

NON-BANK LENDING DURING CRISES

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Global expansion of non-bank financial institutions.

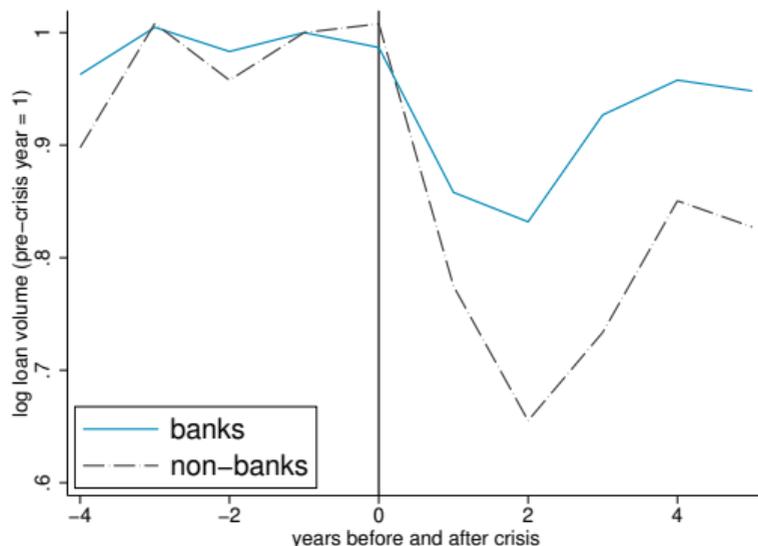
- Potential implications for financial stability and the real economy.
- Balanced funding mix for borrowers, albeit possibly greater cyclical.
- Matter for market liquidity, but also lending to non-financial firms.

Tightening financial conditions & rising concerns of global financial crisis.

This paper:

- Non-banks' adjustment of syndicated lending during financial crises.
- Importance of borrower (b), lender (l) & b-l characteristics in driving the response.

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



Results robust to

- Granular fixed effects (lender-borrower, lender/borrower-time).
- Intensive and extensive margin of lending.

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 declines 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 amplify financial instabilities and associated real effects during financial crises; of particular concern at current juncture.

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

- **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.

- Granular loan-level data: Allows for sharp identification.
- Stronger external validity with global coverage of syndicated lending.
- Novel evidence on relationship value for non-banks.

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.

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 (~ 12k matched to Compustat).
- With borrower/lender FEs: restrict to lenders and borrowers with at least two observations in a given year.

Non-banks: wide global lending footprint ([▶ Graph](#)); have loans with higher volume, maturity & spreads, & higher crisis exposure ([▶ Table](#)); serve riskier borrowers ([▶ Table](#)).

Levels of analysis:

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

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.

NON-BANK LENDING DURING CRISES AND BORROWER SELECTION

VARIABLES	(1) log(credit int)
crisis exposure	-0.220** (0.095)
crisis exposure × non-bank	
Observations	360,294
R-squared	0.847
Lender*Borrower FE	✓
Lender*Year FE	✓
Borrower*Year FE	-

- Average lenders significantly reduce lending after crises in borrower countries.
 - . 4.6% per s.d. increase in lender exposure to crisis.

NON-BANK LENDING DURING CRISES AND BORROWER SELECTION

VARIABLES	(1) log(credit int)	(2) log(credit int)
crisis exposure	-0.220** (0.095)	-0.212** (0.095)
crisis exposure × non-bank		-0.107*** (0.004)
Observations	360,294	360,294
R-squared	0.847	0.847
Lender*Borrower FE	✓	✓
Lender*Year FE	✓	✓
Borrower*Year FE	-	-

Adding non-bank interactions:

- Lending by non-banks declines by more relative than by banks.
 - . Magnitude: 6.7% (non-banks) vs. 4.5% (banks) per s.d. increase in crisis exposure.

NON-BANK LENDING DURING CRISES AND BORROWER SELECTION

VARIABLES	(1) log(credit int)	(2) log(credit int)	(3) log(credit int)
crisis exposure	-0.220** (0.095)	-0.212** (0.095)	0.038 (0.037)
crisis exposure × non-bank		-0.107*** (0.004)	-0.052** (0.024)
Observations	360,294	360,294	360,220
R-squared	0.847	0.847	0.956
Lender*Borrower FE	✓	✓	✓
Lender*Year FE	✓	✓	✓
Borrower*Year FE	-	-	✓

Absorb credit demand effect via borrower-time FE:

- Relative decline in non-bank lending: 1.1% per s.d. increase in exposure.
- Borrower characteristics explain one half of differences in lending behavior.

NON-BANK LENDING DURING CRISES AND BORROWER SELECTION

VARIABLES	(1) log(credit int)	(2) log(credit int)	(3) log(credit int)	(4) log(credit)	(5) log(credit)
crisis exposure	-0.220** (0.095)	-0.212** (0.095)	0.038 (0.037)	0.039 (0.149)	-0.018 (0.056)
crisis exposure × non-bank		-0.107*** (0.004)	-0.052** (0.024)	-0.788*** (0.238)	-0.313*** (0.037)
Observations	360,294	360,294	360,220	1,220,620	1,220,491
R-squared	0.847	0.847	0.956	0.300	0.866
Lender*Borrower FE	✓	✓	✓	✓	✓
Lender*Year FE	✓	✓	✓	✓	✓
Borrower*Year FE	-	-	✓	-	✓

Extensive margin: Robust finding

- Relative decline in non-bank lending: 6.2% per s.d. increase in exposure.
- Important to consider formation and termination of 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 since 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	0.026 (0.055)	0.008 (0.052)	-0.024 (0.053)
crisis exposure × non-bank	-0.175*** (0.021)	-0.123*** (0.021)	-0.118*** (0.022)
relation: duration	-0.966*** (0.051)		0.270*** (0.031)
crisis × duration	0.178*** (0.027)		0.040** (0.017)
relation: frequency		-1.188*** (0.070)	-1.317*** (0.083)
crisis × frequency		0.154*** (0.054)	0.111* (0.063)
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.
 - They lead to lower spreads during crises, but not so for non-banks ([Table](#)).

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	0.026 (0.055)	0.008 (0.052)	-0.024 (0.053)	-0.003 (0.062)	-0.024 (0.059)
crisis exposure × non-bank	-0.175*** (0.021)	-0.123*** (0.021)	-0.118*** (0.022)	-0.283*** (0.034)	-0.105*** (0.023)
relation: duration	-0.966*** (0.051)		0.270*** (0.031)		0.290*** (0.032)
crisis × duration	0.178*** (0.027)		0.040** (0.017)		0.037** (0.017)
relation: frequency		-1.188*** (0.070)	-1.317*** (0.083)		-1.258*** (0.087)
crisis × frequency		0.154*** (0.054)	0.111* (0.063)		0.101* (0.060)
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

- Does non-banks specialization in riskier borrowers protect those borrowers from the contraction in credit during crises?
 - . Not really: they cut lending especially to riskier borrowers (▶ [Table](#))
- Real effects: firms connected to non-banks see a stronger decline in overall loan volumes (across all lenders) as well as in investment (▶ [Table](#))

- Does non-banks specialization in riskier borrowers protect those borrowers from the contraction in credit during crises?
 - . Not really: they cut lending especially to riskier borrowers (▶ Table)
- Real effects: firms connected to non-banks see a stronger decline in overall loan volumes (across all lenders) as well as in investment (▶ Table)
- Additional robustness checks:
 - . Borrower subset: public / private.
 - . Alternative relationship measures.
 - . Lender subset: no investment bank; US/JP/UK lender only.
 - . Types of loan: credit line / term loan.
 - . Level of analysis: lender-borrower country aggregation.
 - . Growth rate of new credit as dependent variable.

- 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
- Growth of non-bank lending: Could amplify financial distress and propagate shocks to the real economy.
 - . Non-banks' specialization in riskier segments of the market does not come with stabilizing benefits during crises.
 - . Lending relationship with a non-bank provides less value to firms during crises.
- Monitoring non-banks important in money markets and lending activities to non-financial firms.

APPENDIX

NON-BANKS' WIDESPREAD GLOBAL FOOTPRINT

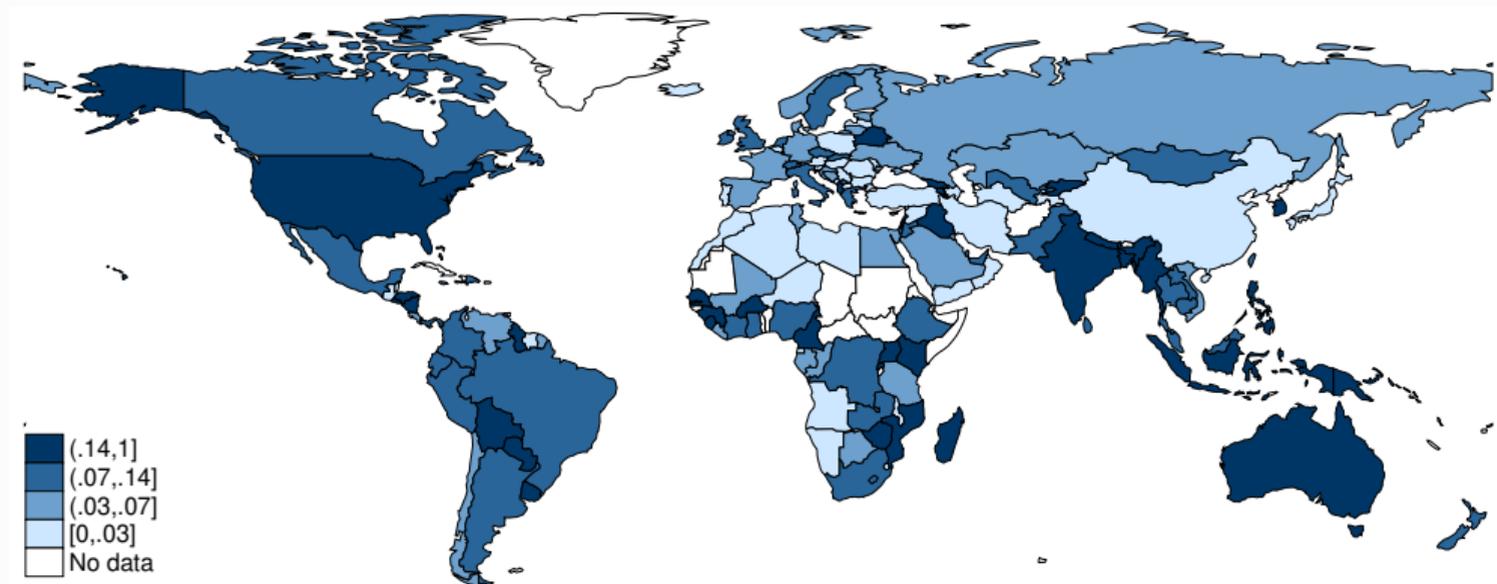


Figure: Country-level loan share of non-banks, average 1995-2018

▶ Back

BANKS AND NON-BANK LENDING: DESCRIPTIVE DIFFERENCES

	banks		non-banks		mean diff.
	mean	sd	mean	sd	t
total loan amount (mil 2012 USD)	88.40	(191.75)	121.25	(276.04)	-23.38
term loan amount (mil 2012 USD)	24.96	(101.81)	49.70	(149.72)	-33.07
credit line amount (mil 2012 USD)	54.36	(119.99)	52.64	(129.78)	2.01
all-in drawn spread (bps)	160.08	(119.08)	244.37	(154.29)	-86.85
log maturity (month)	3.67	(0.67)	3.84	(0.61)	-34.63
crisis exposure	0.06	(0.21)	0.08	(0.23)	-14.32
Observations	339910		20999		360909

Non-banks:

- Extend loans with larger volume, maturity and spread.
- Have higher exposure to banking crises

▶ Back

- Define high-risk borrowers:
 - . Borrowing cost (all-in-drawn spread) above 75-th percentile among borrowers in the same country (1) / industry (2).
 - . Leverage at third tercile (3).

VARIABLES	(1) country spread Pr(non-bank lender)	(2) industry spread Pr(non-bank lender)	(3) leverage Pr(non-bank lender)
high-risk	0.180*** (0.004)	0.161*** (0.004)	0.040*** (0.004)
Observations	464,757	464,757	404,845
R-squared	0.144	0.142	0.126

Linear probability model, with Borrower Country*Industry*Year FE.

- Riskier borrowers are significantly more likely to obtain a loan from a non-bank

LENDING RELATIONSHIPS AND THE PRICE OF LENDING BY NON-BANKS

VARIABLES	(1) spread	(2) duration spread	(3) duration spread	(4) frequency spread	(5) frequency spread
crisis	25.513*** (4.163)				
relation		-0.157 (0.115)	-0.060 (0.125)	-1.192*** (0.199)	-1.087*** (0.219)
crisis × relation		-0.626*** (0.078)	-0.730*** (0.112)	-0.610*** (0.132)	-0.847*** (0.132)
crisis × non-bank			-1.065 (2.060)		-1.695 (2.390)
non-bank × relation			-1.451** (0.602)		-1.740*** (0.635)
crisis × non-bank × relation			1.872*** (0.209)		3.774*** (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

EXTENSION: RISKY BORROWERS SUFFER MORE DURING CRISES

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

▶ Back

EXTENSION: REAL EFFECTS

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

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.

VARIABLES	(2)	(3)	(4)	(5)
	loan volume	investment	low connection loan volume	low connection investment
connected to non-bank	-0.551*** (0.034)	-0.000 (0.001)	-0.299*** (0.030)	-0.001 (0.003)
crisis × connected to non-bank	-0.082** (0.040)	-0.013*** (0.003)	-0.417*** (0.059)	-0.019*** (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	✓	✓	✓	✓

▶ Back