Nonbank Lending and Credit Cyclicality

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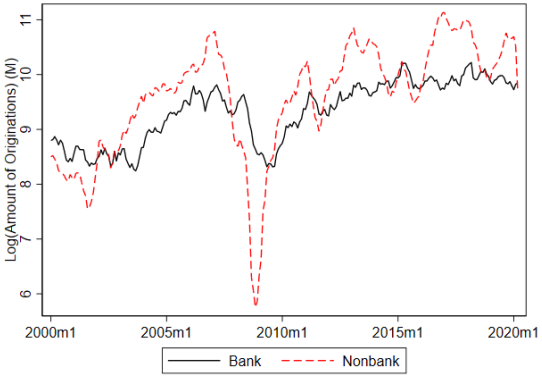
Motivation

- Growing importance of nonbank lenders (CLOs, loan mutual funds) in the syndicated lending market
- Increasing regulatory concern
  - 2019 Financial Advisory Roundtable meeting at the NY Fed discussed *"financial stability implications of the rapid growth in nonbank credit provision in recent years"*
- Financial stability of nonbanks vs. banks ex-ante unclear:
  - Banks have stable insured deposits and receive government support
  - Largest nonbank lender (CLOs) are long-term financed ⇒ no run risk

This paper: compare banks' and nonbanks' credit supply cyclicality

Bank and Nonbank US Syndicated Term Loan Originations



⇒ **Aggregate Lending by nonbanks is more cyclical than lending by banks**

Our Approach

1. Contrast bank and nonbank lending sensitivity to the credit cycle
   - Use Excess Bond Premium (EBP) as main credit cycle measure
   - Robust to alternate measures

2. Exploit the unique features of the syndicated loan market for identification
   - Loan facilities originated in "Deals" which often include
     - Bank and nonbank facilities...
     - Issued to the same borrower at the same time...
     - Under the same contract and with the same seniority

   $\Rightarrow$ Include deal FEs to absorb common characteristics "within-deals", across facilities
     - Khwaja and Mian (2008), Ivashina and Sun (2011)

Identifying Bank and Nonbank Loans

Definition: Term A = bank loan; Term B = nonbank loan

- Consistent with prior literature (Nini, 2008; Ivashina and Sun, 2011) and industry convention
- Consistent with CLO holdings (>95% of loans held by CLOs are Term B)

Preview of Results

1. Over the last two decades: nonbank lenders' credit supply is 2-3 times as cyclical as that of banks.

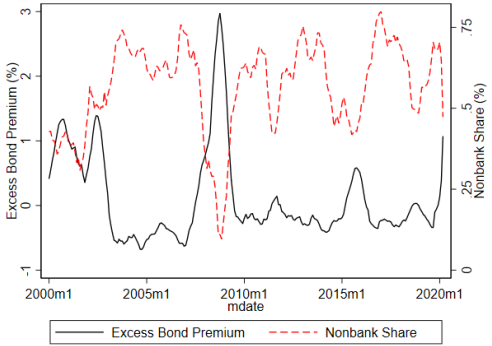
2. The cyclicality of nonbanks – as opposed to bank health – explains the majority of the decline in syndicated loan originations during both the Great Recession and the COVID-19 crisis.

3. Cyclicality in flows to nonbanks matches cyclicality in nonbank lending

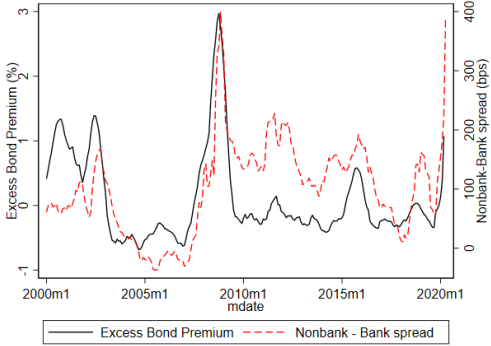
Documenting Nonbank Lending Cyclicality

Aggregate Results: Sensitivity to the Credit Cycle

Nonbank Share



Nonbank-Bank Spread



⇒ **Quantity & spread movements consistent with changes in credit supply**

Within Deal Results: Volumes

$$\text{Log(Loan Volume}_{idft}) = \delta_{idt} + \beta \text{EBP}_{t-1} \times 1_{f=\text{TermB}} + \epsilon_{idft}$$

	Log(Loan Volume)			
	(1)	(2)	(3)	(4)
Excess Bond Premium	**−0.11*** **			
	(0.02)			
Term B	0.54***			
	(0.02)			
Excess Bond Premium x Term B				
Borrower FE	Y			
Deal FE				
Borrower x Facility-Type FE				
Obs.	23,549			
R^2	0.797			

Within Deal Results: Volumes

$$\text{Log(Loan Volume}_{idft}) = \delta_{idt} + \beta \text{EBP}_{t-1} \times 1_{f=\text{TermB}} + \epsilon_{idft}$$

	Log(Loan Volume)			
	(1)	(2)	(3)	(4)
Excess Bond Premium	**−0.11*** **	**−0.07*** **		
	(0.02)	**(0.02)**		
Term B	0.54***	0.50***		
	(0.02)	(0.02)		
Excess Bond Premium x Term B		**−0.14*** **		
		(0.02)		
Borrower FE	Y	Y		
Deal FE				
Borrower x Facility-Type FE				
Obs.	23,549	23,549		
R^2	0.797	0.798		

Within Deal Results: Volumes

$$\text{Log(Loan Volume}_{idft}) = \delta_{idt} + \beta \text{EBP}_{t-1} \times 1_{f=\text{TermB}} + \epsilon_{idft}$$

	Log(Loan Volume)			
	(1)	(2)	(3)	(4)
Excess Bond Premium	**−0.11*** **	**−0.07*** **		
	(0.02)	**(0.02)**		
Term B	0.54***	0.50***	0.42***	
	(0.02)	(0.02)	(0.03)	
Excess Bond Premium x Term B		**−0.14*** **	**−0.17*** **	
		(0.02)	**(0.03)**	
Borrower FE	Y	Y		
Deal FE			**Y**	
Borrower x Facility-Type FE				
Obs.	23,549	23,549	7,196	
R^2	0.797	0.798	0.898	

Within Deal Results: Volumes

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	(1)	(2)	(3)	(4)
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		(0.02)	**(0.03)**	**(0.03)**
Borrower FE	Y	Y		
Deal FE			**Y**	Y
Borrower x Facility-Type FE				**Y**
Obs.	23,549	23,549	7,196	3,478
R^2	0.797	0.798	0.898	0.966

One stdv increase in EBP ⇒ nonbank volumes drop 11 ppt more than bank volumes (for the same borrower in the same deal)

Within Deal Results: Spreads

$$\text{Spread}_{idft} = \delta_{idt} + \beta \text{EBP}_{t-1} \times 1_{f=\text{TermB}} + \epsilon_{idft}$$

	All in Drawn Spread			
	(1)	(2)	(3)	(4)
Excess Bond Premium	20.57***	−0.92		
	(3.27)	(4.00)		
Term B	−52.85***	−35.76***	−84.87***	
	(6.26)	(5.17)	(7.97)	
Excess Bond Premium x Term B		**60.54*** **	**77.07*** **	**50.64*** **
		(5.14)	**(8.13)**	**(13.43)**
Borrower FE	Y	Y		
Deal FE			Y	Y
Borrower x Facility-Type FE				Y
Obs.	21,181	21,181	6,566	3,110
R^2	0.585	0.595	0.713	0.92

One stdv increase in EBP ⇒ nonbank spreads rise 51 bps more than bank spreads

Robustness Checks

- Focus on real investment loans (i.e., exclude financial engineering) Results
- Include credit lines Results
- Exclude public firms (substitution to bonds) Results
- Control for time-varying borrower risk Results
- Use alternate credit cycle measures (VIX, HY spreads, GZ spreads) Results
- Extensive margin Results

Alternative Explanations: Bank Health and Specialness

Bank Specialness - Monitoring & Relationships

	Log(Facility Amount)						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Excess Bond Premium x Term B	−0.132***	−0.163***	−0.221***	−0.121***	−0.155***	−0.262**	−0.179***
	(0.035)	(0.030)	(0.076)	(0.041)	(0.038)	(0.114)	(0.031)
EBP x TLB x Public	−0.085*						
	(0.048)						
EBP x TLB x Unrated		−0.009					
		(0.045)					
EBP x TLB x Large			0.055				
			(0.052)				
EBP x TLB x Old - Compustat				−0.023			
				(0.056)			
EBP x TLB x Old - DealScan					−0.016		
					(0.044)		
EBP x TLB x No. Covenants						0.049	
						(0.037)	
Borrower FE	N	N	N	N	N	N	N
Year-Month FE	N	N	N	N	N	N	N
Deal FE	Y	Y	Y	Y	Y	Y	Y
Relationship Controls	N	N	N	N	N	N	Y
Obs.	7,196	7,196	3,882	2,692	7,196	1,592	6,662
R^2	0.898	0.898	0.908	0.899	0.900	0.913	0.898

Bank Health vs. Nonbank Cyclicality

- Bank health important for origination business (Bruche et al. (2020))
  - Dual role of banks: lenders and underwriters in the syndicated loan market
  - Cyclical banks specialize in nonbank loan originations?

- **Confounding factor?**
  - Within-bank regression (including bank x month FEs):

$$\text{Log}(\text{Loan Volume}_{bft}) = \delta_{bt} + \beta \text{EBP}_{t-1} \times 1_{f=\text{TermB}} + \epsilon_{bft}$$

  $\Rightarrow$ [Next slide] Bank health does not explain nonbank cyclicality

Alternative Hypotheses: Bank Level

	Log(Amount)			
	(1)	(2)	(3)	(4)
Excess Bond Premium	−0.25***	−0.26***		
	(0.02)	(0.02)		
Term B	0.30**	0.16	0.17	−0.04
	(0.11)	(0.11)	(0.12)	(0.08)
Excess Bond Premium x Term B	**−0.29*** **	**−0.32*** **	**−0.34*** **	**−0.27*** **
	(0.02)	**(0.02)**	**(0.02)**	**(0.02)**
Bank FE		**Y**		
Bank x Month FE			**Y**	**Y**
Role	All	All	All	Non-Lead
Obs.	15,998	15,998	13,742	10,202
R^2	0.082	0.33	0.77	0.67

Bank Health vs. Nonbank Cyclicality

- **Large literature** emphasizing the **importance of bank health** in this market
  - Ivashina et.al. (2010), Santos (2010), Chodorow-Reich (2013), Adrian et.al. (2013), ...
- **Relative importance:**
  - Run horse-race between bank health and nonbank dependence for explaining decline in bank-level originations over the Great Recession

$$\Delta\text{Corp Purp Lending}_b = \beta_0 + \beta_1\text{Bank Health}_b + \beta_2\text{Nonbank Dependence}_b + \epsilon_b$$

Nonbank Lending and the GFC Credit Crunch

	Δ Lending				Δ Non-TLB Lending
	(1)	(2)	(3)	(4)	(5)
Nonbank Dependence	**−0.161*** (0.027)**	**−0.145*** (0.037)**	**−0.145*** (0.026)**	**−0.107* (0.051)**	0.089 (0.066)
Lehman exposure		−0.023 (0.038)			
ABX Exposure			−0.070 (0.050)		
07-08 Trading Rev/AT				0.039 (0.027)	0.005 (0.040)
RE CO flag				−0.012 (0.053)	−0.061 (0.048)
07-08 RE NCO/AT				−0.079 (0.052)	**−0.099* (0.043)**
07 Deposits/Assets				0.120 (0.069)	**0.196* (0.091)**
Constant	−0.566*** (0.034)	−0.567*** (0.034)	−0.583*** (0.031)	−0.550*** (0.029)	−0.603*** (0.035)
Obs.	43	42	40	42	42
R^2	0.337	0.326	0.409	0.415	0.203

Sources and Reasons for Nonbank Cyclicality

Cyclicality of Nonbank Flows

- Focus on CLOs + Mutual funds (>80% of nonbank outstandings)
- Nonbank flows = ΔCLO AuM + loan mutual funds flows

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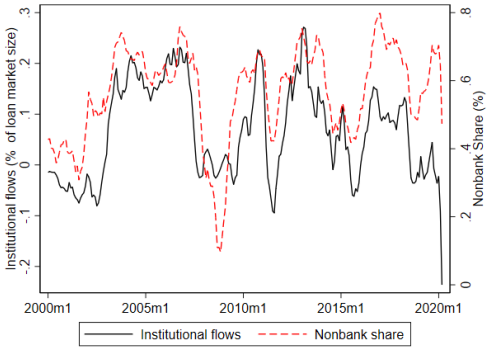
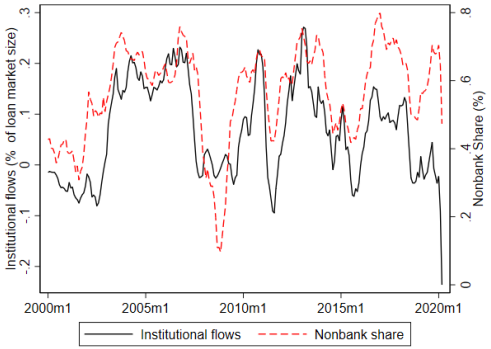


Cyclicality of Nonbank Flows

- Focus on CLOs + Mutual funds (>80% of nonbank outstandings)
- Nonbank flows = ΔCLO AuM + loan mutual funds flows

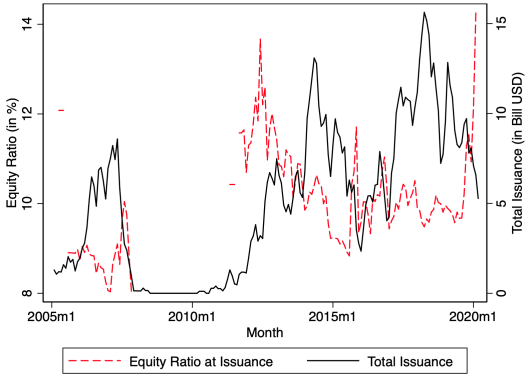


Nonbank flow cyclicality Correlated to Nonbank lending cyclicality

Why are Flows so Cyclical? CLOs

- >60% of nonbank lending in syndicated loan market
- **Securitized vehicles:**
  - Locked-in capital, with average maturity of 11 years
  - Creates safe/highly-rated assets through tranching
  - Safety premium accrues to equity investors
- **Our hypothesis:** pro-cyclical leverage
  - Higher loan volatility/risk ⇒ Larger equity cushion/lower leverage ⇒ Lower gains from securitization ⇒ Lower CLO issuance
  - *"**Concerns about... tranche downgrades**... [are] widening pricing to a level, where it is not acquisitive to issue BBs... which then **impacts the leverage equity can achieve.**"*
    - Amit Roy, Head of U.S. CLO New Issue business at Goldman Sachs, May 2020

Why are Flows so Cyclical? CLOs



CLOs require more equity in busts, restricting new CLO issuance, which then impacts new loan originations

Why are Flows so Cyclical? Mutual Funds

- $\sim$ 20% of nonbank lending in syndicated loan market
- Daily redemption at NAV $\Rightarrow$ liquidity transformation $\Rightarrow$ potential fragility
  - Diamond and Dybvig (1983)
- Test for a concave relationship between returns and flows
  - Goldstein, Jiang, and Ng (2017)

$$\text{Flows}_{ft} = \beta_0 + \beta_1 \alpha_{ft-1} + \beta_2 \alpha_{ft-1} 1_{\alpha_{ft-1}<0} + \text{Fund Controls}_{ft-1} + \gamma_t + \varepsilon_{ft}$$

Why are Flows so Cyclical? Mutual Funds

	Fund Flows			
	(1)	(2)	(3)	(4)
Lagged Return	0.256***	0.424***		
	(0.087)	(0.145)		
Alpha			2.155***	0.284
			(0.767)	(1.102)
Alpha * (Alpha < 0)				1.820**
				(0.765)
(Alpha < 0)				−0.501***
				(0.170)
Year-Month FE	N	Y	Y	Y
Obs.	6,090	6,090	5,433	5,433
Controls	Y	Y	Y	Y
R^2	0.306	0.448	0.405	0.414

Concave relationship between flows and performance suggests fragility

Conclusion

- **Three results**
  - Nonbank credit supply 2-3x as cyclical as banks
  - Nonbank cyclicality "important" for understanding credit crunches (GFC and Covid-19)
  - Nonbank cyclicality correlated with cyclicality in nonbank flows; propose frictions in CLO and mutual funds that might explain cyclicality in flows

- **Implications**
  - Macroprudential policy
    - Nonbanks (might) lead to larger booms but also larger busts
    - Optimal policy?
  - Relevant frictions in this market:
    - Time-varying CLO leverage
    - Run-like features in loan mutual funds

Thank You!

Appendix

Summary Statistics

	Dealscan Sample	All Term Loans Dealscan Sample	Creditflux-Dealscan Sample	All Term Loans Creditflux-Dealscan Sample
Credit Line	47.15%		0.57%	
Term Loan A	11.61%	35.36%	5.23%	5.27%
Term Loan B	20.32%	63.64%	94.00%	94.73%
Other	20.92%		0.20%	
Volume (in Tn USD)	31.19	9.96	3.14	2.97
N	107,752	41,992	6,369	5,899

Back

Summary Statistics

	Mean	Median	Std. dev.
Term B Volume (in Mill. USD)	482.63	250.00	812.51
Term A Volume (in Mill. USD)	180.20	65.00	623.25
Deal Amount (in Mill. USD)	338.13	110.00	794.24
Term B in Deal	0.44	0.00	0.50
Term A in Deal	0.70	1.00	0.46
Term A Spread (in basis points)	301.69	275.00	229.36
Term B Spread (in basis points)	370.38	350.00	169.59
Maturity (in months)	60.89	60.00	22.25
Observations	52832		

Back

Alternative Hypotheses: Bank Level

1. Originate-to-distribute requires balance sheet capacity and cyclical banks tend to originate TLBs

   $\Rightarrow$ compare TLA vs. TLB originations *within* a bank

2. Lead bank needs to retain higher share during crises to have sufficient incentives to monitor (Ivashina, Scharfstein (2010))

   $\Rightarrow$ excluding participations as lead arranger

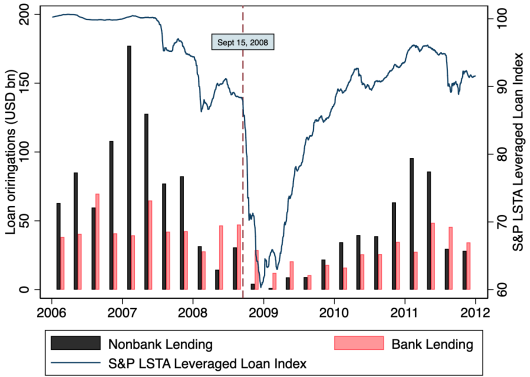
Back

Alternative Hypotheses: Bank Level

	Log(Amount)			
	(1)	(2)	(3)	(4)
Excess Bond Premium	−0.254***	−0.262***		
	(0.023)	(0.023)		
Term B	0.299**	0.160	0.168	−0.035
	(0.113)	(0.108)	(0.118)	(0.076)
Excess Bond Premium x Term B	−0.286***	−0.318***	−0.339***	−0.273***
	(0.022)	(0.021)	(0.021)	(0.019)
Bank FE	N	Y	N	N
Bank x Month FE	N	N	Y	Y
Role	All	All	All	Non-Lead
Obs.	15,998	15,998	13,742	10,202
R^2	0.082	0.334	0.771	0.672

Back

Timeline of Bank and Nonbank Lending during the Great Recession



Large decline in nonbank lending relative to the peak of the credit boom in 2007. Nonbank issuance came to a standstill in Q4 2008 and Q1 2009.

Back

Aggregate Evidence

Specification:

$$\text{Lending Outcome}_{ft} = \delta_t + \beta_1 \text{Credit Cycle}_{t-1} + \beta_2 1_{f=\text{TermB}} + \beta_3 \text{Credit Cycle}_{t-1} \times 1_{f=\text{TermB}} + \epsilon_{ft}$$

- for loan-tranche f in month t
- *Credit Cycle* is measured by the Excess Bond Premium from Gilchrist, Zakrajšek (2012)

Aggregate Evidence: Volume

	Log(Facility Amount)		
	(1)	(2)	(3)
Excess Bond Premium	−0.509***	−0.228***	
	(0.048)	(0.037)	
Term B	0.267***	0.262***	0.261***
	(0.069)	(0.064)	(0.038)
Excess Bond Premium x Term B		−0.576***	−0.580***
		(0.069)	(0.061)
Year-Month FE	N	N	Y
Obs.	485	485	484
R^2	0.324	0.420	0.898

Aggregate Evidence: Spread

	All-in-drawn Spread		
	(1)	(2)	(3)
Excess Bond Premium	38.765***	13.822	
	(10.675)	(9.730)	
Term B	90.999***	91.374***	91.619***
	(8.788)	(8.570)	(6.846)
Excess Bond Premium x Term B		51.188**	52.037***
		(20.430)	(18.043)
Year-Month FE	N	N	Y
Obs.	485	485	484
R^2	0.277	0.327	0.790

Aggregate Evidence: Flows Instrumented with EBP

	Log(Facility Amount)		
	(1)	(2)	(3)
Fund Flows	1.032***	0.468***	
	(0.126)	(0.084)	
Term B	0.270***	0.268***	0.265***
	(0.098)	(0.103)	(0.068)
Fund Flows x Term B		1.143***	1.161***
		(0.238)	(0.194)
Year-Month FE	N	N	Y
Obs.	485	485	484
F-Stat	129.813	64.791	62.520

Aggregate Evidence: Flows Instrumented with EBP

	All-in-drawn Spread		
	(1)	(2)	(3)
Fund Flows	−78.552***	−28.331	
	(25.051)	(21.628)	
Term B	90.744***	90.940***	91.271***
	(10.764)	(11.217)	(8.602)
Fund Flows x Term B		−101.834**	−104.192**
		(50.105)	(40.341)
Year-Month FE	N	N	Y
Obs.	485	485	484
F-Stat	129.813	64.791	62.520

Within Deal Evidence: Extensive Margin

	Fully Balanced Panel			Conditional on Deal	
	(1) Prob(Loan)	(2) Prob(Loan)	(3) Prob(Loan)	(4) Prob(Loan)	(5) Prob(Loan)
Excess Bond Premium	−0.108***	−0.085***			
	(0.008)	(0.007)			
Term B	−0.214***	−0.214***	−0.214***	−29.508***	
	(0.014)	(0.013)	(0.013)	(1.522)	
Excess Bond Premium x Term B		−0.046***	−0.046***	−18.455***	−13.137***
		(0.011)	(0.011)	(1.533)	(1.090)
Borrower FE	Y	Y	N	N	N
Borrower-Month FE	N	N	Y	N	N
Deal FE	N	N	N	Y	Y
Borrower x Facility-Type FE	N	N	N	N	Y
Obs.	6,207,678	6,207,678	6,207,678	52,762	38,376
R^2	0.005	0.005	0.623	0.207	0.682

One stdv increase in EBP reduces the likelihood of obtaining a institutional loan by 18.7 percentage points more than that of bank term loans

Back

Within Deal Evidence: Volume - With Credit Lines

	Log(Facility Amount)				
	(1)	(2)	(3)	(4)	(5)
Excess Bond Premium	−0.099***	−0.081***			
	(0.017)	(0.014)			
Term B	0.512***	0.450***	0.419***	0.546***	0.423***
	(0.031)	(0.033)	(0.031)	(0.040)	(0.037)
Excess Bond Premium x Term B		−0.185***	−0.208***	−0.284***	−0.268***
		(0.035)	(0.032)	(0.050)	(0.044)
Borrower FE	Y	Y	Y	N	N
Year-Month FE	N	N	Y	N	N
Deal FE	N	N	N	Y	Y
Maturity Controls	N	N	N	N	Y
Relationship Controls	N	N	N	N	Y
Obs.	56,386	56,386	56,386	16,752	14,460
R^2	0.727	0.728	0.766	0.808	0.812

Back

Within Deal Evidence: Volume - Real Investment Loans

	Log(Facility Amount)				
	(1)	(2)	(3)	(4)	(5)
Excess Bond Premium	−0.083***	−0.047***			
	(0.019)	(0.017)			
Term B	0.439***	0.386***	0.360***	0.249***	0.268***
	(0.030)	(0.033)	(0.030)	(0.037)	(0.047)
Excess Bond Premium x Term B		−0.145***	−0.170***	−0.197***	−0.216***
		(0.034)	(0.032)	(0.044)	(0.056)
Borrower FE	Y	Y	Y	N	N
Year-Month FE	N	N	Y	N	N
Deal FE	N	N	N	Y	Y
Maturity Controls	N	N	N	N	Y
Relationship Controls	N	N	N	N	Y
Obs.	11,220	11,220	11,220	2,310	2,002
R^2	0.835	0.836	0.865	0.895	0.898

Back

Within Deal Evidence: Volume - Private Borrowers

	Log(Facility Amount)				
	(1)	(2)	(3)	(4)	(5)
Excess Bond Premium	−0.104***	−0.072***			
	(0.020)	(0.017)			
Term B	0.607***	0.571***	0.532***	0.497***	0.502***
	(0.024)	(0.025)	(0.022)	(0.030)	(0.035)
Excess Bond Premium x Term B		−0.102***	−0.114***	−0.123***	−0.118***
		(0.027)	(0.023)	(0.037)	(0.042)
Borrower FE	Y	Y	Y	N	N
Year-Month FE	N	N	Y	N	N
Deal FE	N	N	N	Y	Y
Maturity Controls	N	N	N	N	Y
Relationship Controls	N	N	N	N	Y
Obs.	18,084	18,084	18,084	5,480	4,644
R^2	0.783	0.784	0.825	0.891	0.893

Back

Within Deal Evidence: Volume - Other Credit Cycle Measures

	Log(Facility Amount)			All-in-drawn Spread		
	(1)	(2)	(3)	(4)	(5)	(6)
VIX	−0.161***			23.742***		
	(0.019)			(2.892)		
Term B	0.525***	0.476***	0.444***	−31.799***	−10.510**	−82.201***
	(0.022)	(0.020)	(0.029)	(5.680)	(5.075)	(8.020)
VIX x TermB		−0.137***	−0.165***		62.554***	73.073***
		(0.022)	(0.038)		(5.001)	(8.804)
Borrower FE	Y	Y	N	Y	Y	N
Year-Month FE	N	Y	N	N	Y	N
Deal FE	N	N	Y	N	N	Y
Maturity Controls	N	N	Y	N	N	Y
Relationship Controls	N	N	Y	N	N	Y
Obs.	23,597	23,597	6,130	23,597	23,597	6,130
R^2	0.799	0.834	0.901	0.554	0.587	0.768

Back

Term B Share Regression

	TLB Share					
	(1)	(2)	(3)	(4)	(5)	(6)
Excess Bond Premium	-0.213***	-0.146***	-0.143***	-0.110***	-0.097**	-0.137***
	(0.017)	(0.012)	(0.025)	(0.038)	(0.042)	(0.031)
3-Month Equity Return Volatility					-0.131**	
					(0.050)	
3-Month Equity Return					0.047	
					(0.028)	
Book Leverage						-0.025
						(0.034)
Interest Coverage Ratio						-0.058
						(0.079)
Sample	All	All	DealPurpose	Rating	CRSP	Compustat
Borrower FE	N	Y	Y	Y	Y	Y
DealPurpose FE	N	N	Y	N	N	N
Rating FE	N	N	N	Y	N	N
Coefficient with Borrower FE only			-0.168	-0.112	-0.137	-0.137
Obs.	26,381	19,188	8,573	2,278	1,931	3,784
R^2	0.027	0.640	0.548	0.521	0.519	0.515

Back