Labor Cost Rigidity and Debt Financing: Evidence from Labor Contract Renewal during the Financial Crisis

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Labor Cost Rigidity and Credit Risk

- Firms cannot adjust their labor costs at will in response to business conditions as interests of employees are protected by a complex system of laws and institutions.

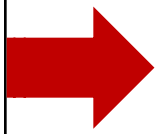
- Labor compensation is the largest expense for firms (Donangelo, et al., 2018).

- The operational risk induced by rigid labor costs and the negative economic shocks could interact with each other and amplify the overall risk of firms during the economic downturn

  (e.g., Favilukis and Lin, 2016; Favilukis, Lin and Zhao, 2019).

The Operating Leverage Effect of Rigid Labor Policies

- Labor cost rigidity increases the operating leverage of firms, creating a lower sensitivity of labor costs to economic shocks.
- Firms constrained by rigid labor policies have less flexibility in adjusting their labor costs in response to economic conditions.
- Labor cost stickiness induced by rigid labor policies makes interest payments riskier and is detrimental to firms in economic downturns when cost control is crucial for the survival of firms.



Operating Leverage Effect: Rigid labor policies increase operating leverage, resulting in higher firm default risk and financing cost in economic downturns.

The Insurance Effect of Rigid Labor Policies

- Stable compensation and job security provided by rigid labor policies can shield workers from business cycle risks and provide workers with insurance in economic downturns.

- Gift-exchange models (Akerlof, 1982; Akerlof, 1984) and the fair wage-effort hypothesis (Akerlof and Yellen, 1990) suggest that workers' effort depends on their gratitude and loyalty to the firm, which, in turn, is related to stability in their compensations.

- Prior literature shows that wage cuts would generate negative feelings among employees and thereby lead to less effort and lower productivity (Ouimet and Simintzi, 2018).

Insurance Effect: Rigid labor policies improve workers' performance, lowering firm default risk and financing cost in economic downturns.

Identification Strategy

- We take advantage of the heterogeneity in the timing of the collective labor agreement renewal for a sample of U.S. firms during the 2008 financial crisis and examine how the labor cost rigidity induced by binding labor contracts affects a firm's financing and real activities.

- The exogeneity of labor contract renewal dates and shocks from a financial crisis provide a unique setting to identify the causal effect of labor cost rigidity on firms' financial policies and real activities in economic downturns.

Collective Bargaining Agreement

- Our paper relies on the labor contract renewal information of unionized firms in the U.S.

- The terms and conditions of employment of unionized firms, such as wage growth rates, working hours and conditions, benefits and so on, are set down and defined in the collective bargaining agreements (CBAs).

- The CBAs are legally binding labor contracts between firms and their workers for an agreed-upon time period.

Labor Contract Renewal (F-7 notice)

- In the U.S., firms generally are not required to disclose the information of their labor contracts. However, if a firm is a unionized one, it needs to submit a F-7 notice to the Federal Mediation and Conciliation Service (FMCS) upon contract expiration.

- The F-7 notices contain information of employer names, employer locations, bargaining unions and representatives, contract expiration dates, and the number of workers involved.

- F-7 notice data are from Bloomberg BNA Labor Plus.

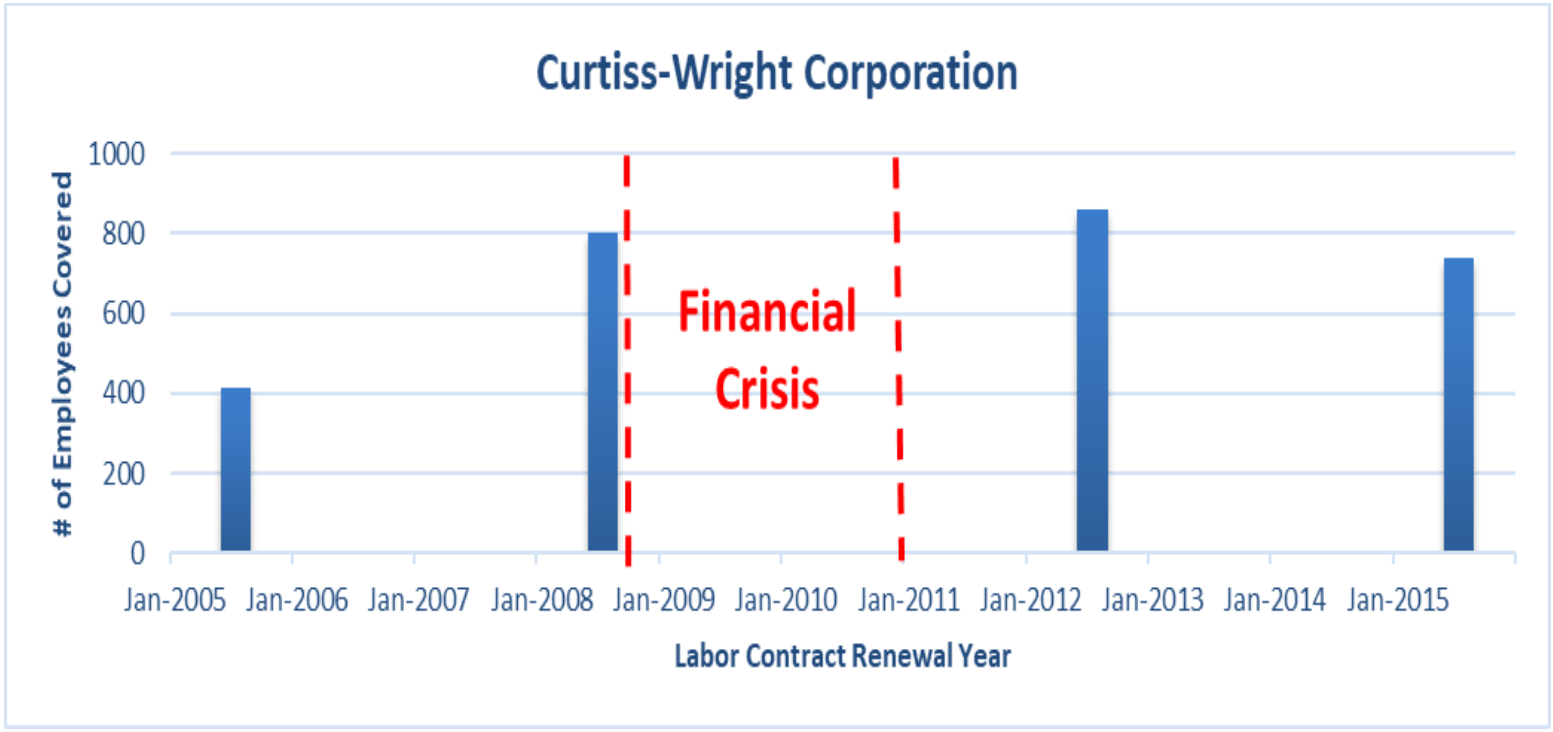
Sample Construction

- September 15, 2008, the day on which Lehman Brothers bankrupted, is taken as the onset of the financial crisis. Sample period spans six years, from 2005 to 2010, covering roughly a three-year pre-crisis period (2005-2007) and a three-year in-crisis period (2008-2010).

- **Binding-contract firms** (**194 firms**): firms with no contract up for renewal from September 15, 2008 to the end of 2010.

- **Flexible-contract firms** (**357 firms**): firms with labor contracts up for renewal from September 15, 2008 to the end of 2010.

An Example of Binding-contract Firms



An Example of Flexible-contract Firms

Another Example of Flexible-contract Firms

Binding-contract vs. Flexible-contract Firms before Crisis

Panel A: Financial Characteristics Comparison (2007)

Group	Profitability	Total Asset	Liability Ratio	Cash Flow	Cash	Q
Binding Contract	0.113	12909.210	0.292	0.534	0.073	1.554
Flexible Contract	0.120	17788.540	0.289	0.516	0.066	1.659
Diff	-0.007	-4879.328	0.002	0.018	0.006	-0.075
T-statistic	-0.816	-0.897	0.129	0.244	0.750	-1.400

Panel B: Bond Characteristics Comparison (2007)

Group	Bond Ratio (%)	Original Maturity (Years)	Remaining Maturity (Years)	Due (08, %)	Due (09, %)	Due (10, %)
Binding Contract	0.284	14.784	7.626	0.013	0.020	0.012
Flexible Contract	0.259	15.703	8.143	0.023	0.019	0.013
Diff	0.025	-0.919	-0.518	-0.010	0.000	-0.002
T-statistic	0.632	-0.907	-0.757	-1.460	0.053	-0.285

Binding-contract vs. Flexible-contract Firms before Crisis

Panel A: Wage Growth (%)

Group	2005	2006	2007
Binding Contract	2.898	2.861	2.708
Flexible Contract	2.941	2.976	3.035
Diff	-0.042	-0.115	-0.327
T-statistic	-0.233	-0.535	-1.476

Panel B: Contract Duration (Years)

Group	2005	2006	2007
Binding Contract	4.155	4.362	4.504
Flexible Contract	4.313	4.286	4.176
Diff	-0.158	0.075	0.328
T-statistic	-0.540	0.231	0.996

Labor Cost Rigidity and Bond Return

- We first study the joint impact of labor cost rigidity and financial crisis on the value of existing bonds.

- We study whether bondholders of binding-contract firms and flexible-contract firms reacted to the outburst of the financial crisis differently.

Bond CAR

Group	CAR (-2, -2)	CAR (-2, -1)	CAR(-2, 0)	CAR(-2, 1)	CAR(-2, 2)	CAR(-2, 3)	CAR(-2, 4)	CAR(-2, 5)
Binding Contract	-0.002	-0.001	0.012**	0.004	0.003	-0.025	-0.032	-0.021
Flexible Contract	0.007***	0.008***	0.032***	0.029***	0.036***	0.038***	0.033***	0.036***
Diff	-0.009**	-0.008**	-0.020***	-0.025*	-0.033*	-0.064**	-0.065***	-0.057**
T-statistic	-2.515	-2.052	-2.890	-1.739	-1.705	-2.585	-2.685	-2.214

Labor Cost Rigidity and New Bond Issuance

- We use a difference-in-differences approach and estimate the following equation:

$$Bond\ Issuance_{i,t} = \beta_1 Binding\text{-}Contract\ Firm * Crisis + \beta_2 Controls_{i,t-1} + \alpha_i + \gamma_t + \varepsilon_{i,t}, \quad (1)$$

- The model is estimated using a conditional fixed-effect logistic model and a linear model for appropriate statistical inference and intuitive interpretation of estimates.

New Bond Issuance

	CLOGIT		OLS	
	(1)	(2)	(3)	(4)
Binding-Contract Firm*Crisis	-0.465*	-0.603**	-0.073**	-0.085**
	(0.280)	(0.308)	(0.032)	(0.035)
Profitability		0.170		-0.007
		(2.139)		(0.305)
Size		-0.404		-0.058
		(0.368)		(0.053)
Liability Ratio		-1.299		-0.166
		(1.243)		(0.175)
Cash Flow		0.470**		0.062**
		(0.201)		(0.030)
Cash		-3.876**		-0.467**
		(1.705)		(0.218)
Q		0.067		0.005
		(0.305)		(0.037)
Firm FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Observations	2,049	1,765	3,612	3,157
R-squared			0.496	0.508

Refinancing Need

- Credit risk should matter more for firms that are in a greater need for refinancing.
- If binding labor contracts increase the operating leverage of firms and lead to higher credit risk, their impact should be stronger for firms with a greater need for refinancing.
- We partition the sample into firms with high refinancing need and firms with low refinancing need by using the soon-to-mature debt maturity ratio, which measures the refinancing need of firms.

Refinancing Need

	CLOGIT		OLS	
	(1)	(2)	(3)	(4)
	High	Low	High	Low
Binding-Contract Firm*Crisis	-1.157**	0.004	-0.149***	-0.025
	(0.496)	(0.419)	(0.055)	(0.044)
Profitability	-0.309	0.943	-0.094	0.117
	(3.702)	(2.488)	(0.538)	(0.331)
Size	-0.038	-0.772*	-0.006	-0.099*
	(0.594)	(0.425)	(0.085)	(0.059)
Liability Ratio	-2.619	-0.727	-0.285	-0.063
	(1.859)	(1.907)	(0.225)	(0.275)
Cash Flow	0.921**	0.232	0.122**	0.034
	(0.393)	(0.243)	(0.048)	(0.034)
Cash	-5.100**	-3.063	-0.623*	-0.330
	(2.553)	(2.501)	(0.369)	(0.248)
Q	0.215	-0.050	0.025	-0.001
	(0.482)	(0.401)	(0.067)	(0.041)
Firm FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Observations	996	764	1,582	1,536
R-squared			0.513	0.489

Placebo Tests

- The operating leverage effect indicates that binding labor contracts prevent firms from lowering wage in bad states.
- The effect is less likely to be a significant factor in normal states when firms have regular cash flows and little need to adjust wage downward.
- We conduct falsification tests of operating leverage channel by examining the difference in bond issuance between flexible-contract and binding-contract firms in non-recessionary periods (placebo periods).

Placebo Tests

Panel A: CLOGIT

	(1) 2004	(2) 2005	(3) 2006
Binding-Contract Firm*Crisis Placebo	-0.198	-0.092	-0.279
	(0.368)	(0.285)	(0.372)
Profitability	2.016	1.078	-1.088
	(2.565)	(2.143)	(3.301)
Size	0.207	0.159	-0.053
	(0.508)	(0.283)	(0.509)
Liability Ratio	1.535	-0.992	-5.974***
	(1.681)	(0.986)	(1.726)
Cash Flow	0.706	0.620**	0.804**
	(0.606)	(0.286)	(0.372)
Cash	-4.513	-3.381	-1.837
	(2.788)	(2.061)	(2.964)
Q	0.387	0.288	-0.179
	(0.502)	(0.333)	(0.574)
Firm FE	YES	YES	YES
Year FE	YES	YES	YES
Observations	1,136	1,904	929

The Real Effect of Binding Contracts: Wage Adjustment

- We examine the difference in their wage and employment adjustments between flexible-contract and binding-contract firms during the financial crisis.

The Real Effect of Binding Contracts: Wage Adjustment

- Flexible-contract firms cut their annual wage growth by almost 0.7 percentage points during the financial crisis.
- In 2007, labor expenses, on average, are about 13 times net income for firms with a positive net income.
- A back-of-the-envelope calculation indicates that a 0.7-percentage-point cut in annual wage growth may raise the net income by nearly 6 percent annually.

$$\begin{aligned} &Labor\ Cost\ Savings\ after\ Tax \\ &= 0.7\% \times Labor\ Costs \times (1 - 35\%) \\ &= 0.7\% \times 13 \times Net\ Income \times (1 - 35\%) = 6\%\ Net\ Income \end{aligned}$$

The Real Effect of Binding Contracts: Investments

	(1)	(2)	(3)
Binding-Contract Firm*Crisis	-0.140***	-0.119***	-0.125**
	(0.033)	(0.031)	(0.060)
Profitability		-0.127	0.228
		(0.248)	(0.504)
Size		-0.009	-0.532***
		(0.010)	(0.106)
Liability Ratio		-0.061	-1.271***
		(0.102)	(0.362)
Cash Flow		0.367***	0.179***
		(0.054)	(0.060)
Cash		1.061***	2.192***
		(0.317)	(0.585)
Q		0.091**	0.187**
		(0.038)	(0.080)
Firm FE			YES
Year FE			YES
Observations	2,862	2,561	2,561
R-squared	0.005	0.147	0.478

Summary

- Flexible-contract firms significantly reduced their labor costs during the crisis while binding-contract firms lacked such flexibility.

- Binding-contract firms experienced a larger drop in bond prices, and they were less likely to issue new bonds during the financial crisis.

- Binding-contract firms reduced their investment spending more significantly during the crisis.

- Our paper provides new direct causal evidence of labor cost rigidity's impact on firm financing and real activities during economic downturns.