Philip R. Lane
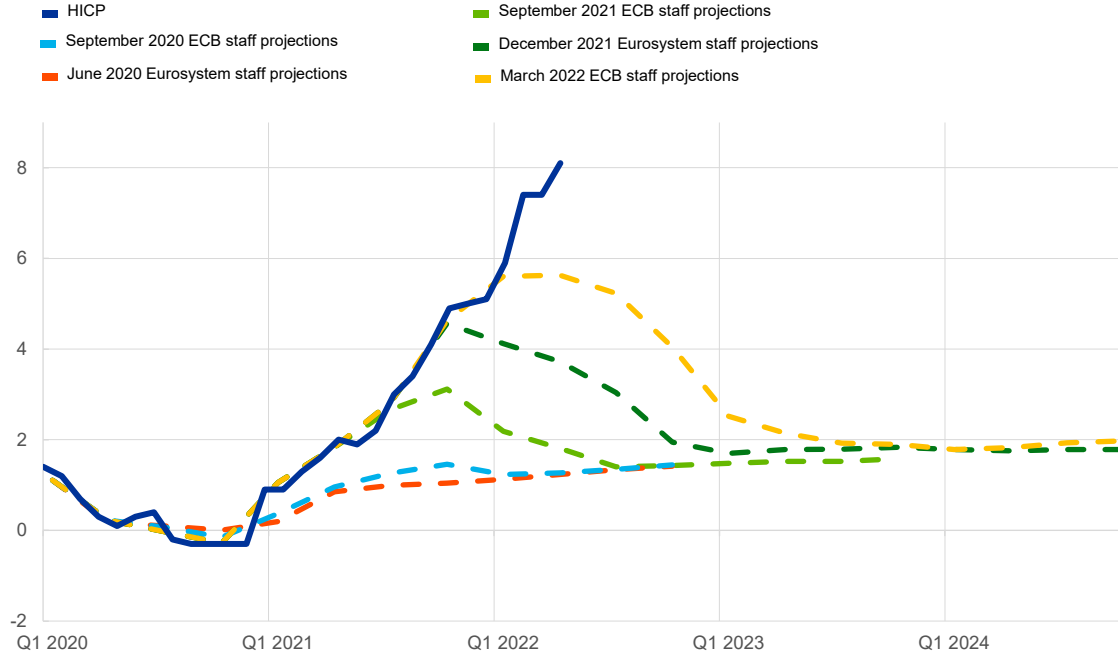Member of the Executive Board

Inflation shocks and monetary policy

CEPR Paris Symposium

Paris, 1 June 2022

HICP and ECB/Eurosystem staff projections
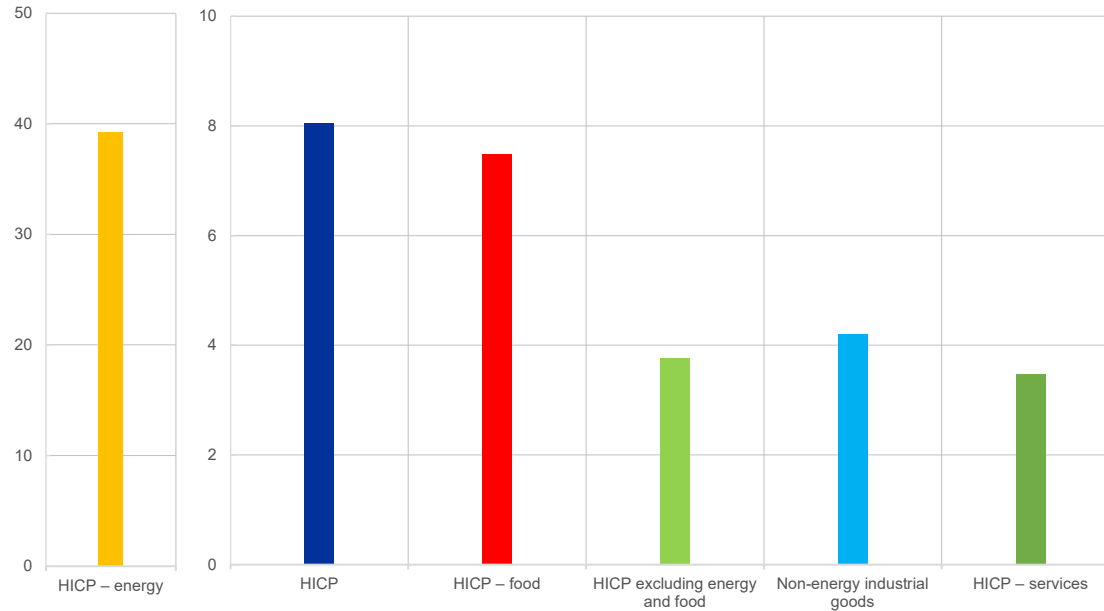
(annual percentage change)

Sources: Eurostat and ECB/Eurosystem staff projections.
Notes: Historical data are at monthly frequency. Forecast data are at quarterly frequency.
The latest observation is for May 2022 (flash estimate) for HICP.

Energy, food, goods and services inflation

(annual percentage changes)

Sources: Eurostat and ECB calculations.
Note: The HICP – food series shown is HICP food including alcohol and tobacco. The latest observations are for May 2022 (flash estimate).
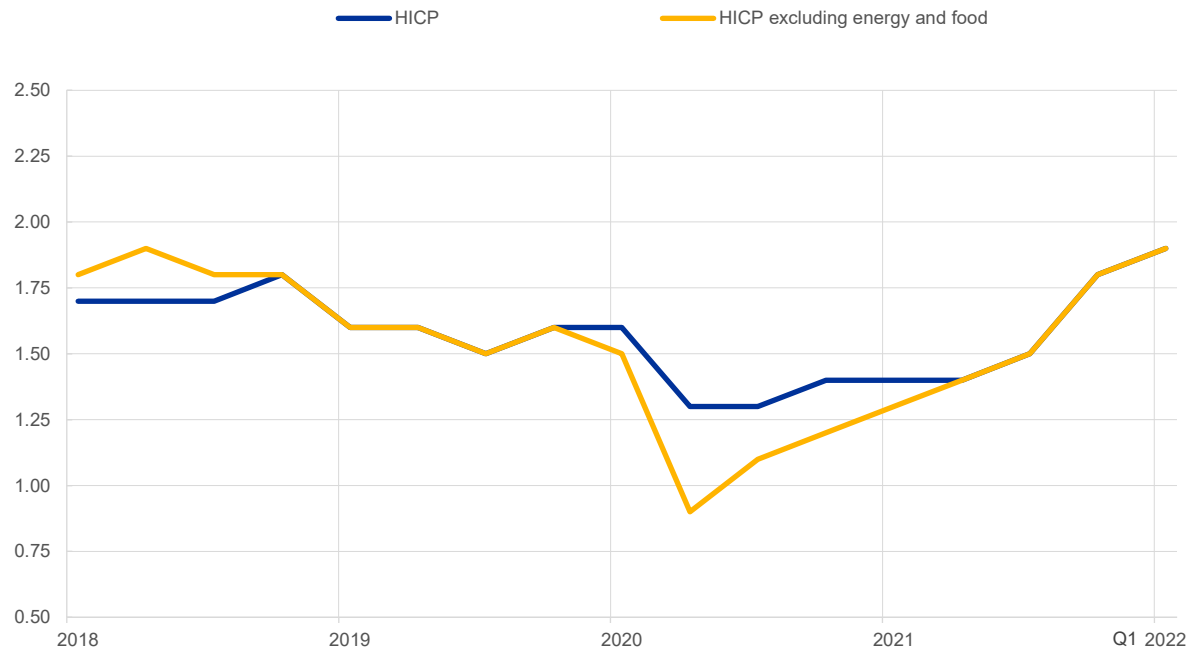
Realised and expected level of HICP (left) and HICP excluding energy and food (right)
(percentages)
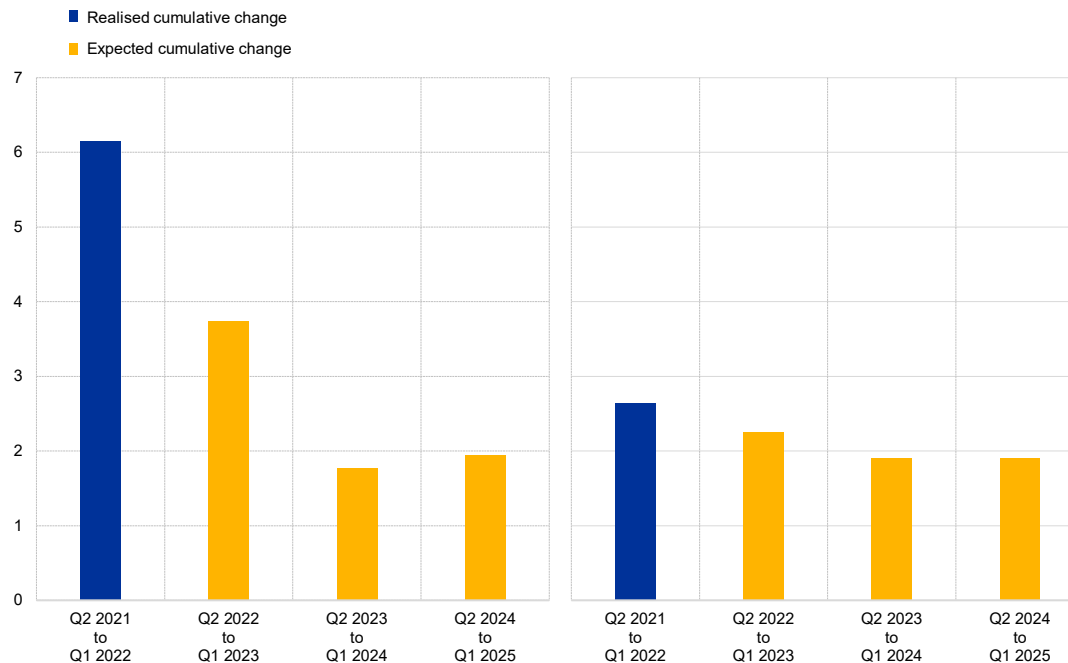
Source: Survey of Monetary Analysts.
Note: Expectation is based on the median from the April 2022 Survey of Monetary Analysts.

End-of horizon projections for HICP and HICPX inflation in the ECB/Eurosystem staff projections
(percentages per annum)

Source: ECB/Eurosystem staff macroeconomic projection exercise, ECB calculations.
Notes: The last observation is for the March 2022 macroeconomic projection exercise.

Three inflation shocks

1) Pandemic cycle: shutdowns; bottlenecks; reopening; balance sheets

2) Energy shock: supply disruptions; global transition; [terms of trade]

3) Russia-Ukraine war: energy; bottlenecks; uncertainty; [longer-term implications]

- Dynamic adjustment to shocks: impulse-responses; longer-term impact

- Euro area: re-anchoring versus de-anchoring

Oil price decomposition

(daily cumulated percentage changes, since 1 January 2019)
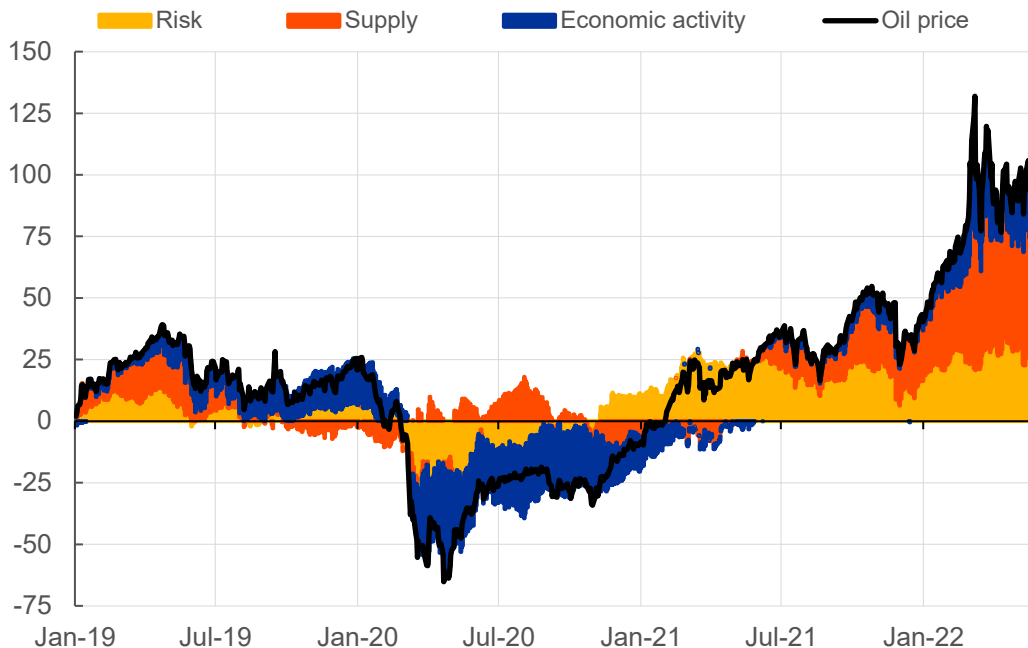
Sources: Refinitiv, Bloomberg, International Energy Agency (IEA) and ECB staff calculations.
Notes: Daily oil model from Venditti, F. and Veronese, G., "Global financial markets and oil price shocks in real time", Working Paper Series, No 2472, ECB, September 2020. Structural shocks are estimated using the spot price, the futures to spot spread, market expectations on oil price volatility and the stock price index. The risk component identifies shocks to risks to future oil demand, whereas the economic activity component identifies shocks to current demand from changes in economic activity.
Latest observations: 31 May 2022.

Goods trade balance and income effect of terms of trade

(left panel: in percentages of GDP; right panel: quarterly percentage point impact in terms of annual GDP growth)
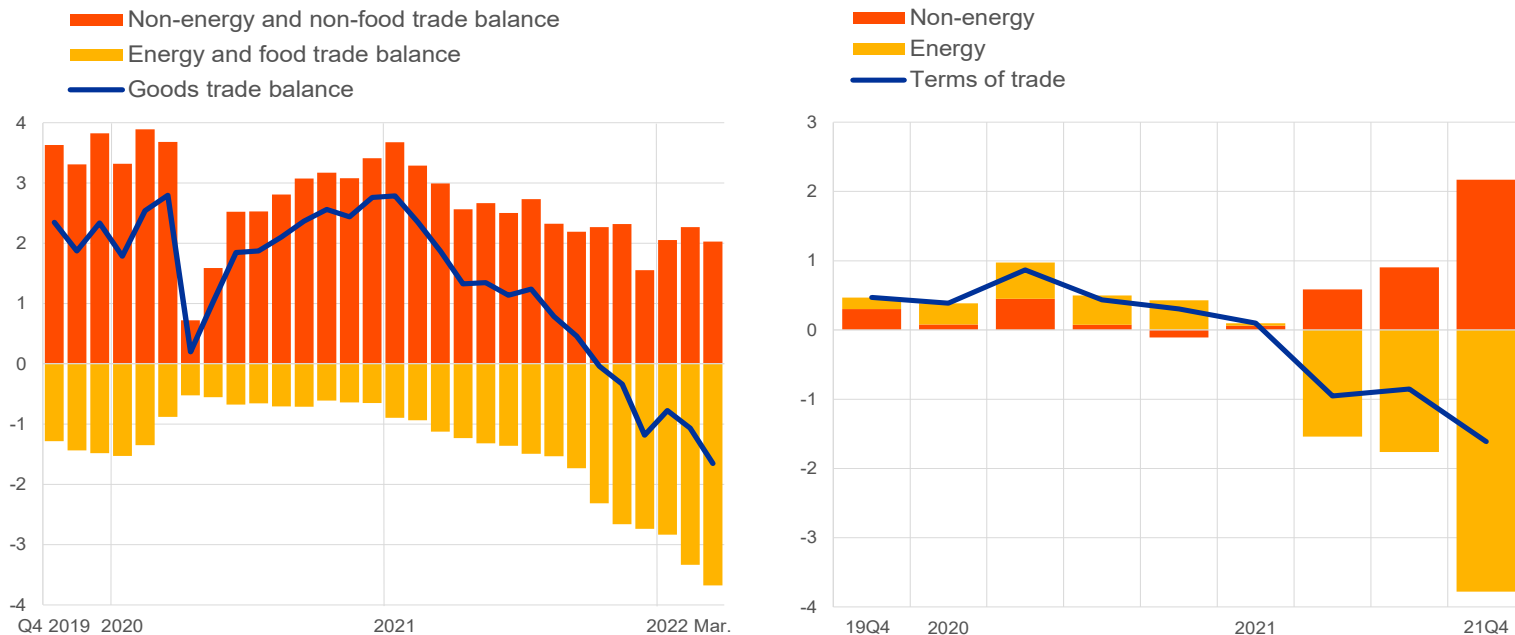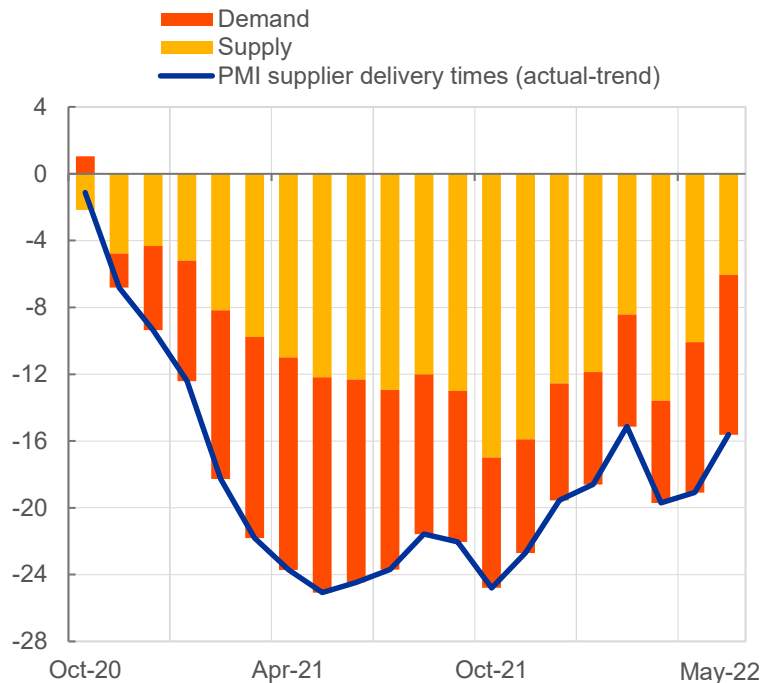

Source: Eurostat and ECB calculations.
Notes: left panel: The value for GDP in Q1 2022 is forecasted; right panel: The income effect of terms of trade is calculated by weighing export and import price changes by their respective volumes and considered as a percentage share of GDP.
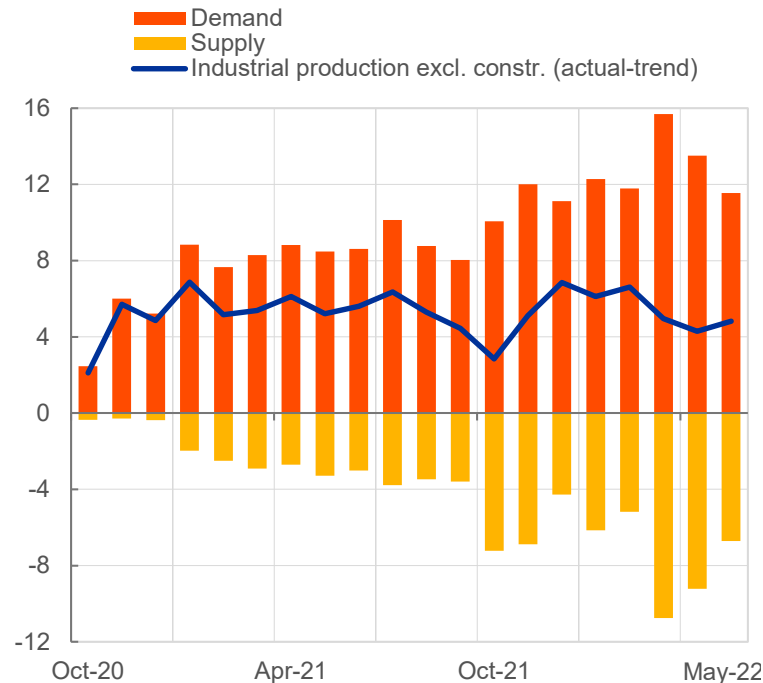Latest observations: left panel: March 2022; right panel: Q4 2021.

PMI suppliers' delivery times: Contributions of supply and demand forces
(diffusion index in deviation from trend)

Industrial production excl. construction: Contributions of supply and demand forces
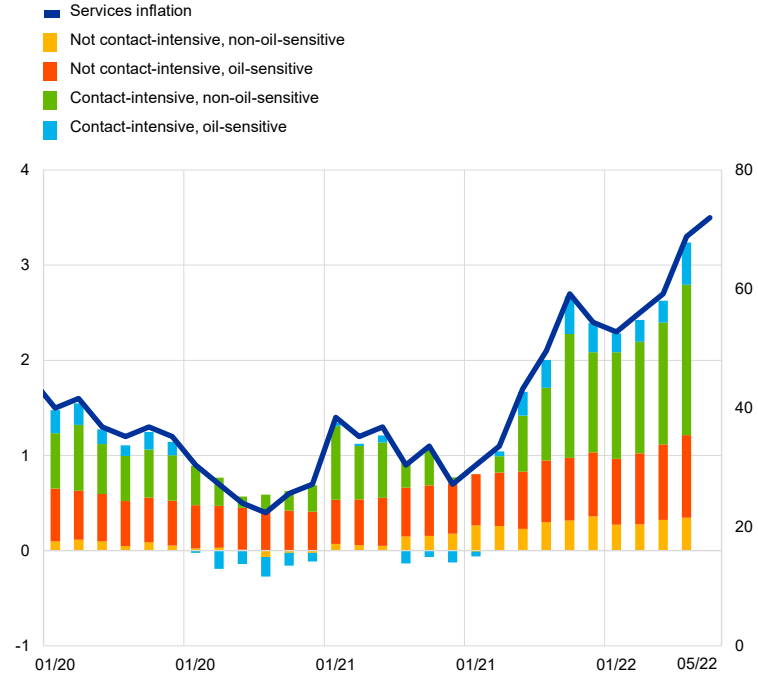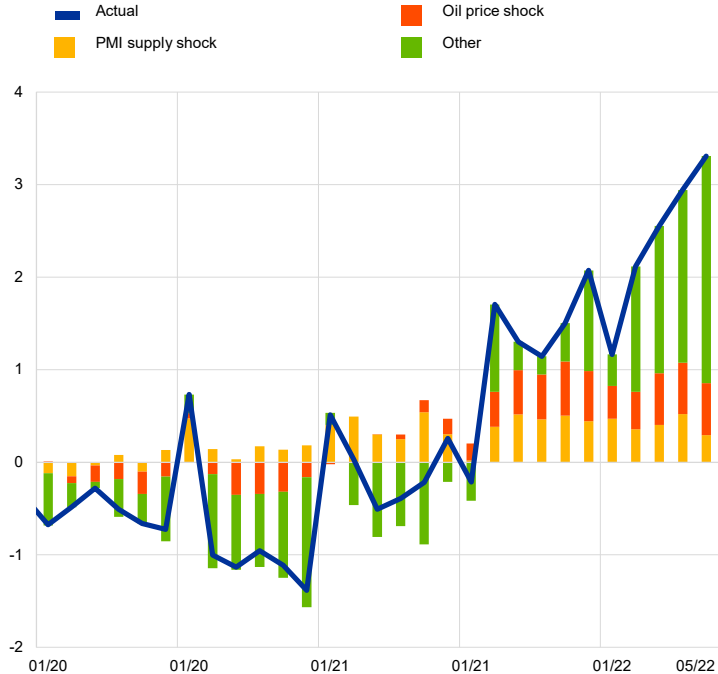### (percentage in deviation from trend)

Sources: Eurostat, S&P Global and ECB staff calculations.
Notes: The SVAR model shows the contribution of aggregate demand (due to demand and interest rate shocks) and aggregate supply (due to supply-chain disruption, energy and other cost-push shocks) forces (see also De Santis, Economic Bulletin, Issue 8/2021). April and May 2022 are computed using internal mechanical forecasts of industrial production, HICP headline and HICP energy prices. The variables incorporated in the model are HICP headline, HICP energy prices, industrial production (excl. construction), the ten-year OIS rate and the PMI suppliers' delivery times. The model is identified using sign and narrative restrictions as in Antolín-Díaz, J. and Rubio-Ramírez, J.F., "Narrative Sign Restrictions for SVARs", *American Economic Review*, Vol. 108, No 10, 2018, pp. 2802-2829.
Latest observation: May 2022.

Decomposition of inflation in non-energy industrial goods and services inflation

(annual percentage changes; percentage point contributions)

Legend (left chart): Actual, PMI supply shock, Oil price shock, Other

Legend (right chart): Services inflation, Not contact-intensive, non-oil-sensitive, Not contact-intensive, oil-sensitive, Contact-intensive, non-oil-sensitive, Contact-intensive, oil-sensitive
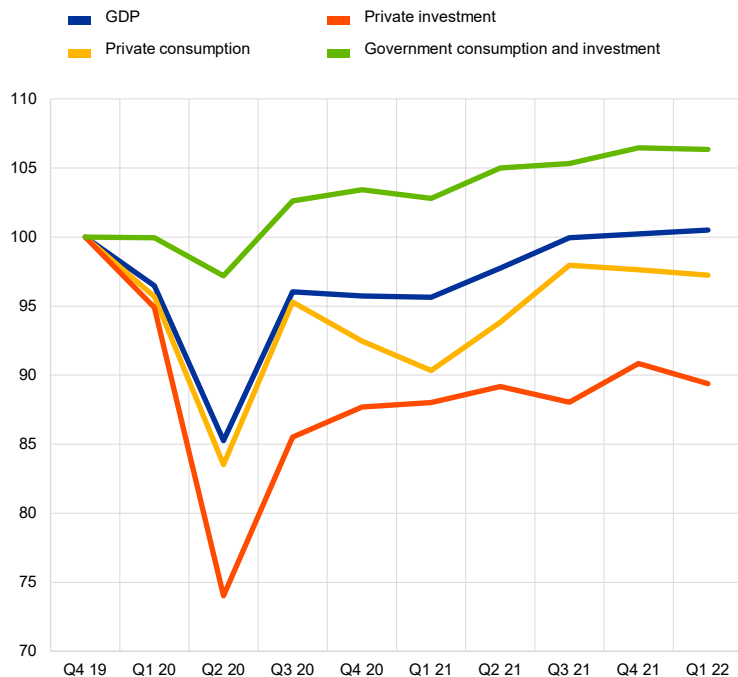
Sources: Eurostat, Narrow Inflation Projections Exercise and ECB calculations.
Notes: HICP non-energy industrial goods inflation is de-meaned by the model mean over the sample from July 2009 to February 2022. Services inflation is decomposed with non-constant weights. Latest observations: April 2022 for contact-intensive and not contact-intensive, May 2022 (flash) for the rest.

10

GDP components and forecasts
(chart: index Q4 2019 = 100)

- GDP
- Private consumption
- Private investment
- Government consumption and investment

Source: Eurostat, ECB projections and calculations.
Notes: The latest observations are for the first quarter of 2022.

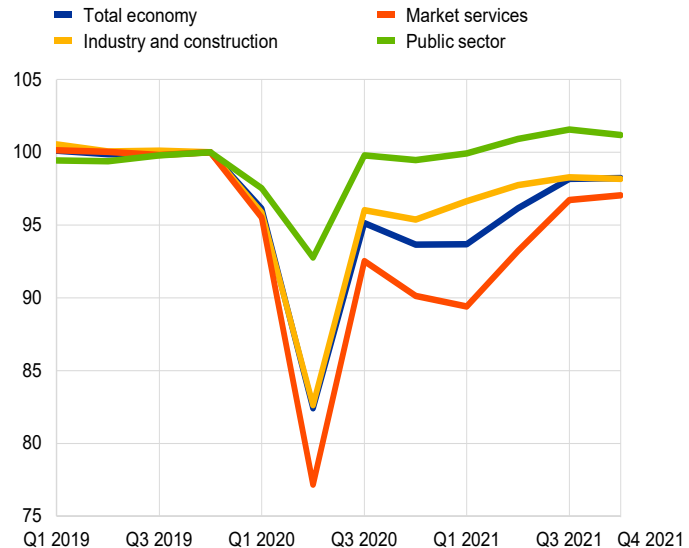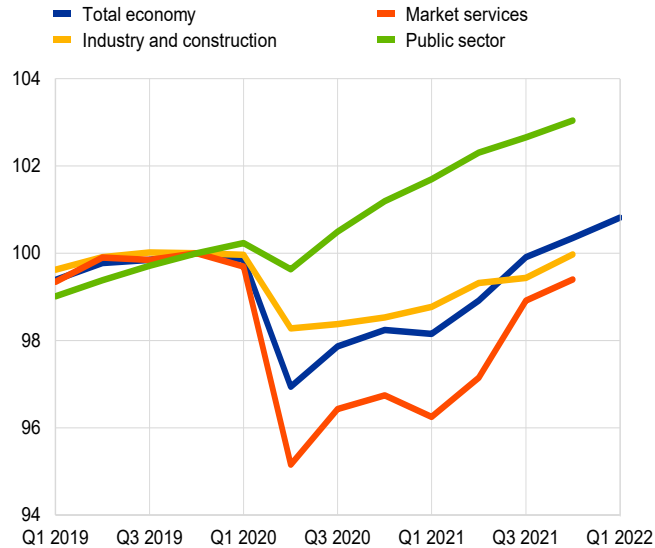## European Commission forecasts for annual GDP growth
(percentages)

	2022	2023
Spring 2022	2.7	2.3
Autumn 2021	4.3	2.4

Source: European Commission.

Labour market: employment and hours worked by sector

(index: Q4 2019 = 100; left panel: persons employed; right panel: total hours worked)

Legend (both panels):
- Total economy
- Industry and construction
- Market services
- Public sector

Household saving rate
(percentages of disposable income)

Legend:
- Household saving rate
- Long-term average (2001-19)
- European Commission Spring 2022 forecast
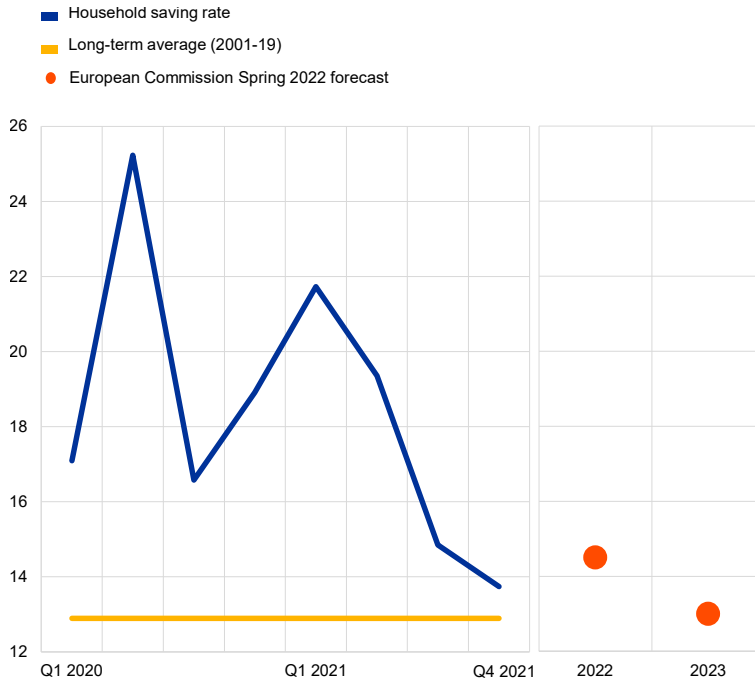
Sources: Eurostat, European Commission and ECB calculations.
Notes: The latest observation is for the fourth quarter of 2021. The data are seasonally adjusted.

Uses and sources of funds, including fiscal support measures, for euro area firms
(EUR billions)

Legend:
- Savings net of fiscal mitigating measures
- Fiscal support measures
- Credit increase
- Capital formation (-)
- Cash increase (-)
- Other (-)
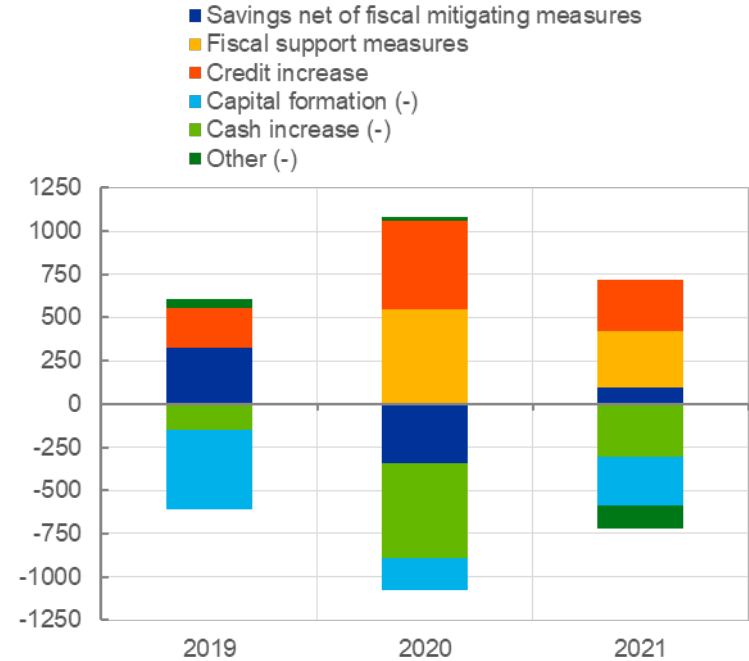
Sources: Eurostat, ECB and ECB estimates.
Notes: "Fiscal support" is defined as the sum of the wage bill savings of firms due to job retention schemes, the effect of moratoria on loan interest payments and rents, tax deferrals and direct grants to firms. "Savings" is gross savings minus consumption of capital. "Credit" includes borrowing from banks and net issuance of debt securities, while "cash" includes currency and deposits. "Capital formation" is gross fixed capital formation plus change in inventories minus consumption of capital. The latest observations are for 2021.

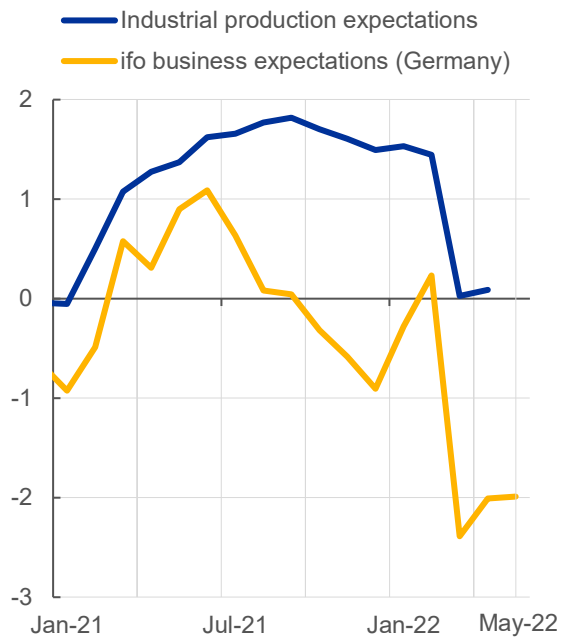# PMI confidence indicators
(diffusion index: 50 = no change)
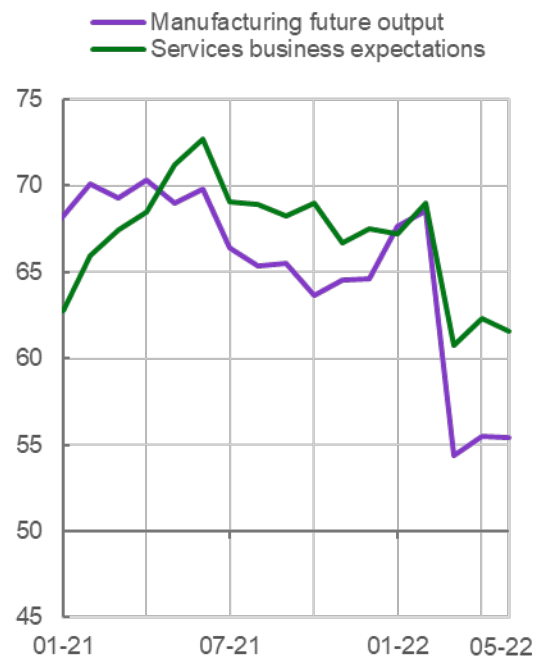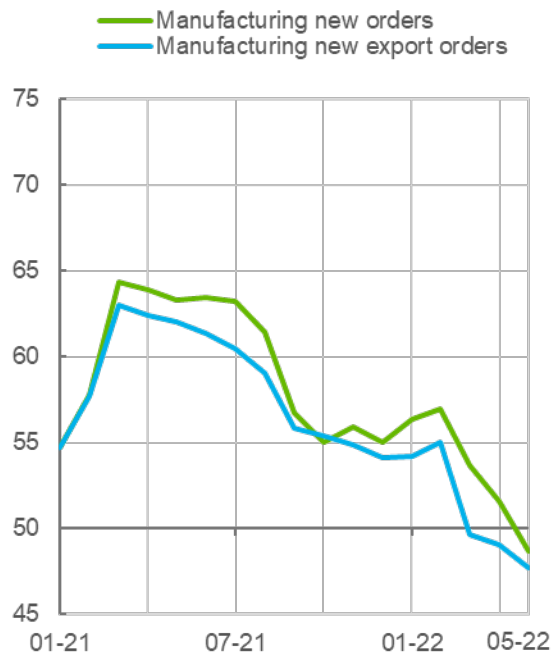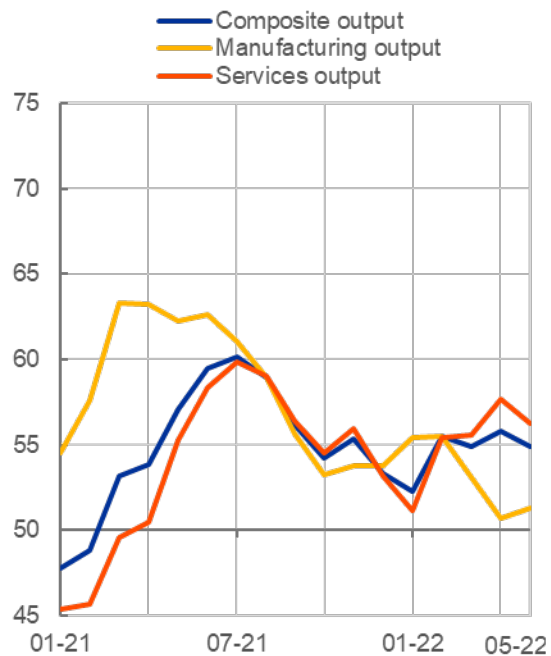
Source: S&P Global.
Note: The latest observations are for May 2022.

Firm confidence indicators
(standardised percentage balances)

— Industrial production expectations
— ifo business expectations (Germany)

Household confidence indicators
(standardised percentage balances)

— Economic situation
— Financial situation
— Major purchases
— Savings
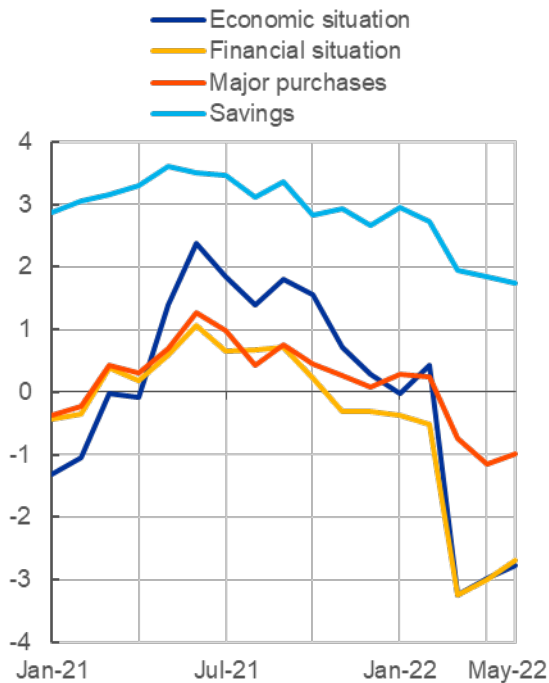
Sentix indicator for investors
(standardised percentage balances)
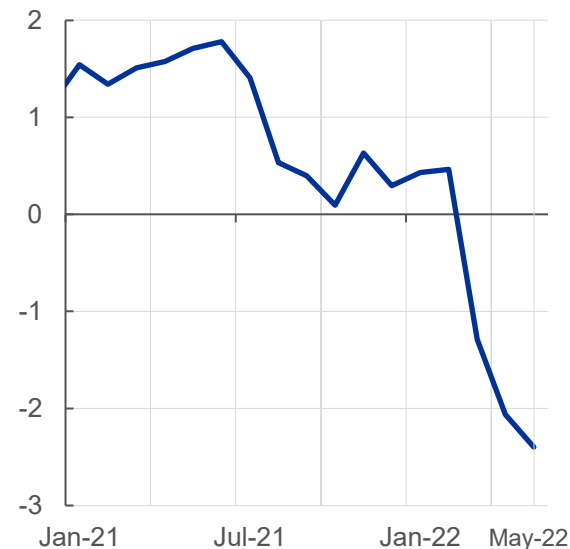
Risks to inflation outlook

- Catch-up adjustment in wages: extent; speed (multi-year)

- Re-set longer-term inflation expectations: extrapolation versus forward-looking

- Inflation psychology: intensity; persistence

- Downward revision in potential output: labour force; "de-globalisation"; [digitalisation]

- Real interest rate channel: investment, consumption, [credit], [asset prices]

  ➤ Elasticity of activity to real interest rates

  ➤ Covariance with terms of trade; uncertainty; macro outlook

Long-term inflation expectations

(annual percentage changes; percentages of respondents)
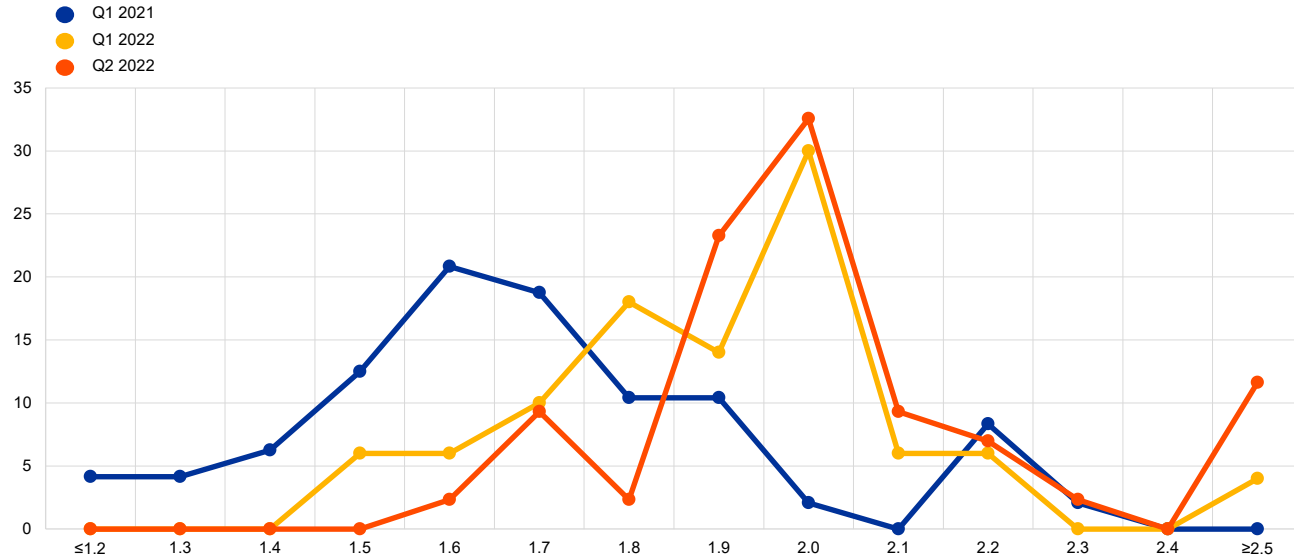

Source: ECB Survey of Professional Forecasters.
Notes: Respondents are asked to report their point forecasts and to separately assign probabilities to different ranges of outcomes. This chart shows the distribution of point forecast responses.

Inflation-linked swap rate
(percentages per annum)

Legend:
- 5y5y inflation-linked swap rate
- Premia-adjusted 5y5y inflation-linked swap rate
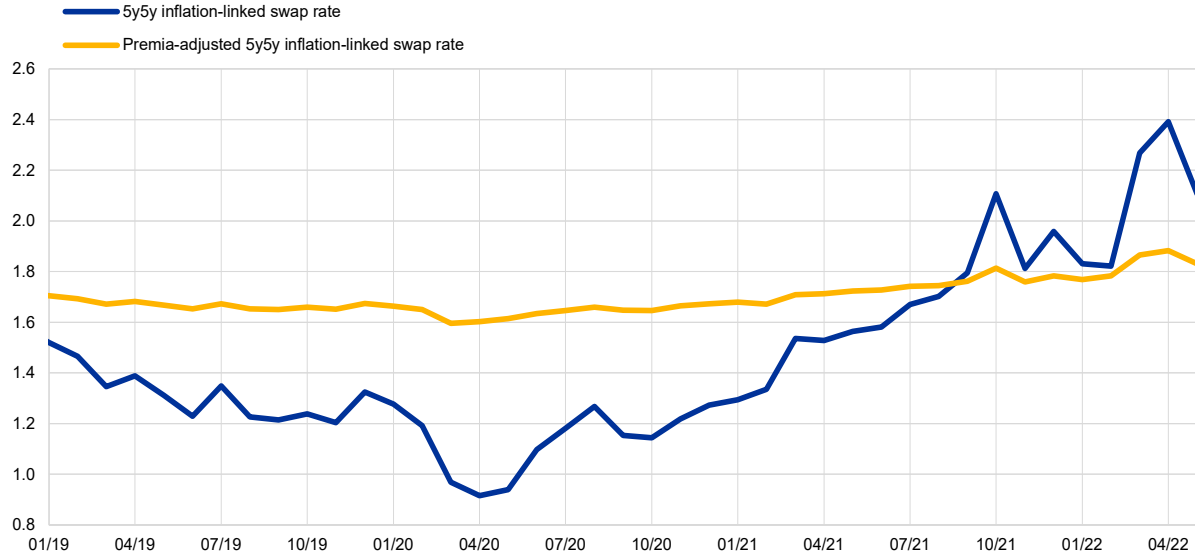
Sources: Refinitiv and ECB calculations.
Notes: Premia-adjusted average estimates based on two affine term structure models following Joslin, Singleton and Zhu (2011) applied to ILS rates adjusted for the indexation lag (monthly data), as in Camba-Mendez and Werner (2017); see Burban et al. (2021), "Decomposing market-based measures of inflation compensation into inflation expectations and risk premia", Economic Bulletin, Issue 8, ECB. The latest observations are for the end of May 2022 (monthly models).

Inflation expectations in the ECB Consumer Expectations Survey

(left panel: annual percentage changes; right panel: annual percentage changes; percentages of respondents)
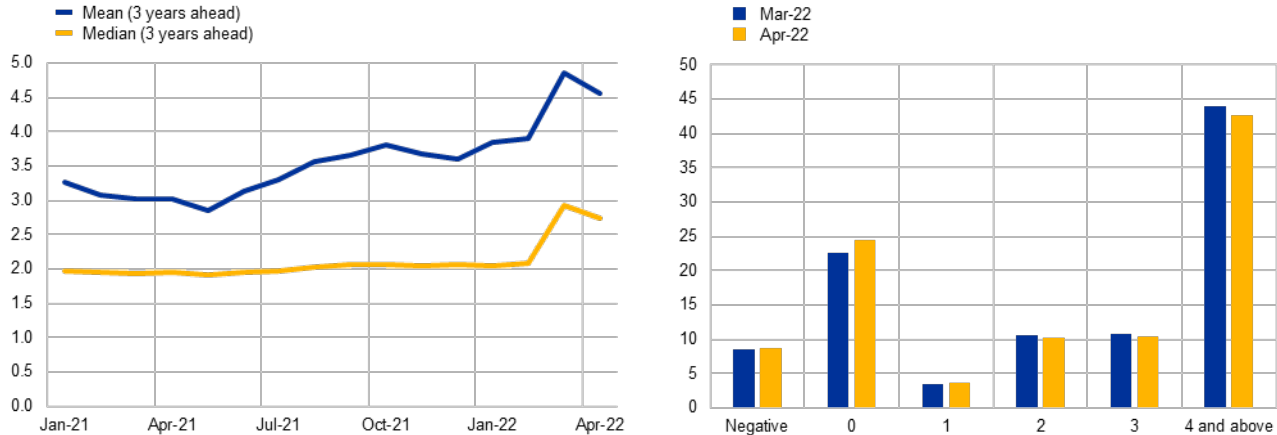
Sources ECB Consumer Expectations Survey and ECB staff calculations.
Notes: "Median" refers to the median across individual respondents. The data are winsorised at the 2nd and 98th percentile.
The latest observations are for April 2022.
Mean values are 3.9%, 4.9% and 4.6% for February, March and April respectively. Median values are 2.1%, 2.9% and 2.7% for February, March and April respectively.

Forward-looking euro area wage tracker
(annual percentage changes; percentage share)
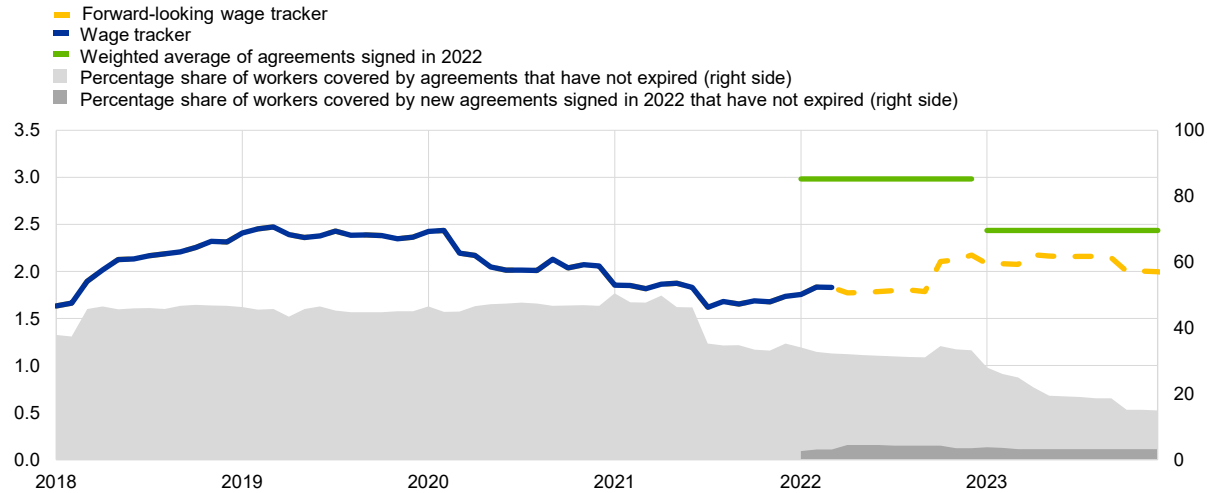
Sources: Calculated based on microdata on wage agreements in Germany, Italy, Spain and the Netherlands. Data fort the Netherlands is based on the database maintained by the Dutch employer association AWVN. For Italy the data comes from Istat (contratti collettivi e retribuzioni contrattuali), for Spain from the Ministerio de Trabajo y Economía Social and for Germany from Bundesbank.
Notes: Experimental euro area wage tracker includes weighted average of Germany, Italy (data from July 2021 to September 2022) Spain and the Netherlands. The orange line shows the weighted average of wage increases in agreements that have not yet expired, weighted by the number of workers covered by these agreements. The green lines show weighted averages of wage increases in agreements that were concluded in 2022, weighted by the number of workers covered by these agreements. Number of employees kept constant 2022 onwards. Latest observations: Last agreements signed in DE May 2022, NL and ES April 2022, IT in March 2022.
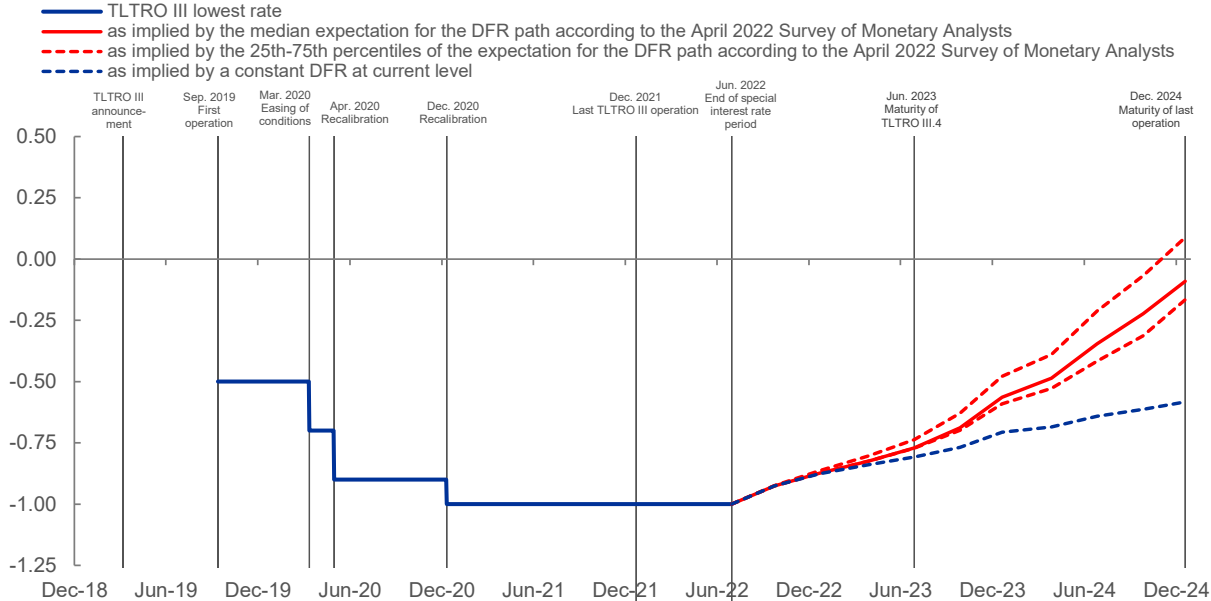
Monthly flow of net purchases under APP and PEPP
(EUR billions)
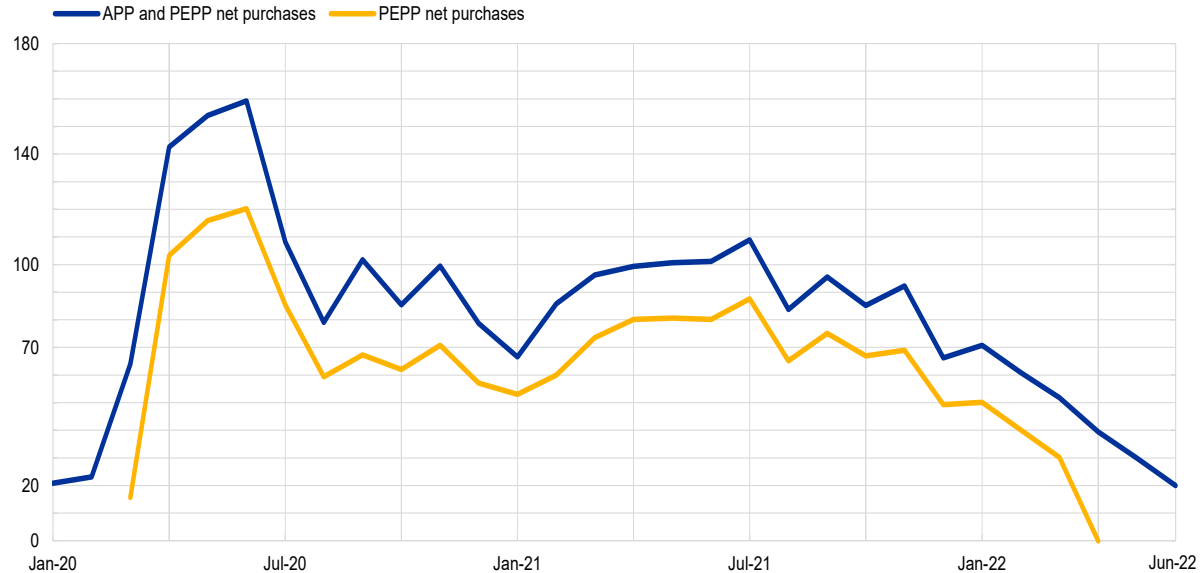
Source: ECB.
Notes: The chart shows aggregated net purchases under the asset purchase programme (APP) and the pandemic emergency purchase programme (PEPP) at month-end. The latest observations are for April 2022. The values for May and June 2022 reflect the ECB's most recent monetary policy announcement.

TLTRO III: lowest rate
(percentages per annum)

Legend:
- TLTRO III lowest rate
- as implied by the median expectation for the DFR path according to the April 2022 Survey of Monetary Analysts
- as implied by the 25th-75th percentiles of the expectation for the DFR path according to the April 2022 Survey of Monetary Analysts
- as implied by a constant DFR at current level

Timeline markers:
- TLTRO III announcement
- Sep. 2019 First operation
- Mar. 2020 Easing of conditions
- Apr. 2020 Recalibration
- Dec. 2020 Recalibration
- Dec. 2021 Last TLTRO III operation
- Jun. 2022 End of special interest rate period
- Jun. 2023 Maturity of TLTRO III.4
- Dec. 2024 Maturity of last operation

Sources: ECB and ECB calculations.

Notes: The TLTRO III lowest rate is the one achievable by a bank meeting all the lending performance thresholds. The solid blue line shows the minimum TLTRO rate after each subsequent recalibration: the minimum rate after the March 2020 and April 2020 recalibrations is the lowest possible rate achievable by repaying the funds at the earliest possible date, while from December 2020 it is the lowest possible rate achievable by repaying the funds at the end of the extended period of temporary rate reduction in June 2022. The dashed blue line after June 2022 shows the evolution of the lowest rate TLTRO III implied by a constant deposit facility rate (DFR) at current levels (-0.5%); the red lines show the lowest TLTRO rate based on the expectations for the DFR as reported in the April 2022 Survey of Monetary Analysts: median (solid line) and 25th-75th percentiles (dashed lines). The rates displayed after June 2022 represent the lowest achievable rate in each quarter assuming that all outstanding funds are repaid in that quarter, where the outstanding funds in a given quarter are calculated as the funds that are outstanding as of now minus all operations maturing by that time.

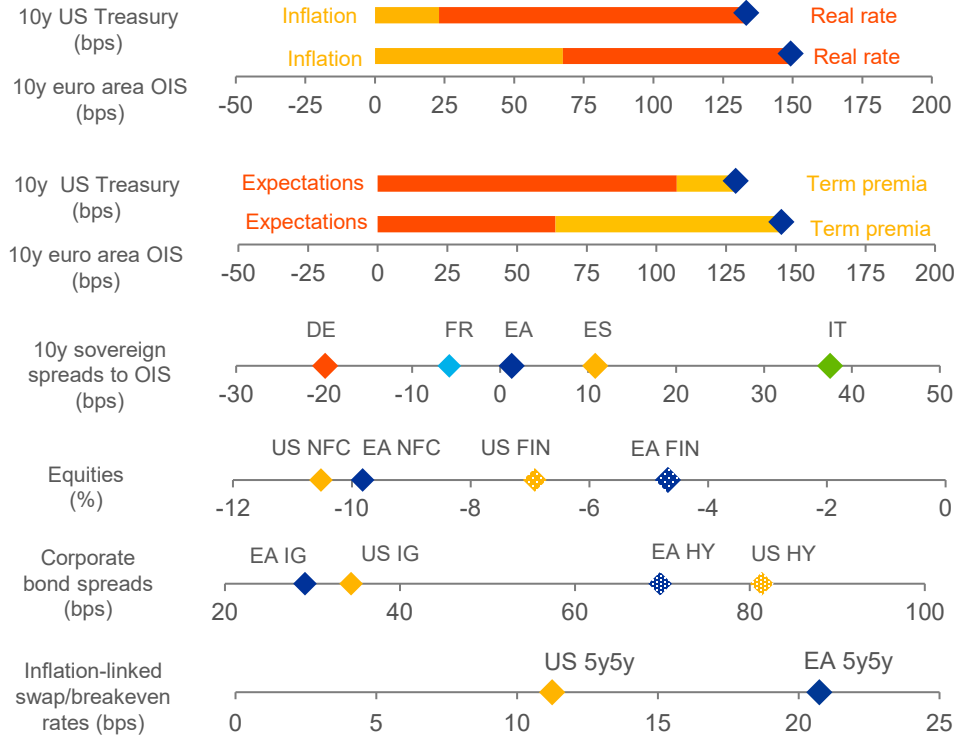**Overnight interest rate swap yield curve**

(percentages per annum)
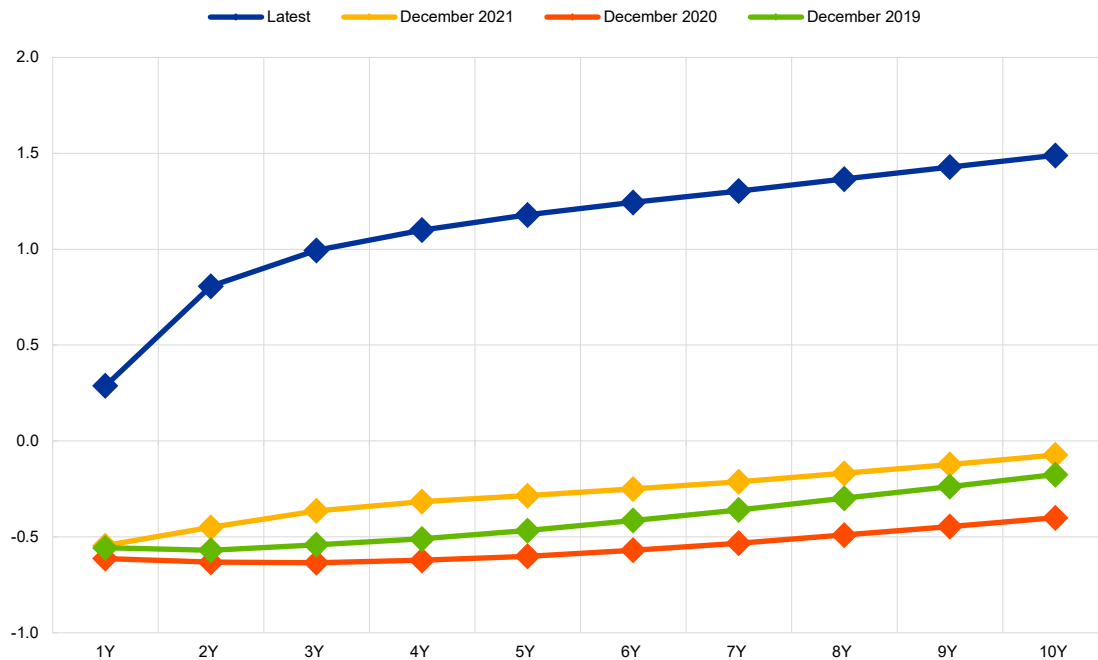
Sources: Bloomberg, Refinitiv and ECB calculations.
Note: The curves refer to the day before the respective Governing Council meetings (15 December 2021, 9 December 2020 and 11 December 2019). The latest observations are for 30 May 2022.

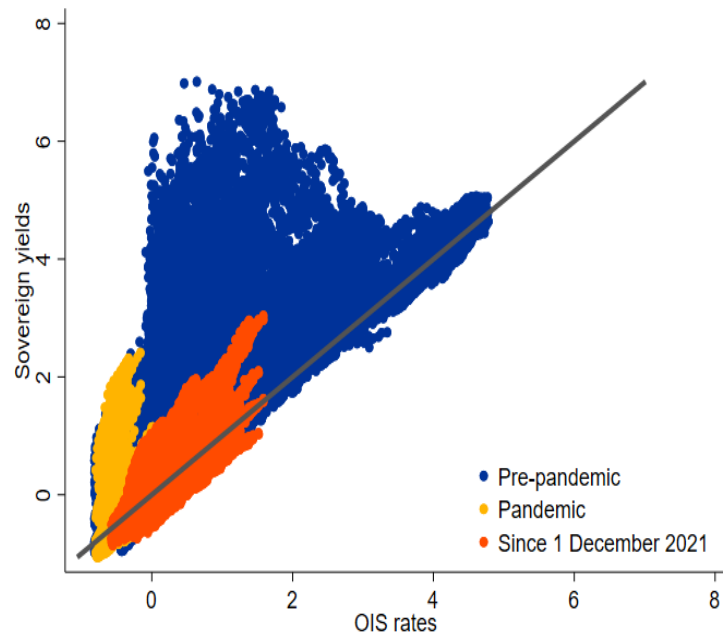# Financial market developments since 1 December 2021

Sources: Refinitiv, Bloomberg, iBoxx, ECB calculations.
Notes: NFC refers to non-financial companies. FIN refers to financial companies. IG refers to Investment Grade. HY refers to High Yield. The latest observations are for 27 May 2022.
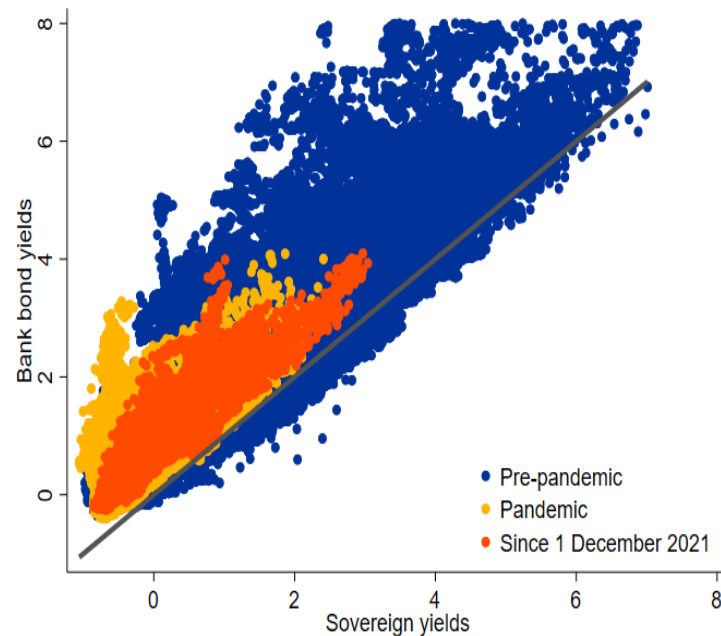
Sovereign yields and OIS rates
(percentages per annum)

Sources: ECB and ECB calculations.
Notes: Each dot corresponds to a daily recording of the sovereign yield in a given country and the OIS rates with the same maturity for the same day . Countries include DE, FR, IT and ES. Maturities span from 1 to 10 years plus 15, 20 and 30 years.
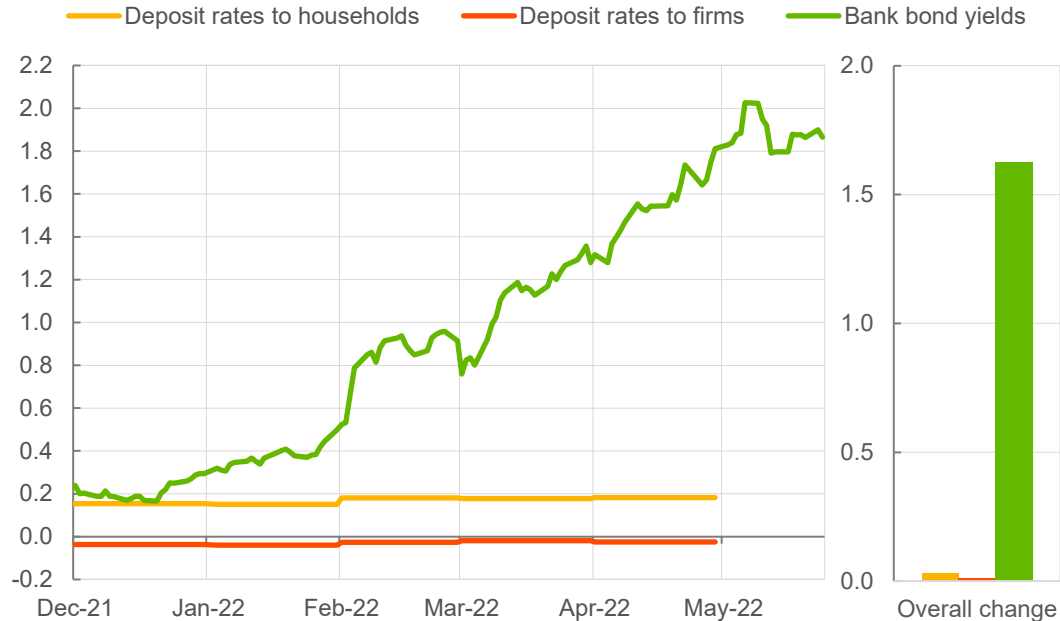Latest observation: 24 May 2022.

Bank bond yields and sovereign yields
(percentages per annum)

Sources: IHS Markit iBoxx and ECB calculations.
Notes: Each dot corresponds to a daily recording of the average yield for senior unsecured bonds with a given maturity issued by banks in a given country and the sovereign yields with the same maturity for the same day in the same country. Countries include DE, FR, IT and ES. Maturities span from 1 to 10 years plus 15, 20 and 30 years.
Latest observation: 24 May 2022.

Evolution of deposit rates and bank bond yields

## (percentages per annum)

Sources: ECB (MIR), IHS Markit iBoxx and ECB calculations.
Notes: Deposit rates are on new business. Daily bank bond yield is the average yield for senior unsecured bonds from IHS Markit iBoxx.
Latest observation: April 2022 for MIR; 24 May 2022 for iBoxx.

Term structure of real forward interest rates
(percentages per annum)

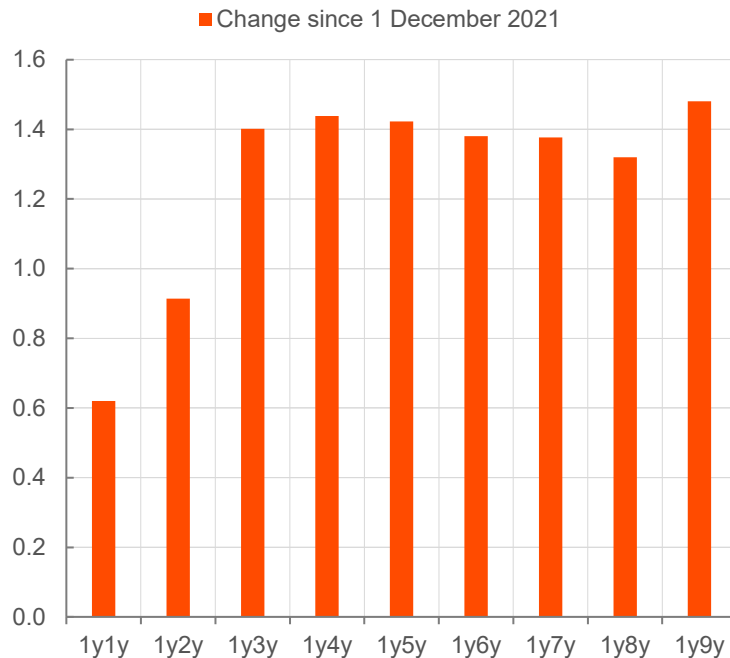— 1 December 2021   — 27 May 2022
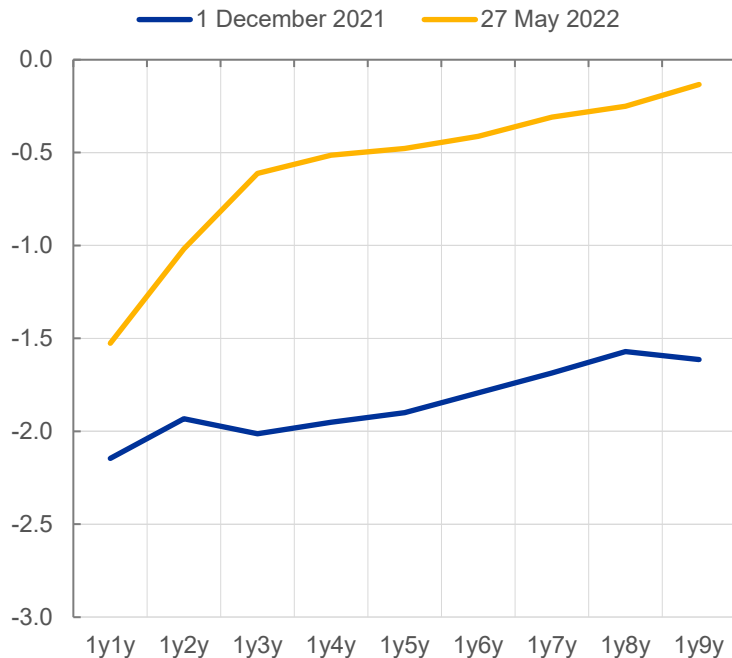
Sources: Bloomberg and Refinitiv.
Note: Real forward rates are calculated by subtracting the inflation-linked swap forward rates from the nominal OIS forward rates for each maturity.

Change in real forward interest rates
### (percentage points)

■ Change since 1 December 2021

Sources: Bloomberg and Refinitiv.
Notes: Real forward rates are calculated by subtracting the inflation-linked swap forward rates from the nominal OIS forward rates for each maturity. The latest observation is for 27 May 2022.

Net external financing of euro area NFCs based on selected instruments
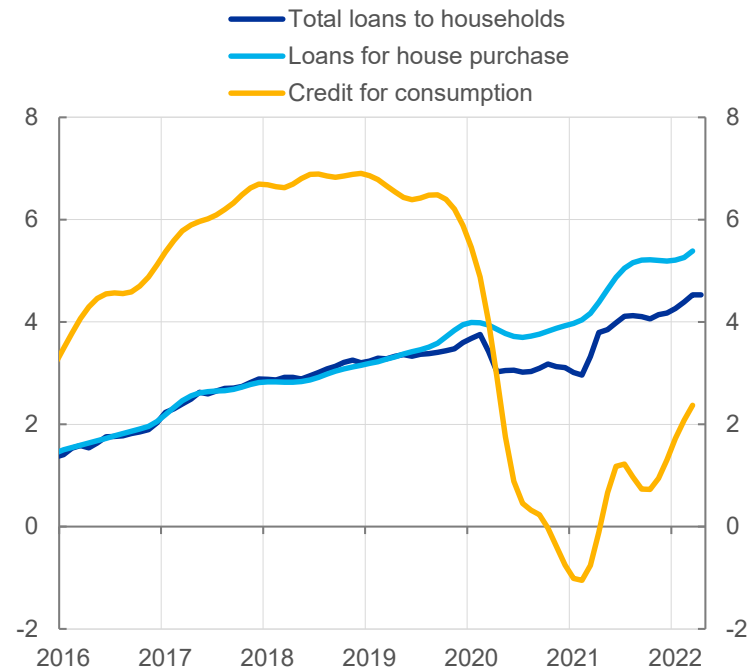### (monthly flows in EUR bn, SA data)
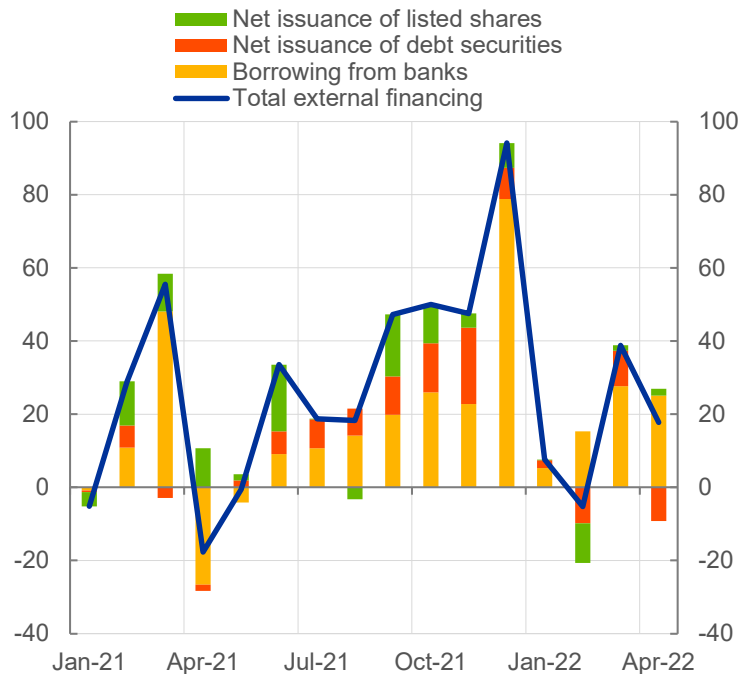
Sources: ECB (BSI, SEC, CSEC) and ECB calculations.
Notes: Net external financing is the sum of MFI loans, net issuance of debt securities and net issuance of listed shares.
Latest observation: April 2022.

MFI loans to households
(annual percentage changes)

Sources: ECB (BSI).
Notes: MFI loans are adjusted for sales, securitisation and cash pooling.
Latest observation: April 2022 for total loans to households; 2022Q1 for the euro area aggregate loans by purpose.

Conclusions

- Monetary policy normalisation appropriate

- Initial steps: clear and robust

- Further steps: state-contingent (gradualism, optionality, flexibility)

- Overall commitment:

    "We stand ready to adjust all of our instruments within our mandate, incorporating flexibility if warranted, to ensure that inflation stabilises at our two per cent target over the medium term."