A Geopolitical Shock to Bank Assets and Monetary Policy Transmission

Falko Fecht, Stefan Greppmair, Björn Imbierowicz
(all Deutsche Bundesbank)

Motivation & research questions

- Three decades of globalization increased interconnectedness and interdependency
- But geopolitical tensions increase bringing about elevated geopolitical risks and geopolitical shocks

- What are the **effects of a geopolitical shock** in a globalized world?
- How are **banks** affected by a geopolitical shock to their assets?
- What are the **implications for monetary policy** transmission through banks?

Motivation & research questions

- Geopolitical Shock = **Russia's invasion in Ukraine in 2022**
- Primarily perceived as an **energy price shock**
- Monetary policy should **"look-through"** as long as inflation expectations remain anchored & second round effects contained
- Ignores potential **demand side effects** of a geopolitical shock

- We show that Euro area banks with higher credit exposure to Russian and Belarusian borrowers ....
  - paid a higher rate on uninsured deposits,
  - cut back their lending to domestic non-financial firms and
  - respond more sensitive to the subsequent monetary policy tightening

$\Rightarrow$ Bank balance sheet channel causes **'silent' monetary policy tightening**

Data

Data

Transaction-level data at bank-firm level

1. MMSR – Unsecured Segment: Corporate deposit transactions
   (28 Banks, 53 firms, NFC deposits 9.5% of TA)
2. AnaCredit: Loans to non-financial companies
   (28 banks, 68.000 firms, NFC loans 13,5% of TA)
3. SHS-G: Bond portfolios of banks

Bank level data

- iMIR: Monthly total deposit and loan volumes and rates for new business
- iBSI: Monthly bank characteristics

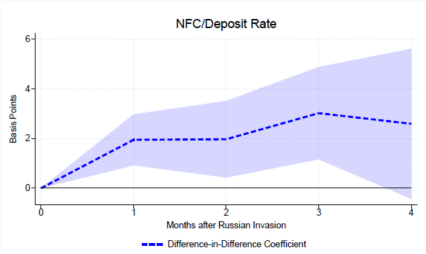
Data

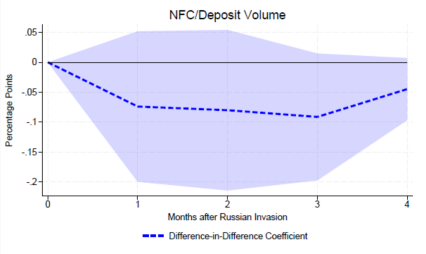
- Sample ranges from 2021:M3 to 2023:M2, where the Russian invasion of Ukraine started on February 24, 2022.
- Bank exposure to the geopolitical shock measured by the ratio of credit (loans and bonds) exposure to Russian + Belarusian borrowers over bank equity in 2021 (avrg.= 7%, median 1.47%)
- High exposed banks: Exposure $\geq$ 2 %

Deposits

Deposits

- What is the impact of the asset shock on rates and and volumes of uninsured NFC deposits?
- **Hypothesis:** Higher exposure $\Rightarrow$ higher failure risk $\Rightarrow$ uninsured depositors (NFCs) require risk permium or withdraw
- **Results:** Exposed banks pay higher deposit rates, volumes indicate (insignificant) decrease





Deposits

- Results prevail in a Diff-in-Diff approach with various fixed effects

	(1) No FE	(2) Time FE	(3) Bank FE	(4) Firm FE	(5) Bank × Firm FE	(6) Firm × Time FE	(7) WLS
Post $\times Exp_b^{Russia}$	0.5738***	0.5811***	0.8117***	0.8306***	0.8761***	0.7352***	0.9224***
	(3.41)	(3.57)	(3.23)	(3.42)	(3.93)	(4.57)	(5.15)
Adj. R^2	26.67	29.25	65.25	67.39	75.42	73.32	62.48
Obs	6211	6211	6211	6211	6211	6211	6211
Banks	28	28	28	28	28	28	28

- **Exposed banks** have to **pay on average a 5 Bps.** higher deposit interest rate (compares with an avrg. deposit rate of -56 Bps. at this time)

Deposits

- Exposed banks' deposit volumes rather decrease

	(1) No FE	(2) Time FE	(3) Bank FE	(4) Firm FE	(5) Bank × Firm FE	(6) Firm × Time FE	(7) WLS
Post $\times Exp_b^{Russia}$	-0.0827	-0.0833	-0.0657	-0.0215	-0.0879	-0.1226	-0.2911**
	(-0.44)	(-0.43)	(-0.42)	(-0.17)	(-0.67)	(-1.26)	(-2.56)
Adj. R^2	31.23	31.49	33.17	37.03	42.47	38.95	38.93
Obs	44084	44084	44084	44084	44084	44084	44084
Banks	28	28	28	28	28	28	28

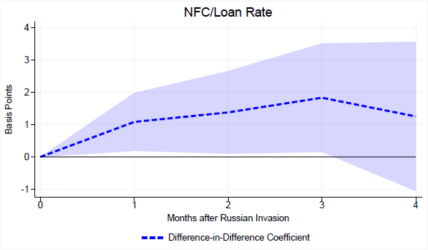
- **Probability** of an exposed bank receiving an additional deposit from a given firm rather **decreases**
- Results on interest rate and volume also **confirmed at the aggregate bank-month level** (iMIR data)

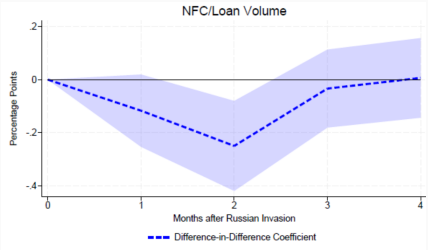
Loans

Impact of the geopolitical shock on loan rates and volumes

- **Hypothesis:** Higher exposure $\Rightarrow$ less risk bearing capacity & higher refinancing costs $\Rightarrow$ tighter lending standards

- **Results:** Banks grant significantly smaller loan amounts and charge marginally significantly higher rates





Impact of the geopolitical shock on loan rates and volumes

- Diff-in-Diff approach with various fixed effects confirms findings
- **Exposed banks grant** on average -2.9% **smaller loan amounts**, no sign of systematic repricing

	(1) Loan Volume	(2) Loan Volume	(3) Loan Volume	(4) Loan Rate	(5) Loan Rate	(6) Loan Rate
Post $\times Exp_b^{Russia}$	-0.0017	-0.0035**	-0.0041**	1.0397	0.8659	1.0434
	(-0.50)	(-2.14)	(-2.36)	(1.23)	(1.41)	(1.20)
Adj. R^2	98.46	98.49	98.46	97.28	97.38	98.61
Obs	1840198	1840198	1840198	1840198	1840198	1840198
Banks	28	28	28	28	28	28
Bank Controls	Yes	Yes	Yes	Yes	Yes	Yes
Bank $\times$ Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	–	–	Yes	–	–
Industry $\times$ Country $\times$ Time FE	–	Yes	–	–	Yes	–
Firm $\times$ Time FE	–	–	Yes	–	–	Yes

- We find this confirmed at the aggregate bank-month level (iMIR data)

Are higher refinancing costs associated with tighter lending?

- **Hypothesis:** Passing through higher deposit rates could cause loan losses; banks rather ration loan supply
- Regress loan supply on change in a bank's funding rate over a 5-day window pre- and post invasion
- **Results:** Stronger deposit rate increase leads to smaller loans in the post period

Post $\times \Delta r_b^{invasion}$	-0.0040**
	(-2.49)
Adj. R^2	98.46
Obs	1839076
Banks	25
Bank Controls	Yes
Bank $\times$ Firm FE	Yes
Firm $\times$ Time FE	Yes

- Confirmed for deposit rate changes in a 10- and 40-days window
- Consistent with the classic bank lending channel

Do credit supply constrains affect corporate borrowers?

- Does the geopolitical shock on banks have **negative demand-side effects**?
- **Hypothesis:**

$\Rightarrow$ Restricted loan supply of exposed relationship lenders cannot easily be substituted

$\Rightarrow$ Firms have to cut back employment, investment & production

- We calculate the **weighted exposure of a firm's lending relationships** in the pre period
- **Firm-level regression** of real variables on relationship lenders' weighted exposure

Do credit supply constrains affect corporate borrowers? (cont.)

	total credit	# employees	total assets	turnover
	(1)	(2)	(3)	(4)
Weighted firm exposure	-0.0048***	-0.0000	-0.0021***	-0.0050**
	(-4.19)	(-0.03)	(-2.73)	(-2.28)
Adjusted R-squared	18.89	2.75	2.89	2.21
Obs.	786,274	174,394	174,394	174,394

- Firm level credit declines: Exposed relationship lenders' **credit shortfall not substituted**
- **Assets and turnover** of firms with more exposed lenders **declines** relatively
- Consistent with diminished aggregate demand

Geopolitical shock and the bank lending channel – Summary

- More exposed banks experience **tighter refinancing conditions** and as a consequence **ration their credit supply** (rather than charging higher lending rates)
- Effect on banks' refinancing costs is **equivalent to a 48 bps MP rate increase**
- As firms cannot easily substitute these loan supply restrictions, their overall borrowing declines
- This leads to **reduction in real activity** (turnover and investment) consistent with diminished aggregate demand
- A geopolitical shock has effect on aggregate demand through the bank lending channel causing a **"silent tightening"**

Monetary Policy Transmission

Monetary Policy Transmission

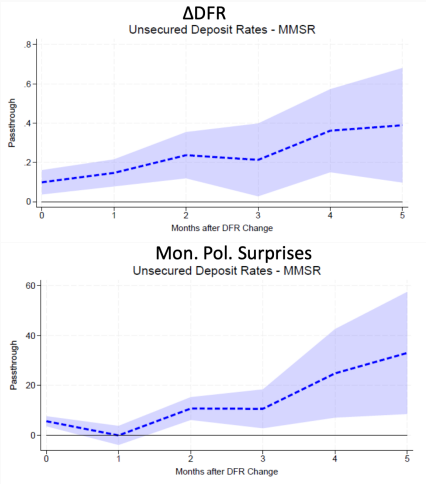
- Does the geopolitical shock affect the **sensitivity of banks' refinancing and lending conditions to monetary policy**?
- **Hypothesis:** Higher exposure $\Rightarrow$ lower net asset value $\Rightarrow$ higher **sensitivity of the external finance premium** to the monetary policy rate changes
- **Sample:** March 2021 to February 2023, encompassing five ECB policy rate hikes.
- Transaction level data from MMSR and AnaCredit **aggregated to the bank-firm-month level** to run monthly local projections

Monetary Policy Transmission

- Do more **exposed banks' deposit rate** respond more sensitive to MP changes?
- **MP Changes:** 1) Change in DFR and 2) Monetary policy surprises (Jarociński & Karadi)

$\Rightarrow$ Exp. banks' **deposit rate more sensitive to MP post invasion**

$\Rightarrow$ 100 bps. rise in DFR leads to **40 bps. larger deposit rate increase** at high-exposure banks

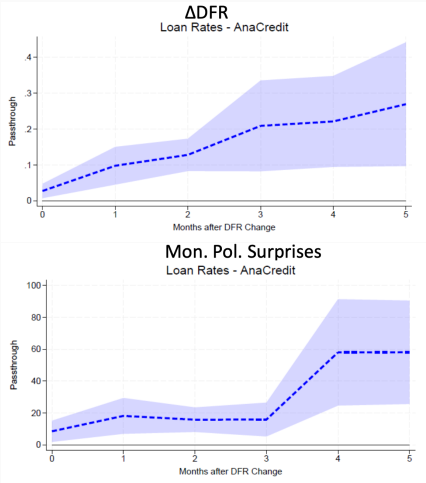


Monetary Policy Transmission

- Do more **exposed banks' loan rates** respond more sensitive to monetary policy changes?

⇒ Exp. banks' **loan rate more sensitive to MP post invasion**

- 100 bps. rise in DFR leads to a **30 bps. larger loan rates increase** at high-exposure banks within five months



Monetary Policy Transmission – Summary

- A geopolitical shock **amplifies the effects of monetary tightening** through the banking system
- More exposed banks' pass-through of the subsequent monetary tightening stronger for deposit and loan rates
- A geopolitical shock accelerates the pass-through of policy and thereby further restrains aggregate demand
- The **geopolitical shock** did not only impact banks' funding (which negatively affected bank lending) but also **magnified the contractionary impact of subsequent rate hikes**

Robustness

Robustness

The results are robust to

- deposit size and type
- different calculations of our exposure measure
- placebo test, using the pandemic

Robustness: Exposure Measure & Alternative Risk Measures

- We including bank-specific geopolitical risk (GPR) index (weighting country-level GPR indices from Caldara and Iacoviello (2022)): idiosyncratic and systematic risk
- Orthogonalized bank CDS spread (to bank characteristics) = idiosyncratic risk
- CDS beta (to iTraxx Bank CDS index) = systematic risk
- Our exposure measure contains additional information

	(1) Baseline	(2) GPR	(3) CDS (Orth)	(4) CDS Beta	(5) Combined
Post $\times Exp_b^{Russia}$	0.7434***	0.5960***	0.6793***	0.6010***	0.3546**
	(3.92)	(3.22)	(3.72)	(4.50)	(2.51)
Post $\times$ GPR		0.3745**			0.2586*
		(2.58)			(1.77)
Post $\times$ CDS$\perp$			0.2561		0.5076*
			(0.85)		(1.74)
Post $\times \beta_{CDS}$				0.699**	0.7750***
				(2.87)	(4.18)
Adj. R^2	.5943	.5958	.5949	.5993	.6023
Obs	5583	5583	5583	5583	5583
Banks	18	18	18	18	18
Bank Controls	Yes	Yes	Yes	Yes	Yes
Bank $\times$ Firm FE	Yes	Yes	Yes	Yes	Yes
Firm $\times$ Time FE	Yes	Yes	Yes	Yes	Yes

Conclusion

Conclusion

- Geopolitical shocks not only impact aggregate supply but also **lower inflationary pressure on the demand-side**
- The effect of the geopolitical shock on bank's refinancing costs is **equivalent to an increase in MP rate of 48 bps!**
- Geopolitical shock made affected banks' refinancing costs and lending rates **more responsive to MP tightening.**

Policy Implications

- After a geopolitical shock, central banks should **tighten monetary policy cautiously** to avoid overshooting and unnecessarily suppressing already weakened private demand
  ($\Rightarrow$ **data-driven approach** with incremental policy rate changes)
- **Supervisors** should require granular disclosure of **country-counterparty concentrations**, embed geopolitical-stress scenarios in Pillar 2 reviews, and oblige banks to price these risks internally
  ($\Rightarrow$ transparent, **forward-looking capitalization of geopolitical concentration risk** of banks)