

MISALLOCATION DUE TO INEFFICIENT EXITS – EVIDENCE FROM INDIA

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MISALLOCATION DUE TO INEFFICIENT EXITS

“The Charkavyuha legend from the Mahabharata describes the ability to enter but not exit, with seriously adverse consequences. It is a metaphor for the workings of the Indian economy in the 21st century, the legacy of several decades of economic policy making.”

— *Economic Survey 2015–16, Ministry of Finance, India*

MISALLOCATION DUE TO INEFFICIENT EXITS

- ▶ “Creative destruction” coined by Joseph Schumpeter.
- ▶ Zombie distortions arising out of suppression of creative destruction.
 - ▶ Spurious reallocation of resources (Caballero et al. (2008)).
- ▶ **This paper:** Creditors’ ability to seize defaulters’ assets as a form of *exit*.
- ▶ Poor creditor rights => banks encumbered by poor institutional setting to recover loans.
- ▶ Long judicial delays prevent reallocation of assets to their best use.

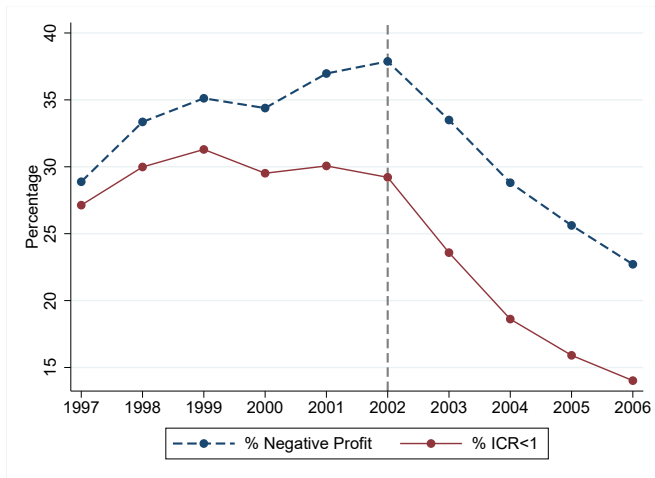
BUT, WHEN CREDITOR RIGHTS IMPROVE . . .

- ▶ Banks no longer constrained by poor institutional setting:
 - ▶ Reallocate resources (debt) away from poor quality firms.
 - ▶ Can force poor quality firms to realign operations?
 - ▶ Improve productive efficiency?
- ▶ **My setting:** SARFAESI Act 2002 in India that made it easier for creditors to seize *secured* assets.
 - ▶ Do creditors reallocate debt, labor and capital?
 - ▶ Does firm and aggregate profitability/productivity improve?

Do improvements in creditor rights lead to a better allocation of resources?

MOTIVATION: IMPACT OF SARFAESI

BORROWER QUALITY AND FIRM PROFITABILITY



$ICR = EBIT / \text{Interest Expense}$

Borrower quality & firm profitability improved drastically!

RESEARCH QUESTION

My setting: SARFAESI Act 2002 in India made it easier for creditors to seize secured assets.

- ▶ Step 1: Examine reallocation of debt to low quality borrowers relative to high quality borrowers.
 - ▶ Examine factors driving reallocation of debt.
- ▶ Step 2: Examine spillovers on high quality borrowers.
- ▶ Step 3: Examine impact on real outcomes: CapEx and Employment.
 - ▶ CapEx: Concentrated in core vs. non-core?
 - ▶ Employment: Concentrated in permanent vs. contract employees?
- ▶ Step 4: Examine profitability and productivity at aggregate and firm-level.

PREVIEW OF FINDINGS - I

- ▶ Reduction in secured borrowings of “low quality” borrowers
 - ▶ Low quality borrowers ↓ by INR 18 million (Avg: INR 41) million.
 - ▶ High quality borrowers ↑ by INR 10 million (Avg: INR 30) million.
 - ▶ Relative to high quality, low quality borrowers ↓ by INR 28 million (71 %).
 - ▶ No similar impact on *unsecured* borrowings.
 - ▶ Effect partly driven by reduction in zombie lending (“evergreening”)
 - ▶ Firms were 10 percent more likely to transition to non-zombie status after SARFAESI.
 - ▶ Effect partly driven by preemptive response to increased threat of liquidation.
 - ▶ Low quality firms with high proportion of tangible assets ↓ secured debt.
- ↑ Creditor Rights \implies Low quality borrowers ↓ secured borrowings.

PREVIEW OF FINDINGS - II

- ▶ Real Outcomes: CapEx and employment of low quality borrowers ↓ relative to high quality borrowers.
 - ▶ CapEx ↓ by INR 24 mn (Avg. INR 48 mn); Employment ↓ by 63 (Avg. 41).
 - ▶ Cuts in non-core projects and underperforming establishments.
- ▶ Spillovers: Reduction in zombie distortions
 - ▶ Secured Debt, CapEx and employment of **non-zombies** ↑ in previously zombie-dominated industries.
- ▶ Improvement in profitability and productivity of firms.

↑ Creditor Rights \implies Reduction in zombie distortions.

RELATION TO LITERATURE

- ▶ Misallocation of resources
 - ▶ Hsieh and Klenow (2009), Duranton, Ghani, Goswami and Kerr (2015)
- ▶ Creditor rights impact credit access
 - ▶ +: Due to higher payoffs (La Porta et. al (1998)).
 - ▶ -: Due to liquidation bias ((Hart and Moore (1994)).
 - ▶ Vig (2012): SARFAESI to show high tangibility firms had lower debt to assets.
- ▶ Zombie distortions
 - ▶ Caballero, Hoshi, and Kashyap (2008) look at zombie distortion in Japan in 90's.

This paper examines how improvement in creditor rights corrects allocative distortions.

PLAN FOR TODAY

1. Data and Empirical Design.
2. Baseline results on borrowing.
 - ▶ Zombie lending.
 - ▶ Preemptive response: heterogeneity across tangibility. (*Optional*)
3. Spillovers due to reduction in zombie distortions
 - ▶ Impact on Non-Zombies.
4. Comment on effectiveness of SARFAESI now. (*Optional*)
5. Conclusion

DATA

- ▶ Firm-level data: Prowess Database.
- ▶ Bank data: RBI; Prime lending rate from State Bank of India (SBI).
- ▶ Supplement (in paper): CapexDx and Annual Survey of Industries (ASI) data.
- ▶ [For baseline focus on 1997–2006.](#)

Data Item	Variables Used	Source
Item 1	Secured Borrowings = Change in Secured Debt	Derived from Prowess
Item 2	Unsecured Borrowings = Change in Unsecured Debt	Derived from Prowess
Item 3	Interest Rate Expense	Prowess
Item 4	Prime Lending Rate for Long-term Loans	SBI
Item 5	Interest Expense	Prowess
Item 6	Lending Rate for Short-term Loans	RBI/Prowess
Item 7	Interest Coverage Ratio (ICR) = EBIT/Interest Expense	Prowess
Item 8	Op. Margin = $\frac{EBITDA}{Sales}$	Prowess
Item 9	Plant and Machinery	Prowess
Item 10	Land and Building	Prowess
Item 11	Capital Work in Progress	Prowess
Item 12	Other Fixed Assets	Prowess
Item 13	Cash and Bank Balance	Prowess
Item 14	Marketable Securities	Prowess
Item 15	Specific Assets = Item 9 + Item 12	Derived from Prowess
Item 16	Non-specific Assets = Item 10 + Item 13 + Item 14	Derived from Prowess
Item 17	Tangibility = Specific assets / (Specific + Non-specific assets)	Derived from Prowess
Item 18	TFP = Log Sales - 2/3 Log E - 1/3 Log K	Derived from Prowess

LOW QUALITY BORROWERS: DEFINITION

- ▶ Define low quality borrowers in terms of interest coverage ratio (ICR).

$$\text{Interest Coverage Ratio}_i = \frac{\text{Earning Before Income and Taxes}}{\text{Interest Expense}}$$

- ▶ Captures ability of firms to service existing debt.
- ▶ Borrowers are considered to be low quality if median ICR in 1998, 1999, 2000 is below 1.
- ▶ Baseline results robust to other profitability measures (ROA, one year).

SUMMARY STATISTICS

BY QUALITY OF BORROWERS

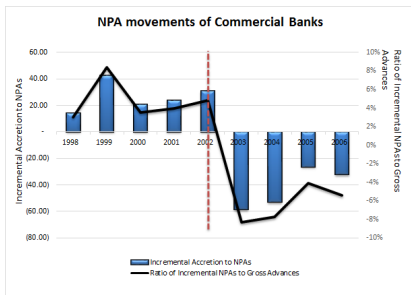
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	All		Low Quality			High Quality		
	Mean	SD	Pre	Post	t-stat on Diff.	Pre	Post	t-stat on Diff.
Secured Borrowings ⁺	36.58	160.7	40.67	28.58	(-4.70***)	30.46	43.66	(7.62***)
Unsecured Borrowing ⁺	2.210	12.23	0.700	2.950	(12.01***)	1.130	3.690	(18.95***)
Capital Expenditure ⁺	69.10	214.8	47.76	41.37	(-2.21**)	71.89	87.42	(6.37**)
Employment	101.0	432.0	41.22	109	(11.02***)	51.89	174.1	(25.33***)
Op. Margin	0.110	0.450	-0.0600	0.0800	(15.22***)	0.170	0.160	(-4.04***)
TFP	2.100	1.160	1.630	1.660	(1.49)	2.370	2.250	(-9.71)
ROA	0.0600	0.120	-0.0300	0.0300	(25.51***)	0.100	0.0700	(-21.15***)
Total Debt ⁺	932.7	5848	885.3	1174	(3.44***)	751.0	1037	(4.39***)
Secured Debt ⁺	457.0	1082	425.0	590.3	(8.25***)	376.8	500.0	(9.86***)
Unsecured Debt ⁺	208.4	638.1	194.8	255.0	(5.01***)	171.1	234.4	(8.03***)
Debt to Assets	0.350	0.350	0.480	0.580	(12.32***)	0.250	0.270	(5.84***)
Log(EBIT)	3.350	2.080	2.500	3.140	(13.66***)	3.350	3.620	(11.66***)
Log(Assets)	5.760	1.720	5.450	5.490	(1.60)	5.710	6.060	(19.00)
Log(Sales)	5.230	2.410	4.470	4.580	(2.76***)	5.440	5.660	(8.80***)
<u>EBITDA</u>	0.0900	0.120	0.0100	0.0700	(27.95***)	0.130	0.110	(-18.81***)
<u>Total Assets</u>								
Observations	50039		15319			34720		

⁺ INR million.

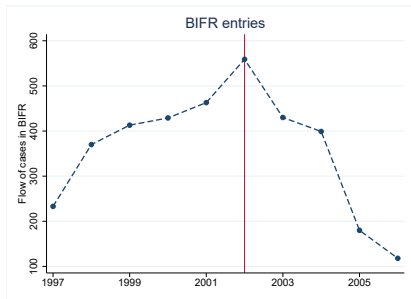
SARFAESI ACT OF 2002

- ▶ SARFAESI Act of 2002 made it easier for secured lenders to seize secured assets of defaulting borrowers.
 - ▶ Pre: Lender subject to elaborate legal process.
 - ▶ Post: Lender can start liquidation process on defaulted borrowers (secured only).
- ▶ Effective on June 21, 2002 but discussions began as early as 1999.
- ▶ Board for Industrial and Financial Reconstruction (BIFR) in 1985 & Debt Recovery Tribunals (DRT) 90's
 - ▶ DRTs: specialized institutions to reduce delays in debt recovery suits.
 - ▶ DRT weak in effect because firms delay using BIFR (Baijal (2008)).
- ▶ SARFAESI (till 2008) was “working” in that debtors were paying up (Raghuram Rajan Report 2009).

SARFAESI HAD AN IMPACT ...



NPA movements



BIFRs filings

NPA reductions and fixed BIFR loophole.

EMPIRICAL METHODOLOGY - BASELINE

▶ Baseline:

$$y_{it} = \alpha_i + \gamma_t + \eta \times \mathbb{1}_{Post} \times \mathbb{1}_{(LowQ)} + \epsilon_{ijt}$$

- ▶ where i indexes firms, t indexes time, α_i and γ_t are firm and year fixed effects.
- ▶ $\mathbb{1}_{Post} = 1$ for (≥ 2002); $\mathbb{1}_{(LowQ)} = 1$ for “Low Quality” firms.
- ▶ Control for $\text{Log}(\text{Sales})$ and $\text{EBITDA}/\text{total assets}$ in baseline specification, S.E. clustered at the firm level.
- ▶ y_{it} : Borrowings = Δ in secured debt (in INR million).

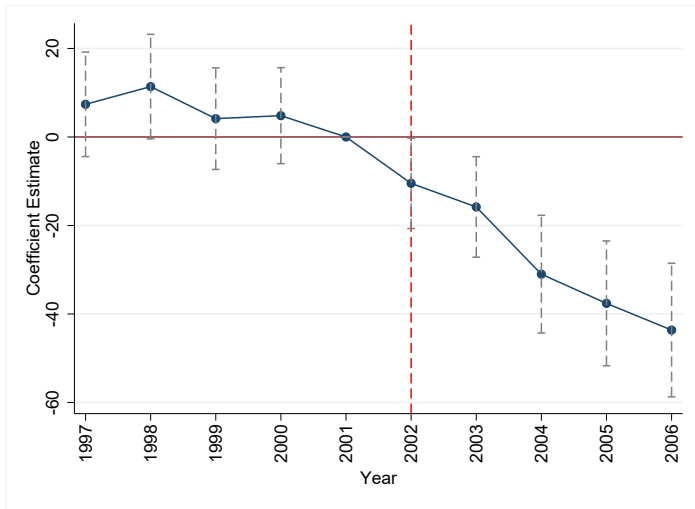
▶ Event Study plots:

$$y_{it} = \alpha_i + \gamma_t + \sum_{\tau} \eta_{\tau} \times (\mathbb{1}_{\tau} \times \mathbb{1}_{(LowQ)}) + \epsilon_{ijt}$$

- ▶ where τ ranges from 1996 to 2006.
- ▶ $\mathbb{1}_{\tau} = 1$ if year is τ ; η_{τ} is coefficient of interest.

SECURED BORROWINGS

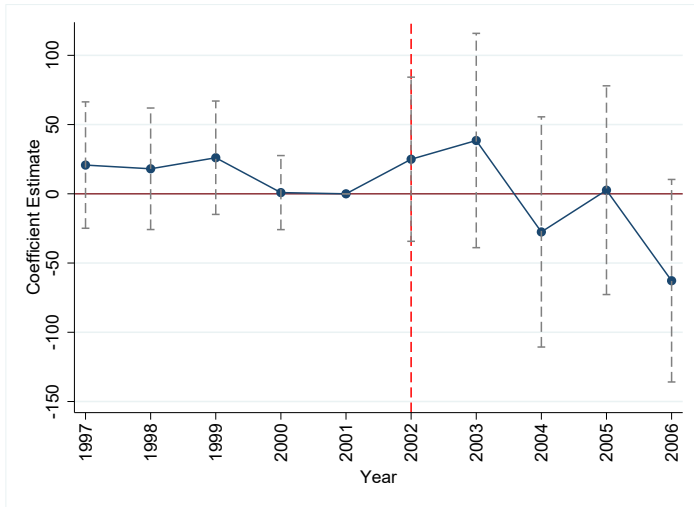
EVENT STUDY PLOTS



Reduction in new secured borrowings by Low Quality borrowers.

UNSECURED BORROWINGS

EVENT STUDY PLOTS



No reduction in unsecured borrowings.

SECURED BORROWINGS

	(1)	(2)	(3)	(4)	(5)	(6)
	Low Quality (INR million)	High Quality	Change in Secured Debt (INR million)		<u>Change in Secured Debt</u> Assets	
Post	-17.63*** (3.301)	9.969*** (1.963)				
Low Quality Borrower * Post			-31.83*** (3.746)	-27.79*** (3.832)	-0.0180*** (0.00296)	-0.0145*** (0.00298)
Baseline Mean	40.67	30.46	40.67	40.67	0.043	0.043
No. of Obs.	15319	34720	50039	50039	43112	43112
R squared	0.413	0.339	0.360	0.362	0.272	0.277
Firm Fixed Effects	Y	Y	Y	Y	Y	Y
Year Fixed Effects	N	N	Y	Y	Y	Y
Controls	N	N	N	Y	N	Y

Low quality firms ↓ secured borrowings by INR 28 million (70%) relative to high quality borrowers.

UNSECURED BORROWINGS

	(1)	(2)	(3)	(4)	(5)	(6)
	Low Quality (INR million)	High Quality (INR million)	Change in Unsecured Debt (INR million)		Change in Unsecured Debt Assets	
Post	2.141*** (0.271)	2.562*** (0.196)				
Low Quality Borrower * Post			-0.658** (0.332)	-0.473 (0.334)	-0.000228 (0.000264)	-0.000134 (0.000267)
Baseline Mean	0.700	1.130	0.700	0.700	.0007	.0007
No. of Obs.	15319	34720	50039	50039	43112	43112
R squared	0.410	0.435	0.432	0.433	0.434	0.434
Firm Fixed Effects	Y	Y	Y	Y	Y	Y
Year Fixed Effects	N	N	Y	Y	Y	Y
Controls	N	N	N	Y	N	Y

No relative impact on unsecured borrowings.

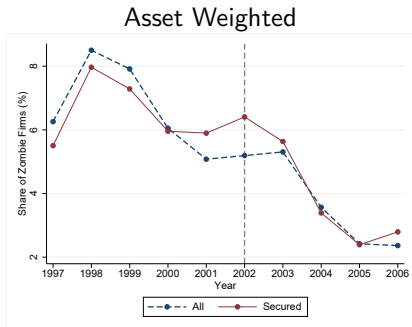
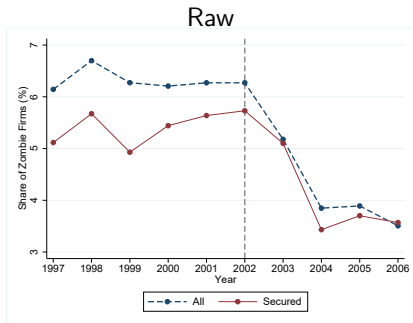
DUE TO REDUCTION IN ZOMBIES LENDING?

REASON I

Zombies defined as firms that receive subsidized credit.

- ▶ Start with Caballero, Hoshi and Kashyap (2008) to identify zombies.
 - ▶ Classified as zombies if Interest expense $<$ interest expense of most creditworthy firms.
- ▶ Above classification ignores profitability of loans:
 - ▶ Zombie: ICR of firm $<$ 1.
 - ▶ Leverage of loans above 15 percent.
- ▶ Evergreening of loans
 - ▶ Baseline: Borrowings $>$ 0.
 - ▶ Robustness: *Secured* borrowings $>$ 0.
- ▶ Highest Rated firms also classified as non-zombies.

SHARE OF ZOMBIES



Percentage of Zombies declined pos-SARFAESI.

Summary Stats

ZOMBIE ANALYSIS

SECURED BORROWINGS

Split into zombies if received zombie lending in 1998, 1998 or 2000.

	(1)	(2)	(3)	(4)	(5)	(6)
	Zombies	Non-Zombies	Secured		¹ zombie current	
	<i>(INR million)</i>		<i>(INR million)</i>			
Post	-26.55*** (4.501)	10.53*** (1.839)				
Zombie * Post			-36.70*** (4.872)	-33.52*** (4.969)	-0.0952*** (0.0113)	-0.0976*** (0.0112)
Baseline Mean	55.48	28.74	55.48	55.48		
No. of Obs.	8807	41232	50039	50039	50039	50039
R squared	0.438	0.334	0.359	0.362	0.318	0.322
Firm Fixed Effects	Y	Y	Y	Y	Y	Y
Year Fixed Effects	Y	Y	Y	Y	Y	Y
Controls	N	N	N	Y	N	Y

Reduction in secured borrowings attributable to reduction in evergreening.

HETEROGENEITY ACROSS TANGIBILITY

REASON 2

- ▶ Did low quality firms preemptively cut back on secured debt?
- ▶ Look at heterogeneity across firms with high tangible assets and those with low tangible assets.
- ▶ Heterogeneity:

$$y_{it} = \alpha_i + \gamma_t \\ + \eta \times \mathbb{1}_{Post} \times \mathbb{1}_{(LowQ)} + \nu \times \mathbb{1}_{Post} \times \mathbb{1}_{(HighT)} \\ + \phi \times \mathbb{1}_{Post} \times \mathbb{1}_{(LowQ)} \times \mathbb{1}_{(HighT)} + \epsilon_{ijt}$$

- ▶ where i indexes firms, t indexes time, α_i and γ_t are firm and year fixed effects.
- ▶ $\mathbb{1}_{(HighT)} = 1$ for “High Tangibility” firms, that is, in excluding the bottom tercile of Tangibility Ratio.
- ▶ $\mathbb{1}_{Post} = 1$ for years when SARFAESI is in effect (≥ 2002).
- ▶ $\mathbb{1}_{(LowQ)} = 1$ for “Low Quality” firms, that is, in bottom tercile of Interest Coverage Ratio.
- ▶ ϕ is the estimate of interest.
- ▶ S.E. clustered at the firm level.

HETEROGENEITY ACROSS TANGIBILITY

SECURED BORROWINGS



Effect driven by high tangibility firms (Vig (2013)).

HETEROGENEITY ACROSS TANGIBILITY

SECURED BORROWINGS

	(1)	(2)	(3)	(4)
	Low Quality	High Quality	All	All
Low Quality * Post			-17.51*** (4.445)	-14.08*** (4.482)
High Tangibility * Post	-19.90*** (5.798)	2.969 (4.086)	2.260 (4.116)	2.681 (4.101)
Low Quality * Post * High Tangibility			-22.25*** (7.068)	-21.47*** (7.085)
Baseline Mean	51.69	41.050	51.69	51.69
No. of Obs.	15317	34540	49857	49857
R squared	0.415	0.338	0.357	0.359
Firm Fixed Effects	Y	Y	Y	Y
Year Fixed Effects	Y	Y	Y	Y
Controls	Y	Y	N	Y

Firms that had most to lose cut back on secured borrowings.

ANALYZING SPILLOVERS

- ▶ Explore the change in trends in profitability:

$$\begin{aligned} y_{it} = & \alpha_i + \gamma_t + \beta_1 \times \mathbb{1}_{High\ Sector\ Zombies} \times \mathbb{1}_{Post} \\ & + \beta_2 \times \mathbb{1}_{Non\ Zombie} \times \mathbb{1}_{Post} \\ & + \beta_3 \times \mathbb{1}_{Non\ Zombie} \times \mathbb{1}_{High\ Sector\ Zombies} \times \mathbb{1}_{Post} \\ & + \beta \times X_{it} + \epsilon_{ijt} \end{aligned}$$

- ▶ where i indexes firms, t indexes time, j indexes sectors, α_i and γ_t are firm and year fixed effects.
- ▶ y_{ijt} is the outcome of interest (change in debt, CapEx, employment) from t to $t - 1$.
- ▶ $\mathbb{1}_{Post} = 1$ for years when SARFAESI is in effect (≥ 2002).
- ▶ $\mathbb{1}_{Non\ Zombie} = 1$ for “Non-Zombie” firms.
- ▶ $\mathbb{1}_{Sector\ Zombies} = 1$ if the sector had a high fraction of zombies in pre-SARFAESI.
- ▶ β_3 is the estimate of interest.
- ▶ S.E. clustered at the firm level.

SPILLOVERS

SECURED BORROWINGS

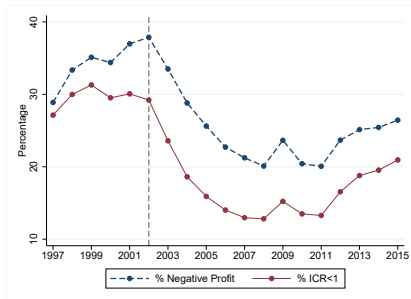
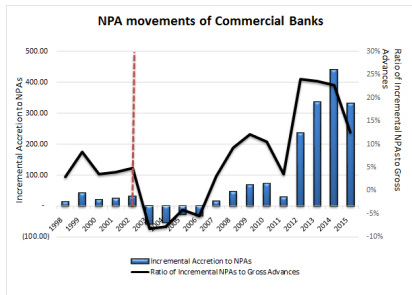
	(1)	(2)	(3)	(4)
	Secured (INR million)		Unsecured (INR million)	
$\mathbb{1}_{Sector\ Zombie}$	-17.91 (11.15)	-20.76* (11.08)	1.011 (0.868)	0.854 (0.863)
Post*Non-Zombie	13.09 (10.32)	8.223 (10.28)	-0.298 (0.791)	-0.527 (0.787)
Non-Zombie* $\mathbb{1}_{Sector\ Zombie}$ *Post	28.88** (11.68)	30.79*** (11.62)	0.358 (0.936)	0.456 (0.931)
Baseline Mean	28.74		1.030	
No. of Obs.	50039	50039	50039	50039
R squared	0.360	0.362	0.433	0.433
Controls	N	Y	N	Y

Spillovers on non-zombie firms firms which increased secured borrowings by INR 31 million.

Robustness

Conclusion

SARFAESI IN THE LONGER TERM ...



- ▶ Robustness with long-term data. LT
- ▶ “Working” so well in 2008, that report warned creditors not to get complacent (Raghuram Rajan Report 2009).
- ▶ Post-2008:
 - ▶ Reluctance to recognize NPAs and evergreen loans (Peek and Rosengren (2005)).

OTHER RESULTS AND ROBUSTNESS

- ▶ Employment ↓, concentrated in permanent employees, unprofitable establishments shutdown. RO IntEmp
- ▶ CapEx ↓, concentrated in non-core projects. IntCapEx
- ▶ Spillovers on CapEx and Employment. SpillRO
- ▶ Profitability improved for low quality firms and at the aggregate level, driven by profitability improvement of zombie firms. Profit
- ▶ Low quality firms whose primary lender were banks with greatest pre-SARFAESI exposure to zombies witnessed the lower secured borrowings. Bank
- ▶ Industries which witnessed greatest decongestion also had higher births, deaths and increase in total number of firms. Closure
- ▶ Robustness Robust
 - ▶ SARFAESI does not apply to Non-banking financial companies (NBFCs)
 - ▶ Robust to alternate definitions of "Low Quality Borrowers", ROA and for listed firms with Tobin's Q.
 - ▶ External validity with DRTs: weak due to BIFR escape route.
 - ▶ Robust to using log of debt (dependent variable).

CONCLUSION

- ▶ Improved creditor rights reallocate resources away from impaired debtors.
- ▶ Spillover effects on “good” firms: CapEx and Employment.
- ▶ Aggregate and firm-level profitability improves.
- ▶ Important for developing countries
 - ▶ Brazil, China and India introduced new bankruptcy laws in the last decade increasing the legal protection of creditors.
- ▶ Highlights the *spillovers* of improved creditor rights on “good” firms.

Thank You!

SARFAESI (MORE DETAIL)

- ▶ Under the SARFAESI Act (section 13 (2)), after a loan has been classified as a non- performing asset (NPA) by the secured creditor, a notice is sent to the relevant borrower.
- ▶ If the borrower fails to discharge his liability in repayment of any secured debt within 60 days from the date of notice by the secured creditor, the creditor is entitled to
 1. Take possession of the secured assets of the borrower.
 2. Takeover of the management of the business of the borrower.
 3. Appoint any person to manage the secured assets, possession of which is taken by the secured creditor.
 4. Require any person who has acquired any of the secured assets from the borrower and from whom money is due to the borrower to directly pay the secured creditor to cover the secured debt owed to the creditor.

SUMMARY STATISTICS

BY ZOMBIE STATUS

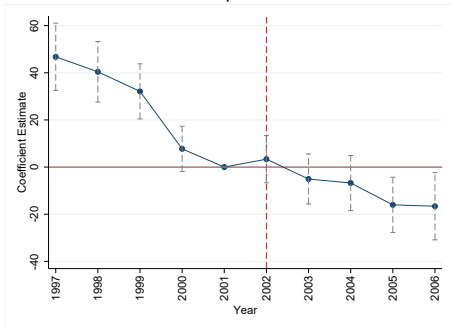
Variables	All		Zombies			Non-Zombies		
	Mean	SD	Pre	Post	t-stat on Difference	Pre	Post	t-stat on Difference
Secured Borrowings	36.58	160.7	55.48	37.45	(-4.70***)	28.74	39.81	(7.19***)
Unsecured Borrowings	2.210	12.23	0.800	3.700	(10.48***)	1.030	3.440	(20.07***)
Capital Expenditure	69.10	214.8	63.88	50.24	(-3.13***)	63.92	79.15	(7.15***)
Employment	101.0	432.0	55.62	131.2	(8.36***)	46.66	160.6	(26.71***)
Op. Margin= $\frac{EBITDA}{Sales}$	0.110	0.450	-0.0500	0.0800	(10.16***)	0.130	0.150	(4.38***)
ROA	0.0600	0.120	-0.0200	0.0200	(13.83***)	0.0700	0.0700	(-4.14***)
TFP	2.100	1.160	1.580	1.590	(0.06)	2.250	2.180	(-5.90)
Total Debt	932.7	5848	1267	1799	(3.37***)	684.5	936.9	(4.68***)
Secured Debt	457.0	1082	499.1	704.3	(7.25***)	366.6	489.2	(10.87***)
Unsecured Debt	208.4	638.1	265.2	343.8	(4.23***)	155.5	216.5	(9.02***)
Debt to Assets	0.350	0.350	0.510	0.630	(10.87***)	0.290	0.300	(5.46***)
Log(EBIT)	3.350	2.080	2.760	3.300	(8.91***)	3.240	3.550	(13.65***)
Log(Assets)	5.760	1.720	5.660	5.760	(3.03***)	5.620	5.930	(18.41***)
Log(Sales)	5.230	2.410	4.640	4.770	(2.66***)	5.230	5.470	(10.01***)
$\frac{EBITDA}{Total Assets}$	0.0900	0.120	0.0100	0.0600	(16.29***)	0.110	0.100	(-2.89***)
Observations	50039		8807			41232		

Firm classified as zombie if it received zombie lending in 1998, 1999 or 2000.

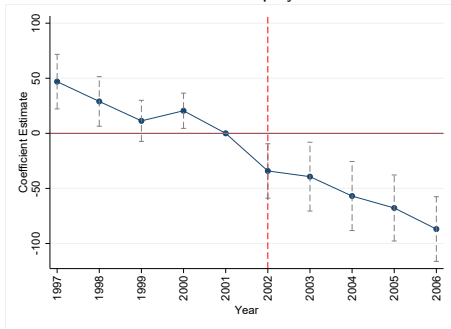
Main

REAL OUTCOMES: CAPEX AND EMPLOYMENT

Capex



Number of Employees



Low Quality borrowers reduce CapEx and Number of Employees.

REAL OUTCOMES

	(1)	(2)	(3)	(4)
	CapEx		No. of Emp.	
Low Quality Borrower * Post	-30.52*** (4.187)	-23.97*** (4.233)	-70.14*** (11.28)	-62.81*** (11.20)
Baseline Mean	47.76		41.22	
No. of Obs.	50039	50039	50039	50039
R squared	0.617	0.621	0.617	0.618
Controls	N	Y	N	Y
Firm FE	Y	Y	Y	Y
Year FE	Y	Y	Y	Y

Low quality borrowers cut back on Capital expenditure and Employees.

REAL OUTCOMES: EMPLOYMENT WITH ASI

Panel A: Type of Employees

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	All Workers		Permanent Workers		Contract Workers		Staff	
Low Quality*Post	-29.64*** (7.081)	-27.55*** (7.537)	-30.18*** (6.638)	-28.41*** (7.059)	0.533 (3.156)	0.855 (3.406)	-11.93*** (3.591)	-11.90*** (3.909)
No. of Obs.	214786	191519	214786	191519	214786	191519	214786	191519
R squared	0.893	0.895	0.880	0.882	0.739	0.742	0.810	0.813
Factory Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y
Year Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y
Controls	N	Y	N	Y	N	Y	N	Y

Panel B: Factory Closures

	(1)	(2)
	¹ Closure	¹ Closure
Low Quality*Post	0.0652*** (0.00520)	
Low ROA*Post		0.0294*** (0.00535)
No. of Obs.	149557	149557
R squared	0.475	0.474
Factory Fixed Effects	Y	Y
Factory Fixed Effects	Y	Y

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Concentrated in permanent employees. [Main](#)

REAL OUTCOMES: CAPEX WITH CAPEXDX

Panel A: By Project Implementation Status

	(1)	(2)	(3)	(4)
	Total CapEx	Completed Projects	Announced Projects	Under Implementation
Low Quality Borrower * Post	-38.95***	-2.833***	-8.890**	-6.136**
	(7.264)	(0.828)	(4.184)	(2.795)
Baseline Mean	80.10	4.420	7.530	11.18
No. of Obs.	25623	25623	25623	25623
R squared	0.612	0.193	0.295	0.310
Firm FE	Y	Y	Y	Y
Year FE	Y	Y	Y	Y

Panel B: For Non-Core Industries

	(1)	(2)	(3)	(4)
	All non-core	Completed Projects	Announced Projects	Under Implementation
Low Quality Borrower * Post	-127.9**	-225.2*	45.18	-118.5*
	(56.23)	(126.1)	(67.05)	(71.93)
Baseline Mean	51.30	216.3	0	7.920
No. of Obs.	25623	25623	25623	25623
R squared	0.336	0.497	0.113	0.201
Firm FE	Y	Y	Y	Y
Year FE	Y	Y	Y	Y

Concentrated in non-core projects. Main

REAL OUTCOMES: SPILLOVERS

	(1)	(2)	(3)	(4)
	Capex		No. of Emp	
$\mathbb{1}_{Sector\ Zombie} * Post$	-29.05*** (10.37)	-35.39*** (10.34)	17.10 (26.95)	9.868 (26.76)
Post*Non-Zombie	11.48 (9.595)	3.074 (9.540)	12.23 (25.55)	2.564 (25.31)
Non-Zombie* $\mathbb{1}_{Sector\ Zombie} * Post$	34.28*** (12.40)	38.08*** (12.30)	51.82* (31.55)	56.16* (31.31)
Baseline Mean	63.92		46.66	
No. of Obs.	50039	50039	50039	50039
R sq.	0.618	0.621	0.617	0.618
Controls	N	Y	N	Y

Standard errors in parentheses, all columns include firm and year fixed effects.

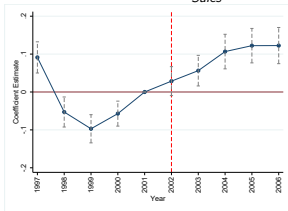
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Spillovers on high quality borrowers in the same sector.

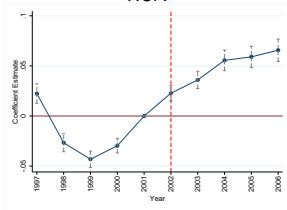
Main

PROFITABILITY

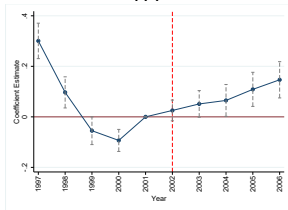
Op. Margin = $\frac{EBITDA}{Sales}$



ROA



TFP



Low Quality borrowers improved profitability and productivity in terms of total factor productivity (TFP = $\text{Log Sales} - \frac{2}{3} \text{Log E} - \frac{1}{3} \text{Log K}$).

Main

PROFITABILITY

Profitability

	(1)	(2)	(3)
	Op. Margin = $\frac{EBITDA}{Sales}$	ROA = $\frac{EBIT}{Assets}$	TFP
Low Q. Borr. * Post	0.113*** (0.0124)	0.106*** (0.0171)	0.0456* (0.0243)
Baseline Mean	-0.03	-0.06	1.63
No. of Obs.	50039	50039	47145
R squared	0.456	0.195	0.796
Firm FE	Y	Y	Y
Year FE	Y	Y	Y

Overall Profitability

	(1)	(2)	(3)
	Op. Margin = $\frac{EBITDA}{Sales}$	ROA	TFP
Post	0.0207 (0.0363)	-0.0203* (0.0111)	-0.162* (0.0913)
1 _{Sector Zombie} *Post	0.0487* (0.0294)	0.0311*** (0.00903)	0.105 (0.0740)
Baseline Mean	.17	.05	1.87
No. of Obs.	191	191	191
R sq.	0.755	0.325	0.752
Firm FE	Y	Y	Y
Year FE	Y	Y	Y

Profitability improved post-SARFAESI.

Main

PROFITABILITY

	(1)	(2)	(3)	(4)	(5)	(6)
	Op. Margin = $\frac{EBITDA}{Sales}$		ROA = $\frac{EBIT}{Assets}$		TFP	
	Non-zombies	Zombies	Non-zombies	Zombies	Non-zombies	Zombies
¹ Sector Zombie *Post	-0.0588 (0.0524)	0.0276** (0.0136)	0.0143 (0.0119)	0.00844** (0.00345)	0.0699 (0.0929)	0.112*** (0.0325)
Baseline Mean	-0.03		-0.06		1.63	
No. of Obs.	8807	41232	8807	41232	8379	38766
R sq.	0.366	0.484	0.379	0.518	0.699	0.807
Firm FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y

Profitability improvement driven by zombie firms.

Main

SARFAESI IN THE LONG TERM

	(1)	(2)	(3)	(4)
	New Secured Borrowings		<i>NewSecuredBorrowings</i> <i>Assets</i>	
Low Quality Borrower * Post	-95.26*** (24.40)	-153.2*** (41.75)	-0.0251*** (0.00120)	-0.0316*** (0.00202)
No. of Obs.	95703	39221	88474	36474
R squared	0.197	0.297	0.192	0.215
Firm Fixed Effects	Y	Y	Y	Y
Year Fixed Effects	Y	Y	Y	Y
Controls	N	Y	N	Y

SARFAESI continues to have an impact

LT

SARFAESI IN THE LONG TERM

Panel A: Closures

	(1)	(2)
	¹ Closure(year<=2006)	¹ Closure(year<=2010)
Low Q. Borr. * Post	0.0352*** (0.00440)	0.0382*** (0.00399)
No. of Obs.	50039	76234
R squared	0.295	0.216
Industry Fixed Effects	Y	Y
Year Fixed Effects	Y	Y

Panel B: Number of Firms, Births and Deaths

	(1)	(2)	(3)	(4)
	Total Number	Births	Deaths	Deaths (till 2010)
Ind. % Zombies*Post	71.18** (30.96)	16.45** (6.657)	1.987 (1.433)	8.938** (3.544)
No. of Obs.	672	672	672	944
R squared	0.898	0.749	0.755	0.520
Industry Fixed Effects	Y	Y	Y	Y
Year Fixed Effects	Y	Y	Y	Y

SARFAESI continues to have an impact

Main

ROBUSTNESS

	(1)	(2)	(3)
	NBFCs	LQ-2001	DRT
Low Quality * Post	-6.567 (5.671)		
Law Applies * Post	14.31*** (3.578)		
Low Quality * Post * Law Applies	-32.22*** (7.594)		
Low Quality Borrower (2001) * Post		-111.9*** (28.58)	
Low Quality Borrower *Post			-17.67* (10.13)
No. of Obs.	29340	29340	25347
R sq.	0.333	0.0832	0.315
Firm FE	Y	Y	Y
Year FE	Y	Y	Y

BANK EXPOSURE

	(1) Low Exposure	(2) High Exposure	(3) All
High Exposure * Low Quality			21.32* (10.95)
Low Quality * Post	1.860 (6.536)	-17.18*** (4.848)	2.654 (6.096)
High Exposure * Post			7.644* (4.259)
Low Quality * Post * High Exposure			-20.06*** (7.697)
No. of Obs.	5178	11597	16775
R squared	0.484	0.435	0.431
Bank Fixed Effects	Y	Y	Y
Year Fixed Effects	Y	Y	Y
Controls	Y	Y	Y

Impact greater for banks with high exposure.

Main

HYPOTHETICAL EXAMPLE

Firm A



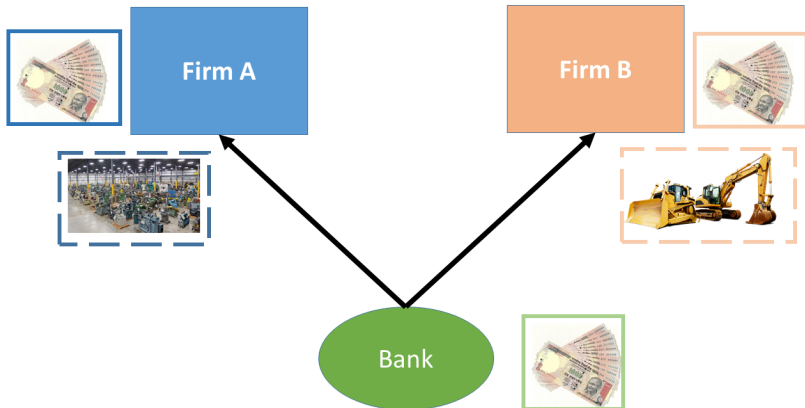
Firm B



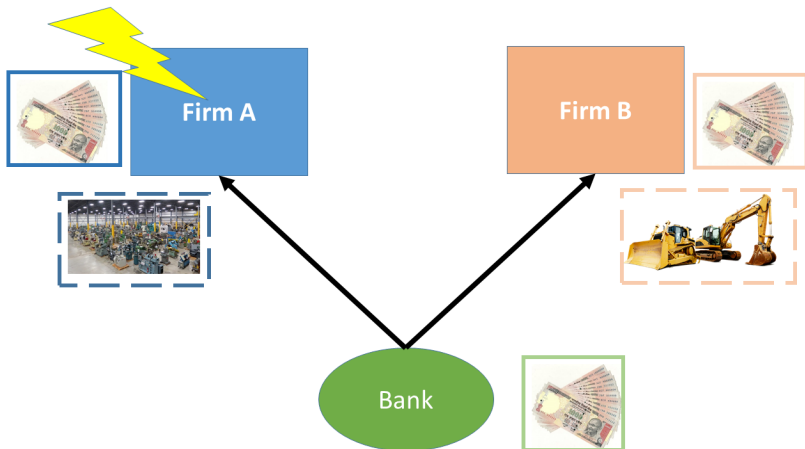
Bank



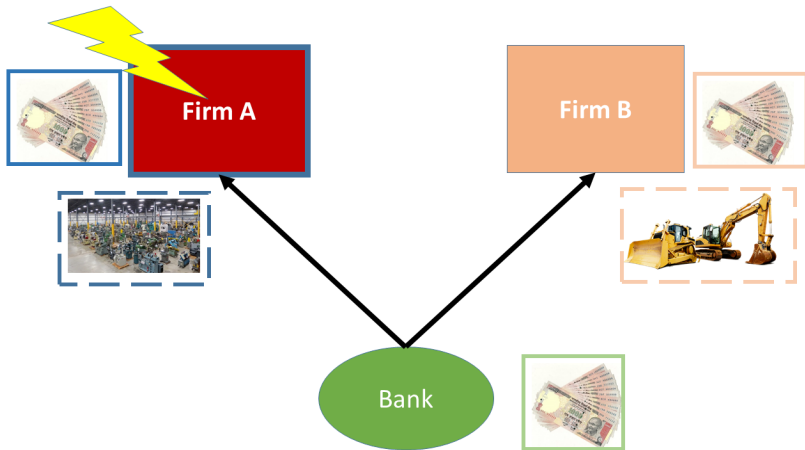
HYPOTHETICAL EXAMPLE



HYPOTHETICAL EXAMPLE



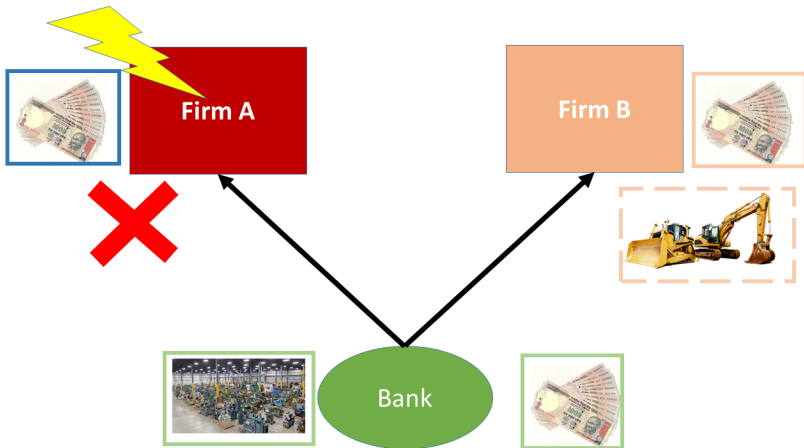
HYPOTHETICAL EXAMPLE



- ▶ Firm A defaults.

HYPOTHETICAL EXAMPLE: SCENARIO 1

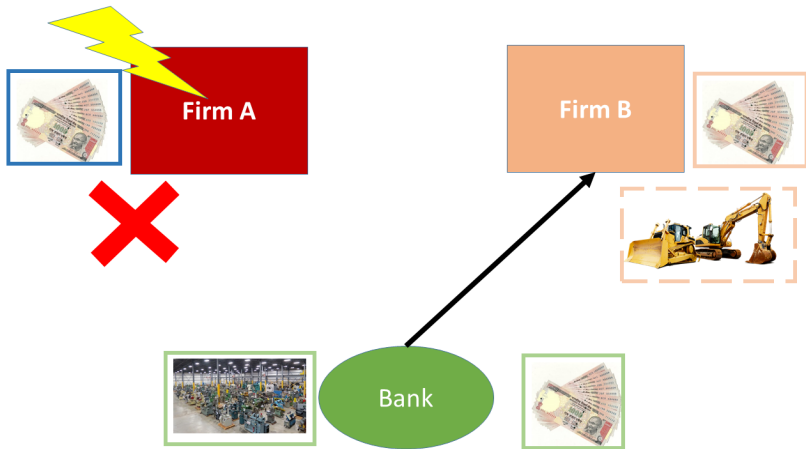
FIRST BEST SCENARIO: BANKS CAN SEIZE ASSETS



- ▶ Firm A defaults and banks seizes assets.

HYPOTHETICAL EXAMPLE: SCENARIO 1

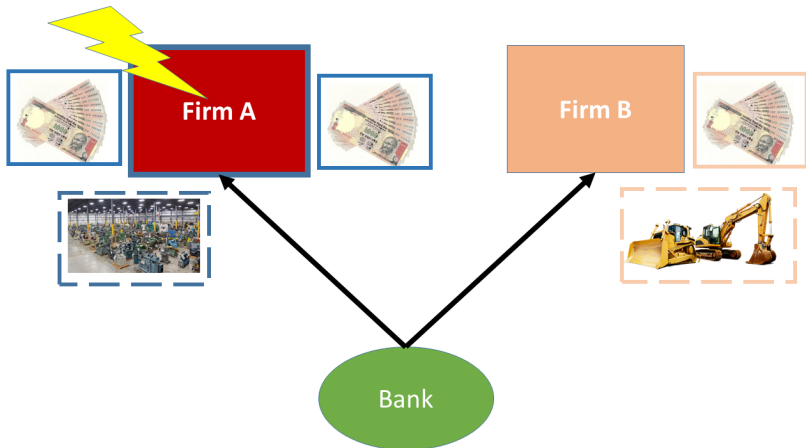
FIRST BEST SCENARIO: BANKS CAN SEIZE ASSETS



- ▶ Bank exits relationship.

HYPOTHETICAL EXAMPLE: SCENARIO 2

SECOND BEST SCENARIO: BANKS CANNOT SEIZE ASSETS



- ▶ Firm A defaults and banks CANNOT seize assets.
 - ▶ Either: Banks “Evergreen loans”
 - ▶ And/Or: Firms borrow more (they have nothing to lose).

SARFAESI ACT OF 2002

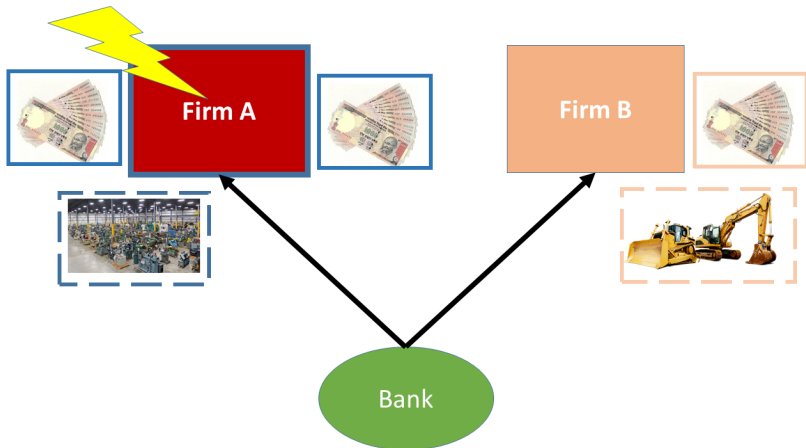
SECURITISATION AND RECONSTRUCTION OF FINANCIAL ASSETS AND ENFORCEMENT OF SECURITY INTEREST

SARFAESI Act of 2002 made it easier for secured lenders to seize secured assets of defaulting borrowers.

- ▶ Pre-SARFAESI lender subject to elaborate legal process to recover dues while firm continued to operate!
- ▶ Post-SARFAESI lender can start liquidation process on defaulted borrowers (secured only).
- ▶ Exit became easier: banks could seize assets and dissolve relationships.

PRE-SARFAESI: SCENARIO 2

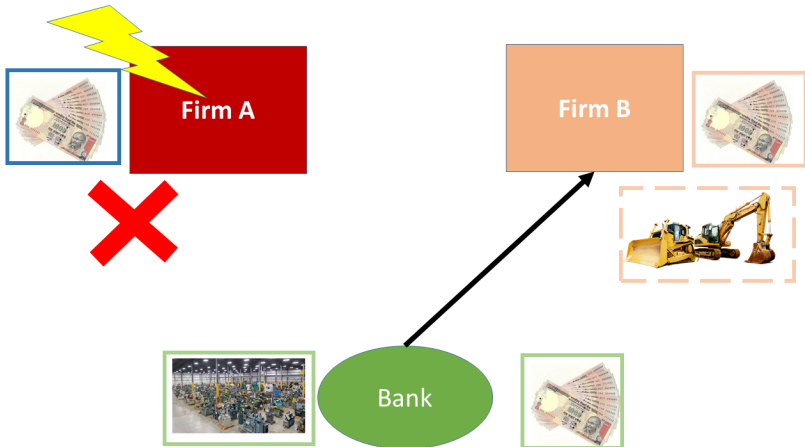
SECOND BEST SCENARIO: BANKS CANNOT SEIZE ASSETS



- ▶ Firm A defaults and banks CANNOT seize assets.
 - ▶ Either: Banks “Evergreen loans”
 - ▶ And/Or: Firms borrow more (they have nothing to lose).

POST-SARFAESI: SCENARIO 1

FIRST BEST SCENARIO: BANKS CAN SEIZE ASSETS



- ▶ Firm A defaults and banks CAN seize assets.
 - ▶ Banks reduce “Evergreening”
 - ▶ And/Or: Bad Firms reduce borrow lending (more at stake).