On the Non-Exclusivity of Loan Contracts: An Empirical Investigation

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Motivation

- Financial contracts are often non-exclusive
  - borrowers cannot commit to borrow from at most one lender
  - contracts cannot be made fully contingent on other lenders
    - E.g., on future lenders

- Non-exclusivity → negative externalities
  - Moral Hazard (e.g., Bizer and DeMarzo, JPE 1992, Holmström and Tirole , QJE 1997)
  - Strategic Default (e.g., Parlour and Rajan, AER 2001)

- Non-exclusivity → Decrease the initial lender's willingness to lend

- Depending on the institutional framework, contractual terms could help mitigate the externalities from non-exclusivity
  - E.g., Fama and Miller (1972), Bizer and DeMarzo (JPE 1992), Bennardo, Pagano, and Piccolo (2009), Parlour and Rajan (AER 2001), Attar et al. (2010)

Motivation

- Despite the substantial theoretical work on the impact of non-exclusivity, there is little empirical evidence

- This is partly due to the lack of adequate data

- A borrower's outstanding debt is an equilibrium outcome, driven both by demand & supply factors, whereas theory concerns supply effects

- THIS PAPER aims to fill this gap by employing a unique dataset containing information on a creditor's willingness to lend to a borrower both before and after a non-exclusivity event realizes

This paper

- We examine how a bank's willingness to lend to a previously exclusive borrower changes once the borrower obtains a loan from another bank

- ... in an institutional setting where banks:
  - Can learn quickly about loans from other banks – [credit registry]
  - Could use collateral effectively to protect their claims – [collateral registry]
    - E.g., Haselmann, Pistor, and Vig (RFS 2010)

- We also examine how the bank's response varies when its existing and *future* loans are protected from the increased risk
  - E.g., Seniority and valuable collateral

Hypotheses

The theory on contractual externalities predicts that:

- **H1.** *When a borrower takes an outside loan, the initial bank's willingness to lend to the borrower decreases in the size of the outside loan.*

- **H2.** *An outside loan will not trigger a change in the initial bank's willingness to lend if the initial bank's existing and future loans are protected from the increased risk.*

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- **H2.** *An outside loan will* not trigger a change *in the initial bank's willingness to lend if the initial bank's* existing and future loans are protected *from the increased risk.*

Alternative Theories

Decrease probability of default
e.g., Detragiache et al. (JF 2000) & Hertzberg et al. (JF 2011)

Perceived as a positive signal
e.g., Biais and Gollier (RFS 1997)

Hypotheses/Findings

The theory on contractual externalities predicts that:

- **H1.** *When a borrower takes an outside loan, the initial bank's willingness to lend to the borrower decreases in the size of the outside loan.* Support

- **H2.** *An outside loan will not trigger a change in the initial bank's willingness to lend if the initial bank's existing and future loans are protected from the increased risk.*

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  Support

- **H2.** *An outside loan will not trigger a change in the initial bank's willingness to lend if the initial bank's existing and future loans are protected from the increased risk.*

  Support

  Retain Seniority

  Secured: assets with high value & low volatility

Data

- Detailed contract characteristics of all commercial loans from one of the largest Swedish banks from April 2002 to December 2008.

- Complemented with:
  - Accounting statements
  - Information from the main credit bureau
    - E.g., ratings, nonperformance with other creditors
  - Information from the Swedish registration office
   - E.g., collateral pledges

Key Variables

- **Internal Limit:** a measure of the bank's willingness to lend to a firm — indicates the amount for which the bank's loan supply becomes vertical

  - Determined based on the borrower's estimated repayment capacity
    - Internal proprietary info & external public info
  - During annual "commitment review" meetings
    - Timing predetermined but could be moved earlier (36%)
  - Not directly communicated to the borrower
  - Involves no commitment

- **Floating Charge/Lien:** a type of collateral that extends automatically to future loans =>

  - Existing bank's current and future loans retain seniority over outside loans
  - Loans are secured by pledged assets.
    - Value & Volatility

Methodology (1)

Treatment & Control Groups

- The TREATMENT GROUP consists of firms that enter the sample with an exclusive relationship with our bank (for at least one year) and at some point during the sample period take a loan from another bank:

Firm obtains outside loan

t_0-12 t_0 t_0+12 time in months

Outside loan is observed
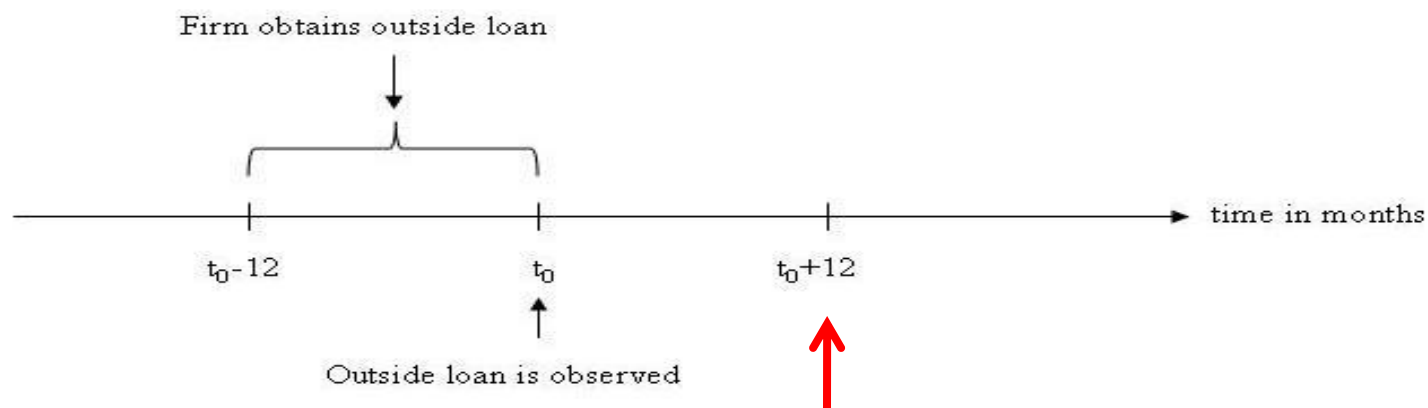
$y = [(Limit_{t_0+12} - Limit_{t_0-12})/Total\ Assets_{t_0-12}]_{treated}$

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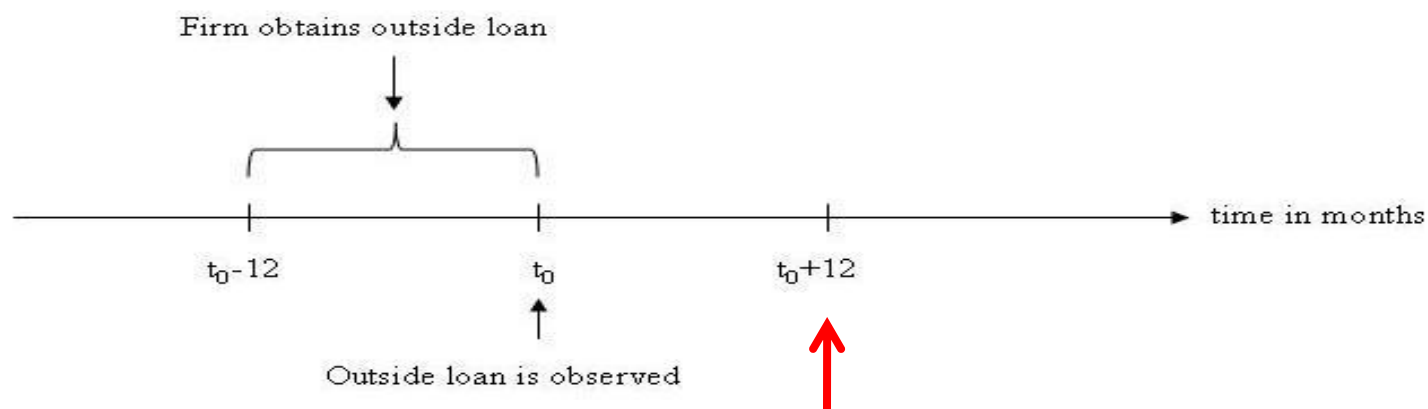

- The bank's response is benchmarked relative to a CONTROL GROUP of SIMILAR FIRMS that enter the sample with an exclusive relationship with our bank and maintain this exclusive relationship at least until t_0+12.

- Our dependent variable becomes:

$$y = [(Limit_{t_0+12} - Limit_{t_0-12})/Total\ Assets_{t_0-12}]_{treated} - [(Limit_{t_0+12} - Limit_{t_0-12})/Total\ Assets_{t_0-12}]_{control}$$

Descriptive Statistics

- This yields 991 non-exclusivity events

- Incidence of non-exclusivity events
  each year: stable & around 5%   →
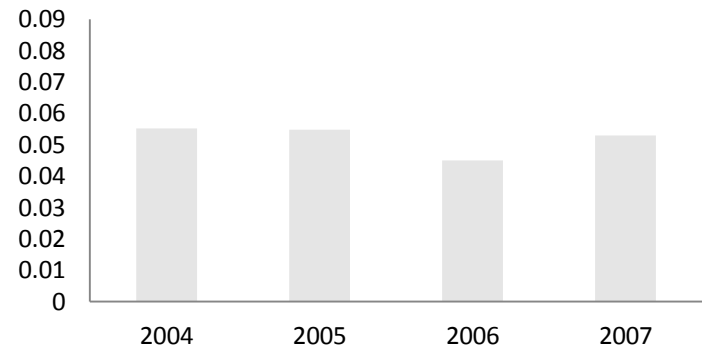
  - Comparable to other studies: 4.5% in Ioannidou and Ongena (2010, JF) using data from Bolivia & 4% in Farinha and Santos (2002, JFI) using data from Portugal.

	Median
- *OutsideLoan* =Outside Loans to Total Assets	0.06
- Size of Outside Loan to internal limit	0.15

Methodology (2)

Treatment & Control Groups

We MATCH on:

Public
- Time (month-year)
- Industry (2 digit NACE codes)
- Firm Age
- Total Assets
- Total Asset's Growth
- Tangible Assets to Total Assets
- Cash Flows to Total Assets
- Total Debt to Total Assets
- Total Bank Debt to Total Assets
- External Rating (1-5)
- Recent Repayment problems

Private
- Internal limit
- Distance to limit (including unused credit lines)
- Interest rate (or internal rating)

Unobserved Heterogeneity

"Match 2"

Results: H1

Average Response & Size of the Outside Loan

Table 4: Non-Exclusivity Externalities and the Size of the Outside Loan: Test of H1

Dependent variable: $[(Limit_{t0+12}-Limit_{t0-12})/TA_{t0-12}]_{Treated} - [(Limit_{t0+12}-Limit_{t0-12})/TA_{t0-12}]_{Control}$

	(III)	(IV)
	Match 2	Match 2
Number of Observations (Matched Pairs)	549	549
Number of Treated Firms	207	207
Intercept	-0.062***	-0.014
	(-2.877)	(-0.559)
OutsideLoan		-0.408***
		(-3.152)
R^2	-	0.060

- A bank's internal limit to total assets of a "treated" firm drops by 6.2 percentage points more than the internal limit to total assets of similar "control" firms.
  - Mean/Median Limit-to-Total Assets around 40% => 15% decrease

15

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- A bank's internal limit drops more the larger the outside loan
  - A 1$ larger outside loan reduces the initial bank's limit by 41 cents.

Results: H2

Floating Charge, Value, and Volatility

Dependent variable: $[(\text{Limit}_{t0+12}-\text{Limit}_{t0-12})/\text{TA}_{t0-12}]_{\text{Treated}} - [(\text{Limit}_{t0+12}-\text{Limit}_{t0-12})/\text{TA}_{t0-12}]_{\text{Control}}$

	(V)	(VI)
	Match 2	Match 2
Number of Observations (Matched Pairs)	549	549
Number of Treated Firms	207	207
Intercept	-0.013	-0.013
	(-0.509)	(-0.515)
OutsideLoan	-0.496***	-0.496***
	(-4.359)	(-4.348)
OutsideLoan x FloatingCharge	0.515***	
	(3.614)	
FloatingCharge	0.053	
	(0.564)	
OutsideLoan x FloatingChargeValue		1.437***
		(4.758)
FloatingChargeValue		-0.045
		(-0.192)
OutsideLoan x FloatingChargeVolatility		-8.100*
		(-1.849)
FloatingChargeVolatility		1.203
		(0.748)
R^2	0.08	0.09

- The firm's initial bank does not react to the *outside loan* if its claims are protected with a floating charge on the firm's assets.

Results: H2

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- The floating charge's effectiveness depends positively on the value of the pledged assets and negatively on the volatility of their values.

18

Results: H2

Other Collateral

Dependent variable: $[(Limit_{t0+12}-Limit_{t0-12})/TA_{t0-12}]_{Treated} - [(Limit_{t0+12}-Limit_{t0-12})/TA_{t0-12}]_{Control}$

	(VII)	(VIII)
	Match 2	Match 2
Number of Observations (Matched Pairs)	549	549
Number of Treated Firms	207	207
Intercept	-0.011	-0.011
	(-0.395)	(-0.373)
OutsideLoan	-0.377**	-0.482***
	(-2.569)	(-3.584)
OutsideLoan x FloatingCharge		0.500***
		(3.137)
FloatingCharge		0.051
		(0.537)
OutsideLoan x OtherCollateral	-0.007	-0.007
	(-0.140)	(-0.145)
OtherCollateral	-0.168	-0.064
	(-0.774)	(-0.306)
R^2	0.06	0.08

- Other collateral does not mitigate the negative externalities: the initial bank reduces its willingness to lend in a similar way as uncollateralized loans

Additional Findings

- Results are driven by non-exclusivity events where the outside loan brings the firm above the initial bank's limit
  - i.e., outstanding debt + outside loan > internal limit

Robustness (1)

- Results are robust to additional matching:
  - Require that between t_0-12 and t_0 the control firm got an inside loan of similar size to the treated firm's outside loan
  - Relationship length
  - Floating Charge

Robustness (2)

- Findings are not driven by the following alternative explanations:
  - Reduced possibilities for rent extraction
    - Fixed fees on lending products
  - Anticipation of non-exclusivity event
    - Earlier period i.e., t_0-24 and t_0-12
  - Endogeneity
    - Next page…

Robustness (3)

ENDOGENEITY

- **Reverse Causality**
  - A prior (and gradual) reduction in the limit pushed the firm elsewhere

  - Failure to increase the limit and accommodate the growing needs of the firm gave incentives to look for an outside loan

- **Omitted Variable Bias**
  - Private information about deteriorating future performance may give incentives to secure additional credit before their bank and other potential creditors learn this => decrease in limit we observe could be due to news about their deteriorating performance

Conclusions

- Findings are consistent with the theories on contractual externalities

- When a previously exclusive firm obtains an outside loan, the firm's initial bank decreases its internal limit to the firm and it decreases it more the larger the outside loan

- The initial bank's willingness to lend does not change when its existing and future loans are protected from the increased risk:

- .... when its existing and future loans retain seniority over the outside loans & loans are secured with assets whose value is high and stable over time

- Information on counterparty exposures combined with the effective use of general collateral could help creditors mitigate non-exclusivity externalities

Descriptives: Floating Charge

Variable Names	Floating Charge			No Floating Charge		
	Mean	Median	SD	Mean	Median	SD
Firm Characteristics						
Public						
Firm Age	12.938	11.500	8.858	21.948	17.000	14.193
Total Assets	11,800,000	2,582,500	21,800,000	10,300,000	2,895,000	33,600,000
Asset Growth	0.968	0.998	0.180	1.076	1.037	0.222
Tangible Assets to Total Assets	0.771	0.804	0.223	0.817	0.870	0.169
Cash Flow to Total Assets	0.028	0.040	0.080	0.053	0.051	0.069
Total Debt to Total Assets	0.518	0.510	0.209	0.506	0.498	0.206
Total Bank Debt to Total Assets	0.322	0.211	0.268	0.337	0.317	0.219
Probability of Default	1.881	1.850	1.442	1.811	1.200	2.409
External Rating (1-5, 5 best)	3.188	3.000	0.911	3.288	3.000	0.831
Recent Repayment Problems	0.000	0.000	0.000	0.000	0.000	0.000
Private						
Internal Limit	6,021,424	924,639	11,700,000	5,593,614	1,294,000	19,900,000
Internal Limit to Total Assets	0.488	0.400	0.296	0.447	0.429	0.191
Distance to Limit	0.118	0.033	0.129	0.085	0.039	0.102
Loan Interest Rate (%)	6.090	5.970	1.835	6.650	6.650	1.587
Internal Rating (1-5, 5 best)	3.333	3.000	0.866	3.079	3.000	0.754
Outside Loan & Limit Adjustment						
Outside Loan to Total Assets	0.133	0.046	0.316	0.126	0.046	0.266
Outside Loan to Internal Limit	0.268	0.104	0.440	0.330	0.104	0.837
Adjustment in the Internal Limit	-0.031	-0.010	0.525	-0.094	-0.067	0.542

Robustness: Reverse Causality?

Table 5: Robustness Checks: Alternative Explanations and Additional Controls

	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(VIII)	(IX)	(X)
	Match 2	Match 2	Match 2	Match 2	Match 2	Match 2	Match 2	Match 2	Match 2	Match 2
Number of Observations (Matched Pairs)	344	344	339	339	549	549	46	46	201	201
Number of Treated Firms	132	132	154	154	207	207	38	38	122	122
Intercept	0.002	0.008	-0.069***	-0.007	-0.063***	-0.014	-0.089*	0.084	-0.068*	-0.007
	(0.226)	(0.763)	(-3.316)	(-0.351)	(-2.907)	(-0.587)	(-1.854)	(1.560)	(-1.958)	(-0.181)
OutsideLoan		-0.046		-0.610***		-0.403***		-1.719***		-0.435***
		(-1.105)		(-6.471)		(-3.079)		(-3.572)		(-2.870)
Fees to Total Assets					0.020	0.005				
					(1.149)	(0.281)				
R^2	-	0.01	-	0.12	0.00	0.06	-	0.27	-	0.07

Robustness: omitted variable bias?

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Robustness: reduced rent extraction?

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Robustness: matching on additional characteristics

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