Quantitative tightening: rationale and market impact
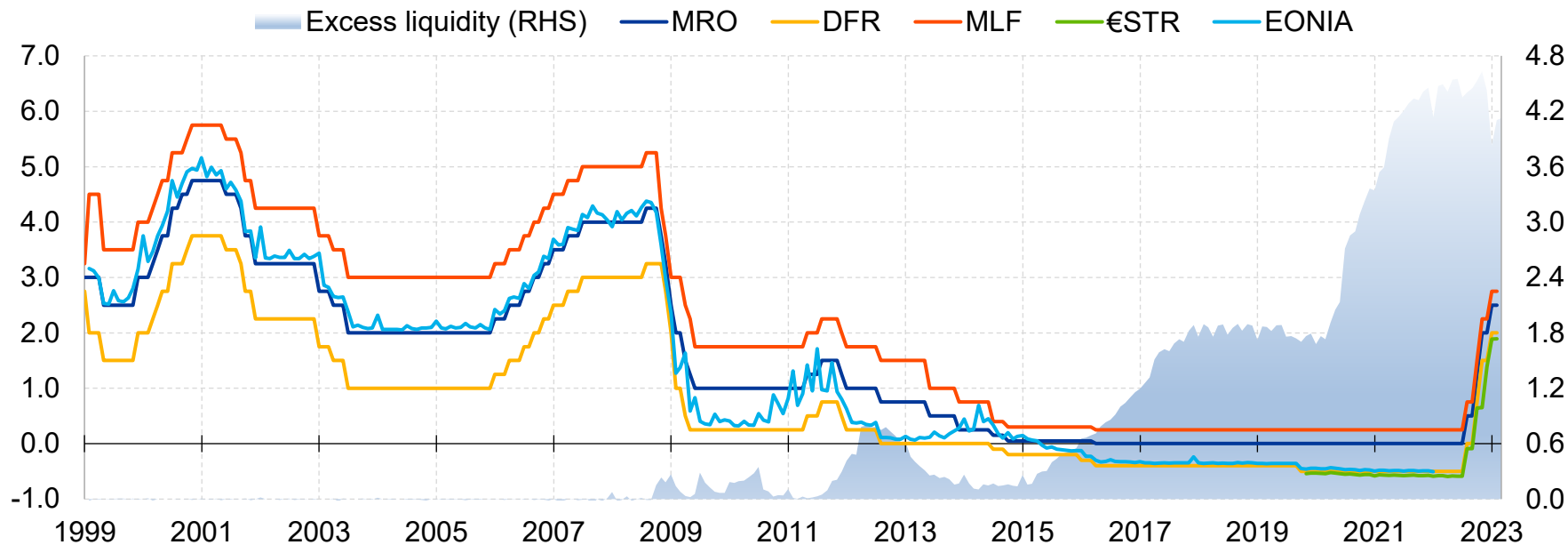
2 March 2023

Isabel Schnabel, Member of the ECB's Executive Board
Money Market Contact Group, Frankfurt am Main

Rising excess liquidity has pushed money market rates towards the floor of the corridor

ECB key policy rates, overnight market rates and excess liquidity
(RHS: EUR trillion; LHS: percentage)

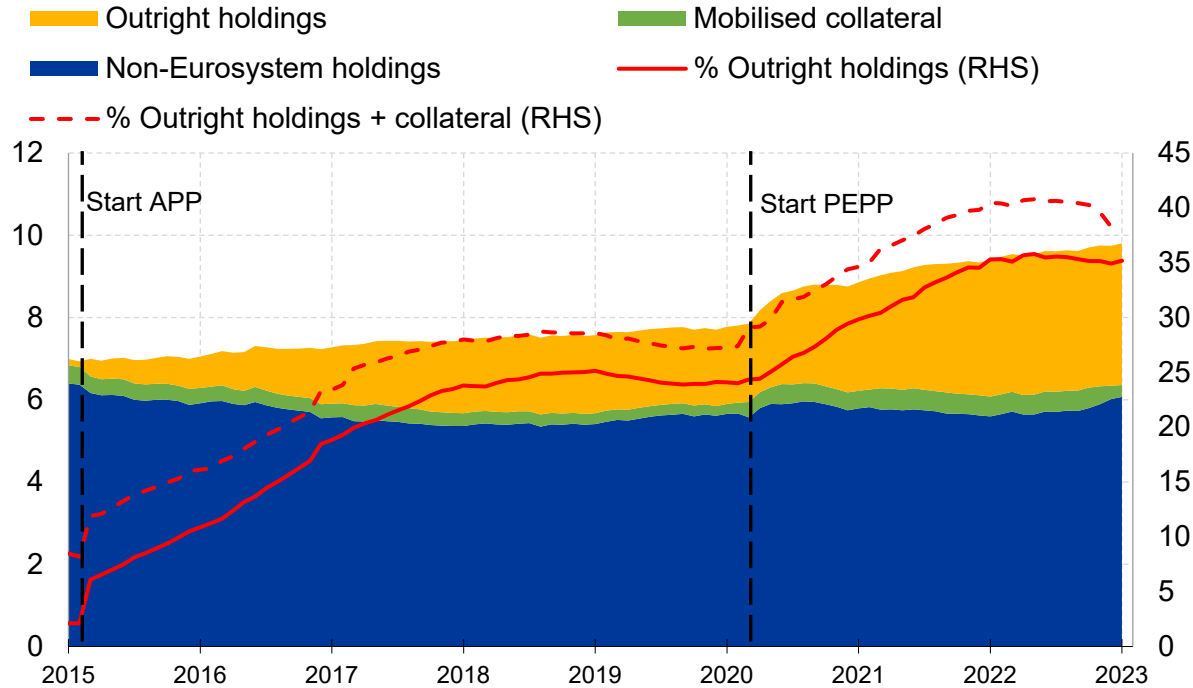Legend: Excess liquidity (RHS), MRO, DFR, MLF, €STR, EONIA

Source: ECB.
Note: Three key ECB policy rates form the policy rate corridor: Main Refinancing Operation (MRO) rate, Marginal Lending Facility (MLF) rate and Deposit Facility Rate (DFR).

Eurosystem's footprint in financial markets has increased measurably over time

Eurosystem footprint in euro area sovereign bond markets
(LHS: EUR trillion; RHS: percentage)

Legend:
- Outright holdings
- Mobilised collateral
- Non-Eurosystem holdings
- % Outright holdings (RHS)
- % Outright holdings + collateral (RHS)

Chart annotations: Start APP; Start PEPP

Source: Eurosystem, CSDB.
Note: Outright holdings refer to EGBs held by the Eurosystem, adjusted by the amount of EGBs lent back to the market via securities lending against cash. Mobilised collateral with the Eurosystem includes EGBs mobilised as collateral for open market operations. Only euro area central and regional government bonds denominated in euro were considered, represented in nominal amounts, without maturity restrictions.

QE has contributed to scarcity of safe and liquid assets in repo and bond markets

German non-GC spread over DFR
(basis points)

Start APP

Cash accepted as collateral in securities lending

Start PEPP
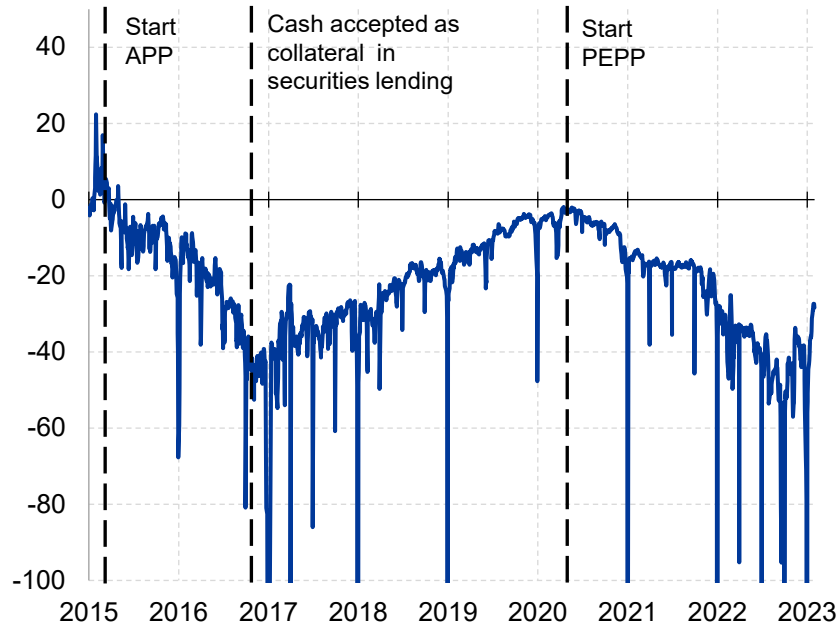
Source: MTS and BrokerTec, ECB calculations.
Note: The y-axis is cut at -100 bps.

2-year Bund asset swap spread
(basis points)

Start APP

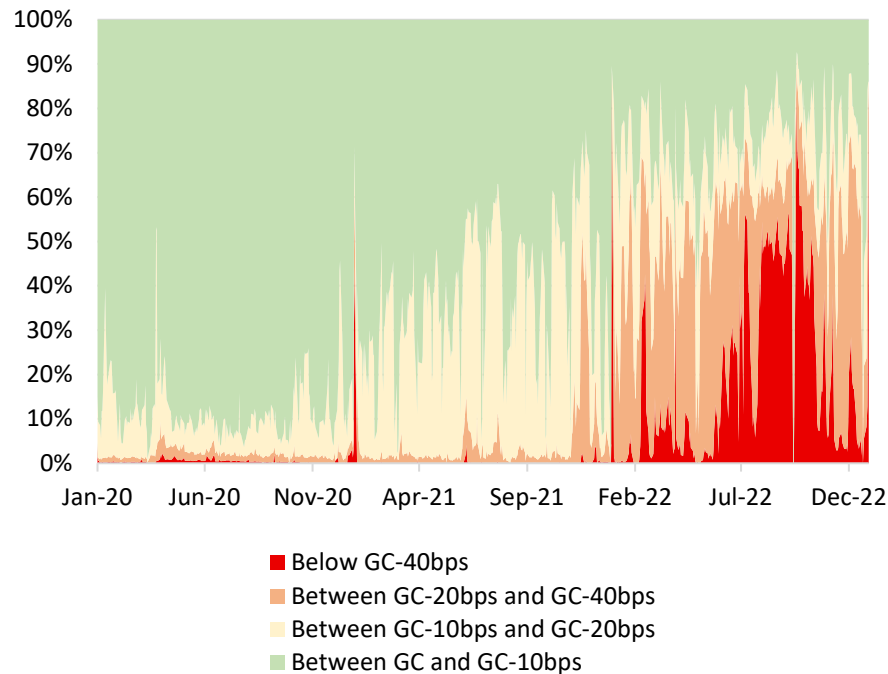Cash accepted as collateral in securities lending

Start PEPP

Source: Bloomberg.

Specialness of German collateral in repo markets
Share of repo volumes below the General Collateral (GC) rate
(by spread band, % of volume)

- Below GC-40bps
- Between GC-20bps and GC-40bps
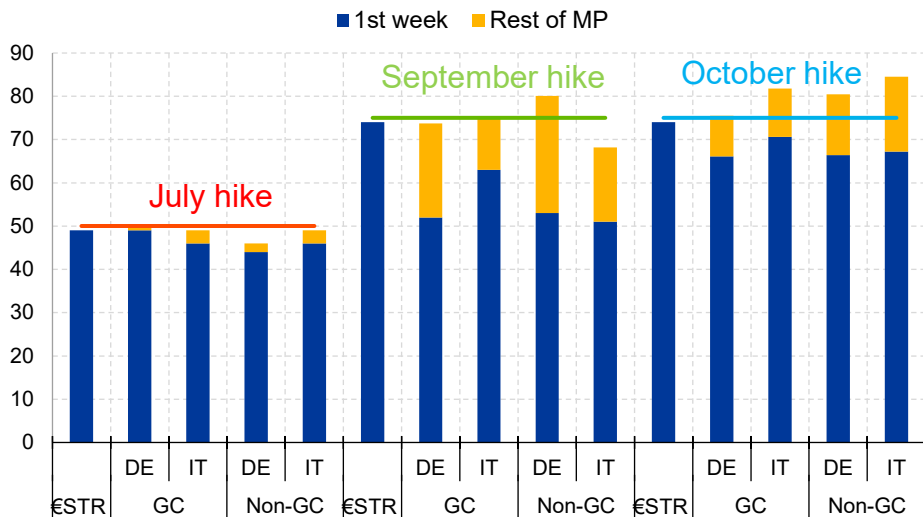- Between GC-10bps and GC-20bps
- Between GC and GC-10bps

Source: MMSR, BrokerTec.
Note: The chart shows the share of the German repo volume trading at a spread to the German
General Collateral repo rate.

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Asset scarcity can delay or even impair monetary policy transmission

Pass-through of changes in ECB policy rates
(basis points)

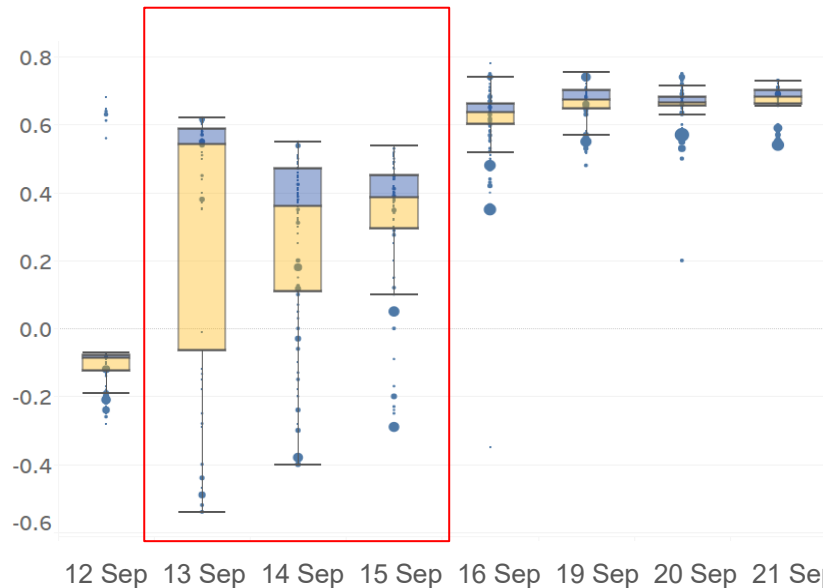## Rate dispersion of repo transactions against General Collateral (GC) around September 2022 rate hike
(percent)

Source: MMSR, BrokerTec/MTS, ECB calculations. Note: Bar chart shows the change in average rates in the first week (blue bar) and last week (yellow bar) of the maintenance period with the new policy rates vs the last day of the Maintenance Period with the old policy rates. GC refers to cash-motivated repo transactions (General Collateral), non-GC to collateral-motivated repo transactions (non-General Collateral).

Source: BrokerTec. Note: Boxes show interquartile ranges with blue portion referring to the 2nd quartile and yellow portion referring to the 3rd quartile of volume distribution. Size of the bubble reflects the volume. Chart displays GC repo rates for all euro area collateral issuers.

QT will be more efficient than TLTRO repayments in easing asset scarcity

Demobilised government bond collateral with Eurosystem after TLTRO repayments
### (in EUR bn)
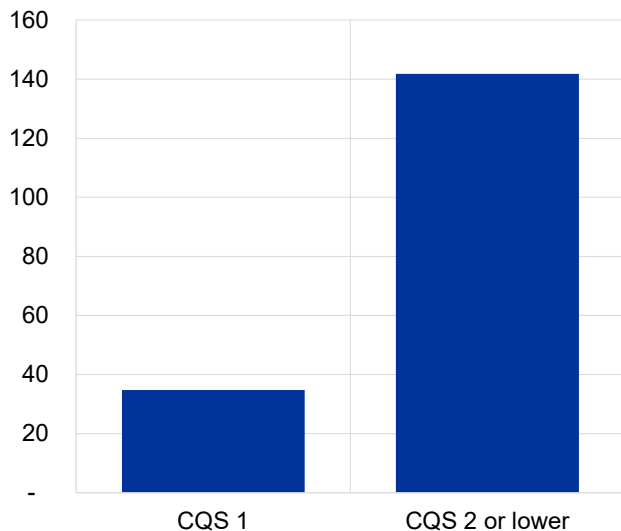
Source: ECB.
Notes: Chart shows the amount of central government bonds (after haircuts) that were removed from Eurosystem collateral pools between 17 November 2022 and 16 February, i.e. following the early TLTRO repayments in November, December and January. The demobilised bonds are broken down by Credit Quality Step and reflect the issuer rating based on the Eurosystem harmonised rating scale.

Share of maturing government bonds in PSPP portfolio in 2023 and 2024
### (%)
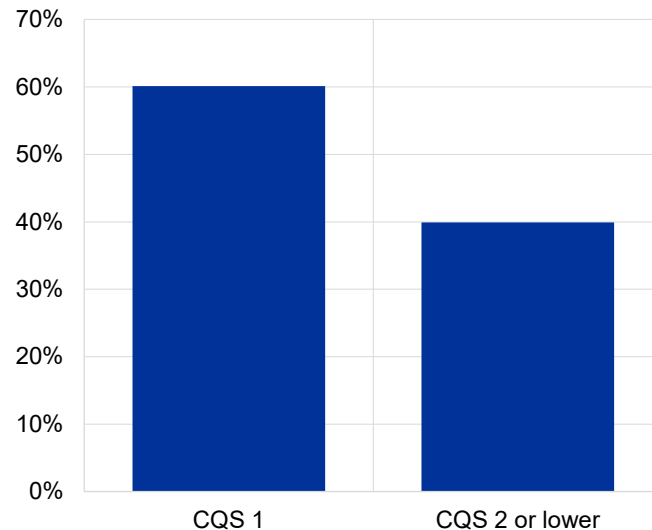
Source: ECB.
Note: Chart shows the share of central government bonds in the PSPP portfolio that will mature in 2023 and 2024 by Credit Quality Step (CQS) of the issuing country. The CQS rating is based on the jurisdiction's long-term rating according to the Eurosystem harmonised rating scale. The data for 2023 excludes bonds that have matured in January and February.

10-year US Treasury term premium
(percentage points)
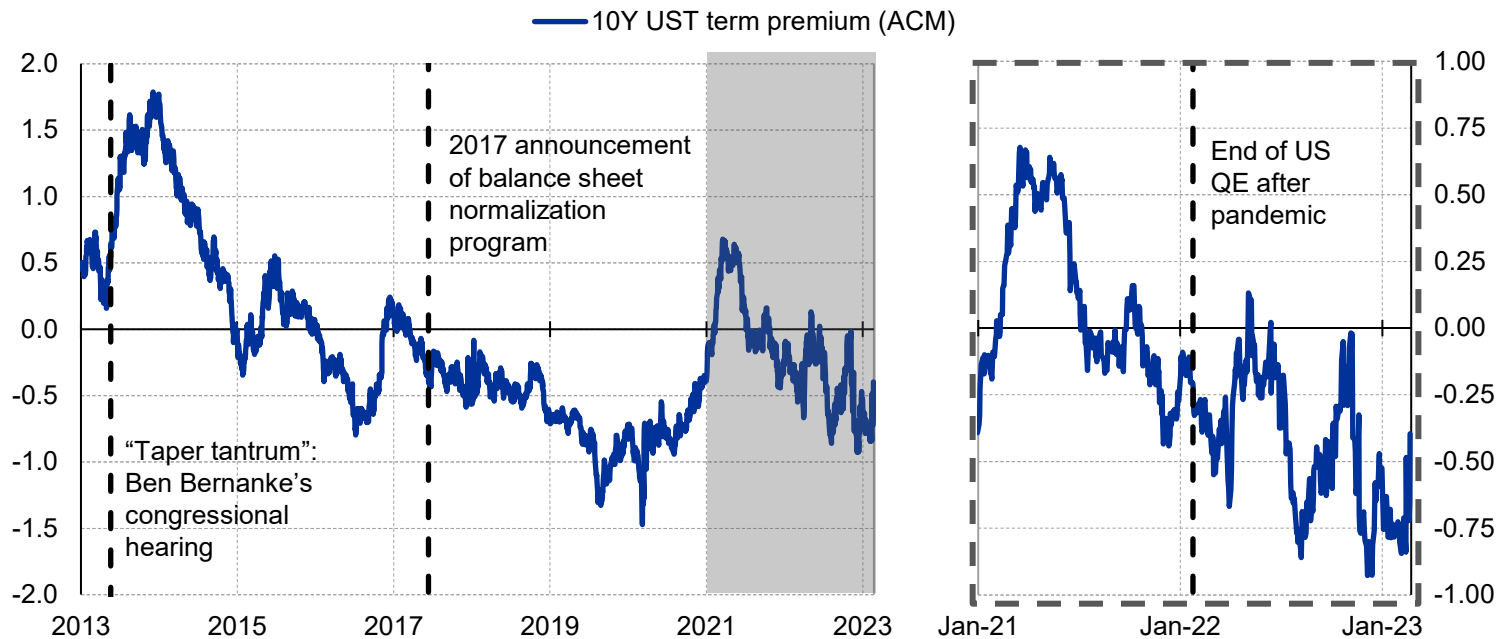
Source: Adrian, Crump & Moench and Bloomberg
Note: Vertical lines refer to key monetary policy events or decisions. 22 May 2013: Ben Bernanke's congressional hearing; 14 June 2017: announcement of balance sheet normalization program; 26 January 2022: End of US QE.
Latest observation: 27 February 2023.

Strong inflows into US Treasury market may have partly offset QT effects

Cumulative net purchases of US Treasury bonds by non-residents since January 2015
(USD billions)

Source: U.S. Department of the Treasury, TIC system.
Latest observation: December 2022.

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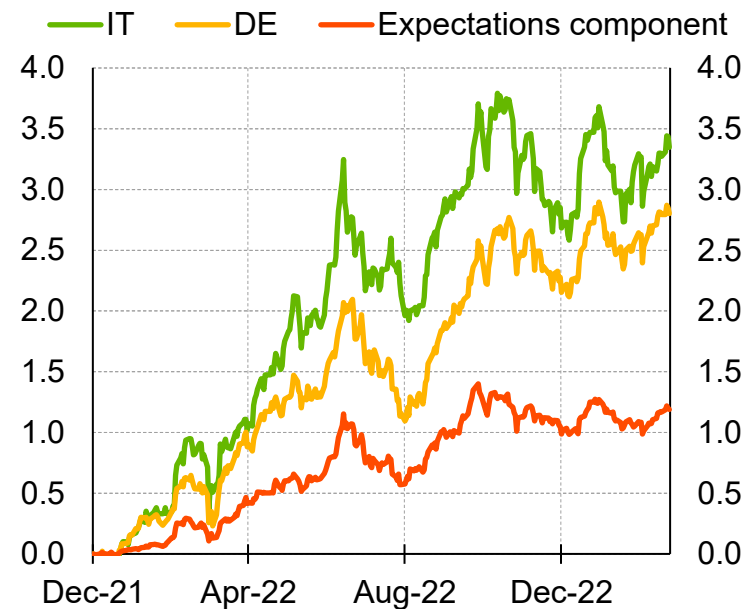# Long-term bond yields have risen well above average expected short-term interest rates

10-year sovereign yields and 10-year OIS expectations component
(cumulative change since Dec-21)

Euro area GDP-weighted

Legend:
- Expectations component
- 10y euro area GDP-weighted

Italy and Germany

Legend:
- IT
- DE
- Expectations component

Sources: Refinitiv, Bloomberg and ECB calculations.
Notes: The decomposition of the 10-year spot OIS rate into expected rates and term premia is based on an affine term structure model fitted to the euro area OIS curve. The estimation method follows Joslin, Singleton and Zhu (2011).
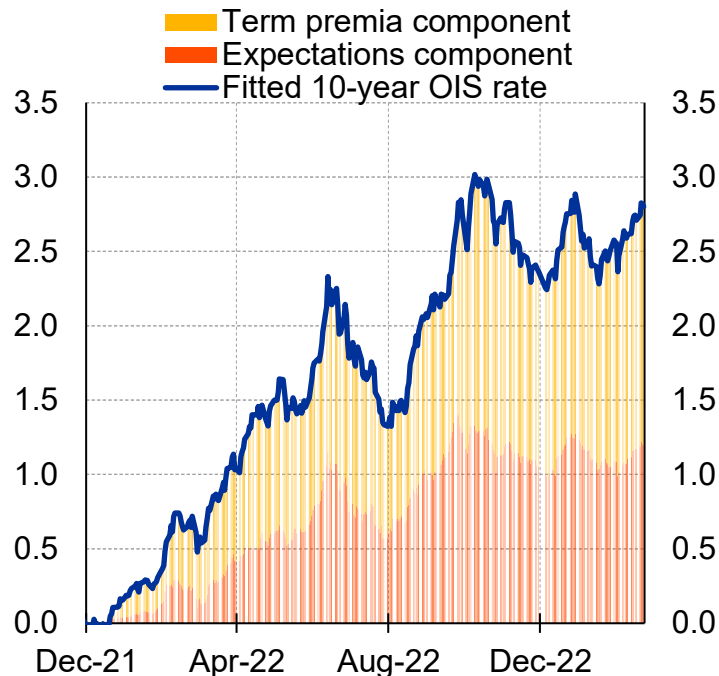Latest observation: 23 February 2023.

Sources: Bloomberg, Refinitiv and ECB calculations.
Notes: The decomposition of the 10-year spot OIS rate into expected rates and term premia is based on an affine term structure model fitted to the euro area OIS curve. The estimation method follows Joslin, Singleton and Zhu (2011).
Latest observation: 23 February 2023.

Substantial rise in euro area term premium over the past year

Decomposition of 10-year spot euro area OIS rate
(cumulative change since Dec-21)

- Term premia component
- Expectations component
- Fitted 10-year OIS rate

Sources: Refinitiv, Bloomberg and ECB calculations.
Notes: The decomposition of the 10-year spot OIS rate into expected rates and term premia is based on an affine term structure model fitted to the euro area OIS curve. The estimation method follows Joslin, Singleton and Zhu (2011).
Latest observation: 23 February 2023.

## 10-year spot euro area OIS term premium
(percentage points)

Sources: Bloomberg, Refinitiv and ECB calculations.
Latest observation: 23 February 2023.

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Rising term premium reflects higher uncertainty about both inflation and monetary policy

10-year inflation risk premium
(%)

Volatility of 3-month EURIBOR
(standard deviation from implied densities; percentage points)
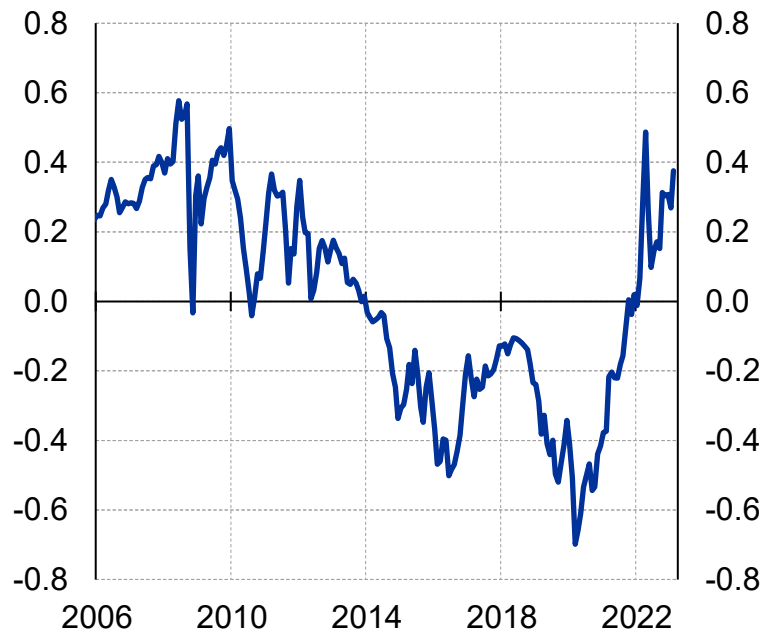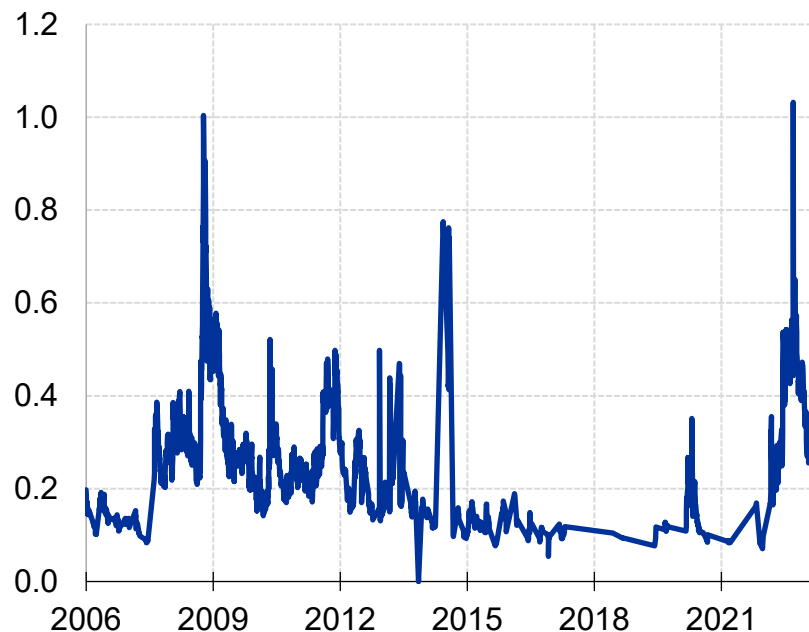

Sources: Bloomberg, Refinitiv and ECB calculations.
Notes: The inflation risk premium is the average estimate from two affine term structure models as in Joslin, Singleton and Zhu (2011) applied to ILS rates adjusted for the indexation lag; see Burban et al. (2022), ECB Economic Bulletin Issue 8, 2021, Box 4. Latest observation: February 2023.
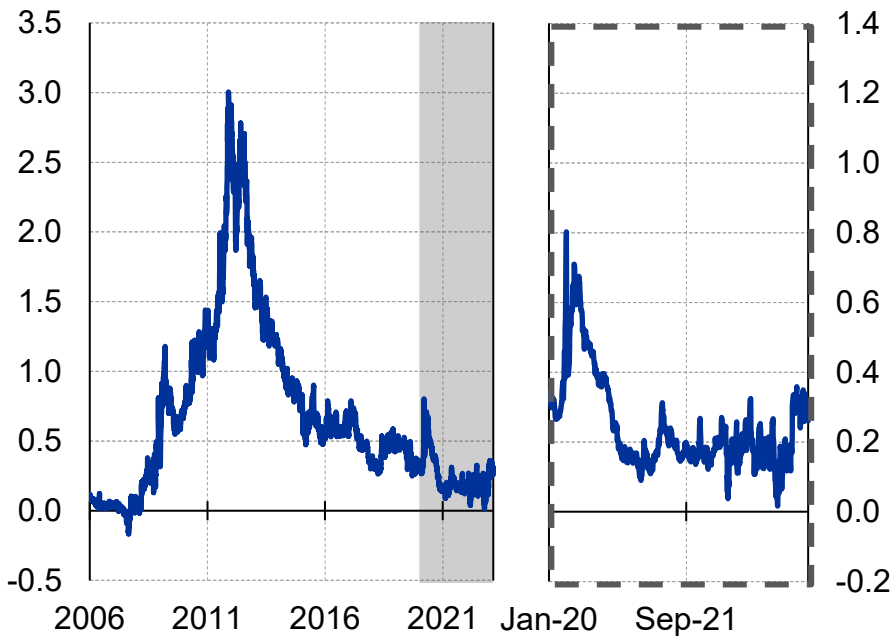
Sources: SDW and ECB calculations.

The rise in OIS rates can explain much but not all of the increase in sovereign yields

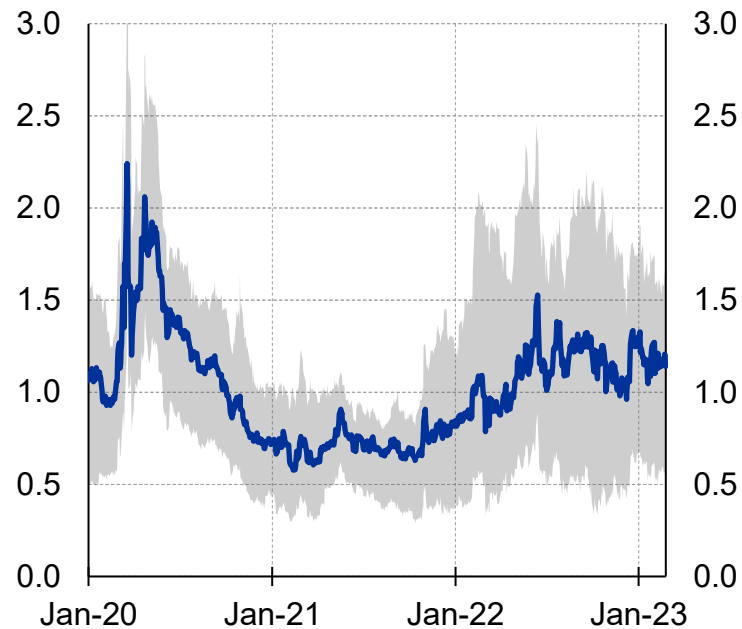## 10-year GDP-weighted sovereign spread over the OIS
(%)

All euro area countries

Sources: Bloomberg and ECB calculations.
Latest observation: 23 February 2023.

Issuers with lower credit rating

Sources: Refinitiv and ECB calculations.
Notes: The blue line depicts the 10-year GDP-weighted spread for ES, IT, GR and PT over the 10-year OIS rate. For historical data, weights are based on each country's GDP of that same year. For 2022 and 2023, weights are computed using 2022 GDP for ES and 2021 GDP for GR, IT and PT. The grey range denotes the minimum and maximum spreads over the 10-year OIS rate among the four countries.
Latest observation: 23 February 2023.

Relationship between risk-free rates and credit risk premia time and state-dependent

Correlation of 1m1y and the spread between 10-year GDP-weighted yield and OIS rate
### (coefficient)

Sources: Bloomberg and ECB calculations.
Note: The chart shows a 60-day moving correlation window. The qualitative nature of the results does not change if the correlation is done at the country-level or if a smaller time window is used.
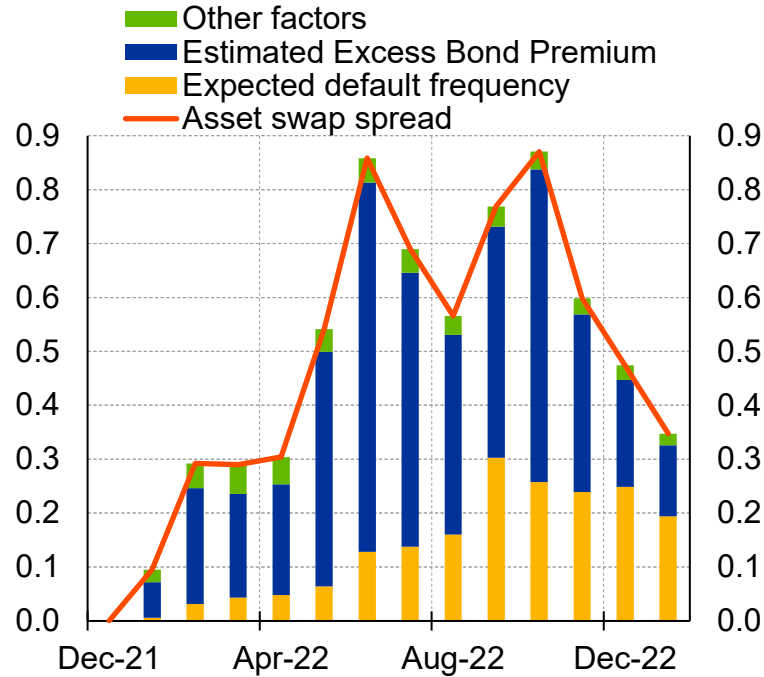Latest observation: 23 February 2023

Sensitivity of sovereign spreads to risk-free rate expectations

- IT until 15 June
- IT after 15 June
- ES until 15 June
- ES after 15 June
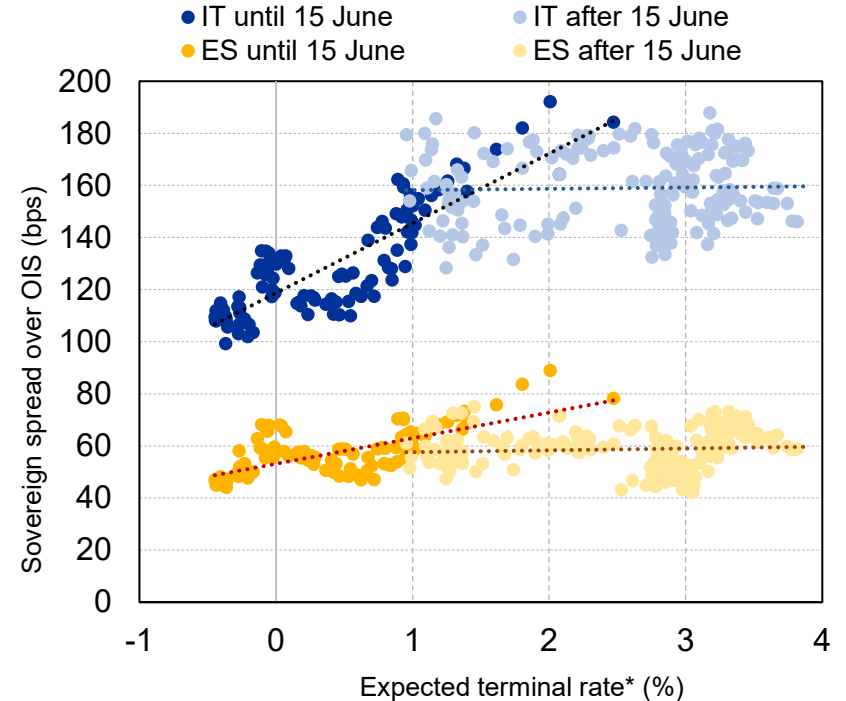
Sources: Bloomberg and ECB calculations. * This chart shows the relationship between the spread of selected sovereign 10-year benchmarks over the 10-year EA OIS rate (y-axis) versus the outright level of the ESTR OIS forward covering the 8th ECB maintenance period from today (%). The chart differentiates between the period from the start of 2022 until 15 June 2022 (ECB announcement on activation of PEPP flexibility and work on an anti-fragmentation instrument) and the period thereafter. Latest observation: 28 February 2023.

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Monetary policy affects credit risk premia through its impact on risk tolerance

**Decomposition of cumulative changes
in euro area corporate bond spreads**
(percent per annum; rebased to zero in December 2021)

Legend:
- Other factors
- Estimated Excess Bond Premium
- Expected default frequency
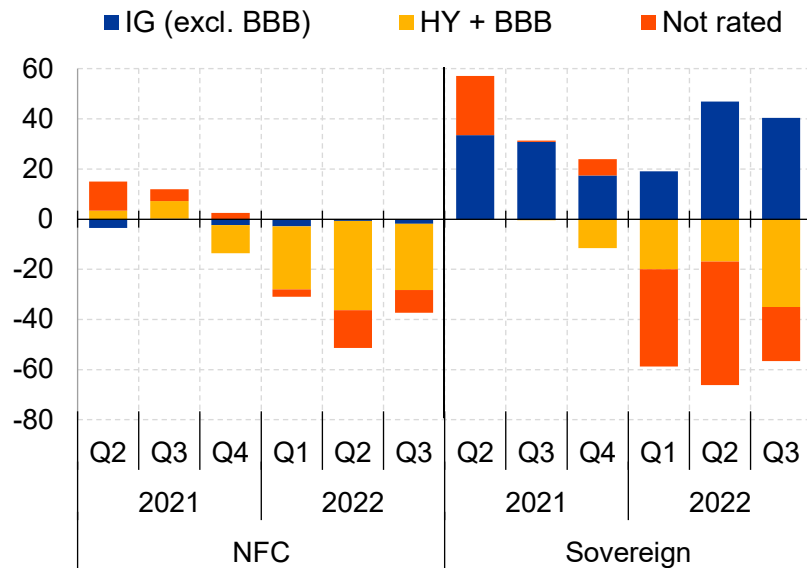- Asset swap spread

Sources: Merrill Lynch, Moody's and ECB calculations.
Notes: See R. De Santis (2018) for more details. "Other factors" refers to country, rating, sector and bond characteristics.
Latest observation: January 2023 (monthly data).

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Portfolio rebalancing is weighing on banks' intermediation capacity

Euro area non-banks debt transactions by issuer type and rating
(Q2 2021 – Q3 2022; € billion, market value)

Legend: ■ IG (excl. BBB) ■ HY + BBB ■ Not rated

NFC — Q2 Q3 (2021) Q4 Q1 Q2 Q3 (2022)
Sovereign — Q2 Q3 (2021) Q4 Q1 Q2 Q3 (2022)

Source: SHSS, CSDB and ECB calculations.
Notes: Transactions in market value. "IG" refers to investment grade debt and "HY" to high yield debt. Non-banks include insurance corporations, pension funds and investment funds.

Bid-ask spreads in euro area bond markets
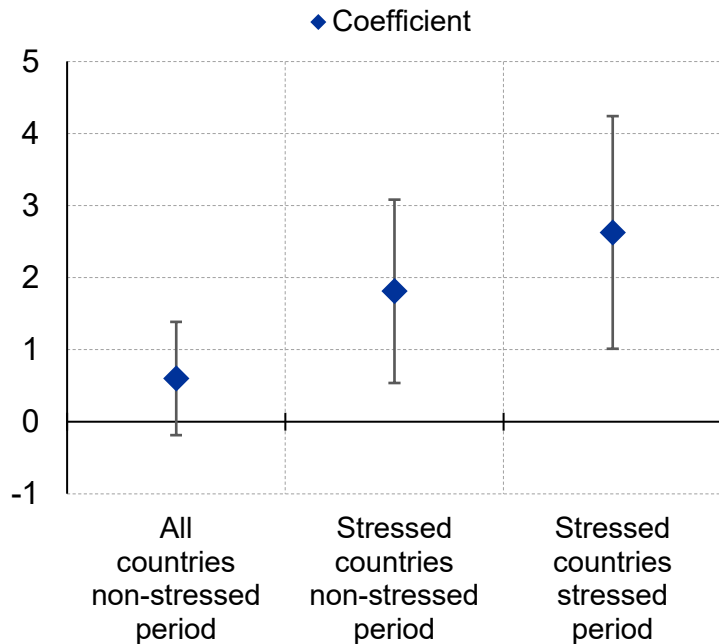(basis points, weighted by market value)

Legend: —— Investment grade —— High yield —— Sovereign
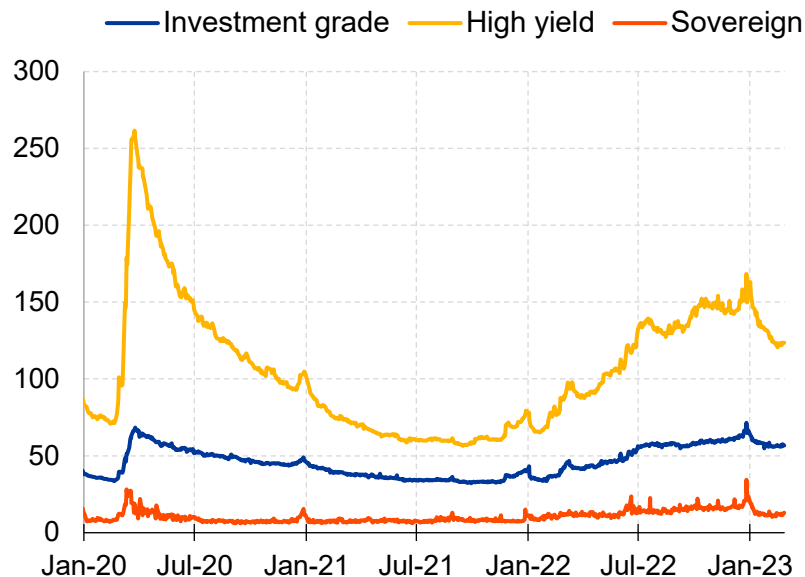
Source: iBoxx, ECB calculations.

"Flow effects" on daily bond returns
(impact of 1 pp increase in purchases of security relative to its outstanding amount, in %)

◆ Coefficient

APP and PEPP portfolios:
impact on risk premia of sovereign bonds
(basis points)
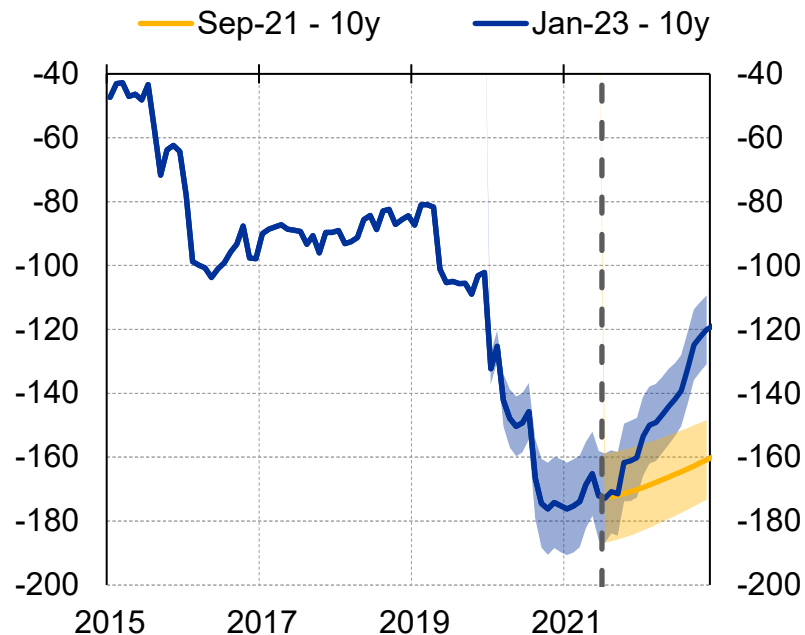
— Sep-21 - 10y   — Jan-23 - 10y

Source: ECB calculations.
Notes: The impact estimates derive from regressions of daily bond returns of individual central government securities on ECB purchases of these securities, scaled by their outstanding amounts, and a full set of security and day-fixed effects. Purchase volumes are instrumented via the blackout periods embedded in the PSPP and PEPP design, as detailed in De Santis and Holm-Hadulla (2020). The blue diamonds are point estimates and the whiskers are 95% confidence intervals.

Source: ECB calculations.
Notes: The upper range of estimates are derived using an arbitrage-free affine model of the term structure with a quantity factor (see Eser et al., 2019). The lower range is derived using an alternative version of the model recalibrated so that the model-implied yield reactions to the March PEPP announcement match the two-day yield changes observed after 18 March. The model results are derived using GDP-weighted averages of the zero-coupon yields of the big-four sovereign issuers (DE, FR, IT, ES). The yellow (blue) line is based on projections of the Eurosystem's holdings of big-four sovereign bonds as informed by the ECB's September 2021 (January 2023) survey of monetary analysts.
Latest observation: January 2023.

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Thank you very much for your attention!