



Access to Collateral and Debt Structure

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Conference on India's Financial System

Central Theme

- The effect of institutions on financial contracting
 - Analyze the effect of strengthening of secured creditor's rights on firm's usage
 - ◆ Secured Debt
 - ◆ Total Debt
 - ◆ Maturity (if time permits)

Law and Finance View

- LLSV (1997, 1999) and subsequent papers
 - Supply side argument



Lender

Improvement in creditor rights facilitates financing in the economy.

Borrower

Lowers the cost of capital



PREDICTION: Secured debt increases...

But, I find the opposite!

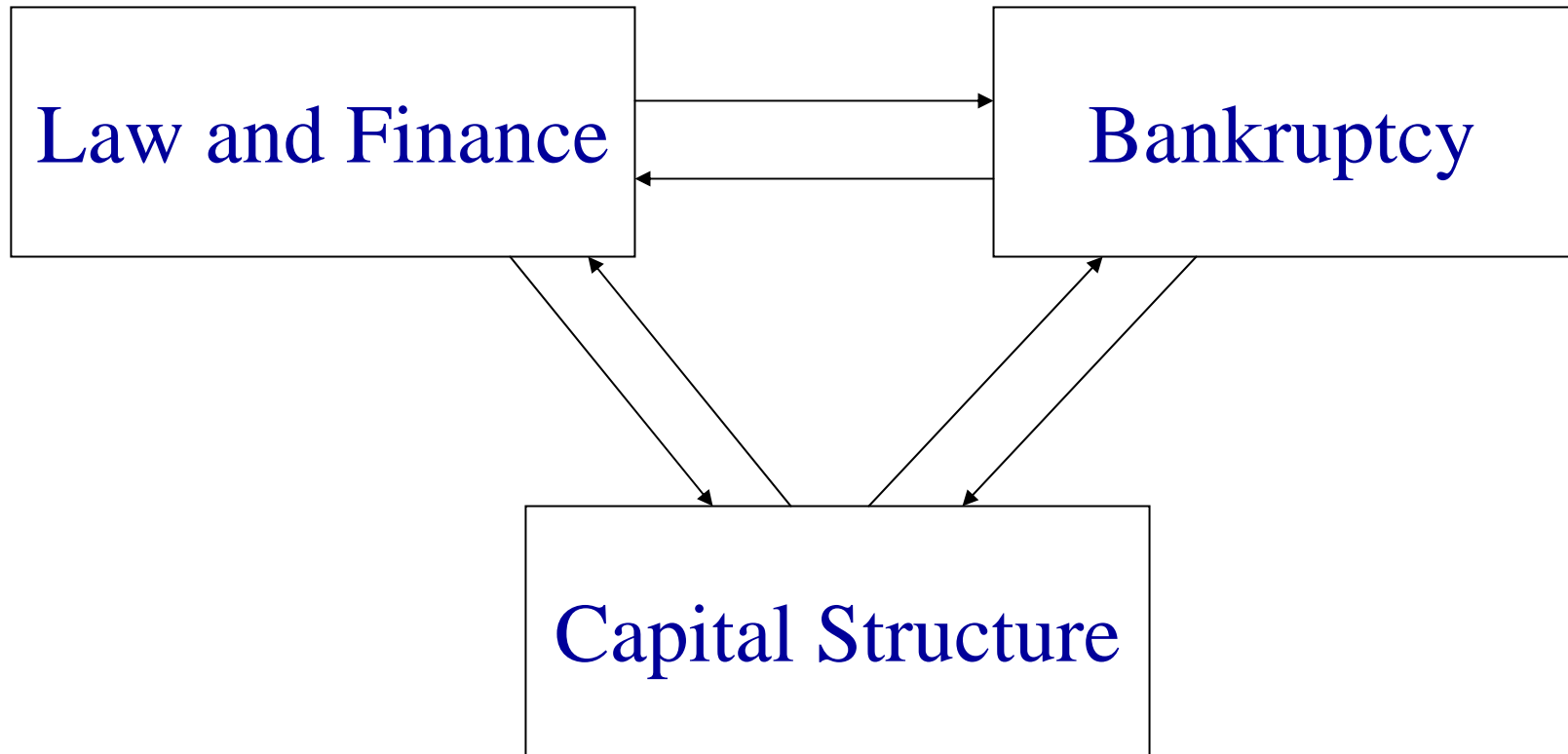
- Secured debt usage *reduced* after passage of a law that strengthened secured creditor rights in India

Why?

What Do I Do?

- **Conceptual Framework**
 - Theoretically analyze how creditor rights affect corporate debt structure: *Demand* and *Supply*
- **Methodological**
 - Use an exogenous event to generate variation in creditor rights
 - Use differences-in-differences methodology on micro level data to establish causality

This Paper



Recent Literature

- **Gianetti (2003)**: Strong creditor rights → higher leverage and long-term debt
- **Qian and Strahan (2006)**: Strong creditor rights → more secured, longer maturity loans, lower interest rates
- **Davydenko and Franks (2006)**: Banks in a creditor-unfriendly code require more collateral
- **Acharya, John and Sundaram (2004)**
- **Visaria (2006)**
- **Hasselmann, Pistor and Vig (2006)**

Outline

- Event
- Analytical Framework
- Methodology
- Results
- Conclusion

Event

- In June 2002, the Government of India passed a law
 - Empowered the banks and financial institutions (F.Is) to bypass the lengthy court process
 - Banks and FIs can seize any of the secured assets of a firm in case of default
- This law (a.k.a *SARFAESI Act*) pertains only to secured assets

Event (cont'd)

- Banks and FI's can take over the assets and management of any company if
 - Company has defaulted in payments for more than 6 months
 - Notice of 60 days
- Right to Appeal
 - Only after 75 percent of the amount to be claimed has been deposited
 - Appeal before the DRT

Purpose of SARFAESI

- Lower Non Performing Assets (NPAs) of banks
- Promote secured credit in India

Timeline

- February 1999: Committee set up to formulate specific recommendations regarding the legal framework of banking system
- March 2000: Panel submitted report on legal reforms
 - Empowering Banks and FIs to take possession of securities and sell them for recovery of loans
 - Committee comprising officials from
 - ◆ Reserve Bank of India, Ministry of Finance, Ministry of Law and ICICI

Timeline (cont'd)

Received huge coverage in press

- May 11, 2000
 - Hindu Business Line
 - *“Spare the rod and spoil the child”*
 - Economic Times
 - *“Sweeping changes proposed in banking laws”*
 - Business Standard
 - *“Radical steps mulled for debt recovery”*
- November 2000: Panel meets to finalize the draft legislation for the new bill
 - Economic Times
 - *“Banks and FI’s may get the nod to sell securities”*

Timeline (cont'd)

- June 2001, Government meets to discuss the recommendation of the committee with regards to the foreclosure law
- Debt recovery jumps 197% in 2001-2002
 - The Economic Times (May 2002)
- SARFAESI Act 2002 passed

Economic Intuition

- Entrepreneurs/Managers have a bias towards continuation
- Creditors on the other hand have a bias towards liquidation
- Increase in Creditor Rights increases the liquidation bias
- Entrepreneurs/Managers then adjust their balance sheets to undo this effect

Set Up

- Entrepreneur has a project that runs for 2 periods
 - At $t = 0$, E requires F to finance the project
 - Project type is private information:
 - ♦ With probability p , the project is of good type and generates C with probability θ in every period
 - ♦ With probability $1-p$, the project is a bad type and generates 0 in every period
 - At $t = 1$, publicly observable returns are realized
 - At $t = 1$, E needs additional funds F to continue project
 - If continued, returns $C_2 \in \{0, C\}$ are realized at $t = 2$
 - Entrepreneur gets private benefit b from continuation.

Event

Model

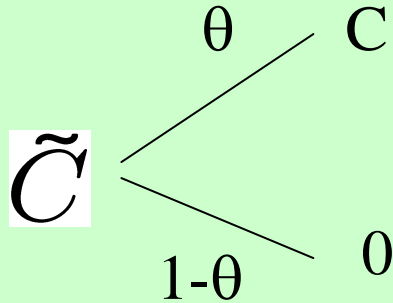
Data

Empirics

Conclusion

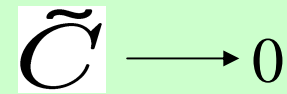
Set Up

Good Firm



In both periods

Bad Firm



\tilde{C}

\tilde{C}

b

t=0

t=1

t=2

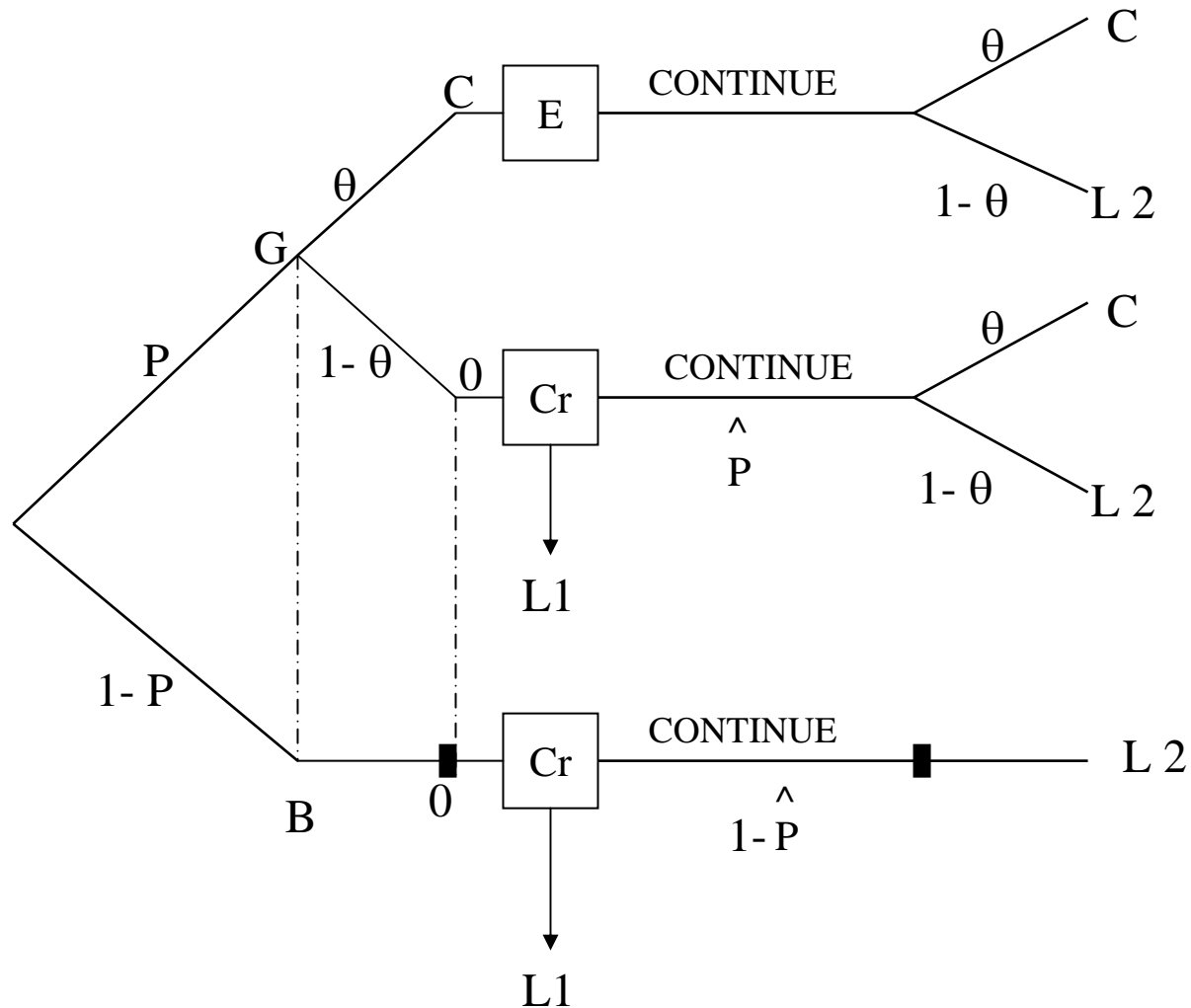
F

F (If refinanced)

Assumptions

- Liquidation values
 - Secured assets can be liquidated at L_1 and L_2 at $t=1$ and $t=2$ respectively.
 - For unsecured debt, liquidation value is normalized to 0
- Assume $L_1 = L$ and $L_2 = \phi L$ where $\phi < 1$
- Assets are lumpy
- Self financing is not possible
 - Entrepreneur consumes everything at the end of period

Schematic



Big Point

- Denote $\text{Prob}(\text{Good}|0) = \hat{p} = \frac{p(1-\theta)}{p(1-\theta)+(1-p)}$
- If $\hat{p}\theta C + \hat{p}(1-\theta)\phi L + (1-\hat{p})\phi L > F + L$ then the creditor will let the firm continue, otherwise she will liquidate the firm
- Let L^* solve: $\hat{p}\theta C - F = L^*[1 - \phi(1 - \hat{p}\theta)]$
 - If $\underline{L} > L^*$, then there is a potential threat of being liquidated with secured debt

Big Point

- Condition for no liquidation threat:

$$\hat{p}\theta C + \hat{p}(1 - \theta)\phi L + (1 - \hat{p})\phi L > F + L$$

- The law changes the liquidation value of the asset from $\mathbf{L} \rightarrow \mathbf{L} + \delta$.

$$\hat{p}\theta C + \hat{p}(1 - \theta)\phi(L + \delta) + (1 - \hat{p})\phi(L + \delta) \stackrel{?}{>} F + (L + \delta)$$

- Note: b is not present in creditor's objective function

Economic Intuition

- **Benefit of collateralization**
 - You sell fewer underpriced claims
- **Cost of collateralization**
 - It may however introduce a premature liquidation threat
 - **Note: b is not present in creditor's objective function**

Summary

- Law has two effects for firms with $L > L^*$
 - 1) Increases the liquidation value from L_2 to L_1
 - ◆ Increase usage of secured debt
 - 2) Increases liquidation cost (b is lost)
 - ◆ Would decrease usage of secured debt
- Point: *If b is high enough, then there will be a decrease in the usage of secured debt*

Summary (cont'd)

- For firms with $L < L^*$
 - An increase in L , leads to an increase in the usage of secured debt
 - These firms do not face any premature liquidation threat from the SARFAESI Act

What is L?

- Divide firms into quintiles of asset tangibility, where asset tangibility is:

$$\frac{\textit{PlantAndMachinery} + \textit{OtherFixedAssets}}{\textit{TotalAssets}}$$

- Rajan and Zingales (1995) definition
- Compare top-most quantile (*Treatment Group*) to bottom most quantile (*Control Group*)

Data

- CMIE data-Balance Sheets/Income Statement
- Drop firms in financial services industry
- Drop firms with missing data
- Overall roughly 5000 firms in manufacturing and services industry
- Coverage 1997-2004

Event

Model

Data

Empirics

Conclusion

Data

Industries	Number of firms	Observations
<i>Chemicals (includes drugs and pharmaceuticals)</i>	722	3728
<i>Textiles</i>	620	3178
<i>Iron and Steel (includes Castings and forging+electrical appliances+copper+aluminum)</i>	486	2370
<i>Consumer electronics</i>	366	1659
<i>Plastics</i>	316	1697
<i>Processed Food + Tobacco</i>	292	1410
<i>Automobiles + ancillaries</i>	232	1341
<i>Engines + material handling equipment</i>	218	1156
<i>Cement (includes abrasives)</i>	207	1062
<i>Wires and Cables</i>	200	1061

Event

Model

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Summary Statistics

Variables	All Firms	Listed Firms	Unlisted Firms
Debt/Assets	0.339 [0.186] 27150	0.345 [0.18] 14799	0.332 [0.192] 12351
Secured Debt/Assets	0.269 [0.179] 27150	0.285 [0.176] 14799	0.251 [0.18] 12351
Long-term Debt/Assets	0.209 [0.17] 27150	0.217 [0.163] 14799	0.2 [0.176] 12351
Secured Debt/Debt	0.769 [0.261] 27150	0.795 [0.232] 14799	0.737 [0.288] 12351
Short-term Debt/Debt	0.432 [0.302] 27150	0.417 [0.284] 14799	0.45 [0.322] 12351
Log (Assets)	3.878 [1.632] 27150	4.202 [1.622] 14799	3.49 [1.557] 12351
Log (EBIT)	1.361 [1.909] 22996	1.707 [1.931] 12557	0.944 [1.797] 10439
Log(Sales)	3.645 [1.878] 26741	3.905 [1.89] 14688	3.328 [1.813] 12053
EBIT/Assets	0.073 [0.122] 27150	0.07 [0.109] 14799	0.077 [0.135] 12351

Event

Model

Data

Empirics

Conclusion

Before/After

Variables	Mean		Median	
	Before	Difference	Before	Difference
Secured-Debt/Assets	0.281*** (0.001)	-0.033*** (0.002)	0.267*** (0.002)	-0.041*** (0.003)
Secured Debt/Debt	0.784*** (0.002)	-0.042*** (0.003)	0.871*** (0.002)	-0.036*** (0.004)
Debt/Assets	0.348*** (0.001)	-0.023*** (0.002)	0.347*** (0.002)	-0.028*** (0.004)
Long-term Debt/Assets	0.217*** (0.001)	-0.022*** (0.002)	0.191*** (0.002)	-0.031*** (0.003)
Short-term Debt/Assets	0.131*** (0.001)	-0.001 (0.001)	0.114*** (0.001)	-0.007*** (0.002)
Short-term Debt/Debt	0.423*** (0.002)	0.026*** (0.004)	0.385*** (0.003)	0.031*** (0.005)
Interest Exp/Op Income	0.317** (0.137)	-0.092 (0.225)	0.401*** (0.007)	-0.160*** (0.012)

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Before/After

	Low Tangibility		Medium Tangibility		High Tangibility	
	Before	Difference	Before	Difference	Before	Difference
Secured Debt/Assets	0.212*** (0.00)	0 (0.00)	0.292*** (0.00)	-0.034*** (0.00)	0.342*** (0.00)	-0.058*** (0.00)
Secured Debt/Debt	0.753*** (0.00)	-0.015** (0.01)	0.799*** (0.00)	-0.040*** (0.01)	0.801*** (0.00)	-0.051*** (0.01)
Debt/Assets	0.277*** (0.00)	0.002 (0.00)	0.357*** (0.00)	-0.023*** (0.00)	0.411*** (0.00)	-0.045*** (0.00)
Long-term Debt/Assets	0.142*** (0.00)	-0.002 (0.00)	0.217*** (0.00)	-0.025*** (0.00)	0.295*** (0.00)	-0.046*** (0.00)
Short-term Debt/Assets	0.134*** (0.00)	0.004 (0.00)	0.140*** (0.00)	0.002 (0.00)	0.116*** (0.00)	0.002 (0.00)
Short-term Debt/Debt	0.346*** (0.00)	0.042*** (0.01)	0.423*** (0.00)	0.042*** (0.01)	0.319*** (0.00)	0.048*** (0.01)
Log(Assets)	3.622*** (0.02)	0.326*** (0.04)	3.744*** (0.02)	0.279*** (0.04)	3.996*** (0.02)	0.297*** (0.04)

Event

Model

Data

Empirics

Conclusion

Before/After (cont'd)

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Event

Model

Data

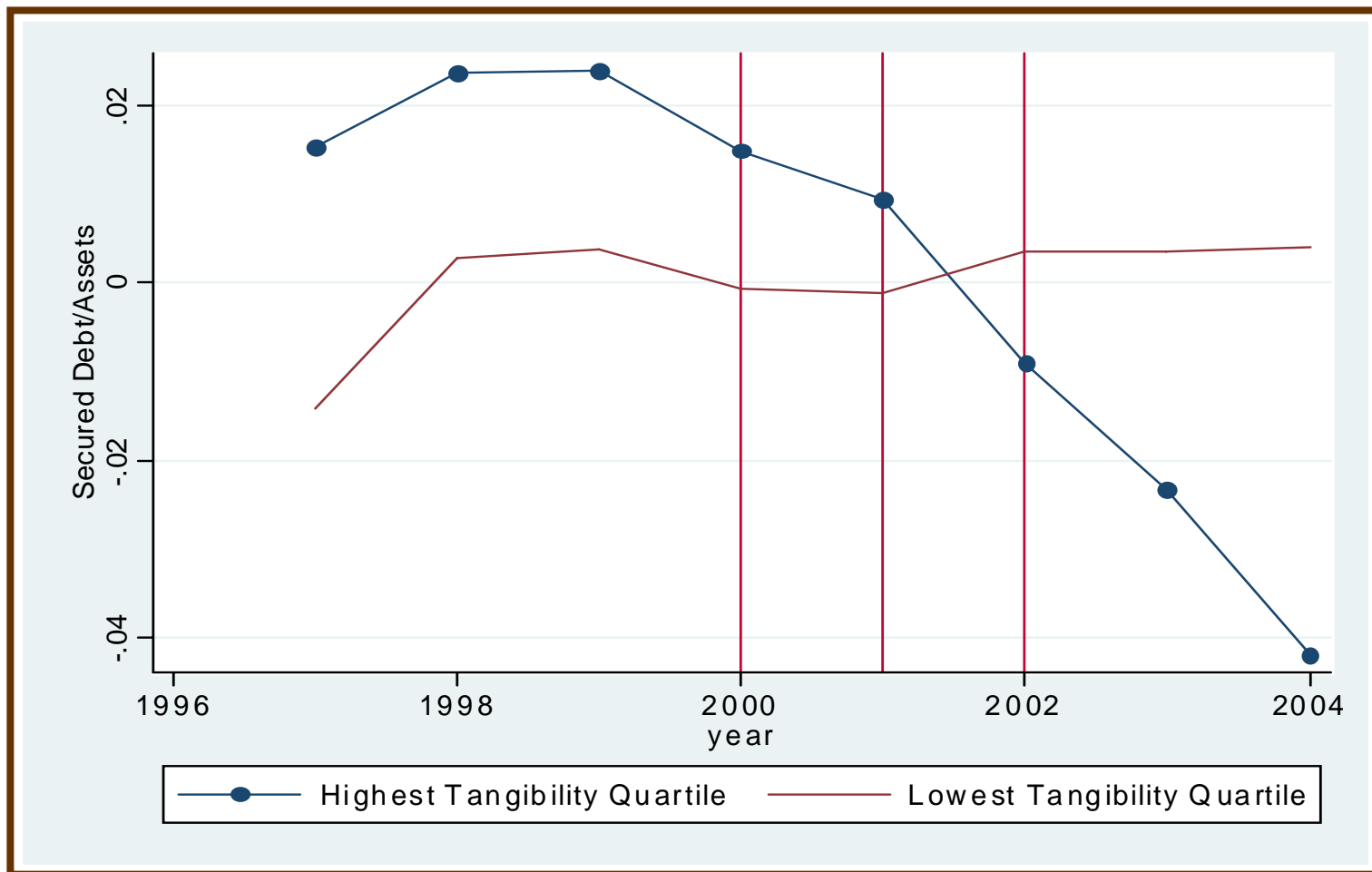
Empirics

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Secured Debt/Assets

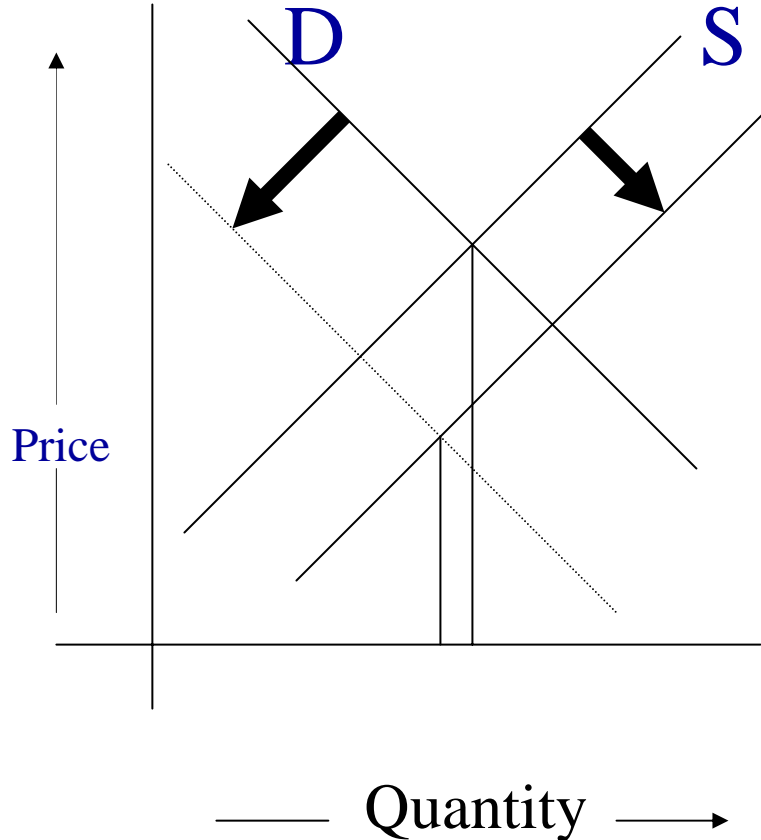


Empirical Strategy

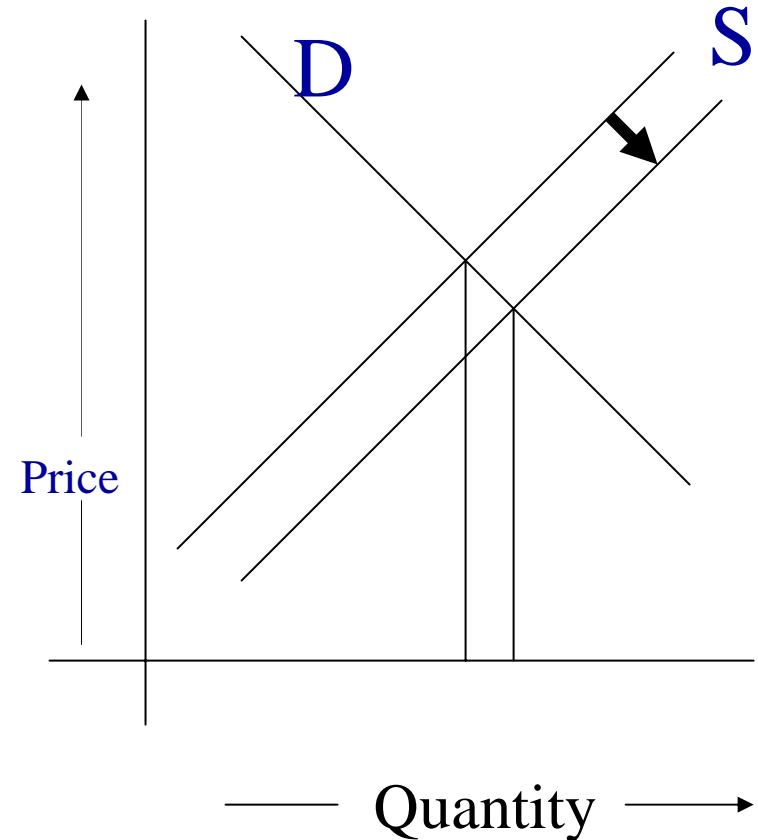
- Differences-in-Differences Specification used to establish causality
 - $y_{it} = \alpha_i + \gamma_t + \delta \cdot 1_{(E=1)} + \theta \cdot 1_{(A=H)} + \eta \cdot 1_{(E=1)} 1_{(A=H)} + \omega \cdot X_{it} + \varepsilon_{it}$
- Specification
 - y_{it} : dependent variable of interest
 - $1_{(E=1)}$: indicator variable is 1 after the law change
 - $1_{(A=H)}$: indicator variable is 1 if firms belong to high tangibility quintile
 - η : variable of interest
 - α_i and γ_t are firm and year fixed effects respectively

Empirical Strategy

- High Tangibility ($L > L^*$)



- Low Tangibility ($L < L^*$)



Secured Debt/Assets

Secured Debt/Assets						
Variables	All Firms			Listed Firms		
	1	2	3	4	5	6
AFTER*HIGH TANG DUM	-0.054*** (0.005)	-0.053*** (0.005)	-0.051*** (0.005)	-0.057*** (0.007)	-0.053*** (0.007)	-0.056*** (0.008)
EBIT/Assets		-0.135*** (0.021)	-0.135*** (0.021)		-0.169*** (0.020)	-0.175*** (0.020)
Log(Sales)		(0.002)	-0.001 (0.002)		0 (0.003)	0.001 (0.003)
Tobin' Q adjusted		0.000 (0.000)	0.000 (0.000)		0.000 (0.000)	0.000 (0.000)
Tangibility		0.035*** (0.013)	0.034*** (0.013)		0.017 (0.018)	0.014 (0.018)
Constant	0.260*** (0.002)	0.255*** (0.016)	0.414*** (0.064)	0.274*** (0.003)	0.278*** (0.020)	0.585*** (0.081)
Number of Firms	3298	3267	3267	1907	1834	1834
Observations	17428	17143	17143	9773	9687	9687
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry*Year Fixed Affects	No	No	Yes	No	No	Yes
R-squared	0.821	0.826	0.829	0.819	0.825	0.829

Robust standard errors in parentheses, errors are clustered at the firm level
 * significant at 10%; ** significant at 5%; *** significant at 1%

Secured Debt/Debt

Secured Debt/Debt						
Variables	All Firms			Listed Firms		
	1	2	3	4	5	6
AFTER*HIGH TANG DUM	-0.035*** (0.008)	-0.036*** (0.008)	-0.032*** (0.009)	-0.033*** (0.011)	-0.033*** (0.011)	-0.033*** (0.013)
EBIT/Assets		-0.038** (0.019)	-0.039** (0.018)		-0.029 (0.023)	-0.033 (0.023)
Log(Sales)		0.015*** (0.004)	0.017*** (0.004)		0.007 (0.005)	0.010* (0.005)
Tobin' Q adjusted		0.000 (0.000)	0.000 (0.000)		0.000 (0.000)	0.000 (0.000)
Tangibility		-0.002 (0.022)	0 (0.022)		-0.011 (0.029)	-0.007 (0.029)
Constant	0.791*** (0.004)	0.848*** (0.029)	1.204*** (0.078)	0.815*** (0.004)	0.908*** (0.038)	1.134*** (0.067)
Number of Firms	3298	3267	3267	1907	1834	1834
Observations	17428	17143	17143	9773	9687	9687
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry*Year Fixed Affects	No	No	Yes	No	No	Yes
R-squared	0.714	0.714	0.717	0.698	0.698	0.705

Robust standard errors in parentheses, errors are clustered at the firm level
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Event

Model

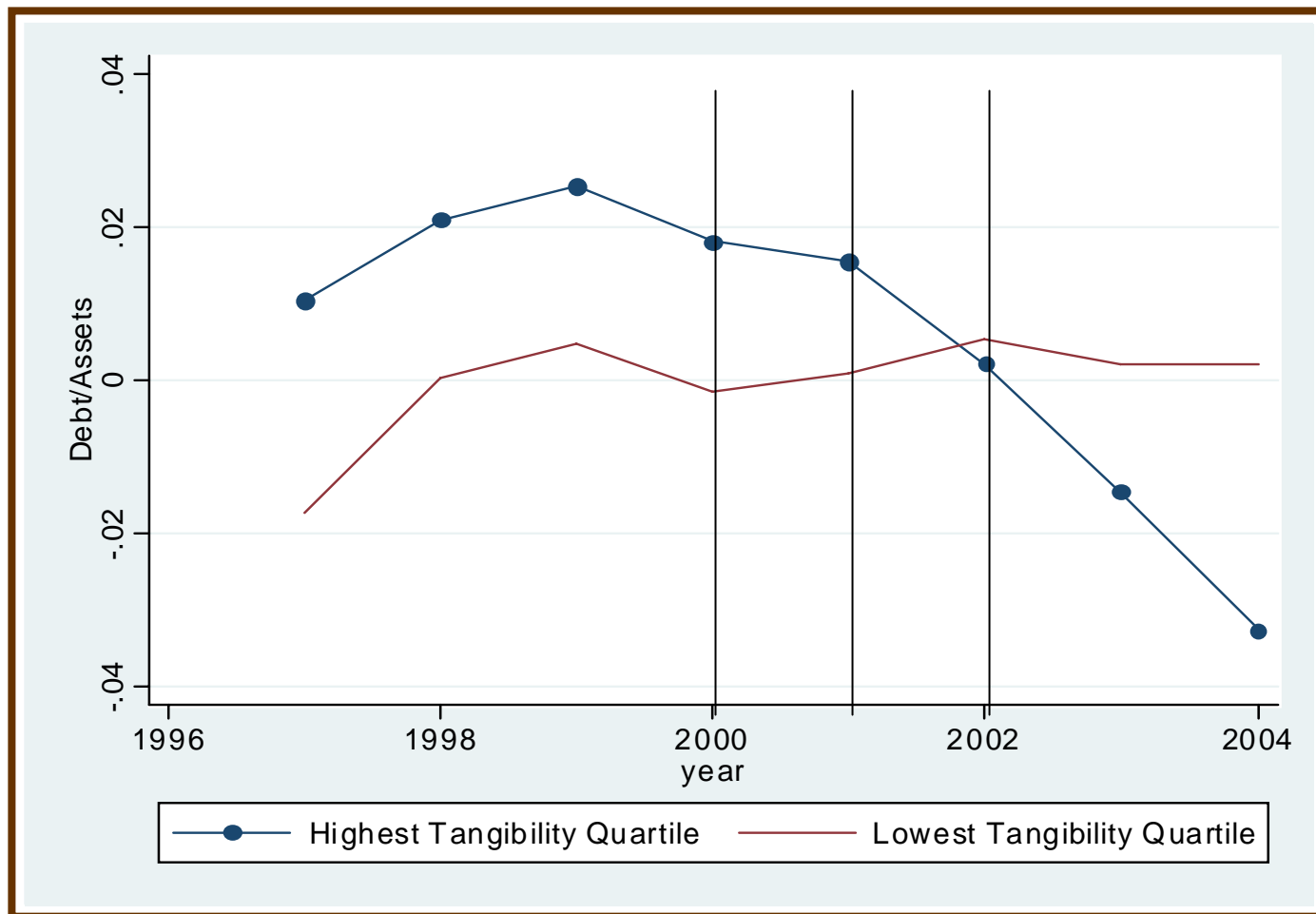
Data

Empirics

Conclusion

What about Leverage?

What about Leverage?



Debt/Assets

Variables	Debt/Assets					
	All Firms			Listed Firms		
	1	2	3	4	5	6
AFTER*HIGH TANG DUM	-0.046*** (0.005)	-0.044*** (0.005)	-0.042*** (0.006)	-0.047*** (0.007)	-0.044*** (0.007)	-0.047*** (0.008)
EBIT/Assets		-0.144*** (0.024)	-0.143*** (0.025)		-0.177*** (0.023)	-0.182*** (0.024)
Log(Sales)		-0.007*** (0.003)	-0.006** (0.003)		-0.003 (0.003)	-0.003 (0.003)
Tobin' Q adjusted		0.000 (0.000)	0.000 (0.000)		0.000 (0.000)	0.000 (0.000)
Tangibility		0.037*** (0.014)	0.035** (0.014)		0.027 (0.019)	0.023 (0.020)
Constant	0.324*** (0.002)	0.318*** (0.017)	0.369*** (0.069)	0.328*** (0.003)	0.316*** (0.022)	0.595*** (0.123)
Number of Firms	3298	3267	3267	1907	1834	1834
Observations	17428	17143	17143	9773	9687	9687
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry*Year Fixed Affects	No	No	Yes	No	No	Yes
R-squared	0.821	0.828	0.831	0.825	0.832	0.836

Robust standard errors in parentheses, errors are clustered at the firm level
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Short-term Debt/Debt

Short-term Debt/Debt						
Variables	All Firms			Listed Firms		
	1	2	3	4	5	6
AFTER*HIGH TANG DUM	0.036*** (0.009)	0.035*** (0.009)	0.043*** (0.010)	0.044*** (0.011)	0.046*** (0.012)	0.052*** (0.014)
EBIT/Assets		-0.026 (0.018)	-0.026 (0.018)		-0.03 (0.027)	-0.023 (0.027)
Log(Sales)		0.016*** (0.004)	0.016*** (0.004)		0.011* (0.006)	0.010* (0.006)
Tobin' Q adjusted		0.000 (0.000)	0.000 (0.000)		0.000 (0.000)	0.000 (0.000)
Tangibility		-0.038* (0.022)	-0.042* (0.023)		-0.042 (0.028)	-0.044 (0.029)
Constant	0.412*** (0.004)	0.306*** (0.031)	0.001 (0.791)	0.400*** (0.004)	0.333*** (0.039)	0.165 (0.429)
Number of Firms	3298	3267	3267	1907	1834	1834
Observations	17428	17143	17143	9773	9687	9687
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry*Year Fixed Affects	No	No	Yes	No	No	Yes
R-squared	0.754	0.754	0.756	0.766	0.765	0.77
Robust standard errors in parentheses, errors are clustered at the firm level * significant at 10%; ** significant at 5%; *** significant at 1%						

Labor Laws

- Besley and Burgess (2004) classify states in India into pro-employer states and pro-worker states
 - Pro-employer states should be affected more this law as compared to the pro-worker states

Labor Institutions

Variables	Sec. Debt/Assets		Sec. Debt/Debt		Debt/Assets	
	1	2	3	4	5	6
AFTER*PRO_EMP_DUM	-0.014* (0.007)	-0.015* (0.007)	-0.01 (0.012)	-0.013 (0.011)	-0.010** (0.003)	-0.010*** (0.003)
EBIT/Assets	-0.310*** (0.019)	-0.314*** (0.020)	-0.068* (0.033)	-0.076** (0.032)	-0.306*** (0.008)	-0.303*** (0.008)
Log(Sales)	0.007 (0.004)	0.007 (0.005)	0.014*** (0.004)	0.014** (0.005)	0.003 (0.003)	0.002 (0.004)
Tobin' Q adjusted	-0.004*** (0.001)	-0.022*** (0.001)	-0.011*** (0.001)	-0.060*** (0.010)	-0.001* (0.001)	-0.016*** (0.001)
Tangibility	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Constant	0.321*** (0.010)	0.671*** (0.014)	0.988*** (0.021)	1.922*** (0.185)	0.347*** (0.010)	0.620*** (0.012)
Number of Firms	1746	1746	1746	1746	1746	1746
Observations	8536	8536	8536	8536	8536	8536
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry*Year Fixed Affects	No	Yes	No	Yes	No	Yes
R-squared	0.838	0.844	0.749	0.757	0.837	0.842

Robust clustered standard errors in parentheses, clustering is done at the state of location of plant

* significant at 10%; ** significant at 5%; *** significant at 1%

Robustness Tests

- Alternate definitions of *Tangibility*
- Different treatment and control groups
- Pre-treatment trends

Conclusion

- Davydenko and Franks (2006)
 - UK: stronger creditor rights (LLSV: 4)
 - France: relatively weaker creditor rights (LLSV: 0)
 - ◆ Secured debt/debt (UK) < Secured debt/debt (FRA)

Conclusion

- Legal changes are accompanied by compositional shifts
 - Secured debt goes down
 - Leverage goes down
- Laws that are made to facilitate lending may adversely effect lending

THANK YOU !