NON-BANK LENDING DURING CRISES

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Global expansion of non-bank financial institutions.

- Potential implications for financial stability and the real economy.
- Balanced funding mix for borrowers, albeit possibly greater cyclicality.
- Matter for market liquidity, but also lending to non-financial firms.

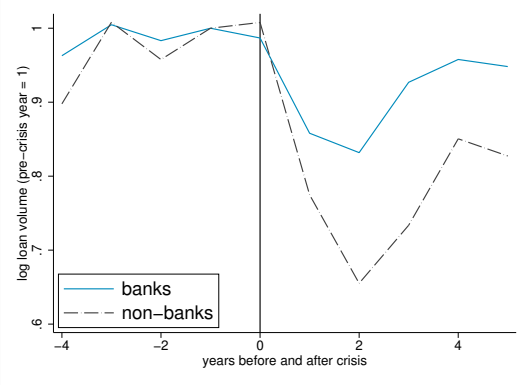
Funding models and cyclicality.

- Work focused on US shows nonbanks curtail lending by more than banks during downturns (higher cyclicality), emphasizing importance of funding models, but ...
- ...less is known about their global lending during crises.

This paper:

- How do non-banks' adjust their syndicated lending during financial crises?
- What are the drivers?

Non-banks reduce lending substantially more than banks during borrowers' crises.



- Results robust to granular fixed effects (lender-borrower, lender/borrower-time)
- Real effects: non-bank connected firms see decline in borrowing/investment

Borrower characteristics account for half of non-bank/bank differences.

- Difference narrows from 50% to 25%.
- Non-banks lend to riskier firms on average, charging higher prices.
- Non-banks cut lending during crises especially to riskier borrowers.

2/3 of the remaining gap: Differences in the value of lending relationships across lender types.

- After accounting for intensity of lending relationships: decline of non-bank lending vs. banks narrows from 25% to 11%.
- Having an existing lending relationship with a non-bank provides less value to firms during a crises.

Rise of non-bank lending could:

- Lead to a shift away from relationship towards transaction lending and
- Amplify financial instabilities and associated real effects during financial crises.

On non-bank lending (mostly MP): Chen, Ren and Zha (2018); Chernenko, Erel and Prilmeier (2019); Elliott, Meisenzahl, Peydro and Turner (2019); Xiao (2020); Kemp, van Stralen, Vardoulakis and Wierts (2018); Fleckenstein, Gopal, Gutierrez Gallardo and Hillenbrand (2021); Cucic and Gorea (2021); Irani, Iyer, Meisenzahl and Peydró (2020).

- **Cross-border focus:** Elliott, Meisenzahl and Peydró (2021).

On financial crises and loan supply: Giannetti and Laeven (2012); Cetorelli and Goldberg (2012); Schnabl (2012); De Haas and Van Horen (2013); Hale, Kapan and Minoiu (2020); Doerr and Schaz (2021).

Our contribution: Novel evidence on lending during episodes of severe financial stress by non-banks in a cross-border context.

- Novel evidence on non-bank lending during crises
- Highlight relevance of relationship value for non-banks, beyond importance of funding models

Data and setting

Syndicated lending: dominant source of cross-border lending to NFCs, especially large firms (Chodorow-Reich, 2014; Doerr and Schaz, 2021).

- Loan-level information at origination: amount, maturity, interest, l/b IDs.
- Standard cleaning: Focus on non-financial, non-utility firms; pro-rata imputation of missing participant contribution.

Identifying non-banks: Start from Dealscan classification scheme, classify both immediate lender and parents.

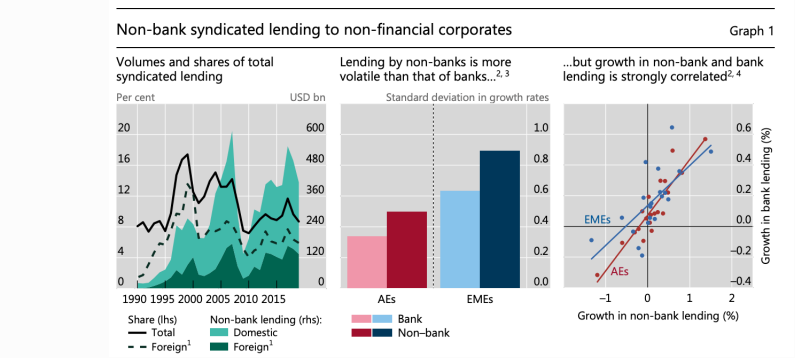
- Keyword search + manually label un-/mis-classified lenders ($\sim$ 3/4).
- Investment banks/finance co/insurance (Aldasoro, Doerr and Zhou, 2022).

Borrower characteristics: Compustat linked to Dealscan ($\sim$ 60% match).

Final sample: **32%** of lenders are nonbanks, extending **11%** of new credit.

Aldasoro, I, S Doerr and H Zhou (2022): "Non-bank lenders in the syndicated loan market", BIS Quarterly Review, March

- Non-banks' syndicated lending to non-financial firms grew 20x from 1990–2019, and represents a sizeable share of the total in most regions and sectors.
- NB lending is more concentrated across countries and industries than that of banks and it is more volatile. NB loans carry higher spreads.



Crisis data: Laeven and Valencia (2020) Systemic Banking Crises Database.

- 83 banking crises from 1995 to 2018.
- Criteria: significant distress in the banking system (losses, runs, liquidations...,) and significant policy responses.

Lenders' crisis exposure:

$$\text{crisis exposure}_{l,c,t} = \frac{\text{loan volume}_{l,c,t} \times \text{banking crisis}_{c,t}}{\sum_c \text{loan volume}_{l,c,t}}$$

- $\text{loan volume}_{l,c,t}$: total amount of outstanding loans granted by lender l to borrowers in country c as of year t.
- $\text{banking crisis}_{c,t}$: dummy variable indicating if borrower country c had a banking crisis in year t.
- On average: $\sim$ 6% of portfolio extended to crisis countries.

Final sample:

- 1995–2018
- Lender-borrower-year aggregation.
- 9600 lenders and 41188 borrowers ($\sim$ 12k matched to Compustat).
- With borrower/lender FEs: restrict to lenders and borrowers with at least two observations in a given year.

Main level of analysis:

- Extensive margin: accounting for formation & termination of relationships (N = 1222273).
  - Adding zero-lending in the immediate year before/after positive lending.
  - Focus of talk today.
- Intensive margin: new syndicated credit extended (N = 360909).

Analysis

Baseline specification:

$$\log(\text{new credit})_{l,b,t} = \beta_1 \text{ crisis exposure}_{l,c,t-1} + \beta_2 \text{ non bank}_l + \beta_3 \text{ crisis exposure}_{l,c,t-1} \times \text{non bank}_l + \phi_{l,b} + \psi_{l,t} + \tau_{b,t} + \varepsilon_{l,b,t}.$$

- Lagged crisis exposure: exposure of lender l to crisis countries.
- Lender-borrower FE ($\phi_{l,b}$): controls for unobservable, time-invariant lender/borrower heterogeneity.
- Lender parent-year FE ($\psi_{l,t}$): accounts for unobservable, time-varying lender fundamentals (including, but not limited to, funding models).
- Borrower-year FE ($\tau_{b,t}$): absorbs borrower characteristics / demand effect.

β_3: change in loan supply by non-banks relative to banks.

VARIABLES	(1) log(credit)
crisis exposure	-0.460***
	(0.168)
crisis exposure × non-bank	
Observations	1,222,273
R-squared	0.220
Lender*Borrower FE	✓
Year FE	✓
Lender Parent*Year FE	-
ILST FE	-
Borrower*Year FE	-

- Average lenders significantly reduce lending after crises in borrower countries.
  - 9.1% per s.d. increase in lender exposure to crisis.

VARIABLES	(1) log(credit)	(2) log(credit)
crisis exposure	-0.460***	-0.395**
	(0.168)	(0.162)
crisis exposure × non-bank		-0.679***
		(0.032)
Observations	1,222,273	1,222,273
R-squared	0.220	0.220
Lender*Borrower FE	✓	✓
Year FE	✓	✓
Lender Parent*Year FE	-	-
ILST FE	-	-
Borrower*Year FE	-	-

Adding non-bank interactions:

- Lending by non-banks declines by more relative than by banks.
  - Magnitude: 22.5% (non-banks) vs. 8.3% (banks) per s.d. increase in crisis exposure.

VARIABLES	(1) log(credit)	(2) log(credit)	(3) log(credit)
crisis exposure	-0.460***	-0.395**	-0.187
	(0.168)	(0.162)	(0.185)
crisis exposure × non-bank		-0.679***	-0.790***
		(0.032)	(0.233)
Observations	1,222,273	1,222,273	1,220,620
R-squared	0.220	0.220	0.300
Lender*Borrower FE	✓	✓	✓
Year FE	✓	✓	-
Lender Parent*Year FE	-	-	✓
ILST FE	-	-	-
Borrower*Year FE	-	-	-

Control for time-varying differences across lenders:

- In global context, differences in funding models do not explain lending gap.
- Further rule out funding channel: contraction is similar for banks with stable and unstable funding (Irani, Iyer, Meisenzahl and Peydró (2020)).

VARIABLES	(1) log(credit)	(2) log(credit)	(3) log(credit)	(4) log(credit)
crisis exposure	-0.460***	-0.395**	-0.187	-0.010
	(0.168)	(0.162)	(0.185)	(0.082)
crisis exposure × non-bank		-0.679***	-0.790***	-0.380***
		(0.032)	(0.233)	(0.052)
Observations	1,222,273	1,222,273	1,220,620	1,220,523
R-squared	0.220	0.220	0.300	0.835
Lender*Borrower FE	✓	✓	✓	✓
Year FE	✓	✓	-	-
Lender Parent*Year FE	-	-	✓	✓
ILST FE	-	-	-	✓
Borrower*Year FE	-	-	-	-

Absorb credit demand via borrower country–sector–size–time FEs:

- Degryse, De Jonghe, Jakovljević, Mulier and Schepens (2019): 'ILST' FEs
- Interaction coefficient halved in size.
- Consistent with argument nonbanks serve riskier borrowers.

VARIABLES	(1) log(credit)	(2) log(credit)	(3) log(credit)	(4) log(credit)	(5) log(credit)
crisis exposure	-0.460***	-0.395**	-0.187	-0.010	-0.023
	(0.168)	(0.162)	(0.185)	(0.082)	(0.074)
crisis exposure × non-bank		-0.679***	-0.790***	-0.380***	-0.314***
		(0.032)	(0.233)	(0.052)	(0.036)
Observations	1,222,273	1,222,273	1,220,620	1,220,523	1,220,491
R-squared	0.220	0.220	0.300	0.835	0.866
Lender*Borrower FE	✓	✓	✓	✓	✓
Year FE	✓	✓	-	-	-
Lender Parent*Year FE	-	-	✓	✓	✓
ILST FE	-	-	-	✓	-
Borrower*Year FE	-	-	-	-	✓

Absorb credit demand effect via borrower-time FE

- More stringent control for credit demand.
- Magnitude: 6.6% per s.d. increase in crisis exposure.
- Borrower characteristics explain half of differences in lending behavior.

Lending relationships

- Literature: Relationship lending insures borrowers during crises.
  (Sette and Gobbi, 2015; Bolton, Freixas, Gambacorta and Mistrulli, 2016; Beck, Degryse, De Haas and Van Horen, 2018)

- Does the value of lending relationships differ across lender types?

Measure lending relationships based on:

- Duration: Years passed sinced first loan.
- Strength: Number of loan extended during the previous 5 years.

Control for two other potential determinants of the lending gap:

- Lenders' industry specialization – can protect borrowers from shocks (De Jonghe, Dewachter, Mulier, Ongena and Schepens, 2020) .
- Lenders' portfolio diversification – geographically diversified lenders supply more credit during borrower-country crises (Doerr and Schaz, 2021) .

ACCOUNTING FOR RELATIONSHIP-LENDING: REDUCED BANK-NONBANK GAP

VARIABLES	(1) log(credit)	(2) log(credit)	(3) log(credit)
crisis exposure	-0.212***	-0.163***	-0.207***
	(0.061)	(0.058)	(0.053)
crisis exposure × non-bank	**-0.167*** **	**-0.124*** **	**-0.118*** **
	(0.017)	(0.029)	(0.028)
relation: duration	-0.957***		0.274***
	(0.050)		(0.031)
crisis exposure × duration	0.259***		0.052***
	(0.021)		(0.017)
relation: frequency		-1.182***	-1.314***
		(0.067)	(0.080)
crisis exposure × frequency		0.222***	0.175***
		(0.045)	(0.053)
Observations	1,220,491	1,220,491	1,220,491
R-squared	0.871	0.879	0.879
3 FEs	✓	✓	✓
Industry lending share	-	-	-
Lender diversification	-	-	-

- Relationship measures narrow the gap between non-banks & banks by 2/3. (Original coef: -0.314)

ACCOUNTING FOR RELATIONSHIP-LENDING: REDUCED BANK-NONBANK GAP

VARIABLES	(1) log(credit)	(2) log(credit)	(3) log(credit)	(4) log(credit)	(5) log(credit)
crisis exposure	-0.212***	-0.163***	-0.207***	0.003	-0.158***
	(0.061)	(0.058)	(0.053)	(0.080)	(0.057)
crisis exposure × non-bank	**-0.167*** **	**-0.124*** **	**-0.118*** **	**-0.282*** **	**-0.106*** **
	(0.017)	(0.029)	(0.028)	(0.035)	(0.024)
relation: duration	-0.957***		0.274***		0.294***
	(0.050)		(0.031)		(0.032)
crisis exposure × duration	0.259***		0.052***		0.039***
	(0.021)		(0.017)		(0.014)
relation: frequency		-1.182***	-1.314***		-1.257***
		(0.067)	(0.080)		(0.084)
crisis exposure × frequency		0.222***	0.175***		0.174***
		(0.045)	(0.053)		(0.045)
Observations	1,220,491	1,220,491	1,220,491	1,162,306	1,162,306
R-squared	0.871	0.879	0.879	0.869	0.880
3 FEs	✓	✓	✓	✓	✓
Industry lending share	-	-	-	✓	✓
Lender diversification	-	-	-	✓	✓

- Robust to including lenders' industry specialization & portfolio diversification

Further evidence on the value of lending relationships:

- How do lending relationships affect the spread on syndicated loans during crises?
- Previous work: mitigate the detrimental effects of crises on the spreads of bank loans (see Sette and Gobbi (2015) or Bolton, Freixas, Gambacorta and Mistrulli (2016))
- What about non-banks?

$$\begin{aligned}\text{spread}_{l,b,t} = {} & \rho_1 \text{crisis}_{c,t} + \rho_2 \text{ relationship}_{l,b,t} \\ & + \rho_3 \text{ crisis}_{c,t} \times \text{relationship}_{l,b,t} + \phi_{l,b} + \psi_{l,t} + \tau_{b,t} + \varepsilon_{l,b,t}.\end{aligned}$$

VARIABLES	(1) spread	(2) duration spread	(3) duration spread	(4) frequency spread	(5) frequency spread
crisis	25.513***				
	(4.163)				
relation		-0.157	-0.060	-1.192***	-1.087***
		(0.115)	(0.125)	(0.199)	(0.219)
crisis × relation		-0.626***	-0.730***	-0.610***	-0.847***
		(0.078)	(0.112)	(0.132)	(0.132)
crisis × non-bank			-1.065		-1.695
			(2.060)		(2.390)
non-bank × relation			-1.451**		-1.740***
			(0.602)		(0.635)
crisis × non-bank × relation			1.872***		3.774***
			(0.209)		(0.382)
Observations	231,473	222,562	222,562	222,562	222,562
R-squared	0.869	0.990	0.990	0.990	0.990
Lender*Borrower FE	✓	✓	✓	✓	✓
Lender*Year FE	✓	✓	✓	✓	✓
Borrower*Year FE	-	✓	✓	✓	✓

Non-banks do not charge higher spreads during non-crises times for their relationship borrowers, but do not protect these borrowers during crises

Extensions

EXTENSION: RISKY BORROWERS SUFFER MORE DURING CRISES

VARIABLES	(1) DS country spread log(credit)	(2) DS industry spread log(credit)	(3) CS leverage log(credit)
crisis exposure	-0.023	-0.023	0.020
	(0.042)	(0.041)	(0.137)
crisis exposure × non-bank	-0.027	-0.035	-0.495***
	(0.024)	(0.023)	(0.118)
exposure × high-risk borrower	0.185***	0.086***	0.046
	(0.039)	(0.018)	(0.028)
non-bank × high-risk borrower	0.114***	0.061***	0.142***
	(0.013)	(0.011)	(0.050)
exposure × non-bank × high-risk borrower	**-0.129*** **	**-0.044** **	**-0.190*** **
	(0.013)	(0.019)	(0.043)
Observations	222,562	222,562	292,507
R-squared	0.938	0.938	0.698
3 FE	✓	✓	✓

$$\Delta y_{f,t} = \gamma_1 \, BC_{c,t-1} + \gamma_2 \text{ connected to } NB_{f,t-1} + \gamma_3 \, BC_{c,1} \times \text{ connected to } NB_{f,t-1} + \phi_f + \pi_t + u_{f,t}.$$

w/ $\Delta y_{f,t}$ = log diff in borrowing by firm f across all lenders in t; or its change in investment rate

- Non-bank connected firms: stronger decline in loan volumes and investment.

	(2)	(3)	(4)	(5)
			low connection	low connection
VARIABLES	loan volume	investment	loan volume	investment
connected to non-bank	-0.551***	-0.000	-0.299***	-0.001
	(0.034)	(0.001)	(0.030)	(0.003)
crisis × connected to non-bank	-0.082**	-0.013***	-0.417***	-0.019***
	(0.040)	(0.003)	(0.059)	(0.003)
Observations	13,510	13,115	2,668	2,591
R-squared	0.247	0.333	0.488	0.444
Firm-level controls	✓	✓	✓	✓
Borrower FE	✓	✓	✓	✓
Borrower Ctry*Industry*Year FE	✓	✓	✓	✓

- Classification of nonbanks by stable/unstable funding.
- Only GFC.
- Borrower subset: public / private.
- Alternative relationship measures.
- Lender subset: no investment bank; US/JP/UK lender only.
- Large lenders (> 10 bln USD in 2012 prices over sample period).
- Types of loan: credit line / term loan.
- Level of analysis: lender-borrower country aggregation.
- Growth rate of new credit as dependent variable (also country aggregation).
- Intensive margin / alternative transformations.

- Cross-country evidence: non-banks contract their syndicated lending by more than banks during financial crises in borrower countries.
  - Difference to a large extent accounted for by different pool of borrowers and the value of relationships, above and beyond different funding models.

- Rising footprint of non-banks could lead to a shift away from relationship towards transaction lending, with potentially negative consequences for borrowers' access to credit during crises.
  - Lending relationship with a non-bank provides less value to firms during crises.
  - Non-banks' specialization in riskier segments of the market does not come with stabilizing benefits during crises.

- Monitoring non-banks important in money markets and lending markets to non-financial firms.