The Effects of Bank Deposit Outflows on Banks and Firms

Lorenzo Burlon Alessandro Ferrari Stephen Kho Nikoleta Tushteva

European Central Bank

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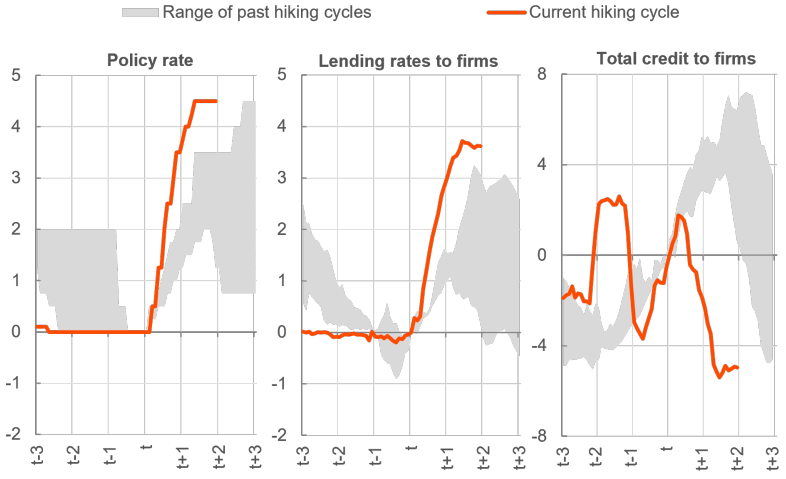
PRELIMINARY

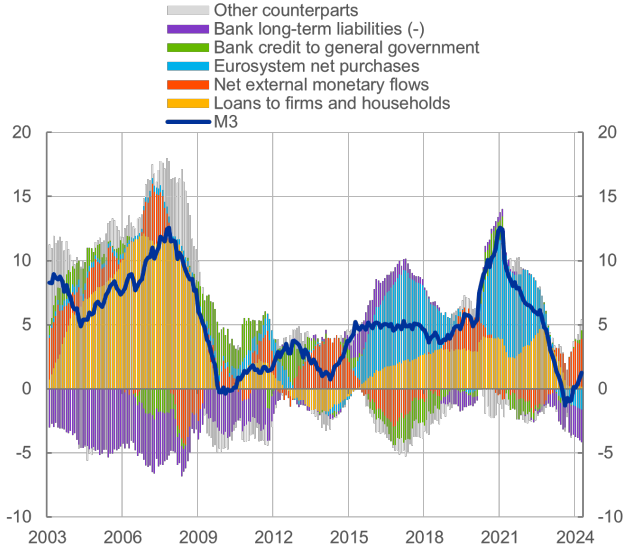
The views expressed are those of the authors and do not necessarily reflect those of the ECB or the Eurosystem

Transmission has been surprisingly strong in this hiking cycle



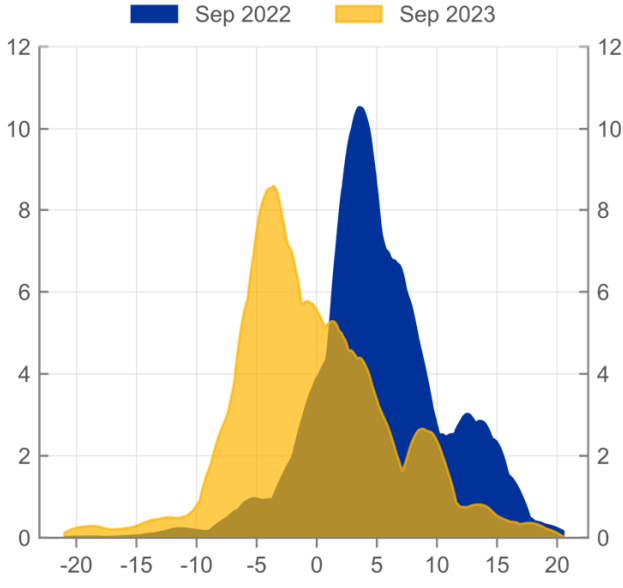
Sources: ECB (BSI, CSEC, MIR) and ECB calculations.

Monetary dynamics have been exceptionally sluggish...



Sources: ECB (BSI) and ECB calculations.

... with huge heterogeneities across banks



Sources: ECB (iBSI) and ECB calculations.

Research question and overview

Research question

Does a weakness in deposit funding impact the supply of bank credit? What is the mechanism? Are there real effects?

What we do

We exploit an unexpected re-calibration of outstanding central bank funding, to assess the impact on

1. deposit funding, in a context of shrinking liquidity
2. bank credit supply (following a Khwaja and Mian (2008) approach)
3. real firm outcomes

Literature

- Deposits: Stein (1998); Kashyap et al. (2002); Hanson et al. (2015); Drechsler et al. (2021); Kho (2024)

- Bank lending channel of monetary policy: Bernanke (1983); Bernanke and Blinder (1988); Kashyap et al. (1994); Bernanke and Blinder (1992); Kashyap et al. (1993); Kashyap and Stein (1994, 2000); Khwaja and Mian (2008); Jiménez et al. (2014); Drechsler et al. (2017); Polo (2021)

- Bank-based monetary policy transmission with shrinking liquidity: Kandrac and Schlusche 2021; Acharya et al. (2023); Altavilla et al. (2023); Fricke et al. (2023); Diamond et al. (2023).

Preview of results

- Deposit outflows impacted credit supply.
- Reduced credit supply by banks with outflows was not compensated by banks with inflows.
- Role of off-balance sheet exposures backed by outstanding liquidity is key.
- Reduced loan supply negatively impacted firm employment and investment.

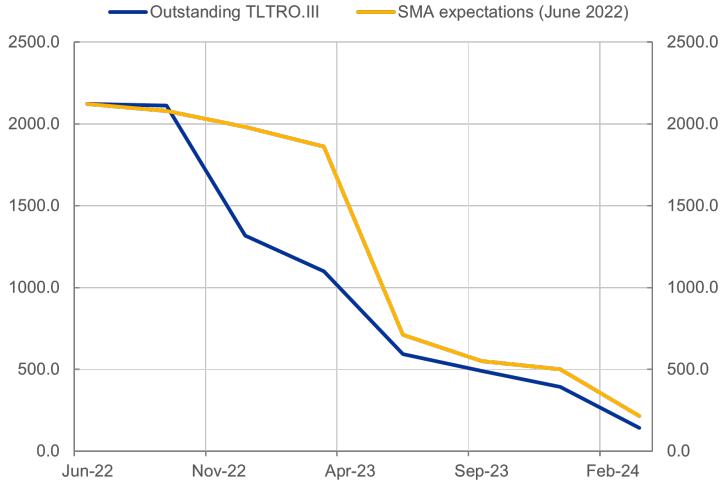
Endogeneity issue + identification strategy

Endogeneity issue: in the aggregate loan origination goes hand-in-hand with deposit creation, and is affected not only by supply but also demand

Identification strategy:

- Timing: how a change in deposits before time t affects loans from t onwards
- Exogenous variation in bank funding conditions that proxies the need of liquidity for banks: TLTRO III news shock
- Isolating supply: Khwaja and Mian (2008) approach

IV: TLTRO recalibration



- On 27 October 2022 TLTRO.III conditions were recalibrated to ensure consistency with broader monetary policy normalisation process
- This triggered large unexpected repayments and liquidity reabsorption More

IV: leakage on 3 July 2022

European Central Bank + Add to myFT

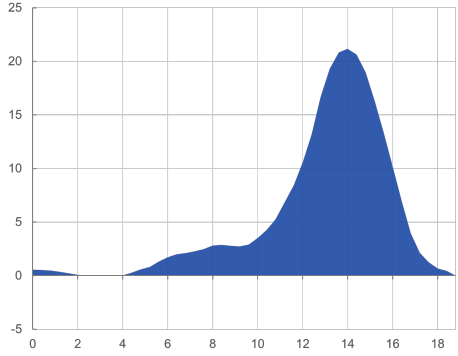
ECB to discuss blocking banks from multibillion-euro windfall as rates rise

Governing council to discuss potential bonanza for lenders from ultra-cheap pandemic loans

The ECB has said it intends to raise its deposit rate to minus 0.25% at its July 21 meeting © Alex Kraus/Bloomberg

Martin Arnold and **Olaf Storbeck** in Frankfurt and **Owen Walker** in London JULY 3 2022 166

Figure: Distribution of shock



Sources: IHS Markit iBoxx and ECB calculations.

- Relevance
- Exclusion restriction

Data

- Combination of wide range of data sources:
  - Bank-level: Individual Balance Sheet Items (iBSI) statistics
  - Loan-level: Credit registry data AnaCredit
  - Bond-level: Markit iBoxx
  - Firm-level Bureau Van Dijk's Orbis Bank Focus and Orbis Europe
- Sample from January 2020 until December 2023 including 62 banks and 1,517,305 firms from 14 euro area countries

Summary statics Balancing table

Specification

$$\text{Deposit growth}_{b,t+3,t} = \alpha^{1S}_{b,f} + \beta^{1S}_{f,t} + \gamma^{1S}\text{Shock}_b \times \text{Post}_t + \theta^{1S}X_{b,t} + \epsilon^{1S}_{b,t} \quad (1)$$

$$\text{Loan growth}_{b,f,t+3+h,t+3} = \alpha^{2S,h}_{b,f} + \beta^{2S,h}_{f,t} + \gamma^{2S,h}\widehat{\text{Deposit growth}}_{b,t+3,t} + \theta^{2S,h}X_{b,t} + \epsilon^{2S,h}_{b,f,t} \quad (2)$$

- Vector of bank-level controls $X_{b,t}$ includes bank assets, ROA, CET1 ratio, NPL ratio, excess liquidity/assets, TLTRO III/assets, securities holdings/assets and deposits/liabilities ratio
- Standard errors clustered at bank/post-shock level

Results

	OLS	First stage	Second stage		Firm level
	Loan growth (h=15)	Deposit growth	Loan growth (h=3)	Loan growth (h=15)	Loan growth (h=15)
3 month deposit growth	0.139**				
	(0.059)				
Shock * post-shock dummy					
Fitted 3 month deposit growth					
Bank controls	Yes				
Firm controls	No				
Bank-firm FE	Yes				
Firm-time FE	Yes				
Firm FE	No				
Time FE	No				
Observations	39,237,171				

* p<0.10, ** p<0.05, *** p<0.010

- OLS controlling for demand is already significant

Results

	OLS	First stage	Second stage		Firm level
	Loan growth (h=15)	Deposit growth	Loan growth (h=3)	Loan growth (h=15)	Loan growth (h=15)
3 month deposit growth	0.139**				
	(0.059)				
Shock * post-shock dummy		-7.012**			
		(2.894)			
Fitted 3 month deposit growth					
Bank controls	Yes	Yes			
Firm controls	No	No			
Bank-firm FE	Yes	Yes			
Firm-time FE	Yes	Yes			
Firm FE	No	No			
Time FE	No	No			
Observations	39,237,171	37,307,576			

* p<0.10, ** p<0.05, *** p<0.010

- OLS controlling for demand is already significant
- Turning to IV the instrument is relevant

Results

	OLS	First stage	Second stage		Firm level
	Loan growth (h=15)	Deposit growth	Loan growth (h=3)	Loan growth (h=15)	Loan growth (h=15)
3 month deposit growth	0.139**				
	(0.059)				
Shock * post-shock dummy		-7.012**			
		(2.894)			
Fitted 3 month deposit growth			2.809**		
			(1.413)		
Bank controls	Yes	Yes	Yes		
Firm controls	No	No	No		
Bank-firm FE	Yes	Yes	Yes		
Firm-time FE	Yes	Yes	Yes		
Firm FE	No	No	No		
Time FE	No	No	No		
Observations	39,237,171	37,307,576	37,307,576		

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- OLS controlling for demand is already significant
- Turning to IV the instrument is relevant
- Credit supply effect is large and persistent

Results

	OLS	First stage	Second stage		Firm level
	Loan growth (h=15)	Deposit growth	Loan growth (h=3)	Loan growth (h=15)	Loan growth (h=15)
3 month deposit growth	0.139**				
	(0.059)				
Shock * post-shock dummy		-7.012**			
		(2.894)			
Fitted 3 month deposit growth			2.809**	2.829**	
			(1.413)	(1.380)	
Bank controls	Yes	Yes	Yes	Yes	
Firm controls	No	No	No	No	
Bank-firm FE	Yes	Yes	Yes	Yes	
Firm-time FE	Yes	Yes	Yes	Yes	
Firm FE	No	No	No	No	
Time FE	No	No	No	No	
Observations	39,237,171	37,307,576	37,307,576	37,307,576	

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3 month deposit growth	0.139**				
	(0.059)				
Shock * post-shock dummy		-7.012**			
		(2.894)			
Fitted 3 month deposit growth			2.809**	2.829**	0.146***
			(1.413)	(1.380)	(0.006)
Bank controls	Yes	Yes	Yes	Yes	Yes
Firm controls	No	No	No	No	Yes
Bank-firm FE	Yes	Yes	Yes	Yes	No
Firm-time FE	Yes	Yes	Yes	Yes	No
Firm FE	No	No	No	No	Yes
Time FE	No	No	No	No	Yes
Observations	39,237,171	37,307,576	37,307,576	37,307,576	19,578,170

* p<0.10, ** p<0.05, *** p<0.010

- OLS controlling for demand is already significant
- Turning to IV the instrument is relevant
- Credit supply effect is large and persistent
- Firms are not fully able to substitute credit across banks

Firm level specification

Transmission Mechanism

Dependent Variable: Loan growth (h=15) Sample splits by:	(1) Off-balance sheet exposure	(2) Bank capital	(3) Bank CDS
High:			
Fitted 3 month deposit growth	2.838** (1.125)	0.388 (1.582)	2.430** (1.067)
Low:			
Fitted 3 month deposit growth	0.760** (0.364)	3.034* (1.592)	8.337 (22.517)
F-test: High = Low	2.973*	1.389	0.068
Bank controls	Yes	Yes	Yes
Bank-firm FE	Yes	Yes	Yes
Firm-time FE	Yes	Yes	Yes

* p<0.10, ** p<0.05, *** p<0.010

- One characteristic stands out as conveying a unique ability to predict differential impacts: off-balance sheet exposures
- Correlation over time of excess liquidity availability and off-balance sheet exposures suggests that a contraction puts under pressure these banks More1 More2

Real effects

- Given results at the firm level, using Orbis we investigate on possible effects on real variables
- We compute the predicted loan growth at the firm level using our baseline IV specification
- We run the following specification:

$$Y_{f,2022} = \alpha_{i,l,s} + \gamma \widehat{Loangrowth}_{f,Dec2022,Sep2022} + \theta X_{f,Sep2022} + \epsilon_f \qquad (3)$$

where $Y_{f,2022}$ is the yearly growth rate of the firm level variables (but for investments) and $X_{f,Sep2022}$ is a series of controls at the bank level and at the firm level More

Real effects: results

	(1) Number of employees	(2) Fixed assets	(3) Current assets	(4) Sales	(5) Investment
Fitted 3 month loan growth	0.014***	0.099***	0.071***	-0.000	0.037***
	(0.002)	(0.004)	(0.003)	(0.003)	(0.001)
Bank controls	Yes	Yes	Yes	Yes	Yes
Firm controls	Yes	Yes	Yes	Yes	Yes
ILS FE	Yes	Yes	Yes	Yes	Yes
Observations	261,519	261,519	261,519	261,519	261,519

* p<0.10, ** p<0.05, *** p<0.010

Table: Measuring real effects in 2022

- Larger impact on fixed assets and investments
- Small but significant impact also on employment

Conclusion

- Deposit outflows negatively affect banks intermediation capacity
- Effect is above and beyond demand effects from tighter policy
- Role of off-balance sheet exposures back by central bank reserves is key
- Reduced credit supply mutes firm performance
- Future research: explore the interaction between banks' and firms' liquidity conditions.

Thank You!

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