Bank to Non-Bank Lending and the Reallocation of Credit

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Motivation

- An essential function of the financial system is to **extend credit to the real economy**
  - Traditionally, deposit-taking banks directly lend to **non-financial firms**
  - More recently, banks are increasingly lending to **non-bank financial institutions** (NBFIs)

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  - Traditionally, deposit-taking banks directly lend to **non-financial firms**
  - More recently, banks are increasingly lending to **non-bank financial institutions** (NBFIs)
- As bank to NBFI lending takes up an increasing share of banks' balance sheets, an important question is how it affects **aggregate loan supply to firms**
  - Does banks' increased lending to NBFIs allows NBFIs to supply more loans to the real economy?
  - Do banks cut direct lending to firms in order to lend to NBFIs?

This Paper

How does bank lending to non-bank financial institutions (NBFI) affects loan supply to the real economy?

- Uncovers several novel facts on **bank lending to NBFIs** and the reallocation of credit
  - Exploit **Credit registry data** from the Euro-area (Anacredit): both banks loans to firms and **banks loans to NBFIs**

$\Rightarrow$ *Bank lending to NBFIs is **not** merely the pass through of lending to firms through non-bank intermediaries*

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- Develop a **model** to rationalize our empirical findings (ongoing)

⇒ *The aggregate effect of bank to NBFIs lending on credit supply hinges on **investor risk preferences***

Main Findings

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- **Novel empirical facts**
  - While some bank loans go to NBFIs that focus on lending to non- financial firms (e.g., private credit funds), a sizeable portion consists of **reverse repos to NBFIs** that primarily invest in **securities** (e.g., investment funds).
  - Bank lending to NBFIs **crowds out** bank credit to non-financial firms rather than liquid assets
  - This substitution is especially pronounces by banks that are more **capital and liquidity constrained**

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- **Model-based analysis**
  - When **capital regulation** tightens banks substitute away from firm loans and towards lending to NBFIs
  - NBFIs with **risk-sensitive investors** hold more **securities** - stronger the contraction in loan supply
  - NBFIs with **less risk-sensitive investors** invest in more **firm loans** - weaker contraction in firm loan supply

⇒ *The extent to which bank lending to NBFIs affects loan supply depends on investor preferences and the composition of the NBFI sector*

Data

Data - a novel granular dataset on banks' lending to firms and NBFIs

Bank-level data

- **Individual Balance Sheet Items** (IBSI)
  - monthly information on granular asset and liability categories at the subsidiary level
- **Supervisory Banking Data** (SUBA)
  - banks' assets, liabilities, and income statements (Financial reporting - FINREP)
  - banks' capital positions and risk exposures (Common Reporting - COREP)
- **Bankscope** and the **Register of Institutions and Affiliates Database** (RIAD)
  - ownership and group structure of banks

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NBFI and Firm Loan-level data

- **AnaCredit**, the European System of Central Banks' credit register
  - Harmonized loan-level data on all Eurozone commercial loans outstanding (above EUR 25,000), including revolving credit, credit lines, reverse repurchase agreements, and term loan granted by banks to firms and **NBFIs**

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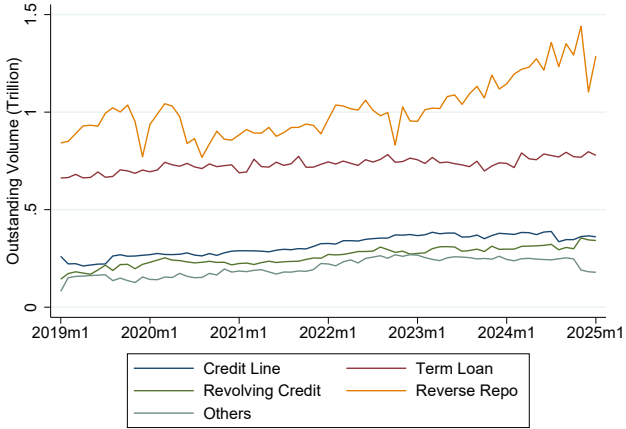
NBFI country-sector balance sheet data

- Non-bank financial corporations statistics
  - **Balance sheets of financial corporations** other than monetary financial institutions by country-sector (IF, IC, MMF, PF, FVCs)

Stylized Empirical Facts

Fact 1. *A significant share of bank lending to NBFIs consists of reverse repos to NBFIs that primarily invest in securities*

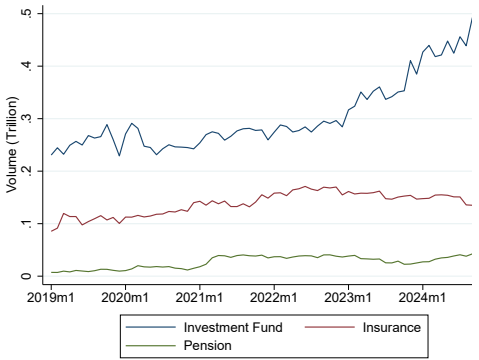
Loan Outstanding Volumes to NBFIs by Instrument



- **Term loans** (35%) and **credit lines** (23%) are a sizeable share of total loans – *as in U.S. (see Acharya et al, 2024)*
- BUT **reverse repos** are the largest category (45%)! – *not reported in U.S. FR Y-14Q data*

Which NBFIs borrow from banks?

Investment Funds, Pensions, and Insurances



Other Financial Institutions

- **IFs** (esp. hedge funds) are large borrowers and their loan volume is growing rapidly since 2023 onward IFs
- The amount borrowerd by **ICPFs** is relatively small

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- The amount borrowerd by **ICPFs** is relatively small
- **OFIs** (S125) represent the largest borrowing sector also display the rapid growth since 2023 Other
- **Financial auxillaries** (FAs - S 126), and **captive financial institutions** (Captives - S 127) also receive a relevant share of bank loans

Changes in Loan Volume by Instrument and NBFI Sector

Which type of NBFIs take up which kind of loans?

$$LoanGrowth_{kt} = \sum_{s} \beta_{ks} 1_s LoanGrowth_{kst} + \epsilon_{kst},$$

- $LoanGrowth_{kt}$: log difference in loan volumes for instrument k in month t;
- 1_s: indicator variable for sector s;
- $LoanGrowth_{kst}$: log difference in loan volumes for instrument k and sector s in month t;
- Observations are at the instrument-sector-month level; SE clustered by sector and month;

$\beta_{ks} > 0$: the loan growth for **sector s** commoves with the overall loan growth for **instrument k** $\Rightarrow$ **sector s** takes up more of those loans and drives more of the aggregate growth of those loans

Changes in Loan Volume by Instrument and NBFI Sector

	Credit Line	Term Loan	Revolving	Repo	Other
	(1)	(2)	(3)	(4)	(5)
Dealers/Market Infrastructure × ΔLoans	0.20***	0.17***	0.15***	0.72***	0.54***
	(0.02)	(0.02)	(0.02)	(0.03)	(0.10)
Hedge Funds/Mutual Funds × ΔLoans	0.35***	0.24***	0.05	0.50***	0.19*
	(0.06)	(0.04)	(0.04)	(0.07)	(0.09)
Other Funds × Δ Loans	0.66***	0.41***	0.37***	0.19***	0.17
	(0.15)	(0.06)	(0.04)	(0.03)	(0.09)
Lending/Factoring/Leasing × Δ Loans	0.72***	0.64***	0.20***	-0.06	0.49***
	(0.09)	(0.05)	(0.04)	(0.03)	(0.13)
Holding Companies and SPVs × Δ Loans	0.93***	0.94***	0.40***	0.10**	0.37*
	(0.14)	(0.11)	(0.02)	(0.03)	(0.16)
Insurances × Δ Loans	0.37***	0.10***	0.08*	0.30***	0.17
	(0.03)	(0.01)	(0.03)	(0.07)	(0.11)
Pensions × Δ Loans	-0.01	0.02***	0.05***	0.10**	0.03
	(0.01)	(0.00)	(0.01)	(0.03)	(0.04)
Observations	504	504	504	504	504
Adjusted R2	0.48	0.27	0.18	0.21	0.26

- Growth in **credit lines, term loans, revolving credit** most correspond to growth in these instruments extended to: other investment funds, OFIs (companies engaged in lending, factoring, leasing; holding companies and SPVs)

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- The growth of **reverse repos** to dealers, market infrastructure providers, hedge funds, and mutual fund closely accounts for the overall growth in reverse repos

Fact 1.

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  - Reverse repos tend to fund government bonds rather than lending to the real economy

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- We group NBFIs with similar economic functions together into the same sector
  - **NBFIs more directly focused on lending** to the real economy tend to borrow from banks in the form of credit lines, term loans, and revolving credit
  - **NBFIs less focused on lending** tend to borrow more in the form of reverse repos

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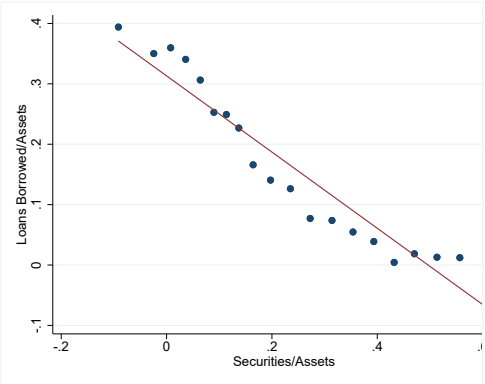
  - **NBFIs less focused on lending** tend to borrow more in the form of reverse repos
- The majority of loans are extended to NBFIs outside of the lending bank's holding company

Group Loans

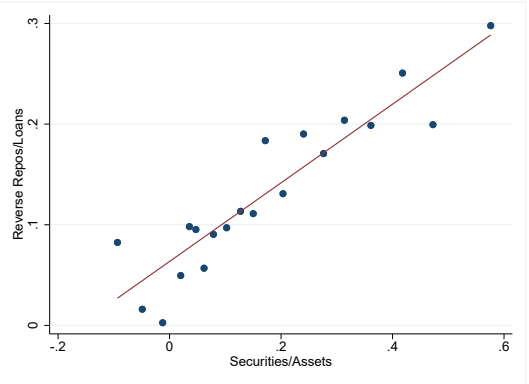
Fact 2. *Non-banks that lend more have higher leverage and borrow a smaller fraction of their loans in the form of reverse repos*

Asset and Liability Composition of NBFIs (NBFI sectors-country level)

Bank Loans vs Securities (Country-Time FE)



Rev Repos vs Securities (Country-Time FE)



- NBFIs that hold more securities borrow less but their bank loans borrowed are concentrated in reverse repos

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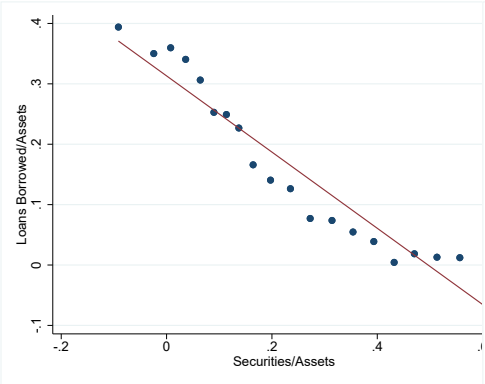

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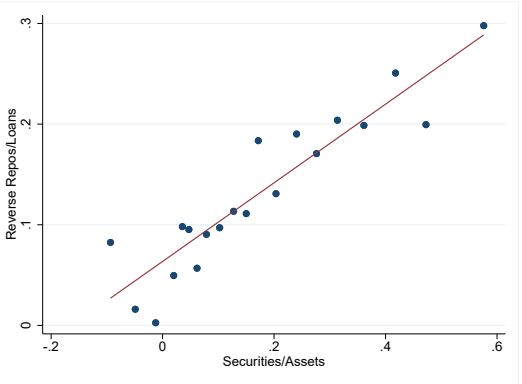
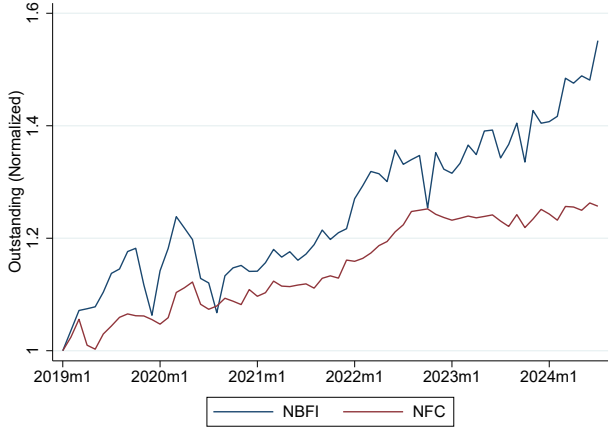


- NBFIs that hold more securities borrow less but their bank loans borrowed are concentrated in reverse repos
- **IFs** and **ICPFs** have a smaller (larger) share of loans (securities) than NBFIs more engaged in lending LoansSec
- **IFs** and **ICPFs** have lower leverage BUT borrow a higher proportion of reverse repos Leverage Bank loans

Fact 3. *Bank lending to NBFIs crowds out bank credit to the the real economy*

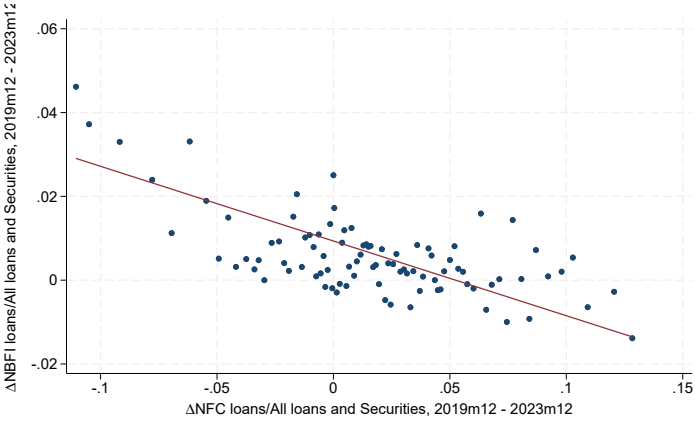
Bank Loan Outstanding Volumes to NBFIs and NFCs



- 2019-2025: bank lending to NBFIs grew by nearly 60%, whereas lending to firms increased by only 20%
- Strong divergence in growth of bank lending to **NBFIs** since after 2022

Did both types of lending evolve independently?

A key question is whether the recent expansion in bank lending to NBFIs reflects a reallocation of credit away from traditional corporate lending or other asset classes, or whether it has evolved independently of them



- Banks that expanded credit to NBFIs tended to simultaneously reduce lending to firms (bank-level)

Substitution between corporate and NBFI lending

Did banks substitute away from firm loans toward NBFI exposures?

$$\Delta \frac{y_{b,t}}{\text{All Loans \& Securities}_{b,t}} = \alpha_b + \alpha_t + \beta \, \Delta \frac{\text{Corporate Loans}_{b,t}}{\text{All Loans \& Securities}_{b,t}} + \varepsilon_{b,t},$$

- $\Delta y_{b,t}/$**All Loans & Securities**$_{b,t}$: change in the holdings of asset type y (e.g., loans to NBFIs) by bank b in month t, normalized by total loans and securities
- Δ**Corporate Loans**$_{b,t}/$**All Loans & Securities**$_{b,t}$: change in bank lending to firms relative to total loans and securities
- **Time FE** (α_t) to absorb any time-varying trends in bank lending and changes in economic conditions, for example due to monetary policy
- **Bank FE** (α_b) to control for any observable and unobservable heterogeneity at the bank level, such as bank size or specialization in Corporate/NBFI lending

Substitution from corporate lending across bank asset classes: bank-level evidence

$$\Delta \frac{y_{b,t}}{\text{All Loans \& Securities}_{b,t}} = \alpha_b + \alpha_t + \beta \, \Delta \frac{\text{Corporate Loans}_{b,t}}{\text{All Loans \& Securities}_{b,t}} + \varepsilon_{b,t},$$

	Δ NBFI loans	Δ MFI loans	Δ HH loans	Δ Gov. Bonds + Reserves	Δ MFI Bonds
	(1)	(2)	(3)	(4)	(5)
$\Delta \frac{\text{Corporate loans}_{b,t}}{\text{All Loans and Securities}_{b,t}}$	-0.413***	0.00339	-0.0999***	-0.212***	-0.00961***
	(0.0198)	(0.0401)	(0.0129)	(0.0416)	(0.00225)
Bank FE	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes
N	25969	22550	26001	20163	25953
R^2	0.261	0.0387	0.132	0.0446	0.0924

- A decline in **bank lending to firms** is associated with the strongest reallocation toward **NBFI loans** among all asset categories
  - A 1% decrease in corporate lending is associated with a 0.4% increase in lending to NBFIs

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- The effects for other liquid or low-risk assets are much weaker or insignificant

⇒ **The expansion of lending to NBFIs crowds out direct financing to the real sector**

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	(0.0244)	(0.0647)	(0.0105)	(0.0683)	(0.00349)
Bank FE	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes
N	25969	22542	25969	20159	25929
R^2	0.275	0.0395	0.134	0.0462	0.110

- The main source of **growth in NBFI lending** is the reallocation of credit away from firm lending
  - A 1% increase in lending to NBFIs is associated with a 0.55% decrease in firm loans

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$$\Delta \frac{\text{NBFI loans}_{b,t}}{\text{All Loans \& Securities}_{b,t}} = \alpha_b + \alpha_t + \beta \, \Delta \frac{y_{b,t}}{\text{All Loans \& Securities}_{b,t}} + \varepsilon_{b,t},$$

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- The main source of **growth in NBFI lending** is the reallocation of credit away from firm lending
  - A 1% increase in lending to NBFIs is associated with a 0.55% decrease in firm loans
- Substitution from other asset categories is considerably weaker in magnitude

⇒ **The growth of bank credit to the NBFI sector has come largely at the expense of traditional firm lending**

Fact 4. *Due to capital and liquidity constraints, banks reallocate credit from firms to NBFIs, particularly through reverse repos and toward NBFIs that do not engage in lending to firms, leading to a decline in aggregate firm credit, especially for smaller and riskier borrowers*

Fact 4

Bank lending to NBFIs crowds out direct credit to firms, BUT...

- Which borrowers are most affected by this reallocation?
- What are the underlying reasons for this substitution?
- Has the rapid growth of bank credit to NBFIs neutral or redistributive effects on total credit supply?

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$\Rightarrow$ Shed light on the **distributional consequences** of the shift from corporate to NBFI lending

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$\Rightarrow$ Shed light on the **distributional consequences** of the shift from corporate to NBFI lending

- If banks merely channel funds through NBFIs that in turn lend to firms, the reallocation may be innocuous
- BUT since banks' lending to NBFIs rises at the cost of firm credit, aggregate financing to the corporate sector may contract if NBFIs do not pass these funds on to firms
- Sample: 2021m12-2023m12

Substitution between corporate and NBFI lending (bank-firm level)

Which type of firms experience the larger drop in credit when banks expand their NBFI lending?

$$log(\text{Lending to Firms}_{b,f,t}) = \alpha_{f,t} + \alpha_{f,b} + \beta Post_t \times \Delta \frac{\text{NBFI Lending}_b}{\text{Loans and Securities}_b} \times C_{f,t} + \epsilon_{b,f,t},$$

- $log(\textbf{Lending to Firms}_{b,f,t})$: log level of bank b's credit to firm f at time t
- $\Delta \frac{\textbf{NBFI Lending}_b}{\textbf{Loans and Securities}_b}$: change in bank b's share of lending to NBFIs btw 2021m12 and 2023m12
- $\textbf{Post}_t$ is a dummy variable equal to 1 for periods after 2022m12
- $C_{f,t}$: firm characteristics (e.g. firm PD, size)
- **Firm-time FE**: control for time-varying credit demand (Khwaja and Mian, 2008)
- **Bank-firm FE**: control for non-random bank-firm matching

Bank lending to firms: loan-level evidence on the affected firms

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	log(Lending to Firms$_{b,f,t}$)				
	(1)	(2)	(3)	(4)	(5)
Post$_t$ × ΔNBFI Lending$_b$	-0.181***	-0.145***	-1.147***	-0.958***	-0.159
	(0.0485)	(0.0498)	(0.355)	(0.369)	(0.108)
Post$_t$ × ΔNBFI Lending$_b$ × $PD_{f,t-1}$		-0.710***		-0.845***	
		(0.118)		(0.180)	
Post$_t$ × ΔNBFI Lending$_b$ × $log(assets_f)$			0.0461**	0.0372*	
			(0.0186)	(0.0192)	
Post$_t$ × ΔNBFI Lending$_b$ × Residual Rate$_f$					12.61***
					(4.755)
Controls and Other Interactions	Yes	Yes	Yes	Yes	Yes
Borrower x Time FE	Yes	Yes	Yes	Yes	Yes
Bank x Borrower FE	Yes	Yes	Yes	Yes	Yes
N	73552394	68399276	27410986	25598892	28423503
R^2	0.943	0.947	0.934	0.939	0.950

- **(1)**: confirms bank-level finding: when banks expand lending to NBFIs, their credit to firms declines
- **(2) - (4)**: The contraction in firm loans is concentrated among **riskier** and **smaller firm**

Bank lending to firms: loan-level evidence on the affected firms

$$log(\text{Lending to Firms}_{b,f,t}) = \alpha_{f,t} + \alpha_{f,b} + \beta Post_t \times \Delta \frac{\text{NBFI Lending}_b}{\text{Loans and Securities}_b} \times C_{f,t} + \epsilon_{b,f,t},$$

	log(Lending to Firms$_{b,f,t}$)				
	(1)	(2)	(3)	(4)	(5)
Post$_t$ × ΔNBFI Lending$_b$	-0.181***	-0.145***	-1.147***	-0.958***	-0.159
	(0.0485)	(0.0498)	(0.355)	(0.369)	(0.108)
Post$_t$ × ΔNBFI Lending$_b$ × $PD_{f,t-1}$		-0.710***		-0.845***	
		(0.118)		(0.180)	
Post$_t$ × ΔNBFI Lending$_b$ × $log(assets_f)$			0.0461**	0.0372*	
			(0.0186)	(0.0192)	
Post$_t$ × ΔNBFI Lending$_b$ × Residual Rate$_f$					12.61***
					(4.755)
Controls and Other Interactions	Yes	Yes	Yes	Yes	Yes
Borrower x Time FE	Yes	Yes	Yes	Yes	Yes
Bank x Borrower FE	Yes	Yes	Yes	Yes	Yes
N	73552394	68399276	27410986	25598892	28423503
R^2	0.943	0.947	0.934	0.939	0.950

- **Residual Rate**: residual from the regression of lending rates on observable borrower and loan characteristics.
- **(5)**: positive interaction with firms' residual loan rates ⇒ decline less pronounced for borrowers associated with **higher mark-ups**, consistent with banks retaining their most profitable exposures

Bank lending to NBFIs: lending and borrower types

What form of NBFI lending expands most when banks reduce corposate lending?

$$log(\text{Lending to NBFI}_{b,n,i,t}) = \alpha_{n,t} + \alpha_{f,n,i} + \beta Post_t \times \Delta \frac{\text{Corporate Lending}_b}{\text{Loans and Securities}_b} \times C_{b,n,i} + \epsilon_{b,n,i,t},$$

- $log(\textbf{Lending to NBFI}_{b,n,i,t})$: log level of bank *b*'s credit to to NBFI *n* with instrument *i* at time *t*
- $\Delta \frac{\textbf{Corporate Lending}_b}{\textbf{Loans and Securities}_b}$: change in bank *b*'s share of lending to NFCs btw 2021m12 and 2023m12
- $\textbf{Post}_t$ is a dummy variable equal to 1 for periods after 2022m12
- $C_{b,n,t}$: NBFI (e.g. share of asset invested in loans) or instrument (e.g. repo loan) characteristics
- **NBFI-time FE**: control for time-varying credit demand (Khwaja and Mian, 2008)
- **bank-NBFI-instrument FE**: account for heterogeneity across instruments and borrower-lender pairs

Bank lending to NBFIs: lending and borrower types

$$log(\text{Lending to NBFI}_{b,n,i,t}) = \alpha_{n,t} + \alpha_{f,n,i} + \beta Post_t \times \Delta \frac{\text{Corporate Lending}_b}{\text{Loans and Securities}_b} \times C_{b,n,i} + \epsilon_{b,n,i,t},$$

	log(Lending to NBFI$_{b,n,i,t}$)		
	(1)	(2)	(3)
Post$_t$ × ΔCorporate Lending$_b$	-0.0521**	-0.0438**	-0.0397**
	(0.0212)	(0.0209)	(0.0161)
Post$_t$ × ΔCorporate Lending$_b$ × Repo Loan$_{b,n,i}$		-0.629**	
		(0.273)	
Post$_t$ × ΔCorporate Lending$_b$ × HighLoanRatio $_n$			0.148**
			(0.0670)
Controls and Other Interactions	Yes	Yes	Yes
Borrower x Time FE	Yes	Yes	Yes
Bank x Borrower x Instrument FE	Yes	Yes	Yes
N	1635480	1635480	504236
R^2	0.967	0.967	0.964

- **(1)**: banks reducing corporate lending increase credit to NBFIs
- **(2)**: the increase is more than ten times stronger for **reverse repo** transactions
- **(3)**: the increase in lending to NBFI is weaker/reverses for NBFIs with a **high share of assets invested in loans**

Bank lending to NBFI: loan-level evidence on transmission channel

What drives banks' substitution away from corporate lending?

$$log(\text{Lending to NBFI}_{b,n,t}) = \alpha_{n,t} + \alpha_{n,b} + \beta Post_t \times C_b + \epsilon_{b,n,t},$$

- $log(\textbf{Lending to NBFI}_{b,n,t})$: log level of bank *b*'s credit to NBFI *n* at time *t*
- $\textbf{Post}_t$ is a dummy variable equal to 1 for periods after 2022m12
- C_b: bank-level characteristics that proxy for the mechanisms behind the substitution
- **borrower-time FE** : control for time-varying credit demand (Khwaja and Mian, 2008)
- **bank-firm FE**: control for non-random bank-firm matching

Bank Lending to NBFIs: loan-level evidence on transmission channels

- NBFI loans **systematically safer** than corporate loans (lower PDs)

⇒ H.1: *banks may shift away from assets that require more equity capital to meet tighter capital requirements*

	log(Lending to NBFI$_{b,n,t}$)			
	(1)	(2)	(3)	(4)
Post$_t$ × ΔCorporate Lending$_b$	-0.0694***			
	(0.0210)			
Post$_t$ × Total Capital Ratio$_{b,2021}$		-0.538***		
		(0.128)		
Post$_t$ × ΔECB Funding$_b$			-0.0749*	
			(0.0428)	
Post$_t$ × ΔHH+Corporate Deposits$_b$				-0.0900***
				(0.0327)
Controls and Other Interactions	Yes	Yes	Yes	Yes
Borrower x Time FE	Yes	Yes	Yes	Yes
Bank x Borrower FE	Yes	Yes	Yes	Yes
N	970259	316544	549031	731335
R^2	0.966	0.964	0.964	0.965

- **CR constraints**: Banks with lower ex-ante CR (closer to regulatory constraints) increased NBFI lending more
- EA banks optimizing to meet tighter capital requirements (Basel III, CCyB tightening,..) shifted away from high–risk-weight assets toward low–risk-weight assets, such as NBFI loans

Bank Lending to NBFIs: loan-level evidence on transmission channels

- NBFI loans **more liquid** (reverse repos with shorter mat.) than NFC loans

⇒ H.2: *banks may shift away from corporate loans into NBFI loans due to liquidity constraints*

	log(Lending to NBFI$_{b,n,t}$)			
	(1)	(2)	(3)	(4)
Post$_t$ × ΔCorporate Lending$_b$	-0.0694***			
	(0.0210)			
Post$_t$ × Total Capital Ratio$_{b,2021}$		-0.538***		
		(0.128)		
Post$_t$ × ΔECB Funding$_b$			-0.0749*	
			(0.0428)	
Post$_t$ × ΔHH+Corporate Deposits$_b$				-0.0900***
				(0.0327)
Controls and Other Interactions	Yes	Yes	Yes	Yes
Borrower x Time FE	Yes	Yes	Yes	Yes
Bank x Borrower FE	Yes	Yes	Yes	Yes
N	970259	316544	549031	731335
R^2	0.966	0.964	0.964	0.965

- **Liq. Shock 1**: TLTRO recalibration (higher interest rate on outstanding funds) in Oct 22 triggered the fastest and largest decline in ECB borrowing
- **Liquidity constr**: Banks with larger ECB borrowing/assets increased NBFI lending post recalibration

Bank Lending to NBFIs: loan-level evidence on transmission channels

- NBFI loans **more liquid** (reverse repos with shorter maturity) than NFC loans

⇒ H.2: *banks may shift away from corporate loans into NBFI loans due to liquidity constraints*

	log(Lending to NBFI$_{b,n,t}$)			
	(1)	(2)	(3)	(4)
Post$_t$ × ΔCorporate Lending$_b$	-0.0694***			
	(0.0210)			
Post$_t$ × Total Capital Ratio$_{b,2021}$		-0.538***		
		(0.128)		
Post$_t$ × ΔECB Funding$_b$			-0.0749*	
			(0.0428)	
Post$_t$ × ΔHH+Corporate Deposits$_b$				-0.0900***
				(0.0327)
Controls and Other Interactions	Yes	Yes	Yes	Yes
Borrower x Time FE	Yes	Yes	Yes	Yes
Bank x Borrower FE	Yes	Yes	Yes	Yes
N	970259	316544	549031	731335
R^2	0.966	0.964	0.964	0.965

- **Liq. Shock 2**: Beginning in July 2022, the ECB's rate hikes triggered significant outflows of deposits from bank balance sheets
- **Deposit channel of monetary policy** (Drechsler et al., 2017): banks losing a greater share of core deposits expanded their NBFI lending by more after the tightening of monetary policy

Firm-level credit and exposure to bank lending to NBFIs

Does the asset substitution by banks btw corporate and NBFI loans have significant effects on firm financing?

$$\Delta log(\text{borrowing}_f) = \alpha_i + \beta \Delta \text{NBFI loans}_f + \epsilon_f,$$

- $\Delta log(\textbf{borrowing}_f)$: log change in firm-level debt btw 2019 and 2022 (outstanding loans and total debt)
- Δ**NBFI loans**$_f$: firm-level exposure to banks' lending to NBFIs
  - weighted average change in the share of each bank's credit to the NBFI sector, with weights given by the firm's outstanding credit with those banks in 2019

Firm-level credit and exposure to bank lending to NBFIs

$$\Delta log(\text{borrowing}_f) = \alpha_i + \beta \Delta \text{NBFI loans}_f + \epsilon_f,$$

	Δ log(loans$_f$)			Δ log(total debt$_f$)		
	(1)	(2)	(3)	(4)	(5)	(6)
Δ NBFI loans$_f$	-0.389***	-0.369***	-0.147	-0.133**	-0.172***	0.00829
	(0.123)	(0.122)	(0.140)	(0.0647)	(0.0638)	(0.113)
Δ NBFI loans$_f$ × Small Firm$_f$			-0.804***			-0.276*
			(0.280)			(0.157)
Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	No	Yes	Yes	No	Yes	Yes
N	132680	132614	132614	171101	171064	183095
R^2	0.00130	0.0137	0.0139	0.00486	0.0307	0.0236

- Firms initially dependent on banks that expanded their NBFI exposures experienced significantly larger declines in both total loans (bank & NBFI) and overall debt (Orbis) between 2019 and 2022
  - The effect is again concentrated among small firms

⇒ **Bank lending to NBFIs does not appear to channel back to firms!**

Concluding Remarks

Conclusion

We document how **bank lending to NBFIs shapes the supply of credit to the real economy** using granular Euro-area data

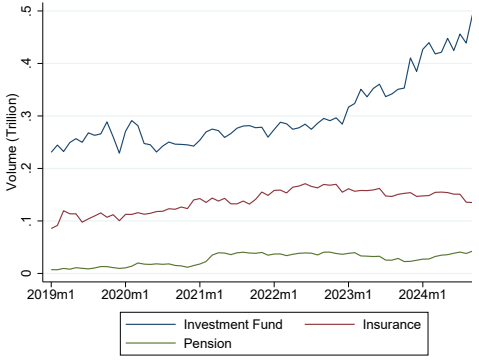
- Fact 1. *A significant share of bank lending to NBFIs consists of reverse repos to NBFIs that primarily invest in securities*
- Fact 2. *Non-banks that lend more have higher leverage and borrow a smaller fraction of their loans in the form of reverse repos*
- Fact 3. *Bank lending to NBFIs crowds out bank credit to the the real economy*
- Fact 4. *Due to capital and liquidity constraints, banks reallocate credit from firms to NBFIs, particularly through reverse repos and toward NBFIs that do not engage in lending to firms, leading to a decline in aggregate firm credit, especially for smaller and riskier borrowers*

$\Rightarrow$ Distributional dimension of bank–NBFI interactions

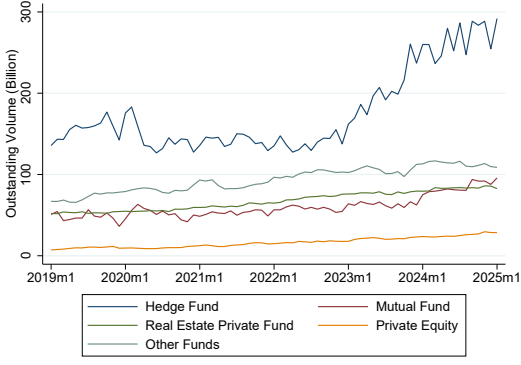
Additional Material

Which NBFIs borrow from banks?

Investment Funds, Pensions, and Insurances



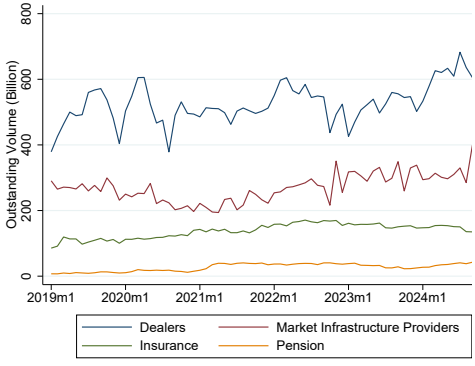
Investment Funds



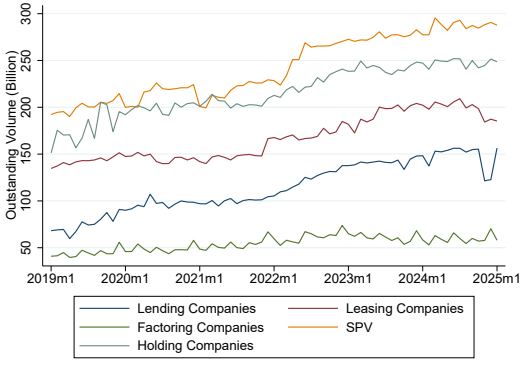
- Among IFs, **hedge** funds are the largest borrowers and also display the rapid growth starting in 2023
- The volume of loans to **private equity funds** and **other funds** (incl. private debt funds) is rather limited Back

Which NBFIs borrow from banks?

Dealers, Pensions, and Insurances



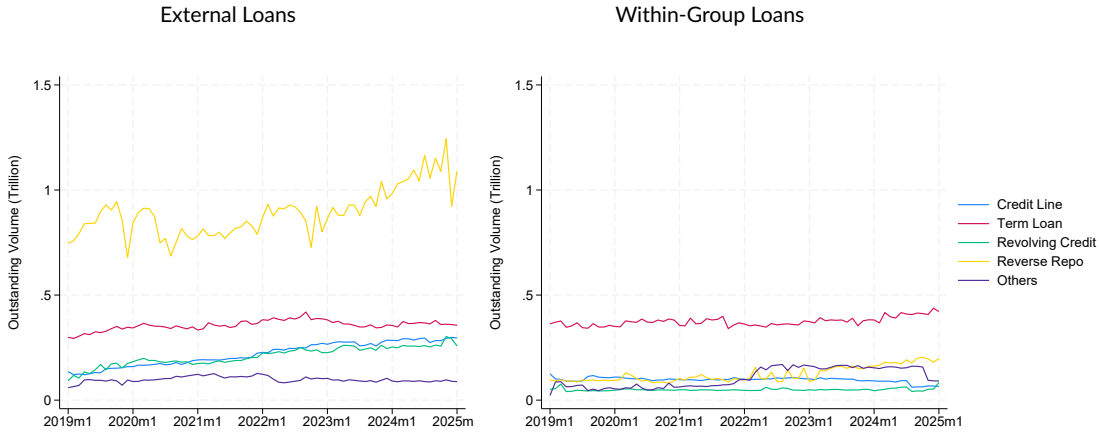
Lending and Holding Companies



- **Dealers & Brokers** borrow non negligible amounts
- Banks lend less to NBFIs that are more directly engaged in lending to the real economy
- The volume of loans to **private equity funds** and **other funds** (incl. private debt funds) is also rather limited

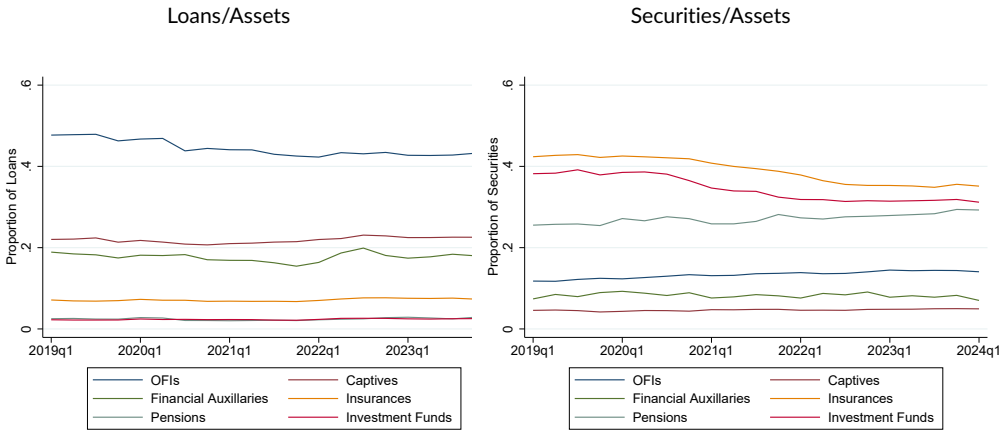
Back

Loan Volumes to NBFIs by Instrument (External and Within Group Loans)



- The majority of loans are extended to NBFIs outside of the lending bank's holding company
- Only term loans have a relatively more sizeable portion of within-group loans
- OFIs (SPVs, leasing companies, lending companies, and factoring companies) have a relatively larger proportion of intra-group term loans Back

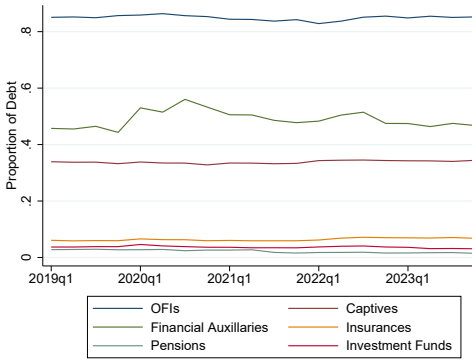
Asset and Liability Composition of NBFIs



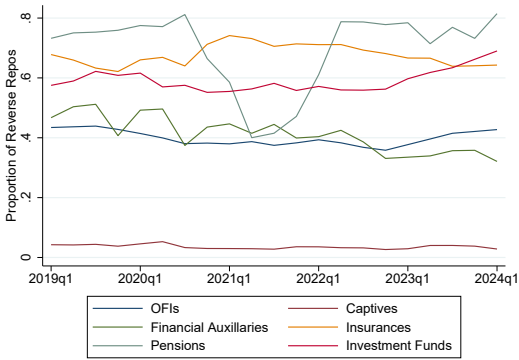
- **IFs** and **ICPFs** have a smaller (larger) share of loans (securities) on their asset sides than NBFIs more engaged in lending such as **OFIs**, **FA** and **Captives** Back

Asset and Liability Composition of NBFIs

Debt/Asset



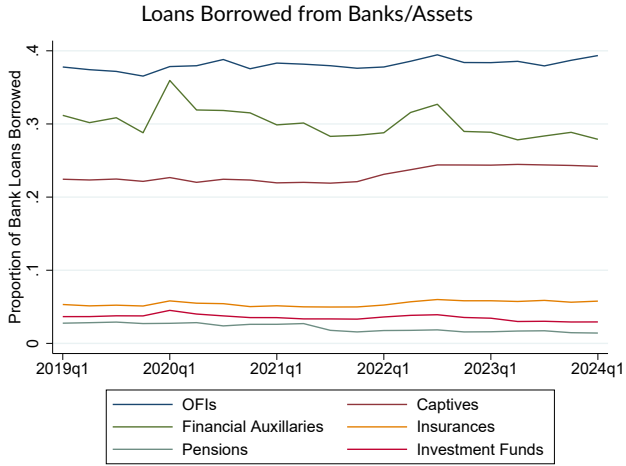
Reverse Repos/Loans Borrowed from Banks



- **IFs** and **ICPFs** have lower leverage (and bank loans-to-asset share) than **OFIs**, **FA** and **Captives** BUT borrow a higher proportion of reverse repos Bank loans

⇒ NBFIs that lend more have higher leverage and a smaller fraction of repo borrowing Back

Asset and Liability Composition of NBFIs



- **IFs** and **ICPFs** have lower share of bank loans-to-assets than **OFIs**, **FA** and **Captives** Back

Default Probability of NBFI and Corporate Loans

Average and median default probabilities by loan type

	NBFI Median (1)	Corporate Median (2)	NBFI Mean (3)	Corporate Mean (4)	Diff in Means (5)
Credit Lines	0.64	0.79	5.30	6.55	1.25***
Term Loans	1.12	1.19	6.63	10.74	4.11***
Revolving Credit	1.00	1.83	10.01	16.06	6.06***
Repo	0.26	0.32	1.03	1.89	0.86***
Others	0.75	1.40	6.37	8.97	2.60***

- Across all instruments, loans to NBFIs are systematically safer (both by loan type and by maturity)
- PDs btw 1 and 6 pp lower for NBFI exposures compared to corporate loans: NBFI loans carry much lower risk weights relative to corporate loans

Back