

# Why gradual and predictable? Bank lending and real economy during sharp QT



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## Abstract

Most central banks in advanced economies typically follow a gradual and predictable pace in reducing their balance sheets. Exploiting the recalibration of ECB's outstanding central bank funding in 2022, we show that a sharp reabsorption of bank liquidity channels a tightening impact on credit supply. The tightening originates from the sudden need for banks accustomed to large liquidity holdings to more rapidly adapt to the new environment. The associated reduction in credit supply has an impact on the real economy.

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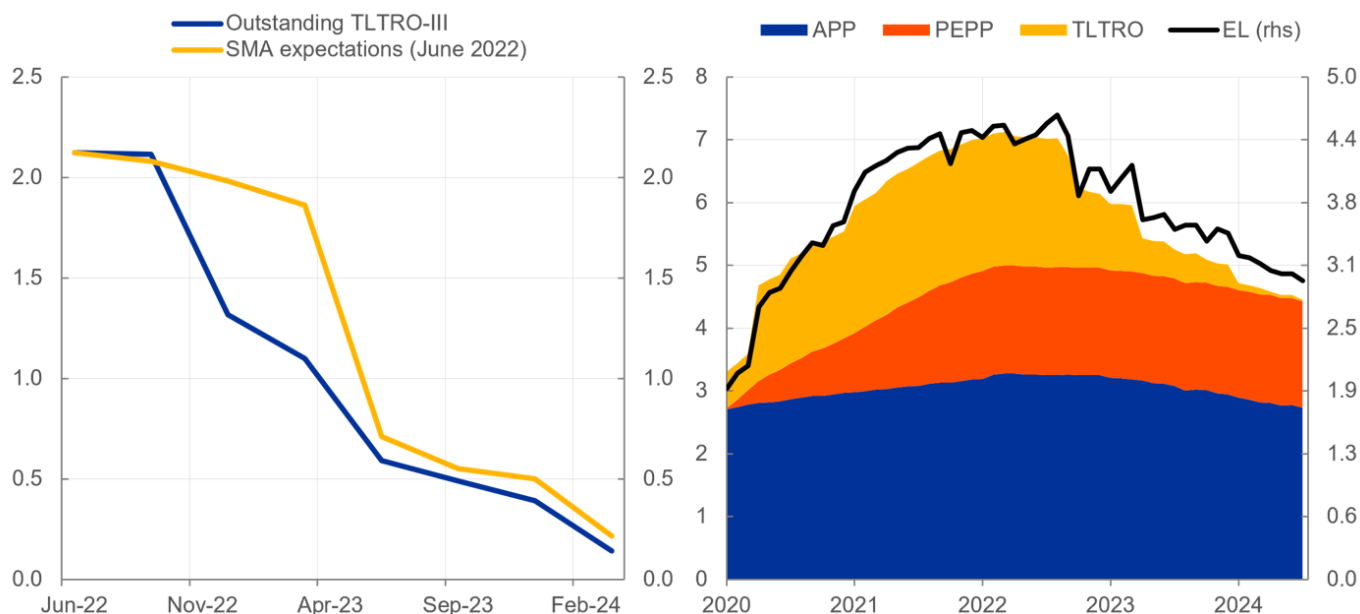
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## Introduction

When contracting their balance sheets, central banks in advanced economies tend to be very vocal about the gradual and predictable manner in which they plan to proceed. Arguments in favour of these principles normally range between the potential signaling effects seen during the Taper Tantrum of 2013 (see, for example, Chari et al. (2020)) and concerns about market functioning (see, e.g., Logan and Bindseil (2019) and Copeland et al. (2024)). Comparatively, the role that these principles play in the bank-based transmission of monetary policy are considerably less explored.

The exceptional circumstances of the inflationary pressures in 2022 prompted the ECB to change the terms of its targeted longer-term refinancing operations (TLTRO III) on 27 October 2022. This program had initially been designed to provide banks with cheap funding, encouraging them to lend more to businesses and households. The recalibration removed the impediments for an early voluntary repayment of borrowed funds, inducing banks to opt to repay more than EUR 1 trillion of central bank funding by over 6 months earlier than originally preferred and leading to a rapid contraction in aggregate liquidity (Figure 1). As a consequence, central bank reserves contracted at a pace and magnitude never experienced before in the Eurosystem. In parallel, bank credit slowed down sharply.

**Figure 1. Central bank funding and reserves in the euro area (EUR bn)**



Notes: The left-hand side panel shows the actual amount of outstanding TLTRO-III funds, as well as median expectations of market analysts in June 2022 for the amount of outstanding TLTRO-III funds (i.e., before the leak about the recalibration), in trillions of euros. The right-hand side panel shows central bank assets by ECB programme (Asset Purchase Programme, Pandemic Emergency Purchase Programme and TLTRO, on the LHS scale) as well as excess liquidity in trillion of euros (on the RHS scale). Excess liquidity refers to the amount of central bank reserves held by commercial banks above minimum reserve requirements.

## Empirical exercise and results

In this paper we use differential exposure to the recalibration of TLTRO III as a measure of the sudden withdrawal of liquidity. For identification, we use the market reactions that followed the publication of a news report on 3 July 2022 (Financial Times (2022)), which anticipated some features of the recalibration announced in October of the same year. Bank bond yields showed increases in bank funding costs around this event (Figure 2), reflecting the market's views of the liquidity and funding pressures stemming from either using banks' own liquidity or fetching the necessary liquidity via alternative funding sources to face the front-loaded repayments needs. Importantly, this impact came on top of the well-anticipated increase in funding costs associated with the then-ongoing phase-out of TLTRO III.



**Table 1. Impact of accelerated absorption of central bank reserves ('TLTRO shock') on lending**

Dependent variable:	(1) Loan growth 12 months before	(2) Loan growth 6 months before	(3) Loan growth 6 months ahead	(4) Loan growth 12 months ahead	(5) Loan growth 18 months ahead
TLTRO shock	-3.796 (4.687)	0.189 (4.138)	-18.203* (10.675)	-14.019*** (4.815)	-24.347*** (6.510)
Bank controls	Yes	Yes	Yes	Yes	Yes
Bank-firm FE	Yes	Yes	Yes	Yes	Yes
Firm-time FE	Yes	Yes	Yes	Yes	Yes
Observations	41,001,833	53,827,053	69,553,726	53,732,925	40,845,953
R-squared	0.657	0.534	0.533	0.653	0.704

Notes: The table presents the estimation of a local projection model à la Jordà (2005) where the loan growth over the horizon reported in the first lines is explained by the reaction of bank bond yields around the news of the TLTRO recalibration on 4 July 2022. The regression includes controls for time-varying bank characteristics capturing various confounding factors (bank size, capitalisation, profitability, exposure to credit risk, liability structure, exposure to the TLTRO phase out and the recalibration itself, excess liquidity and securities holdings), as well as firm-month fixed effects and bank-firm fixed effects. Errors are clustered at the bank and post-period level. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.010$ .

Second, we show that the mechanism underlying this contraction was related to the pre-existing liquidity constraints and was mostly independent of banks' pre-existing liquidity levels due to the endogeneity of off-balance sheet exposures to the availability of liquidity (Table 2). On the one hand, low-liquidity banks faced a larger need to gather expensive funding and therefore contracted credit because of the higher funding costs, consistent with the bank lending channel (Bernanke (1983)). On the other hand, high-liquidity banks had larger off-balance sheet exposures backed by the very same liquidity to unwind, so they resorted to faster, more abrupt contraction in on-balance sheet exposures (Acharya et al. (2023)). As a result, credit supply contracted for both types of banks, signaling that credit supply tightening stemming from the pace of balance sheet reduction acts independently from decisions on the magnitude of the reduction, or the starting point in terms of liquidity levels.

**Table 2. Bank characteristics by level of exposure to TLTRO shock**

	TLTRO shock above median		TLTRO shock below median		Difference between below and above median t-test
	Mean	St.dev	Mean	St.dev	
TLTRO shock	0.151	0.016	0.095	0.060	-6.151***
Excess liquidity/Assets	11.817	6.873	15.032	8.359	2.045**
Securities holdings/Assets	6.576	8.218	10.168	8.868	2.047**
HQLA/Assets	18.617	10.338	25.392	10.703	3.088***
(HQLA - TLTRO)/Assets	9.149	9.884	13.487	9.115	2.224**
TLTRO/Assets	9.244	6.785	11.714	8.639	1.548
Assets	131.745	214.405	159.656	238.955	0.599
CET 1 Ratio	16.678	4.590	17.620	10.743	0.554
Profitability	6.542	5.160	8.252	5.901	1.502
NPL ratio	2.170	3.118	2.849	3.429	1.009
Deposit ratio	64.728	21.632	66.650	24.356	0.406
Securities issued/Assets	17.303	15.609	18.117	21.210	0.213
Liquidity coverage ratio	223.953	89.486	254.049	145.597	1.095
Undrawn credit/Assets	0.800	0.934	1.082	0.982	1.271
Uninsured deposits/Liabilities	11.089	7.550	10.525	6.794	-0.383

Notes: The table presents means and standard deviations for selected bank characteristics within groups of banks by level of TLTRO shocks in July 2022. The table also reports t-tests of the differences in means between the two groups of banks. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.010$ .

Third, we document that the contraction in credit supply stemming from the sudden increased incentive of repaying central bank funding at the bank level had real effects, with exposed firms contracting employment and investment (Table 3). This evidence is consistent with a large body of literature showing that credit contractions do leave a mark on the real economy. Moreover, while borrowers exposed to the shock were also more likely to fall into arrears, banks did not rebalance their portfolios towards safer borrowers in response to the shock as would be expected by a more standard interest rate hike (see Gambacorta and Song (2018)). This contrasts with what had been observed with the pandemic recalibration of the same TLTRO III programme just two years earlier, when changes in the pricing of the policy had led to large take-up and an increase in loan supply towards safer borrowers (Barbiero et al. (2022)).

**Table 3. Measuring real effects of TLTRO shock via credit supply**

Dependent variable:	(1) Employment growth	(2) Fixed investment	(3) Intangible investment	(4) Liquidity growth	(5) Sales growth	(6) Growth in arrears
Predicted decline in loan supply to firm	-0.020*** (0.001)	-0.094*** (0.003)	-0.053*** (0.005)	-0.060*** (0.002)	-0.003 (0.002)	0.019*** (0.003)
Average bank-level controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm-level controls	Yes	Yes	Yes	Yes	Yes	Yes
Control for loan demand	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	360,250	357,085	177,433	360,963	360,257	339,770
R-squared	0.012	0.044	0.003	0.015	0.017	0.001

Notes: The table presents the results of regressions where the yearly variable reported on the first line measured in 2022 is explained by the drop in loan supply predicted by the reaction of bank bond yields around the news of the TLTRO recalibration on 4 July 2022. The regression includes controls for bank characteristics capturing various confounding factors (bank size, capitalisation, profitability, exposure to credit risk, liability structure, exposure to the TLTRO phase out and the recalibration itself, excess liquidity and securities holdings), as well as firm-level controls (estimated loan demand, profitability, leverage and liquidity) and country fixed effects and bank-firm fixed effects. Errors are clustered at the firm level. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.010$ .

## Conclusion

Our findings underscore the critical importance of the modality in which central banks implement changes to their balance sheets. The recalibration of TLTRO III in 2022 reached its stated goals to reinforce the transmission of our policy rates to bank lending conditions so that TLTRO III contributed to the transmission of the monetary policy stance needed to ensure the timely return of inflation to the ECB's 2% medium-term target. It contributed to normalise funding costs and removed deterrents to early voluntary repayments of outstanding TLTRO funds, with an associated large reduction of bank liquidity in a context of still ample reserves. In doing so, the recalibration of TLTRO III also taught us that faster adjustments in bank liquidity can indeed reduce bank credit and reach the real economy, possibly offering a bank credit perspective to how central banks should calibrate the pace at which central banks should reduce their balance sheets in normal times.<sup>2</sup>

<sup>2</sup> On the relation between central bank reserves and bank credit, see e.g. Kandrac and Schlusche (2021); Altavilla et al. (2022); Acharya et al. (2023); Fricke et al. (2023); Diamond et al. (2024); Altavilla et al. (2025).

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