The Distributive Impact of Reforms in Credit Enforcement: Evidence from Indian Debt Recovery Tribunals

Work in Progress: Very Preliminary

Ulf von Lilienfeld-Toal, Dilip Mookherjee & Sujata Visaria

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Motivation

- Commonly believed that weak enforcement of credit contracts restricts the functioning of credit markets
- Borrowers cannot credibly commit to repay loans $\rightarrow$ lender risks rise $\rightarrow$ cost of credit increases $\rightarrow$ credit access decreases
- Enlargement of set of incentive-compatible debt contracts should constitute a Pareto improvement

Motivation, contd

- Cross-sectional empirical evidence:
- Weak investor protection correlated with
  - thinner debt markets (cross-country): La Porta et al. (1997, 1998)
  - greater exclusion of the poor (cross-US-state): Gropp et al. (1997)
- Micro-panel study of debt enforcement tribunals (DRT) set up in different Indian states at different times in 1990s: Visaria (2007): significant effects on (average) repayment behavior and interest rates on new loans
- Even more broadly, property rights allow borrowers to pledge them as collateral, which increases credit access for the poor (De Soto, Field 2007)

Motivation, contd.

- We shall argue here that with borrower heterogeneity, effects of enforcement reforms/property rights are ambiguous in theory: they do **not** constitute a Pareto improvement in general

- This owes to a general equilibrium (GE) effect of the reform, overlooked by the conventional argument focused on a partial equilibrium (PE) effect

Motivation, contd.

- GE effect: raises the interest rate owing to increased demand for credit
- Alternatively: reform changes not just absolute but also *relative* profitability of lending to different borrowers
- This changes the distribution of credit: small (poorer) borrowers may end up even more credit-constrained, while large (wealthier) borrowers gain
- Hence credit averages may conceal significant distributional changes, and effects on aggregate output/efficiency are ambiguous

This Paper

- Present simple theoretical model with borrower heterogeneity where GE effect overwhelms PE effect for small borrowers, opposite for large borrowers
- Examine empirical evidence from borrower-level panel of effects of Indian DRT reform: show that there was a significant credit reallocation from small to large borrowers
- The same phenomenon can also be explained alternately by incompleteness of debt contracts
- Currently trying to use the data to discriminate between the GE story and the incomplete contracts (IC) story

1. GE Model

- Construct a model where small borrowers can be adversely affected by higher θ through effects on equilibrium profit rate (based on von Lilienfeld-Toal & Mookherjee 2007).

- Population of borrowers, differentiated by (collaterizable) fixed assets W, with given distribution G over $[0, \Omega]$

- A borrower seeks to invest in a new project at scale γ, costing $\gamma.I$, generating return of $yf(\gamma)$, where $y \in \{y_s, y_f\}$ is a borrower-specific shock, and f is an increasing, eventually-concave function

- Simplify by abstracting from project moral hazard: probability of success ($y = y_s$) is e, given

- For most part, assume risk neutrality

Loan Contracts, Enforcement

- Contract stipulates amount borrowed (γ), and amount T_k to be repaid in state $k \in \{s, f\}$
- Borrower may decide to default on the loan *ex post*
- In case of default, lender can seize θ fraction of *ex post* assets of borrower, which equals $W + \nu . y_k f(\gamma)$
- $1 - \nu$ is fraction of firm's returns diverted by the entrepreneur

Loan Contracts, Enforcement, contd

- Enforcement institution represented by θ, incorporating delays and/or uncertainties in the collection process; these are affected by judicial reforms such as DRT; we shall treat ν as a parameter

- Entrepreneur will not default in state k if and only if $T_k \leq \theta[W + \nu.y_k f(\gamma)] + d$, where d is an additional default cost incurred by borrower (reputation loss, legal costs etc)

Lenders

- 'Competitive' supply of loans, represented by supply curve of loanable funds (per borrower):

$$L_s(\pi) = \begin{cases} a + \delta \cdot \pi, & \text{if } \pi \geq \alpha; \\ 0, & \text{else,} \end{cases}$$

  where π is the return per rupee loaned, and $\alpha \geq 0, a \geq 0, \delta \geq 0$

- Assuming linear supply curve for simplicity, any upward sloping curve will do

Lenders, continued

- Key issue: is $\delta < \infty$?
- One view: with global capital markets, $\delta = \infty$: infinitely elastic supply of capital to any given economy
- Alternative view: 'local knowledge' and 'monitoring loans' matter for financial intermediaries, and these are in restricted supply

Lenders: Microfoundation of Supply Side

- A given lender incurs loan monitoring (screening/collection) costs of c per rupee loaned, which has to be subtracted from gross rate of return π on loans to obtain net profit
- A lender with monitoring cost c has capacity to lend upto $L(c)$
- Given distribution $H(.)$ over c
- If going rate of return on loans is π, set of lenders that will be willing to lend: those with $c \leq \pi$, so $L_s(\pi) \equiv \int_0^\pi L(c)dH(c)$

Microfoundation, continued

- Each borrower forms a coalition with a set of lenders to enter into an (exclusive) credit contract
- *Competitive Supply Assumption:* For any lender with cost c and lending capacity $L(c)$, there exist other borrowers with cost at or below c with aggregate lending capacity at least $L(c)$
- Under this assumption, gross rate of return π on lending must be equalized across all active lenders, and stable allocations can be characterized as 'Walrasian' allocations

Microfoundation, continued

- In a Walrasian allocation, everyone takes π as given; each borrower selects a project scale and debt contract to maximize expected payoff, subject to incentive compatibility (IC) and a participation constraint (PC) for lenders (where they must be assured a return of at least π on this contract)

- Obtain a demand curve for loans as a function of π; equilibrium π^* determined to clear the market

- Say that we have *complete contracts* (CC) if repayment obligation T_k can vary with the state $k \in \{s, f\}$

- Say that there are *GE effects* if $\delta < \infty$

Case 1: Complete Contracts, No GE Effect

- If $\delta = \infty$, lenders rate of return fixed at α
- With CC, there is no default in equilibrium (if there is in state k, reduce T_k and avoid default and related deadweight loss d)
- Borrower of wealth W obtains credit γ and repayments T_s, T_f which maximize

$$e[y_s f(\gamma) + W - T_s] + (1-e)[y_f f(\gamma) + W - T_f]$$

subject to

$$T_k \leq \theta[W + \nu y_k f(\gamma)] + d, k = s, f \qquad (IC)$$

and

$$eT_s + (1-e)T_f \geq \gamma I(1+\alpha) \qquad (PC)$$

Case 1: CC, No GE, continued

- *Observation:* With complete contracts and no GE effect, higher θ is Pareto-improving
- This is a pretty general result: e.g., if T_k cannot be conditioned on k because the state k is costly to verify, it will still be true
- Logic of mechanism design problem, where a higher θ relaxes incentive constraints
- Does not apply if contracts are incomplete

Case 1: CC, No GE, continued

- First-Best benchmark: $\gamma^F(\alpha)$ which maximizes $[\bar{y}f(\gamma) - \gamma I(1+\alpha)]$, where $\bar{y}$ denotes $ey_s + (1-e)y_f$

- Equilibrium credit allocation: $\gamma(W;\theta,\alpha)$ maximizes $[\bar{y}f(\gamma) - \gamma I(1+\alpha)]$ subject to:

$$\theta[W + \nu f(\gamma)\bar{y}] + d \geq \gamma I(1+\alpha) \qquad (IC')$$

- Consider case with $\nu = 0$: then (IC') imposes upper bound on project scale:

$$\gamma \leq \tilde{\gamma}(\theta W, \alpha; \theta) \equiv \frac{\theta W + d}{I(1+\alpha)}$$

- Assume that upper bound Ω of W is such that a borrower of type Ω cannot attain the first-best, i.e., all borrowers are credit-constrained

Case 1: CC, No GE, continued

- If f is concave,

$$\gamma(W, \alpha; \theta) = \frac{\theta W + d}{I(1 + \alpha)}$$

- If f is S-shaped, borrowers with W below some threshold do not operate at all, others invest $\frac{\theta W + d}{I(1+\alpha)}$
- Higher θ thus raises access to credit and/or expands credit volume for all borrowers; interest rate (with $\nu = 0$) is unaffected: $T_k = \theta W + d = \gamma I(1 + \alpha)$, hence $\frac{T_k}{\gamma . I} = 1 + \alpha$
- Basis of usual presumption that higher θ relaxes everyone's credit constraints

Case 2: CC, with GE Effect

- Continue to assume $\nu = 0$ for simplicity
- Now we have to solve for the equilibrium π
- Suppose f is concave and Ω not too large: demand of borrower W is $\frac{\theta W + d}{I + \pi}$
- Equilibrium π^* solves (where $\bar{W}$ denotes mean wealth) if a not too small:

$$\frac{\theta \bar{W} + d}{I(1+\pi)} = a + \delta.\pi$$

- Clearly π^* is increasing in $\theta \bar{W}$

Case 2: CC with GE Effect, continued

- Equilibrium credit allocation:

$$\gamma(W, \pi^*(\theta\bar{W}); \theta) = \frac{\theta W + d}{I(1 + \pi^*(\theta\bar{W}))}$$

- PE effect of raising θ: the numerator, effect is proportional to W
- GE effect: the denominator, applies uniformly to all borrowers

Case 2: CC with GE Effect, continued

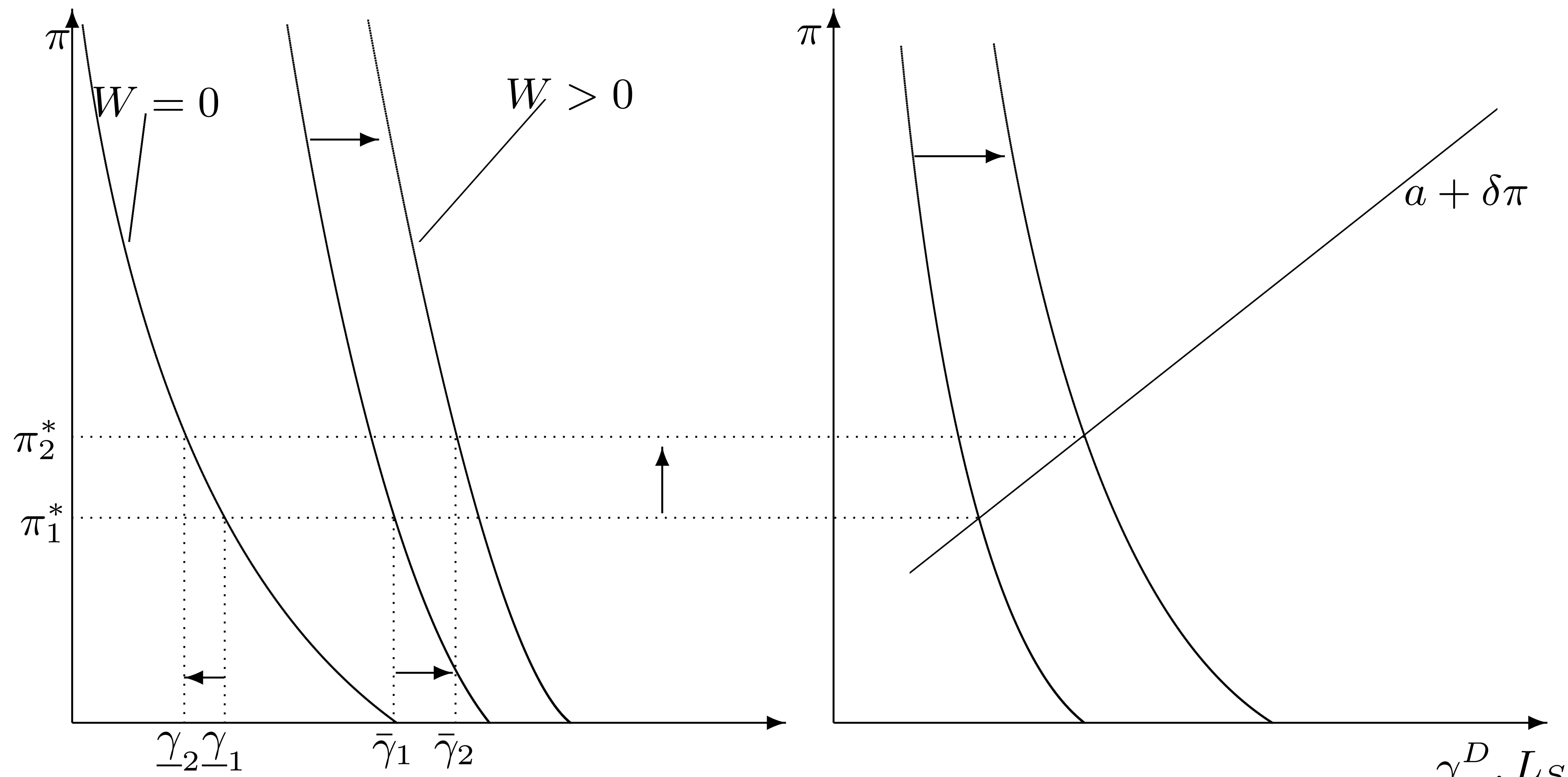
PROPOSITION **1** *With CC and GE, suppose f is concave, Ω not too large, and $\nu = 0$. If θ increases, there exists threshold $\hat{W}$ such that:*

(a) If $W < \hat{W}$, credit falls, and the borrower is worse off

(b) If $W > \hat{W}$, credit rises, and borrower is better off only if W is sufficiently large

(c) Average credit rises

Note: If Ω is large enough that some borrowers are not credit-constrained, then for such borrowers credit will decrease following an increase in θ: overall effect will be U-shaped



π
W = 0
W > 0
π
a + δπ
π*2
π*1
γ2 γ1
γ̄1 γ̄2
γ^D, L_S

Case 2: CC with GE Effect, continued

- Output and Welfare effects are ambiguous: average project scale rises, but inequality also rises

- Interest rate effects: if we interpret the interest rate to correspond to the success state s, then

$$\frac{T_s}{\gamma.I} = \theta \nu y_s \frac{f(\gamma)}{\gamma.I} + \frac{\theta W + d}{\gamma.I}$$

- Interest rate rises for poor borrowers for whom γ falls, ambiguous for others whose credit expands

Context for Empirical Work: DRT Reform

In 1993, Indian government passed a law for debt recovery tribunals (DRTs) to be set up across country

DRT: specialized court which only processes debt cases, follows new streamlined procedure

Suit can be filed by lenders in a DRT in a given state if overdue claims exceed Rs 1 million, and borrower or project is located in that state

Fast processing of cases, defendants given less time to respond, not allowed to file counter-claims, increased cost of appeals

DRTs allowed to make interim orders that prevent defendant from transferring or disposing of assets, to obtain arrest warrants

DRTs, continued

DRTs set up in different states at different times between 1994-99

Timing of establishment of DRTs across states not related to state economic condition, prior cases pending in courts, or political variables (Visaria (2007)), so we shall proceed on the assumption this was exogenous

Evidence in Visaria (2007) suggests they decreased time taken to process cases, increased repayment on loans subject to DRT limit, and lowered interest rates on subsequent loans

Data

data collected from a large private bank's project loan database

panel level data set by borrower-quarter, 1982-2002, includes:

credit given to borrower

- broken down by project for which loan given
- but here we use only aggregate new credit given per quarter

interest rate charged

loan duration, borrower's assets, industry, state where HQ and project located, etc.

Empirical specification

Dependent variable y_{ijt}: total new credit received by borrower i located in state j in quarter t

Regress y_{ijt} on

- DRT dummy D_{jt} for state j in quarter t
- size class for fixed assets of firm i in a previous quarter t'
- interaction of asset size category with DRT dummy

Industry, state, quarter controls; both OLS and borrower FE; cluster at state-quarter level (alternatively by borrower)

Data Issues

Use data of all new project loans disbursed by the bank, by quarter, from 1982–2002 (we do not observe total borrowing from all sources, just this bank)

First DRT occurs in 1994, last one in 1999, so we use 1991-2002 for the regressions

A borrower is in the data-base if it got a loan in some quarter between 1982–2002

Data Issues, continued

Significant censoring: less than 10% borrower-quarter pairs associated with a new loan

We do not know whether a borrowing firm existed prior to the first loan or after the last loan

A borrower-quarter pair is included if this borrower got a loan in a prior quarter (i.e., presuming there is no exit of firms)

Data Issues, continued

Potential endogeneity of asset size: use historical asset size

First version we use: lagged four quarters back

Even lagged asset size may be affected by DRT (e.g., more than one year after DRT)

Many years where asset data of a given borrower is missing

Alternative way of avoiding both these problems: use asset size in some given year prior to 1994

But this would miss borrowers that enter subsequently

Data Issues, continued

So the second version we use: a fixed measure of asset size for a borrower, their size in the first quarter they get a loan (we drop this first-quarter observation in the regression)

Missing data problems substantially mitigated

With borrower fixed effects, this second version would utilize only pre-DRT asset size measures

But then we would miss possible effects of DRT on entry of new borrowers

Other problem: asset size measure could be from many years ago, so a poor proxy of current asset size

Data Issues, continued

Location: can use either borrower HQ location or project location

Quarter of the borrowers have projects in multiple states (concentrated among the large borrowers)

DRT can be invoked by lender if either HQ location or project location is in a DRT state

We use HQ location, as that is more of a firm characteristic, compared to location of projects which can be chosen endogenously (contrast with Visaria (2007))

Table 0A: Summary Statistics **Lagged Asset data**

	Whole sample	Quartile 1	Quartile 2	Quartile 3	Quartile 4
Average asset size ('10millions)	167.53	5.85	17.16	45.96	570.26
	(850.89)	(2.67)	(4.37)	(14.93)	(1589.07)
Fraction observations where credit received (%)	7.89	6.10	6.71	8.38	10.14
	(26.96)	(23.93)	(25.03)	(27.71)	(30.18)
Fraction observations where credit above 1 million	97.09	94.25	96.53	97.90	98.34
	(16.82)	(23.29)	(18.31)	(14.35)	(12.79)
Average volume of credit ('10millions)	0.95	0.19	0.21	0.45	2.81
	(9.74)	(8.00)	(1.56)	(2.65)	(16.97)
Volume of credit if positive ('10m)	12.06	3.07	3.12	5.36	27.77
	(32.71)	(32.25)	(5.22)	(7.58)	(46.37)
Average duration of loan (days)	1868.62	1969.40	1924.48	1842.96	1799.43
	(1145.98)	(923.68)	(968.61)	(1132.78)	(1344.74)
Average interest rate (%)	15.21	15.38	15.96	15.55	14.40
	(4.40)	(4.80)	(4.06)	(4.14)	(4.45)
N	*65228*	*15688*	*15876*	*16468*	*17196*

Note: Standard deviation in parentheses.

Table 0B: Summary Statistics **Historical asset data from first observation**

	Whole sample	Quartile 1	Quartile 2	Quartile 3	Quartile 4
Asset size ('10millions)	51.77	1.90	5.50	11.90	185.40
	(485.07)	(0.92)	(1.29)	(2.90)	(951.70)
Fraction obs where credit received (%)	4.91	4.37	4.33	4.88	6.06
	(21.62)	(20.44)	(20.35)	(21.54)	(23.85)
Fraction obs where credit above 1 million	94.51	94.09	92.07	94.65	96.42
	(22.71)	(23.58)	(27.03)	(22.51)	(18.59)
Volume of credit ('10millions)	0.55	0.24	0.35	0.40	1.22
	(7.94)	(6.19)	(7.57)	(5.06)	(11.38)
Volume of credit if positive ('10m)	11.28	5.41	8.12	8.18	20.08
	(34.09)	(29.14)	(35.50)	(21.49)	(41.96)
Duration of loan (days)	1892.68	1852.50	1865.50	1912.90	1923.57
	(1158.55)	(1026.68)	(1026.68)	(1191.89)	(1276.01))
Interest rate (%)	15.06	15.77	15.14	15.15	14.44
	(4.58)	(4.69)	(4.60)	(4.38)	(4.56)
N	*143936*	*35270*	*35829*	*36408*	*36429*

Note: Standard deviation in parentheses.

Table 1A **Own state DRT Effect**
Dependent variable: Volume of credit, Lagged Asset data

	OLS		Borrower Fixed Effects	
	(1)	(2)	(3)	(4)
DRT Effect on Small	-0.563		-0.441	
	0.000 ***		0.002 ***	
	0.000 ***		0.000 ***	
DRT Effect on Large	0.071		-0.152	
	0.642		0.362	
	0.728		0.457	
DRT Effect on Quartile 1		-0.274		-0.359
		0.241		0.192
		0.190		0.007 ***
DRT Effect on Quartile 2		-0.596		-0.543
		0.000 ***		0.000 ***
		0.001 ***		0.000 ***
DRT Effect on Quartile 3		-0.674		-0.558
		0.000 ***		0.000 ***
		0.001 ***		0.001 ***
DRT Effect on Quartile 4		0.612		0.282
		0.030 *		0.284
		0.071 *		0.321
Fixed effects	*I, S, Q*	*I, S, Q*	*Q*	*Q*
N	*65228*	*65228*	*65228*	*65228*

Note: First row = p value for state x quarter clustering, Second row = p value for borrower clustering.

Table 1B **Own state DRT Effect**
Dependent variable: Volume of credit, Historical Asset data from first observation

	OLS		Borrower Fixed Effects	
	(1)	(2)	(3)	(4)
DRT Effect on Small	-0.225		-0.226	
	0.005 ***		0.005 ***	
	0.020 **		0.024 **	
DRT Effect on Large	0.028		0.006	
	0.686		0.941	
	0.774		0.954	
DRT Effect on Quartile 1		-0.330		-0.346
		0.002 ***		0.001 ***
		0.010 ***		0.005
DRT Effect on Quartile 2		-0.120		-0.106
		0.119		0.298
		0.296		0.460
DRT Effect on Quartile 3		-0.199		-0.244
		0.001 ***		0.000 ***
		0.035 **		0.017 **
DRT Effect on Quartile 4		0.256		0.253
		0.037 *		0.076 *
		0.103		0.124
Fixed effects	*I, S, Q*	*I, S, Q*	*Q*	*Q*
N	*143936*	*143936*	*143936*	*143936*

Note: First row = p value for state x quarter clustering, Second row = p value for borrower clustering.

Table 2A **Own State DRT Effect**
Dependent variable: Credit positive, Lagged Asset data

	Logit		Conditional Logit	
	(1)	(2)	(3)	(4)
DRT Effect on Small	-0.209		-0.106	
	0.029 **		0.505	
	0.033 **		0.321	
DRT Effect on Large	0.063		0.056	
	0.307		0.449	
	0.411		0.499	
DRT Effect on Quartile 1		-0.043		-0.101
		0.771		0.671
		0.755		0.521
DRT Effect on Quartile 2		-0.336		-0.109
		0.001 ***		0.454
		0.002 ***		0.355
DRT Effect on Quartile 3		-0.057		0.050
		0.470		0.609
		0.569		0.630
DRT Effect on Quartile 4		0.173		0.061
		0.023 **		0.498
		0.057 *		0.515
Fixed effects	*I, S, Q*	*I, S, Q*	*Q*	*Q*
N	*65228*	*65228*	*65228*	*65228*

Note: First row = p value for state x quarter clustering, Second row = p value for borrower clustering.

Table 2B **Own State DRT Effect**
Dependent variable: Credit positive, Historical Asset data from first observation

	Logit		Conditional Logit	
	(1)	(2)	(3)	(4)
DRT Effect on Small	-0.174		-0.141	
	0.023 **		0.328	
	0.029 **		0.095	
DRT Effect on Large	0.011		0.021	
	0.858		0.819	
	0.867		0.768	
DRT Effect on Quartile 1		-0.069		-0.022
		0.515		0.892
		0.490		0.834
DRT Effect on Quartile 2		-0.270		-0.257 **
		0.429		0.144
		0.007 ***		0.017
DRT Effect on Quartile 3		-0.157		-0.159
		0.167		0.214
		0.097 *		0.106
DRT Effect on Quartile 4		0.141		0.163
		0.017 **		0.046 **
		0.088 *		0.056 *
Fixed effects	*I, S, Q*	*I, S, Q*	*Q*	*Q*
N	*14396*	*14396*	*14396*	*14396*

Note: First row = p value for state x quarter clustering, Second row = p value for borrower clustering.

Table 3A **Own state DRT Effect**
Dependent variable: Interest rate, Lagged Asset data

	OLS		Borrower Fixed Effects	
	(1)	(2)	(3)	(4)
DRT Effect on Small	0.758		0.327	
	0.012 **		0.261	
	0.025 **		0.396	
DRT Effect on Large	0.237		0.031	
	0.395		0.898	
	0.434		0.917	
DRT Effect on Quartile 1		0.98		0.283
		0.021 **		0.567
		0.047 **		0.64
DRT Effect on Quartile 2		1.43		0.401
		0.267		0.214
		0.311		0.348
DRT Effect on Quartile 3		0.916		0.254
		0.378		0.35
		0.485		0.463
DRT Effect on Quartile 4		-0.082		-0.145
		0.284		0.597
		0.301		0.656
Fixed effects	*I, S, Q*	*I, S, Q*	*Q*	*Q*
N	*5146*	*5146*	*5146*	*5146*

Note: First row = p value for state x quarter clustering, Second row = p value for borrower clustering.

Table 3B **Own state DRT Effect**
Dependent variable: Interest rate, Historical Asset data from first observation

	OLS		Borrower Fixed Effects	
	(1)	(2)	(3)	(4)
DRT Effect on Small	0.41		0.007	
	0.115		0.98	
	0.161		0.983	
DRT Effect on Large	0.114		-0.093	
	0.646		0.654	
	0.679		0.748	
DRT Effect on Quartile 1		0.704		0.218
		0.013 **		0.43
		0.036 **		0.554
DRT Effect on Quartile 2		0.468		-0.217
		0.903		0.567
		0.909		0.634
DRT Effect on Quartile 3		0.421		-0.033
		0.266		0.91
		0.33		0.929
DRT Effect on Quartile 4		-0.168		-0.143
		0.962		0.553
		0.966		0.664
Fixed effects	*I, S, Q*	*I, S, Q*	*Q*	*Q*
N	*7073*	*7073*	*7073*	*7073*

Note: First row = p value for state x quarter clustering, Second row = p value for borrower clustering.

Alternative Explanation: Incomplete Contracting

- Is this evidence of a GE effect, or could this represent an alternative channel?
- Present an alternative explanation of credit reallocation, based on incomplete contracting
- Related to Gropp et al (1997), Bolton and Rosenthal (2002), who stress insurance value to borrowers of weak enforcement
- Idea: debt contract is not state-contingent, and firms may default in equilibrium following adverse shocks
- Likelihood of such default greater for small firms, who decide to borrow less when there is stronger enforcement (to avoid default costs, or related risks)

IC Model without GE Effects

- Consider version of our earlier model, with $\nu > 0$, $y_f = 0$
- Incomplete Contract: $T_s = T_f \equiv T$; no GE Effect: $\pi = \alpha$
- Default in state k if $T > \theta[W + \nu y_k f(\gamma)] + d$

IC Model without GE Effects, contd

- Two possible ranges of T:
  - *No Default*: $T \leq \theta W + d$
  - *Default only in state f*: $T \in (\theta W + d, \theta\{W + \nu y_s f(\gamma)\} + d]$
- Optimal Safe Contract: γ^S maximizes $f(\gamma)\bar{y} - \gamma I(1+\alpha)$, subject to $\gamma \leq \frac{\theta W + d}{I(1+\alpha)}$
- If f is concave and firm is credit constrained, $\gamma^S = \frac{\theta W + d}{I(1+\alpha)}$, just as before

IC Model without GE Effects, contd

- Main benefit of default contract (with $\nu > 0$): allows borrower to expand project scale, as project output itself serves as part collateral:

$$\gamma \leq \frac{\theta[W + \nu y_s f(\gamma)] + d}{I(1+\alpha)}$$

- Interest rate in default contract is higher:

$$\frac{T}{\gamma.I} = \frac{1}{e}[1 + \alpha - (1-e)\frac{\theta W}{\gamma.I}]$$

- But this reflects default risk, so *ex ante* loan cost is the same

IC Model without GE Effects, contd

- Borrower payoff in default contract:

$$f(\gamma)\bar{y} - \gamma I(1+\alpha) - (1-e)d + W$$

- If $\theta\nu$ is not too small (e.g., bigger than e), scale restriction in the default contract does not bind, and $\gamma^D = \gamma^F$, independent of θ, W
- Main drawback of default contract: default cost $(1-e)d$ and risk (if borrower is risk-averse)
- Tradeoff between Safe and Default Contracts: scale versus default costs/risks

IC Model without GE Effects, contd

- Poor borrowers will prefer default contract: scale restriction in the safe contract too extreme, while scale and default cost in the default contract is independent of W (reinforced if d rising in W)
- Wealthy borrowers will prefer safe contract
- As θ rises, scale of safe contract expands, motivating poor borrowers to switch to the safe contract: *their borrowing falls*
- Wealthy borrowers already in safe contract: their borrowing expands

IC Model without GE Effects, contd

- Payoff effects: still a Pareto improvement (in absence of GE effects and borrower risk aversion)
- If borrowers are risk-averse then default is a source of insurance for small borrowers, which gets reduced as θ rises: in that case small borrowers may become worse-off
- Interest rate effects of higher θ: *they fall (for small borrowers), unchanged for wealthy borrowers*

GE Effect or Default-Avoidance?

- One key difference in prediction: interest rates for small borrowers
- Empirical results are not definitive on these dimensions: tendency for interest rates for small borrowers to rise (consistent only with GE effect), though not statistically significant in FE regressions
- Alternative way of discriminating between the two explanation: look for cross-state spillovers owing to GE effect if credit markets in different states are not perfectly segmented (currently in progress)

Conclusion

- Puzzling effect of contraction of credit volume (and higher cost) to small borrowers following credit enforcement reform in India
- Provided two possible explanations for this: GE effect, default-avoidance
- Empirical results do not (yet) clearly discriminate in favor of one hypothesis over another
- Conceivable that GE effects and default-avoidance are both operating at the same time
- Either way, the results cast doubt on general presumption that strengthening lender collection rights or expanded scope for collateral will relax credit market imperfections for most borrowers, or that aggregate efficiency/output will rise

Conclusion and Future Directions

- Need to explore issues of possible endogenous entry of new borrowers
- Asset size measurement problems: endogeneity-cum-measurement error; model asset size dynamics?
- Control for dependence on existing debt, capital installed, or serial correlation?
- Cross-state effects could indicate importance of GE effect, and is interesting for its own sake (to what extent does investment react to credit market reforms?)