

A Geopolitical Shock to Bank Assets and Monetary Policy Transmission

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Part 1

Motivation

Geopolitics is back at the centre of macro policy

- **2022:** Russia invades Ukraine; G7 sanctions freeze Russian assets
- **2023–2024:** Israel–Gaza war; Houthi attacks disrupt Red Sea shipping
- **2024:** Iran–Israel exchanges; renewed oil-price spikes
- **2025–2026:** US–Venezuela tension; deepening US–China trade conflict
- **2026:** Strait of Hormuz tensions; recurrent disruption risk

Central banks face the same question every time:

Look through the shock, or lean against it?

The standard view: geopolitics as supply shock

The dominant narrative since 2022: *geopolitical events raise energy prices, disrupt supply chains, and drive cost-push inflation.*

“The combination of base effects, the easing of supply bottlenecks . . . will contribute to inflation falling back over time . . . The monetary policy challenge is to assess the strength and persistence of the cyclical adjustment dynamics.”

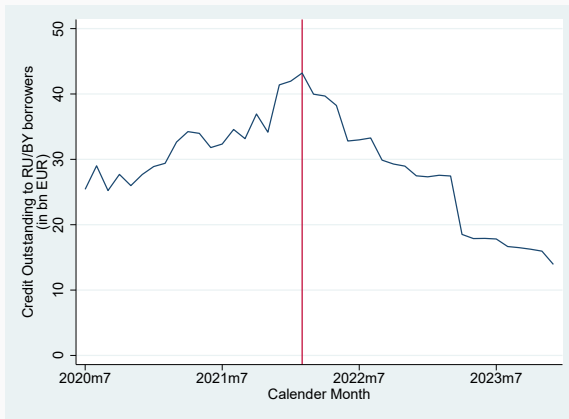
Philip Lane, ECB Executive Board, CEBRA 2022.

Policy prescription: *“Look through the supply shock unless inflation becomes persistent.”*

This view treats geopolitics as a shock to aggregate *supply*.

It misses a potential demand-side channel.

But banks were sitting on billions of Russian credit



Euro-area banks' outstanding credit to Russian/Belarusian borrowers. Source: AnaCredit.

**Geopolitical shocks are also *asset* shocks for banks –
and that impacts *aggregate demand*.**

Part 2

Preview of Main Findings

Three findings

1. Silent Tightening *(before any ECB action)*

Depositor discipline raises funding costs at exposed banks; lending contracts as a result. For exposed banks' customers: ≈ 43 bp implicit policy-rate equivalent (≈ 5.4 bp economy-wide).

2. Amplified MP Transmission *(during the hiking cycle)*

The same exposed banks pass each ECB hike on with extra force. Differential: $+20$ bp on deposit rates and $+30$ bp on loan rates per $+100$ bp of ECB policy tightening.

3. Real Effects *(downstream consequence)*

Firms borrowing from exposed banks contract total credit, assets, turnover, employment, and investment: the downstream consequence of the funding shock and the lending contraction.

Part 3

Outline - Research Questions

Does a geopolitical shock to bank assets affect monetary conditions through the banking system?

We answer this in four steps that follow the timeline of the shock:

1. Does the asset shock disrupt bank **funding** (deposits) in the period *before* any ECB action?
2. Does the funding stress translate into a **lending** contraction in the same pre-hike period?
3. Does balance-sheet weakness **amplify** the transmission of the subsequent ECB hiking cycle?
4. Do these mechanisms translate into measurable **real effects** at the firm level?

Each step maps to one block of the empirical analysis.

Motivation

Preview of Main Findings

Outline - Research Questions

Literature & Contribution

Data & Identification

Deposit Market Results

Lending Channel

Silent Tightening

Monetary Policy Transmission

Real Effects

Conclusion

Part 4

Literature & Contribution

Three literature strands, one holistic paper

Geopolitical Risk

How geopolitical shocks are measured and how they hit trade, prices, and the macroeconomy.

Caldara & Iacoviello (2022)

Federico et al. (2025) etc.

Stops at the aggregate level: the banking system is absent.

Bank Lending Channel

How bank balance-sheet shocks pass into credit supply and the real economy.

Kashyap & Stein (2000)

Jimenez et al. (2012) etc.

Has no geopolitical trigger: shocks come from financial crises or funding runs.

MP Transmission

How bank heterogeneity shapes the pass-through of policy rates to deposit and loan rates.

Drechsler-Savov-Schnabl (2017)

Altavilla et al. (2019)

Jarocinski & Karadi (2020) etc.

Takes bank weakness as given: its origin is left unexplained.

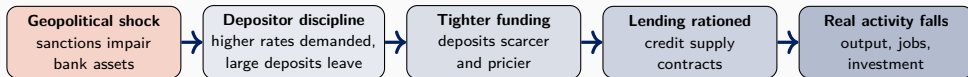


This paper connects the three strands into one chain: a geopolitical shock impairs bank assets, depositor discipline turns it into a funding shock, lending contracts, and the weakened banks reshape how monetary policy reaches the economy. ($\neq$ Niepmann & Shen 2025)

Feasible because we observe both sides of the bank balance sheet at the transaction level, for the same banks, through the shock *and* the hiking cycle.

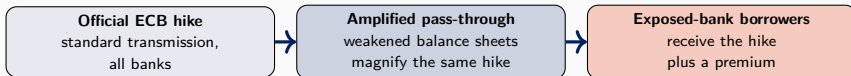
The mechanism, and our four contributions

Phase 1, before any ECB action. The shock alone already tightens monetary conditions:



This is a Silent Tightening: conditions tighten as if policy had moved, yet no central bank has acted.

Phase 2, once the ECB starts hiking. The same weakened banks transmit policy with extra force:



Our four contributions map onto this chain: (1) the *Silent Tightening* (Phase 1); (2) the *amplified* pass-through of later hikes (Phase 2); (3) *real effects* on firms (end of Phase 1); (4) a *geopolitics-adjusted Taylor rule*.

The first complete micro-chain, both balance-sheet sides, for a *realized* geopolitical shock.

Part 5

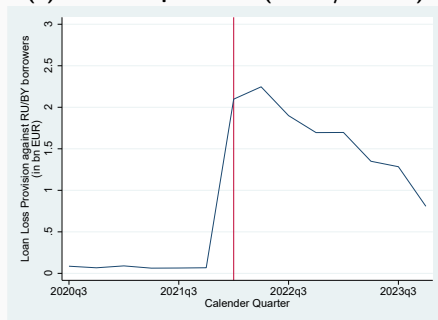
Data & Identification

The shock was real, exogenous, and varied across banks

Why the 2022 invasion identifies a clean balance-sheet shock:

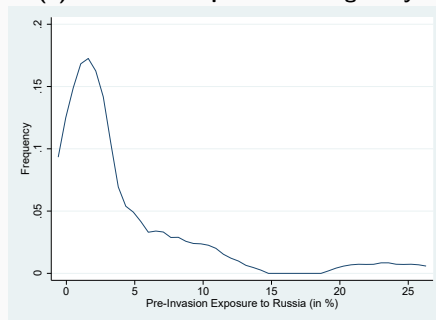
- **Unanticipated, exogenous** to euro-area balance sheets, **sharp date** (Feb 24, 2022)
- Treatment: $Exp_b^{Russia} = \overline{(\text{Loans} + \text{Bonds})}_b^{Russia} / \overline{\text{Book Equity}}_{b,2021}$ (pre-war fixed, standardised)

(a) Loan loss provisions (Russia/Belarus)



Surged to ~€2 bn within a year. Source: AnaCredit.

(b) Cross-bank exposure heterogeneity



Kernel density, exposure/equity, conditional on non-zero.

Banks really had to absorb the loss; exposure varies enough to identify causal effects.

Data: granular Eurosystem micro-data

Source	Granularity	Coverage
MMSR	transaction-level NFC deposits	31 banks, 720 firms, 29k obs. (9.5% TA)
AnaCredit	loan-level NFC credit	31 banks, 900k firms, 14M loans (13.5% TA)
SHS-G	security-level bond holdings	all euro-area significant banks
iMIR	bank-level rates and volumes	144 euro-area banks (representative)
iBSI	bank balance-sheet items	all euro-area reporting banks

31 banks = euro-area MMSR + German MMSR add-on; results are robust to excluding the German subset.

Unique feature: we observe both sides of the bank balance sheet – deposits *and* loans – at the transaction level, simultaneously.

Sample period: March 2021 – February 2023 (symmetric around the invasion).

Identification: continuous DiD with saturated FE

Baseline equation (bank-firm-day for deposits; bank-firm-month for loans):

$$Y_{b,f,t} = \beta \cdot \text{Post}_t \cdot \text{Exp}_b^{\text{Russia}} + \gamma X_{b,t-1} + \alpha_{b,f} + \alpha_{f,t} + \epsilon_{b,f,t}$$

- $\alpha_{b,f}$: bank-firm FE absorb time-invariant relationship features
- $\alpha_{f,t}$: firm-time FE absorb depositor / borrower demand (Khwaja-Mian)
- β : differential effect of the geopolitical shock on *exposed* vs. *non-exposed* banks for the *same* counterparty

Dynamic version: LP-DiD traces the response over time; the transmission part interacts exposure with policy changes.

Part 6

Deposit Market Results

Exposed banks pay higher deposit rates

$$\text{DiD: } r_{D,b,f,t} = \beta \cdot \text{Post}_t \cdot \text{Exp}_b^{\text{Russia}} + \gamma X_{b,t-1} + \alpha_{b,f} + \alpha_{f,t} + \epsilon_{b,f,t}$$

Dep. variable: deposit rate (bp)	(1) Bank FE	(6) Firm×Time FE	(7) WLS
$\text{Post} \times \text{Exp}_b^{\text{Russia}}$	1.07*** (3.49)	0.52*** (5.39)	0.62*** (5.76)
Bank×Firm FE	–	Yes	Yes
Firm×Time FE	–	Yes	Yes
Bank controls	Yes	Yes	Yes
Observations	29,719	29,719	29,719

- Col. (6): *same* firm on the *same* day, exposed vs. non-exposed bank $\Rightarrow$ identification off pure bank-side variation
- Effect = **21% of within firm-time dispersion** in deposit rates

Depositor discipline on prices: the same firm earns a higher rate at the more exposed bank.

Exposed banks lose deposits at the large-depositor margin

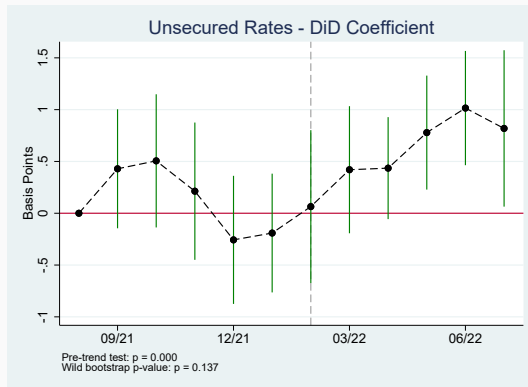
Account-level evidence on extensive margin (Tab. 4) and bank-aggregate volume (Tab. 5).

Outcome (Dep. variable)	Coefficient	t-stat	FE
<i>Extensive margin (bank-firm-day)</i>			
P(new deposit), full sample	~ 0 (ns)	1.10	Firm $\times$ Time
P(new deposit) $\times$ Large depositor	-0.060^{***}	-3.56	Firm $\times$ Time
<i>Aggregated to bank-day</i>			
log(deposit volume)	-0.051^{**}	-2.73	Bank, Time

- Large depositors react ~ 6 pp more strongly than small ones to bank exposure
- Bank-aggregate deposit volume falls by $\sim 5\%$ – economically substantial

Depositor discipline on quantities: precisely the depositors whose balances matter withdraw from exposed banks.

Event study with pre-trends



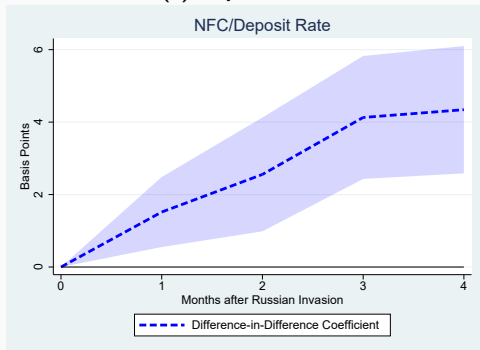
- Pre-period coefficients oscillate mildly around zero; no systematic trend
- Pre-trend joint test: the asymptotic version over-rejects with 31 clusters; wild cluster bootstrap $p = 0.137$
- Post-invasion rates rise to **+0.8 – 1.1 bp** by May / June 2022

Visual evidence for parallel trends. Same pattern for loan volumes → Appendix A7.

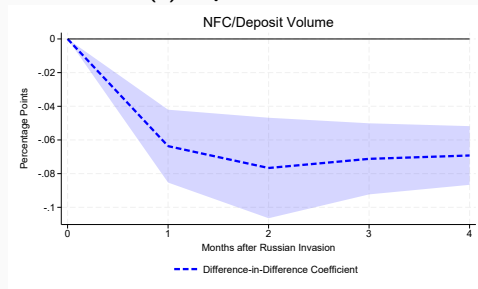
Aggregate validation: iMIR confirms the deposit findings

Local projection on the broader iMIR sample (144 euro-area banks vs. 31 in MMSR). Same exposure measure, monthly bank-level data.

(a) Deposit rates



(b) Deposit volumes



- Rates rise up to **+4 bp**, volumes fall up to **-8%** within the first quarter

External validity: same sign and magnitude on the 5× larger sample; the MMSR finding is not an artefact of the 31-bank window.

Identification: addressing the common concerns

Concern	What we find
Selection, observable and unobservable	Effect holds in matched sample (PSM / IPW); unobservables cannot plausibly overturn it (Oster 2019)
SUTVA / spillovers	No offsetting inflows at non-exposed banks
Small- N inference (~ 31 banks)	Significant under wild cluster bootstrap and random treatment assignment
Concentration and dose-response	No single bank drives the result (leave-one-out); effect rises with exposure intensity

Major concerns can be ruled out. The headline result survives.

Parallel trends: previous slide. Covid placebo and full details → Appendix A5–A17.

Part 7

Lending Channel

Exposed banks reduce lending

Same DiD on AnaCredit loan-level data; sample of active bank-firm pairs with any new loan in the post-period.

Dep. variable: $\log(\text{loan volume})$	(3) ICST FE	(4) Firm $\times$ Time FE
Post $\times$ Exp_b^{Russia}	−0.0120** (−2.21)	−0.0402*** (−4.71)
Bank $\times$ Firm FE	Yes	Yes
Firm $\times$ Time FE	–	Yes
Observations	3,200,158	308,380

ICST = Industry $\times$ Country $\times$ Size $\times$ Time FE, following Degryse et al. (2019). Column (3) retains single-bank firms; column (4) is the Khwaja-Mian within-firm specification.

- Quantity rationing; no systematic loan-rate repricing; externally validated on the broader iMIR sample (Appendix A19)

The funding shock reaches the asset side: exposed banks ration credit.

Tighter funding causes the lending contraction

Identification challenge: is the lending decline driven by the funding shock, or by something co-moving with exposure?

We isolate the *geopolitically-driven* component of each bank's deposit-rate change in the 5 days around the invasion. Only this component predicts lending cuts; the restricted prediction (without exposure) does not.

Effect of Δr_b^{inv} on lending	raw	geopolitical component	restricted (no exposure)
Coefficient	−0.013**	−0.011**	−0.002 (n.s.)

2SLS confirms the direction: weak-IV-robust Anderson-Rubin $p = 0.015$.

raw: observed deposit-rate change around the invasion. *geopolitical component:* projected on Exposure. *restricted:* projected on pre-war bank controls only (size, capital, funding mix, risk), *without* Exposure.

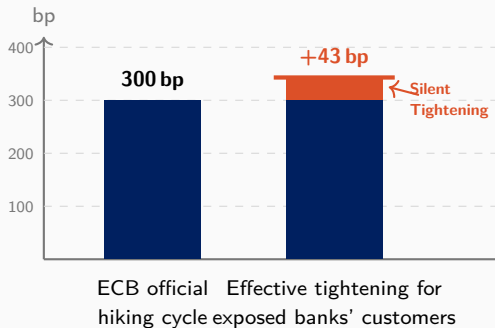
The *geopolitically-driven* part of funding costs causes the lending contraction.

Part 8

Silent Tightening

Silent Tightening: ~ 43 bp of *implicit* tightening

Aggregating bank-level funding-cost effects, benchmarked against the common deposit-rate pass-through (Chodorow-Reich 2014; Federico, Hassan & Rappoport 2025). Baseline group: high-exposure banks ($>5\%$ of book equity).



How we arrive at ~ 43 bp:

$$\Delta r_p^{\text{equiv}} = \frac{C_{\text{Shock}}}{C_{\text{MP}}^{\text{per bp}}} \approx 43 \text{ bp}$$

economy-wide: $\approx 5.4 \text{ bp}$ [0.8; 13.4]

C_{Shock} ($\sim \text{€}414 \text{ mn}$): funding-cost increase from the shock alone, high-exposure banks ($>5\%$ of equity), four pre-hike months.

$C_{\text{MP}}^{\text{per bp}}$: funding costs per +1 bp of policy, transmitted through the common pass-through over a four-month horizon.

Economy-wide: computed on all euro area deposits; bootstrap 95% CI [0.8; 13.4], bootstrap $p = 0.014$; stable at 3–10 bp across all material-exposure definitions.

~ 43 bp implicit tightening for exposed banks' customers before any ECB action; ~ 5.4 bp economy-wide.

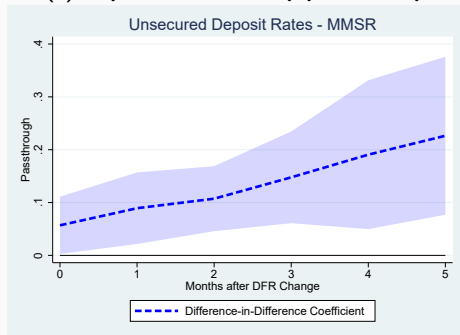
Part 9

Monetary Policy Transmission

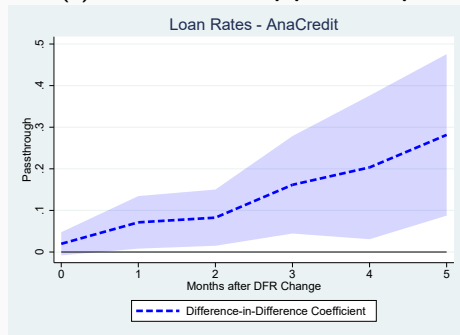
Amplified pass-through: each hike hits exposed banks harder

LP-DiD with $\sum_k \Delta MP_{t-k} \times Exp_b^{Russia}$; full sample through 2023. Robust to high-frequency MP surprises (Jarocinski-Karadi 2020).

(a) Deposit rates: +20 bp per +100 bp



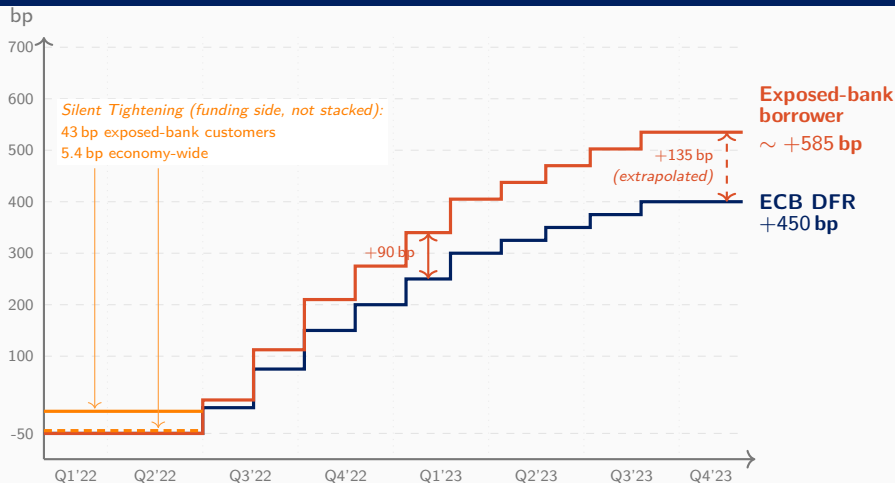
(b) Loan rates: +30 bp per +100 bp



- Differential builds over time for both deposits and loans
- Per +100 bp ECB hike: +20 bp extra on deposit rates, +30 bp extra on loan rates

Weakened balance sheets amplify policy on both rate margins.

Effective tightening at exposed-bank borrowers



+30 bp per +100 bp loan-rate amplification ($1.3\times$ pass-through): **+90 bp** in-sample, **~ +135 bp** extrapolated over the full cycle (borrower ~ +585 bp vs. ECB +450 bp cumulative).

Funding-side Silent Tightening (43 bp pre-hike) shown unstacked; the two channels are not additive.

Geopolitics-adjusted Taylor rule: numerical example

Standard Taylor rule: calibrated to the observed 2022-2023 ECB cycle peak ($r_p^* \approx +400$ bp); applied to the ECB's *first* step (July 2022, +50 bp), the reference point closest in time to the silent tightening.

How much of its own did the ECB need? Net the banking-channel tightening out of the desired first-step tightening of 50 bp:

$$\underbrace{50 \text{ bp}}_{\text{tightening the ECB wants}} - \underbrace{\Delta r_N^{\text{equiv}}}_{\text{silent tightening } \approx 5.4 \text{ bp}} - \underbrace{\text{amplification}}_{\text{arriving with the step } \approx 1-2 \text{ bp}} \Rightarrow \underbrace{\approx 43.5 \text{ bp}}_{\text{ECB's own step needed}}$$

The banking channel does part of the tightening, so the ECB can do less.

To deliver the same 50 bp, the ECB's own step needed to be only ~ 43.5 bp; exposed banks supplied the other $\sim 13\%$.

This is the central bank's *own* dose; exposed-bank customers still *experience* more tightening, not less (the counterfactual chart). The two questions carry opposite signs.

Part 10

Real Effects

Real Effects on firms: the chain reaches the real economy

Firm-level analysis; firm exposure = loan-weighted bank exposure. Annual data centered on the invasion period (AnaCredit and JANIKA).

	(1) Loan Volume	(2) Employees	(3) Balance Sheet	(4) Turnover	(5) Investment
$\overline{Exp}_f^{Russia}$	-0.0050*** (-3.82)	-0.0081*** (-4.77)	-0.0115*** (-7.77)	-0.0189*** (-5.88)	-0.0928*** (-3.11)
Adj. R^2 (%)	4.48	4.08	3.35	3.40	0.47
Obs	173,349	173,349	173,349	173,349	4,808
Controls	Yes	Yes	Yes	Yes	Yes
ICS FE	Yes	Yes	Yes	Yes	Yes

t-stats in parentheses; SEs clustered at industry-size-country level.

- Firms cannot fully substitute the lost credit from exposed banks
- Annual outcomes capture the downstream effects of the credit contraction
- Mechanism chain: *shock* → *funding* → *lending* → *real activity*

Finding 3: measurable real economic consequences.

Part 11

Conclusion

- 1. Silent Tightening.** A geopolitical shock to bank assets tightens funding conditions before any ECB move: ~ 43 bp policy-rate equivalent for exposed-bank customers (~ 5.4 bp economy-wide).
- 2. Amplified transmission.** The same weakened banks pass each later hike on with extra force: $+20$ bp on deposits and $+30$ bp on loans per $+100$ bp.
- 3. Real effects.** Firms tied to exposed banks contract credit, investment, and employment.
- 4. Policy.** A geopolitics-adjusted Taylor rule nets out the banking-channel tightening: the ECB's own first step needed to be only ~ 43.5 of 50 bp.

Geopolitics is also a financial channel.
Monetary policy needs to acknowledge it.

Appendix

Material for Q&A

A1–A4	Model derivations
A5–A11	Identification & robustness deep-dive
A12–A15	Additional results
A16–A17	Frequently anticipated questions
A18	Niepmann & Shen side-by-side comparison
A19	iMIR validation: lending contraction

A1. Bank balance sheet under the shock

Pre-shock ($t = 0$):

$$L_b + e_b = D_b + K_b$$

Post-shock ($t = 1$): sanctions force write-off of $\alpha \cdot e_b$:

$$L_b + (1 - \alpha) e_b = D_b + \underbrace{(K_b - \alpha e_b)}_{\tilde{K}_b}$$

What changes:

- Equity falls by $\alpha \cdot e_b$ (the mechanical write-off)
- Asset side mechanically reduced
- Leverage rises: $\Lambda_b = (L_b + (1 - \alpha)e_b)/\tilde{K}_b$
- Deposits and lending re-equilibrate through depositor discipline (Pred. 1) and bank optimisation (Pred. 2)

Notation matches the paper; α is exogenous, fixed by the sanctions regime.

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A2. Deposit supply micro-foundation

Risk-averse corporate depositors maximise mean-variance utility:

$$U_f = E[r_D \cdot D_f^d] - \frac{\rho}{2} \sigma_{R_b}^2 (D_f^d)^2$$

where ρ is risk aversion and $\sigma_{R_b}^2$ rises with bank leverage Λ_b .

Linearised FOC gives the supply curve used in the paper:

$$D_b^S(r_D, \Lambda_b) = d_0 + d_1 r_D - d_2 \Lambda_b, \quad d_1, d_2 > 0$$

Net outflow condition (Prediction 1, extensive margin):

$$d_2 \cdot \frac{D_b}{K_b} > d_1 \cdot \varphi$$

holds when risk aversion dominates rate sensitivity, which is empirically true at exposed banks.

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A3. Period-2 deposit rate: amplification term

Period-2 deposit rate after equity depleted by both shock and duration:

$$r_{D,2}(b) = \bar{r}_D + \Delta r_p + \varphi \cdot \frac{\alpha e_b}{\tilde{K}_{b,2}}$$

where $\tilde{K}_{b,2} = \tilde{K}_b - \theta \cdot \Delta r_p \cdot L_b$ (duration θ marks bonds down).

First-order Taylor expansion of $1/\tilde{K}_{b,2}$ around $\theta \Delta r_p = 0$:

$$\frac{1}{\tilde{K}_{b,2}} \approx \frac{1}{\tilde{K}_b} \left(1 + \frac{\theta \Delta r_p L_b}{\tilde{K}_b} \right)$$

$\Rightarrow$ **Period-2 deposit rate:**

$$r_{D,2}(b) \approx \bar{r}_D + \Delta r_p + \underbrace{\varphi \frac{\alpha e_b}{\tilde{K}_b}}_{\delta_b} + \underbrace{\varphi \theta L_b \frac{\alpha e_b}{\tilde{K}_b^2}}_{\psi(b)} \cdot \Delta r_p$$

A4. Silent Tightening: full derivation

Aggregate direct funding cost of the geopolitical shock (four pre-hike months, high-exposure banks >5% of equity):

$$C_{\text{Shock}} = \sum_t \sum_i D_i \cdot \text{Exp}_i \cdot \beta_{\text{Shock},t} \approx \text{€}414 \text{ mn}$$

Benchmark: common pass-through (per +1 bp of policy, same horizon; *excludes* amplification):

$$C_{\text{MP}}^{\text{per bp}} = \sum_t \sum_i D_i \cdot \beta_{\text{MP},t}$$

Silent Tightening equivalent:

$$\Delta r_p^{\text{equiv}} = \frac{C_{\text{Shock}}}{C_{\text{MP}}^{\text{per bp}}} \approx 43 \text{ bp within-exposed, } \approx 5.4 \text{ bp economy-wide [0.8; 13.4]}$$

Geopolitics-adjusted Taylor rule (measured loan weights ω_b^L , AnaCredit):

$$r_p^{*,\text{geo}} = r_p^* - \Delta r_N^{\text{equiv}} - \sum_b \omega_b^L \psi(b) \Delta r_p \frac{\alpha e_b}{K_b}$$

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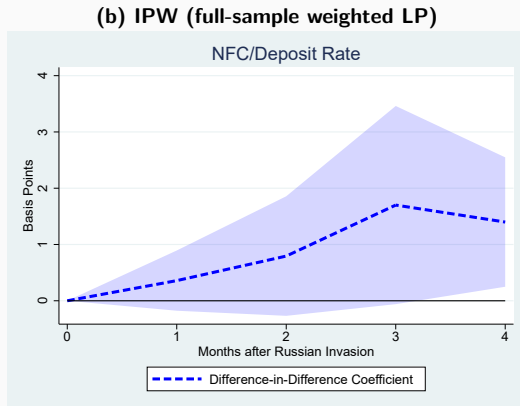
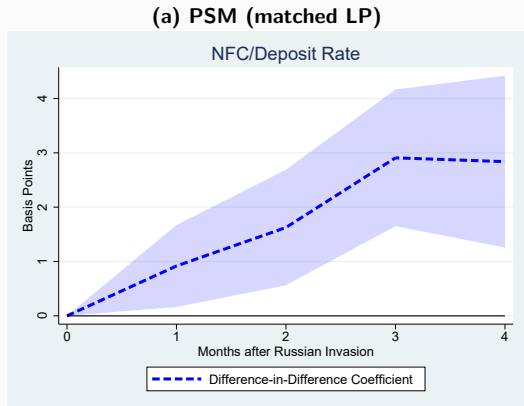
A5. PSM balance: pre- vs. post-match

Variable	Sample	Treated	Control	% Bias
Log(Total Assets)	U	11.61	10.33	97.3
	M	11.47	11.20	20.7
Equity ratio	U	8.03	10.01	-49.4
	M	8.29	8.20	2.2
Deposit ratio	U	39.56	55.17	-83.7
	M	42.36	41.94	2.2
Loan ratio	U	35.73	47.45	-76.2
	M	37.42	37.86	-2.9
Bond ratio	U	8.77	12.09	-47.8
	M	9.25	7.79	21.1
Reserve ratio	U	17.78	13.70	47.2
	M	17.80	20.85	-35.3
Russian funding	U	0.019	0.010	20.5
	M	0.017	0.010	15.0

Mean standardised bias falls from 49.1% to 13.5%; χ^2 joint test $p = 0.577$.

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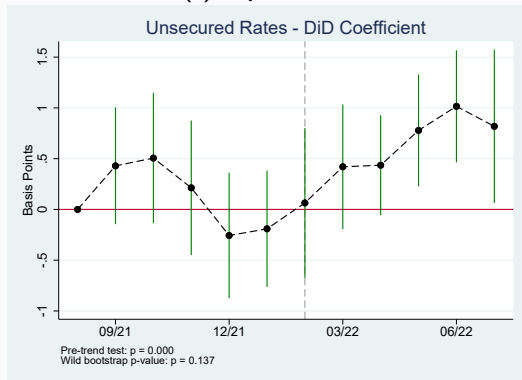
A6. PSM + IPW: deposit rate LP holds in matched sample



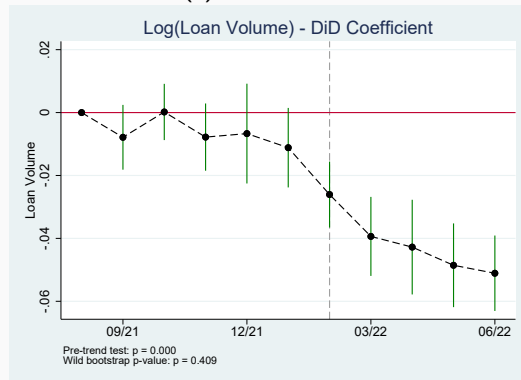
- PSM (left): monotone path to $\sim +2.7$ bp at month 3, CI entirely above zero
- IPW (right): qualitatively and quantitatively identical
- Bias diagnostics in A5

A7. Event study: deposit rates and loan volumes

(a) Deposit rates



(b) Loan volumes



- Pre-period coefficients individually insignificant; no systematic trend
- Wild bootstrap pre-trend p -values: 0.137 (rates), 0.263 (volumes)
- Post-invasion direction consistent with the main DiD results

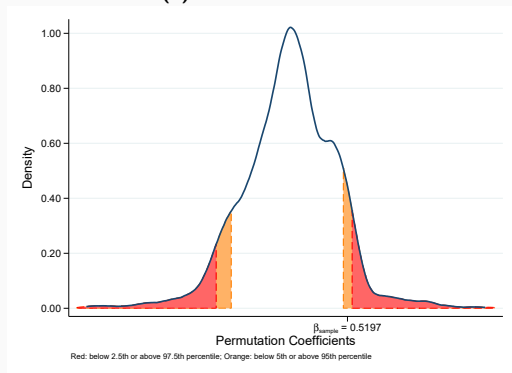
A8. Wild Cluster Bootstrap: full table

	Bank FE	Firm $\times$ Time FE	WLS
<i>Panel A: Deposit rates</i>			
Post $\times$ Exp _b ^{Russia}	1.0693*	0.5198**	0.6236***
t-stat	(3.49)	(5.39)	(5.76)
WCB p	[0.064]	[0.029]	[0.009]
<i>Panel B: Deposit activity (triple)</i>			
Post $\times$ Exp $\times$ Large	−0.0480*	−0.0601**	−0.0563**
t-stat	(−4.13)	(−3.56)	(−2.14)
WCB p	[0.069]	[0.029]	[0.046]
<i>Panel C: Loan volumes</i>			
Post $\times$ Exp _b ^{Russia}	—	−0.0455**	—
t-stat	—	(−3.46)	—
WCB p	—	[0.031]	—

Bottom line: saturated specifications survive WCB at 5% (or 1%) across all three panels. 10 000 draws for deposits, 1 000 for loans.

A9. Permutation & Oster: two more inference checks

(a) Permutation null



1 000 reassignments;
sample $\hat{\beta} = 0.50$;
 $p_{\text{perm}} \in (0.05, 0.10)$

(b) Oster (2019) stability

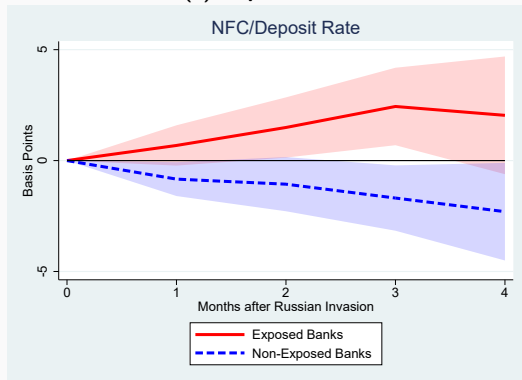
	Rate	Activity	Loan
$\hat{\beta}_0$	0.676	-0.0444	-0.0380
$\hat{\beta}_1$	0.613	-0.0450	-0.0402
$\hat{\beta}^* (\delta = 1)$	0.533	-0.0456	-0.0410
$\delta(\hat{\beta} = 0)$	7.6	-78.7	-49.3

$R_{\max} = 1.3 R_1$. $|\delta| \gg 1$:
unobservables would have to be much
stronger than observables to nullify.

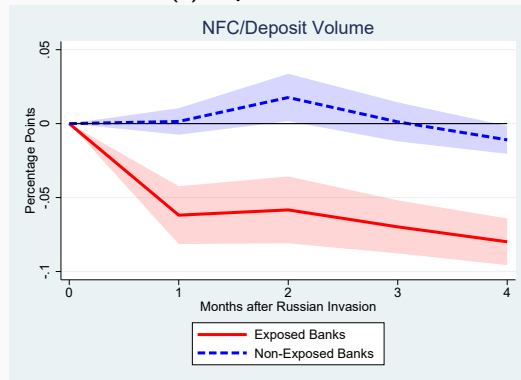
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A10. SUTVA: by-group LP (no deposit re-routing)

(a) Deposit rates



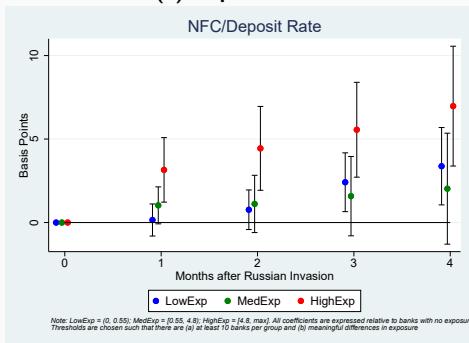
(b) Deposit volumes



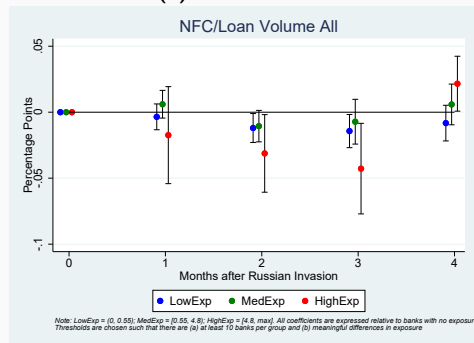
- Red (exposed): clear rate increase and volume decline
- Blue (non-exposed): essentially flat in volumes
- No evidence that non-exposed banks absorb the outflows $\Rightarrow$ SUTVA holds

A11. Dose-response: low / medium / high exposure

(a) Deposit rates



(b) Loan volumes



Bins: Low (0, 0.75%), Med [0.75%, 5%), High [5%, max].

- Monotone ordering across bins
- Largest effect at the top – consistent with threshold mechanism above 5%
- Validates linearity assumption used in main specification

A12. Alternative exposure definitions

Variant of exposure measure	Result on deposit rate
Loans + bonds / equity (baseline)	0.50***
Loans + bonds / total assets	similar magnitude, sig. at 1%
Loans only / equity	similar, slightly stronger
Bonds only / equity	insignificant
Including borrowers with Russian parent	similar magnitude
First-degree-neighbour countries (spillover)	only weak evidence
Indicator: any positive exposure	+2 bp deposit rate

- Loan exposure carries the information (larger volume, opaque)
- Spillover to neighbouring countries is limited
- Binary indicator works too – result is not a knife-edge of measurement

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A13. Alternative depositor segments

We re-run the baseline on different depositor sets:

- Large banks only → effect persists
- Term deposits up to 1 month → similar
- Insurance companies and pension funds → similar
- Investment funds → similar
- Active repricing only → similar

We also extend to household deposits (Online Appendix):

- Households also reduce their deposits at exposed banks
- Magnitude smaller (less mobile depositors), but qualitatively the same

Sample composition is not driving the headline.

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A14. Bank-side heterogeneity: no individual bank drives the result

Leave-one-out:

- Dropping any single exposed bank leaves the headline coefficient within the original 95% CI
- Effect is *distributed* across the exposed banks, not concentrated in 1–2 large outliers

Splits along three dimensions:

- **Size:** effect stronger at mid-sized banks; very large banks more diversified
- **Capital ratio:** stronger at banks with lower pre-shock equity (less buffer)
- **Liquidity buffer:** marginally stronger at banks with thinner liquid asset cushions

What we don't find:

- No difference between universal vs. specialised banks; no business-model split

Consistent with the credit-channel view: balance-sheet vulnerability is what matters.

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A15. Covid placebo: no spurious effect

Dep. variable	Bank FE	Firm $\times$ Time FE	WLS
<i>Panel A: Deposit rate</i>	0.012 (0.18)	-0.003 (-0.07)	0.014 (0.32)
<i>Panel B: P(new deposit)</i>	0.001 (0.21)	0.002 (0.35)	-0.002 (-0.34)
<i>Panel C: Log(deposit volume)</i>	0.018 (0.43)	-0.011 (-0.27)	0.008 (0.21)

- Same bank-level Russia exposure, but the placebo "shock" is Covid (Mar 2020)
- Sample: Apr 2019 – Feb 2021
- All coefficients indistinguishable from zero

Rules out that exposed banks just respond to *any* crisis.

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A16. “Where did the deposits go?”

The question. If exposed banks lose deposits, those funds must go somewhere. Who absorbs them?

What we can show.

- Non-exposed banks in our sample do *not* show clear inflows (SUTVA test, A10)
- This rules out simple in-sample reallocation

What we cannot show.

- Destinations: foreign banks, money market funds, direct central bank deposits
- Our data do not track depositor flows outside the euro-area MFI universe

Why it matters less than it seems. The identification of the bank-level effect does not depend on knowing the destination – only on the within-firm differential between exposed and non-exposed banks (Khwaja-Mian).

A17. “Why not a Bartik / shift-share instrument?”

The question. The exposure measure looks Bartik-style (pre-determined shares $\times$ aggregate shock); shouldn't you apply Goldsmith-Pinkham, Sorkin & Swift (2020) diagnostics?

Our answer.

- The treatment is a *single event*, not a continuous shift-share over many origins
- Exposure is a single dimension (Russia/Belarus), not a Bartik weighted sum across many industries / countries
- Standard concerns (exclusion via shock origin, identification at the share level) do not map cleanly onto our setup

What we do instead: PSM + IPW (A5–A6) for selection; Oster (2019) (A9) for unobservables; dose-response bins (A11) for non-linearity; Covid placebo (A15) for general crisis response.

If a referee still pushes, a single-shock-Bartik IV is available on request.

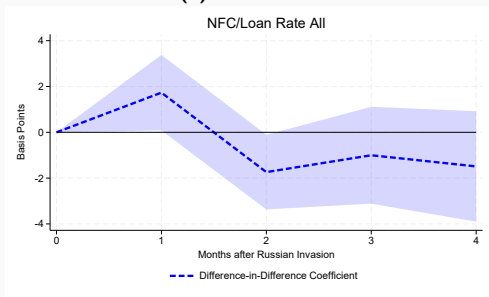
A18. Niepmann & Shen: detailed side-by-side

Dimension	Niepmann & Shen (2025)	This paper
Trigger	Continuous GPR, many events	Single sharp event (Feb 2022)
Setting	US global banks w/ foreign affiliates	Euro-area banks (incl. no affiliates)
Data	US supervisory (FR Y-14, FFIEC 009)	MMSR + AnaCredit + iBSI / iMIR / SHS-G
Granularity	Bank-country, loan-firm (C&I)	Transaction-level deposits + loans + firm
Deposits	Not studied	Discipline on rates and volumes
Lending	Cross-border / affiliate / domestic	Domestic euro-area NFC lending
Real effects	Not studied	Credit, assets, turnover, jobs, invest.
MP transmission	Not the focus	Standalone amplified pass-through
Trigger primitive	Anticipatory expropriation risk (no realised loss)	Realised asset write-offs from binding sanctions
Binding bank channel	Consolidated capital constraint via RWA inflation on retained foreign assets	Depositor discipline on liability side; equity impaired by write-offs
Required profile	Banks with foreign affiliates	Any euro-area bank with Russia/Belarus exposure
Transmission path	RWA inflation → capital constraint → less domestic lending	Write-off → equity loss → depositor discipline → funding cost → lending → real → MP amplification

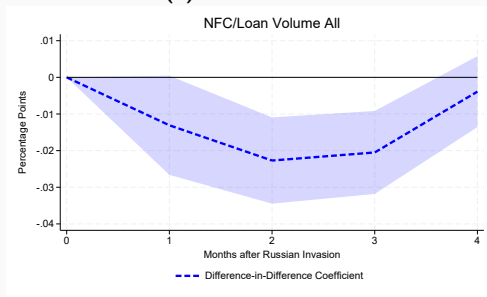
A19. Aggregate validation: iMIR confirms the lending contraction

Same LP-DiD on iMIR loan data (144 euro-area banks vs. AnaCredit's transaction sample).

(a) Loan rates



(b) Loan volumes



- **Volumes:** persistent contraction, trough around month 2
- **Rates:** modest, short-lived rise; existing loan contracts are fixed-rate and competition caps repricing on new loans $\Rightarrow$ banks ration *quantity* rather than raise prices

External validity: lending contraction confirmed on the broader iMIR sample with the same exposure measure.