

Labor and capital structure

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Econ 526

Two views on labor and capital structure

- Managers use debt as a bargaining tool to decrease wages.
 - More credible threat in firms with variable profits (Matsa)
 - An increase in labor union power should lead firms with variable profits to increase their leverage.
- Wages are a source of operating leverage, which is substitute with financial leverage
 - If labor unions are strong, wages are high and firms want to decrease overall risk by reducing leverage. (Simintski, Vig and Volpin).
- Eventually, this is an empirical question

Is this interesting?

- To the extent you are interested in capital structure, yes.
- To the extent you are interested in labor (wage setting), yes.
- Interesting to think a little bit about how finance and labor interact in the macro.

There are evidence that debt and wages are positively correlated (Hanka, JFE, 1998) on a large sample.

Table 9

First-difference OLS model of wages.

All variable are first difference from prior year. Dependent variable is change in labor-related expense (\$1000's) per employee.

Sample includes all Compustat firms in the period 1953–92 with at least 100 employees, excluding SIC codes 40, 48–49 and 60–69, other two digit SIC codes with fewer than five firms, firms that died before 1965, firms whose reported wage expense excludes costs of employee benefits, and points affected by bankruptcy, liquidation, substantial mergers, accounting changes, or with less than three years of back data. Dollar values are deflated by the 1987 CPI. All variables are Winsorized at the 1% tails. Intercept not reported. Standard errors in parentheses.

Explanatory variable	Coefficient
Debt = book debt/assets	−2.2** (0.4)
Lag 1 Debt = Prior year's debt	−1.0* (0.4)
Lag 2 Debt = 2 year's prior debt	−0.10 (0.36)
Industry mean wage ^a	0.35** (0.02)
Proportional change in number of employees since prior year	−6.0** (0.1)
Total assets, log (\$MM)	−0.30 (0.23)
Part time employees 10% or more (0/1 indicator)	−0.51** (0.15)
Assets per employee (\$MM)	51.0** (2.0)
Fraction of assets depreciated	5.0** (0.8)
ROA = After-tax operating cash flow/assets	5.8** (0.6)
Adjusted R^2	0.35
Sample size (firm years)	8,210

^aIndustry mean is the same-year mean among other firms in the narrowest SIC that contains at least four other firms.

Evidence on LBOs show that skilled labor is affected by a sudden increase in debt...

- Lichtenberg & Siegel (JFE, 1990): small LBOs between 1981-1986, using plant level data.
- Decrease in compensation of skilled workers but nothing/slight increase in compensation of unskilled workers. Similar results on employment
- Interpretation:
 - Perotti-Spicer: Market for unskilled labor very competitive compared to market for skilled labor → impact of debt on wages stronger
 - Technological: LBOs improve the relative productivity of unskilled labor relative to skilled labor → increase in the demand and price for unskilled labor (?)
 - Shleifer-Summers (1987): New management is not tied in by the engagements of previous management and renegotiate optimal long term contracts.
- Hard to interpret: endogeneity of LBO decisions?

Differences between LBO and non-LBO plants in mean growth rates (in percent) of labor variables, by period relative to year of LBO (absolute values of t -statistics in parentheses).^a

Period	Growth rate during period											Number of LBO plants
	C_N	C_P	C_N/C_P	E_N	E_P	E_N/E_P	W_N	W_P	W_N/W_P	W'_P	H_P	
$t - 3$ to $t - 2$	3.5% (2.5)	-0.6% (0.7)	4.1% (3.0)	1.3% (1.2)	-0.0% (0.0)	1.3% (1.2)	2.2% (2.1)	-0.6% (1.2)	2.8% (2.3)	-0.0% (0.0)	-1.6% (1.4)	983
$t - 2$ to $t - 1$	-2.6 (2.3)	-0.3 (0.3)	-2.3 (2.4)	-2.7 (2.4)	0.1 (0.1)	-2.8 (2.7)	0.1 (0.8)	-0.4 (0.5)	0.5 (0.4)	0.6 (0.8)	-2.7 (2.2)	983
$t - 1$ to t	-3.1 (3.1)	-0.4 (0.3)	-2.7 (2.1)	-3.1 (2.7)	-0.3 (0.4)	-2.8 (2.2)	-0.0 (0.0)	-0.1 (0.2)	0.1 (0.1)	0.0 (0.1)	-0.8 (0.7)	983
t to $t + 1$	-3.4 (2.3)	0.8 (0.5)	-4.2 (2.7)	-3.3 (2.4)	-1.4 (1.3)	-1.9 (1.3)	-0.1 (0.1)	2.2 (2.7)	-2.3 (1.5)	1.7 (1.9)	-1.7 (1.1)	636
$t + 1$ to $t + 2$	-7.2 (4.4)	1.2 (0.8)	-8.4 (4.8)	-2.1 (1.3)	-0.3 (0.3)	-1.8 (1.2)	-5.1 (3.6)	1.5 (1.8)	-6.6 (3.8)	0.6 (0.6)	1.2 (0.7)	481
$t - 3$ to $t - 1$	0.9	-0.9	1.8	-1.4	0.1	-1.5	2.3	-1.0	3.3	0.6	-4.3	983
$t - 1$ to $t + 2$	-13.7	1.6	-15.3	-8.5	-2.0	-6.5	-5.2	3.6	-8.8	2.3	-1.3	481

^aThe sample is an extract of the Census Bureau's Longitudinal Research Database linked to Morgan Stanley data on LBOs and includes annual data for 1972-1986 on 12,895 continuously observed manufacturing plants.

→ again: wage drop, employment decrease concentrated on white collars

Unionized industries are more leveraged

Bronars & Deere (1991, QJE)

TABLE III
DEBT-EQUITY REGRESSIONS (WEIGHTED-LEAST-SQUARES):

Dependent variable:	Log(DE)	Log(ADJDE _E)	Log(ADJDE _w)
Independent variable	Coefficient	Coefficient	Coefficient
Constant	-2.35 (-4.24)	-2.36 (-4.26)	-2.53 (-4.29)
Log(PLANT)	0.14 (1.60)	0.14 (1.60)	0.38 (3.98)
Log(EMP)	-0.32 (-2.34)	-0.32 (-2.34)	-0.37 (-2.57)
Log(SALES) (× 100)	0.64 (0.04)	0.46 (0.03)	-18.55 (-1.07)
PSALES (× 100)	-1.29 (-1.66)	-1.28 (-1.65)	-0.63 (-0.76)
UNION	1.23 (3.78)	0.81 (2.47)	0.17 (0.50)
DUR	0.76 (2.33)	0.76 (2.32)	1.30 (3.75)
NON	0.62 (1.92)	0.62 (1.91)	1.06 (3.09)
TPU	1.56 (5.28)	1.56 (5.27)	1.68 (5.36)
WTRT	1.62 (4.29)	1.62 (4.30)	1.80 (4.49)
FIRE	1.51 (4.22)	1.52 (4.24)	1.70 (4.46)
SERV	1.82 (4.99)	1.83 (4.99)	1.94 (4.98)
F-Statistic	12.04	10.88	9.73
R ²	0.48	0.46	0.43

Note. *t*-statistics are in parentheses. Each regression includes observations from 153 industries.

Finer Cross
sectional
evidence

Table 2: Unionization and Current Debt

	(1)	(2)	(3)	(4)
<i>A. Manufacturing firms, 1977 (n = 654)</i>				
Union coverage	0.001 (0.012)	0.010 (0.011)	-0.002 (0.011)	-0.009 (0.007)
Union coverage * Profit variability		0.036 (0.010)	0.027 (0.009)	0.016 (0.006)
Profit variability		0.009 (0.004)	0.005 (0.004)	0.001 (0.002)
R^2	0.05	0.11	0.28	0.21
<i>B. Manufacturing firms, 1987 (n = 375)</i>				
Union coverage	0.042 (0.019)	0.035 (0.019)	0.028 (0.017)	0.010 (0.013)
Union coverage * Profit variability		0.039 (0.016)	0.052 (0.014)	0.039 (0.011)
Profit variability		-0.004 (0.006)	-0.022 (0.005)	-0.017 (0.004)
R^2	0.09	0.11	0.29	0.20

MATSA
(2008)

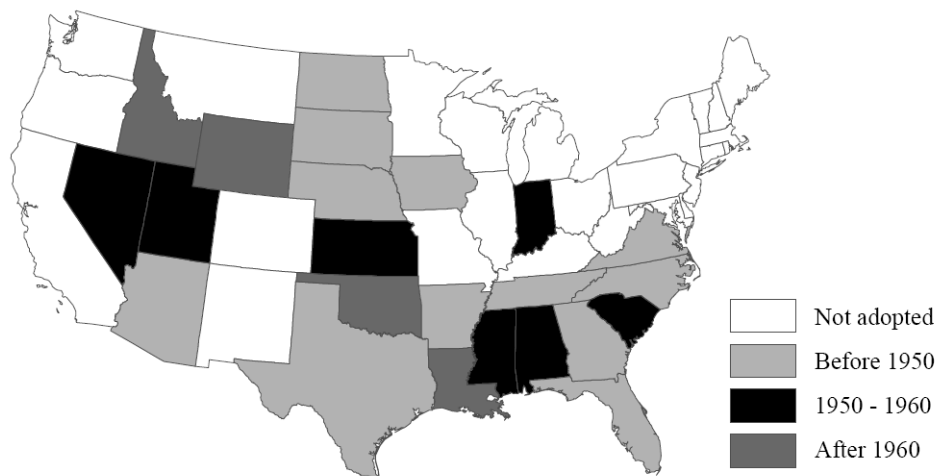
Note: Reported coefficients are estimated from regressions of debt in current liabilities divided by the market value of the firm (divided by assets in Column 4). Debt is regressed on the fraction of a firm's workforce covered by collective bargaining, the variability of the firm's profits, an interaction of those variables, and a set of controls. Profit variability is measured in units of standard deviations of $sd(\Delta \text{earnings})/\text{assets}$, where earnings is before depreciation and amortization. When uninteracted, the collective bargaining coverage coefficient measures the effect of the law at the mean of profit variability, and the profit variability coefficient measures the effect for non-unionized firms. Controls in all regressions include industry fixed effects at the two-digit SIC level. Where indicated, controls also include financial controls: the proportion of fixed assets, the before interest marginal tax rate (1987, 1999 only), the market-to-book ratio, log sales, modified Altman's z-score, and ROA. Standard errors are reported in parentheses. The sample consists of manufacturing firms with at least five years of pre-period data. Compustat variables are winsorized at the 1% tails. In Column (4), the mean (standard deviation) of the dependant variable is 0.042 (0.048) in 1977, 0.052 (0.059) in 1987, and 0.054 (0.056) in 1999.

Specification
with control
variables...

Right-to-work laws adoption as a source of variation for union bargaining power.

- 1935: National Labor Relations Act (1) creates the National Labor Relations Board that certifies and monitors unions (2) prevents discrimination against employees in unions (3) allows mandatory inscriptions at union.
- 1947: Labor-Management Relations Act: broadly anti-union; states are allowed to outlaw employment contract with mandatory inscription at union (right-to-work laws).

A. Adoption of right-to-work laws, 1947-2005

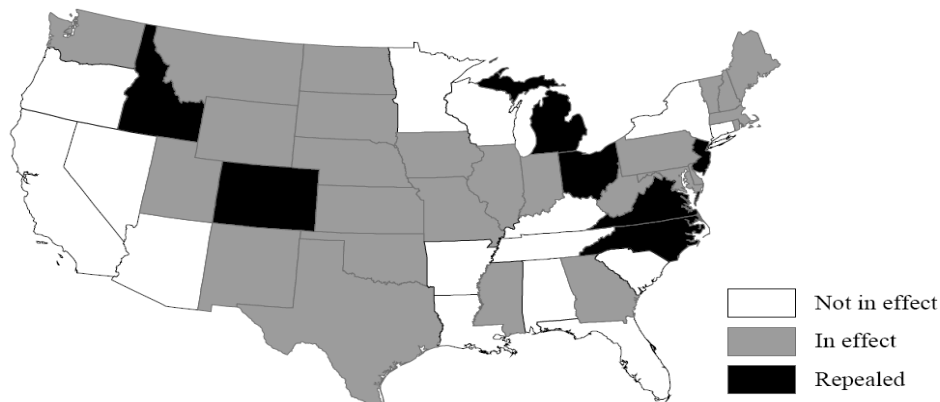


Unions become weaker in firms located in states that adopted right-to-work laws in the 50s → union membership decreases by 5 to 10%

Some states grant strong power to union through “work stoppage” provisions.

- States have large autonomy over unemployment insurance terms
→ Variation across time and states in the conditions under which a worker fired for a labor dispute qualify to unemployment insurance.
- In particular, “work stoppage provision”, adopted by 35 states in 1960: allows workers to collect benefits during a labor dispute if the employer continue to operate at normal level (insurance for failed strikes).

B. Unemployment insurance work stoppage provisions, 1960-1973



Unions become stronger in firms located in states that adopt work stoppage provision in 60s.

- Empirical specification:

$$\frac{DEBT_{ijst}}{VALUE_{ijst}} = \alpha'_1 LAW_{st} + \alpha'_2 LAW_{st} * VARIABILITY_i + \eta_i + \tau_{jt} + \xi_{ijst}$$

Estimated on industries with relatively high coverage

- Identifying assumption: *legislative change did not occur because some states anticipated that variable firms were likely to change their leverage (...)*

Almost no support for the idea that firms issue more short term debt when unions become stronger.

The effect is present only for firms with high profit variability:

- 1) Conform to theory
- 2) Alternative interpretation (e.g.): variability capture size and only sophisticated CFOs adjust. → back to the start

Table 8: Estimates of the Effect of Changes in Labor Law on Current Debt

	(1)	(2)	(3)
<i>A. Right-to-work laws, 1950-1960</i>			
RTW law in effect	-0.045 (0.036)	-0.051 (0.041)	-0.041 (0.030)
RTW law in effect * Profit variability	-0.048 (0.010)	-0.056 (0.011)	-0.034 (0.006)
Observations	3,277	2,976	2,976
R^2	0.66	0.69	0.73
<i>B. Work stoppage provisions, 1960-1973</i>			
No WSP in effect	-0.006 (0.005)	-0.003 (0.007)	-0.003 (0.005)
No WSP in effect * Profit variability	-0.013 (0.005)	-0.011 (0.008)	-0.009 (0.005)
Observations	14,157	13,711	13,711
R^2	0.63	0.66	0.66
Financial controls		X	X
Book value			X

Note: Reported coefficients are estimated from regressions of debt in current liabilities divided by the market value of the firm (divided by assets in Column 3). Debt is regressed on a RTW law or WSP indicator variable, an interaction of that variable with the variability of the firm's profits, and a set of controls. (The profit variability main effect is absorbed by a firm fixed effect.) Profit variability is measured in units of standard deviations of $sd(\Delta \text{earnings})/\text{assets}$, where earnings is before depreciation and amortization. When uninteracted, the RTW indicator measures the effect of the law at the mean of profit variability. Controls in all regressions include firm and industry-by-year fixed effects. Where indicated, controls also include financial controls: the proportion of fixed assets, log sales, and ROA. Industry fixed effects are at the two-digit SIC level. Standard errors, clustered at state level, are reported in parentheses. Compustat variables are winsorized at the 1% tails. The sample includes firms in industries with high union coverage (listed in Appendix Table A3).

The other view: Employment protection Laws for OECD countries

Index covering

- (1) laws protecting workers with regular contracts (Regular Contracts)
- (2) those affecting workers with fixed-term (temporary) contracts or contracts with temporary work agencies (Temporary Contracts)
- (3) regulations applying to collective dismissals (Collective Dismissals).

Index ranges from 0 to 6 and has time series variations

Data: Worldscope with 21 countries

Specification

- Y = market leverage

$$y_{it} = \gamma_t + \lambda_i + \delta \cdot EPL_{k,t-1} + \beta \cdot X_{it} + \epsilon_{it},$$

Table II: DID Analysis: Employment Protection Legislation

This table reports the results of regressions of leverage on the EPL Indicator and a set of controls. Leverage is defined as total debt over market value of assets. EPL is lagged by one year. Columns 1 and 2 include interacted year times two-digit industry fixed effects; column 2 also includes country fixed effects; column 3 includes firm and year times two-digit industry fixed effects and column 4 adds country times two-digit industry fixed effects. Other Control variables refer to macro factors (GDP Growth, log (GDP per Capita, Creditor Rights). In Column 1, these also include indicators characterizing countries' legal origin, tax system (using an indicator used by Fan, Titman and Twite (2006)) and countries' financial development, namely whether a country is a bank-based or a market-based economy. In the rest of the specifications these country-level controls are absorbed by the fixed effects. All variables are defined in Table I. Robust standard errors are reported in parentheses. *, **, ***, indicates significance at the 10%, 5% and 1% respectively. Standard errors are clustered at the country level. Firm-level variables are winsorized at the 1% tails. The sample consists of manufacturing firms in 21 countries. Coverage: 1985-2004.

	(1)	(2)	(3)	(4)
EPL	-0.0325 (0.0068)***	-0.0456 (0.0134)***	-0.0409 (0.0162)**	-0.0409 (0.0163)**
Tangibility	0.166 (0.0585)**	0.168 (0.0604)**	0.251 (0.0436)***	0.253 (0.0437)***
Size	0.0110 (0.0019)***	0.0110 (0.0019)***	0.0608 (0.0080)***	0.0608 (0.0080)***
ROA	-0.555 (0.097)***	-0.554 (0.100)***	-0.499 (0.047)***	-0.497 (0.046)***
Q	-0.0941 (0.0044)***	-0.0935 (0.0045)***	-0.0650 (0.0041)***	-0.0647 (0.0040)***
Other Control Var.	X	X	X	X
Country*Industry FE				Yes
Country FE		Yes		
Ind*Year FE	Yes	Yes	Yes	Yes
Firm FE			Yes	Yes
Observations	61,248	61,248	61,248	61,248
Adjusted R^2	0.34	0.34	0.78	0.75

Cross-sectional heterogeneity (testing the channel)

- Effects should be stronger for firms:
 - More labor intensive (operating leverage is higher)
 - Higher labor turnover (firms with more creation/destruction of jobs → employees ask for higher compensation → higher operating leverage)
 - With lower liquidation value (higher cost of financial distress so more crowding out).

Table IV: Cross-sectional Heterogeneity: Labor Intensity and Turnover

This table reports the results of regressions of cross-sectional heterogeneity. Total debt over market value of assets is regressed on the interaction of EPL with a proxy of Labor intensity at the industry level and a set of controls. Labor intensity is computed as the median cost of staf over sales for each industry defined at the 2-digit level. Turnover is a proxy for employment turnover calculated using data by Davis, Haltiwanger and Schuh (1996). All columns include firm fixed effects. Columns 1 and 5 include firm and year times two-digit industry fixed effects; columns 2 and 6 include firm and country times year fixed effects; Columns 3 and 7 include firm, year times two-digit industry fixed effects and country times year fixed effects and Columns 4 and 8 add country times two-digit industry fixed effects to the previous specification. Other Control variables refer to macro factors (GDP Growth, log (GDP per Capita, Creditor Rights). All variables are defined in Table I. Robust standard errors are reported in parentheses. *, **, ***, indicates significance at the 10%, 5% and 1% respectively. Standard errors are clustered at the country level. Firm-level variables are winsorized at the 1% tails. The sample consists of manufacturing firms in 21 countries. Coverage: 1985-2004.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
EPL	-0.0160 (0.0240)				0.0029 (0.0241)			
EPL*Labor Intensity	-0.0904 (0.0486)*	-0.0742 (0.0397)*	-0.0844 (0.0315)***	-0.0874 (0.0369)**				
Labor Intensity		0.0450 (0.048)						
EPL*Turnover					-0.0049 (0.0015)***	-0.0033 (0.0006)***	-0.0042 (0.0009)***	-0.0062 (0.0014)***
Turnover						0.0101 (0.0031)***		
Tangibility	0.251 (0.0435)***	0.229 (0.0438)***	0.213 (0.0412)***	0.215 (0.0419)***	0.251 (0.0436)***	0.228 (0.0438)***	0.215 (0.0412)***	0.212 (0.0419)***
Size	0.0608 (0.0080)***	0.0594 (0.0081)***	0.0628 (0.0081)***	0.0632 (0.0082)***	0.0607 (0.0081)***	0.0593 (0.0082)***	0.0632 (0.0082)***	0.0627 (0.0082)***
ROA	-0.499 (0.0467)***	-0.518 (0.0506)***	-0.512 (0.0483)***	-0.510 (0.0480)***	-0.499 (0.0467)***	-0.518 (0.0505)***	-0.512 (0.0482)***	-0.510 (0.0480)***
Q	-0.0649 (0.0041)***	-0.0567 (0.0031)***	-0.0554 (0.0030)***	-0.0552 (0.0029)***	-0.0650 (0.0041)***	-0.0567 (0.0030)***	-0.0555 (0.0029)***	-0.0553 (0.0029)***
Other Control Var.	X				X			
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Ind*Year FE	Yes		Yes	Yes	Yes		Yes	Yes
Country*Year FE		Yes	Yes	Yes		Yes	Yes	Yes
Country*Industry FE				Yes				Yes
Observations	61,248	61,248	61,248	61,248	61,248	61,248	61,248	61,248
Adjusted R^2	0.78	0.79	0.76	0.77	0.78	0.79	0.76	0.77

Table V: Cross-sectional Heterogeneity - Liquidation Values

This table reports the results of regressions of cross-sectional heterogeneity. Total debt over assets is regressed on the interaction of EPL with a proxy for the liquidation value of firms' assets (L) and a set of controls. The first proxy L1, is the median tangibility in the industry, L2 is a measure of creditor rights and L3 is the product of the two measures (L1*L2). All columns include firm fixed effects. Columns 1, 5 and 7 include also year times two-digit industry fixed effects. Column 6 controls for year times two-digit industry and country times two-digit industry fixed effects in addition to firm fixed effects. Columns 2 and 8 add year times country fixed effects to the firm fixed effects, Columns 3 and 9 add country times year and year times two-digit industry fixed effects to the firm fixed effects and Columns 4 and 10 control for firm, year times two-digit industry, country times year and country times two-digit industry fixed effects. Other Control variables refer to macro factors (GDP Growth, log (GDP per Capita, Creditor Rights). All variables are defined in Table I. Robust standard errors are reported in parentheses. *, **, ***, indicates significance at the 10%, 5% and 1% respectively. Standard errors are clustered at the country level. Firm-level variables are winsorized at the 1% tails. The sample consists of manufacturing firms in 21 countries. Coverage: 1985-2004.

Table V *Continued*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
EPL	-0.093 (0.0158)***				-0.105 (0.0214)***	-0.104 (0.0204)***	-0.087 (0.0164)***			
EPL*L1	0.171 (0.0675)**	0.088 (0.0548)	0.103 (0.0588)*	0.125 (0.0541)**						
L1		-0.162 (0.102)								
EPL*L2					0.0426 (0.0113)***	0.0423 (0.0111)***				
L2					-0.0618 (0.0177)***	-0.0621 (0.0174)***				
EPL*L3							0.0980 (0.0259)***	0.0690 (0.0337)**	0.0841 (0.0252)***	0.1000 (0.0252)***
L3							-0.116 (0.0397)***	-0.140 (0.0659)**	-0.078 (0.0809)	-0.022 (0.0843)
Tangibility	0.251 (0.0432)***	0.229 (0.0439)***	0.213 (0.0412)***	0.215 (0.0419)***	0.247 (0.0412)***	0.249 (0.0413)***	0.249 (0.0413)***	0.229 (0.0440)***	0.213 (0.0410)***	0.215 (0.0416)***
Size	0.0608 (0.0080)***	0.0593 (0.0081)***	0.0627 (0.0081)***	0.0632 (0.0082)***	0.0609 (0.0080)***	0.0609 (0.0080)***	0.0609 (0.0079)***	0.0593 (0.0080)***	0.0627 (0.0081)***	0.0633 (0.0081)***
ROA	-0.499 (0.0468)***	-0.518 (0.0505)***	-0.512 (0.0482)***	-0.055 (0.0479)***	-0.498 (0.0465)***	-0.496 (0.0462)***	-0.499 (0.0469)***	-0.518 (0.0505)***	-0.512 (0.0484)***	-0.510 (0.0480)***
Q	-0.0650 (0.0041)***	-0.0567 (0.0031)***	-0.0554 (0.0030)***	-0.0552 (0.0029)***	-0.0645 (0.0038)***	-0.0643 (0.0037)***	-0.0647 (0.0039)***	-0.0567 (0.0031)***	-0.0554 (0.0030)***	-0.0553 (0.0030)***
Other Control Var.	X				X	X	X			
Ind.*Country FE				Yes		Yes				Yes
Country*Year FE		Yes	Yes	Yes				Yes	Yes	Yes
Ind.*Year FE	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	61,248	61,248	61,248	61,248	61,248	61,248	61,248	61,248	61,248	61,248
Adjusted R^2	0.78	0.79	0.76	0.77	0.79	0.76	0.79	0.79	0.76	0.77

Another (better) test

- Schmalz (2013)
 - Does unionization of firms affect leverage policy?
 - Let's look at unionized vs. non unionized firms

Is this the right regression?

Table 4: Non-causal correlations between unionization and changes of cash-to-asset ratio (c2a), net leverage (net lev), operating leverage (ol), and market leverage (mlev). OLS regression of the outcome variable on a union-win dummy, with the slope constrained to zero. The definition of “(un-)constrained” is according to Whited-Wu, as before. Standard errors are clustered at the firm level. The table shows that the average firm that becomes unionized reduces its cash-to-asset ratio and increases leverage after a unionization election. The effect is driven by elections with very high or strongly negative winning margins in financially constrained firms.

Panel C: Full sample	$\Delta(\text{c2a})$	$\Delta(\text{net lev})$	$\Delta(\text{ol})$	$\Delta(\text{mlev})$
Union-win	-0.0210*** (0.00770)	0.00825** (0.00324)	0.00406 (0.00872)	0.0437 (0.0266)
Observations	4,489	4,416	3,845	4,040

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Another (better) test

- Schmalz (2013)
 - Does unionization of firms affect leverage policy?
 - Can we simply look at unionized vs. non unionized firms?
 - No → RD design:
 - Vote share and 50% as a threshold
 - Compare firms leverage policy where unions barely win vs. unions barely lost.
 - Schmalz idea: risk management.
 - Labor is an asset, not an input in the production function.
 - You need to manage the financing risk of this asset.
 - If you are unconstrained, you can simply increase cash holding today and set aside future wage payments.
 - If you are constrained, trade-off between risk management and actual investment → you want to invest.
 - Prediction: cash should increase and leverage decrease in unconstrained firms. Reverse for financially constrained firms.

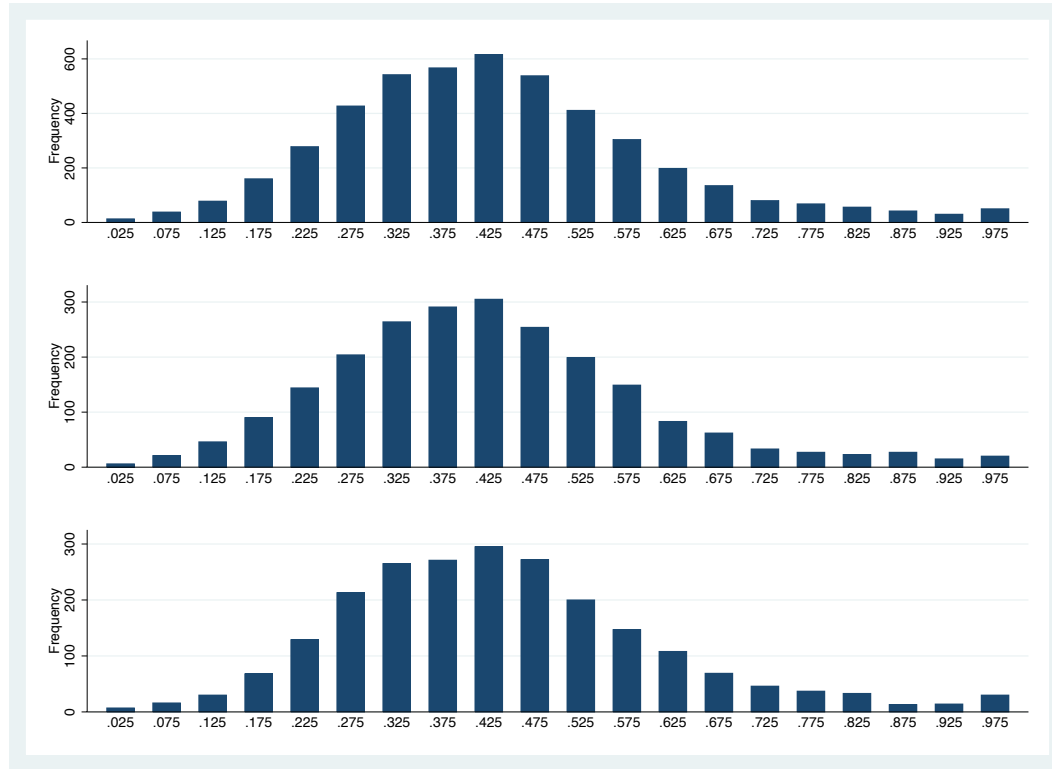


Figure 3: Vote share distributions for the full sample (top), unconstrained firms (center), and constrained firms (bottom). The 20 vote share bins are equally spaced and constructed as in [Lee and Mas \(2012\)](#). The unconstrained/constrained split is made at the sample median of the WI index. An identifying assumption of the RD design is that no party can precisely control the election outcome just to the right and left of the 50 % vote share threshold. In other words, there must not be systematic sorting of firms, or subsets of firms within close proximity of that threshold. Such sorting would be visible from a discontinuity in the vote share distribution at the 50% vote share threshold. Note that only quasi-continuity of the forcing variable is required, but not equal probabilities just right and left of the threshold. A McCrary test does not reject quasi-continuity of the vote share density at the 50% vote share for any subset of the data, including industry splits.

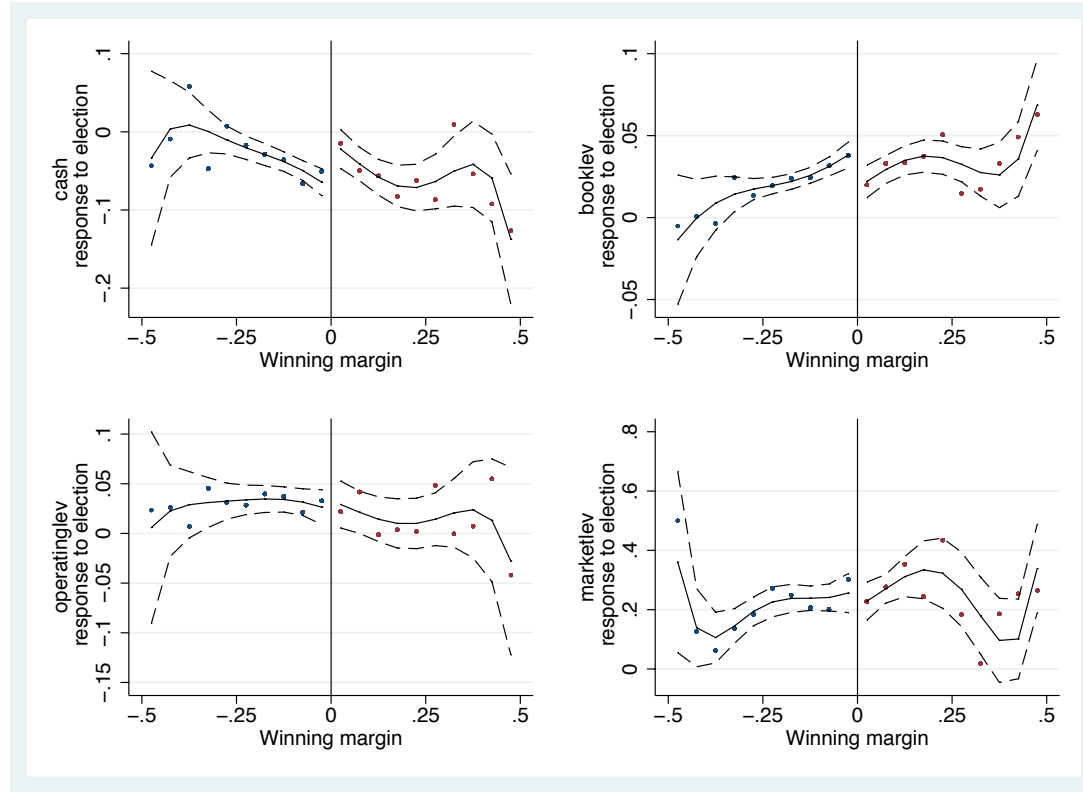


Figure 4: Election response of financially unconstrained firms' cash-to-asset ratios ("cash"= cash divided by total assets), net book leverage ("booklev" = debt minus cash divided by total assets), operating leverage ("operatinglev", defined as in [Novy-Marx \(2011\)](#)), and market leverage ("marketlev" = total liabilities / (market value of equity + total liabilities)). "Unconstrained" means being below the sample median according to the Whited-Wu index. The dots depict the average value of the bins introduced in Figure 3. Winning margin is vote share minus 50%. The right hemispheres of the graphs show the response of firms in which a union gets established. Left is the response of firms in which no union gets established. The solid line represents predicted values based on a sixth-order polynomial regression; the dotted lines are 95% confidence intervals. As multiple elections can happen in the same firm, standard errors are clustered at the firm level. A discontinuity of the outcome variable at the 0%-winning margin threshold is the estimated causal effect of unionization. There is a significant positive causal effect of unionization on cash-to-asset ratios, a significant negative effect on net book leverage. Estimates of the effect on operating leverage and market leverage are insignificant.

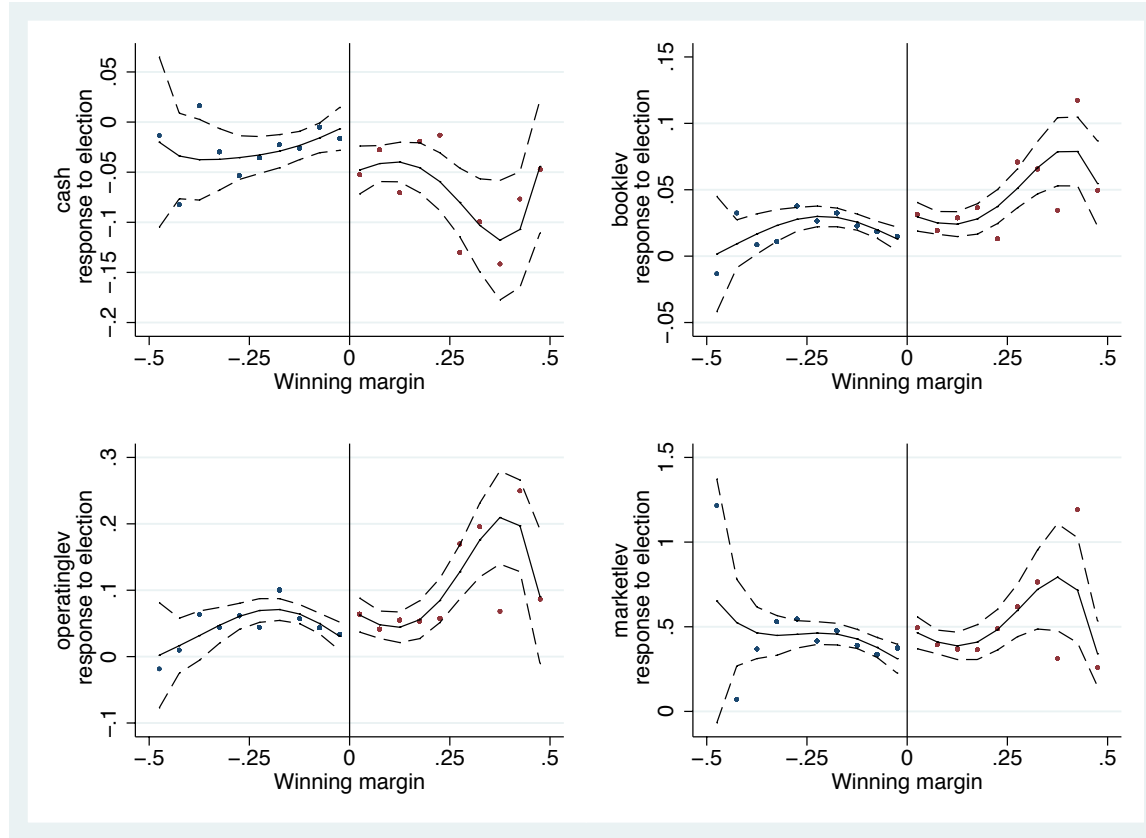


Figure 5: Election response of financially constrained firms' cash-to-asset ratios, net book leverage, operating leverage, and market leverage, as defined in Figure 4. Point estimates are weakly negative for cash-to-assets, and weakly positive for book leverage, operating leverage, and market leverage.

Table 3: Causal effect of unionization on changes of cash-to-asset ratio (c2a), net leverage (net lev), operating leverage (ol), and market leverage (mlev). The tables report coefficients on the union-win dummy from sixth-order polynomial regressions on the winning margin and win dummy, as well as corresponding p-values. “Unconstrained” means being in the lower half of the sample according to the Whited-Wu index of financial constraints; the definition of “constrained” is symmetric. Standard errors are clustered at the firm level.

Panel A: Unconstrained firms	$\Delta(\text{c2a})$	$\Delta(\text{net lev})$	$\Delta(\text{ol})$	$\Delta(\text{mlev})$
Union-win	0.0603*** (0.0222)	-0.0237*** (0.00843)	0.00985 (0.0204)	-0.0574 (0.0797)
Observations	2,243	2,243	1,967	2,138
Panel B: Constrained firms	$\Delta(\text{c2a})$	$\Delta(\text{net lev})$	$\Delta(\text{ol})$	$\Delta(\text{mlev})$
Union-win	-0.0498* (0.0270)	0.0232** (0.0112)	0.0515* (0.0266)	0.222** (0.111)
Observations	2,238	2,169	1,872	1,899
Panel C: Full sample	$\Delta(\text{c2a})$	$\Delta(\text{net lev})$	$\Delta(\text{ol})$	$\Delta(\text{mlev})$
Union-win	0.00320 (0.0178)	0.000168 (0.00719)	0.0261 (0.0167)	0.0663 (0.0660)
Observations	4,489	4,416	3,845	4,040

*** p<0.01, ** p<0.05, * p<0.1

Table 6: Causal effect of unionization on cash-to-assets (c2a) and net leverage (net lev) of unconstrained and constrained firms for different measures of financial constraints. The dummy D takes value one if the firm falls in the upper half of the respective measure. OLS regressions on a union-“win” dummy, union-“win” dummy interacted with constraint-dummy, winning margin, and all interactions. Sample restricted to elections within 20% of the threshold. Standard errors clustered at the firm level. Kaplan-Zingales (KZ-D), ratings (R-D), and Whited-Wu (WI-D) dummies are 1 if more likely to be constrained; total assets (AT-D) and Dividend (Div-D) dummies are 1 if less likely to be constrained according to the respective measure.

Outcome	$\Delta(\text{c2a})$	$\Delta(\text{net lev})$	$\Delta(\text{c2a})$	$\Delta(\text{net lev})$	$\Delta(\text{c2a})$	$\Delta(\text{net lev})$	$\Delta(\text{c2a})$	$\Delta(\text{net lev})$	$\Delta(\text{c2a})$	$\Delta(\text{net lev})$
win	0.0379* (0.0206)	-0.0107 (0.00718)	0.0738 (0.0562)	-0.0408 (0.0274)	0.0584*** (0.0200)	-0.0201*** (0.00759)	-0.0338 (0.0730)	0.0121 (0.0371)	-0.113	0.0739**
KZ-D· win	-0.0559* (0.0299)	0.0173 (0.0123)								
R-D· win			-0.0696 (0.0581)	0.0426 (0.0282)						
WI-D· win					-0.102*** (0.0316)	0.0377*** (0.0131)				
AT-D· win							0.0801*** (0.0305)	-0.0265** (0.0128)		
Div-D· win									0.129* (0.0750)	-0.0816** (0.0377)
Observations	3,209	3,154	3,195	3,140	3,209	3,154	3,208	3,153	3,209	3,154

*** p<0.01, ** p<0.05, * p<0.1