BofA SECURITIES

European Rates Viewpoint

Three ratios and front-end EUR rates

Primer

Key takeaways

- Regulations on banks have been fully implemented in recent years
- We look at the net stable funding ratio, leverage ratio, and liquidity coverage ratio
- We describe their recent interaction with front-end euro rates

A short guide on three bank-related ratios…

Three regulatory ratios for banks in the euro area are the net stable funding requirement (NSFR), leverage ratio (LR), and the liquidity coverage ratio (LCR). These ratios were introduced for the first time in 2015 as part of the EU's Capital Requirements Regulation, and their full implementation has been applicable in recent years.

… and their implications for front-end EUR rates

This report defines the NSFR, LR, and LCR, and details the key aspects of their methodology from the perspective of front-end EUR rates. We describe the impact they have had on front-end EUR rates, such as the euro-short term rate (€str), the euro interbank offered rate (Euribor), and repo rates, especially in the context of recent market developments.

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Net stable funding requirement

The NSFR ratio compares a bank's weighted liabilities and own funds against its weighted assets. It creates an incentive for banks to use more stable sources of funding to fund their activities. The NSFR ratio is defined as:

$$\frac{Available\ stable\ funding}{Required\ stable\ funding}$$

Banks are required to maintain a NSFR ratio of at least 100%. This requirement has been applicable in the European Union (EU) since 28 June 2021.

Available stable funding

The available stable funding (ASF) is a weighted sum of the accounting value of various liability types and own funds by their respective ASF factor. ASF factors are primarily a function of the residual maturity of the liability or own fund (Exhibit 1). In particular:

- Liabilities with a residual maturity less than six months provided by central banks and debt issued banks will have an ASF of 0%;
- Liabilities with a residual maturity of between six months and one year provided by central banks and debt issued banks will have an ASF of 50%;
- Liabilities with a residual maturity of greater than one year provided by central banks and debt issued banks will have an ASF of 100%;
- Retail deposits have an ASF of at least 90%.

Exhibit 1: ASF factors
Residual maturity of liability or own fund a key determinant of the ASF factor

ASF factor	Details
0%	Liabilities without a stated maturity
	Deferred tax liabilities and minority interests where residual maturity is less than 6M
	Trade date payables from purchases of financial instruments, of FX and of commodities, that are expected to settle within the standard settlement cycle
	Liabilities that are categorised as being interdependent with assets
	Liabilities with a residual maturity of less than 6M provided by the ECB, central bank of a Member State, the central bank of a third country, financial customers
	Liabilities or capital items or instruments not listed with ASF of 50%, 90%, 95% and 100%
50%	The absolute value of the difference, if negative, between the sum of fair value across all netting sets with positive fair value and the sum of fair values across all netting sets with negative fair value
	Operational deposits
	Liabilities with residual maturity of less than 1Y provided by the central or regional government or public sector entities of a Member State or of a third country, multilateral development banks and international organisations, non-financial corporate customers, credit unions
	Liabilities with residual contractual maturity of a minimum of 6M but less than 1Y provided by the ECB, central bank of a Member State, central bank of a third country, financial customers
	Liabilities or capital items or instruments with residual maturity of a minimum of 6M but less than 1Y other than those listed with ASF of 90%, 95% and 100%
90%	Other retail deposits: sight, fixed notice period of less than 1Y, term retail deposits with residual maturity < 1Y
95%	Stable retail deposits: sight, fixed notice period of less than 1Y, term retail deposits with residual maturity < 1Y
100%	Common Equity Tier 1 items
	Additional Tier 1 items, excluding items with effective residual maturity of less than 1Y
	Tier 2 items with residual or effective residual maturity of more than 1Y
	Any other capital instruments with residual or effective residual maturity of 1Y or more
	Any secured or unsecured borrowings and liabilities with a residual maturity of 1Y or more

Source: EU

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Required stable funding

The required stable funding (RSF) is a weighted sum of the accounting value of various types of assets and off-balance sheet items by their respective RSF factor. Assets with longer residual maturity or lower quality tend to have higher RSFs (Exhibit 2). In particular, reserves at the Eurosystem and unencumbered level 1 high quality liquid assets (HQLA) excluding extremely high quality covered bonds have a RSF of 0%.

Exhibit 2: RSF factors

Residual maturity and asset quality are key determinants of the RSF

RSR factor	Details
0%	Unencumbered level 1 HQLA excluding extremely high quality covered bonds
	Unencumbered shares of units in CIUs that are eligible for a 0% haircut for the calculation of the liquidity coverage ratio
	All reserves in the ECB, central bank of a Member State or a third country
	All claims on the ECB, central bank of a Member State or a third country with residual maturity of less than 6M
	Trade date receivables from sales of financial instruments, FX or commodities that are expected to settle within the standard settlement cycle
	Assets that are categorised as being interdependent with liabilities
	Monies due from securities financing transactions with financial customers, on a net basis, with residual maturity less than 6M, where monies due are collateralised by level 1 HQLA excluding extremely high quality covered bonds
5%	Unencumbered shares of units in CIUs that are eligible for a 5% haircut for the calculation of the liquidity coverage ratio
	Monies due from securities financing transactions with financial customers, on a net basis, with residual maturity less than 6M, where monies due are not collateralised by level 1 HQLA excluding extremely high quality covered bonds
	Undrawn portion of committed credit and liquidity facilities
	Trade finance off-balance sheet related products with residual maturity of less than 6M
7%	Unencumbered extremely high quality covered bonds eligible as level 1 HQLA
7.5%	Trade finance off-balance sheet products with residual maturity of at least 6M but less than 1Y
10%	Monies due from securities financing transactions with financial customers that have a residual maturity of less than 6M other than those with RSF of 0% and 5%
	Trade finance on-balance sheet related products with a residual maturity of less than 6M
	Trade finance off-balance sheet products with residual maturity of 1Y or more
12%	Unencumbered shares of units in CIUs that are eligible for a 12% haircut for the calculation of the liquidity coverage ratio
15%	Unencumbered assets eligible as level 2A assets
20%	Unencumbered shares of units in CIUs that are eligible for a 20% haircut for the calculation of the liquidity coverage ratio
25%	Unencumbered assets eligible as level 2B securitisations
30%	Unencumbered high quality covered bonds
	Unencumbered shares of units in CIUs that are eligible for a 30% haircut for the calculation of the liquidity coverage ratio
35%	Unencumbered assets eligible as level 2B securitisations
	Unencumbered shares of units in CIUs that are eligible for a 35% haircut for the calculation of the liquidity coverage ratio
40%	Unencumbered shares of units in CIUs that are eligible for a 40% haircut for the calculation of the liquidity coverage ratio
50%	Unencumbered assets eligible as level 2B assets excluding level 2B securitisations and high quality covered bonds
	Operational deposits held in another financial institution
	Monies due from transactions with residual maturity of less than 1Y with the central or regional government or public sector entity of a Member State or of a third country, multilateral development banks and international organisations, non-financial corporates, retail customers, and SMEs, credit unions
	Monies due from transactions with residual maturity of at least 6M but less than 1Y with the ECB or the central bank of a Member State or third country, financial customers
	Trade finance on balance-sheet related products with a residual maturity of at least 6M but less than 1Y
	Assets encumbered for a residual maturity of at least 6M but less than 1Y
	Any other assets with a residual maturity of less than 1Y other than those with RSF less than 50%
55%	Unencumbered shares of units in CIUs that are eligible for a 55% haircut for the calculation of the liquidity coverage ratio
65%	Unencumbered loans secured by mortgages on residential property or unencumbered residential loans fully guaranteed by an eligible protection provider with a residual maturity of 1Y or more, provided that those loans are assigned a risk weight of 35% or less
	Unencumbered loans with a residual maturity of 1Y or more, excluding loans to financial customers and loans provided that those loans are assigned a risk weight of 35% or less
85%	Any assets and off-balance-sheet items, including cash, posted as initial margin for derivative contracts
	Any assets and off-balance-sheet items, including cash, posted as contribution to the default fund of a CCP
	Unencumbered loans with a residual maturity off 1Y or more, excluding loans to financial customers and loans that are not past due for more than 90d and are assigned a risk weight of more than 35%
	Trade finance on-balance-sheet related products with a residual maturity of 1Y or more
	Unencumbered securities with a residual maturity of 1Y or more that are not in default and that are not eligible as liquid assets
	Unencumbered exchange-traded equities that are not eligible as level 2B assets
	Physically traded commodities, including gold but excluding commodity derivatives
	Assets encumbered for a residual maturity of 1Y or more in a cover pool funded by covered bonds or covered bonds
100%	Any assets encumbered for residual or contractual maturity of 1Y or more other than those with RSF less than 100%, including loans to financial customers with residual maturity of 1Y or more, non-performing exposures, items deducted from own funds, fixed assets, non-exchange-traded equities, retained interest, insurance assets, defaulted securities

Source: EU

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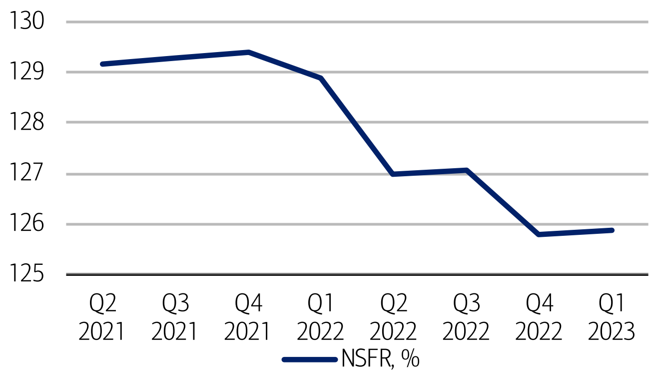
Interaction with front-end rates

The NSFR of EU banks declined from 129% in 2Q 2021 to 126% in 1Q 2023 (Exhibit 3). NSFR considerations could prompt banks to adjust their funding mix.

The attractiveness of funding sources from a NSFR perspective could fall when its residual maturity falls. In December 2022, banks voluntarily repaid €447bn of targeted longer-term refinancing operation (TLTRO) III borrowings. Of this, €351bn was from the operation that matures on 28 June 2023 (Exhibit 4). Borrowings from the 28 June 2023 operation would have been less attractive, as they would have a residual maturity of less than six months after December 2022, prompting its ASF factor to fall to 0%.

Exhibit 3: NSFR of EU banks participating in the SSM

NSFR has been applicable since 2Q 2021



Source: ECB. SSM = single supervisory mechanism

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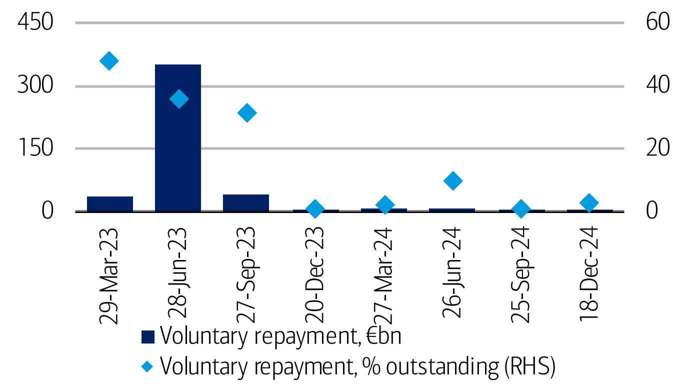
Exhibit 4: Voluntary TLTRO repayments in December 2022

Strong repayment of the Jun23 as ASF set to fall to 0%



Source: ECB

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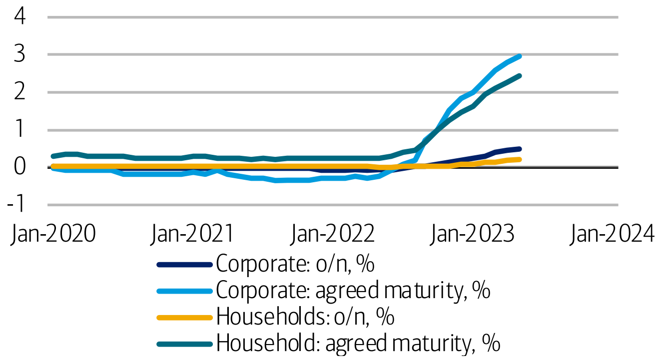
As longer-term funding from TLTROs decrease, banks may look to other sources of longer-term funding. One option is term deposits, where competition has increased in the euro area since 2H 2022. Banks increased their term deposit rates outright and relative to their overnight deposit rate, while the ECB started its rate hike cycle, and have prompted depositors to shift from overnight to term deposits (Exhibit 5).

Another option is to increase longer-term debt issuance. Euro area banks have increased net debt issuance meaningfully since 2H 2022, particularly in up to 1Y and over 2Y tenors (Exhibit 6). The issuance yield from debt up to 1Y tenor could feed into Euribor fixings as Euribor panel banks base their submissions on actual transactions to the extent possible. Increased issuance might put upward pressure on Euribor fixings and widening pressures on Euribor-€str spreads, especially at tenors where issuance is concentrated.

Exhibit 5: Corporate and household deposit rates

Banks increased term deposit rates since 2H 2022



Source: ECB

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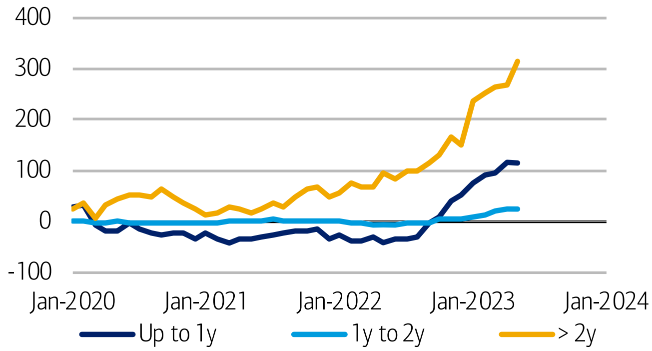
Exhibit 6: Cumulative net debt issuance by EA banks since 2020, €bn

Increase in net issuance since 2H 2022



Source: ECB

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Leverage ratio

The LR compares a bank's total exposure against its capital. It is designed to reduce the risk of excess leverage in the banking sector and to limit potential volatility from any potential deleveraging process. The LR is defined as:

$$\frac{Tier\ 1\ capital}{Total\ exposure\ measure}$$

Banks are required to always have a leverage ratio of 3%. Banks have been obliged to disclose their leverage ratio since 2015, but the leverage ratio became a binding minimum requirement on 28 June 2021. Banks are required to provide quarter-end LR snapshots as well as daily average reporting for each quarter.

The total exposure measure is the sum of the exposure values of:

- On balance sheet exposure;
- Derivative exposure;
- Securities financing transaction exposure;
- Off balance sheet items;
- Regular-way purchase of sales awaiting settlement.

The LR requirement for global systemically important institutions (GSII) is increased by a capital add-on equivalent to 50% of the risk-based capital buffer for GSIIs. The add-on must also be met with Tier 1 capital only. For example, the LR requirement for a bank subject to a risk-based GSII buffer of 2% will increase from 3% to 4%. The GSII are identified annually based on year-end data.

The GSII score is based on five categories, each with a weighting of 20%: (1) size; (2) interconnectedness; (3) substitutability/financial institution infrastructure; (4) complexity; and (5) cross-jurisdictional activity.

Interaction with front-end rates

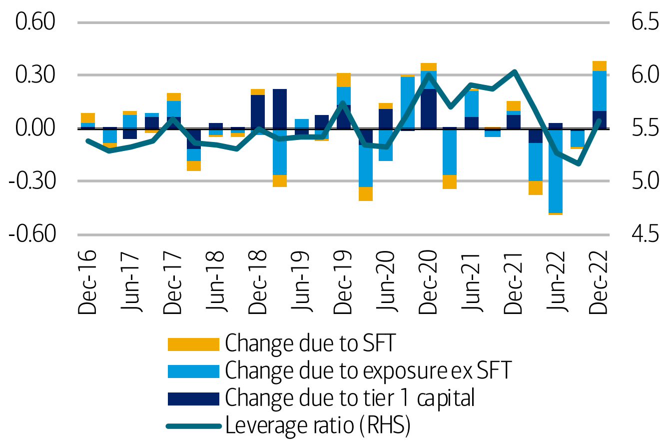
The LR and GSII methodology, as well as other regulatory measures, could give an incentive for banks to reduce their exposure on key reporting dates such as quarter-end and year-end. Banks in the EU have had a leverage ratio at the aggregate level between 5 and 6 since 3Q 2016 (Exhibit 7).

Since records began, leverage ratios have consistently increased in December and fallen back the following March. This type of exposure reduction leads to a temporary reduction in financial intermediation. In December, decreases in securities financing transaction exposure consistently contributed to a higher LR; which then increases in the following March and contributes to a higher LR. One type of securities financing transaction is repo.

The reduction in repo intermediation has been reflected in repo rates, which tend to richen the most over the year-end turn. Banks charge their repo counterparties more to justify the marginal increase in their exposure over the key reporting date. The Germany one-day general collateral (GC) repo rate richened beyond -200bp vs €str over the year-end turn of 2022 (Exhibit 8).

An alternative way for banks to reduce their exposure value is to net repo and reverse repo transactions. Banks may net repo and reverse repos from their LR calculations if both transactions are (1) with the same counterparty; (2) have the same explicit final settlement date; (3) legally enforceable; and (4) settled through the same settlement system. Netting opportunities create demand for bills to be used on the opposite transaction with the greatest richening pressure on the bill that just cover the key reporting date. Such richening pressures tend to be strongest into year-end (Exhibit 9).

Exhibit 7: Leverage ratio of EU banks participating in the SSM
SFT consistently scaled back in December, raising the LR



Source: BofA Global Research, ECB. SFT = securities financing transactions
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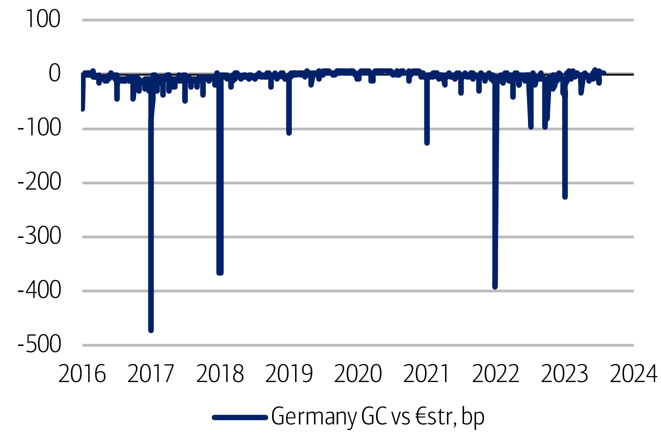
Exhibit 8: Germany one-day GC vs €str
Reducing exposure over year-end causes repo to richen



Source: BofA Global Research, Bloomberg, CME Group. €str proxied by Eonia-8.5bp prior to Oct19
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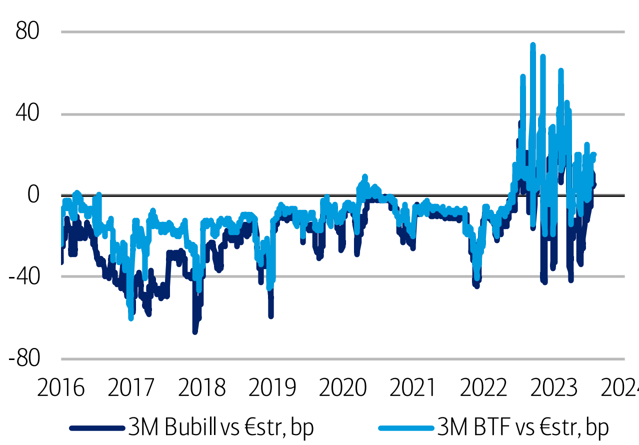
The richness of repo rates and euro area bills over key reporting dates could create opportunities for certain market participants. Non-euro area reserve managers able to deposit cash at the central bank might:

- Lend scarce European Government Bonds (i.e., borrow cash from repo at a very low rate) and place the euro cash received from the associated repo transaction at the Eurosystem;
- Place euros as deposits at the Eurosystem rather than using euros to purchase bills that are trading extremely rich.

Such flows contributed to previous spikes in the Eurosystem's liabilities to non-euro area residents over key reporting dates (Exhibit 10).

Exhibit 9: 3M Bubill and BTF vs €str
Bills that just cover the year-end tend to richen in 4Q



Source: BofA Global Research, Bloomberg. €str proxied by Eonia-8.5bp prior to Oct19
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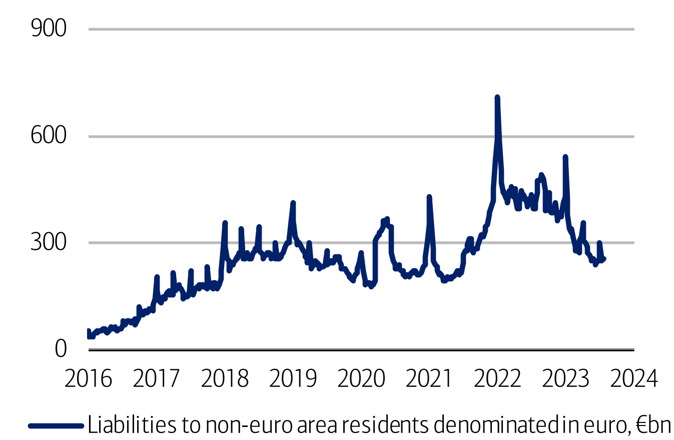
Exhibit 10: Eurosystem liabilities to non-euro area residents
Increases over key reporting date may reflect repo richness



Source: ECB
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Liquidity coverage ratio

The LCR compares a bank's liquidity buffer with its expected net outflows over a 30-day stress period. It is designed to ensure banks that have adequate unencumbered HQLA that can be easily converted into cash to meet liquidity needs in a stress scenario. The LCR is defined as:

$$\frac{Liquidity\ buffer}{Net\ liqudity\ expected\ outflows\ over\ a\ 30\ calendar\ day\ stress\ period}$$

Banks must maintain a LCR of at least 100% but may monetise their liquid assets to cover their net liquidity outflows during stress periods, even if it causes their LCR to fall below 100% during such periods. The LCR's minimum requirement was phased in at 60% from October 2015, 70% from January 2016, 80% from January 2017, and 100% from January 2018.

Liquidity buffer

The liquidity buffer consists of a bank's unencumbered HQLA. Assets are deemed unencumbered if the bank is not required to dispose the asset via an outright sale or a repo agreement within the following 30 calendar days. The market value of the assets is used for the purpose of calculating the LCR. HQLA are categorised by:

- **Level 1 assets** include coins and banknotes; reserves; assets representing claims on or guaranteed by the central bank or central government of a Member State or third country of credit quality step 1; extremely high quality covered bonds. The market value of extremely high quality covered bonds is subject to at least a 7% haircut for the LCR calculations, while all other Level 1 assets are not subject any haircuts. Level 1 assets must compose at least 60% of the liquidity buffer at all times, and a minimum of 30% of the liquidity buffer must be composed of level 1 assets excluding extremely high quality covered bonds.

- **Level 2A assets** include assets representing claims on or guaranteed by regional governments, local authorities or public sector entities in a Member State; assets representing claims on or guaranteed by the central government, central bank, regional government, local authority or public sector entity of a third country; high quality covered bonds; and corporate debt securities at credit quality step 1. The market value of level 2A assets are subject to a haircut of at least 15%.

- **Level 2B assets and securitisations**

Net liquidity expected outflows over a 30 calendar day stress period

Liquidity outflows are calculated by multiplying the outstanding balances of different liability and off-balance sheet commitments by their applicable outflow rate. For outflows from deposits where the counterparty is the domestic central bank, the outflow rate is 0%.

Liquidity inflows are assessed over a period of 30 calendar days and comprise only contractual inflows from exposures that are not past due and for which the bank has no reason to expect non-performance within 30 calendar days.

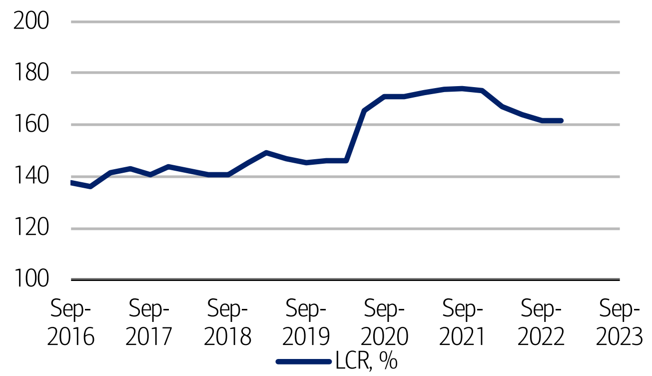
Examples of stress period are: (1) a run-off of a significant proportion of its retail deposits; (2) partial or total loss of unsecured wholesale funding capacity; (3) partial or total loss of secured short-term funding; (4) additional liquidity outflows as a result of a credit rating downgrade of up to three notches; (5) increased market volatility affecting the value of collateral of its quality or creating additional collateral needs; (6) unscheduled draws on liquidity and credit facilities; and (7) potential obligations to buy back debt or to honour non-contractual obligations.

Interaction with front-end rates

The LCR of banks in the EU was between 140% and 150% prior to COVID-19 (Exhibit 11). The monetary response to COVID-19 in the Euro area, which included QE and TLTRO enhancements, led to a meaningful increase in reserves. This represented an increase in the liquidity buffer and raised the LCR to over 170%, and pressure on banks to demand unencumbered HQLA for LCR purposes was limited.

As the ECB continues quantitative tightening (QT) and the TLTROs roll off (Exhibit 12), this would lead to a reduction in reserves and, in turn, banks' liquidity buffer. Some of the decline in banks' liquidity buffer from the TLTRO roll-off would be offset by the return of collateral pledged at the Eurosystem: in 2Q 2023, banks pledged €187bn of central government securities at the central bank, equivalent to 12% of their European Government Bond (EGB) holdings (Exhibit 13).

Exhibit 11: LCR of EU banks participating in the SSM
LCR rose significantly after monetary response to COVID



Source: ECB

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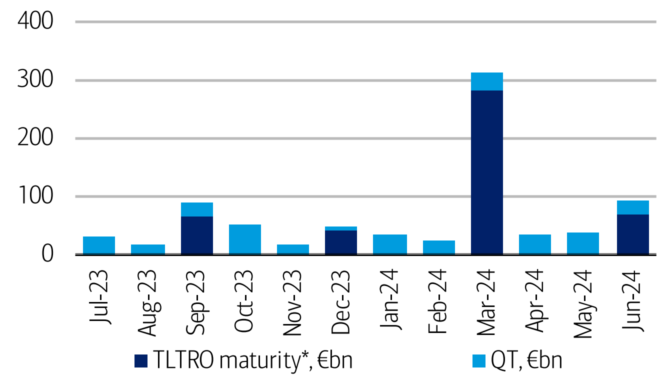
Exhibit 12: APP redemption and TLTRO maturity schedule
Fall in reserves from QT and TLTRO roll off reduces HQLA



Source: ECB. *No voluntary repayment assumed.

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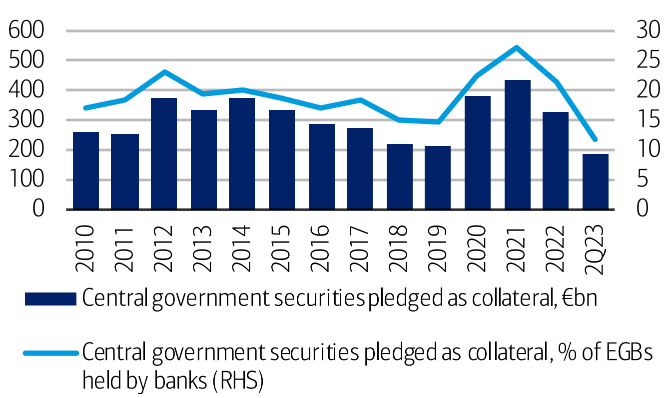
The implementation of the LCR would have increased banks' demand for HQLA, including reserves. This could impact the relationship between the euro overnight rate and excess liquidity. Historically, the euro overnight rate would be significantly less responsive to changes in excess liquidity when excess liquidity is more than €1trn (Exhibit 14). This insensitivity suggested €1trn of excess liquidity was sufficient to meet banks' reserve demand. But to the extent the LCR has prompted banks to increase reserves, the euro overnight rate may respond meaningfully to declines in excess liquidity before excess liquidity falls below €1trn.

Exhibit 13: Central government securities pledged at Eurosystem
Banks take back highest quality assets sooner



Source: BofA Global Research, ECB

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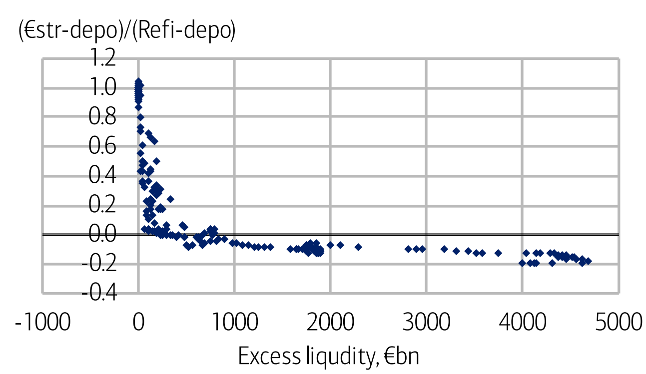
Exhibit 14: €str and excess liquidity
LCR may change sensitivity of OIS to excess liquidity



Source: BofA Global Research, ECB. Data since 2005 shown.

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