



EXECUTIVE SUMMARY

The European Central Bank (ECB) has progressed its monetary policy tightening to tame inflation. Recently, the ECB also focused on liquidity conditions in the euro area. Excess liquidity has dropped substantially after the repayment of the June TLTROs repayment but remains elevated at around €3.5 trillion. Against this backdrop, the minutes of the July Governing Council (GC) showed that some members were in favor of potential changes to minimum bank reserves. The Minimum Reserve Requirements (MRR) ratio could rise from 1% to between 2% to 10%, according to market participants, with material implications for banks, money markets, and the broader eurozone financial landscape. This move to help drain excess liquidity could reduce bank profitability and tighten conditions in money markets. This note lays out the potential consequences of an increase in the MRR, including those associated with a large increase of the ratio, and discusses alternative strategies like quantitative tightening and reverse tiering deposit schemes as ways to normalize excess liquidity. Contacts expect a decision to be announced together with the conclusion of the operational framework review during the first half of 2024.

TIME TO NORMALIZE THE ECB'S EXCESS LIQUIDITY?

After ten consecutive rate hikes and an expectation for policy rates to plateau, market contacts are now increasingly focused on the excess liquidity generated by the unprecedented expansion of the ECB's balance sheet. Still large amounts of excess liquidity are incurring significant costs to the ECB given policy rates are now 450 basis points higher than in July 2022. There is thus more attention on reserves requirements, an increase of which could reduce this cost, and also support the implementation of ECB monetary policy because tighter liquidity should amplify policy transmission.

The excess liquidity corresponds to the liquidity in the banks' Current Account plus the Deposit Facility minus the Margin Lending Facility and the Minimum Reserves Requirement amounts. This liquidity is generally remunerated at different rates depending on whether it's in excess or within the required reserves. Market participants do not expect any major change to reserve requirements before the review of the ECB operational framework, currently expected to conclude during the first half of 2024. However, recent comments from some GC members regarding the necessary magnitude of reserve requirement changes has drawn considerable attention.

As background, on July 27, 2023, the ECB revised the remuneration of minimum bank reserves from the deposit facility rate to 0%, while maintaining the minimum reserve requirement ratio (MRR ratio, i.e. the reserves banks are required to hold at the central bank) at 1%. This change became effective as of the beginning of the maintenance period starting on September 20, 2023.¹ In doing so, the central bank aimed to "*preserve the effectiveness*" and "*improve the efficiency*" of monetary policy by lowering payments on required reserves.

A Reuters article around mid-September cited sources that the ECB is reportedly considering raising the MRR from the current 1% of customer deposits to a potential range of a 3-4%.² This was reportedly one of three focus areas that the ECB is considering in the broader context of reducing excess liquidity – with other focus areas including the unwinding of its bond purchase programmes and a new operational framework for short-term interest rates.

Anticipation that changes to the MRR could be made were further fueled by the July ECB meeting accounts, which showed that the GC had discussed quite extensively the increase of the threshold of the MRR.³ While some members expressed reservations against a change, some considered the MRR as a monetary policy tool and favored coming back to the level prevailing prior to 2011, i.e., a 2% ratio.

More recently, Austrian GC Member Holzmann expressed a preference to increase the MRR to up to 10%.⁴ A recent blog post from Austrian National Bank staff suggests that this preference was inspired by a CEPR column from May this year that proposed to decrease the ratio of remunerated to unremunerated reserves with the aim of reducing the "*subsidy*" provided to banks.⁵ Moreover, a Reuter article from November suggested that during the October monetary policy meeting, ECB officials reportedly discussed the possibility of reducing the interest paid on government deposits to address the increasing losses incurred in their efforts to combat inflation.⁶

Overall, market contacts highlight that any debate over the changes in the MRR that results in uncertainty could prompt banks to turn more risk adverse and curtail lending. Some analysts and banks pointed to the downside risks of such a measure highlighting that it would be counterproductive in the current context where banks have to support the economy, pointing to the risk to see the fragile outlook morphing into a “*credit crunch-driven recession*”.

WHAT ARE THE CONSEQUENCES OF MATERIALLY INCREASING THE RATIO OF THE MINIMUM RESERVE REQUIREMENTS?

• Significant Shifts in Eurozone Liquidity and ECB Interest Expenditures

Excess liquidity has increased from €1.8trillion at the start of 2020 to a peak of roughly €4.7 trillion in mid-2022 before declining to about €3.5 trillion more recently. The decline in excess liquidity over the last year primarily stemmed from repayments in the targeted longer-term refinancing operations (TLTROs) as the ECB tweaked TLTRO terms to make them less appealing to banks (Figure 1). Banks, no longer benefiting from positive interest rate spreads by depositing TLTRO loans at the ECB, repaid TLTROs with ECB-held cash, reducing excess liquidity (Table 1). After the most significant repayment in June the excess liquidity dropped to around €3.5 trillion

Currently, the aggregated current accounts of Eurozone banks amount to €155 billion, of which the MRR represents the lion's share. According to market contacts, the reduction of the remuneration from the deposit facility to 0% would lower the ECB's interest expenditures about €6.5 billion per year.

• Quantitative Tightening vs. Liquidity Tightening

Raising the MRR will allow the ECB to reduce excess liquidity without altering its QT in the APP and the reinvestments in the PEPP. During its quantitative easing (QE), the ECB bought securities from banks, leading banks to deposit the proceeds, in turn increasing excess liquidity. In QT and liquidity tightening (LT), the ECB aims to absorb QE-generated liquidity using distinct methods. QT shrinks the ECB's balance sheet, while that of the banking system remains unchanged as the ECB is selling the securities back to banks, which in turn reduce their liquidity deposited at the ECB. Conversely, LT maintains the ECB's balance sheet size, but alters its liability composition as banks withdraw liquidity from the deposit facility to meet the increased minimum reserve requirement. However, the balance sheet of the banking system might contract as the minimum reserves do not earn interest, so that banks may reduce their balance sheets by shedding customer deposits and securities holdings or curb back on lending (Table 2).

• Increasing Minimum Reserves Could Help Drain Excess Liquidity

Increases in MRR played a significant role in absorbing excess liquidity until before 2011. The rate has been reduced on January 18, 2012, from 2% to 1% as part of the non-standard measures to ensure a smooth transmission of monetary policy. At that time the objective was (1) to support the bank lending channel by freeing up balance sheet space for loans, and (2) provide liquidity in the euro area to foster money market activity (Figure 2 and Figure 3). Therefore, *increasing* the MRR ratio would be reversing this mechanism. Market contacts perceive that the ECB will likely implement larger changes after the operational framework review during the first half of 2024. Against this backdrop, market analysts looked at various scenarios and their implications on the liquidity in the euro area. It is estimated that:

- Increasing the MRR to 3% could reduce excess liquidity by year-end 2024 by 8% to €3.2 trillion, a reduction akin to consensus expectations for the run-off of the holdings in the APP and Pandemic Emergency Purchase Programme (PEPP) as well as TLTRO repayments following median estimates of the October ECB Survey of Monetary Analysts (SMA).
- An increase to 4% could lower excess liquidity to €2.9 trillion, mirroring the effect of the downside scenario on QT in the APP and an earlier end to PEPP reinvestments as captured by the 25th percentile of October SMA estimates and accelerated TLTRO repayments as captured by the 75th percentile of October SMA estimates.
- An increase to 10% could slash excess liquidity by 40% to €2.2 trillion (Figure 4). To prevent navigating into the steeper part of the demand curve for bank reserves in which even small changes in the supply of, or demand for, reserves could lead to large swings in interest rates (Figure 5), the ECB might need to bolster excess reserves. However, even though an increase to 10% MRR might need to be mitigated by more LTROs, this would appear counterintuitive given the recent discouragement through tweaked TLTRO terms.⁷ Additionally, differences between countries also make it crucial for the ECB to tread carefully when raising the MRR. For instance, even a small increase to 2% at the country level could turn some banking systems' total excess liquidity negative (Figure 6). Moreover, even if a banking sector still has positive aggregate liquidity after an MRR adjustment, certain banks in the system could fall into a deficit. A higher MRR ratio would also impact banks' liquidity coverage ratios (LCR) with analysts estimating that every 1 ppt. increase in MRR could see a roughly 4.5 ppt. decline in banks' LCRs (Figure 7). Beginning with the

September-end level, when the MRR still earned at the deposit facility rate, if everything else remains constant, each 2.5ppt. increase in MRR in combination with the un-remuneration of the MRR could reduce commercial banks' net interest income by an incremental €16.5bn. (Figure 8). As a consequence, a higher MRR would hence erode bank earnings (Figure 9).

• Impact for Money Markets

While the change for reserves to be remunerated at 0% has had very limited impact so far, markets participants are concerned about the level of the ratio.

A reduction of the excess liquidity stemming from higher MRR could improve policy transmission. However, it could also entail some volatility in the interbank market especially at the end of the month, as observed end of September (quarter-end) with ESTR fixing dropping by 2.6 basis points partially reflecting possible banks' MRR optimization behavior. According to market participants the banks' window dressing practice by refusing customer deposits around month-end cutoff dates could potentially even further intensify (Figure 8). This may result in heightened volatility at month-end in the secured funding markets as redirected deposits seek placement within the repo markets (Figure 9). To mitigate the latter, the ECB might modify the calculations for the minimum reserve requirement calculations by averaging deposit balances over a longer period to discourage window dressing practices such as rejecting customer deposits near month-end cutoff dates.

Moreover, an increase of the MRR could also lead to arbitrage between unsecured and secured funding markets as excess liquidity declines. The MRR cost could, thus, lead to a decline in ESTR volume and rate, and an increase in repo rate. Currently, arbitrage between these two markets might not be a prominent concern, as it appears costly, so that market participants maintain a cautious approach. However, as excess liquidity gradually declines, the significance of this topic may gain traction. The recent downward shift in ESTR rates at September month-end, partly attributed to MRR optimization, showcases a subtle yet notable influence. The situation may take a different turn once excess liquidity moves closer towards the floor required excess liquidity, for which a consensus estimate is a level of €2 trillion.

As market contacts expect banks to shed deposits and reduce their holdings of high-quality liquid assets in the broader context of banks reducing their balance sheets, an increase of the MRR would put pressure on funding spreads and European government bond swap spreads. As long as excess liquidity remains abundant and given banks' limited deposit elasticity to interest rates, the increased cost of funding through higher MRR could be transmitted to depositors as evidenced in the minutes of the ECB money market contact group.⁸

OTHER POSSIBLE AVENUES THE ECB COULD CONSIDER TO NORMALIZE THE EXCESS LIQUIDITY ACCORDING TO MARKET PARTICIPANTS.

• Introducing a Reverse Tiering Deposit Scheme

The ECB's monetary policy meeting on 26-27 July revealed that the Governing Council also contemplated the possibility of a two-tier system in the context of reverse tiering.⁹ However, the central bank ultimately decided not to act in any of the ECB meetings since then. To provide some context, reverse tiering involves dividing the current account reserves exceeding the MRR into two tiers: one that earns interest and another that remains unremunerated. This approach reverses the logic of tiering applied by the ECB from September 2019 to September 2022, when the ECB allowed a multiplier of up to 6 times the MRR to be exempt from being penalized at a negative deposit facility rate. Market participants contemplate two potential variations of reverse tiering under the assumption of all else being equal and focusing on the effect of the multiplier. The first closely resembles the mechanics of tiering, with the proportion allocated to the non-exempt tier that earns no interest being determined by a multiplier based on the MRR. Another variation involves this proportion to be based on outstanding TLTROs, which could incentivize banks to repay their TLTRO loans earlier (Figure 11).

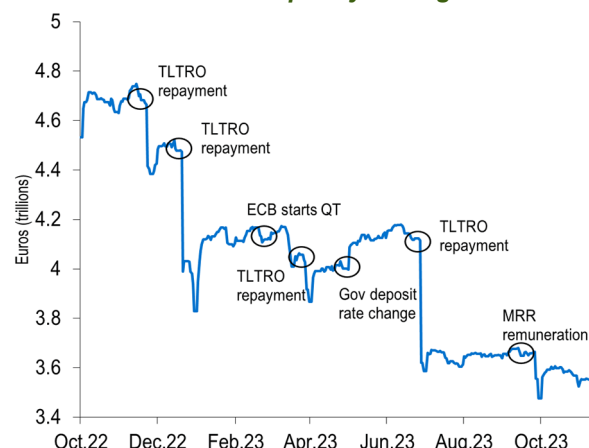
- **Multiplier based on MRR:** Market participants view the potential adoption of reverse tiering based on MRR as a straightforward and familiar approach, owing to its prior testing in the tiering system. Analysts speculate that implementing a multiplier of 12 times the MRR could reduce excess liquidity from €3.5 trillion to €2.5 trillion. However, this reduction may exert upward pressure on the ESTR. The upward pressure on ESTR arises not only because excess liquidity moves to a more elastic area of the demand curve but also due to banks facing liquidity shortages potentially needing to borrow in the interbank market, consequently bidding up ESTR.
- **Multiplier based on TLTROs:** In this approach, banks would match their allocation to TLTRO borrowings, currently at approximately €500 billion, at a 0% interest rate. Analysts are considering a multiplier of one time the outstanding TLTROs to reduce excess liquidity to around €3.0 trillion, exceeding the required floor. Like the MRR-based approach, this strategy could proportionally reduce the ECB's excess liquidity costs and encourage early TLTRO repayments. However, concerns arise about a level playing field, as outstanding TLTROs may differ significantly from excess

liquidity distribution. This might prompt banks with larger TLTRO loans to borrow substantial amounts in the interbank market to meet their non-exempt tier allocation, incurring additional costs.

- **Debt certificates**

A central bank can also drain a banking system's excess liquidity by issuing debt certificates at an interest rate corresponding to the policy rate. As commercial banks purchase these on the capital market, their excess liquidity diminishes. Riksbank is one advanced economy central bank that currently issues debt certificates.¹⁰ Conceptually, the structural operations listed in the ECB's operational framework foresee the possibility of issuing debt certificates with a maturity of up to one year to adjust the structural position of the Eurosystem vis-à-vis the banking sector, and they have been part of the ECB's balance sheet in its early years until 2004.¹¹ Despite remaining dormant in the ECB's toolkit, the potential revival of debt certificates holds promise in reconciling the challenge of liquidity drainage while at the same time enhancing financial market functioning. Market participants expect the ECB's operational framework review to clarify the potential role of debt certificates in adjusting the excess liquidity and creating a new, widely accepted, safe, and liquid asset across euro area money markets.

Figure 1
Evolution of Excess Liquidity During the Last Year



Source: IMF staff illustration. IMF staff calculations.

Table 1
Components of Excess Liquidity

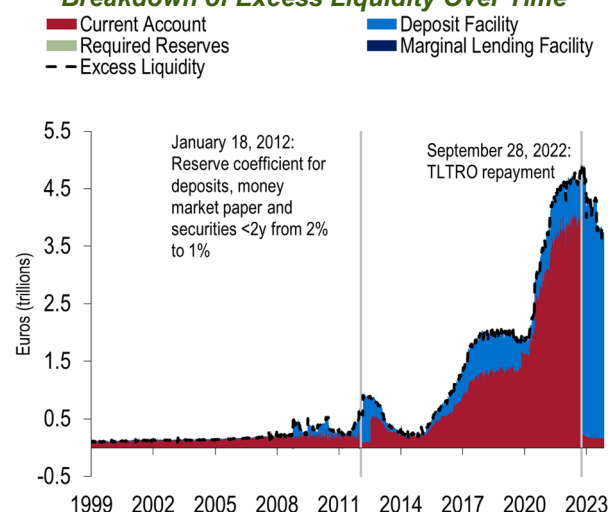
$$\begin{aligned} \text{Excess Liquidity} = & \text{Cash held in Current Account} \\ & + \text{Recourse to the Deposit Facility} \\ & - \text{Minimum Reserve Requirement} \\ & - \text{Liquidity Drawn in Marginal Lending Facility} \end{aligned}$$

Table 2
Mechanics of Quantitative Easing, Quantitative Tightening and Liquidity Tightening

Quantitative Easing			
ECB		Banking System	
Assets	Liabilities	Assets	Liabilities
Security Holdings ↑	Deposit Facility ↑	Security Holdings ↓	
	Current Account ↑	Cash at the ECB ↑	
Quantitative Tightening			
ECB		Banking System	
Assets	Liabilities	Assets	Liabilities
Security Holdings ↓	Deposit Facility ↓	Security Holdings ↑	
	Current Account ↓	Cash at the ECB ↓	
Liquidity Tightening			
ECB		Banking System	
Assets	Liabilities	Assets	Liabilities
	Deposit Facility ↓	Security Holdings ↓	
	Current Account ↓	Cash at ECB ↓	
	Minimum Reserves ↑	Minimum Reserves ↑	Deposits ↓

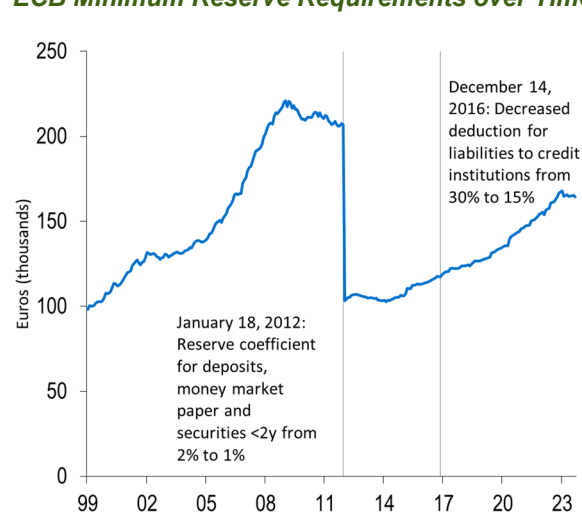
Note: Banks' minimum reserves are held in their current account while under Liquidity Tightening, the minimum reserve requirement is carved out from the current account for a stylized illustration of the two effects at play.

Figure 2
Breakdown of Excess Liquidity Over Time



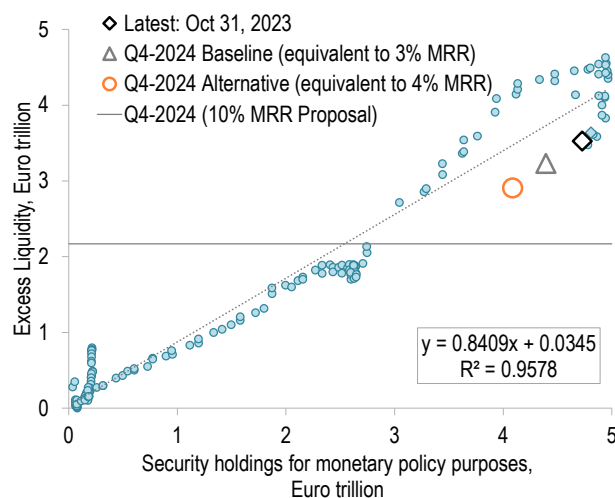
Source: Bloomberg L.P., IMF staff calculations.

Figure 3
ECB Minimum Reserve Requirements over Time



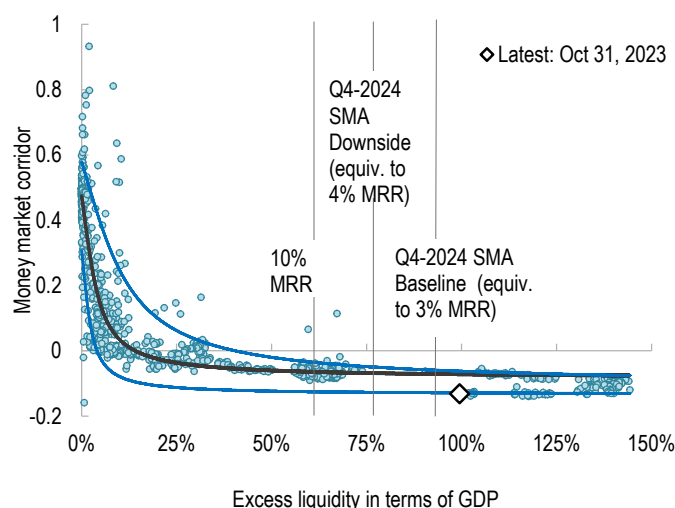
Source: Bloomberg L.P., IMF staff calculations.

Figure 4
Relationship between Excess Liquidity and Asset Purchases



Source: Bloomberg L.P., IMF staff calculations.

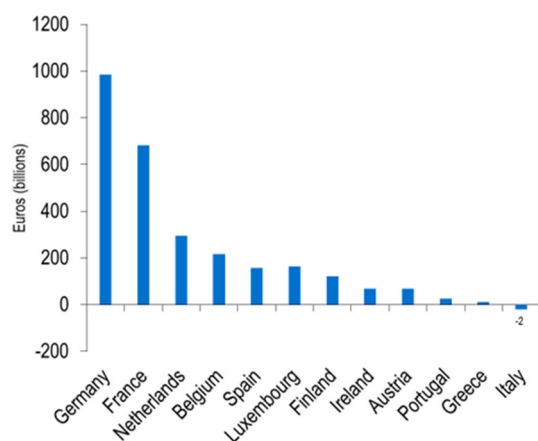
Figure 5
Relationship of Excess Liquidity and ESTR Money Market Corridor



Source: Bloomberg L.P., IMF staff calculations.

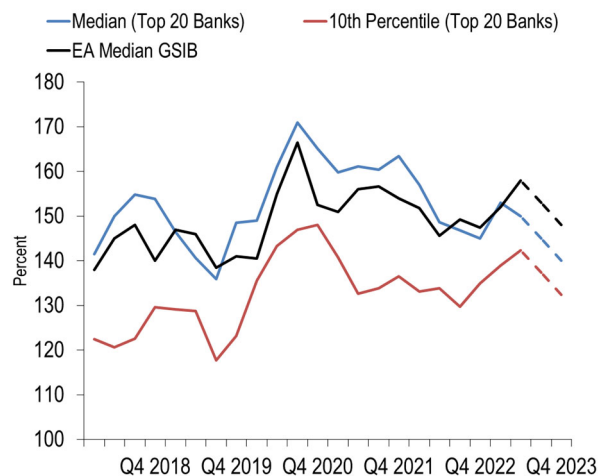
Note: Calculation as in IMF working paper 2023/179. For the money market corridor, 0 corresponds to the deposit facility rate and 1 to the marginal lending facility rate.

Figure 6
At country level, already a 1 pp. MRR increase to 2% could turn some banking systems' total excess liquidity net of TLTROs negative



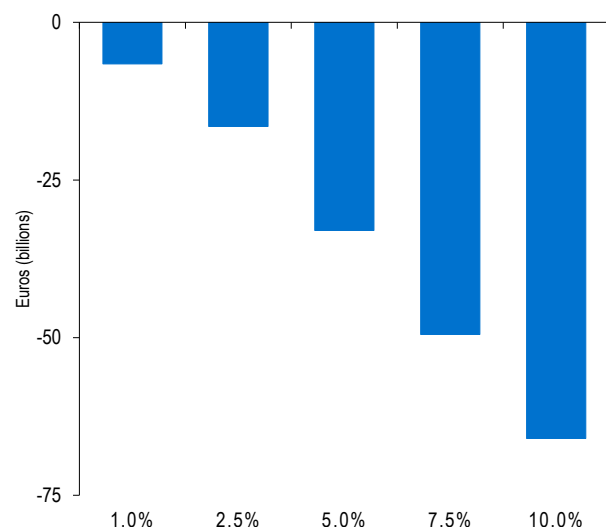
Source: European Central Bank Statistical Data Warehouse (SDW), IMF staff calculations. Note: Excess liquidity net of TLTROs based on latest available SDW data as of Oct 15, 2023.

Figure 7
Implication of higher minimum reserves on LCR levels assuming a 3 pp. MRR increase to 4%



Source: Standard & Poor's Capital IQ, Bloomberg L.P., IMF staff calculations

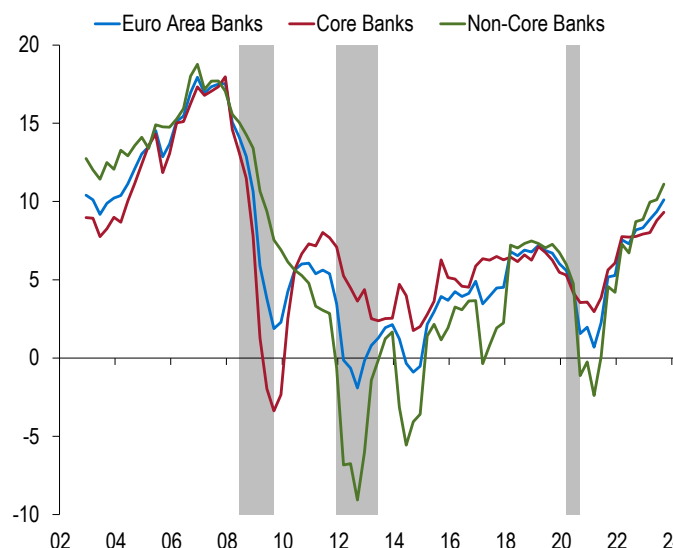
Figure 8
NII lost per percentage point increase of MRR combined with un-remuneration of minimum reserves requirements.



Source: Bloomberg, IMF staff calculations

Note: Horizon is 12 months, relating to the minimum reserve requirement of Euro 165.3 bn in September 2023 before the un-remuneration.

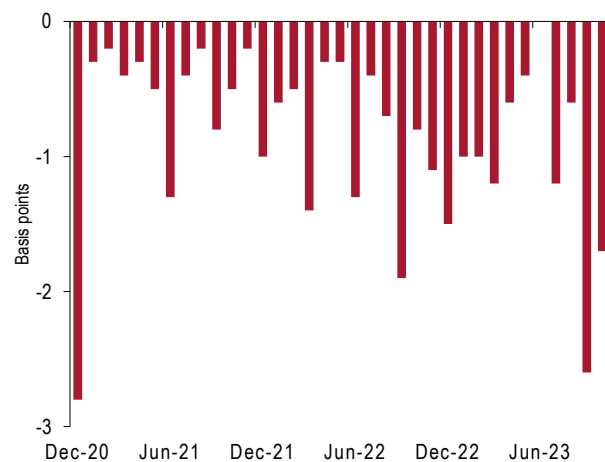
Figure 9
Return on Equity for Euro Area Banks



Source: LSEG Datastream, EABCN, IMF staff calculations.

Note: grey shading reflects Euro Area recessions.

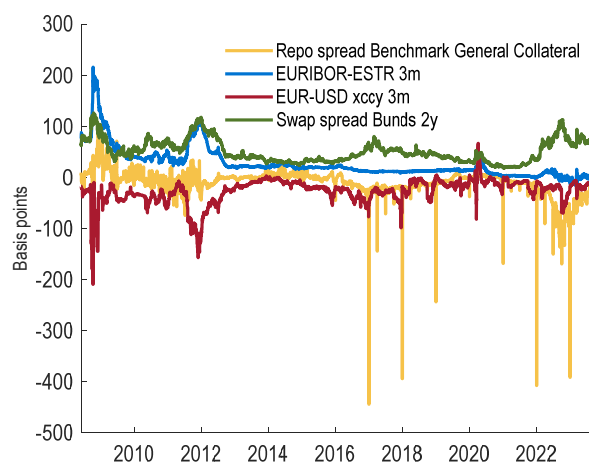
Figure 10
September ESTR Decline Mirrors Magnitude of Turn of the Year from 2020 to 2021



Source: Bloomberg L.P., IMF staff calculations.

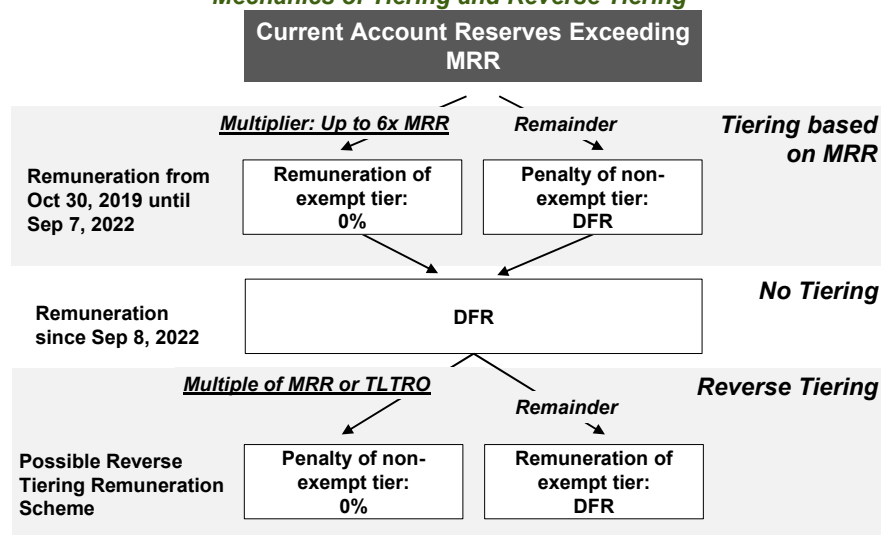
Note: Captures daily change in ESTR in bps at the turn of the month.

Figure 11
Euro Area Funding and Swap Spreads



Source: Bloomberg L.P., Refinitiv EIKON, IMF staff calculations.

Table 3
Mechanics of Tiering and Reverse Tiering



Source: IMF staff illustration.

Disclaimer: This is an internal document produced by the Global Markets Analysis Division (GA) of the Monetary and Capital Markets Department. It reflects GA staff's interpretation and analysis of market views and developments. Market views presented may or may not reflect a consensus of market participants.

¹ <https://www.ecb.europa.eu/press/pr/date/2023/html/ecb.pr230727~7206e9aa48.en.html>

² <https://www.reuters.com/markets/europe/ecb-tackle-excess-liquidity-next-stage-inflation-fight-sources-2023-09-18/>

³ <https://www.ecb.europa.eu/press/accounts/2023/html/ecb.mg230831~b04764f45f.en.html>

⁴ <https://www.bloomberg.com/news/articles/2023-09-27/ecb-should-raise-minimum-reserves-to-5-10-holzmann-tells-wiwo?srnd=economics-v2>

⁵ <https://www.suerf.org/suerf-policy-brief/76659/a-two-tier-system-of-minimum-reserve-requirements-by-de-grauwe-and-ji-2023-a-closer-look>

⁶ <https://cepr.org/voxeu/columns/extraordinary-generosity-central-banks-towards-banks-some-reflexions-its-origin>

⁷ <https://www.reuters.com/markets/europe/ecb-reviews-interest-government-deposits-curb-losses-sources-2023-11-01/>

⁸ The demand curve for excess reserves illustrates how money market rates react to shifts in reserve supply. Abundant reserves flatten the curve, aligning rates with the deposit facility rate (DFR) at the corridor floor, as the DFR sets the opportunity cost for lending reserves. When excess liquidity decreases and supply and demand achieve better balance, rates shift towards the main refinancing operations (MRO) rate, reflecting the transition into the steeper part of the demand curve.

⁹ <https://www.ecb.europa.eu/paym/groups/mmcg/html/index.en.html>

¹⁰ <https://www.ecb.europa.eu/press/accounts/2023/html/ecb.mg230831~b04764f45f.en.html>

¹¹ <https://www.riksbank.se/en-gb/markets/market-operations/riksbank-certificates/>

¹² <https://www.ecb.europa.eu/mopo/implement/html/index.en.html>

¹³ https://www.suerf.org/docx/f_288277613d0286fde7bc1d0bcfaa2dc_46467_suerf.pdf