Discretion and Systemic Risk in Credit-Line Contracts: Theory and Evidence

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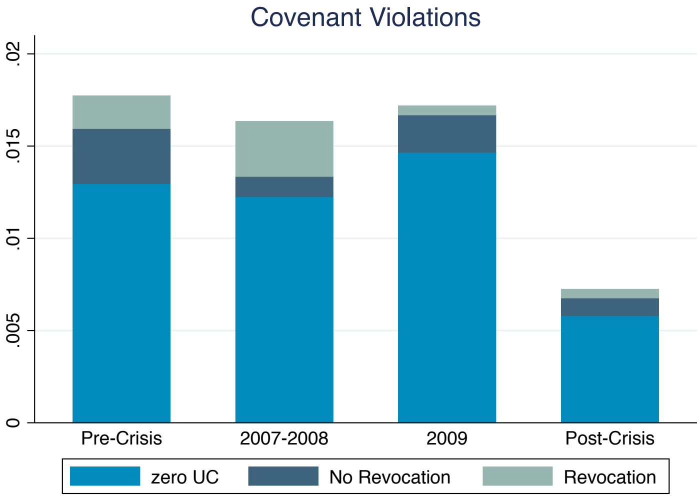
Revolving credit-line contracts

- Account for about 20% of leverage.
- Drawn + Undrawn = Total amount (credit limit).
- A typical contract involves an up-front commitment fee and a draw-down fee.
- Credit line contracts are subject to covenants.
- Upon covenant violation potential bank's actions are *to restrict access to credit line (U=0)* and to renegotiate.
- In the data... *Following a covenant violation, many firms preserve the credit line access.*

Covenant Violations and Revocations



Research Questions

1. Why and when can we expect banks to preserve access to a credit line following a covenant violation?

2. To what extend are credit lines a substitute for internal cash holdings for firms?

Main Results

- Covenants safeguard banks from liquidity insolvency in *systemic events*:
  - novel role of covenants that is complimentary to firm-related reasons;
  - Banks revoke credit lines of covenant violators to ration scarce liquidity.
  - In 2007-2008, firms violating a covenant were 7.1% *more likely* to lose a credit line than non-violating firms.
- During *normal times*, banks can forgive covenant violations:
  - do not revoke a credit line following a covenant violation due to reputation concerns;
  - Outside of the crisis period, 2007-2009, the covenant violations *did not* increase the likelihood of credit-line revocation.

Model Set Up

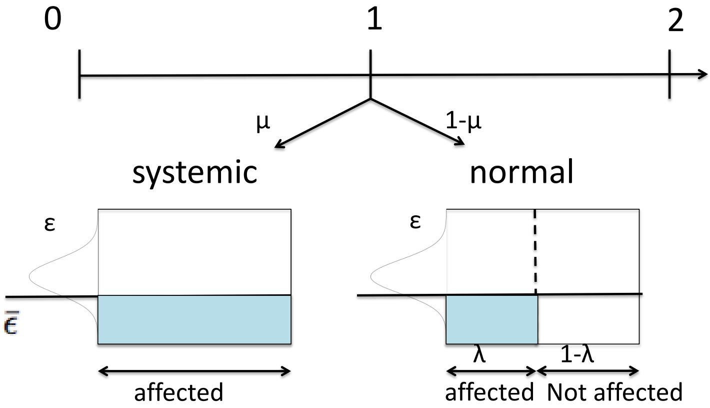
- Building off the Holmstrom and Tirole [1998] environment:
  - Moral hazard leads to pledgeable income $<$ value of the project;
  - Liquidity shock;
  - Credit line is a liquidity insurance.
- Add two aggregate states:

Crisis all firms are hit with a liquidity shock;
  - liquidity demand $>$ liquidity supply

Normal time only some firms are hit with a liquidity shock;
  - liquidity demand $<$ liquidity supply

- Consider types of banks:
  - without reputation
  - with reputation

Credit-line Contracts and Covenants



Liquidity: $L = (1 - F(\bar{\epsilon}))(\rho - \rho_0)$

Liquidity: L+y(1-λ)

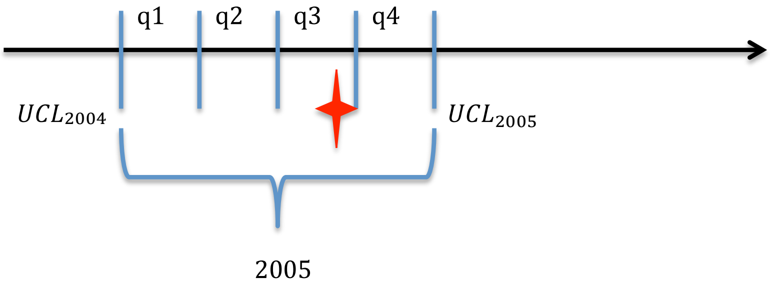
Credit-line Contracts

- Banks without reputation offer non-discretionary contracts. Following a covenant violation:
  - revoke in systemic events;
  - revoke during normal times.
- Banks with reputation offer *discretionary* contracts. Following a covenant violation:
  - revoke in systemic events;
  - do not revoke during normal times.

Data sources

- Hand-collected covenant violations data from Sufi and Roberts [2009] (quarterly).
- Credit lines (used and unused) from Capital IQ (annual).
- Firm fundamentals from Compustat.
- The final dataset consists of approx. 20,000 firm-year observations with more than 300 unique covenant violations for the period 2002-2011.

Revocation of a Credit Line



Revocation in 2005 is recorded if

- $UCL_{2004} > 0$,
- $UCL_{2005} = 0$,
- $DCL_{2005} - DCL_{2004} < UCL_{2004}$.

This definition is close to AAIP [2014] JFE.

The 2007-2008 crisis period and 2009.

The **2007-2008** period — an *increased demand* for credit lines by firms, and *not enough supply* by banks.

- Berrospide, Meisenzahl, and Sullivan [2012], Ivashina and Scharfstein [2010] show that demand for credit lines in 2007-2008 increased by almost 100% but there was not enough supply to meet the demand.
- No flight-so-safety and severe distrust in the banking system in 2007-2008 (Diamond and Rajan [2009], Acharya, Schnabl, and Suarez [2013]).
- Acharya and Mora [2015] - until the government interventions at the end of 2008, banks' role as liquidity providers through deposits inflows was severely impaired.

2009 — a significant flight-to-safety *deposit inflows* driven by, among other, the following:

- The Emergency Stabilization Act increased the deposit insurance limit from USD 100,000 to USD 250,000 per depositor.
- The FDIC announced a temporary program, guaranteeing the newly issued senior unsecured debt of banks as well as non-interest bearing deposit transaction accounts largely held by companies.
- The Federal Reserve liquidity facilities were introduced.

PROBIT RESULTS: HYPOTHESIS 1

VARIABLES	(1) No Controls	(2) Full
Covenant Violation$_t$ x Crisis$_{2007-2008}$	0.07044**	0.07084**
	(0.034)	(0.034)
Covenant Violation$_t$ x Crisis$_{2009}$	0.01787	0.01977
	(0.060)	(0.060)
Crisis$_{2007-2008}$	0.01268**	0.0151***
	(0.005)	(0.005)
Crisis$_{2009}$	-0.02964***	-0.0223***
	(0.008)	(0.008)
Covenant Violation$_t$	-0.00492	-0.00776
	(0.023)	(0.023)
Controls	no	yes
Industry Fixed Effects	no	yes
Rating Fixed Effects	no	yes
Stock Exchange Fixed Effects	no	yes
Pseudo R^2	0.01	0.04
Observations	11,343	11,343

- Controls: Profitability, Size, Leverage, M/B, Cash, Tangibility, NWC, Capex, R&D, Div Dummy, CF Vol, Age, Debt Maturity.
- We find support for the first hypothesis: If a company violates a covenant in times with no systemic liquidity shock, banks would be more likely to renegotiate the credit line contract and even excuse the covenant violation by the firm.

PROBIT RESULTS: HYPOTHESIS 2

VARIABLES	(1) No Controls	(2) Full
Covenant Violation$_t$ x Crisis$_{2007-2008}$	0.07044**	0.07084**
	(0.034)	(0.034)
Covenant Violation$_t$ x Crisis$_{2009}$	0.01787	0.01977
	(0.060)	(0.060)
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- We find support for the second hypothesis: Banks are more likely to revoke the access to a credit line facility for firms that violated a covenant during times of severe liquidity tightness. Correspondingly, firms that violated a covenant during the 2007-2008 crisis, conditional of fundamentals, faced an increased probability of revocation, by 8.6% as compared to the period outside the crisis.

PROBIT RESULTS: HYPOTHESIS 3

VARIABLES	(1) No Controls	(2) Full
Covenant Violation$_t$ x Crisis$_{2007-2008}$	0.07044**	0.07084**
	(0.034)	(0.034)
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- Controls: Profitability, Size, Leverage, M/B, Cash, Tangibility, NWC, Capex, R&D, Div Dummy, CF Vol, Age, Debt Maturity.
- We find support for the third hypothesis: When banks experience a "flight-to-safety" driven inflow of deposits during the crisis, they are more likely to preserve the access to a credit line for a firm that violated a covenant, as compared to a time when the banks do not have enough capital (no deposits inflows).

Bank Reputation: Violators Subsample

- Hand-collect data on bank names that firms have credit lines with from 10Q/10K filings.
- Match with bank fundamentals from SNL data set.
- **174** bank-firm-year observation that correspond to 152 unique firms and 53 unique financial institutions.

Bank Reputation: Violators Subsample

Bank Name	Non-revoked	Revoked	Total
Bank of America Corporation	36	1	37
Wells Fargo & Company	25	3	28
JPMorgan Chase & Co.	17	4	21
SVB Financial Group	9	1	10
Citigroup Inc.	6		6
MUFG Americas Holdings Corporation	5		5
PNC Financial Services Group, Inc.	4		4
U.S. Bancorp	3	1	4
BB&T Corporation	3		3
KeyCorp	2	1	3
National Bank Holdings Corporation	3		3
PrivateBancorp, Inc.	3		3
...			
Wachovia Corporation	2		2
...			
AmSouth Bancorporation		1	1
...			
Commerce Bancshares, Inc.	1		1
...			
Total	158	16	174

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PNC Financial Services Group, Inc.	4		4
U.S. Bancorp	3	1	4
BB&T Corporation	3		3
KeyCorp	2	1	3
National Bank Holdings Corporation	3		3
PrivateBancorp, Inc.	3		3
...			
Wachovia Corporation	2		2
...			
AmSouth Bancorporation		1	1
...			
Commerce Bancshares, Inc.	1		1
...			
Total	158	16	174

Banks with credit-line reputation

Banks without credit-line reputation

Bank Reputation Analysis

Reputation		Crisis		Non-Crisis		Factor
Yes	Revocations Total	7 39	17.9%	4 101	3.96%	4.5
No	Revocations Total	2 10	20%	3 24	12.5%	1.6

- In crisis: similar probabilities of revocation;
- Outside of crisis: banks with credit-line reputation revoke substantially less than banks without reputation;

Bank Reputation Regression Analysis

The Effect of Covenant Violations and Bank Reputation on Credit Line Revocations

VARIABLES	(1) No Controls	(4) Full
$Crisis_{2007-2008}$	0.10280**	-0.11472
	(2.239)	(-0.215)
Lender Reputation x $Crisis_{2007-2008}$		0.81523***
		(3.388)
Lender $Reputation_t$	-0.08630*	-0.12983**
	(-1.744)	(-2.012)
Lender Capital Ratio x $Crisis_{2007-2008}$		-0.06470*
		(-1.700)
Lender Capital $Ratio_t$		0.00936
		(0.535)
Lender Liquidity Ratio x $Crisis_{2007-2008}$		0.00678**
		(1.982)
Lender Liquidity $Ratio_t$		0.00118
		(1.982)
Bank Controls	no	yes
Firm Controls	no	yes
Industry Fixed Effects	no	no
Rating Fixed Effects	no	yes
Stock Exchange Fixed Effects	no	yes
Debt Maturity Controls	no	all years
Pseudo R^2	0.03	0.35
Observations	174	128

- Bank Controls: Size, Deposit Ratio, Non-performing Loans, Age.
- Firm Controls: Profitability, Size, Leverage, M/B, Cash, Tangibility, NWC, Capex, R&D, Div Dummy, CF Vol, Age, Debt Maturity.

Conclusion

- It might appear in the data that banks forgive covenant violations and do not withdraw credit lines.
- This paper argues that this is to be expected in normal times and more from banks with reputation in credit-line segment.
- In systemic events, banks use covenant violations to ration scarce liquidity.
- Credit lines as sources of liquidity are *conditional* on both firm fundamentals and bank's liquidity.

Policy Implications

- Higher capital requirements:
  - make offering discretionary contract more attractive than non-discretionary contract;
  - can lead to more discretionary contracts;
  - on average *tighter* covenant thresholds;
  - lower liquidity provision during systemic events.