Mortgage Liquidity Shocks and Corporate Lending: Evidence from Household-Initiated Bank Balance Sheet Adjustment

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MOTIVATION. EXISTING EVIDENCE ON MONETARY POLICY TRANSMISSION

- **Monetary policy affects corporate lending through banks' funding structure and balance-sheet constraints, shaping the supply of credit in response to policy-rate changes**
  - Bernanke and Blinder, 1988; Kashyap and Stein, 2000; Jimenez et al., 2012&2014; among others.
- **Policy-rate hikes increase debt-service costs for households with floating-rate mortgages, affecting their cash flows and consumption:**
  - Hughson et al., 2016; Di Maggio et al., 2017; Cloyne et al., 2020.
- **But … can household balance-sheet adjustments induced by monetary policy affect banks' balance-sheets and their supply of corporate credit?**

THIS PAPER

- **450bp rise in policy rate (between July 22 and Sept 23) → increase in monthly payment bills, which produced:**
  - Cumulative early redemptions amounted to 9%, made without reducing bank deposit balances.
  - More pronounced for HH with floating-rate mortgages in high-income areas.
- **We find that banks more exposed to early repayments:**
  - Redirected the extra liquidity primarily towards NFCs loans, particularly safer micro/small firms.
    - *NFC credit declined 4.23% vs. 4.80% absent the early-repayment channel.*
  - Did not reinvest it into consumer credit, mortgages, financial assets like cash or fixed-income securities.
  - Did not exhibit higher delinquency rates.
- **Our paper introduces a novel channel of monetary policy transmission.**
  - Remains significant even when accounting for traditional channels like bank capital or income gap.

OUTLINE

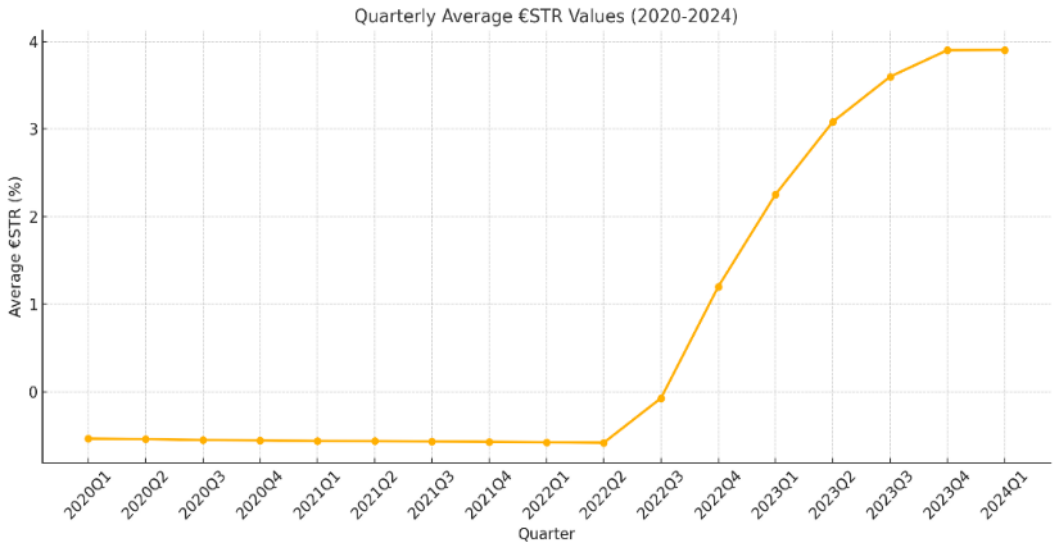
- **Dataset, monetary policy shock and early repayments.**
- **Banks allocation of the "extra liquidity" gathered from early mortgage repayments.**
  - Allocation across credit segments.
  - Allocation to purposes other than credit.
  - Household income mechanism for mortgage repayments.
- **Anatomy of credit reallocation to NFCs.**
  - Baseline analysis of credit reallocation.
  - Credit reallocation beyond traditional channels.
  - Firm characteristics.
  - Contract characteristics and ex-post performance.
- **Conclusion and policy implications.**

Dataset, monetary policy shock and early repayments

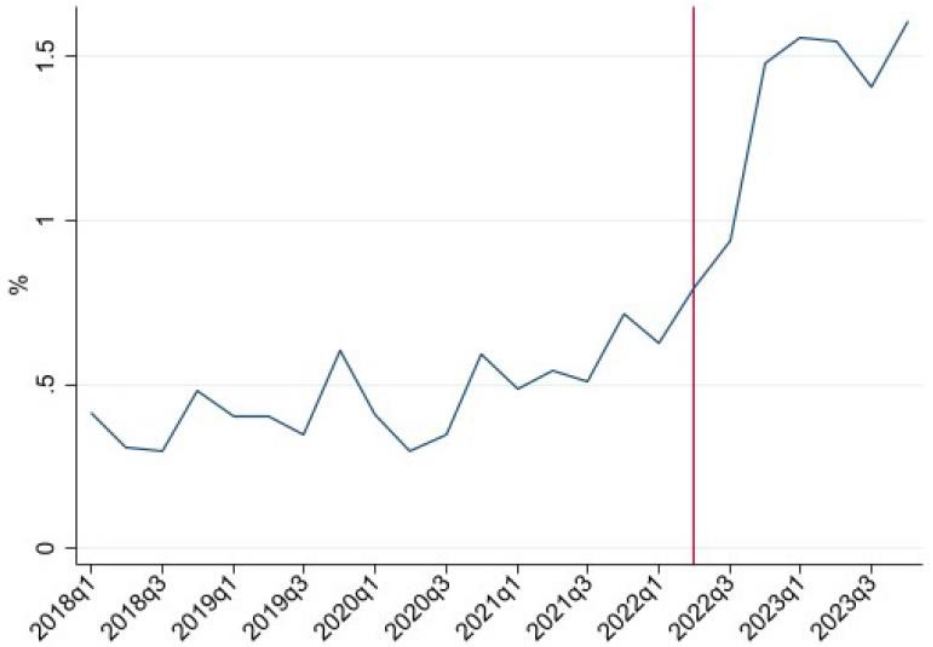
DATASET

- **Credit registry of the Banco de España (CIRBE): Monthly information on all credit exposures (to NFCs and households) of all monetary financial institutions domiciled in Spain at the contract level.**
  - **Loan characteristics at origination and information about the evolution of the contract.**
- **Central de Balances (CB): Financial statements filed by Spanish firms.**
- **Other sources : (i) Spanish bank balance sheet information and the recourse to Eurosystem funding and (ii) income at zip-code.**
- **Final sample:**
  - Sample period: December 2020 – December 2023 (6 semesters).
  - Granular information about 433,604 NFC and 65 banks.

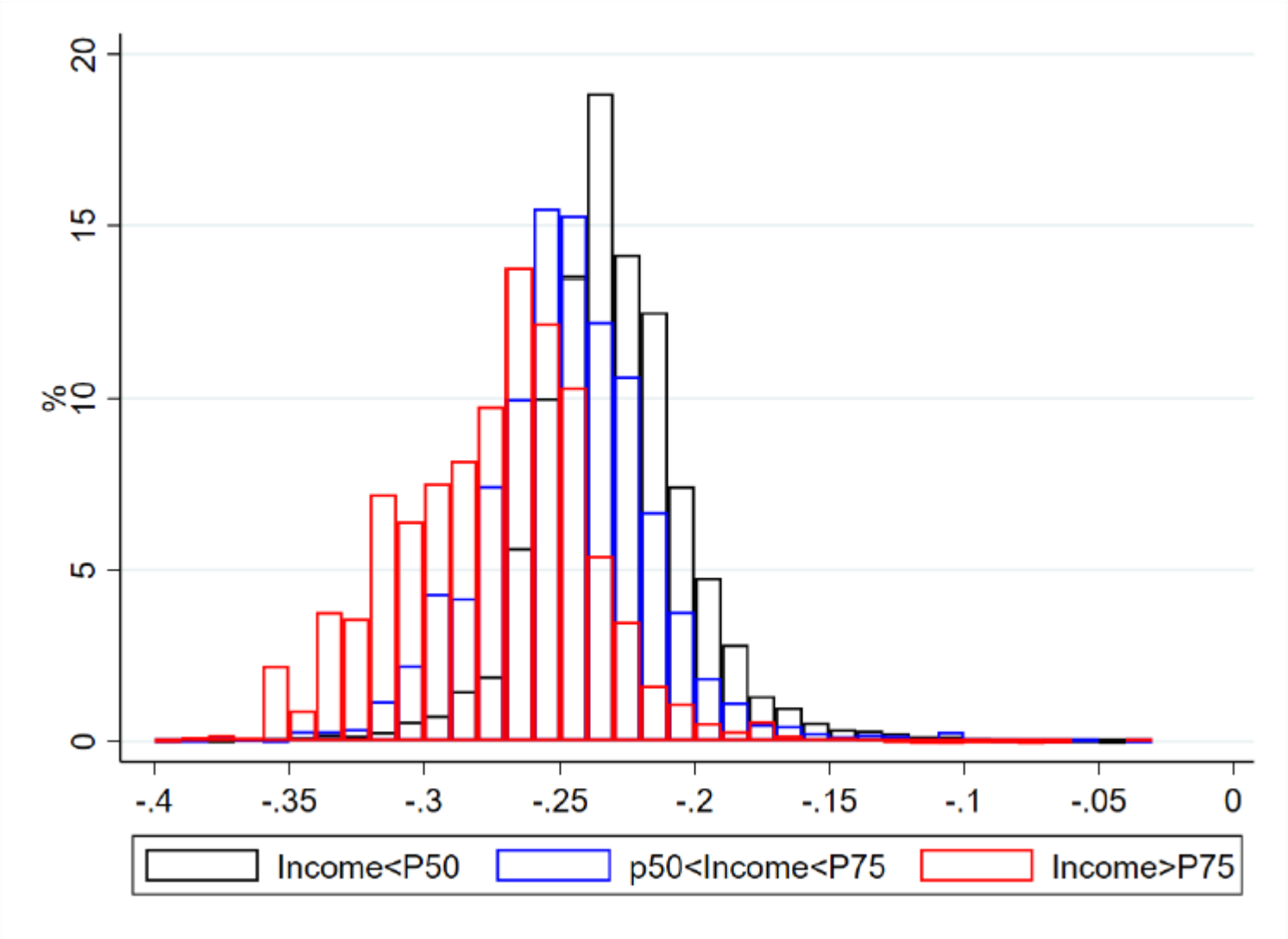
THE MONETARY POLICY TIGHTENING LEADS TO AN INCREASE IN EARLY REDEMPTIONS



- **Reference rates for floating rate mortgages experienced cumulative interest rate increases of 450 bp that led to an increase in early mortgage redemption by households.**
  - **The cumulative early redemptions in the six quarters following June 2022 amounted to 9% of the total amount outstanding.**



MORTGAGE REPAYMENTS ROSE MORE STEEPLY IN HIGH-INCOME ZIP CODES



- **Between December 2021 and December 2023, high-income zip codes experienced a steeper drop in mortgage stock than medium- or low-income areas.**

MORE EARLY REDEMPTIONS IN HIGH-INCOME ZIP CODES

Panel A: Exposure Floating Rate Mortgages and Early Redemptions	N	Below P50	Above P50	Below P75	Above P75
Floating Rate Mortgages (Dec20) (%)	65	86.33	88.35	87.80	89.11
Early Redemption (Jan21 - Jun22) (%)	65	1.99	2.33	1.93	2.58
Early Redemption (Jul22 - Dec23) (%)	65	3.97	6.78	4.33	8.55

- **The share of floating rate mortgages is similar in high- and low-income areas.**
- **Early redemptions rose sharply in high-income areas during the tightening phase, after being modest and relatively uniform across income segments beforehand.**

DESCRIPTIVE EVIDENCE AT BANK LEVEL ON THEIR EXPOSURE TO FLOATING RATE MORTGAGES IN HIGH INCOME AREAS

- **Bank (*b*) proportion of Floating Rate Mortgages (FRM) over the stock of mortgages as of Dec 2020 in high income areas (zip-code level):**

$$\text{FRM}_{b,pj} = \frac{\text{Stock of Floating Rate Mortgages in High Income Areas}_{b,pj}}{\text{Stock of Mortgages}_{b}}.$$

- **We consider alternative definitions of high-income zip codes (based on the distribution at province level - i.e., p50 and p75).**

- **Descriptive information based on 65 banks.**

Panel B: Floating-Rate Mortgages in High-Income Zip Codes over the Stock of Mortgages

	N	Mean	P50	SD	P10	P90
$\text{FRM}_{b,p50}$ (%)	65	50.45	50.54	22.77	14.20	82.68
$\text{FRM}_{b,p75}$ (%)	65	27.37	25.11	18.72	4.23	54.81

Descriptives

Banks allocation of the “extra liquidity” gathered from early mortgage repayments

REALLOCATION OF CREDIT ACROSS BUSINESS SEGMENTS BASED ON EXPOSURE TO FLOATING-RATE MORTGAGES IN HIGH-INCOME AREAS

- **We estimate the following equation of the credit dynamics at the <u>bank–zip-code level-time:</u>**

$$\Delta Credit_{zc,b,t} = \alpha_{zc,t} + \alpha_b + \beta Post_t \; x \; FRM_{b,p75} + \gamma Controls_{b,t} + \varepsilon_{zc,b,t}$$

  - $\Delta Credit_{zc,b,t}$: Semiannual growth rate in the stock of financial credit at the bank-zip code-time level
  - $FRM_{b,p75}$: Exposure of banks to floating rate mortgages in high-income areas as of December 2020
  - $Post_t$: Equals one for the period July 2022 – December 2023.
  - $Controls_{b,t}$: Bank characteristics.
  - $\alpha_{zc,t}$: Fixed effects at **zip code–time.**
  - α_b: Bank fixed–effects to control for time–invariant bank characteristics.

- **<u>Sample</u>: all bank-zip code with positive bank credit exposure during the whole sample period**

NFCS SHOWS A POSITIVE AND SIGNIFICANT ASSOCIATION WITH OUR EXPOSURE VARIABLE WHILE MORTGAGES AND CONSUMER CREDIT EXHIBIT NEGATIVE RELATIONS

	(1)	(2)	(3)
Dep. Variable		ΔCredit	
Credit Segment	NFCs	Mortgages	Consumer Credit
$Post_t \times FRM_{b,p75}$	0.033*	-0.017*	-0.182***
	[0.018]	[0.010]	[0.017]
Observations	275,520	543,198	440,610
R-squared	0.261	0.151	0.155
Bank Controls	YES	YES	YES
Bank FE	YES	YES	YES
Location-Time FE	YES	YES	YES

- **The volume of credit reallocated to firms by banks more exposed to FRM seems larger than the repayments done by corporations while for mortgages early repayments may outweigh new lending.**
  - Significant drop in mortgage demand might forced banks to redirect funds to firms. BLS
  - INE: HH not inclined to increase real consumption or borrow for consumption purposes during sample period.

NO EVIDENCE OF REALLOCATION TOWARD ALTERNATIVE INVESTMENTS

- **We also examine the relation between the alternative uses of liquidity and banks' exposure to early redemptions:**
  - Alternative uses include: (i) Fixed-income securities, (ii) investment funds, (iii) other investments, (iv) cash and cash equivalents and (v) reserves.
- **These results rule out the possibility that banks redirected liquidity from early redemptions to non-credit investments.**

Results

HOUSEHOLDS DO NOT USE BANK DEPOSITS FOR EARLY REPAYMENT OF THEIR MORTGAGES

- **Relation between deposits dynamics vs. bank exposure to floating-rate mortgages in high-income areas:**
  - Mean test based on the change in household deposits between June 2022 and December 2023 relative to total assets.

	Exposure to floating rate mortgages in high-income areas		
	High	Low	Diff
Total deposits	–0.1%	0.7%	-0.8%

- **Households shifted sight deposits into time deposits while banks did not experience overall deposit outflows.**
- **Other bank characteristics also remain consistent regardless of their exposure to floating-rate mortgages in high-income areas.**

OTHER INCOME MECHANISM FOR MORTGAGE REPAYMENTS

- **Income-consumption gap and early repayments:**
  - **High-income households (top quartile):** €12,000 income-consumption gap → enabled early repayments (average €11,900).
  - **Low-income households (first three quartiles):** Gap only €785 → early repayments difficult…
- **Wealth concentration:**
  - Households in the top quintile of net wealth held ~90% of equities and investment funds.
  - Stock market gains (Ibex35 +25%, Eurostoxx50 +35%).
- **During the tightening cycle, savings and equity/fund gains gave high-income households the liquidity to accelerate mortgage repayments.**
- **Monetary tightening raises the implicit return on mortgage repayment, inducing household deleveraging as a safe, high-yield alternative to other low-risk assets**

Anatomy of credit reallocation to NFCs

Anatomy of credit reallocation to NFCs

Baseline analysis of credit reallocation

Credit reallocation beyond traditional channels

Firm characteristics

Contract characteristics and ex-post performance

BASELINE ANALYSIS OF CREDIT REALLOCATION

- **We leverage on granular information at the bank-firm-time level to investigate the reallocation of credit from mortgages to NFCs based on the following regression:**

$$\Delta Credit_{f,b,t} = \alpha_{i,l,s,t} + \alpha_b + \beta Post_t \; x \; FRM_{b,pj} + \gamma Controls_{b,t} + \Omega \; Controls_{f,t} + \varepsilon_{fb,t}$$ **with *pj = 50, 75 and 90***

  - $\Delta Credit_{f,b,t}$: Semiannual growth rate in the stock of financial credit
  - $FRM_{b,pj}$: Exposure of banks to floating rate mortgages in high-income areas as of December 2020.
    - *pj refers to the 50th, 75th and 90th percentile of the distribution of income within a given province.*
  - $Post_t$: Equals one for the period July 2022 – December 2023.
  - $Controls_{b,t}$ and $Controls_{f,t}$: Bank and firm characteristics.
  - $\alpha_{i,l,s,t}$: Fixed effects at **industry–location–size–time.**
  - α_b: Bank fixed–effects to control for time–invariant bank characteristics.

Descriptives

- **The sample consist of 434,952 firms, 829,141 bank-firm relations, and 3,736,296 bank-firm-operation-time observations.**

BANKS WITH HIGHER EXPOSURE TO FLOATING-RATE MORTGAGES IN HIGH-INCOME AREAS TEND TO REALLOCATE MORE CREDIT TO NFCS

	(1)	(2)	(3)
Dep Variable		ΔCredit$_{f,b,t}$	
High-Income Area (pj)	50^{th} percentile	75^{th} percentile	90^{th} percentile
Post$_t$×FRM$_{b,pj}$	0.354**	0.391***	0.623**
	[0.171]	[0.139]	[0.278]
Observations	3,736,296	3,736,296	3,736,296
R-squared	0.193	0.193	0.193
Bank Controls	YES	YES	YES
Bank FE	YES	YES	YES
Firm Controls	YES	YES	YES
ILST FE	YES	YES	YES

- **During monetary tightening, semiannual credit growth to the average firm increases by 1.7% for banks with low exposure (10th percentile) and by 21.5% for banks with high exposure (90th percentile).**
- **At the aggregate level, NFCs credit declined by 4.23% (observed), compared with a 4.80% decline in the absence of the early-repayment channel.**

Rob Test

Anatomy of credit reallocation to NFCs

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OUR CHANNEL HOLDS DESPITE THE PRESENCE OF TRADITIONAL TRANSMISSION CHANNELS OF MONETARY POLICY

	(1)	(2)	(3)	(4)
Dep. Variable		ΔCredit$_{f,b,t}$		
Post$_t$×FRM$_{b,p75}$	0.399***	0.478***	0.360***	0.362***
	[0.127]	[0.144]	[0.135]	[0.114]
Post$_t$×Distance Tier 1 Capital Ratio$_b$		0.535***	0.674***	0.672***
		[0.117]	[0.147]	[0.157]
Post$_t$×Income Gap$_b$			0.152***	0.149***
			[0.052]	[0.052]
Post$_t$×Liquidity Ratio$_b$				0.244
				[0.268]
Observations	3,736,296	3,736,296	3,736,296	3,736,296
R-squared	0.192	0.193	0.193	0.193
Bank Controls	YES	YES	YES	YES
Bank FE	YES	YES	YES	YES
Firm Controls	YES	YES	YES	YES
ILST FE	YES	YES	YES	YES

- **These channels are bank's balance sheet strength (capital and liquidity) and income gap (sensitivity of the bank net interest income to changes in interest rates).**
- **The economic impact of the new channel (2.5 pp) is comparable to that of the capital (2.9 pp) and income gap (2.9 pp).**

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BANKS REALLOCATE CREDIT WITHOUT TAKING ADDITIONAL RISKS

	(1)	(2)
Definition High PD	$PD > 1.5\%$	$PD > 3\%$
Dep. Variable	$\Delta\text{Credit}_{f,b,t}$	
$\text{High PD}_{f,t}$	-0.026***	-0.053***
	[0.007]	[0.005]
$\text{Post}_t \times \text{High PD}_{f,t}$	0.010	0.005
	[0.006]	[0.006]
$\text{Post}_t \times \text{FRM}_{b,p75}$	0.397***	0.394***
	[0.139]	[0.139]
$\text{Post}_t \times \text{FRM}_{b,p75} \times \text{High PD}_{f,t}$	-0.312***	-0.178**
	[0.068]	[0.067]
Observations	3,736,296	3,736,296
R-squared	0.193	0.193
Bank Controls	YES	YES
Bank FE	YES	YES
Firm Controls	YES	YES
ILST FE	YES	YES

- **Is credit reallocation by banks with high exposure to floating rate mortgages in high-income areas linked to a risk-taking strategy.**
  - We add the firm PD and its interaction terms.
- **The estimates suggest a reallocation of lending toward safer firms among banks with higher floating-rate mortgage exposure, with no evidence of increased credit provision to riskier firms during the tightening period.**

BANKS REALLOCATE CREDIT TOWARDS MICRO/SMALL FIRMS

Dep. Variable	(1) ΔCredit$_{f,b,t}$	(2) ΔCredit$_{f,b,t}$
$Post_t \times FRM_{b,p75} \times Large_f$	0.244	0.242
	[0.147]	[0.149]
$Post_t \times FRM_{b,p75} \times SME_f$	0.406***	
	[0.140]	
$Post_t \times FRM_{b,p75} \times Small_f$		0.412***
		[0.139]
$Post_t \times FRM_{b,p75} \times Medium_f$		0.355**
		[0.167]
Observations	3,736,296	3,736,296
R-squared	0.193	0.193
Bank Controls	YES	YES
Bank FE	YES	YES
Firm Controls	YES	YES
ILST FE	YES	YES

- **Reallocation of credit flows towards SMEs, and particularly, towards small/micro firms.**
- **Suggestive evidence that banks allocate credit toward exposures with risk weights (RW) similar to those of mortgages.**
  - Average RW for mortgages ~12%.
  - Average RW for retail SME exposures ~14.5%–23%, depending on the model used.
  - Average RW for corporate SME and corporate exposures are 38% - 54% and 45% - 57%, respectively.

Anatomy of credit reallocation to NFCs

Baseline analysis of credit reallocation

Credit reallocation beyond traditional channels

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CONTRACT CHARACTERISTICS AND EX-POST PERFORMANCE

- **Using a contract-level panel of all new loans granted between 2020 and 2023, we analyze how banks adjust interest rate, maturity, size and collateral when exposed to floating-rate mortgages in high-income areas.**
  - More exposed banks shift toward **smaller and more collateralized loans**, consistent with lending to safer firms and products closer to mortgages in risk profile.

- **We also analyze loan performance (arrears within one year) to assess whether the reallocation involves additional risk-taking.**
  - We find that **small firms**—key recipients of reallocated credit—experience a **decline in arrears**, indicating that the credit shift does not worsen risk and may improve loan quality.

Loan Characteristics | Ex-post Performance

CONCLUSIONS AND POLICY IMPLICATIONS

- **We unveil the link between household-initiated bank balance sheet adjustments and the bank lending channel of monetary policy.**
  - **Monetary tightening triggers early mortgage repayments** (floating-rate, high-income households), creating a **bank liquidity shock**.
  - This shock leads to an expansion of credit to NFCs, favouring safer micro/small firms.
  - **This reallocation channel is quantitatively comparable** to traditional monetary transmission channels.
- **Aggregate effects are economically meaningful.**
  - NFC credit declined by 4.23%, compared with a 4.80% decline in the absence of the early-repayment channel.

CONCLUSIONS AND POLICY IMPLICATIONS

➔ **Central banks should account for mortgage market structure as an additional mechanism affecting monetary policy transmission**

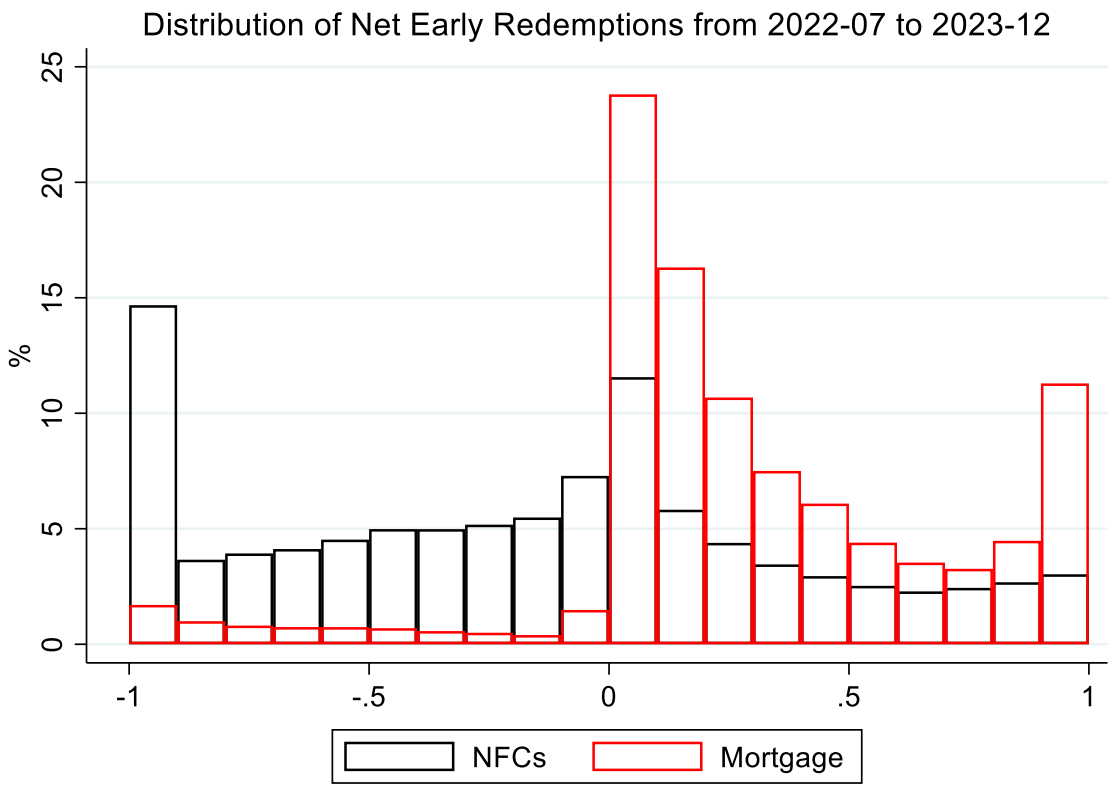
➔ **Economies with a high share of floating-rate mortgages may experience more heterogeneous transmission of monetary policy to corporate credit through liquidity reallocation**

- ➔ *Weakening* the transmission of monetary policy to firms – particularly via credit to safer micro/small
- ➔ Alleviating the financing constraints faced by these firms

➔ **<u>External validity</u>: since mid-2022, euro-area households with floating-rate mortgages—especially high-income—have accelerated principal repayments, consistent with the mechanism.**

THANKS FOR YOUR ATTENTION

BOTH HOUSEHOLDS AND NFCS REPAY THEIR DEBT EARLY, BUT ONLY THE LATTER TO DELEVERAGE THEIR NET POSITION



- **For every HH and NFCs with early redemptions during the period July 2022 – December 2023, we define the net early redemptions as:**

$$\frac{\sum_{Jul22}^{Dec23} Early\ Redemption - \sum_{Jul22}^{Dec23} New\ Credit}{Max\ Credit\ Exposure_{Jul22-Dec23}}$$

- **HH repay their mortgages early to deleverage.**
- **A significant share of NFCs repay credit yet acquire new credit.**

DESCRIPTIVE EVIDENCE ON THE CHARACTERISTICS AND CREDIT OF NON-FINANCIAL CORPORATIONS

- **We compute the semiannual growth rate in the stock of financial credit of firm *f* in bank *b*:**

$$\Delta \text{Credit}_{f,b,t} = \frac{\text{BankDebt}_{f,b,t} - \text{BankDebt}_{f,b,t-1}}{\frac{\text{BankDebt}_{f,b,t} + \text{BankDebt}_{f,b,t-1}}{2}}$$

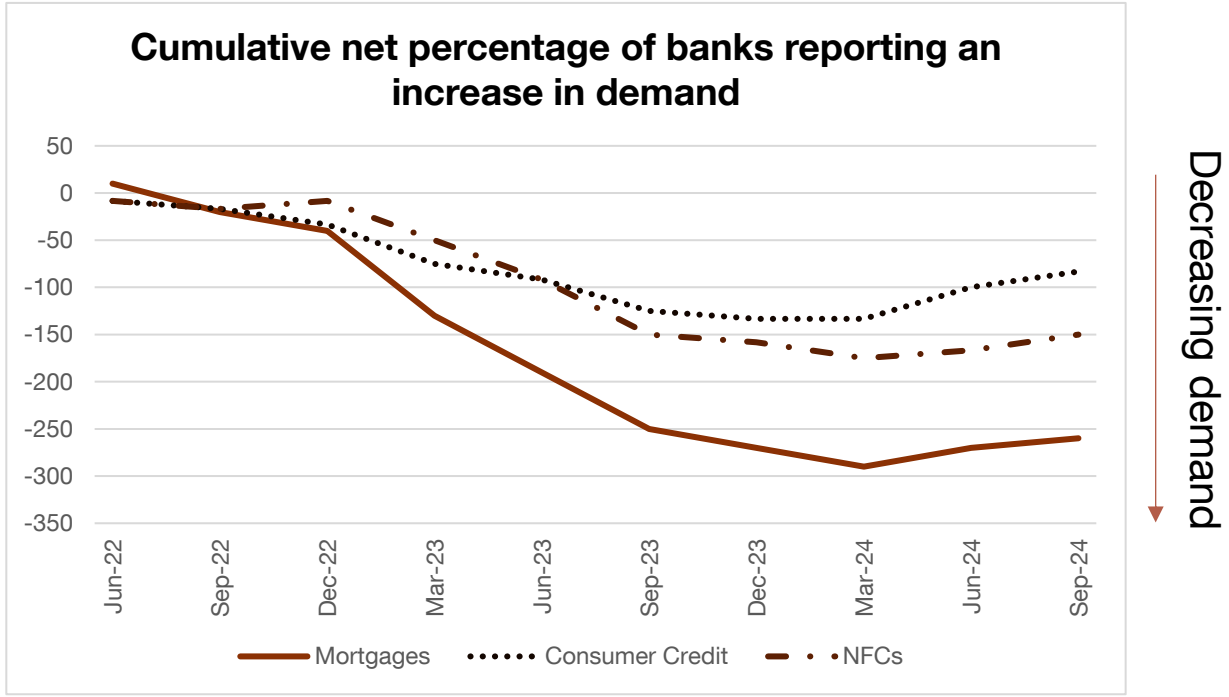
- **A general deleveraging trend is observed throughout the sample period. This trend is more pronounced after the interest rate hike.**

Panel A: $\Delta \text{Credit}_{f,b,t}(\%)$						
	N	Mean	P50	SD	P10	P90
Full sample	3,736,296	-6.25	-6.53	72.03	-49.66	36.90
Before July 2022	1,858,531	-1.32	-4.24	74.63	-45.29	57.55
After July 2022	1,877,765	-11.13	-8.70	69.02	-55.72	21.46

- **Our sample consist of 434,952 NFCs (64% micro, 24% small, 6% medium size and 6% large firms).**

Panel B: Firm Characteristcs						
	N	Mean	P50	SD	P10	P90
Net Ord Income (000€)	434,952	46.73	6.46	181.77	-34.56	132.32
Equity/TA (%)	434,952	26.91	33.47	66.41	-8.82	78.76
Cash/TA (%)	434,952	18.69	11.18	20.53	0.56	48.71
Probability of Default (%)	434,952	1.90	1.06	6.88	0.27	2.39

DEMAND CONDITIONS DURING MONETARY TIGHTENING



Source: Bank Lending Survey

- **The significant drop in mortgage demand forced banks to redirect funds to firms.**
  - The negative relation between early redemptions and new consumer credit could be explained by the high risk of this segment (not a direct substitute).

NO EVIDENCE OF REALLOCATION TOWARD ALTERNATIVE INVESTMENTS

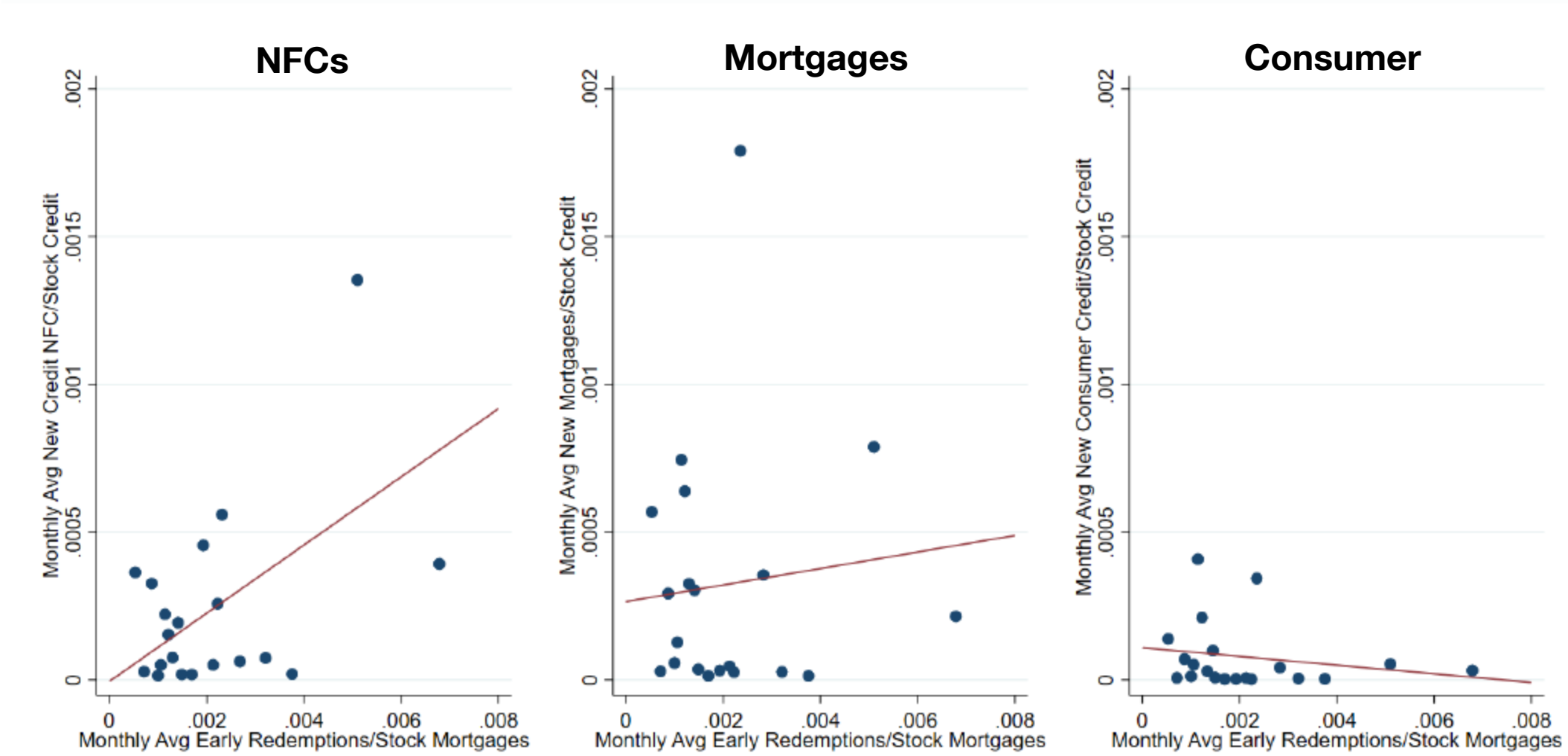
- **Alternative uses of liquidity and banks' exposure to floating rate mortgages in high-income areas:**

$$\Delta BalanceSheetItem/TA_{b,t} = \beta\, FRM_{b,p75} + \gamma Controls_{b,t} + \varepsilon_{b,t}$$

  - Change from June 2022 to December 2023 relative to the bank's total of: (i) Fixed-income securities, (ii) investment funds, (iii) other investments, (iv) cash and cash equivalents and (v) reserves.

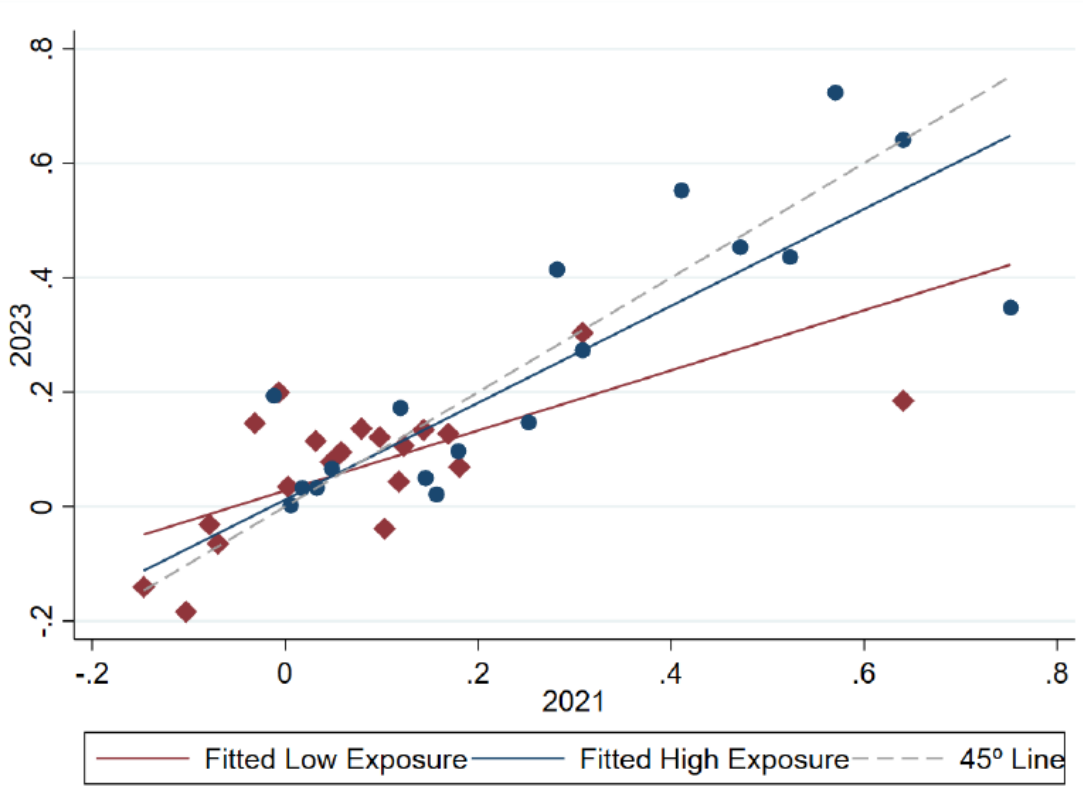
	(1)	(2)	(3)	(4)	(5)
Dep Variable	ΔDebt	ΔInvFund	ΔOther Investments	ΔCash	ΔReserves
$FRM_{b,p75}$	14.220	-0.211	-0.431	-0.000	0.221
	[9.140]	[0.484]	[0.474]	[0.112]	[0.523]
Observations	65	65	65	65	65
R-squared	0.347	0.378	0.094	0.013	0.511
Bank Controls	YES	YES	YES	YES	YES

ASSOCIATION BETWEEN NEW CREDIT AND EARLY REDEMPTIONS DEPENDING ON THE CHANGE IN BANK DEPOSITS



NO EVIDENCE OF ADDITIONAL INTEREST RATE RISK DERIVED FROM THE REALLOCATION OF CREDIT

- **Credit reallocation (mortgages → NFCs) can alter repricing timing, creating maturity mismatches and impacting banks' interest rate risk exposure (income gap).**



** Banks are split into high and low exposure based on the median share of floating-rate mortgages in high-income areas.*

- **Estimate income gap: sensitivity of the bank net interest income to changes in interest rates, function of mismatch in timing between interest rate resets on assets and liabilities.**
- **Income gap stayed stable for highly exposed banks; slightly decreased for low-exposure ones.**
  - A mean test on the change in income gap (2021–23) shows no significant differences between groups.
- **New lending practices have not disrupted the alignment of asset and liability repricing.**

RESULTS HOLD UNDER A LARGE SET OF ROBUSTNESS TEST

- **Different specifications (fixed effects)** — Rob I
- **Excluding the first semester of 2022**
- **Alternative dependent variables** — Rob II
- **Weighted panel regressions**
- **Alternative samples excluding large/small banks** — Rob III
- **Alternative definitions of the exposure to floating rate mortgages** — Rob IV
- **Time-varying allocation of credit to NFC** — Rob V

Baseline

	(1)	(2)	(3)	(4)	(5)	(6)
Dep Variable			ΔCredit$_{f,b,t}$			
Post$_t$ × FRM$_{b,p75}$	0.391***	0.475***	0.419***	0.395***	0.423***	0.429***
	[0.139]	[0.133]	[0.154]	[0.141]	[0.156]	[0.158]
Observations	3,736,296	2,603,124	3,736,240	3,736,123	3,736,069	3,733,188
R-squared	0.193	0.413	0.196	0.195	0.198	0.207
Bank Controls	YES	YES	YES	YES	YES	YES
Firm Controls	YES	NO	YES	YES	YES	YES
ILST FE	YES	NO	YES	YES	YES	YES
Bank FE	YES	YES	NO	NO	NO	NO
Firm-Time FE	NO	YES	NO	NO	NO	NO
Bank-Province FE	NO	NO	YES	NO	YES	NO
Bank-Sector FE	NO	NO	NO	YES	YES	NO
Bank-Sector-Province FE	NO	NO	NO	NO	NO	YES

ROBUSTNESS (II)

Alternative Periods, Dependent Variables and Weighting

	(1)	(2)	(3)	(4)	(5)	(6)
$\text{Post}_t \times \text{FRM}_{b,p75}$	0.391***	0.538***	1.680***	0.191**	0.763*	0.564***
	[0.139]	[0.123]	[0.567]	[0.074]	[0.425]	[0.200]
Observations	3,736,296	3,093,351	3,736,296	3,736,296	3,736,296	3,654,775
R-squared	0.193	0.195	0.188	0.195	0.264	0.224
Bank Controls	YES	YES	YES	YES	YES	YES
Firm Controls	YES	YES	YES	YES	YES	YES
ILST FE	YES	YES	YES	YES	YES	YES
Bank FE	YES	YES	YES	YES	YES	YES
Weights	NO	NO	NO	NO	Bank	Bank-ZC
Dependent variable	Baseline	Baseline	Log-change	Dummy	Baseline	Baseline

ROBUSTNESS (III)

Dealing with size

	(1)	(2)	(3)	(4)	(5)	(6)
Dep Variable	ΔCredit$_{f,b,t}$					
Sample	Baseline	Excl. Large Banks	Excl. Small Banks	Excl. Large and Small Banks	Excl. Cred. Cooperatives	Baseline
Post$_t$×FRM$_{b,p75}$	0.391***	0.312**	0.392***	0.314**	0.617**	0.562***
	[0.139]	[0.151]	[0.140]	[0.152]	[0.250]	[0.161]
Post$_t$×Ln(Total Assets)						-0.025***
						[0.005]
Observations	3,736,296	1,506,675	3,735,679	1,506,082	3,261,011	3,736,296
R-squared	0.193	0.257	0.193	0.257	0.201	0.193
Bank Controls	YES	YES	YES	YES	YES	YES
Bank FE	YES	YES	YES	YES	YES	YES
Firm Controls	YES	YES	YES	YES	YES	YES
ILST FE	YES	YES	YES	YES	YES	YES

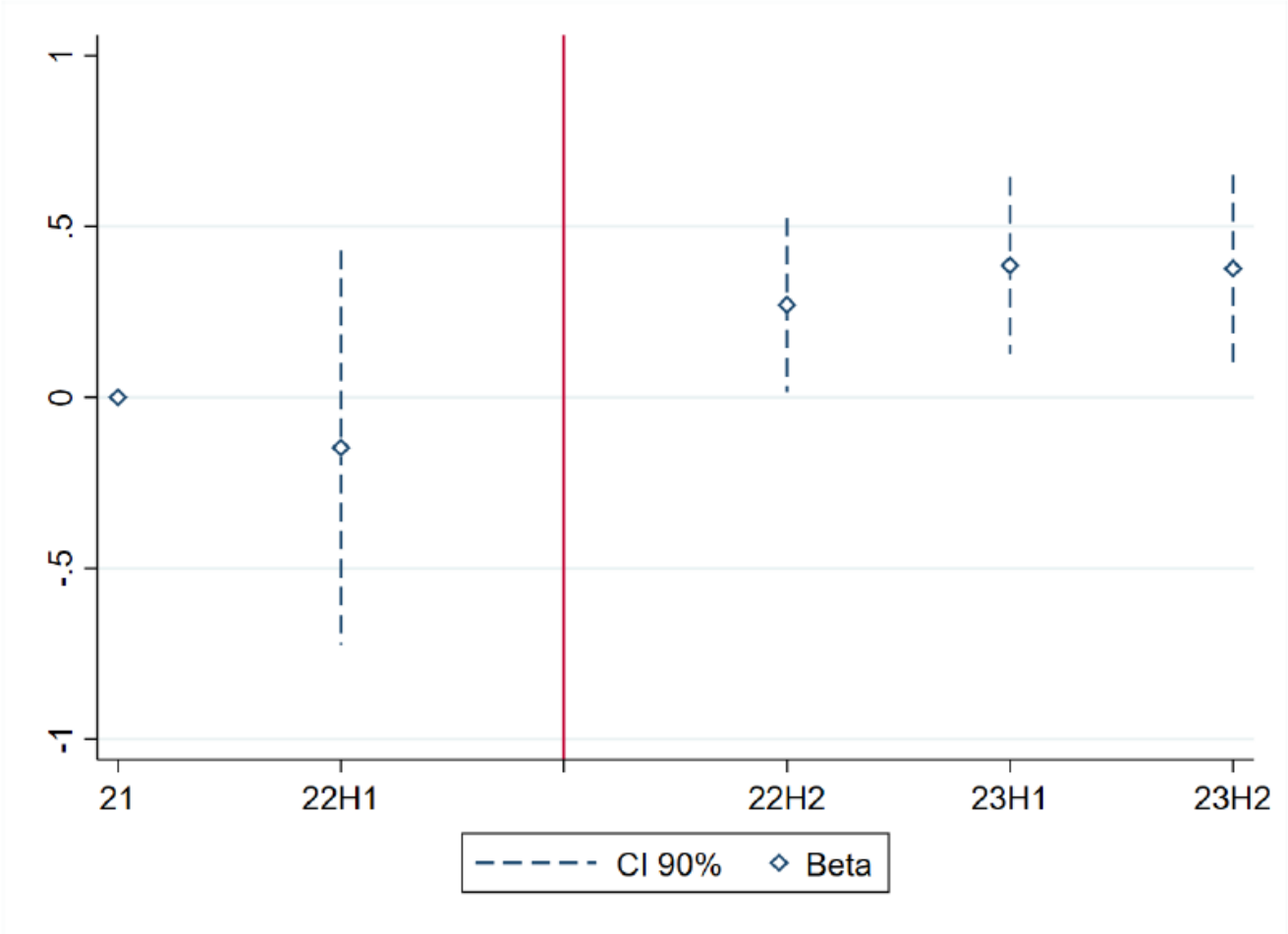
ROBUSTNESS (IV)

Alternative Exposure Variable

	(1)	(2)	(3)
Dep Variable		$\Delta\text{Credit}_{f,b,t}$	
$\text{Post}_t \times \text{FRM}_{b,pj}$	0.391***	0.631***	0.392**
	[0.139]	[0.212]	[0.169]
Observations	3,736,296	3,736,296	3,736,296
R-squared	0.193	0.193	0.193
Bank Controls	YES	YES	YES
Firm Controls	YES	YES	YES
ILST FE	YES	YES	YES
Bank FE	YES	YES	YES
Scaling Factor	Mortgages	TA	Mortgages
Geographic Scope of Threshold	Province	Province	National

ROBUSTNESS (V)

Time-varying allocation of credit to nfcs



CONTRACT CHARACTERISTICS

- **We construct a new panel at the <u>contract level</u> (c) based on all new operations of financial credit granted from December 2020 to December 2023.**

$$Characteristic_{c,f,b,t} = \alpha_{ilst} + \alpha_b + \beta Post_t \; x \; FRM_{b,p75} + \gamma Controls_{b,t} + \Omega \; Controls_{f,t} + \varepsilon_{cfbt}$$

- **We consider four alternative contract characteristics:**
  - Interest rate (in %).
  - Maturity at origination (logarithm of the maturity in months).
  - Size (logarithm of the total amount granted in euros).
  - Presence of collateral (represented as a dummy variable).
- **The sample consist of 134,064 firms, 215,986 bank-firm relations, and 2,947,795 bank-firm-operation-time observations.**
  - Approximately 57% of these new contracts have maturities shorter than three months.
    - *We also analyze a more restrictive subsample of contracts with maturities longer than 3 months.*

BANKS MORE EXPOSED TO FLOATING RATE MORTGAGES IN HIGH-INCOME AREAS PROVIDE SMALLER AND COLLATERALIZED LOANS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dep Variable	Interest rates		Log(Maturity)		Log(Amount)		Collateral	
Sample	All	> 3M	All	> 3M	All	> 3M	All	> 3M
$Post_t \times FRM_{b,p75}$	-1.834	-0.574	-0.083	-1.047***	-1.090**	-2.355***	0.089***	0.069
	[1.146]	[1.111]	[0.299]	[0.308]	[0.476]	[0.404]	[0.028]	[0.044]
Observations	2,947,795	1,208,685	2,947,795	1,208,685	2,947,795	1,208,685	2,947,795	1,208,685
R-squared	0.684	0.689	0.666	0.756	0.674	0.703	0.870	0.898
Bank Controls	YES	YES	YES	YES	YES	YES	YES	YES
Firm Controls	YES	YES	YES	YES	YES	YES	YES	YES
Bank FE	YES	YES	YES	YES	YES	YES	YES	YES
ILST FE	YES	YES	YES	YES	YES	YES	YES	YES

EX-POST PERFORMANCE

- **We leverage the new <u>contract-level</u> (c) panel to study the ex-post performance of the new credit during the first year.**

$$Dummy\ Arrears_{c,f,b,t} = \alpha_{i,l,s,t} + \alpha_b + \beta Post_t\ x\ FRM_{b,p75} + \gamma Controls_{b,t} + \Omega\ Controls_{f,t} + \varepsilon_{c,f,b,t}$$

  - $Dummy\ Arrears_{c,f,b,t}$: dummy variable equal to one if the loan falls into arrears in any month within the first year after origination, and zero otherwise.

- **We conduct this analysis for the whole sample of contracts and the subsample with maturities longer than three-months.**
- **We extend this analysis:**
  - Adding firm size variables.
  - Collapsing the information at bank-firm-time level.

SMALL-FIRMS—KEY BENEFICIARIES OF THE LIQUIDITY REALLOCATION HAVE SHOWN A SIGNIFICANT DECLINE IN ARREARS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dep Variable				Dummy Arrears				
Unit of Analysis		Contract Level				Bank-Firm Level		
Sample	All	> 3M	All	> 3M	All	> 3M	All	> 3M
$Post_t \times FRM_{b,p75}$	-0.031	-0.040			-0.066***	-0.063		
	[0.022]	[0.037]			[0.021]	[0.041]		
$Post_t \times FRM_{b,p75} \times Small_f$			-0.086***	-0.118***			-0.133***	-0.134***
			[0.024]	[0.037]			[0.028]	[0.034]
$Post_t \times FRM_{b,p75} \times Medium_f$			0.081	0.083			0.094	0.089
			[0.067]	[0.108]			[0.091]	[0.128]
$Post_t \times FRM_{b,p75} \times Large_f$			0.019	0.042			0.106	0.082
			[0.068]	[0.082]			[0.085]	[0.108]
Observations	2,947,795	1,208,685	2,947,795	1,208,685	741,112	306,496	741,112	306,496
R-squared	0.531	0.582	0.531	0.582	0.428	0.487	0.429	0.487
Bank Controls	YES	YES	YES	YES	YES	YES	YES	YES
Firm Controls	YES	YES	YES	YES	YES	YES	YES	YES
Bank FE	YES	YES	YES	YES	YES	YES	YES	YES
ILST FE	YES	YES	YES	YES	YES	YES	YES	YES