Creditor Rights, Threat of Liquidation, and Labor-Capital Choice of Firms

Shashwat Alok [1]

joint with

Ritam Chaurey[2] and Vasudha Nukala [3]

[1]**Indian School of Business**,
[2]Johns Hopkins University (SAIS) and [3]Washington University at St. Louis (Olin School of Business)

ABFER

May 2018

Research Question

- How does the strengthening of creditor rights in a setting with weak contract enforcement affect real decisions of firms?
  - Firms' financing choices
  - **Capital investments**
  - **Hiring of workers**

Motivation
The Big Picture

- What is the effect of finance on employment?
- The recent financial crisis and the resulting high unemployment around has brought to bear the role of finance in job-creation and employment!
    - Massive job destruction - about 20 million jobs worldwide (ILO(2010))
    - Worst labor market conditions in the US since the Great Depression (Elsby, Hobjin and Sahin(2010))
- The displacement of workers has engendered public anger at financial markets and bankers.
- Hot policy debate - Are financial markets a net destroyer of jobs?
    - "Financial Markets promised prosperity; instead they have bought hardships" - The Economist, 2009
    - "A cancer eating away at the job-creation system" - John Evans, general secretary of the Trade Union Advisory Committee, which advises the OECD.

Motivation...
What do we know?

Finance and Growth
- A large literature in both macroeconomics and finance highlights the positive impact of financial development on economic growth.
- King and Levine (1995), Rajan and Zingales (1996), Black and Strahan 2002, Jayaratne and Strahan 1996 among others

Law and Finance
- Cross-country literature shows that stronger investor protection leads to larger and broader capital markets, higher economic growth
- Micro-level studies: Stronger creditor protection $\rightarrow$ more lending, higher leverage and long-term debt, lower interest rates

Taken Together
- Improving Legal Institutions (Investor Protection) that govern financial contracting environment $\implies$ Eases financial constraints $\implies$ Higher Economic Growth $\implies$ Greater Investments and Employment
- Conversely an event that tightens financial constraints $\implies$ Lower Investments and Employment

Motivation...
What do we know?

- However, the link between improving legal institutions (Investor Protection) that govern financial contracting environment and employment is apriori ambiguous
- Theoretically, Garmaise (2008): Easing/Tightening of financial constraints can have contrasting effects on labor and capital
- Implication of Easing (Tightening) financial constraints
- On one hand (**Scale Effect**)
    - Greater (lower) Investments $\rightarrow$ more jobs
    - complementarity between labor and capital
- On the other hand (**Substitution Effect**)
    - To the extent that capital needs greater financing $\rightarrow$ may cause substitution of labor with capital
    - Jobless growth? - Easing financial constraints can allow for investments in capital-intensive technologies $\rightarrow$ high output but no job creation
    - Conversely, tightening financial constraints $\rightarrow$ may cause substitution of capital with labor

Whether scale or substitution Effect dominates is then an empirical question

Our Paper

Big Picture Question: How does financial contracting environment effect labor-capital Investment decision of firms?

- Focus on one unique aspect of the broader question: the role of Creditor Rights
- How does a strengthening of creditor rights affects the labor-capital input decision of firms?
- Use a plausibly exogenous quasi-experimental setting - SARFAESI to allow for causal inference
- SARFAESI passed in India in 2002 afforded banks the rights to seize and liquidate collateral

Why do we care?

- Creditor protection is a key aspect of the financial contracting environment
- Extant literature - Real effects of strengthening creditor rights on capital structure choices, capital investments, and risk taking.

- Effects depend upon the kind of protection offered to creditors!
    - collateral laws - what assets can be used as collateral
    - rights afforded to lenders in the event of borrower default/bankruptcy
    - the efficiency of judicial system in debt recovery
    - extra-judicial rights to seize and liquidate collateral

- However, surprisingly little is known regarding the effect of creditor protection on the firm's choice between capital and labor.

Hypotheses

- Expansion in the set of collateralizable assets, or judicial efficiency may enhance both the supply and demand for credit.

- **Scale Effect**: Greater Capital Investments $\rightarrow$ More Labor (Campello and Larrain (2016)

- **Substitution Effect**: Move to Capital-Intensive techniques (Automation) $\rightarrow$ Reduce Labor

Hypotheses

- An increase in the rights of banks to directly seize and liquidate collateral or rights offered to banks in bankruptcy may engender the opposite effect
- Extra-judicial powers $\rightarrow$ sub-optimally "excessive" liquidations of firms with positive continuation value (Aghion et al. (1992), Shleifer and Vishny (1992), Acharya et al. (2011), Acharya and Thakor (2016))
- Increased threat of liquidation $\implies$ higher effective cost of capital $\implies$ decrease in demand for secured credit (Vig(2013))
- **Scale Effect**: Lower Capital Investments $\rightarrow$ Reduce Labor
- **Substitution Effect**: Our Paper
    - Tangible assets are easier to seize and liquidate
        - replace tangible assets (for instance, fixed assets such as plant and machinery) with intangible assets (labor).
    - Capital requires upfront investments and needs to be financed, while labor expenses can at least partially be met ex-post from sales revenue (Garmaise (2008), Benmelech et al. (2015), Sun and Zhang (2016)).
        - Thus, firms trying to reduce their leverage (following a raised cost of capital) may substitute capital with labor.

Summary of findings

- SARFAESI increased the threat of liquidation for firms
- Firms in the treated group (higher share of pre-SARFAESI collateralizable assets) differentially substitute **away** from formal secured credit **towards** trade credit in short-term
- Treated firms hire **more** workers and invest **less** in fixed capital, and plant and machinery
- Heterogeneity across space and industries
  - effect is stronger in states with lower pre-policy efficiency of courts
  - effect is stronger for industries with higher elasticities of substitution between capital and labor

Creditor Rights in India pre−SARFAESI

- Historically - regulatory bottlenecks and judicial delays in the recovery of secured assets
    - Loan recovery cases were filed in the civil court system
    - Had to follow the tedious Code of Civil Procedure Act of 1908
    - Large depreciation in the value of secured assets held as collateral by the bank
- Debt Recovery Tribunal Act of 1993 (DRT Act)
    - Establishment of fast-track specialized courts all over India for debt recovery cases - [Visaria (2009)]
    - Even after establishment of DRT Act, secured creditors could not seize security of a defaulting firm without a court/tribunal order
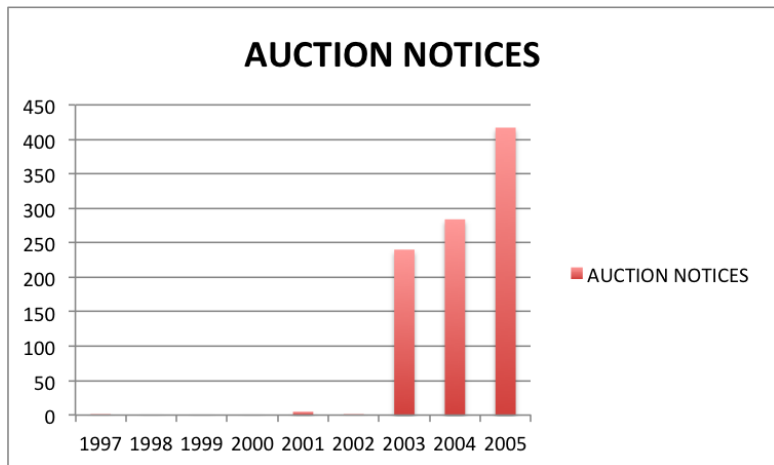
Securitization and Reconstruction of Financial Assets and Enforcement of Security Interests Act of 2002 (SARFAESI)

- If a firm (**borrower**) defaulted on payments for more than 6 months, the **secured creditor (bank)** could give a notice of 60 days and:
  - Bypass the lengthy court/tribunal proceedings and seize and liquidate the assets of the defaulting firm
  - Take over the management of the business of the borrower
- SARFAESI was retrospective - applied to both new and old contracts
- Applied to secured loans and not to unsecured loans
- A borrower could appeal against SARFAESI only after property was seized
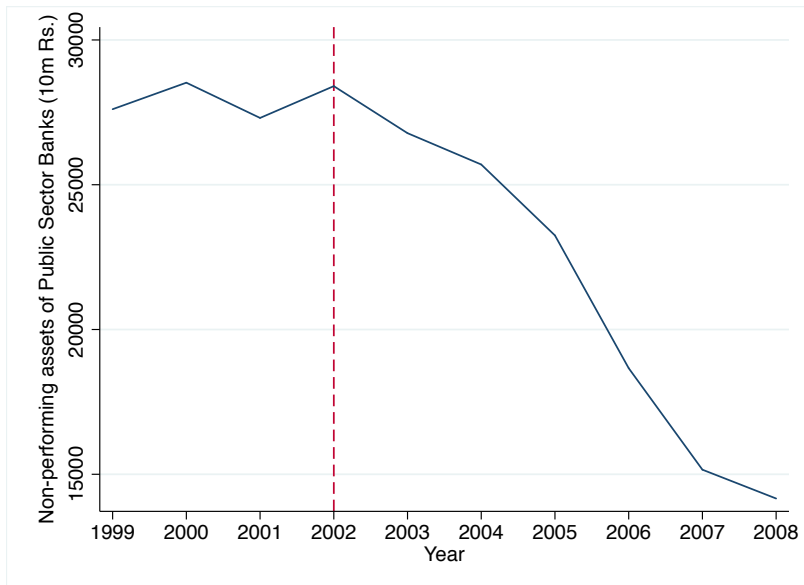
SARFAESI Auction Notice

Non-performing assets of public sector banks

Commentators on credit growth

- Some commentators wrote about the lack of credit growth in 2003

    - For example, in **"Why has credit not picked up?"** (Manas Chakravarty, August 14, 2003) - "Tuesday's figures for the Index of Industrial Production show that industrial output rose 5.7 per cent last June, compared to 4.5 per cent in June 2002.....Also surprisingly, the **fall in credit** has occurred at a time when industrial growth has been higher...There's no doubt that the **recent slowdown in credit offtake has been unprecedented in recent years.**"

Empirical strategy - Difference-in-Differences

- SARFAESI was a national policy - we define groups with differing treatment intensity
- We use pre-policy proportion of collateralizable assets - **pre-policy ratio of fixed assets to total assets** to divide firms in to treatment and control groups
    - Alternate measures - pre-policy ratio of land and buildings to total assets, pre-policy amount of outstanding loans

Empirical strategy - Difference-in-Differences

- SARFAESI was a national policy - we define groups with differing treatment intensity
- We use pre-policy proportion of collateralizable assets - **pre-policy ratio of fixed assets to total assets** to divide firms in to treatment and control groups
  - Alternate measures - pre-policy ratio of land and buildings to total assets, pre-policy amount of outstanding loans
- Fixed assets include
  - land and buildings
  - plant and machinery
  - transport equipment
  - computer equipment including software
  - capital work in progress
- Total assets include fixed assets and current assets (inventory, cash in hand and at bank, sundry debtors and other current assets)

Empirical strategy - Difference-in-Differences

- SARFAESI was a national policy - we define groups with differing treatment intensity
- We use pre-policy proportion of collateralizable assets - **pre-policy ratio of fixed assets to total assets** to divide firms in to treatment and control groups
  - Alternate measures - pre-policy ratio of land and buildings to total assets, pre-policy amount of outstanding loans
- Fixed assets include
  - land and buildings
  - plant and machinery
  - transport equipment
  - computer equipment including software
  - capital work in progress
- Total assets include fixed assets and current assets (inventory, cash in hand and at bank, sundry debtors and other current assets)
- Highest tercile of share of collateralizable assets - **treatment group**
- lowest tercile of share of collateralizable assets - **control group**

Empirical Strategy - DID

- To evaluate the effect of the SARFAESI law (DID), we estimate the following regression specification using firm-level data:

$$Y_{ijt} = \nu_i + \delta_{jt} + \beta_0 \ Law_t + \beta_1 \ Treatment_i + \beta_2 \ Law_t \times Treatment_i + \beta_3 X_{ijt}$$
$$+\epsilon_{ijt}$$

- Controls include firm size, profitability, and firm, year, and 3-digit industry$X$year fixed effects

- The coefficient on the interaction term β_2 captures the differential impact of the law on *treatment group* relative to the *control group*

- This specification compares the average differential response to SARFAESI (Post-SARFAESI vs Pre-SARFAESI) by firms in the treatment relative to those in the control group

Data

- ASI firm level panel data from 1999-2000 to 2007-08
  - Main source of industrial statistics in India
  - ASI covers the entire Factory Sector - formal manufacturing units
  - Includes all firms employing 10 or more workers using electricity or 20 or more workers without electricity
  - contains relevant firm-level information such as employment (by types of workers), wages, investment in fixed capital, short-term debt, inputs, outputs, etc.

Short-term formal credit
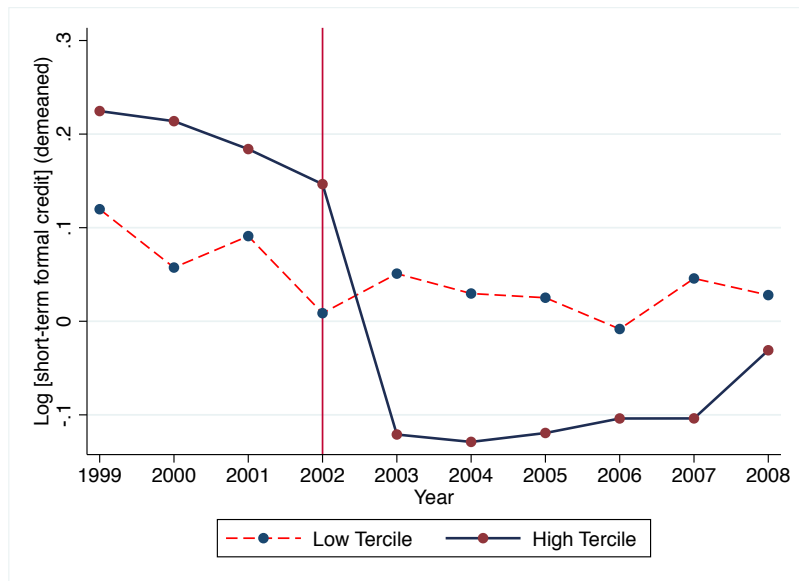
Short-term trade credit
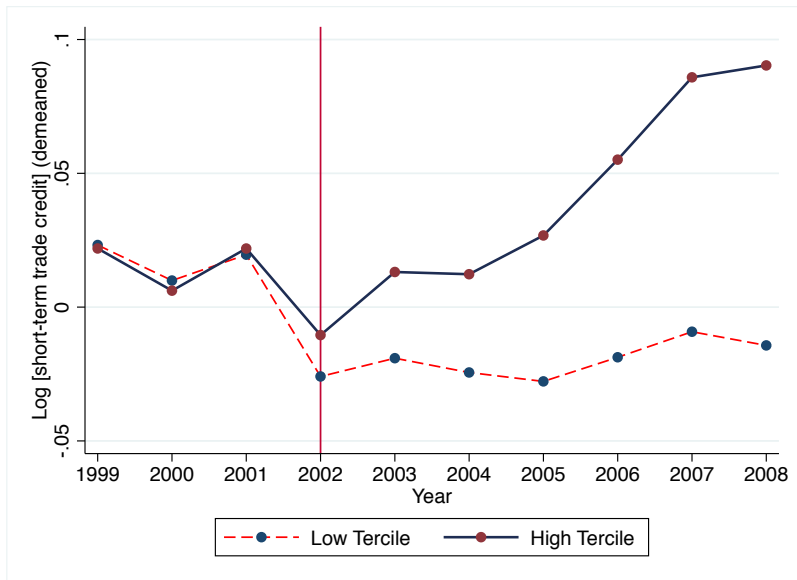
Impact of SARFAESI on Debt

	Log(STformalcredit)		STformalcredit/total assets		Log(STtradecredit)		STtradecredit/total assets	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Law X Treatment	-0.316***	-0.225***	-0.00457**	-0.00323*	0.116**	0.203***	0.0202***	0.0211***
	(0.0829)	(0.0813)	(0.00197)	(0.00196)	(0.0511)	(0.0467)	(0.00248)	(0.00248)
N	212,080	206,926	206,931	206,926	212,080	206,926	206,931	206,926
R^2	0.786	0.796	0.761	0.763	0.851	0.867	0.793	0.794
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Industry-year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Impact of SARFAESI on Firm Closure

	Open	
	(1)	(2)
Law X Treatment	-0.00359***	-0.00331***
	(0.00115)	(0.00117)
N	212,080	206,926
R^2	0.009	0.011
Firm FE	Yes	Yes
Year FE	Yes	Yes
Controls	No	Yes
Industry FE	Yes	Yes

Total workers
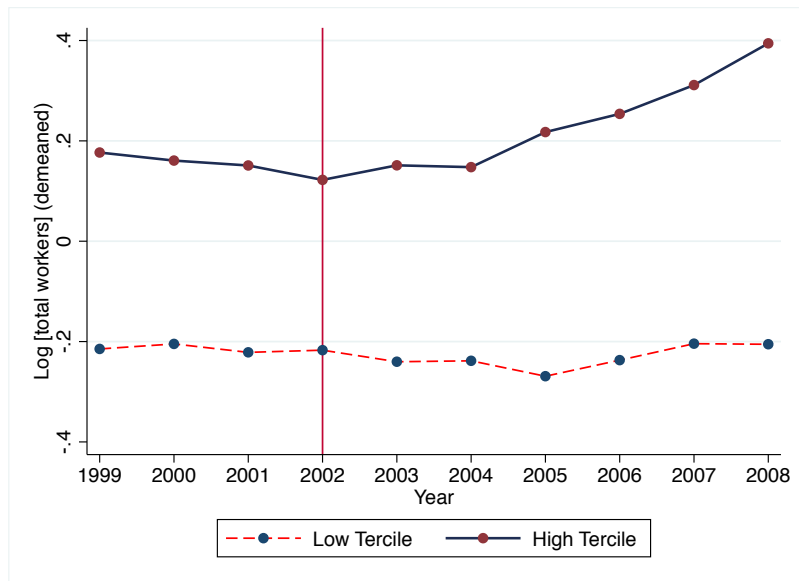
Impact of SARFAESI on Employment

	Panel A:Log(Number of Workers)					
	Permanent		Contract		Total	
	(1)	(2)	(3)	(4)	(5)	(6)
Law X Treatment	0.0687***	0.0796***	0.0746***	0.0820***	0.0798***	0.0917***
	(0.0110)	(0.0108)	(0.0187)	(0.0190)	(0.00843)	(0.00796)
N	212,080	206,926	212,080	206,926	212,080	206,926
R^2	0.923	0.927	0.802	0.803	0.947	0.953
	Panel B: Log(Wage per worker)					
	Permanent		Contract		Total	
	(7)	(8)	(9)	(10)	(11)	(12)
Law X Treatment	0.0599**	0.0701***	0.137***	0.149***	0.0403***	0.0443***
	(0.0243)	(0.0246)	(0.0502)	(0.0510)	(0.00513)	(0.00513)
N	212,080	206,926	212,080	206,926	212,080	206,926
R^2	0.816	0.818	0.774	0.775	0.898	0.900
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes
Industry-year FE	Yes	Yes	Yes	Yes	Yes	Yes

Gross value additions in plant and machinery
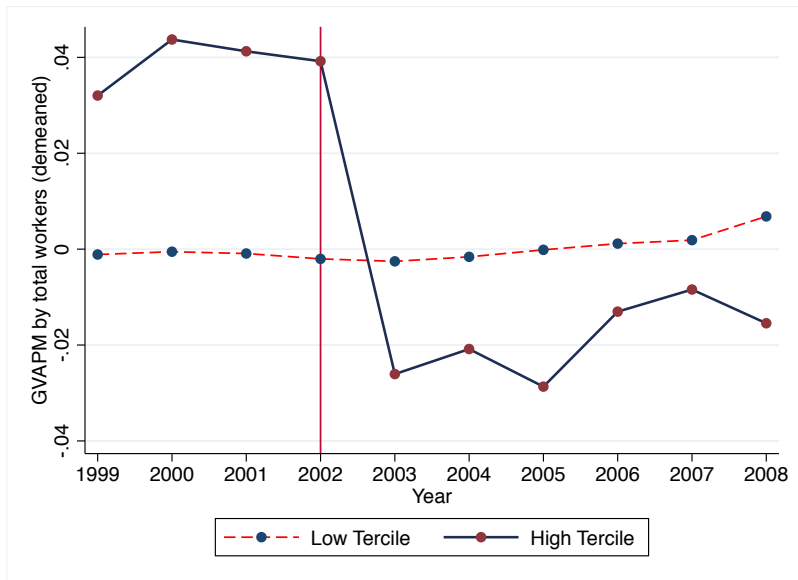
Gross value additions in fixed capital
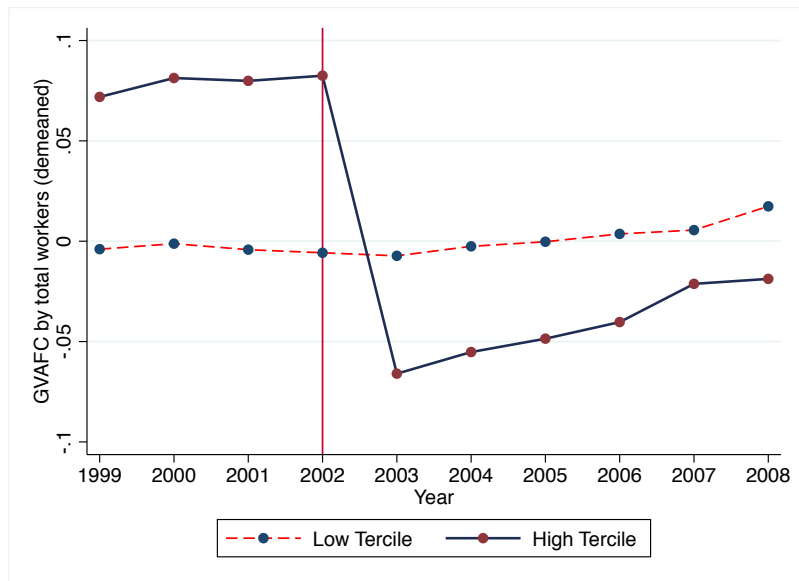
Impact of SARFAESI on Capitalization by Firms

	GVAFC/total workers		GVAPM/total workers		Log(rental PMFC)	
	(1)	(2)	(3)	(4)	(5)	(6)
Law X Treatment	-0.0834***	-0.0794***	-0.0579***	-0.0561***	0.137**	0.184***
	(0.0194)	(0.0197)	(0.0105)	(0.0107)	(0.0674)	(0.0667)
N	212,080	206,926	212,080	206,926	212,080	206,926
R^2	0.808	0.808	0.371	0.371	0.166	0.150
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes
Industry-year FE	Yes	Yes	Yes	Yes	Yes	Yes

Empirical Strategy - DIDID with court efficiency

- Cross-sectional heterogeneity - DIDID specifications across high and low court efficient states:

$$Y_{ijst} = \nu_i + \delta_j t + \beta_0 \text{ Law}_t + \beta_1 \text{ Treatment}_i + \beta_2 \text{ Court-efficiency}_s$$
$$+\beta_3 \text{ Law}_t \text{ X Treatment}_i$$
$$+\beta_4 \text{ Law}_t \text{ X Court-efficiency}_s + \beta_5 \text{ Court-efficiency}_s \text{ X Treatment}_i +$$
$$\beta_6 \text{ Court-efficiency}_s \text{ X Law}_t \text{ X Treatment}_i + \beta_7 X_{ijt} + \epsilon_{ijst}$$

- We use Amirapu (2016) measure of court efficiency: fraction of trials disposed off in less than one year in the District/Sessions court in the state

  - Court-efficiency$_s$ = 0 if state courts are efficient (Amirapu measure above median)
  - Court-efficiency$_s$ = 1 if state courts are not efficient (Amirapu measure below median)

- Banks should be **more** likely to invoke SARFAESI provisions in states with **less** efficient courts

Impact of SARFAESI: Triple interaction with Court efficiency

	Total Workers		GVAFC/Total workers		GVAPM/Total workers	
	(1)	(2)	(3)	(4)	(5)	(6)
Law X Treatment	0.0588***	0.0774***	-0.0336*	-0.0277	-0.0295**	-0.0269**
	(0.0122)	(0.0116)	(0.0189)	(0.0194)	(0.0131)	(0.0134)
Law X Court efficiency	-0.0387***	-0.0295***	0.00934*	0.0110*	0.00269	0.00341
	(0.0115)	(0.0109)	(0.00559)	(0.00594)	(0.00313)	(0.00332)
Court efficiency X Treatment	0.0625	0.0829	1.179	1.193	0.741	0.749
	(0.0725)	(0.0678)	(1.026)	(1.040)	(0.681)	(0.690)
Court efficiency X Law X Treatment	0.0455***	0.0307**	-0.121**	-0.125***	-0.0696**	-0.0712**
	(0.0166)	(0.0156)	(0.0472)	(0.0477)	(0.0278)	(0.0281)
N	204,671	199,637	204,671	199,637	204,671	199,637
R^2	0.948	0.953	0.863	0.863	0.373	0.373
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes
Industry-year FE	Yes	Yes	Yes	Yes	Yes	Yes

Empirical Strategy - DIDID with labor-capital substitution

- We use a proxy for the ease of labor-capital substitution at the industry-level
    - 2-digit industry-level measure of elasticity of substitution between labor and capital (Goldar, Pradhan, and Sharma (2013))
- The DIDID specification is:

$$Y_{ijst} = \nu_i + \delta_j t + \beta_0 \text{ Law}_t + \beta_1 \text{ Treatment}_i + \beta_2 \text{ High Substitution}_i$$
$$+ \beta_3 \text{ Law}_t \text{ X Treatment}_i$$
$$+ \beta_4 \text{ Law}_t \text{ X High Substitution}_i + \beta_5 \text{ High Substitution}_i \text{ X Treatment}_i +$$
$$\beta_6 \text{ High Substitution}_i \text{ X Law}_t \text{ X Treatment}_i + \beta_7 X_{ijt} + \epsilon_{ijst}$$

- *High Substitution$_i$* $= 1$ if a firm i is in an industry in the highest tercile of ease of substitution between K and L
- *High Substitution$_i$* $= 0$ if a firm i is in an industry in the lowest tercile of ease of substitution between K and L

Impact of SARFAESI: Triple interaction with Elasticity of Substitution

	Total Workers		GVAFC/Total workers		GVAPM/Total workers	
	(1)	(2)	(3)	(4)	(5)	(6)
Law X Treatment	0.0684***	0.0821***	-0.0769	-0.0700	-0.0265	-0.0225
	(0.0221)	(0.0207)	(0.0607)	(0.0611)	(0.0286)	(0.0288)
Law X Goldar	-0.0361**	-0.0199	0.00829*	0.0157***	0.00360*	0.00780***
	(0.0168)	(0.0158)	(0.00470)	(0.00524)	(0.00205)	(0.00250)
Treatment X Goldar	-0.0765	-0.0792	0.0508	0.0490	0.0687	0.0681
	(0.0580)	(0.0522)	(0.0722)	(0.0726)	(0.0504)	(0.0506)
Law X Goldar X Treatment	0.0461*	0.0463*	-0.0480	-0.0494	-0.0916**	-0.0923**
	(0.0261)	(0.0245)	(0.0754)	(0.0759)	(0.0403)	(0.0406)
N	102,625	100,732	102,625	100,732	102,625	100,732
R^2	0.946	0.953	0.545	0.545	0.319	0.319
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes

Empirical Strategy - DIDID with labor laws

- We use labor regulation measures from Besley and Burgess (2004) - (BB code) who code each state-level amendment made to the Industrial Disputes Act between 1958 and 1992 as being pro-worker ($+1$), neutral (0), or pro-employer (-1).
- Pro-employer states - easy to hire and fire permanent workers, no restrictions on contract workers
- Pro-worker states - harder to hire and fire permanent workers, no restrictions on contract workers
- These labor regulations should not differentially affect investment behavior in response to SARFAESI
- Labor regulations should only affect the type of workers hired by firms (permanent vs contract)

Empirical Strategy - DIDID with labor laws

- We explore cross-sectional heterogeneity by running DIDID specifications across pro-worker and pro-employer states with the following regression:

$$Y_{ijst} = \nu_i + \delta_j t + \beta_0 \text{ Law}_t + \beta_1 \text{ Treatment}_i + \beta_2 \text{ Pro-worker}_s$$
$$+ \beta_3 \text{ Pro-employer}_s + \beta_4 \text{ Law}_t \text{ X Treatment}_i$$
$$+ \beta_5 \text{ Pro-worker}_s \text{ X Treatment}_i$$
$$+ \beta_6 \text{ Pro-employer}_s \text{ X Treatment}_i + \beta_7 \text{ Pro-worker}_s \text{ X Law}_t$$
$$+ \beta_8 \text{ Pro-employer}_s \text{ X Law}_t + \beta_9 \text{ Pro-worker}_s \text{ X Law}_t \text{ X Treatment}_i$$
$$+ \beta_{10} \text{ Pro-employer}_s \text{ X Law}_t \text{ X Treatment}_i + \beta_{11} X_{ijt} + \epsilon_{ijst}$$

- The coefficient on the triple interaction terms, β_9 and β_{10} capture the differential effects for firms in pro-employer versus pro-worker states before and after SARFAESI

Impact of SARFAESI: Triple interaction with State laws-Employment

	Permanent Worker		Contract Worker		Total Worker	
	(1)	(2)	(3)	(4)	(5)	(6)
Proworker X Law X Treatment	0.00465	-0.00686	0.144***	0.134**	0.0367	0.0214
	(0.0269)	(0.0260)	(0.0545)	(0.0546)	(0.0230)	(0.0216)
Proemployer X Law X Treatment	0.0946***	0.0813***	-0.00281	-0.0127	0.0373*	0.0201
	(0.0244)	(0.0242)	(0.0439)	(0.0446)	(0.0191)	(0.0182)
N	194,002	188,897	194,002	188,897	194,002	188,897
R^2	0.926	0.930	0.803	0.804	0.948	0.954
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes
Industry-year FE	Yes	Yes	Yes	Yes	Yes	Yes

Impact of SARFAESI: Triple interaction with State laws-Capital

	GVAFC/total workers		GVAPM/total workers	
	(1)	(2)	(3)	(4)
Proworker X Law X Treatment	0.00196	-0.00126	0.0103	0.00865
	(0.0839)	(0.0841)	(0.0491)	(0.0492)
Proemployer X Law X Treatment	-0.0287	-0.0324	-0.00245	-0.00480
	(0.0586)	(0.0590)	(0.0380)	(0.0383)
N	194,002	188,897	194,002	188,897
R^2	0.804	0.804	0.344	0.345
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes
Industry-year FE	Yes	Yes	Yes	Yes

Impact of SARFAESI on Productivity

- SARFAESI led to lower capital investment by firms
  ↓
  lower firm productivity over time

- SARFAESI increased threat of liquidation for firms
  ↓
  unproductive firms closed down
  ↓
  disciplining force on existing firms
  ↓
  higher firm productivity in short to medium term

Impact of SARFAESI on Productivity

	log [TFP]		log [labor productivity]	
	(1)	(2)	(3)	(4)
Law X Treatment	0.0725***	0.0649***	0.0267**	0.0223**
	(0.0154)	(0.0130)	(0.0120)	(0.00999)
N	165,465	164,803	211,596	206,456
R^2	0.445	0.508	0.067	0.218
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes
Industry-year FE	Yes	Yes	Yes	Yes

Conclusion

- With inefficiencies in the bankruptcy system, strengthening creditor rights may lead to an increased threat of liquidation
- Firms may respond to the threat of liquidation by changing their labor-capital allocation in unanticipated ways
- Although we show that short-term productivity increased, long run aggregate productivity may decrease
- Developing countries need better laws on creditor protection
  - "The solution is not more draconian laws, such as SARFAESI. We need new institutions such as bankruptcy courts and turn-around agents" (Raghuram Rajan, Kurien memorial lecture, 2014)

Thank you!