Labor Unemployment Risk and Corporate Financing Decisions

Agrawal and Matsa JFE 2013

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Introduction

Unemployment Risk

- Workers face adverse consequences from unemployment
- Workers require a higher premium to take on more unemployment risk
- Firms can factor in this cost and manage it
- Hard to measure
- Hard to disentangle from other financial policy considerations

Introduction

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Background Theory

- Workers facing unemployment risk require higher wages, additional benefits, improved working conditions
- Firms must compensate ex ante for workers to bear these risks
- Compensation increases with risks

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Background Theory

- Compensation demanded by workers facing unemployment risk should affect firms' financing policy
- More debt gives greater probability of financial distress
- Higher financial distress expands worker's exposure to unemployment risk
- Then, raising leverage will raise worker's "premium"

NPV[Debt Issue] = NPV[Tax Shield] + NPV[Cost of Financial Distress] + Δ Labor Expense

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Contribution and Hypothesis

- Because of labor frictions, the cost of debt becomes higher.
  *Because debt financing increases the probability of layoffs in
  distress, it raises the compensation that workers require
  today to bear increased unemployment risk.*
- Provides novel empirical evidence that worker
  unemployment risk significantly impacts firms' corporate
  financial policies

Contribution and Hypothesis

Hypothesis:

Firms choose conservative financial policies partly as a means of mitigating worker exposure to unemployment risk

Design

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- Overcome challenge of measuring unemployment risk by exploiting changes in unemployment laws
- More generous state unemployment benefits make layoffs less costly and reduce workers' demand for compensation

Prediction

Increasing generosity of state unemployment benefits lead to higher firm leverage and lower interest coverage ratios

Design

Unemployment Benefits

- Use state unemployment benfits to identify impact of shock to unemployment risk on financial policy
- Must assume that residual variation of UI benefits, after sufficient controls, is uncorrelated with unobservable covariates affecting corporate leverage.

Design

Tests

1. Show relation between UI generosity and leverage is strong for firms whose workers face greater expected unemployment costs
2. Show relation between UI generosity and firms with tight financing
3. Examine timing of leverage changes to pin a causal link
4. Look at bordering states to test economic conditions
5. Look at other mechanisms: firm UI cost and unions

Institutional Background

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- Each state has autonomy in UI benefits
    - Can select eligibility, wage benefit amounts, duration
- Variation stems largely from maximum bounds and duration
- Economic conditions also contribute to variation
- Political forces also contribute
- Managers may be more willing to layoff worers in times of generous UI

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Meaningful Shock

Then, changes in unemployment benefits make for a meaningful shock to the cost of layoff of workers. Heterogeneity across states helps. Additionally, variation in unemployment insurance laws helps to make a clean setting to look at relation between financial policy and workers exposure to risk.

Data

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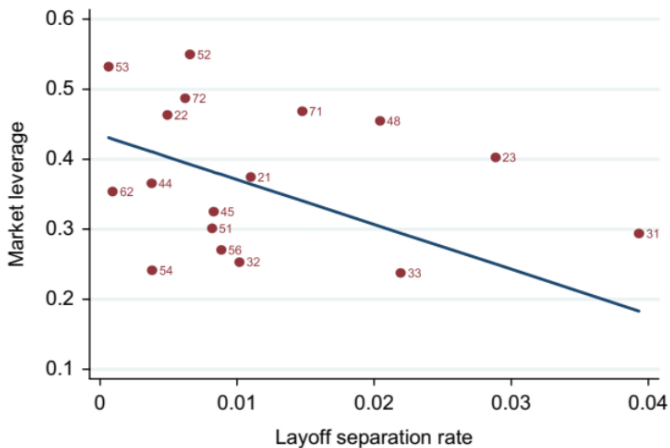Agrawal and
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Figure 1: Correlation of layoff separation rate and market leverage

Data

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- Collect data on stat UI benefit laws and firm balance sheet characterisitcs
- UI benefits from Dept of Labor 1950 - 2008
- Generosity is measured as maximum benefit amount and duration alllowed

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- Variation between max benefits is high ($6000 in MS to $28,000 in MA)
- At some point all states experience changes in state UI benefits over sample period
- States typically increase benefits from 25% to 75%
- No indication that states change laws affecting corporate debt capacity with UI laws
- Correlation between tax rate and log max total benefit is not significant.

Data

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- Compustat
- All firms (except financial and utilities) from 1950 -2008
- Non-missing Observations
- 14,000 firms and 140,000 firm years
- Winsorized at 1% tails

Method

- Use a Panel Regression

$$\frac{DEBT_{ist}}{VALUE_{ist}} = \alpha_1 LN(MAX\_UI\_BENEFIT)_{st-1} + X_{ist}\beta + \nu_i + \omega_t + \varepsilon_{ist}$$

where i is firm in state j at time t.

Variables

- X_{it} is set of controls
- ν_i is firm fixed effects
- ω_t is year fixed effects

Controls include proportion of fixed assets, M/B ratio, log of sales, probability of banktrupcy, ROA, state unemployment rate, state GDP.

- Standard errors corrected for clustering at state level

Results

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- 100 log point increase in total benefits result in 4.5% greater average market leverage (1)
- Accounting for firms whose headquarters and high percentage of workers are in different states gives $\alpha = 5.7$ (3)
- Still significant controlling for firm characteristics and macroeconomic conditions (4) and (2)
- Significant across first differences (5)
- Significant when excluding outlier observation

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Table 3
Unemployment insurance laws and firms' capital structures.
This table summarizes the results from firm-panel regressions of total debt divided by assets (market value in Panel A, book value in Panel B) and log interest coverage (Panel C) on the natural log of the maximum total potential benefit available under the state's unemployment insurance system in the previous year, and a set of controls. Controls in all regressions include year fixed effects. Where shown, controls also include firm fixed effects, state economic indicators (state unemployment rate and state gross domestic product growth rate), and firm financial controls (proportion of fixed assets, market-to-book ratio, natural log of sales, modified Altman Z-score, and return on assets). Where indicated, industries are excluded in which a large percentage of the workforce is likely to be geographically dispersed, namely, retail, wholesale, and transport. Standard errors, adjusted for clustering at the state level, are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively. OLS=ordinary least squares.

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Total debt/market value						
Log max total benefit$_{t-1}$	0.045***	0.046***	0.057***	0.048***	0.030**	0.045***
	(0.015)	(0.016)	(0.017)	(0.012)	(0.012)	(0.010)
Number of observations	127,233	106,059	87,160	87,160	77,446	1,588
R^2	0.61	0.63	0.62	0.65	0.11	0.64
Panel B: Total debt/book value						
Log max total benefit$_{t-1}$	0.024***	0.031***	0.040***	0.025***	0.012*	0.031***
	(0.009)	(0.011)	(0.010)	(0.009)	(0.006)	(0.007)
Number of observations	127,233	106,059	87,160	87,160	77,446	1,588
R^2	0.58	0.59	0.59	0.68	0.16	0.50
Panel C: Log interest coverage						
Log max total benefit$_{t-1}$	−0.154**	−0.124*	−0.150*	−0.131*	−0.042	−0.381***
	(0.060)	(0.067)	(0.085)	(0.068)	(0.068)	(0.052)
Number of observations	127,233	106,059	87,160	87,160	77,446	1,588
R^2	0.58	0.59	0.58	0.64	0.12	0.54
Sample						
Level of aggregation	Firm-year	Firm-year	Firm-year	Firm-year	Firm-year	State-year
Exclude dispersed industries	No	No	Yes	Yes	Yes	Yes
Control variables						
State economic indicators	No	Yes	Yes	Yes	Yes	Yes
Firm financial controls	No	No	No	Yes	Yes	No
Firm fixed effects	Yes	Yes	Yes	Yes	No	No
State fixed effects	No	No	No	No	No	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Estimation method	OLS	OLS	OLS	OLS	First-differences	Median regression

Figure 2:

Results

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- Panel B shows book leverage, which have consistent results across the models with market leverage. They are slightly less, suggesting firms actively optimize.
- Panel C employs interest coverage (ratio of operating earnings before depreciation to interest expense) which measure a firm's ability to use currect profits to cover interest payments of debt.
  - Helps capture debt use of growing firms
  - Higher UI benefits imply lower interest coverage ratios (more debt)
- 100 log point increase in max UI benefit suggest 15% lower interest coverage.

Identification Analysis

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(1) Control for local macroeconomic conditions

Have minimal effect on estimated association between UI benefits and leverage (in columns 2-6 of Table 3)

Identification Analysis

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(2) Timing

If poor, unobserved economic conditions cause firms to increase leverage and induce legislators to raise UI benefits, one should expect to see increases in leverage before benefits improve.

- Table 4 shows inclusion os controls for contemporaneous and forward values of UI benefits in leverage regressions does not affect correlation beween lagged UI benefits and corporate leverage ratio

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Table 4

Falsification tests: timing of capital structure changes and unemployment insurance (UI) laws in bordering states.

This table summarizes the results from falsification tests. Column 1 reproduces the baseline results. Column 2 reports firm-panel regressions of firms' financial leverage (total debt divided by the market value of the firm) on 1-year lagged, contemporaneous, and 1-year forward values of the natural log of the maximum total potential benefit available under the state's unemployment insurance system, and a set of controls. Columns 3 and 4 report firm-panel regressions of firms' financial leverage on the natural log of the maximum total potential benefit available under the state's UI system in the previous year, the median of the natural log of the maximum total potential benefit available under the UI systems in bordering states, and the controls. Controls in all regressions include firm and year fixed effects, state economic indicators (state unemployment rate and state gross domestic product growth rate), and firm financial controls (proportion of fixed assets, market-to-book ratio, natural log of sales, modified Altman Z-score, and return on assets). Industries are excluded in which a large percentage of the workforce is likely to be geographically dispersed, namely, retail, wholesale, and transport. Standard errors, adjusted for clustering at the state level, are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)
Log max total benefit$_{t-1}$	0.048***	0.040***	0.047***	
	(0.017)	(0.013)	(0.016)	
Log max total benefit$_t$		0.009		
		(0.019)		
Log max total benefit$_{t+1}$		0.005		
		(0.019)		
Log max total benefit$_{t-1}$, bordering states median			0.020	0.025
			(0.027)	(0.028)
Number of observations	87,160	75,445	87,039	87,039
R^2	0.65	0.66	0.65	0.65
Control variables				
State economic indicators	Yes	Yes	Yes	Yes
Firm financial controls	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes

Figure 3: Timing

Identification Analysis

(3) Heterogeneities

1 Would expect to find stronger relation between UI benefits and corporate financial policies in industries where labor unemployment risk is more relevant

2 Relation between UI generosity and firms' financial policies should be stronger for financially constrained firms - financing frictions increase unemployment risk and means for higher wage premiums demanded. Conservative financing should ensue.

Heterogeneities - Greater Unemployment Risk

Panel A: Industries with greater expected worker unemployment costs					
	More labor intensive (1)	High UI payment rates (2)	High layoff separation rates (3)	More low-wage workers (4)	Low employee home ownership (5)
Log max total benefit$_{t-1}$	0.047*** (0.017)	0.055*** (0.020)	0.046** (0.020)	0.056*** (0.019)	0.062*** (0.015)
Panel B: Industries with lower expected worker unemployment costs					
	Less labor intensive (6)	Low UI payment rates (7)	Low layoff separation rates (8)	Fewer low-wage workers (9)	High employee home ownership (10)
Log max total benefit$_{t-1}$	0.028 (0.022)	0.023 (0.020)	0.037* (0.022)	0.032 (0.026)	0.016 (0.022)
Control variables					
State economic indicators	Yes	Yes	Yes	Yes	Yes
Firm financial controls	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes

Figure 4:

Heterogeneities - Financing Constraints

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Panel A: Firms that face greater financial constraints			
	Zero dividends (1)	Low cash flows (2)	Small firms (3)
Log max total benefit$_{t-1}$	0.061*** (0.022)	0.061** (0.026)	0.047** (0.022)

Panel B: Firms that face weaker financial constraints			
	Positive dividends (4)	High cash flows (5)	Large firms (6)
Log max total benefit$_{t-1}$	0.022* (0.011)	0.035*** (0.013)	0.029 (0.020)
Control variables			
State economic indicators	Yes	Yes	Yes
Firm financial controls	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes

Figure 5:

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(4) Local Unobservable Economic Shocks

- Separate firms who have higher intrastate commerce
- Firms with higher out of state sales have greater relationship between UI generosity and leverage

Identification Analysis

Table 5

Impact of unemployment insurance laws by geography of sales, national versus local.

This table summarizes the results from firm-panel regressions of firms' financial leverage (total debt divided by the market value of the firm) on the natural log of the maximum total potential benefit available under the state's unemployment insurance system in the previous year, and a set of controls. Each column corresponds to different sample restrictions based on the geographic breakdown of sales in the firms' industry, specifically the percent of the value of product shipments in the firm's three-digit North American Industry Classification System industry sent to destinations in a different US state and is based on the 2007 Commodity Flow Survey. Controls in all regressions include firm and year fixed effects, state economic indicators (state unemployment rate and state gross domestic product growth rate), and firm financial controls (proportion of fixed assets, market-to-book ratio, natural log of sales, modified Altman Z-score, and return on assets). Industries are excluded in which a large percentage of the workforce is likely to be geographically dispersed, namely, retail, wholesale, and transport. Standard errors, adjusted for clustering at the state level, are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

	Full sample (1)	Sales data not missing (2)	Interstate sales > 70% (3)	Interstate sales > 75% (4)	Interstate sales > 80% (5)	Interstate sales > 85% (6)
Log max total benefit$_{t-1}$	0.048***	0.041*	0.046*	0.048*	0.047*	0.060***
	(0.017)	(0.024)	(0.024)	(0.024)	(0.023)	(0.021)
Number of observations	87,160	61,503	58,913	57,774	51,851	30,840
R^2	0.65	0.64	0.64	0.64	0.64	0.63
Control variables						
State economic indicators	Yes	Yes	Yes	Yes	Yes	Yes
Firm financial controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes

Figure 6:

Identification Analysis

(5) Profits

No signs of poor operating performance when benefits increase

	(1)	(2)	(3)	(4)
Log max total benefit$_{t-1}$	−0.013	−0.004	0.000	0.013
	(0.016)	(0.019)	(0.023)	(0.025)
Number of observations	127,233	106,059	87,160	87,160
R^2	0.67	0.67	0.67	0.74
Exclude dispersed industries	No	No	Yes	Yes
Control variables				
State economic indicators	No	Yes	Yes	Yes
Firm financial controls	No	No	No	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes

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(6) Neighboring states

If firm's operations are concentrated at firm HQ, generosity of UI in neighboring states should bear no effect

Falsification tests: timing of capital structure changes and unemployment insurance (UI) laws in bordering states.

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	(1)	(2)	(3)	(4)
Log max total benefit$_{t-1}$	0.048***	0.040***	0.047***	
	(0.017)	(0.013)	(0.016)	
Log max total benefit$_t$		0.009		
		(0.019)		
Log max total benefit$_{t+1}$		0.005		
		(0.019)		
Log max total benefit$_{t-1}$, bordering states median			0.020	0.025
			(0.027)	(0.028)
Number of observations	87,160	75,445	87,039	87,039
R^2	0.65	0.66	0.65	0.65
Control variables				
State economic indicators	Yes	Yes	Yes	Yes
Firm financial controls	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes

Figure 8:

Extended Benefits

- Extended benefits excluded from analysis to minimize concern of ommitted variables.

Alternative Mechanisms

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Pure Cash Flow Effect

- When UI benefits increase, firms' premium costs increase. Less money to pay debt, then, and leverage is increases
- Rejected by data (from identification analysis looking at profitability)

Strategic Leverage

- Greater UI benefits could lead to wage bargaining. Firms could raise leverage to maintain tougher bargaining stance.
- Repeat analysis separating firms based on high and low union presence.
- Relation between UI benefits and leverage are not significantly different between groupings