Collateralization, Bank Loan Rates and Monitoring

Geraldo Cerqueiro
Universidade Católica Portuguesa

Steven Ongena
University of Zurich, SFI and *CEPR*

Kasper Roszbach
Sveriges Riksbank and *University of Groningen*

Day Ahead Conference, Federal Reserve Bank of Philadelphia
January 2, 2014

SVERIGES RIKSBANK

This paper:

- attempts to take a step forward in identifying the role that collateral plays in debt contracts, for credit availability and for bank monitoring;
- uses a unique dataset from a large bank containing frequently updated internal assessments of collateral values, and
- finds that, in response to a legal reform that exogenously reduced collateral values, the bank
  - increased interest rates,
  - tightened credit limits, and
  - reduced the intensity of its monitoring of both borrowers and collateral
- This spurred delinquency on tax payments by borrowers, documenting the economic importance of (i) collateral for borrowers and (ii) lender seniority for banks

We find that …

An exogenous reduction in the collateral coverage ratio (collateral/ loan exposure, mean = 47%) of 6 percentage points

was followed by

Changes in contract features

- Increase in the loan spread by 20 bps (mean spread = 4.1%, mean rate = 6.6%)
- 11 percent reduction in borrower's lending limit in the bank

A drop in monitoring activity

- 2.3 months extra between collateral reviews (mean = 10.3 months)
- 0.8 months (25 days) extra between borrower reviews (mean = 12.2 months)

An increase in borrower delinquencies

- 12 percentage points rise of firms with delayed tax payments (mean = 7%)

Motivation

- Collateral is used all over the world to facilitate lending by alleviating information asymmetries

- Collateral can have aggregate implications
- Fluctuations in collateral values can generate credit cycles: Bernanke-Gertler (1989), Kiyotaki-Moore (1997)
- Affects debt capacity and investment: Gan (2007); Vig (2011); Chaney et al. 2009)

- However: still know more about theoretical motivations for using collateral than about its empirical workings

- Partly due to data limitations partly due to simultaneity issues involving debt contract parameters

This paper deals with role of collateral at micro level

- How does pledged collateral influence loan rates and the availability of credit?
  - An ex-ante sorting device or means to influence ex-post borrower behavior? [Bester , 1985; Chan-Thakor, 1987; Boot-Thakor, 1994]

Empirical evidence:
- Ex-post concerns dominate [Berger-Frame-Ioanniddou, 2010)]
- positive relation between collateral and loan rates [Brick-Palia , 2007); Bharath et al. 2007]
- But: difficult to address simultaneity of rates and collateral posting

- How does collateral affect bank monitoring?
  - Substitutes for screening [Manove-Padilla-Pagano, 2001]
  - Affects bank monitoring [Berglöf-Von Thadden, 1994, Rajan-Winton, 1995, Longhofer-Santos, 2000]

Empirical evidence:
- Collateralized claims are better monitored [Ono-Uesugui, 2009; Argentiero, 2009]

What are floating liens

- A special collateral right
  - Compares to US FL; UK (floating charge), AUS (chattel pledge)
- Typically constitutes a prioritized collateral claim on "personal" (i.e., moveable) - as opposed to real - property related to a business
  - Assets can be called not only in case of bankruptcy but when other creditor seizes assets
- Pool of underlying assets can vary over time, assets remain available for operations of business
- In Sweden, some classes of assets were excluded from the FL such as:
  - cash, money in bank accounts and assets that that can be mortgaged in other ways (typically real estate and financial assets like stock and bonds)

Exploit an experimental setting

- A change in the law in Sweden altered the value of floating liens (FL), a common collateral type in Sweden.

- As of 1 January 2004:
  - Special priority rights of old and new floating liens (FL) were weakened and "converted" into *normal* priority rights: Assets can now only be claimed in case of bankruptcy
  - Share of assets that could serve as FL collateral restricted to 55% of their total, but types of assets slightly widened.
  - Purpose to reduce the value of FL collateral

Official records of the Parliamentary Committee on Civil Law:

"Give stronger incentives for banks in credit granting decisions to analyze profitability, do ongoing monitoring and weaken incentives to secure collateral. …[and] avoid inefficient liquidations and improve opportunities for temporarily troubled but essentially profitable businesses to re-emerge."

Data

All Swedish corporate accounts of a large Nordic-Baltic commercial bank

- All loan files kept by bank for each borrower between 2002:04 and 2005:09, monthly frequency
- Focus on "business loans" (those with a pre-determined quarterly repayment schedule)
  - not secured by standardized collateral such as cars, real estate, etc.
  - but may be secured by floating lien
- Loan rates on business loans are adjustable at quarterly basis
  - only contract term that is adjustable (!)
- Matched with official register of pledged floating liens maintained by Swedish Companies Registration Office

SVERIGES RIKSBANK

Empirical strategy

- Exploit the *exogenous and (almost) unambiguous* deterioration in the value of the FL
  - We can asssess if indeed it was a deterioration for the bank
- Treatment group: all firms that pledged a FL to bank before 2004
- Control group: all other firms with business loan
- Obtain by OLS a differences-in-differences estimator of

$$(\bar{y}_{Post} - \bar{y}_{Pre})_i = \alpha + \beta \cdot Treated_i + \varepsilon_i,$$

Result #1

There is a deterioration in the value of the floating lien as assessed by the bank

Figure 1 – Change in the Law and Collateral Value

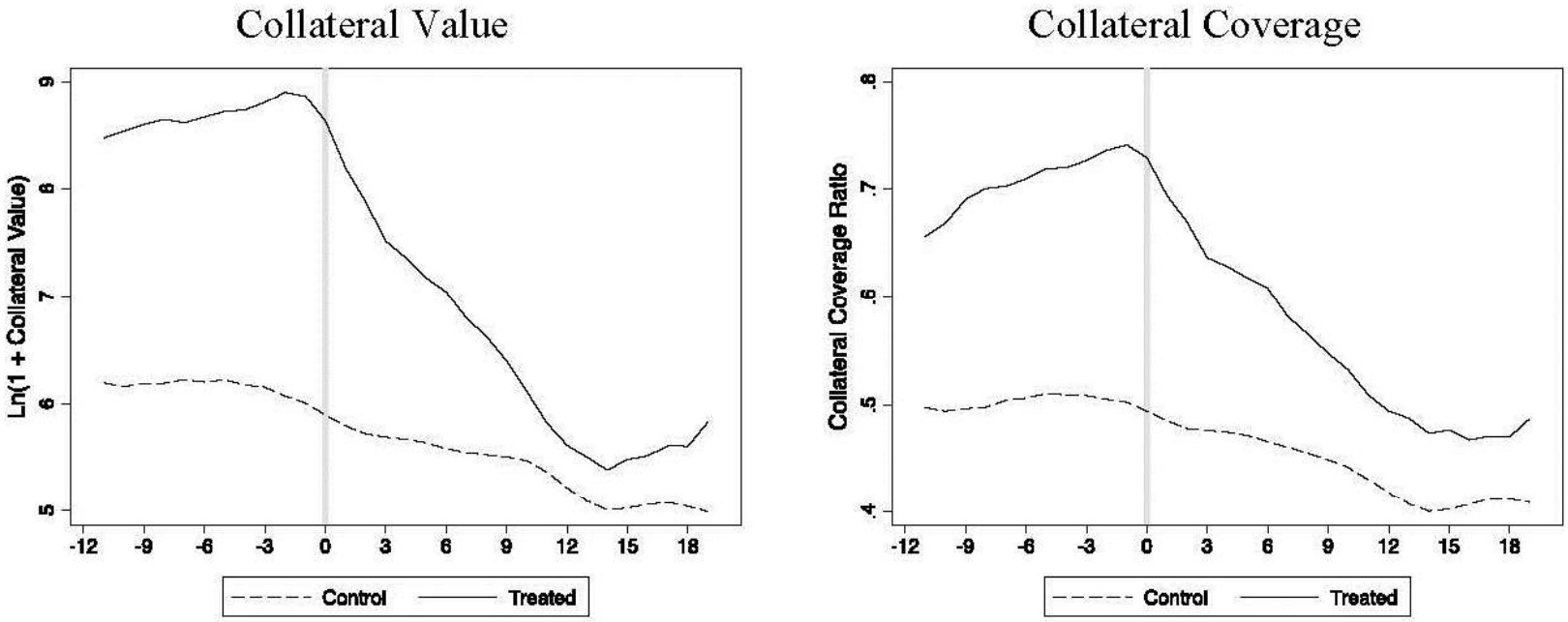


Table 4 – Change in the Law and Collateral Value

	Dependent variable: Post - Pre Difference of	
	Ln(1 + Collateral Value)	Collateral Coverage
Treated	-1.06***	-6.16***
	(-4.93)	(-2.98)
Constant	-0.72***	-3.18***
	(-12.97)	(-5.96)
Observations	2,580	2,580
R-squared	0.01	0.00

Mean collateral ratio = 46.55 %
Standard deviation: 46.44 %

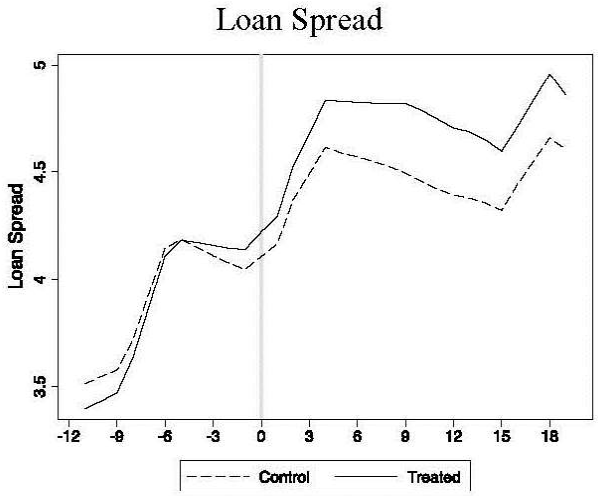
Treated 65.70 – 6.16 = 59.54 %

Result #2

The drop in collateral values results in:

- A tightening of the adjustable terms of the outstanding collateralized loans,
- A reduced willingness of the bank to lend (credit supply) to the firm.

- Impact on credit terms



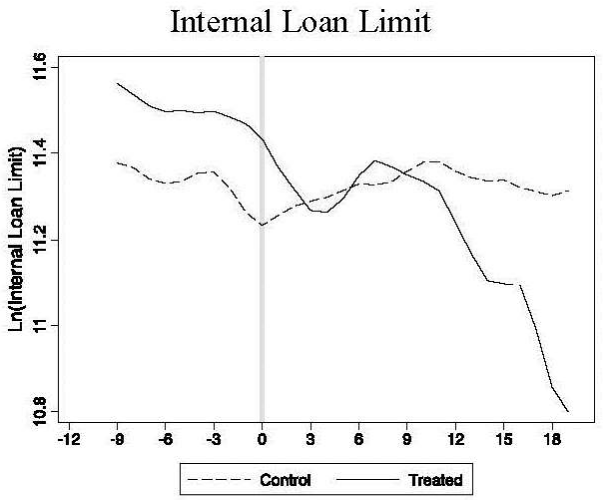


Table 5 – Change in the Law and Loan Contract Terms

	Dependent variable: Post - Pre Difference of		
	Loan Spread	Ln(Loan Balance)	Ln(Internal Loan Limit)
Treated	0.20***	0.02	-0.11**
	(5.00)	(0.47)	(-2.29)
Constant	0.61***	-0.48***	-0.12***
	(60.76)	(-49.73)	(-10.84)
Observations	2,580	2,580	2,477
R-squared	0.01	0.00	0.00

Mean loan spread = 4.28 %
Standard deviation: 0.11 %

4.28 + 0.20 = 4.68 %

Mean internal limit= EUR 177,080
Standard deviation: EUR 2,616,090

Exp(ln(177,080) – 0.11) = EUR 158,634

Result #3

The loss of collateral also results in:

- A decrease in the monitoring of this collateral by the bank : Rajan and Winton (*JF* 1995): collateral can improve lenders' incentives to monitor when the value of the assets pledged is risky

- An ambiguous effect on the monitoring by the bank of the borrower given that the decrease in monitoring of this collateral may be more than offset by increased monitoring of borrower operations and cash-flows

Hence net effect may be negative or positive, but possibly *"smaller"*?

Figure 4 – Change in the Law and Monitoring

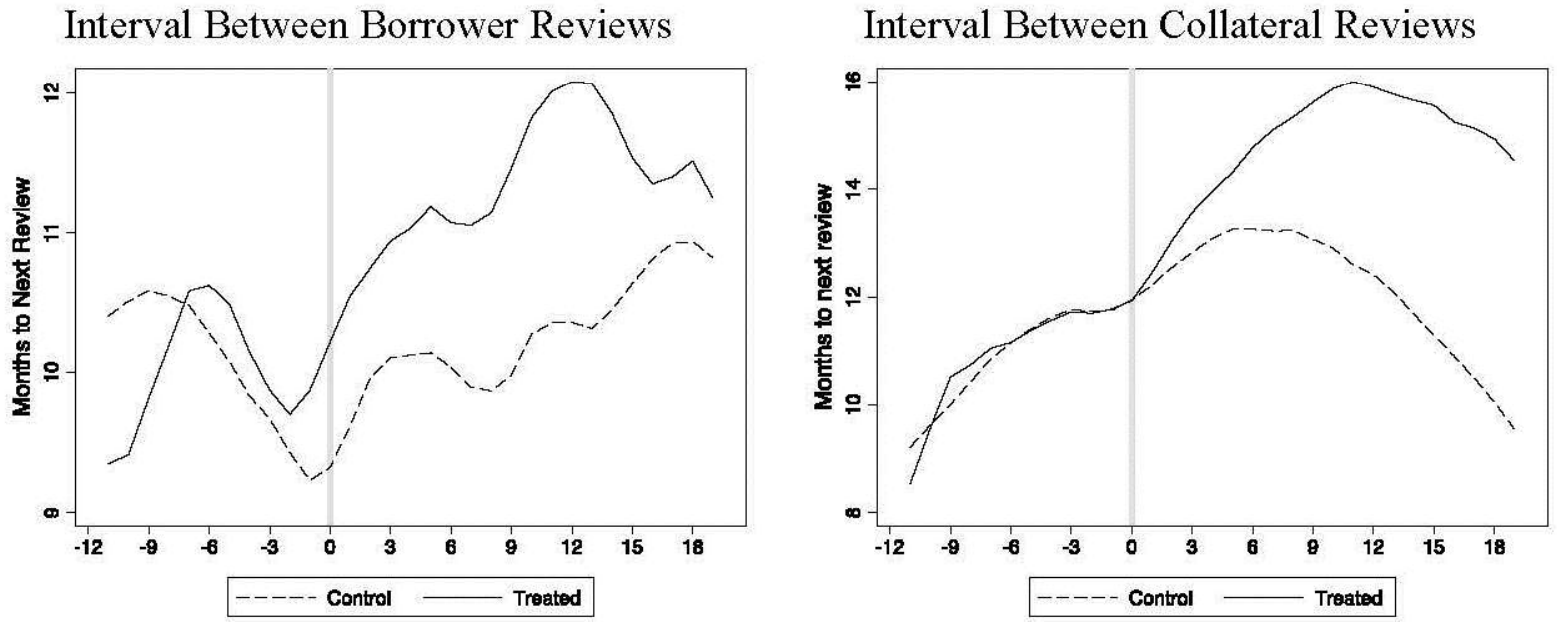


Table 6 – Change in the Law and Monitoring

	Dependent variable: Post - Pre Difference of	
	Interval Between Borrower Reviews	Interval Between Collateral Reviews
Treated	0.84***	2.27***
	(3.04)	(4.17)
Constant	-0.25***	0.71***
	(-3.49)	(3.84)
Observations	2,580	2,580
R-squared	0.00	0.01

Mean time = 10.25 months

- Standard deviation: 4.33 months

10.25 + 0.84 = 11.09 months

25 days increase

Mean time = 12.22 months

- Standard deviation: 9.08 months

10.25 + 2.27 = 12.52 months

Robustness and symmetry

- Placebo test: redo for lease contracts as control group
- Differential trends (before and after)
- Non-linear effect over time of treatment

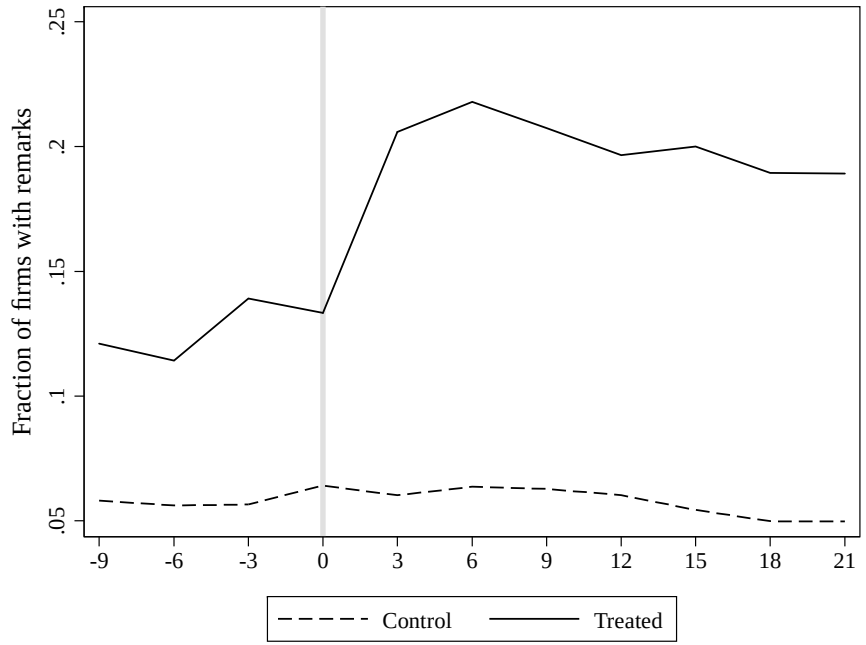
- After-treatment period restricted to December 31st, 2004
  - Treated "Winners": borrowers that pledged a floating lien to any other creditor than our bank before 2004
  - Find similar "opposite" effects for collateral coverage, loan rates and collateral monitoring

Result #4

- Delinquencies on tax payments to the tax authorities increase significantly

(VAT payments, employers taxes, court injunctions)

Change in the Law and Borrower Delinquency on Tax Payments



SVERIGES RIKSBANK

Change in the Law and Borrower Delinquency

	Dependent variable: Post - Pre Difference of
	Borrower Missed a Tax Payment
Treated	0.12***
	(5.06)
Constant	0.03***
	(4.73)
Observations	2,580
R-squared	0.01

Conclusion

When we use a change in law in Sweden that exogenously reduced the value of floating liens, we find that:

- Collateral is important for both lender and borrower
- The exogenous decrease in collateral values led to:
  - An increase in lending rates
  - A reduction in credit supply
  - A reduction in bank monitoring frequency

Our findings suggest that while pledging high-quality collateral

- enables borrowers to pay lower loan rates and benefit from increased credit availability,
- it also preserves banks' incentives to monitor the borrower.

How do our findings relate to recent empirical work?

Findings are consistent with:

- Haselmann, Pistor and Vig (2010): Strengthening legal rules designed to protect creditors' claims outside bankruptcy increased bank lending in transition countries
- Berger, Frame & Ioannidou (2010): Document that collateral serves primarily as a contractual device to solve moral hazard problems.

Our findings complement:

- Vig (2011): Reform that improved ability of lenders to access the collateral of the firm reduced corporate secured debt, debt maturity, and asset growth in India. Introduced *a liquidation bias* and firms alter their debt structures to contract around it
- Rodano, Serrano-Velarde & Tarantino (2011): Reforms of Italian bankruptcy law strengthening firms' rights to renegotiate outstanding deals with creditors increased funding cost for SME; But law simplifying liquidation procedure decreased funding cost
- Benmelech et al. (2008, 2009, 2011); (Gavazza, 2010): examine the effects of liquidation value on financial contracts using the redeployability of assets

THANK YOU

Extra slide

- How this paper complements literature on liquidation values and financial contracts
  - Has access to precise collateral values as assessed by the creditor.
  - Analyzes a separate determinant of liquidation value: an exogenous decrease in the value of a special priority right claim
  - Also analyze the role of the priority structure of claims: provide an estimate of the value of creditor seniority.
  - Although the priority structure of creditors is key in corporate finance theory, direct empirical evidence on the actual value of debt seniority is scant.