder Corporations

Note: chairperson (shareholder representative) breaks ties in large firms.
History of Shared Governance in Germany

- Works Council Act introduced in Weimar Republic in 1920
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- Post World War II:
  - Industry leaders tainted by direct involvement in Nazi regime
  - Workers' movements considered to be less tainted
  - At the same time: nationalization of major industries in UK
  - Codetermination encoded with landmark acts (1951, 1952)
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• 1960s: union movement pushes for full co-determination; social-liberal coalition passes Co-Determination Law of 1976
  • > 2000 employees: 1/2 of supervisory board seats to workers
Worker Representation by Incorporation Date

Incorporation in/before 1994

Incorporation after 1994

≤500 Employees

>500 Employees

Share of Workers on Supervisory Board

Note: only listed firms (Hoppenstedt Aktienführer).
Hold-Up: Beyond Wage Bargaining

Now: firm and workforce bargain over capital in first stage (Manning, 1987)

\[
\max_K \{ \nu \log (W^* - b\bar{L}) + (1 - \nu) \log (F(K, \bar{L}) - W^* - cK) \}
\]

\text{Stage 1: Firm and workforce bargain. Equilibrium level of } K \text{ will depend relative bargaining power:}

\[
\Rightarrow F_K(K^*, \bar{L}) = c - (c - c') \times \left[ \frac{(\nu - \phi)S(\bar{L}, K) + \nu(c' - c)K^*}{(1 - \phi)S(\bar{L}, K) + \nu(c' - c)K^*} \right]
\]

- No worker control: \( \nu = 0 \Rightarrow F_K(\bar{L}, K^*) = c + (c - c') \frac{\phi}{1 - \phi} \Rightarrow \text{underinvestment} \)
- Full worker control: \( \nu = 1 \Rightarrow F_K = c' < c \Rightarrow \text{overinvestment} \)

Stage 2: (Same as above!) Wage bargaining, e.g. Nash with worker bargaining power \( \phi \) and outside option \( b\bar{L} \):

\[
W^*(\bar{L}, K) = b\bar{L} + \phi S(\bar{L}, K)
\]

Total Surplus \( S(\bar{L}, K) = F(K, \bar{L}) - b\bar{L} - c'K \)
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Firm Survival: Old Shareholder Corporations

Probability of being observed vs. Years Relative to Incorporation for Old Shareholder Corp., New Shareholder Corp., Old Non-Shareholder Corp., and New Non-Shareholder Corp.
Firm Survival: No Effect

Note: Average DiD effect on exit hazard: 0.0015 (SE 0.004), baseline 0.038