Creditor's Protection and Bank Loans: Market Power and Bankruptcy Reform's Effects

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The Plan of the Talk

- Introduction
- Institutional Background
- Database
- Empirical Strategy
- Estimation Results and Findings
- Robustness Tests
- Final Remarks and Further Steps

Investor's protection and Capital Markets

- Better creditors protection is associated with lower interest rate and higher credit volume
  - Theoretical research
    - Aghion and Bolton (1992)
    - Hart and Moore (1998)
  - Empirical evidence
    - La Porta et al. (1997, 1998): cross country (49 countries)
    - Lilinefeld-Toal et al. (2012) (India)
    - Araujo et al. (2012), Coelho et al. (2012), Assunção et al. (2014) (Brazil)

Investor's protection and Capital Markets

- Several countries have introduced new corporate bankruptcy legislations to increase creditor's protection

  - India (1993)
  - South Korea (1997)
  - Brazil (2005)
  - China (2007)
  - …

Bank Loans and Credit Markets

Some features of the banking industry

- High concentration rates and imperfect competition for a large set of countries in the banking industry
    - Saunders and Schumacher (2000), Claessens et al. (2004), Bikker et al. (2012)...

This paper

- Research Question:
  - Can the lack of competition in the financial sector hamper the effects of a more effective creditor protection on credit markets?
- Economic Foundations: Banking oligopoly price theory
  - In an imperfect competition market, a bank wants to retain the extra margin generated by an increase in creditor protection
  - The lower is the competition in the loan market, the lower will be the reduction (increase) in loan rates (credit supply).

The Brazilian Corporate Bankruptcy Reform

- Institutional aspects:
  - New Bankruptcy Legislation (BBR): issued in February 2005 and became legally effective in June 2005
- Previous legislation:
  - Until 2005: a Federal Law from 1945
  - Preference to labor demands and taxes at expenses of creditors
  - System punished firms under financial distress
- Main features of the new legislation:
  - Aim: continuity of business enterprisers with profitable projects that did not fulfill its debt contract but has good prospectus of surviving
  - Encourage creditors-borrowers cooperation (extrajudicial recovery)
  - A fast and efficient liquidation of assets if the rehabilitation were not possible

Database used

- Period: July 2004 to December 2007 (monthly data)
  - Credit Information System (SCR)
    - Our key source of information (contract-level data)
  - Monthly Banking Accounting Data
  - Macroeconomic-financial data (controls)
  - Swap Pre-DI rates (for loan spreads)

Credit Information System (SCR)

- Available information: New loan contracts issued every month
  - contacted interest rate, loan size, maturity, contract characteristics (bank, credit line, credit risk, collateral)
- Data restriction:
  - Free lending funds: no compulsory destination
  - Own credit operations: excluded credit operations of intermediaries
  - Prefixed loan rates: loans with pre-determined fixed credit terms
  - Exclusion: real estate and mortgage loans, BNDES loans, non-payroll attached loan
- Our observation: Bank-level data - collapsed

Credit lines

- Credit contracts classified in 10 different credit lines

Description		Number
Overdraft	Consumers	1
Leasing and Goods Financing	Consumers	2
Vehicle Financing	Consumers	3
Loans and Other Credit Lines	Consumers	4
Working Capital; Overdraft and Supplier Financing	Firms	5
Commercial Papers Discount	Firms	6
Leasing and Goods Financing	Firms	7
Vehicle Financing	Firms	8
Loans and Other Credit Lines	Firms	9
Trade Finance: Import and Export	Firms	10

- Each line is also divided in collateralized and non-collateralized lines.

Outcome Variables

- Loan interest rate:
  - bank-month average contracted interest rate of individual credit operations weighted by the size (value) of the credit operations (*CAop*).

$$Y_{blrct} = \frac{\sum_i^I CAop_{iblrct} R_{iblrct}}{\sum_i^I CAop_{iblrct}}$$

- Spread over interbank rate:
  - bank-month average spread over the interbank rate, IRTS (same maturity)

$$S_{blrct} = \frac{1 + Y_{blrct}}{1 + IRTS_{WMat_b lrct}}$$

Competition Indicators

- Measure of Competition:
  - Relevant market: competition in each credit line
  - Baseline: credit line, credit risk category, collaterized, month/year (finest criteria)

$$HHI_{lrct} = \sum_{1}^{B} \left(\frac{ContractedCredit_{blrct}}{\sum_{1}^{B} ContractedCredit_{blrct}} \right)^2$$

  - Extensions: credit line and time (coarser criteria)
  - Other proxies:
    - C4: the sum of market share of the first big lenders in a given market
    - MS: the market share of the bank in a given market
    - H - Statistics: Panzar-Rosse competition measure in a given credit line

Covariates

- Bank idiosyncratic variables:
  - Public bank, market share (entire credit portfolio), Basel index, liquidity index, total monthly receipts over equity, total of non-performing loans (90 days), weighted maturity (days) of the credit portfolios.

- Macroeconomic variables:
  - interest rate term structure (IRTS), interbank rate (CDI, 1day), 7 volatility point over the term structure, gross domestic product (GDP), industrial production, inflation (IPCA).

Empirical Strategy

- Modified Differences-in-Differences approach: (triple difference)

$$
\begin{aligned}
Y_{blrct} = {} & \beta_0 + \beta_1 \Lambda_{lrct} + \beta_2 dmLaw_t + \beta_3 T_{blrct} dmLaw_t + \beta_4 \Lambda_{lrct} T_{blrct} + \beta_5 \Lambda_{lrct} dmLaw_t \\
& + \beta_6 \Lambda_{lrct} T_{blrct} dmLaw_t + \sum_{c=1}^{C} \varphi_c BankControls_{bt} + \sum_{m=1}^{M} \mu_m MacroControls_t + \\
& + \sum_{f=1}^{F} \phi_f dmYear_t + \sum_{h=1}^{H} \phi_h dmMonth_t + \eta_{b,l,r,c} + \varepsilon_{b,l,r,c,t},
\end{aligned}
$$

  - Y_{blrct}: outcome variables (loan interest rate and bank spread) by credit institutions or banks b, by credit lines l, by credit risk class r, and whether the operations are collateralized, c = 1, or not, c = 0, at time t.

Empirical Strategy (cont.)

- Triple difference approach:

$$Y_{blrct} = \beta_0 + \beta_1 \Lambda_{lrct} + \beta_2 dmLaw_t + \beta_3 T_{blrct} dmLaw_t + \beta_4 \Lambda_{lrct} T_{blrct} + \beta_5 \Lambda_{lrct} dmLaw_t + \beta_6 \Lambda_{lrct} T_{blrct} dmLaw_t + \sum_{c=1}^{C} \varphi_c BankControls_{bt} + \sum_{m=1}^{M} \mu_m MacroControls_t + \sum_{f=1}^{F} \phi_f dmYear_t + \sum_{h=1}^{H} \phi_h dmMonth_t + \eta_{b,l,r,c} + \varepsilon_{b,l,r,c,t},$$

  - $dmLaw_t$: BBR dummy variable (0 before June/2015, and 1, otherwise)
  - T_{blrct}: treated-control dummy (1 for treated group, and 0 for control)
    - treated group: collateralized corporate loans (without subsided loans)
    - control group: consumer credit loans (without payroll attached credits)

Empirical Strategy (cont.)

- Triple difference approach:

$$Y_{blrct} = \beta_0 + \beta_1 \Lambda_{lrct} + \beta_2 dmLaw_t + \beta_3 T_{blrct} dmLaw_t + \beta_4 \Lambda_{lrct} T_{blrct} + \beta_5 \Lambda_{lrct} dmLaw_t + \beta_6 \Lambda_{lrct} T_{blrct} dmLaw_t + \sum_{c=1}^{C} \varphi_c BankControls_{bt} + \sum_{m=1}^{M} \mu_m MacroControls_t + \sum_{f=1}^{F} \phi_f dmYear_t + \sum_{h=1}^{H} \phi_h dmMonth_t + \eta_{b,l,r,c} + \varepsilon_{b,l,r,c,t},$$

  - Bank's market power indicator: Λ_{lrct}
  - treatment-status dummy: $T_{blrct}dmLaw_t$ (effect β_3)
  - market-power market "hampering" dummy: $\Lambda_{lrct}T_{blrct}dmLaw_t$ (effect β_6)
  - Net effect of the BBR: $\beta_3 + \beta_6 \times \Lambda_{lrct}$ – *av. treated after BBR*

Empirical Strategy (cont.)

- Triple difference approach:

$$Y_{blrct} = \beta_0 + \beta_1 \Lambda_{lrct} + \beta_2 dmLaw_t + \beta_3 T_{blrct} dmLaw_t + \beta_4 \Lambda_{lrct} T_{blrct} + \beta_5 \Lambda_{lrct} dmLaw_t + \beta_6 \Lambda_{lrct} T_{blrct} dmLaw_t + \sum_{c=1}^{C} \varphi_c BankControls_{bt} + \sum_{m=1}^{M} \mu_m MacroControls_t + \sum_{f=1}^{F} \phi_f dmYear_t + \sum_{h=1}^{H} \phi_h dmMonth_t + \eta_{b,l,r,c} + \varepsilon_{b,l,r,c,t},$$

  - BBR effect: identified by
    - comparing the change (before and after BBR) in the outcome variable of credit contracts affected by BBR (corporate loans) with the change in the outcome variables of loans not affected by BBR (consumer loans).
  - Competition Hampering effect: identified by
    - comparing the change (before and after BBR) in the outcome variable of corporate loan contracts with high vis-à-vis the ones with low competition.

Estimation Results and Findings

- Econometric specifications:
  - Model (1): Dif-in-Dif variables, and month-year dummies
  - Model (2): outliers are excluded from Model (1)
    - Outliers are treated: Hadi (1994) algorithm for loan rates and spreads (1%).
  - Model (3): Model (2) with controls
  - Model (4): Model (3) with symmetric sample (11 months before and after)

Main Results

Loan Interest Rates

Table 12: Main Results - HHI and Bankruptcy Reform Effect on Mean Interest Rate

	(1)	(2)	(3)	(4)
R-sq: within	0.0311	0.0402	0.0465	0.0453
Test F	F(20,26743)	F(33,23859)	F(33,23555)	F(32,10522)
	42.88	30.3	34.83	15.61
Independent Variables				
β_0	0.2052***	0.7833	0.4531	0.3938
	[0.009]	[0.686]	[0.477]	[1.121]
Market Share - Credit Portfolio	4.0087***	5.2588***	2.0405***	5.1715***
	[0.245]	[0.366]	[0.265]	[0.600]
$HHI_{CreditLine,Risk,Collateral}$	0.0713***	0.1536***	0.0881***	0.0826***
	[0.023]	[0.034]	[0.024]	[0.030]
Dummy of BBR	0.0824***	0.1060***	0.0863***	0.0678***
	[0.008]	[0.013]	[0.009]	[0.012]
Dummy of BBR * Dummy of Treated Group	-0.0707***	-0.0836***	-0.0736***	-0.0708***
	[0.009]	[0.013]	[0.009]	[0.012]
$HHI_{CreditLine,Risk,Collateral}$ * Dummy of Treated Group	-0.0575**	-0.0998**	-0.0621**	-0.0708***
	[0.029]	[0.044]	[0.031]	[0.036]
$HHI_{CreditLine,Risk,Collateral}$ * Dummy of BBR	-0.0960***	-0.2204***	-0.1091***	-0.1328***
	[0.023]	[0.035]	[0.024]	[0.025]
$HHI_{CreditLine}$ * Dummy of BBR * Dummy of Treated Group	0.0925***	0.2020***	0.1083***	0.1307***
	[0.029]	[0.044]	[0.031]	[0.032]

Main Results

Spread over Interbank Rate

Table 13: Main Results - HHI and Bankruptcy Reform Effect on Mean Spread over IRTS

	(1)	(2)	(3)	(4)
N Obs	29,022	26,132	25,800	11,790
R-sq: within	0.0371	0.047	0.0523	0.0581
Test F	F(20,26550)	F(33,23859)	F(33,23555)	F(32,10522)
	51.110	35.680	39.390	20.270
Independent Variables				
β_0	0.0882***	0.7508	0.4398	0.3763
	[0.007]	[0.599]	[0.416]	[0.952]
Market Share - Credit Portfolio	3.5017***	4.6322***	1.7590***	4.4319***
	[0.209]	[0.320]	[0.231]	[0.509]
$HHI_{CreditLine,Risk,Collateral}$	0.0524***	0.1200***	0.0655***	0.0734***
	[0.019]	[0.080]	[0.021]	[0.025]
Dummy of BBR	0.0705***	0.0915***	0.0744***	0.0584***
	[0.007]	[0.011]	[0.008]	[0.010]
Dummy of BBR * Dummy of Treated Group	-0.0664***	-0.0722***	-0.0638***	-0.0610***
	[0.008]	[0.012]	[0.008]	[0.008]
$HHI_{CreditLine,Risk,Collateral}$ * Dummy of Treated Group	-0.0402	-0.0675*	-0.0376	-0.0626**
	[0.025]	[0.038]	[0.027]	[0.030]
$HHI_{CreditLine,Risk,Collateral}$ * Dummy of BBR	-0.0853***	-0.1815***	-0.0868***	-0.1146***
	[0.020]	[0.030]	[0.021]	[0.022]
$HHI_{CreditLine}$ * Dummy of BBR * Dummy of Treated Group	0.0758***	0.1601***	0.0812***	0.1121***
	[0.025]	[0.030]	[0.021]	[0.027]

Main Results

Potential Effect of BBR and Hampering Effect

- Potential effect of BBR: β_3 under perfect competition HHI=0
  - loan rates drop ≅700 basis points (19.2% of the average interest rate) wrt to control group.
  - spreads drop ≅600 basis points (12.8%a.a→≅6.8%a.a) wrt to the control group.

- Lack of competition - hampering effect: $\beta_6 \times HHI_{t \geq June2005}$
  - loan interest rates : ≅200 basis points (27.5% of the potential effect)
  - spreads: ≅200 basis points (23.6% of the potential effect)
  - Lack of Competition: it hampers 24%-40% of the BBR effect.

- Bottom line: Lack of Competition hampers 24%-40% of the BBR effect.

Robustness Tests

- Other Measures of bank competition (Results are similar)
  - Coarse definitions of market power
  - Other proxies for market power
- Invariance of banking competition to BBR (Results are similar)
- Falsification test
  - Placebo tests
  - Random assignment of competition measures

Conclusions and Final Remarks

- Take-Home Message:
  - 2005 Brazilian Bankruptcy Reform (BBR) leaded to lower interest rates of corporate loans.
  - Lack of competition in corporate credit market hampered around 24-40% of BBR effects on loan interest rates.
- Policy Implication:
  - Potential effects of creditor protection reforms cannot be achieved without competition-enhancing policies in the banking sector
- Further Steps:
  - Local market competition

Parallel Trends: Treated and Control Groups