IN-DEPTH ANALYSIS

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Overly reliant on Central Bank funding?

Consequences of exiting TLTRO

Economic Governance and EMU Scrutiny Unit (EGOV)
Directorate-General for Internal Policies
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EN

Overly reliant on central bank funding?

Consequences of exiting TLTRO

Abstract

Following the gradual demise of TLTROs, the banking sector as a whole does not appear overly reliant on Central bank funding. Excess liquidity with the ECB remains abundant and banks enjoy a large cushion of unencumbered government bonds to be used in secured borrowing. They have also increased outstanding debt securities, although at a cost that has hugely increased since early 2022. Private-sector deposits, after returning to pre-Covid levels, remained roughly stable, as banks prioritised short-term profitability and hence hesitated to use them to shore up funding. Deposits could, however, provide lenders with a source of additional funding to offset future liquidity constraints.

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CONTENTS

LIST OF ABBREVIATIONS

BPS	Basis points (hundredth of a percentage point)
CDS	Credit default swap
ECB	European Central Bank
HQLA	High-quality liquid assets
MFI	Monetary and financial institutions (credit institutions and money market funds)
TLTRO	Targeted longer-term refinancing operation

LIST OF FIGURES

LIST OF TABLES

EXECUTIVE SUMMARY

TLTRO III, aimed at providing cheap long-term funding to credit institutions, will be entirely phased out by end 2024. Following the ECB's decision, in October 2022, to increase costs while providing banks with additional early repayment dates, almost €1 trillion of TLTRO money has been repaid early; a further significant reduction has occurred in June 2023, as the "jumbo" operation initiated three years before came to an end.

According to a multivariate "funding liquidity index" developed by ECB experts, the decision to accelerate the phasing out of TLTROs came at a time when rollover, redemption and margin risks were already increasing. As most of the liquidity provided by the ECB via the TLTROs has been rolled back, some analysts have claimed that excess liquidity for euro area banks remains abundant, whereas others have signalled a risk that individual countries and institutions may be vulnerable to the phase out of the remaining TLTRO operations. Banks in Cyprus, Greece, Italy and Slovakia remain highly reliant on TLTROs, which account for more than 4% of the credit institutions' total assets.

Credit institutions have reacted to the Central bank's announcement in several ways:

- on the assets side, they have reduced the excess liquidity held with the Eurosystem and recorded an increase in unencumbered assets, due to the collateral freed-up by phased out TLTROs. Overall, highly liquid assets held by significant institutions are still largely above pre-pandemic levels. However, the share held by most banks in debt securities issued by their domestic country remains high, especially for some large banking systems like Italy, France and Spain. Government bond portfolios that are highly concentrated on a single issuer are more vulnerable to adverse market developments; in the event of a debt crisis, large exposures to domestic sovereigns may also reinforce the so-called "bank-sovereign loop", leaving banks exposed to investors' disaffection and funding shortages;
- on the liabilities side, banks have resumed net issuance of debt securities and used time deposits to retain funding provided by households and non-financial corporations, New bonds were issued gradually, as the cost of bank debt in Europe skyrocketed from less than 1% in early 2022 to more than 4% in late. Private-sector deposits, after returning to pre-Covid levels, did not experience any particular reaction to the ECB's announcement leading to early TLTRO repayments, as banks have been reluctant to use this channel to shore up funding, to avoid jeopardising short-term profitability. Debt securities and deposits have reacted differently across Member States: while Finland, Slovenia and Austria have been faster in resuming net bond issuances, Greece, Portugal and Cyprus have shown a somewhat stronger increase in deposits.

Private sector deposits may provide banks with a source of additional funding to offset future liquidity constraints at the cost of paying higher returns. In other words, lenders could increase rates and trade some profits for higher deposit volumes, using short-term funding from households and non-financial companies to shore up their overall liquidity position. This perspective looks feasible in light of the fact that credit institutions have hitherto been slow in passing through increases in money market yields to retail depositors, but banking systems where rates on time deposits were raised more significantly have been capable of attracting a larger amount of new retail funding.

Institution-specific weaknesses, however, can only be addressed through in-depth, bank-by-bank data that is not available to the author of this paper. In this respect, it is reassuring that the SSM has engaged with significant institutions in a thorough assessment of their plans to replace TLTROs, looking at the volatility and diversification of funding sources, as well as at the amount and quality of collateral that can be used to access central bank facilities.

In order to remove segmentations between cash-rich and cash-strapped banks, the ECB (in its monetary function) should restore incentives to route excess liquidity into the interbank circuit (including across national boundaries), while at the same time avoiding liquidity squeezes caused by overly radical measures.

1. TLTRO III AND ITS GRADUAL PHASE OUT*

Targeted longer-term refinancing operations (TLTROs) are non-conventional liquidity-enhancing operations providing cheap long-term funding to credit institutions. They are "targeted", in that the conditions applied depend on the receiving bank's willingness to keep financing companies and households. A first series was launched in 2014, a second one in 2016 and the third one (known as "TLTRO III") in 2019.

TLTRO III included ten refinancing operations, each one with a maturity of three years, starting in September 2019 at a quarterly frequency. Borrowing rates paid by individual banks would depend on their lending patterns: as the latter increased loans to corporate and retail clients (excluding residential mortgages), lower rates would apply, down to the interest rate earned by credit institutions on the ECB deposit facility (with an additional discount of 50 basis points from June 2020 to June 2022).

Table 1: TLTRO III Operations

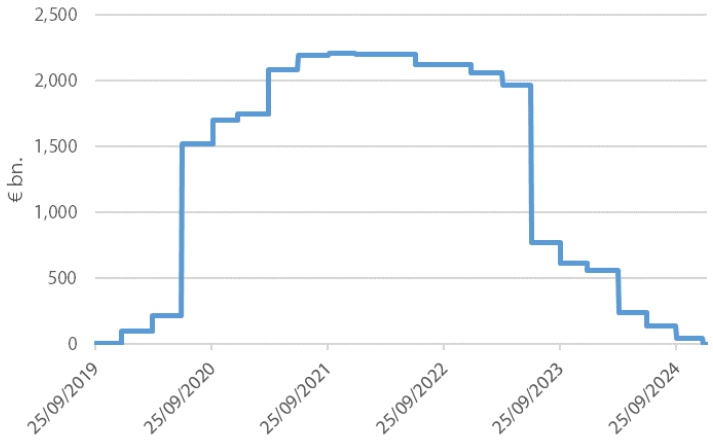
Settlement date	Amount (€bn)	Maturity date
25/09/2019	3.4	28/09/2022
18/12/2019	97.7	21/12/2022
25/03/2020	115.0	29/03/2023
24/06/2020	1,308.4	28/06/2023
30/09/2020	174.5	27/09/2023
16/12/2020	50.4	20/12/2023
24/03/2021	330.5	27/03/2024
24/06/2021	109.8	26/06/2024
29/09/2021	97.6	25/09/2024
22/12/2021	52.0	18/12/2024

Source: ECB, https://www.ecb.europa.eu/mopo/implement/omo/html/top_history.en.html.

The planned time-profile of these operations is portrayed in Figure 1: as can be seen, they were meant to provide cheap liquidity for about €2 tn. up to June 2023, when the €1.3 tn. deal started in June 2020 was due to end.

* Conversations with Nico Di Gabriele and Mario Quagliariello are gratefully acknowledged. All errors remain mine.

Figure 1: planned time profile of TLTROs



Source: our computations on https://www.wifa.uni-leipzig.de/institut-fuer-wirtschaftspolitik/forschung/tltro-tracker

On 27 October 2022, the ECB announced that the cost of existing TLTRO III operations would be fully indexed to the average applicable key ECB interest rates, removing the 50 bps discount and making this source of funding less attractive. At the same time, banks were provided with additional early repayment dates. This led to a wave of early repayments totalling almost €1 trillion, most of which were associated with the "jumbo" operation of June 2020.

Table 2: Early repayments of TLTRO III

Date	Early repayments (€bn)
23/11/2022	296.3
21/12/2022	447.5
25/01/2023	62.7
22/02/2023	36.6
29/03/2023	87.7
28/06/2023	29.5
27/09/2023	34.2
Total	994.5

Source: ECB, https://www.ecb.europa.eu/mopo/implement/omo/html/communication-history.en.html.

As of today, most of the liquidity provided by the ECB via the TLTROs has been rolled back. Some analysts have claimed that excess liquidity for euro area banks remains abundant[1], whereas others have

[1] (Cazzulani and Teig 2023).

signalled a risk that individual countries and institutions may be vulnerable to the phase out of the last TLTRO deals in late 2023 and 2024[2].

Based on the latest available Eurosystem data (see Figure 15 on page 27[3]), banks in Cyprus, Greece, Italy and Slovakia remain highly reliant on TLTROs, which account for more than 4% of the credit institutions' total assets. Compared to October 2022 (the last month before the ECB triggered early repayments), the sharpest reductions in TLTRO usage have occurred for Greece, Spain, Portugal and Italy.

* * *

According to a multivariate "funding liquidity index" developed by ECB experts[4], the decision to accelerate the phasing out of TLTROs came at a time when rollover, redemption and margin risks were already increasing. Against that backdrop, credit institutions have reacted to the Central bank's announcement in several ways: in §2 we show discuss the adjustments performed on both the assets side (reducing the excess liquidity held with the Eurosystem and recording an increase in unencumbered assets, due to the collateral freed-up by phased out TLTROs) and on the liabilities side (resuming net issuance of debt securities and using time deposits to retain funding provided by households and non-financial corporations). In §3, we focus on retail deposits to explore whether they can represent a source of additional funding for liquidity-constrained institutions. §4 concludes.

[2] (Comfort and Arons 2023a; Weber, Cherry, and Gledhill 2023).

[3] Additional country-specific evidence is reported in the Annex (from page 26).

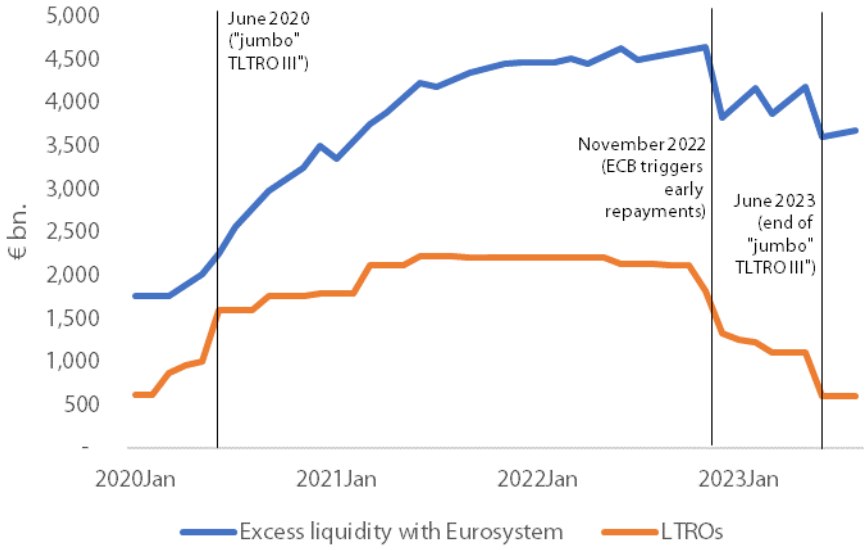
[4] See (de Vette et al. 2023). Roll-over risk is the risk that a bank might be unable to replace short-term funding at reasonable costs as it comes due; redemption risk is the risk that depositors withdraw funds; margining risk is the risk that haircuts on repo transactions and margin loan increase, reducing loanable values.

2. HOW BANKS ARE ADJUSTING TO THE END OF TLTRO III

2.1. The assets side: excess liquidity and unencumbered securities

As concerns excess liquidity, Figure 2 shows the total amount of excess reserves and deposit facilities held by euro area banks with the Eurosystem, as well as the amount of outstanding LTROs (mostly associated with TLTRO III) recorded on the latter's consolidated balance sheet. Excess liquidity, while showing a decreasing trend after the ECB's October 2022 announcement, has remained substantially higher than the amount of the TLTROs that are due to expire in late 2023 and 2024.

Figure 2: Excess liquidity with the Eurosystem and LTROs



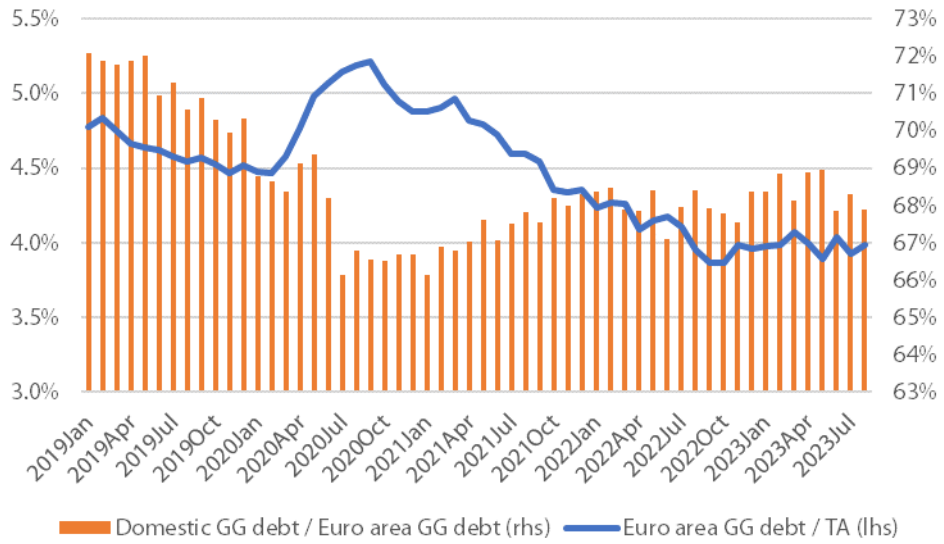
Source: author's computations on ECB data. Excess liquidity includes excess reserves (BSI dataset) and amounts held on the deposit facility (ILM dataset). Some monthly data are based on interpolations to take care of missing/inconsistent data points[5]

The decrease in excess liquidity and the differential ("cushion") between excess liquidity and outstanding TLTROs present significant differences across euro area countries (see Figure 16 in the Annex, page 28). While the weighted average cushion for the whole area amounts to 8% of total assets, some countries (including Italy, Greece and – less so – Slovakia and France) show values closer to zero, hinting at possible liquidity pressures as the remaining TLTROs come to an end.

This is not to say that banks lack alternative funding sources to replace phased-out TLTROs. Debt securities issued by euro area general governments and held by monetary financial institutions, a widely accepted collateral when banks need additional funding, seem to have remained overall stable since TLTRO early repayments were triggered in Fall 2022 (see Figure 3).

[5] When the ECB lifted the deposit facility rate to 0.75% as of 14 September 2022, banks shifted excess liquidity from their current accounts to the deposit facility (see Kinsele and Lizarazo 2022). As the two items are recorded in two separate databases, on the basis of different criteria, this led to temporary data inconsistencies in the total "excess liquidity" shown in the chart.

Figure 3: Public debt securities held by MFIs and issued by euro area countries



Source: author's computations on ECB data (BSI dataset). Data refers to Monetary Financial Institutions (MFIs) and therefore includes money market funds. GG stands for General Government.

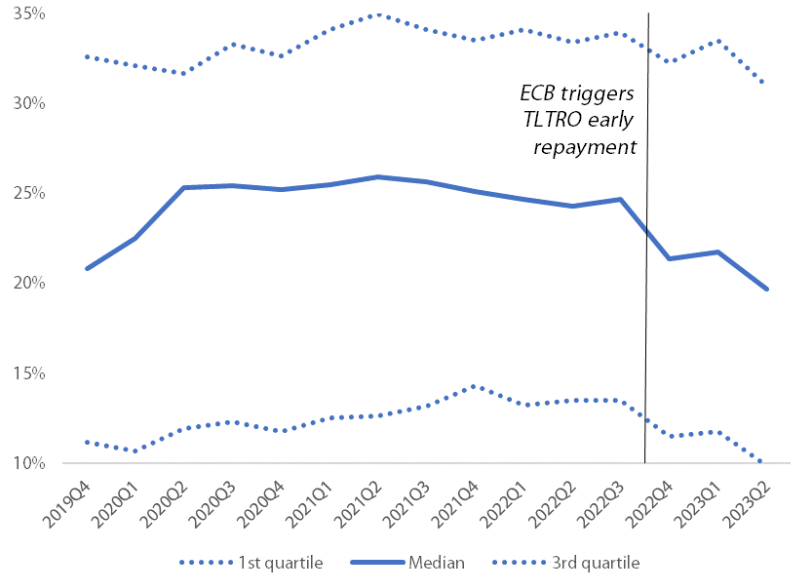
However, the share held by each bank in debt securities issued by its own domestic sovereign – while having fallen since mid-2020 - remains above two thirds. Higher values emerge for several countries, including large banking systems like Italy, France and Spain (as documented in Figure 17 on page 28). Government bond portfolios that are highly concentrated on a single country are known to be more vulnerable to adverse market developments, as they may, e.g., suffer from an increase in the haircuts associated with security-backed funding and from changes in the eligibility requirements dictated by repo counterparties[6]. In the event of a government debt crisis, large exposures to domestic sovereigns may also reinforce the so-called "bank-sovereign loop", leaving banks vulnerable to investors' disaffection and funding shortages on the wholesale market.

The government bonds reported in the previous figure also include "encumbered" securities, that is, securities already that are being used in repos or otherwise pledged as collateral for funding operations. In this respect, however, Figure 4 suggests that the decrease in TLTROs has reduced the share of "encumbered" assets, enhancing the banks' capacity to use their Treasury bond portfolios to raise additional wholesale funding[7].

[6] The interaction between the banks' "funding liquidity" (the ease with which financial intermediaries can borrow) and "market liquidity" (the ability to rapidly execute sizeable securities transactions at a low cost and with a limited price impact) goes beyond the scope of this paper. See e.g. (de Vette et al. 2023).

[7] Figure 4 reports the median value. According to (European Banking Authority 2023), the weighted average asset encumbrance ratio for European banks has fallen from 28% to 25.6% between September 2022 and June 2023.

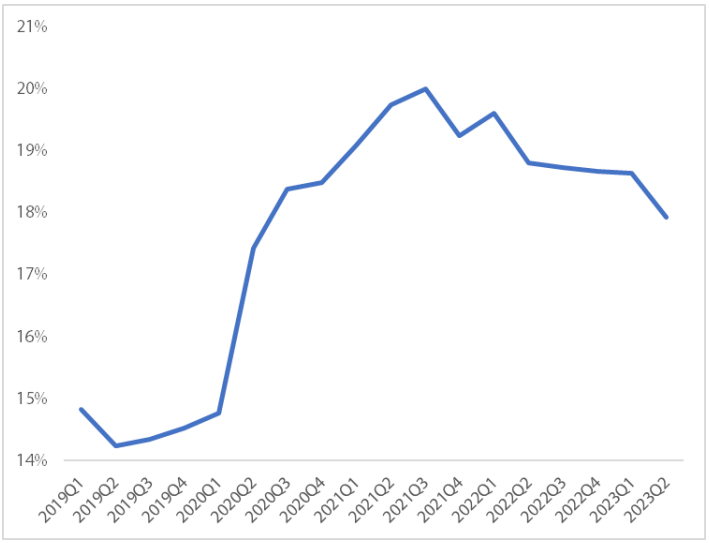
Figure 4: Asset encumbrance ratios of euro area banks



Source: author's computations on ECB data

Overall, highly liquid assets held by significant institutions ("Level 1 HQLAs", which include claims on Central banks, unencumbered securities issued by Member States and other eligible public sector entities, as well as covered bonds of extremely high quality[8]) are still largely above pre-pandemic levels, even though they have been showing a downward trend in the last two years (see Figure 5).

Figure 5: Level 1 High Quality Liquid Assets over total assets



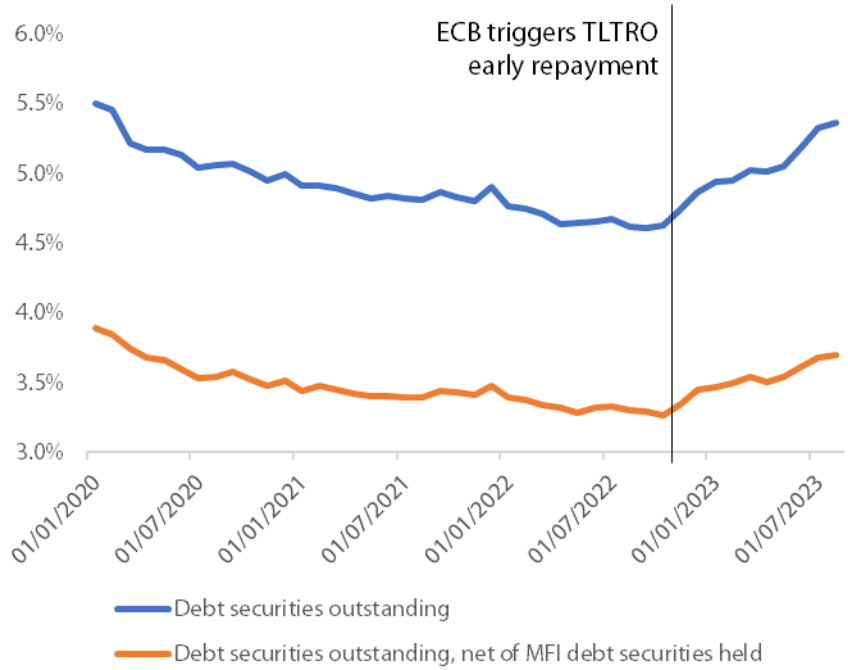
Source: author's computations on ECB data (SUP dataset, significant institutions only).

[8] See (Grandia et al. 2019) on the relationship between HQLAs and central bank operations.

2.2. The liabilities side: debt securities and private sector deposits

Following the ECB's October 2022 announcement, euro area banks have resumed issuing debt securities, including those aimed at institutional investors: according to (European Banking Authority 2023), as of end of July 2023 banks had already issued more instruments across all debt classes (including Tier 2 instruments and AT1 instruments) than year to date in the previous two years. As shown in Figure 6, after reaching a low of 4.6% (3.3% net of the MFI debt securities held on the assets side), the incidence on total assets has bounced back to 5.4% (3.7% on a net basis) in August 2023.

Figure 6: Debt securities outstanding as a share of total assets

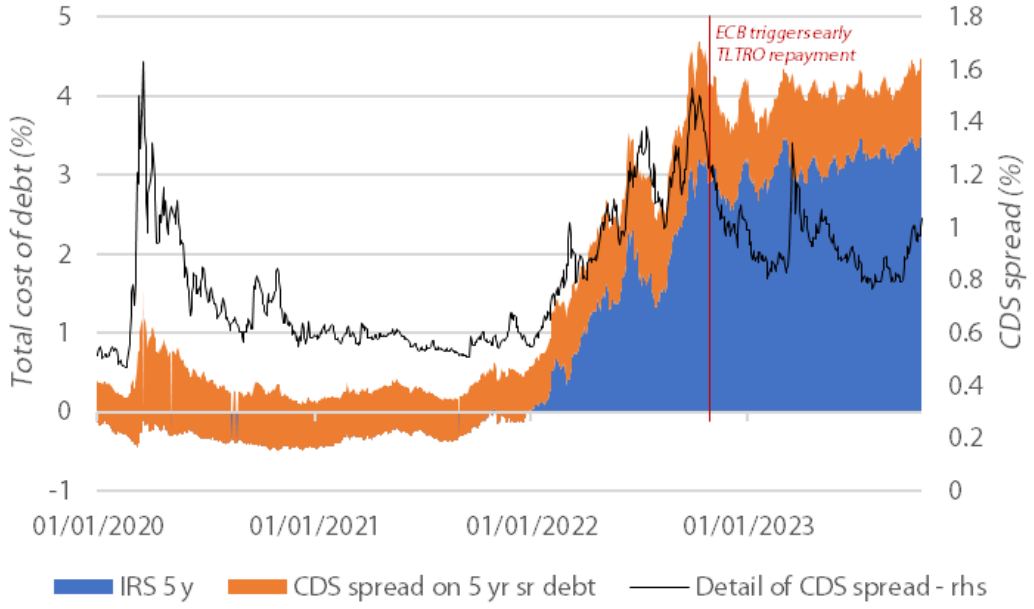


Source: ECB MFI statistics, aggregated balance sheets

Such a rebound has occurred as the cost of bank bonds in Europe skyrocketed from less than 1% in early 2022 to more than 4% in late 2023 (see Figure 7), meaning that debt securities could only be increased gradually, in order to avoid locking in a temporary over-heating in long-term rates and risk premiums[9].

[9] Regarding risk premiums, CDS spreads look consistently higher than they were before the outbreak of the Ukraine war and the ensuing energy crisis but seem to have returned to less critical levels after the peek experienced in March 2023 following the crisis of Credit Suisse and US regional banks.

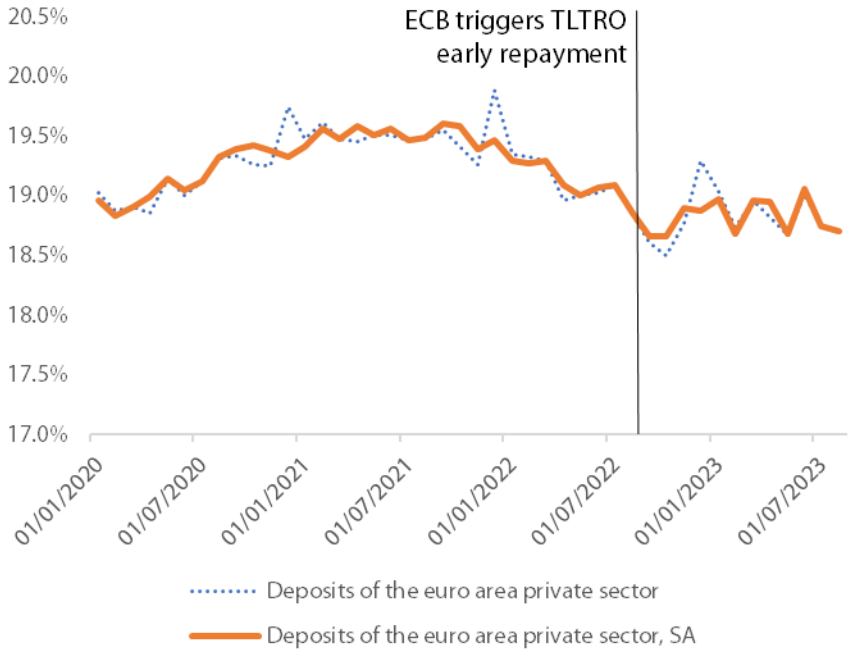
Figure 7: CDS spreads on senior debt for European financials



Source: Refinitiv (data on the CDS spread are based on the iTraxx EU senior financials benchmark)

Deposits raised from the private sector traditionally represent a major source of funding for euro area banks. As shown in Figure 8, after returning to pre-Covid levels, deposits did not experience any particular reaction to the ECB's announcement leading to early TLTRO repayments: seasonally-adjusted values have kept floating just below 19% of total assets, and did not show any special trend.

Figure 8: Deposits with the euro area private sector as a share of total assets

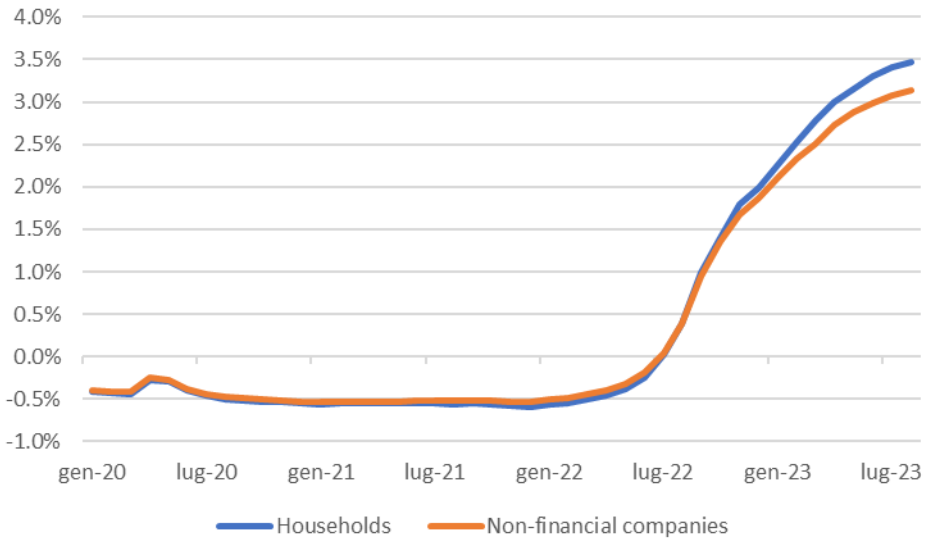


Source: ECB MFI statistics, aggregated balance sheets

Following the October 2022 ECB announcement, debt securities and deposits have reacted differently across Member States, as suggested by Figure 18 in the Annex (see page 29): while Finland, Slovenia and Austria have been faster in resuming net issuances of debt securities, whereas Greece, Portugal and Cyprus (followed by Spain and Italy) have shown a somewhat stronger increase in the incidence of private sector deposits on total assets.

Although banks turning to bond issuances have accepted the compression of net interest margins resulting higher market rates, the overall flat profile of private sector deposits suggests that banks have been reluctant to use this channel to shore up funding, to avoid jeopardising short-term profitability. In fact, the cost of demand funds raised from households and non-financial companies, having long exceeded that of wholesale short-term funds, is now significantly inferior to Euribor rates. This has provided banks with hefty unit profits on customer deposits (see Figure 9), which have supported the dramatic surge in net interest margin and return on equity recorded in late 2022 and 2023.

Figure 9: Unit profitability of overnight deposits from households and non-financial companies



Source: author's computations on ECB data (MIR and FM datasets). Unit profitability is computed as the difference between the 3-month Euribor rate (at which funds can be reinvested on the wholesale market) and the rate paid on overnight deposits

* * *

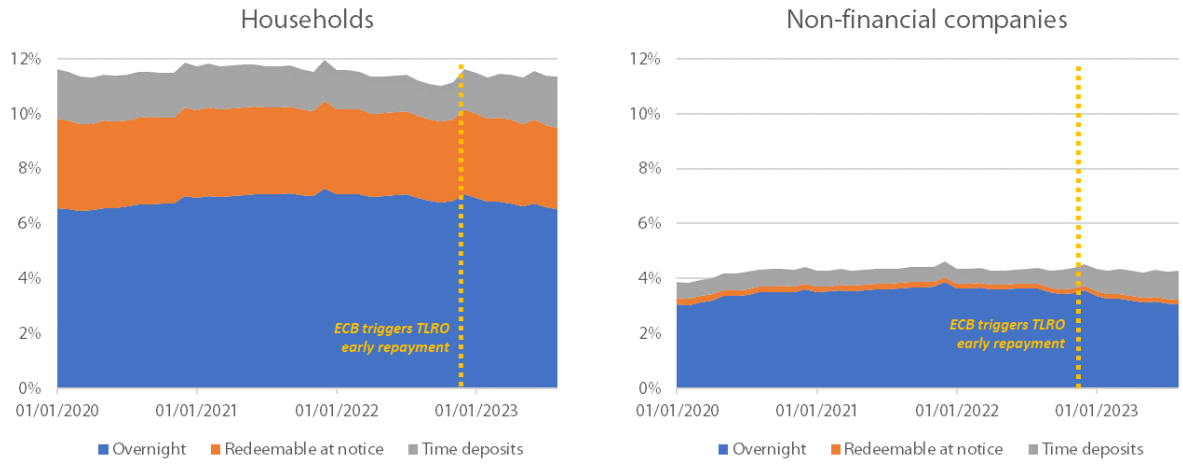
Given that rates have been lagging behind money market yields, one could argue that private sector deposits may provide a source of additional funding to offset any liquidity constraints, at the cost of paying higher returns. According to this view, banks could increase rates and trade some profits for higher deposit volumes, using short-term funding from households and non-financial companies to shore up their overall liquidity position. This hypothesis is further investigated in the next paragraph.

3. PRIVATE SECTOR DEPOSITS AS A SOURCE OF ALTERNATIVE FUNDING

3.1. Private sector deposits after TLTRO early repayments

Although private sector deposits have stayed almost unchanged following the start of early TLTRO repayments, their composition has evolved towards the most rate-sensitive components (see Figure 10), namely time deposits, whose incidence on total deposits has increased by one percentage point for households and nine percentage points for non-financial companies.

Figure 10: Different types of deposits as a share of total assets – euro area



Source: author's computations on ECB data (BSI dataset). Data refer to MFIs

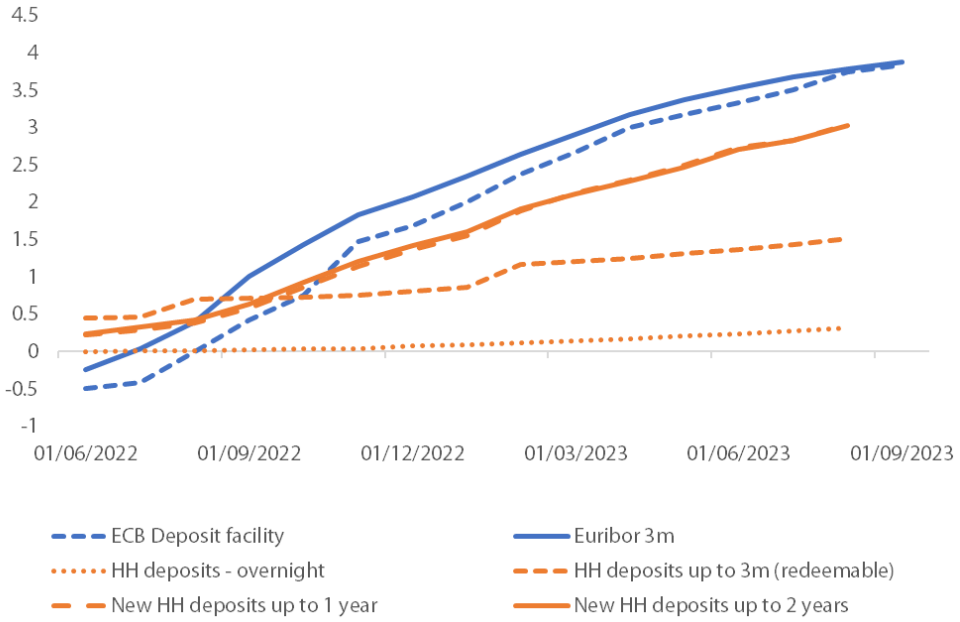
It should be noted that time deposits, together with deposits redeemable at notice, play a more significant role in some specific euro area countries, such as The Netherlands, Belgium and France. However, after October 2022, banks in almost all Member States have reduced overnight deposits and shifted towards other forms of funding from households and non-financial companies (see Figure 19 and Figure 20 in the Annex, page 30).

3.2. The cost of retail deposits

In the remainder of this paragraph, for the sake of brevity, we focus on deposits with households (henceforth, "retail deposits"), which – as noted above – represent the most part of the deposits raised by euro area banks from the private sector.

Figure 11 shows how key interest rates (in blue) have evolved since June 2022 (when the ECB started to increase its policy rates in response to higher inflation), and how the cost of retail deposits (in orange) has changed in response to new market conditions.

Figure 11: Key interest rates (blue) and rates on retail deposits (orange)



Source: author's computations on ECB data (MIR and FM datasets)

Before commenting on retail rates, it should be noted that the spread between Euribor rates and the rates paid by the Eurosystem on its deposit facility (the two blue lines) has grown thinner over time, weakening the incentive, for cash-rich institutions, to lend on the interbank market. Such an imbalance must be addressed, as it hampers the orderly operation of wholesale markets and limits the transfer of funds from banks running a liquidity surplus to those facing liquidity deficits. In this sense (although this is a wide-ranging issue that goes beyond the scope of this paper), it is worth emphasizing that, in order to make banks less reliant on Central bank funding, the ECB should cautiously pursue a gradual shift towards a "scarce reserves system" where market rates move within a "corridor" delimited by policy rates[10].

Moving now to retail rates (the orange lines), Figure 11 shows how their reaction has been markedly different for the three types of deposits considered in the picture: little or no movement occurred for overnight deposits (that are mostly motivated by transactional needs and whose holders may have reacted slowly to an environment of increasing inflation), whereas time deposits experienced a sustained increase, with "redeemable at notice" funding lying in-between.

To summarise how the unit cost of deposits has reacted to the shift in key ("blue") rates, one can compute the ratio between the changes experienced by those two variables over the period shown in the chart (June 2022 to August 2023). For example, the unit cost of new time deposits with a maturity up to two years has risen by 2.79% (from 0.24% to 3.03%) whereas the rate paid on the ECB deposit facility has increased by 4.24% (from -0.5% to 3.74%[11]); the quotient between those two values (also known as the "deposit beta"[12]) would therefore be equal to 65.8%. This is much higher than, say, for

[10] See (Whelan 2023; Dabrowski 2023) for a recent and thorough discussion. On the debate surrounding possible reforms of Central Bank operations, see e.g. (Schnabel 2023; Canepa and Koranyi 2023a; 2023b)

[11] Deposit facility rates in Figure 11 are monthly averages of daily values.

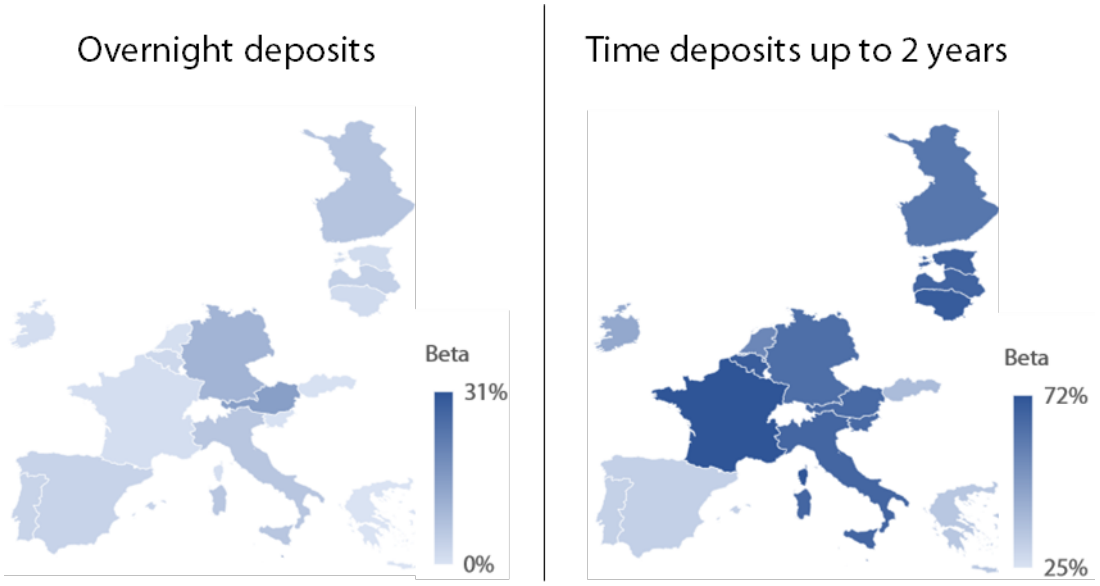
[12] See e.g. (European Central Bank 2023).

overnight deposits where the unit cost rose from 0% to 0.31%, leading to a beta of 7.3% (0.31%/3.74%). In simple terms, deposit betas are a measure of the pass-through of monetary policy rates to the deposit market.

One of the reasons why overnight deposits are typically associated with low betas is the fact that they are respond asymmetrically to changes in key yields[13], as their unit cost reacts quickly in the event of a rate cut but more sluggishly when market returns increase. Although the issue goes beyond the scope of this paper, it should be noted that this phenomenon is likely to have wealth-distribution effects, as low-income households tend to keep most of their savings (if any) as overnight deposits[14], while affluent families can afford to allocate a significant share of their assets to other short-term investments (including bank time deposits) whose remuneration reacts faster (and by a larger extent) to rising market rates.

As shown in Figure 12, deposit betas have been very heterogeneous across euro area banking systems[15]: while overnight deposits have recorded a relatively stronger response in Germany and Austria, time deposits have exhibited a marked reaction in France (where the rates on time deposits are partly regulated on the basis of inflation and market yields[16]) whereas Iberian countries have been slower to adjust. Further details on country-specific betas[17] are provided in Figure 21 and Figure 22 on page 31.

Figure 12: Betas of the rates on overnight and time deposits



Source: author's computations on ECB data (MIR and FM datasets). Data for France is based on time deposits up to one year.

[13] See e.g. (Resti and Sironi 2007 Chapter 1; Gerlach, Mora, and Uysal 2018).

[14] See e.g. (Barr 2009).

[15] However, according to (Joint Committee of European Supervisory Authorities 2023), "deposits at EU banks have demonstrated to be much stickier than at US banks, which has contributed to rather low deposit betas".

[16] See e.g. (Fitchratings 2023).

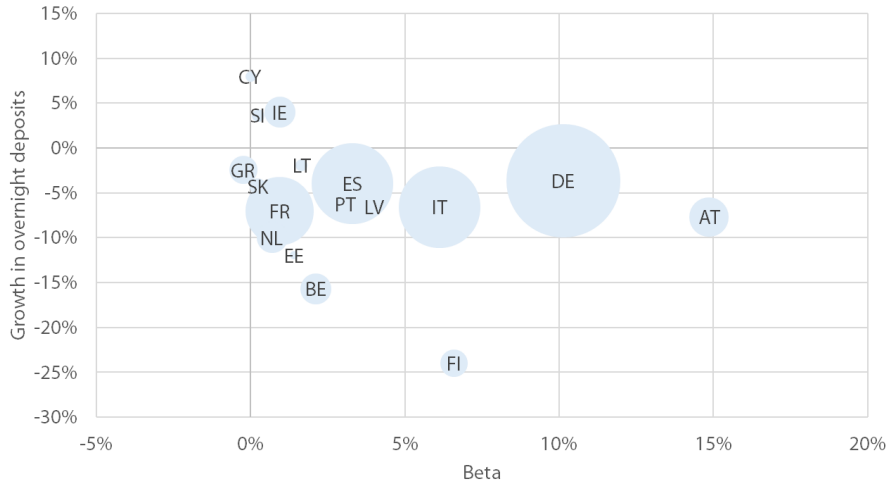
[17] Needless to say, country averages summarise a whole range of behaviours by individual banks, with liquidity constrained banks apparently associated with higher betas. See (Grodzicki et al. 2023).

3.3. Did higher rates on retail deposits lead to higher volumes?

As shown in Figure 12, banks in individual Member States have shown varying degrees of willingness to adjust the remuneration of deposits in response to higher policy rates. This provides a "natural experiment" to assess the link between yields and aggregated volumes, and whether, in the coming months, lenders in liquidity-constrained countries can use higher deposit rates to stimulate an increase in retail funding.

Figure 13 compares betas and growth rates for overnight deposits: no special correlation emerges between the two. This is unsurprising, given that – as noted above - overnight deposits are mostly held for transactional purposes and therefore are typically associated with low levels of price elasticity. Furthermore, as the return of inflation and higher policy rates was largely unexpected (and many experts believed that it would be short-lived), retail depositors may have suffered from monetary illusion and could therefore have been slow in reacting to new market conditions.

Figure 13: Betas and growth rates of overnight deposits

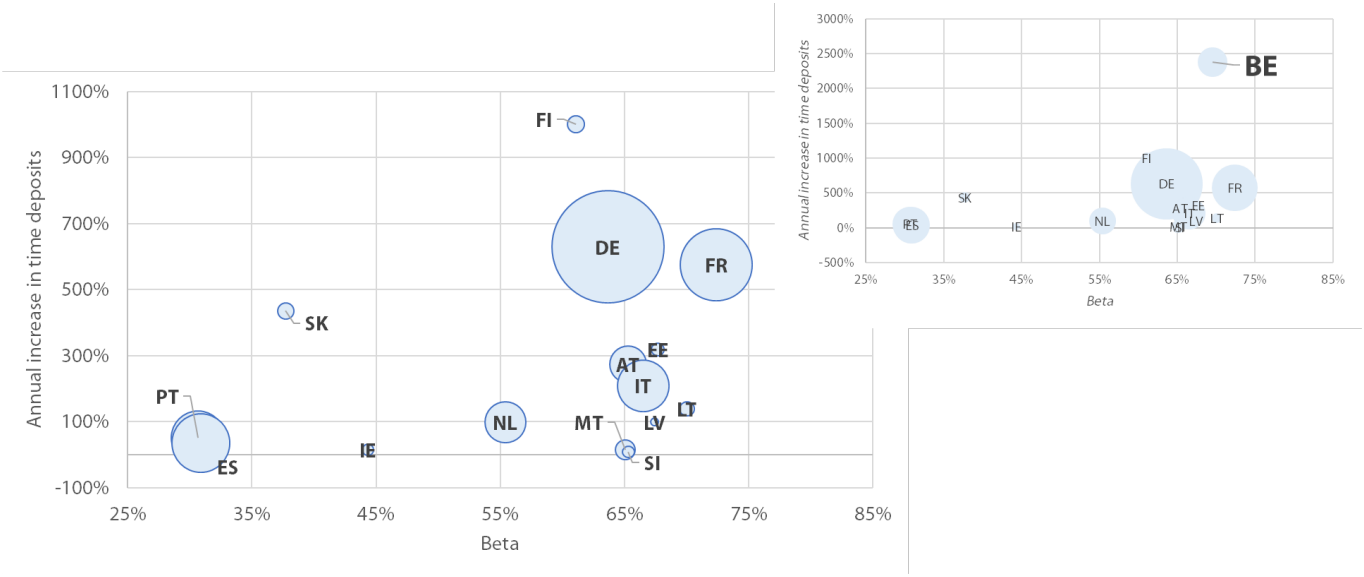


Source: author's computations on ECB data (MIR and BSI datasets). Betas measure the change in the rate paid on overnight deposits as a share of the change in the rate earned on the ECB deposit facility. Growth in overnight deposits is measured between June 2022 and August 2023. The size of the bubbles corresponds to overnight deposits in June 2022.

Things change when one looks at time deposits (Figure 14). Here, a positive correlation emerges between betas and growth rates, with Belgium[18], France, Germany and Finland using yield increases to stimulate additional funding, Iberian countries adopting a more conservative stance and other banking systems (such as The Netherlands and Slovakia) carrying out a careful balancing act between higher volumes and higher costs.

[18] Due to a very strong increase in time deposits, Belgium was removed from the main chart (on the left) to make results for other countries easier to read.

Figure 14: Betas and growth rates of time deposits up to two years



Source: author's computations on ECB data (MIR and BSI datasets). Betas measure the change in the rate paid on time deposits (up to two years, up to one year for France only) as a share of the change in the rate earned on the ECB deposit facility. Growth in time deposits (up to two years) compares flows in June 2022 – August 2023 to flows recorded twelve months before. The size of the bubbles corresponds to new time deposits between June 2022 and August 2023.

This points to some room for manoeuvre for banks wishing to use retail deposits as a source of additional funding. Still, several caveats are in order:

- the actual effect of higher rates on new funding flows depends on a number of country-specific, bank specific and time-specific factors, such as the dynamics of disposable income and the savings rate, the loan-to-deposit ratio[19], the competition of non-bank subjects (including governments[20], whose securities may also be made more attractive to retail investors by adjusting tax rates). Hence, while a trade-off between unit margins and funding volumes clearly exists, there is significant uncertainty on the actual size of the market response to be expected if deposit rates are further increased;
- for banking systems where time deposits play a limited role and could therefore be expanded in order to raise additional retail funding, a shift from overnight to time-committed deposits is likely to produce a significant impact on the weighted average cost of deposits;
- if bank deposits are made more appealing by offering higher rates, this could weaken demand for other products, including managed savings, where banks currently earn significant fees.

Having said that, retail funding looks as a feasible avenue for banks wishing to shore up their liquidity positions as the last TLTROs are gradually phased out.

[19] See (Kang-Landsberg and Plosser 2022).
[20] See e.g. (Bahceli 2023).

4. FINAL REMARKS

Following the gradual demise of TLTROs, the banking sector as a whole does not appear overly reliant on Central bank funding. Excess liquidity with the ECB remains abundant and banks enjoy a wide cushion of (largely unencumbered) government bonds to be used in secured borrowing. They have also increased outstanding debt securities, although at a cost that has hugely increased since early 2022. Private-sector deposits, after returning to pre-Covid levels, remained roughly stable, as banks prioritised short-term profitability and hence hesitated to use them to shore up funding. Retail deposits could, however, provide lenders with a source of additional funding to offset future liquidity constraints.

Against this backdrop, two further remarks are worth making.

First, our analysis of the overall liquidity profile of euro area banks does not provide details on individual situations which could prove more tense than eurozone averages, or even country-level data, suggest. Institution-specific weaknesses can only be addressed through in-depth, bank-by-bank data that is not available to the author of this paper. In this respect, it would be hard to disagree with the ECB when it states that, rather than aiming at tighter requirements across the board, supervisors must "go deeper into the liquidity profiles and funding profiles of individual banks"[21]. It is therefore reassuring that, over the last few months, the SSM has engaged with significant institutions in a thorough assessment of their plans to replace TLTROs, looking at the volatility and diversification of funding sources, as well as at the amount and quality of collateral that can be used to access central bank facilities.

Secondly, in order to remove segmentations between cash-rich and cash-strapped banks and increase the efficiency of wholesale markets, the ECB is called to a difficult balancing exercise, restoring incentives to route excess liquidity into the interbank circuit (including across national boundaries), while at the same time avoiding liquidity squeezes caused by overly radical measures. Rather than just drying up some excess reserves to improve the transmission of a tighter monetary policy regime, the Central bank may want to consider ways to dissuade banks from keeping large unused cash piles on their balance sheets. Institutions must of course be encouraged to hold an adequate amount of liquid assets, but holding huge stashes of idle money should be made increasingly uneconomical.

[21] See (Comfort and Arons 2023b).

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ANNEX: ADDITIONAL COUNTRY-SPECIFIC EVIDENCE

Figure 15: LTROs over total assets

	Oct 22	Aug 23	Delta
Austria	7.8%	2.5%	-5.3%
Belgium	6.4%	1.0%	-5.4%
Cyprus	8.7%	6.8%	-2.0%
Germany	3.7%	1.2%	-2.4%
Estonia	4.7%	0.1%	-4.6%
Spain	9.3%	1.3%	-8.0%
Finland	3.9%	1.0%	-3.0%
France	4.0%	1.3%	-2.7%
Greece	15.0%	5.3%	-9.8%
Ireland	2.2%	0.0%	-2.1%
Italy	10.7%	4.6%	-6.0%
Lithuania	3.0%	2.5%	-0.5%
Luxembourg	2.6%	0.6%	-2.0%
Latvia	2.3%	0.3%	-1.9%
Malta	1.6%	0.1%	-1.5%
Netherlands	5.7%	0.9%	-4.8%
Portugal	9.1%	1.2%	-7.8%
Slovenia	2.8%	0.2%	-2.6%
Slovakia	8.9%	4.1%	-4.7%
Euro Area	**5.4%**	**1.6%**	**-3.8%**

Source: author's computations on ECB data (ILM dataset for LTROs, BSI dataset for total assets[22]).

[22] To minimise biases due to the high incidence of MMFs on MFIs for some countries, total assets for credit institutions at October 2022 and August 2023 are estimated based on MMF data for September 2022 and June 2023.

Figure 16: Excess liquidity with the Eurosystem over total assets

	Nov 2022	Aug 2023	Delta %	Excess liquidity with Eurosystem net of outstanding LTROs
Austria	11.4%	9.5%	-2%	7%
Belgium	19.6%	17.5%	-2%	17%
Cyprus	33.4%	33.2%	0%	26%
Germany	13.2%	11.2%	-2%	10%
Estonia	19.2%	17.8%	-1%	18%
Spain	11.0%	7.3%	-4%	6%
Finland	16.9%	16.3%	-1%	15%
France	9.4%	7.5%	-2%	6%
Greece	15.0%	9.4%	-6%	4%
Ireland	10.6%	8.6%	-2%	9%
Italy	8.2%	5.2%	-3%	1%
Lithuania	20.8%	14.0%	-7%	11%
Luxembou	22.7%	17.7%	-5%	17%
Latvia	17.9%	19.1%	1%	19%
Malta	13.4%	13.2%	0%	13%
Netherlan	14.4%	11.4%	-3%	11%
Portugal	11.8%	7.9%	-4%	7%
Slovenia	16.8%	19.1%	2%	19%
Slovakia	9.7%	9.9%	0%	6%
Euro area	**11.9%**	**9.6%**	-2%	**8%**

Source: author's computations on ECB data. Excess liquidity includes excess reserves (BSI dataset) and amounts held on the deposit facility (ILM dataset).

Figure 17: Public debt securities issued by euro area countries on total assets

	Oct 22	Aug 23	Delta	% of domestic GG debt as of Aug 23
Austria	3.3%	3.7%	0.4%	43.7%
Belgium	4.4%	4.1%	-0.2%	47.6%
Cyprus	5.8%	6.1%	0.3%	62.4%
Germany	2.0%	2.1%	0.1%	55.7%
Estonia	2.0%	1.7%	-0.3%	26.0%
Spain	9.0%	9.3%	0.3%	76.0%
Finland	0.9%	1.2%	0.3%	33.3%
France	2.0%	2.2%	0.2%	81.7%
Greece	10.7%	13.0%	2.3%	70.6%
Croatia	10.3%	11.4%	1.1%	86.3%
Ireland	2.0%	1.5%	-0.5%	44.1%
Italy	11.7%	12.2%	0.6%	80.8%
Lithuania	5.2%	5.2%	0.0%	52.7%
Luxembourg	3.6%	2.9%	-0.8%	2.7%
Latvia	7.2%	5.4%	-1.8%	48.7%
Malta	12.6%	12.3%	-0.3%	46.4%
Netherlands	1.7%	1.6%	-0.1%	18.6%
Portugal	12.5%	13.5%	1.0%	41.9%
Slovenia	9.1%	9.6%	0.6%	44.8%
Slovakia	9.1%	9.5%	0.4%	91.6%
Euro area	3.9%	4.0%	0.1%	67.9%

Source: author's computations on ECB data (BSI dataset). Data refers to Monetary Financial Institutions (MFIs)[23]. GG stands for General Government.

[23] MFIs include money market funds, which account for more than 10% of total assets in Ireland and Luxembourg.

Figure 18: Debt securities outstanding and private sector deposits as a share of total assets

	Debt securities outstanding, net of MFI debt securities held			Deposits from private sector and general government		
	Oct 22	Aug 23	Delta	Oct 22	Aug 23	Delta
AT	6.0%	7.2%	1.1%	21.8%	22.5%	0.7%
BE	2.2%	2.4%	0.3%	25.1%	25.2%	0.1%
CY	-0.7%	-0.7%	0.1%	32.4%	34.1%	1.7%
DE	3.7%	4.1%	0.4%	19.8%	20.5%	0.7%
EE	2.5%	2.8%	0.4%	34.8%	35.1%	0.3%
ES	4.0%	4.7%	0.7%	27.1%	28.2%	1.1%
FI	8.7%	10.3%	1.6%	13.0%	13.5%	0.5%
FR	3.5%	4.0%	0.5%	14.0%	13.9%	-0.1%
GR	0.9%	1.3%	0.4%	31.4%	33.9%	2.6%
HR	0.5%	0.8%	0.3%	38.4%	38.9%	0.5%
IE	-2.5%	-2.3%	0.1%	10.5%	10.9%	0.4%
IT	2.3%	2.7%	0.4%	26.0%	26.9%	0.9%
LT	-0.3%	-0.4%	-0.1%	38.4%	36.3%	-2.0%
LU	-1.5%	-2.2%	-0.7%	15.0%	13.4%	-1.6%
LV	0.1%	0.2%	0.1%	36.1%	36.4%	0.3%
MT	-0.3%	-0.1%	0.1%	31.2%	31.7%	0.5%
NL	5.5%	5.9%	0.4%	21.0%	21.6%	0.6%
PT	1.2%	1.4%	0.2%	30.6%	32.2%	1.7%
SI	0.6%	1.8%	1.2%	37.5%	37.3%	-0.1%
SK	3.6%	4.3%	0.7%	30.6%	30.5%	-0.1%
U2	3.3%	3.7%	0.4%	19.2%	19.6%	0.4%

Source: ECB MFI statistics, aggregated balance sheets. U2 stands for euro area. Due to data limitations, private sector deposits also include general government.

Figure 19: Deposits with households over total assets: main components

	Overnight deposits			Deposits redeemable at notice			Time deposits		
	Oct 22	Aug 23	Delta	Oct 22	Aug 23	Delta	Oct 22	Aug 23	Delta
AT	10.8%	9.6%	-1.1%	0.0%	0.0%	0.0%	4.0%	4.8%	0.8%
BE	5.0%	4.2%	-0.8%	11.4%	10.7%	-0.8%	0.3%	1.6%	1.3%
CY	12.2%	12.8%	0.6%	1.4%	1.4%	0.0%	6.9%	7.0%	0.0%
DE	8.7%	8.2%	-0.5%	2.5%	2.2%	-0.3%	1.3%	2.2%	0.9%
EE	12.1%	10.6%	-1.5%	1.1%	1.3%	0.1%	2.9%	6.0%	3.1%
ES	15.7%	15.0%	-0.7%	0.0%	0.0%	0.0%	1.1%	1.7%	0.6%
FI	6.1%	5.1%	-1.0%	1.4%	1.7%	0.3%	0.2%	0.6%	0.4%
FR	2.7%	2.5%	-0.2%	3.5%	3.7%	0.2%	1.5%	1.7%	0.2%
GR	18.0%	17.0%	-1.0%	0.4%	0.3%	-0.1%	3.8%	5.6%	1.9%
HR	16.9%	18.5%	1.6%	0.0%	0.0%	0.0%	6.1%	5.6%	-0.4%
IE	4.5%	4.5%	0.1%	0.2%	0.2%	0.0%	0.1%	0.1%	0.0%
IT	12.4%	11.5%	-1.0%	4.1%	4.1%	0.0%	0.5%	0.9%	0.4%
LT	18.0%	16.5%	-1.6%	0.1%	0.1%	0.0%	3.3%	5.2%	2.0%
LU	2.3%	1.8%	-0.5%	0.0%	0.0%	0.0%	0.3%	0.8%	0.5%
LV	17.3%	15.9%	-1.4%	1.2%	1.3%	0.0%	1.4%	2.9%	1.4%
MT	16.5%	16.5%	0.0%	0.1%	0.1%	0.0%	4.4%	5.2%	0.8%
NL	2.3%	2.0%	-0.2%	6.3%	6.5%	0.2%	1.0%	1.2%	0.2%
PT	10.9%	10.0%	-1.0%	0.4%	0.4%	0.0%	10.8%	11.0%	0.1%
SI	21.4%	22.3%	0.8%	0.0%	0.0%	0.0%	2.6%	3.2%	0.6%
SK	14.8%	14.4%	-0.4%	1.0%	0.7%	-0.3%	3.5%	4.3%	0.8%
U2	6.9%	6.5%	-0.4%	3.0%	3.0%	0.0%	1.3%	1.9%	0.5%

Source: author's computations on ECB data (BSI dataset). Data refer to MFIs. U2 stands for euro area

Figure 20: Deposits with non-financial companies over total assets: main components

	Overnight deposits			Deposits redeemable at notice			Time deposits		
	Oct 22	Aug 23	Delta	Oct 22	Aug 23	Delta	Oct 22	Aug 23	Delta
AT	3.7%	3.0%	-0.6%	0.0%	0.1%	0.0%	0.9%	1.4%	0.4%
BE	4.4%	3.7%	-0.7%	11.4%	0.6%	-10.8%	0.4%	1.2%	0.8%
CY	7.4%	7.0%	-0.4%	1.4%	0.3%	-1.2%	0.6%	0.9%	0.3%
DE	3.0%	2.7%	-0.4%	2.5%	0.0%	-2.5%	0.8%	1.1%	0.3%
EE	12.5%	9.8%	-2.6%	1.1%	0.2%	-0.9%	0.8%	2.6%	1.8%
ES	4.9%	4.3%	-0.6%	0.0%	0.0%	0.0%	0.7%	1.0%	0.3%
FI	3.2%	2.8%	-0.4%	1.4%	0.1%	-1.3%	0.2%	0.3%	0.1%
FR	2.8%	2.3%	-0.4%	3.5%	0.1%	-3.4%	0.9%	1.3%	0.4%
GR	5.9%	5.3%	-0.6%	0.4%	0.1%	-0.3%	0.8%	1.6%	0.8%
HR	8.9%	8.2%	-0.7%	0.0%	0.0%	0.0%	0.7%	2.3%	1.6%
IE	2.4%	2.3%	0.0%	0.2%	0.0%	-0.2%	0.4%	0.4%	-0.1%
IT	5.1%	4.7%	-0.5%	4.1%	0.1%	-4.1%	0.3%	0.6%	0.3%
LT	8.8%	8.4%	-0.4%	0.1%	0.1%	0.0%	0.2%	1.5%	1.2%
LU	1.3%	1.0%	-0.3%	0.0%	0.0%	0.0%	0.3%	0.4%	0.1%
LV	12.1%	10.8%	-1.3%	1.2%	0.1%	-1.2%	0.4%	2.2%	1.9%
MT	4.3%	4.1%	-0.2%	0.1%	0.1%	0.0%	0.3%	0.3%	0.0%
NL	5.2%	4.2%	-1.0%	6.3%	1.5%	-4.8%	0.5%	0.8%	0.3%
PT	6.5%	5.7%	-0.8%	0.4%	0.2%	-0.2%	1.2%	2.1%	0.9%
SI	7.1%	7.2%	0.1%	0.0%	0.3%	0.3%	1.6%	1.8%	0.1%
SK	6.4%	6.0%	-0.4%	1.0%	0.1%	-1.0%	1.1%	2.0%	0.9%
U2	3.5%	3.1%	-0.5%	3.0%	0.2%	-2.8%	0.7%	1.0%	0.3%

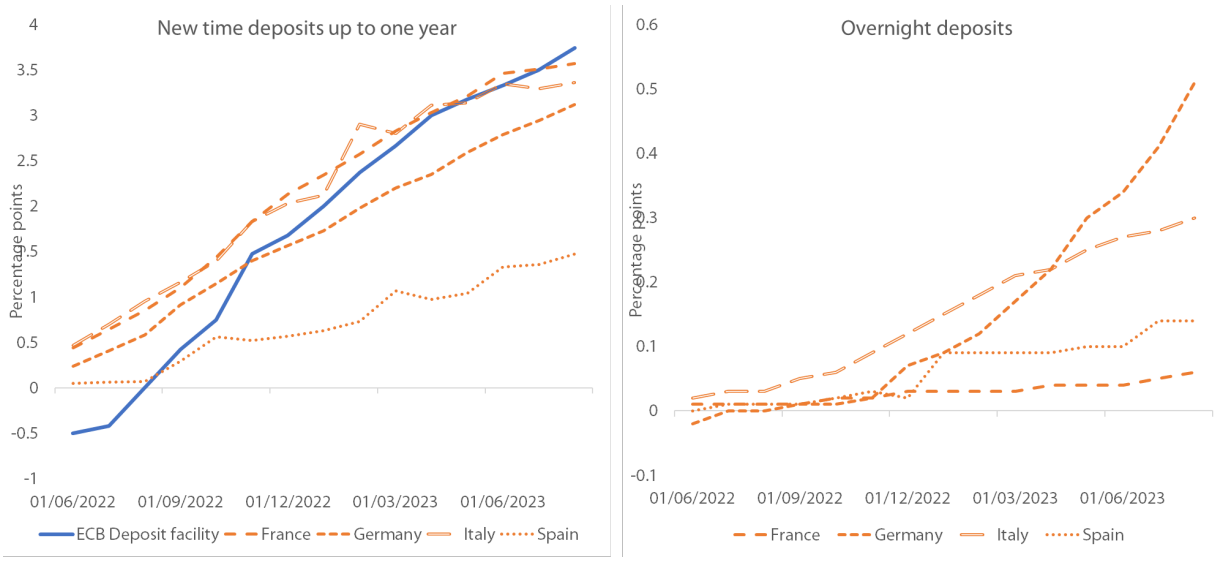
Source: author's computations on ECB data (BSI dataset). Data refer to MFIs. U2 stands for euro area

Figure 21: Rates on retail deposits and their betas

	Overnight deposits				New time deposits up to two years*			
	June 2022	August 2023	Delta	Beta on ECB DF	June 2022	August 2023	Delta	Beta on ECB DF
Austria	0.06	0.69	0.63	15%	0.12	2.89	2.77	65%
Belgium	-0.01	0.08	0.09	2%	0.18	3.13	2.95	70%
Cyprus	0.00	0.00	0.00	0%	0.05	1.09	1.04	25%
Estonia	0.06	0.12	0.06	1%	0.57	3.44	2.87	68%
Finland	0.02	0.30	0.28	7%	0.36	2.95	2.59	61%
France	0.01	0.05	0.04	1%	0.44	3.51	3.07	72%
Germany	-0.02	0.41	0.43	10%	0.24	2.94	2.7	64%
Greece	0.03	0.02	-0.01	0%	0.12	1.56	1.44	34%
Ireland	0.02	0.06	0.04	1%	0.02	1.9	1.88	44%
Italy	0.02	0.28	0.26	6%	0.47	3.29	2.82	66%
Latvia	0.00	0.17	0.17	4%	0.18	3.04	2.86	67%
Lithuania	0.00	0.07	0.07	2%	0.28	3.25	2.97	70%
Malta	0.02	1.35	1.33	31%	0.13	2.89	2.76	65%
Netherlands	0.02	0.05	0.03	1%	0.4	2.75	2.35	55%
Portugal	-0.03	0.10	0.13	3%	1.42	2.72	1.3	31%
Slovakia	0.00	0.01	0.01	0%	0.07	1.67	1.6	38%
Slovenia	0.01	0.02	0.01	0%	0.3	3.07	2.77	65%
Spain	0.00	0.14	0.14	3%	0.05	1.36	1.31	31%
Euro area	0.00	0.27	0.27	6%	0.24	2.82	2.58	61%
*up to one year for France								

Source: author's computations on ECB data (MIR and FM datasets). Betas measure the change in the rate paid on overnight deposits as a share of the change in the rate earned on the ECB deposit facility.

Figure 22: Key interest rates (blue) and rates on retail deposits (orange)



Source: author's computations on ECB data (MIR and FM datasets)

Following the gradual demise of TLTROs, the banking sector as a whole does not appear overly reliant on Central bank funding. Excess liquidity with the ECB remains abundant and banks enjoy a large cushion of unencumbered government bonds to be used in secured borrowing. They have also increased outstanding debt securities, although at a cost that has hugely increased since early 2022. Private-sector deposits, after returning to pre-Covid levels, remained roughly stable, as banks prioritised short-term profitability and hence hesitated to use them to shore up funding. Deposits could, however, provide lenders with a source of additional funding to offset future liquidity constraints.
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