



EUROPEAN CENTRAL BANK

EUROSYSTEM

Money and inflation

25 September 2023

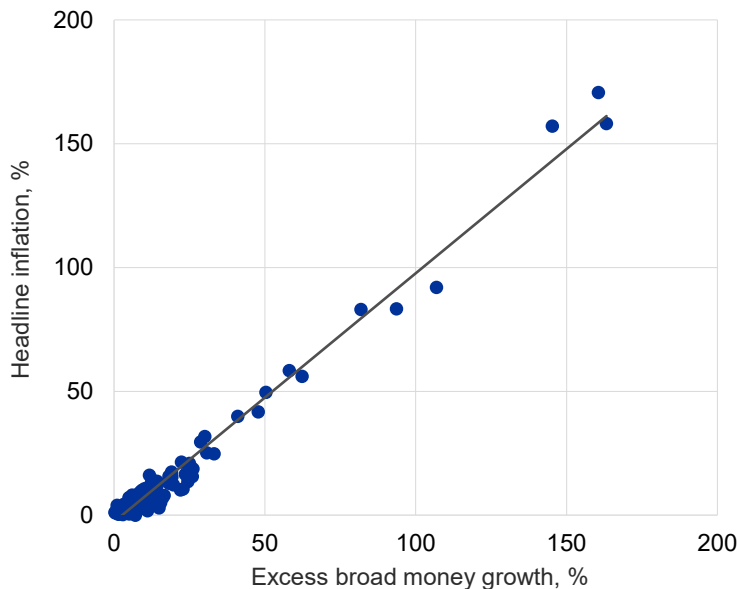
Isabel Schnabel, Member of the Executive Board of the ECB
Thünen Lecture, Verein für Socialpolitik, Regensburg



Long-run relationships seem to support the quantity theory of money

Inflation and excess money growth

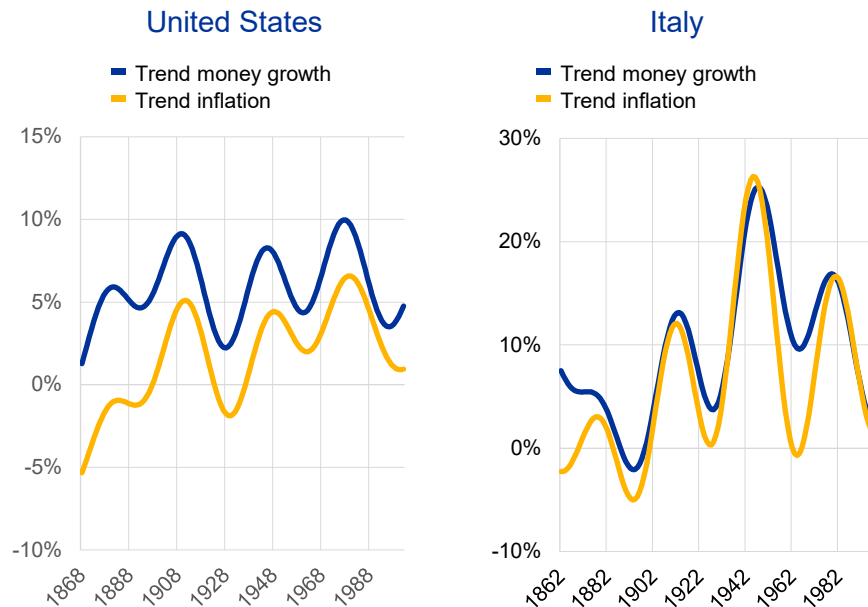
(country-specific non-overlapping 10-year averages)



Source: Borio et al. (2023), "Does money growth help explain the recent inflation surge?", BIS Bulletin No 67. Notes: Country-specific non-overlapping 10-year averages from 1951 to 2021 (subject to data availability). The sample covers: AR, AU, BR, CA, CH, CL, CN, CO, DK, EA, GB, HU, ID, IL, IN, JP, KR, MX, MY, NO, NZ, PE, PH, RU, SA, SE, SG, TH, TR, TW, US and ZA. Broad money is defined following the national broad money definitions (M2 or M3) and money plus quasi-money for PE, backdated with money and quasi-money data to get long series. Excess broad money growth is defined as the difference between the growth in broad money and the growth in real GDP.

Trend money growth and inflation

(percent per year)

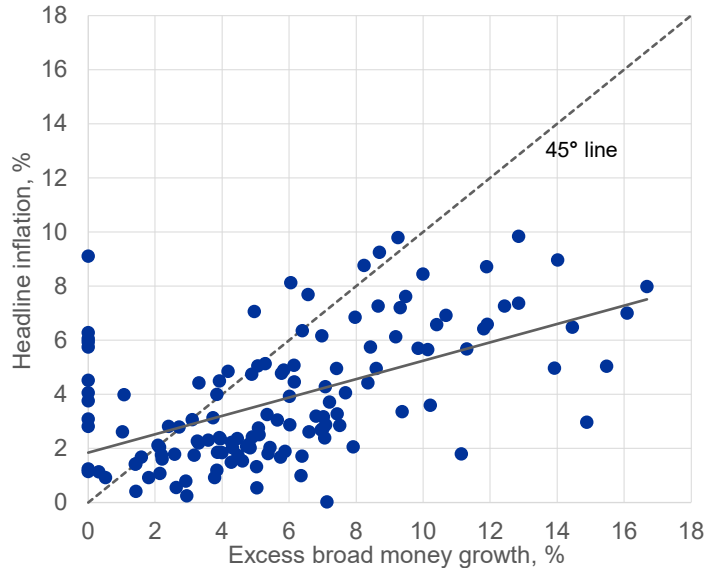


Source: Benati, L. (2021), "Long-Run Evidence on the Quantity Theory of Money", Discussion Paper 21-10, University of Bern.

Notes: The chart shows the low-frequency components (associated with periodicities beyond approximately 30 years) of money growth and inflation extracted via Müller and Watson's methodology. For more details, see Benati (2021).

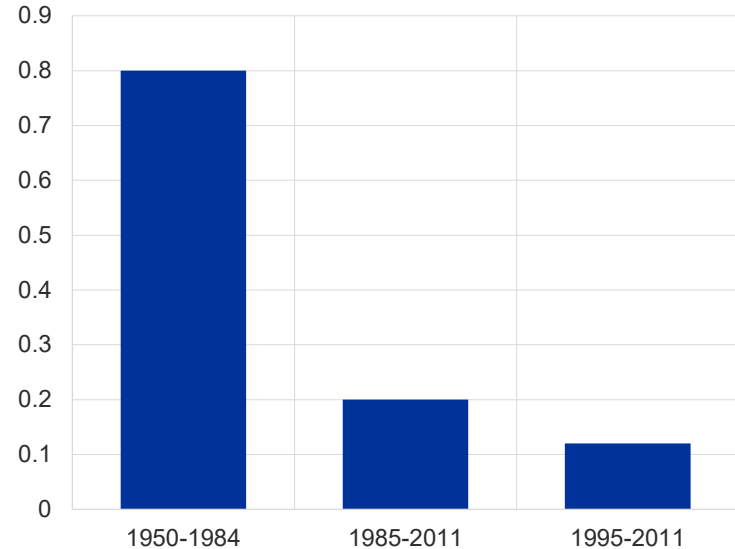
But the money-inflation nexus weakens in countries and periods of low inflation

Inflation and excess money growth: excluding high-inflation countries (country-specific non-overlapping 10-year averages)



Source: Borio et al. (2023), "Does money growth help explain the recent inflation surge?", BIS Bulletin No 67. Notes: Country-specific non-overlapping 10-year averages from 1951 to 2021 (subject to data availability). The sample covers: AU, CA, CH, CL, CN, CO, DK, EA, GB, HU, ID, IL, IN, JP, KR, MX, MY, NO, NZ, PE, PH, RU, SA, SE, SG, TH, TW, US and ZA. Broad money is defined following the national broad money definitions (M2 or M3) and money plus quasi-money for PE, backdated with money and quasi-money data to get long series. Excess broad money growth is defined as the difference between the growth in broad money and the growth in real GDP.

Long-run impact of money growth on inflation across samples (average correlation coefficients)

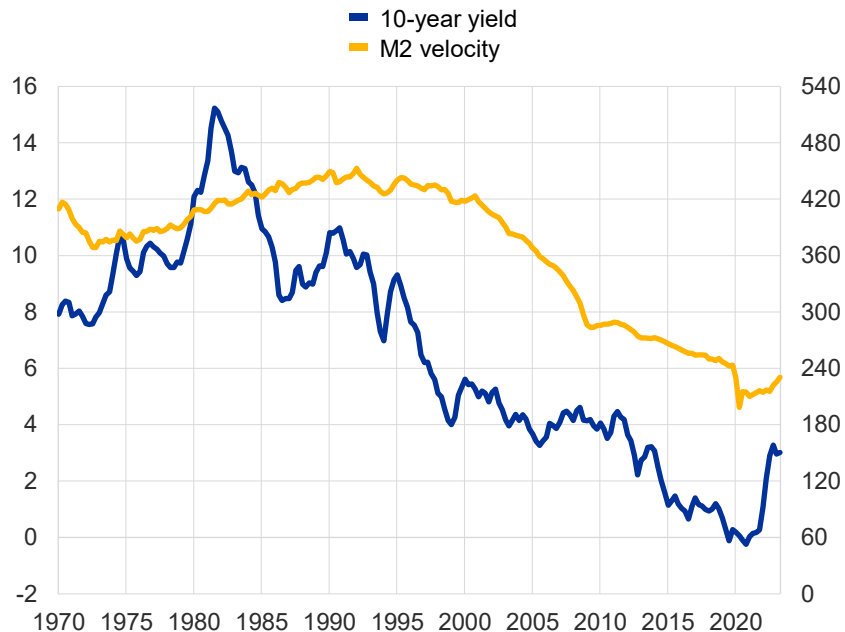


Source: Gertler, P. and Hofmann, B. (2018), "Monetary facts revisited", Journal of International Money and Finance, Vol 86, pp 154–70.

Declining interest rates and lower inflation volatility made identification more difficult

Euro area 10-year GDP-weighted bond yield and M2 velocity

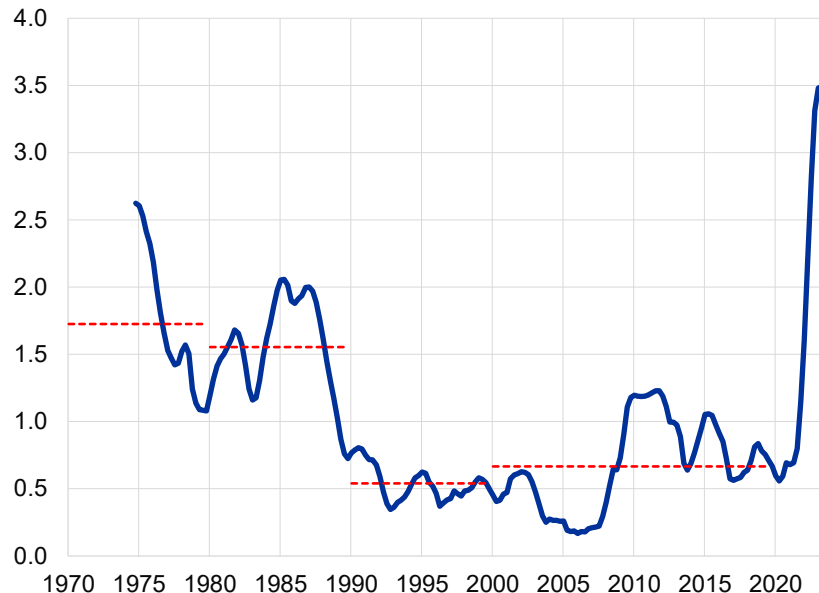
(lhs:% per annum; rhs: ratio nominal GDP / M2)



Sources: Eurostat and ECB calculations.
Latest observation: 2023 Q2.

Volatility of euro area HICP inflation

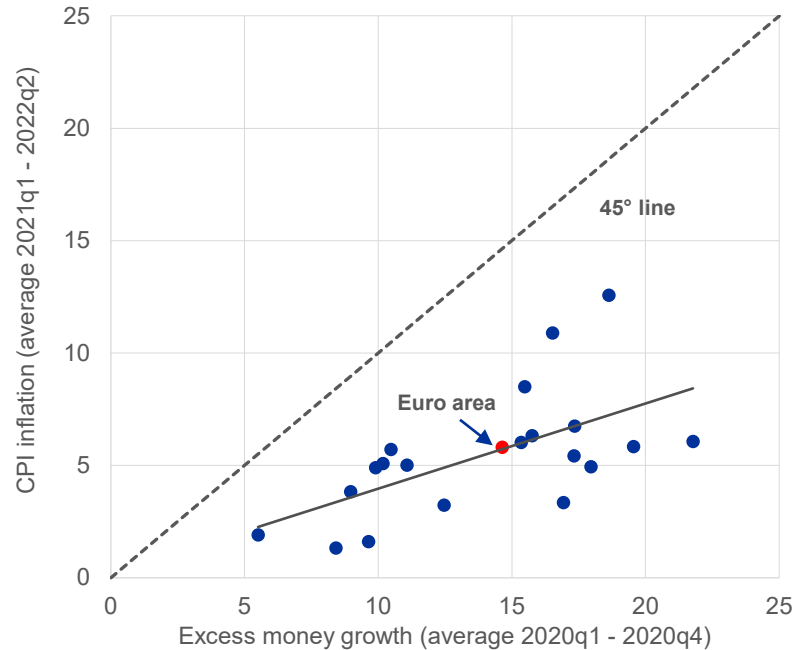
(standard deviation of y-o-y inflation)



Source: Eurostat.
Note: Standard deviation over preceding 16 quarters. Dashed lines denote averages over the periods 1970-1979, 1980-1989, 1990-1999 and 2000-2019.
Latest observation: 2023 Q2.

Post-pandemic inflation surge was positively correlated with excess money growth

Excess money growth and CPI inflation (% per year)

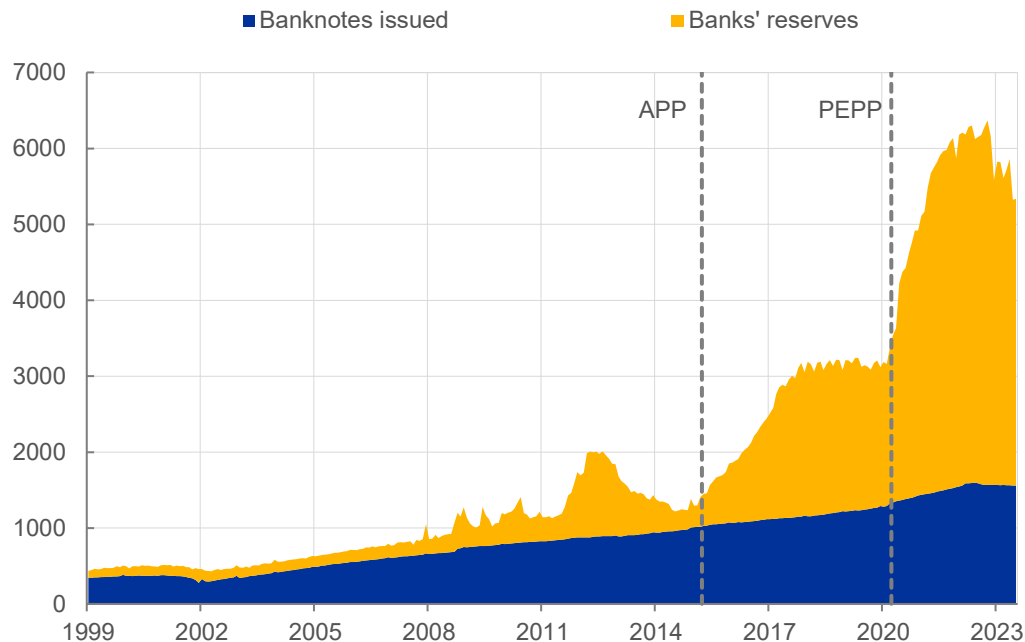


Source: ECB.

Notes: The chart plots excess money growth in 2020 against average CPI inflation between 2021 Q1 and 2022 Q2. Red dot denotes euro area. Countries included are Australia, Canada, Chile, China, Denmark, Euro area, Hungary, India, Indonesia, Israel, Japan, Korea, Mexico, New Zealand, Norway, Poland, South Africa, Sweden, Switzerland, U.K. and U.S.

Asset purchases and TLTROs resulted in a sharp increase in base money

Base money (EUR billion)



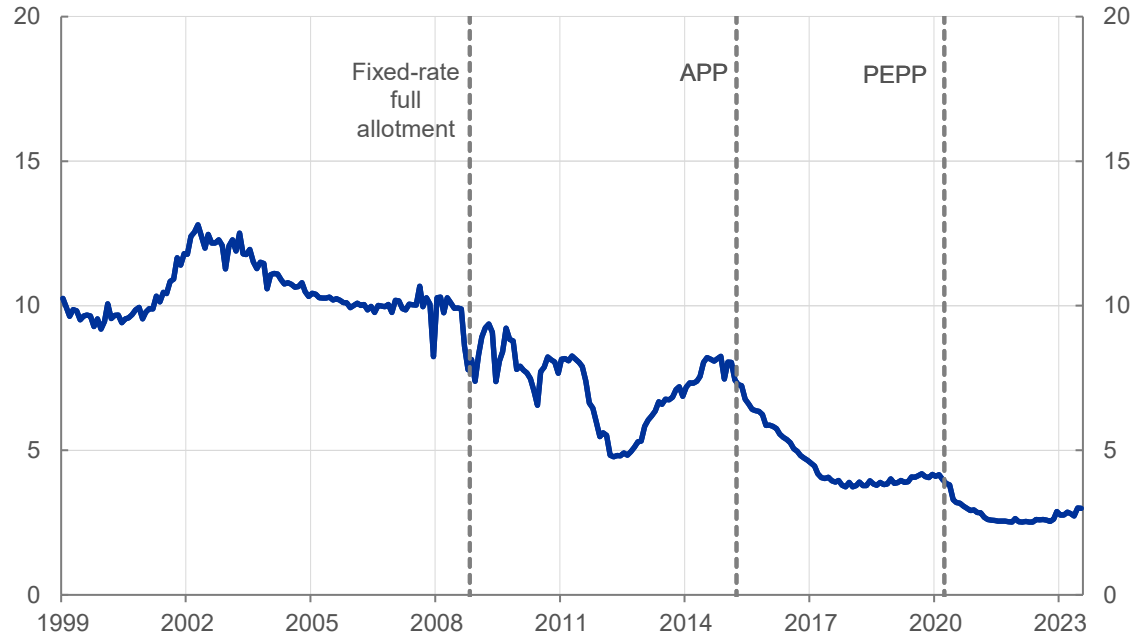
Source: ECB.

Notes: Base money consists of banknotes in circulation, the deposits that credit institutions are required to hold in their current accounts with the Eurosystem in order to cover the minimum reserve requirement (required central bank reserves) and credit institutions' holdings of highly liquid deposits with the Eurosystem over and beyond the level of required central bank reserves (excess central bank reserves and recourse to the deposit facility). Banks' reserves are all deposits held by euro area banks with the Eurosystem. Starting date for the APP is March 2015 and for the PEPP March 2020. The first series of TLTROs started in June 2014, TLTRO II in March 2016 and TLTRO III in March 2019.

Latest observation: July 2023.

Money multiplier fell as impact of QE on broad money was weaker than on base money

Money multiplier: M3/ M0 (ratio)



Sources: ECB and ECB calculations.

Notes: The money multiplier is defined as the ratio between the seasonally-adjusted stock of M3 and base money. Starting date for fixed rate full allotment is October 2008, March 2015 for APP and March 2020 for PEPP.

Latest observation: July 2023.

Relationship between broad money growth and inflation is highly state-dependent

M3

(annual percentage changes)



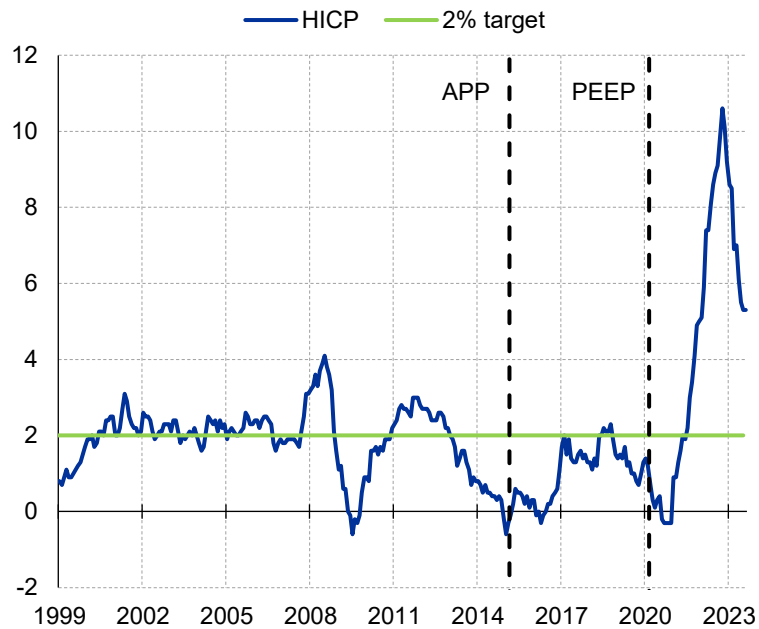
Source: ECB.

Notes: Starting date for the APP is March 2015 and March 2020 for the PEPP.

Latest observation: July 2023.

HICP inflation

(annual percentage changes)

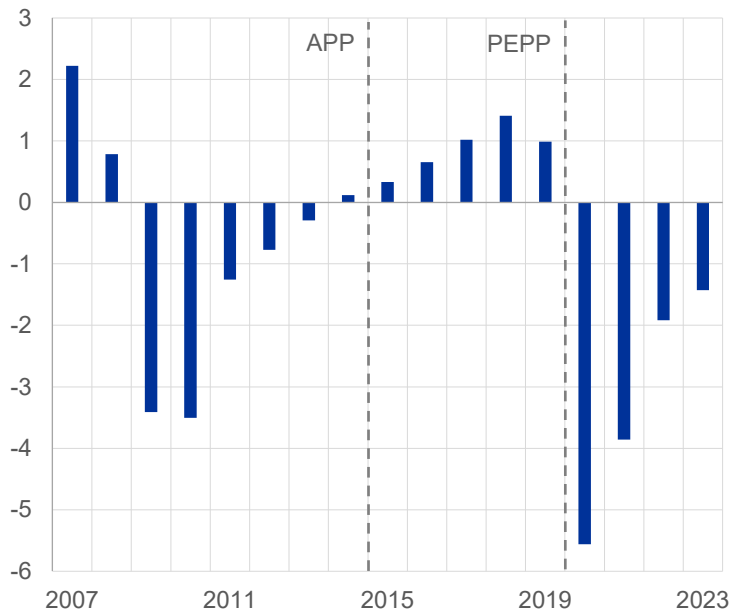


Source: Eurostat.

Latest observation: August 2023.

Need for balance sheet repair after crises muted impact of QE on credit creation

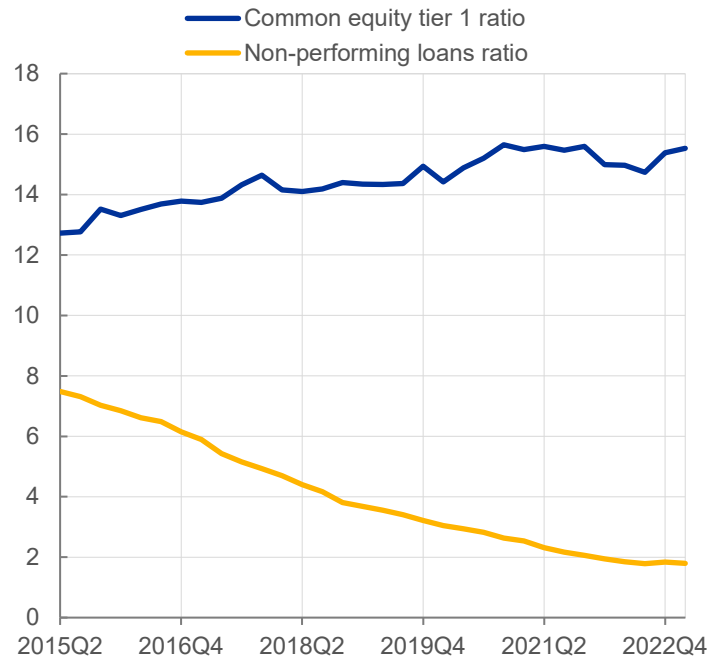
Aggregated euro area primary fiscal balance (% GDP)



Sources: European Commission Ameco Spring 2023.

Note: Grey vertical lines denote the start of the year in which the programmes began.
Latest observation: 2023.

Common equity tier 1 and non-performing loans ratios (%)



Source: ECB Supervisory Reporting.

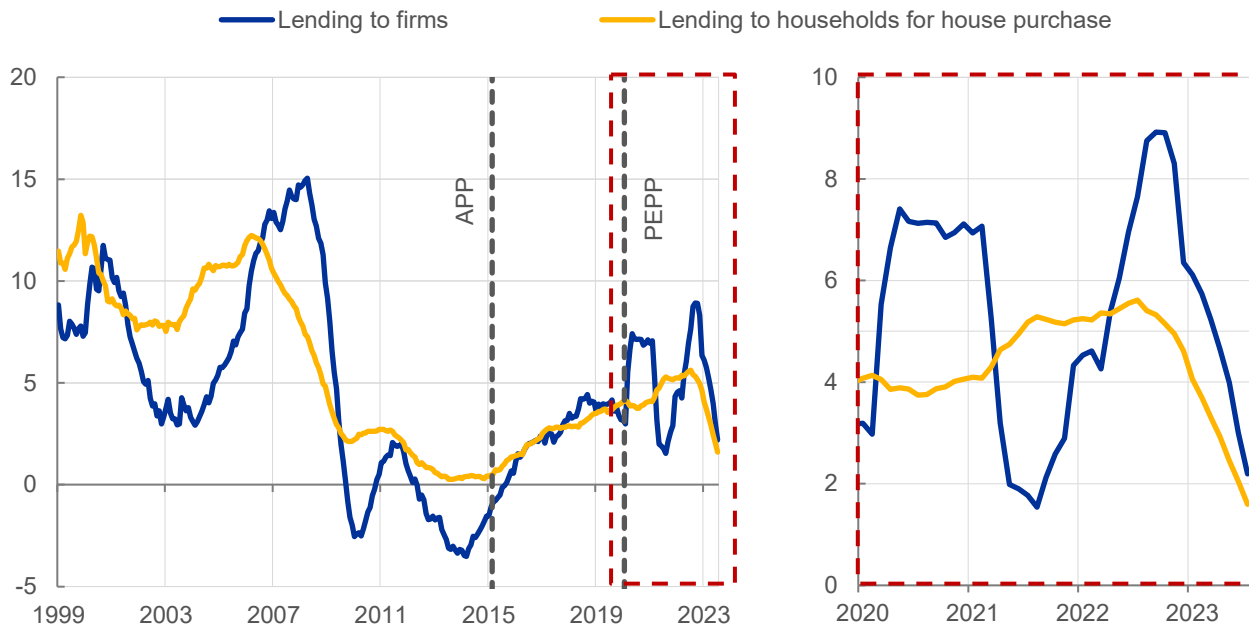
Notes: The sample consists of significant institutions under the supervision of the ECB.

Latest observation: 2023 Q1.

Credit expansion in the pandemic went well beyond the “dash for cash”

Bank lending growth

(annual percentage changes)



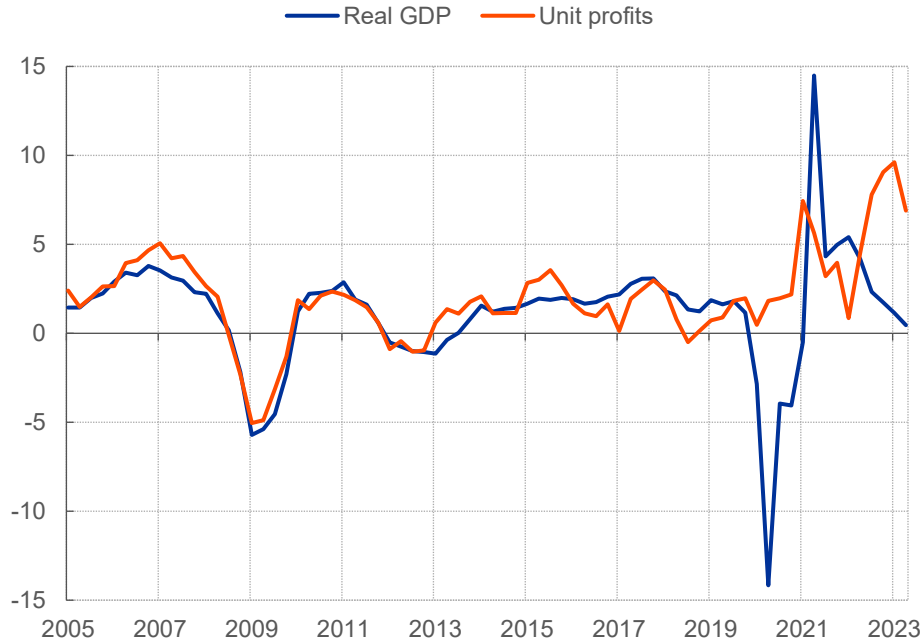
Sources: ECB and ECB calculations.

Notes: MFI loans are adjusted for sales, securitisation (and also cash pooling activities for firms) since 2004. Before January 2023, the adjustment for loans to households for house purchase is that of the entire household sector. Starting date for the APP is March 2015 and March 2020 for the PEPP.

Latest observation: July 2023.

Profit margins have recently become an amplifier rather than a shock absorber

Real GDP and unit profits (annual percentage changes)

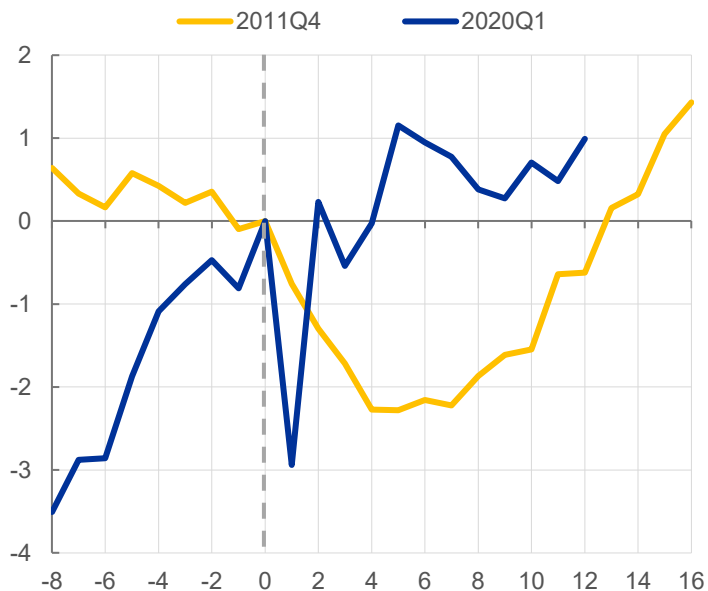


Source: Eurostat, ECB calculations.
Latest observation: 2023Q2.

Resilience of real disposable income during pandemic and energy crisis

Real disposable income around the euro area sovereign debt crisis and the COVID-19 pandemic

(deviations from t=0)

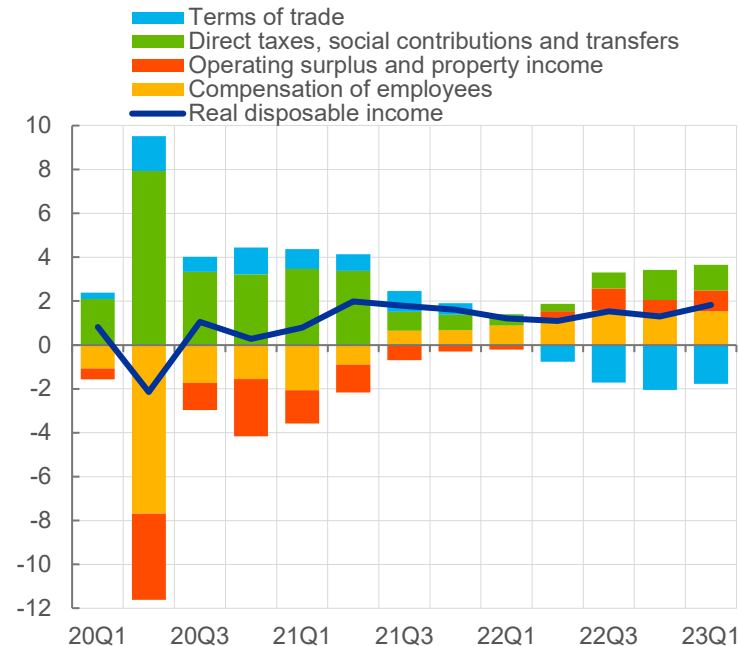


Sources: Eurostat and ECB calculations.

Notes: 2011 Q4 corresponds to the intensification of the euro area sovereign debt crisis. 2020 Q1 corresponds to the outbreak of the pandemic and the subsequent inflation shock.

Drivers of real disposable income

(index: Q4 2019 = 0, percentages and percentage point contributions)



Sources: Eurostat and ECB calculations.

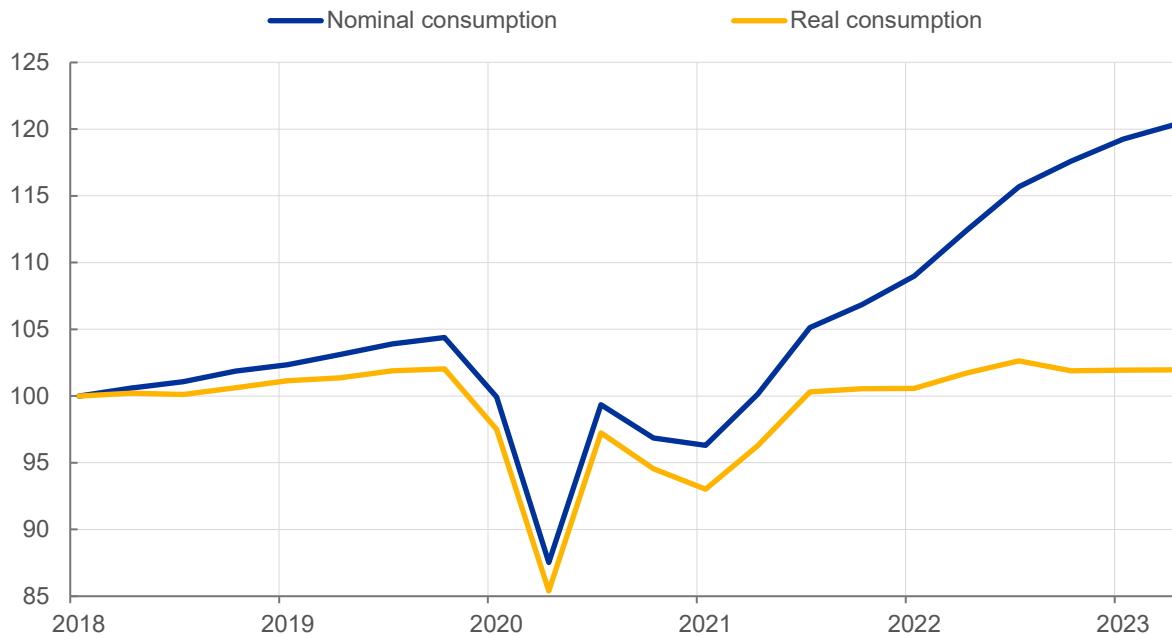
Notes: Disposable income is deflated with the private consumption deflator, whereas its components are deflated with the GDP deflator. "Terms of trade" are calculated as the ratio of GDP to the private consumption deflators. For more details, see [De Santis and Stoevsky \(2023\)](#).

Latest observations: Q1 2023.

Households managed to maintain their pre-crisis real consumption expenditures

Nominal and real consumption expenditures by households

(index: 2018 Q1 = 100)

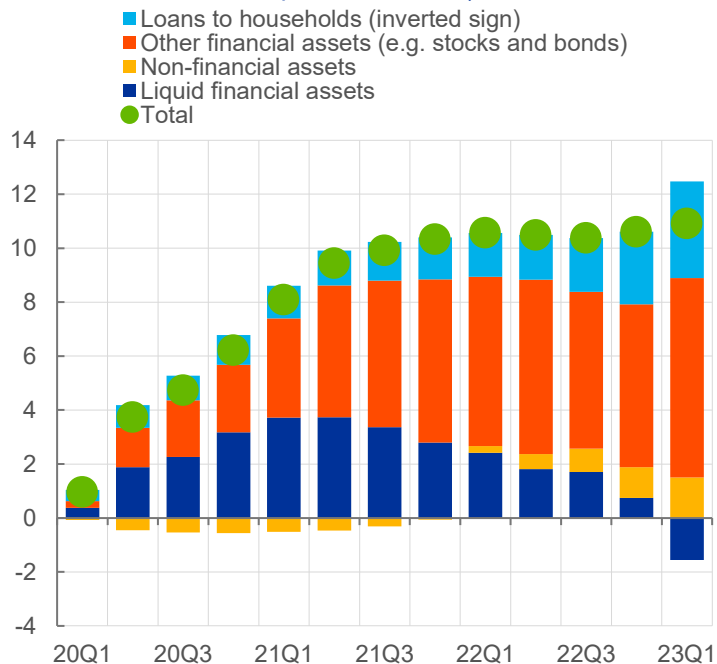


Sources: Eurostat, ECB calculations.
Latest observation: 2023 Q2.

Fiscal stimulus resulted in excess savings and strong deposit growth ...

Allocation of cumulated excess savings across assets

(deviations from the pre-pandemic trend; percentages of trend disposable income)

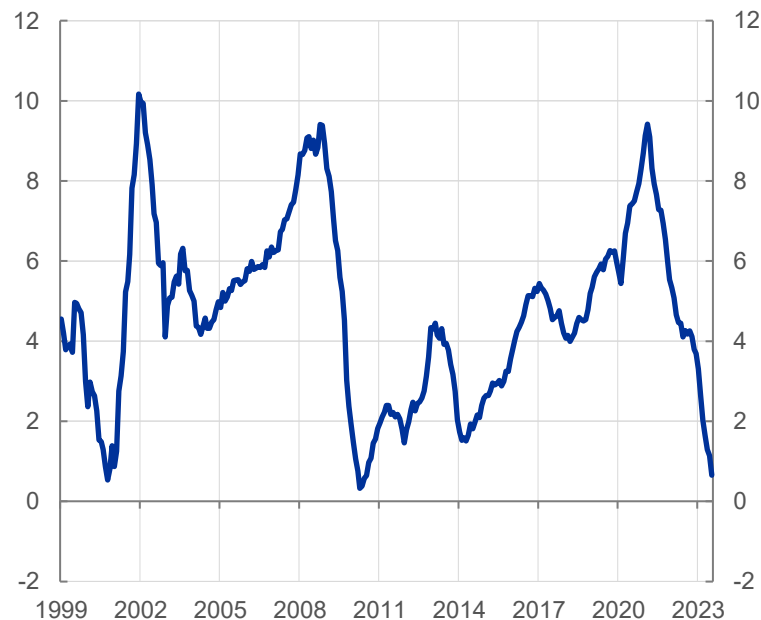


Sources: Eurostat, ECB and ECB calculations.

Notes: Each entry represents the cumulated value exceeding its trend estimated between 2015 and 2019. Liquid financial assets refer to currency and deposits. Non-financial assets refer to gross capital formation. Other financial assets are calculated as a residual and mainly refer to stocks and bonds.

Latest observation: 2023 Q1.

Household M3 deposit growth (annual percentage changes)

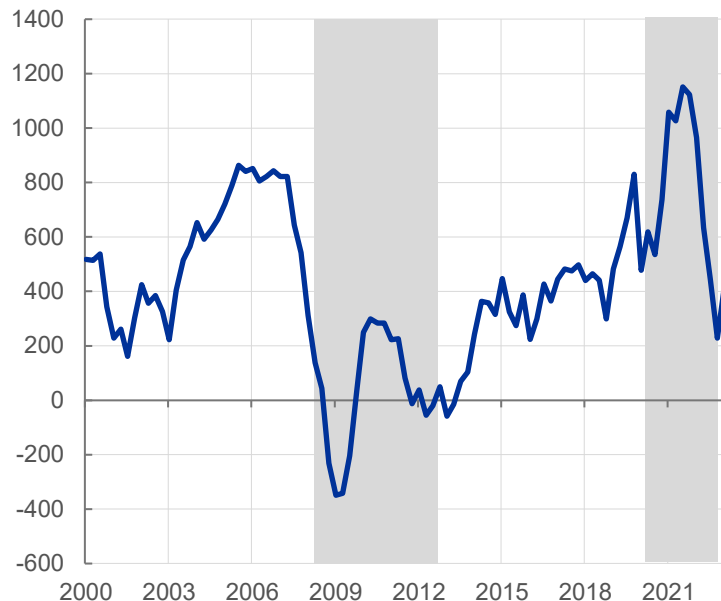


Source: ECB.

Latest observation: July 2023.

... as well as wealth creation, even among low-wealth households

Change in household net worth (EUR billions)

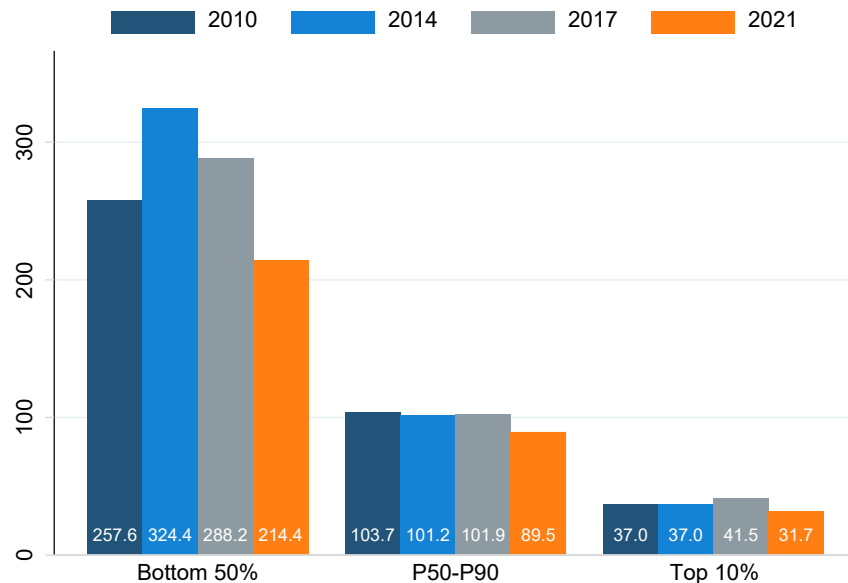


Source: Eurostat.

Latest observation: 2023Q1.

Notes: The shaded area between 2008 and 2013 refers to the global financial crisis and the euro area sovereign debt crisis. The shaded area in 2020 and beyond refers to the pandemic and the energy shock.

Total debt over liquid assets across net wealth distribution (ratio, multiplied by 100)



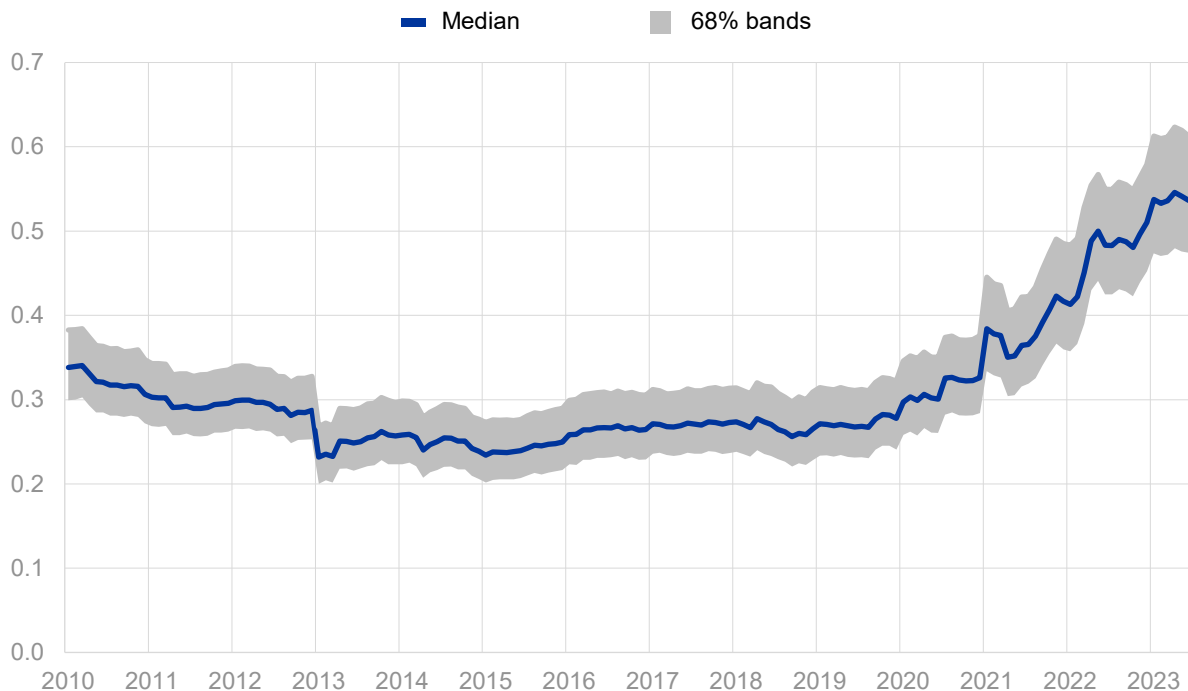
Source: Eurosystem Household Finance and Consumption Survey, 2010-2021.

Notes: The chart shows the ratio of total debt (mortgage and non-mortgage) over total liquid assets. Total liquid assets consist of deposits, mutual funds, bonds and stocks. The ratio is shown for three groups of households sorted by net wealth: lower half of the distribution, percentiles 50 to 90 and the top 10%. The chart illustrates that for households in bottom half the ratio decreased more substantially between 2017 and 2021 than for the other groups of households.

Common factors explain larger share of variation in inflation

Connectedness among HICP items

(share of variance, ten-year rolling window)



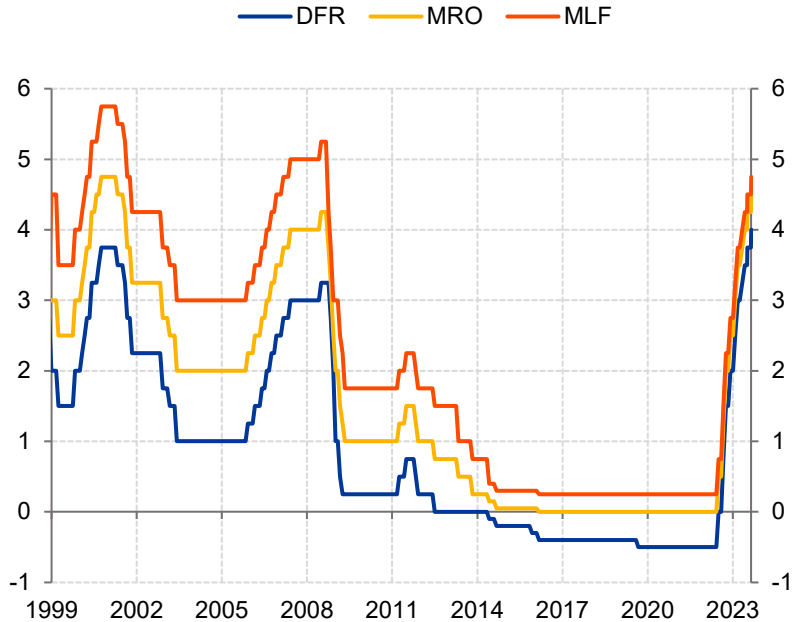
Source: ECB staff calculations.

Note: The connectedness index is based on the methodology of Diebold and Yilmaz (2014) for thirteen HICP items at zero forecasting horizon (contemporaneous). It measures how shocks or disturbances associated to a particular item affect the remaining components of the HICP.

Latest observation: July 2023.

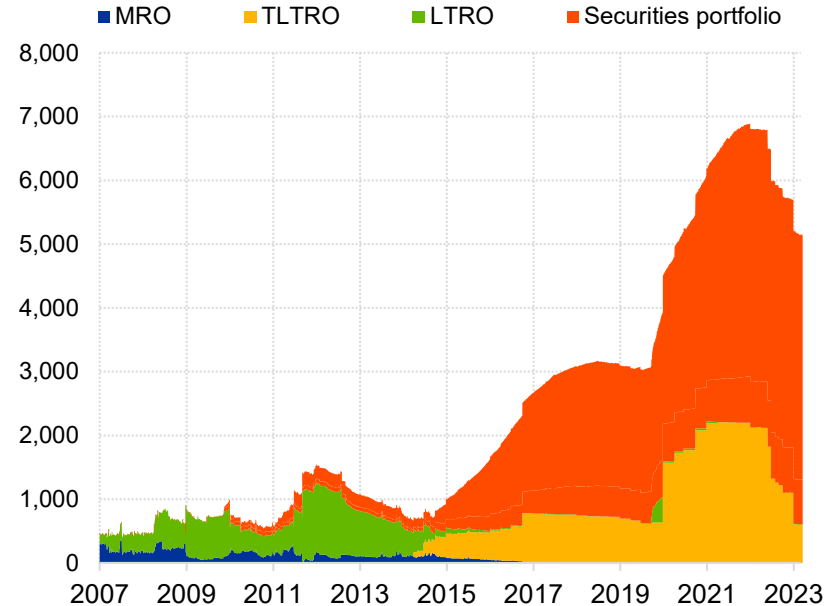
Sharp tightening in monetary policy was needed to break inflation dynamics

ECB key interest rates (%)



Source: ECB.
Latest observation: 20 September 2023.

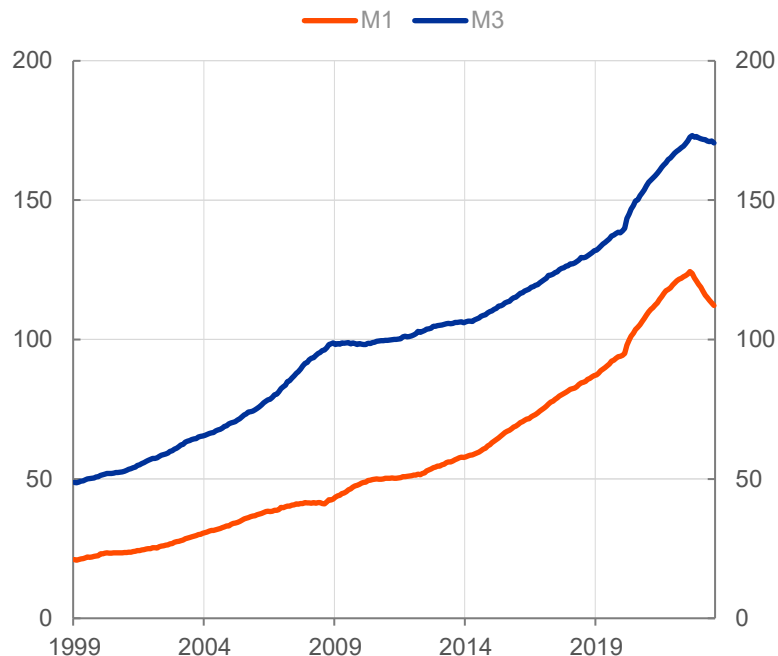
Eurosystem total assets (€ billion)



Source: ECB.
Latest observation: 20 September 2023.

Negative money growth is currently not a reliable recession indicator

M1 and M3 (index of notional stocks)

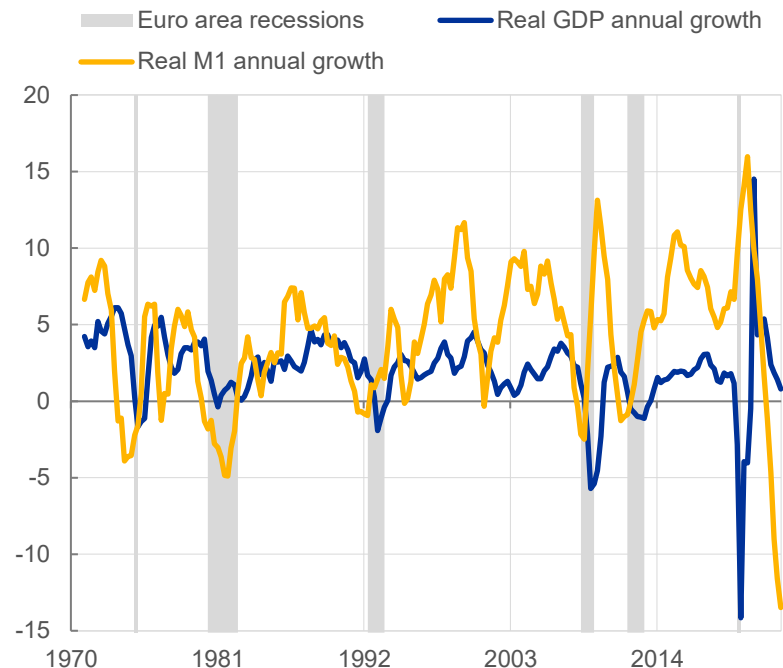


Source: ECB.

Notes: M3 index is 100 in Dec 2010; M1 index rebased to fit the actual M1-to-M3 proportion in Dec 2010.

Latest observation: July 2023.

Real M1, real GDP and euro area recessions (annual percentage changes)



Sources: ECB, CEPR and ECB calculations.

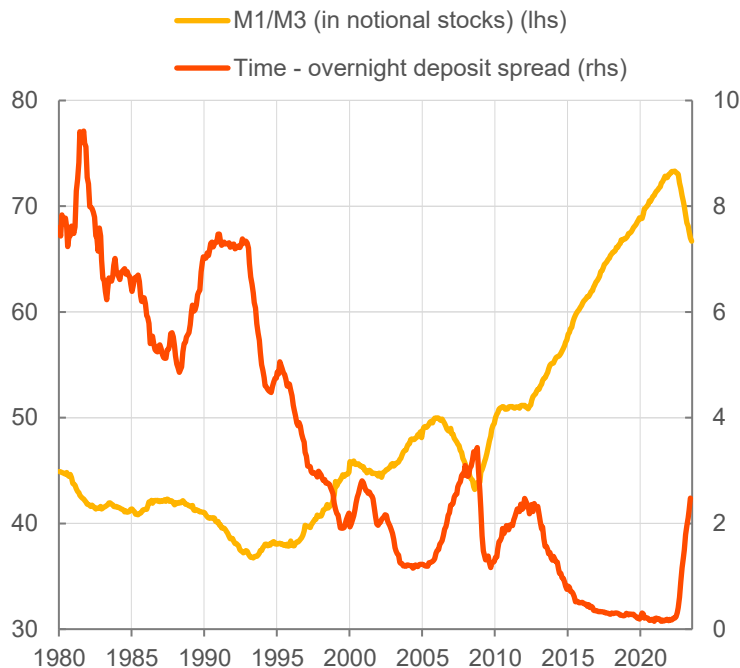
Notes: Real M1 and real GDP obtained by deflating nominal variables with the HICP. Shaded areas delimit recessions as identified by the CEPR Euro Area Business Cycle Dating Committee.

Latest observation: 2023 Q2.

Normalisation of interest rates triggered a rebalancing of portfolios

M1-to-M3 ratio and deposit spread

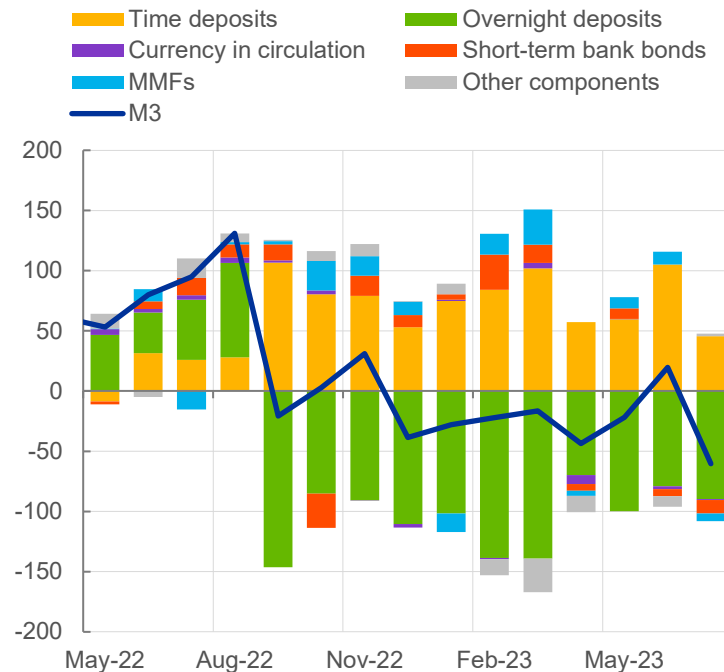
(lhs: ratio; rhs: percentage points)



Sources: ECB and ECB calculations.
 Latest observation: July 2023.

Reallocation within M3 components

(seasonally adjusted monthly flows in EUR billion)



Sources: ECB and ECB calculations.
 Notes: Time deposits are those with a maturity of up to two years. "Other components" consist of deposits redeemable at notice of up to three months and repurchase agreements.
 Latest observation: July 2023.

Thank you very much for your attention!