SPEECH

Striking the right balance: the ECB's balance sheet and its implications for monetary policy

Speech by Piero Cipollone, Member of the Executive Board of the ECB, at an MNI Connect webcast

Frankfurt am Main, 18 February 2025

Today I would like to discuss the ECB's balance sheet and its implications for our monetary policy.

In recent years, the monetary policy debate has mainly focused on our interest rate decisions. This is for good reason. In response to the biggest inflation shock in a generation, we embarked on the fastest tightening of monetary policy in the ECB's history through rate hikes.

During this tightening phase, we used policy rates as the primary tool for setting our monetary policy stance, while normalising our balance sheet in a measured and predictable way. We initiated the gradual unwinding of our asset purchase programmes and recalibrated our targeted longer-term refinancing operations (TLTROs).[1] As a result, the size of our balance sheet has fallen by more than a quarter from its peak.

Policy rates remain our primary instrument and will therefore continue to attract the most attention. But we should not underestimate the important role that our balance sheet policies have played over time as a component of our overall monetary policy stance and in ensuring the smooth transmission of our monetary policy to the real economy. This still holds true today as we make our monetary policy less restrictive.

Inflation has now fallen substantially to levels close to 2%. Our latest projections foresee it converging towards our target over the medium term, and the risks to the inflation outlook – once sharply skewed to the upside – have now become more balanced.

At the same time, the euro area's economic recovery remains weak – especially in the near term. The risks to the growth outlook are tilted to the downside and, if they materialise, may derail the recovery, with implications for the inflation outlook.

Against this background, the Governing Council has gradually been reducing the degree of monetary policy restriction by cutting policy rates towards neutral territory. While our direction is clear, we are very attentive to incoming information in view of the prevailing uncertainty about the economic environment. We continue to make decisions on a meeting-by-meeting and data-dependent basis. This gives us the option to adapt our interest rate path if necessary to ensure that inflation stabilises sustainably at our 2% medium-term target.

However, given the importance of financial conditions in determining the inflation outlook, we also need to consider the role played by the reduction of our balance sheet. In the tightening phase our rate decisions and balance sheet policies complemented each other, but they are now going in opposing directions.

This divergence has important implications across at least two dimensions.

First, it contributes to a steepening of the yield curve. Our rate cuts exert downward pressure primarily at the short end of the yield curve. At the same time, the gradual runoff of our asset purchase portfolios exerts upward pressure on long-term and, to a lesser extent, intermediate yields. This has been compounded by recent spillovers from the US.[2]

Second, it may affect credit supply. Declining levels of central bank liquidity could constrain banks' ability to extend credit, resulting in tighter credit conditions and potentially slowing down the investment and consumption that are critical for economic recovery.

In setting the policy stance, we therefore need to consider the impact of the overall set of financial conditions resulting from our interest rate and balance sheet policies. In other words, we need to strike the right balance if we are to achieve our inflation aim without an undue negative impact on incomes and employment. A rate cut has a more contained easing effect when the balance sheet is simultaneously reduced. This has implications when discussing the appropriate policy rate path.

We also need to consider the potential risks to the transmission of our monetary policy. In the past, abundant levels of liquidity have acted as a safeguard against spikes in liquidity needs that emerged regardless of where our rates stood. With this in mind, we need to carefully monitor the transition from abundant to less ample excess liquidity, mindful of the potential implications for financial stability.

Today, I would like to take stock of the ECB's experience with balance sheet policies, explaining why they remain a vital part of our monetary policy toolbox. I will then discuss the implications of the ECB's balance sheet for our monetary policy in the current environment.

The ECB's experience with balance sheet policies

At the ECB, balance sheet policies have served a dual purpose over time, allowing us to deliver on our price stability mandate amid exceptionally difficult circumstances.

First, during periods when interest rates approached their effective lower bound and inflation remained below target, the ECB used asset purchases to support an accommodative monetary policy stance.

For instance, the ECB launched its asset purchase programme (APP) in 2015 to stimulate the economy and inflation at a time when deflationary threats loomed large. Asset purchases and the associated provision of central bank liquidity worked in several ways – including through the portfolio rebalancing, exchange rate and credit channels – to generate a significant upward effect on both economic activity and inflation.[3]

Second, balance sheet policies have been pivotal to ensuring the smooth transmission of our monetary policy to the real economy, in both tightening and easing phases.

At times when we were lowering our policy rates, our TLTROs, launched in 2014, provided banks with long-term funding on favourable terms to incentivise them to lend to firms and households. This led to a persistent compression in lending rates and an increase in loan volumes over time.[4]

But balance sheet policies were also instrumental in ensuring the smooth transmission of monetary policy at times when we were increasing our policy rates. The announcement of our Transmission

Protection Instrument (TPI) in 2022 allowed us to embark on the fastest rate hiking cycle in our history without sparking financial fragmentation in the euro area.

Of course, the stance and transmission functions of our balance sheet policies do not operate in isolation. There can be beneficial interactions between the two.

As rates increased, for example, euro area banks had sufficient liquidity to manage any maturity mismatches that arose. This – alongside strengthened regulation and supervision – helped them to emerge unscathed from the market turbulence in March 2023 that saw the collapse of three regional banks in the United States.

The proportionate use of balance sheet policies in an evolving economic landscape

The substantial expansion of the ECB's balance sheet required careful monitoring of potential side effects. That is why the principle of proportionality lies at the core of how we use our balance sheet instruments.[5]

In its 2021 strategy review, the Governing Council assessed that its use of balance sheet measures – alongside negative interest rates and forward guidance – had indeed been proportionate, taking into account any side effects, for instance on inequality and the financial sector.[6]

Some concerns, however, require a more nuanced perspective.

For example, there is little evidence to suggest that excessive risk appetite may be attributable to larger central bank balance sheets. If this were the case, we should have seen less risk-taking in markets as central banks began to withdraw their market footprint.

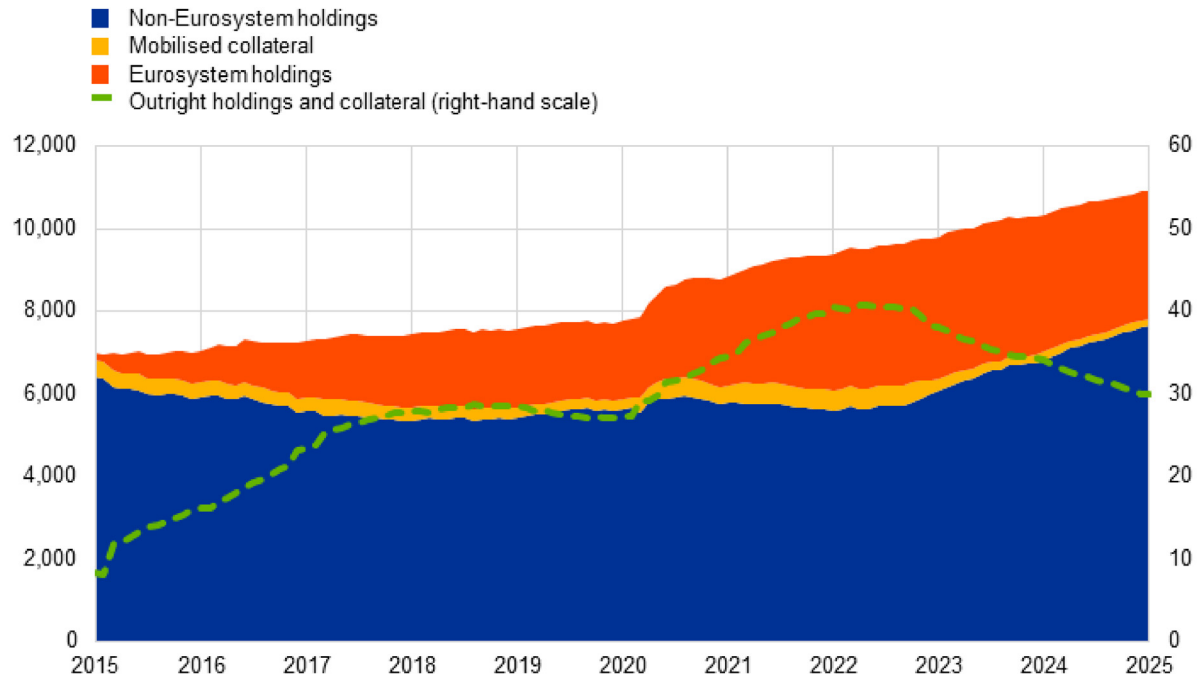
But the opposite has been the case. Today equity markets are near all-time highs. This may be due to "animal spirits"[7], which have also been observed outside periods of central bank balance sheet growth. We saw them at play, for instance, during the dot-com bubble – a period when the cyclically adjusted price-to-earnings ratio hit its historic peak and central bank balance sheets were distinctly lean.

Moreover, as the Eurosystem gradually reduces its footprint in sovereign bond markets by reducing its holdings of euro area government bonds, concerns about the size of the balance sheet are becoming less and less justified (Chart 1).[8]

Chart 1

Size of euro area government bond market and the Eurosystem's market footprint

(left-hand scale: EUR billions; right-hand scale: percentages)



Sources: Eurosystem and Centralised Securities Database.

Notes: The chart shows the evolution of the size of the euro area government bond market and splits it into outright holdings (yellow) and mobilised collateral (green), as well as what is not held or mobilised as collateral with the Eurosystem (blue). The Eurosystem market footprint is a relative measure, computed as the share of the Eurosystem's euro area government bond (EGB) holdings compared with the nominal amount outstanding. Outright holdings are EGBs held by the Eurosystem via purchase programmes, adjusted by EGBs lent back via the securities lending against cash collateral facilities. Mobilised collateral includes EGBs mobilised as collateral for open market operations. The latest observations are for 31 January 2025.

Going forward, an evolving economic landscape suggests that balance sheet policies could be increasingly useful as monetary policy instruments. Let me highlight two developments that are particularly relevant here.

First, the non-bank financial sector has grown considerably over time and is becoming increasingly relevant in the funding of the real economy.

In the euro area, the financial assets of non-banks have more than doubled since the global financial crisis.[9] Compared with banks, non-banks are more responsive to monetary policy measures that influence longer-term interest rates, such as asset purchases.[10] Given that non-banks adjust their portfolios more actively in response to changes in interest rates, this also increases the need for sufficient liquidity in the system to facilitate these adjustments.

Second, geopolitical fragmentation means that the global economy is becoming more shock prone and subject to higher levels of uncertainty (Chart 2).

Chart 2

Global Economic Policy Uncertainty index

Source: Bloomberg.

Note: The latest observation is for December 2024.

In this environment, we need to remember that the euro area is subject to fragmentation risk. A key lesson from the sovereign debt crisis is that balance sheet policies have been instrumental in making the euro area a more “normal” jurisdiction from the perspective of monetary policy.

As we navigate an increasingly complex economic landscape, the transition from abundant to less ample excess liquidity represents an inflection point that also requires close monitoring.

In this environment, banks’ liquidity needs are met via a broad mix of instruments under our new operational framework. These include our short-term main refinancing operations (MROs) and three-month longer-term refinancing operations (LTROs) and will also include – at a later stage – structural longer-term credit operations and a structural portfolio of securities.[11]

However, the decline in excess liquidity warrants careful monitoring, as it could exert additional tightening pressures on financial and financing conditions, potentially exceeding the intended policy stance.

The implications of the ECB’s balance sheet for monetary policy in the current environment

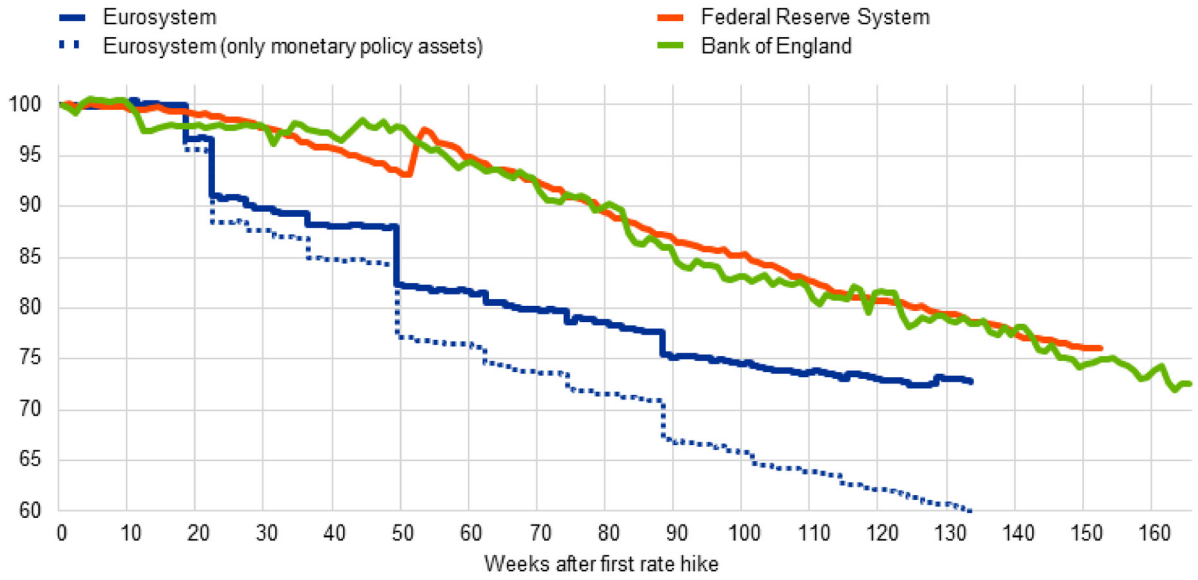
It is in this context that I would like to talk about the implications of our balance sheet for monetary policy in the current environment.

The ECB's balance sheet has been reduced at a faster pace than those of central banks in other major economies during their tightening cycles (Chart 3). So far, much of this decline can be attributed to banks' repayments of TLTRO loans.[12]

Chart 3

Central bank total assets

(index = 100 at the start of the respective policy rate hiking cycles)



Sources: Bloomberg and ECB calculations.

Notes: The x-axis starts on 21 July 2022, 16 March 2022 and 15 December 2021 for the Eurosystem, Federal Reserve System, and Bank of England respectively. For the Bank of England, reserve balances are used as a proxy for the total balance sheet. The latest observations are for 12 February 2025.

Looking ahead, however, any further reduction in the size of our balance sheet will stem from the gradual unwinding of our asset purchase portfolios, as the Eurosystem no longer reinvests the principal payments from maturing securities.

As in the past, the normalisation of our balance sheet has implications for our monetary policy stance and the possible risks to monetary policy transmission.

The monetary policy stance

Let me start with the implications for our monetary policy stance.

Our reaction function for rate decisions is built around three well-known criteria: (i) the inflation outlook, (ii) the dynamics of underlying inflation and (iii) the strength of monetary policy transmission.

Inflation has fallen by around three-quarters from its peak in late 2022 (Chart 4). The disinflation process is well on track, and our staff projections see inflation averaging 2.1% this year, 1.9% next year and 2.1% in 2027.

Chart 4

Headline inflation

(annual percentage changes)

Source: Eurostat.
Note: The latest observation is for January 2025 (flash estimate).

Most measures of underlying inflation suggest that inflation will settle at around our 2% medium-term target on a sustained basis. In particular, the ECB's measure of the persistent and common component of inflation (PCCI)[13] – a more forward-looking indicator of underlying inflationary pressures that tends to better predict future inflation – stood at 2.1% in December, and 2.0% when excluding energy.

Domestic inflation remains high, as wages and prices in certain sectors are still adjusting to the past inflation surge with a substantial delay. But our wage tracker is signalling a significant moderation in wage growth, and profits are partially buffering the impact on inflation.

It is the third leg of our reaction function – the strength of monetary policy transmission – that I would like to discuss in more detail, however.

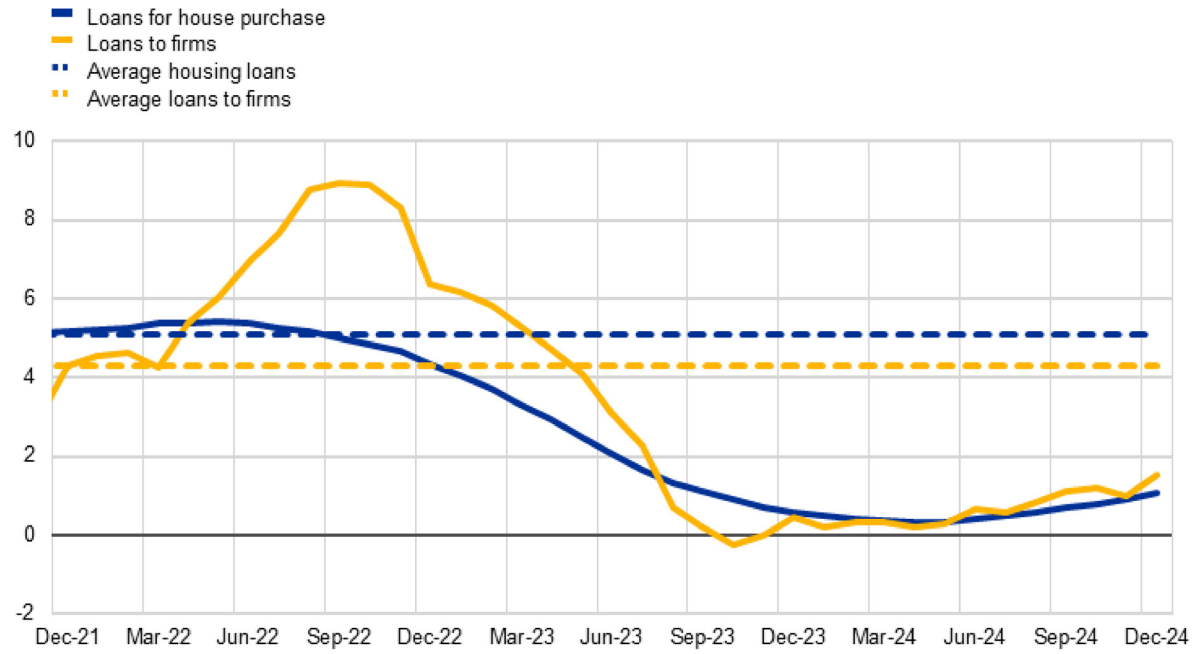
As we cut interest rates, new borrowing for firms and households is becoming less expensive. But financing conditions continue to be tight – in part because our monetary policy remains restrictive and past rate hikes are still working their way through the economy.[14]

While credit continues to expand, lending to firms and households remains subdued by historical standards. In December, the annual growth rate of lending to firms was roughly two-thirds below its historical average.[15] Growth in housing loans increased gradually but also remained muted overall, at around one-fifth of its long-term average (Chart 5).[16]

Chart 5

Loans to firms and households

(percentage points)



Sources: ECB (BSI) and ECB staff calculations.

Note: The latest observations are for December 2024.

At the same time, the recent gradual recovery in lending has not kept pace with the nominal growth of the economy, as reflected in the continued decline of the loan-to-GDP ratio (Chart 6).

Chart 6

Ratio of bank loans to GDP

Sources: ECB (BSI), Eurostat and ECB staff calculations.

Note: The latest observation is for the third quarter of 2024.

While policy rates remain our primary instrument for adjusting our monetary policy stance, the normalisation of our balance sheet may also affect the stance through two key channels.

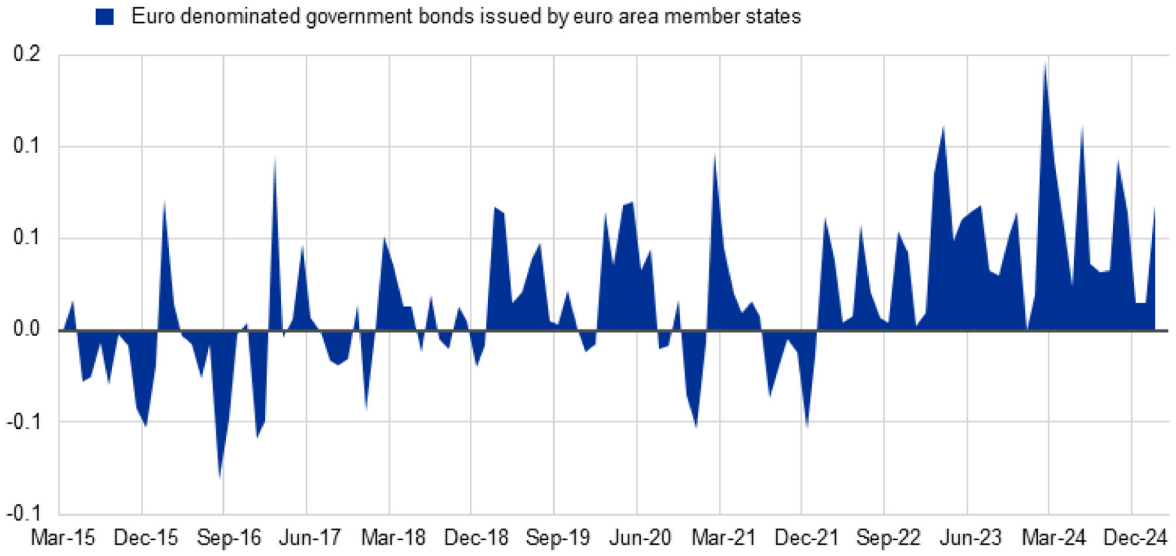
First, while our rate cuts exert downward pressure primarily at the short end of the yield curve, our quantitative tightening exerts upward pressure on long-term maturities and, to a lesser extent, intermediate ones. This serves to tighten financial conditions.[17]

Indeed, the runoff of the asset portfolios of central banks has arguably been one of several factors contributing to a steepening of sovereign yield curves in recent months – akin to a reversal of the duration risk channel previously associated with central banks through quantitative easing (Chart 7).

Chart 7

New duration risk absorbed by private investors

(EUR billions per basis point)



Sources: Bloomberg and ECB.

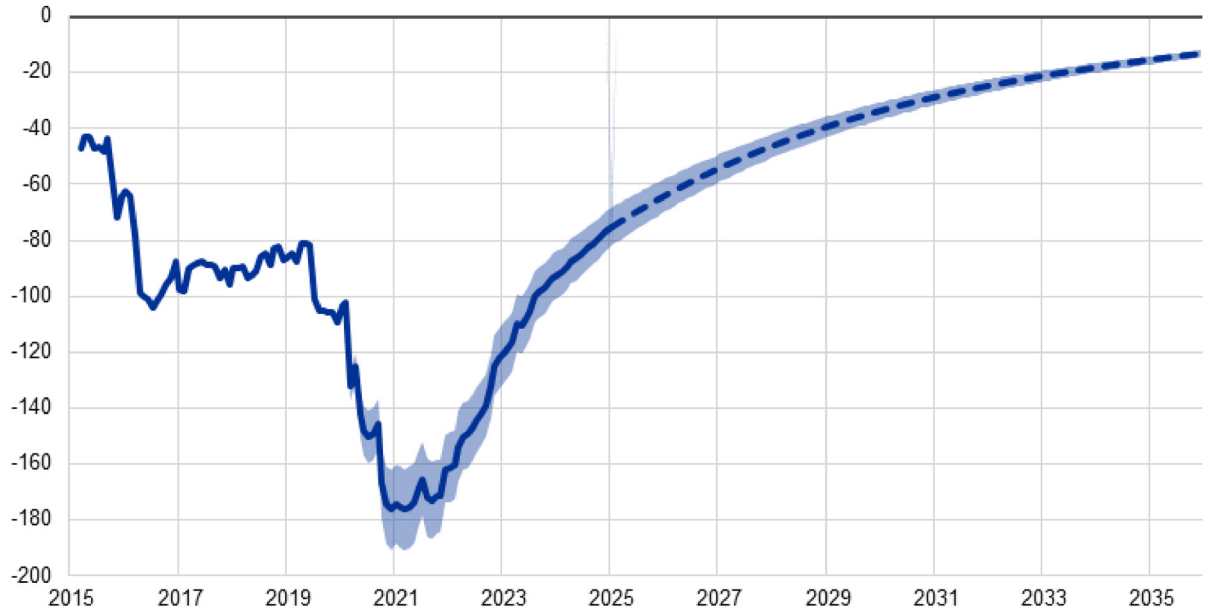
Notes: The chart shows the month-on-month change in the duration of government bonds held by private investors (i.e. investors other than the domestic central bank). Rates are approximated by weighted average maturity.

At its peak in early 2022, the impact of current and expected Eurosystem bond holdings in our asset portfolios lowered ten-year sovereign bond yields by around 175 basis points.[18] Due to quantitative tightening, however, the easing impact has now fallen to around 75 basis points and is expected to further reduce over time (Chart 8).

Chart 8

Impact of APP and PEPP sovereign bond holdings on ten-year sovereign risk premia

(basis points)



Source: ECB calculations.

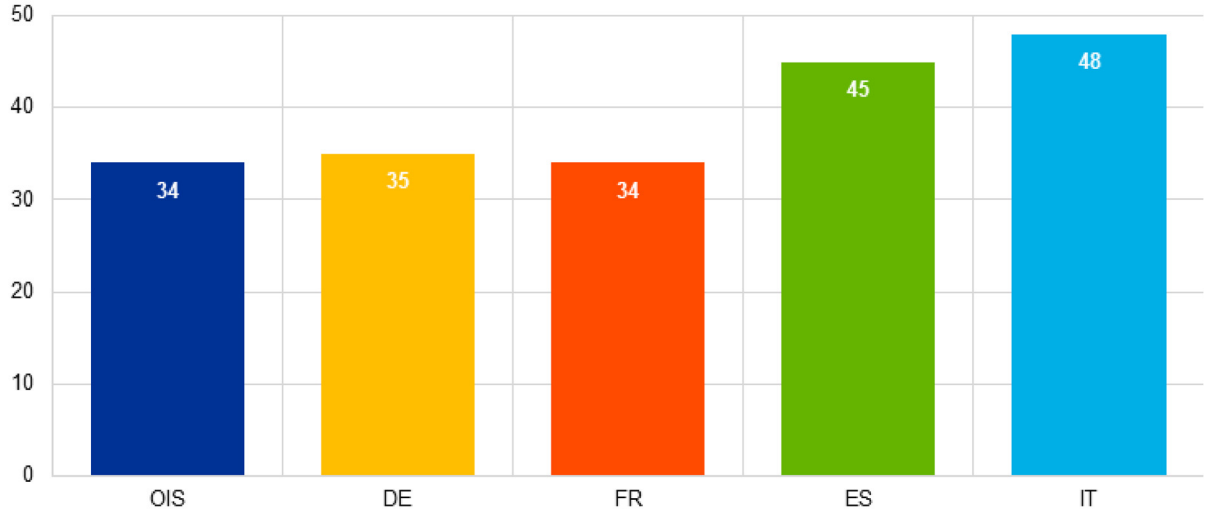
Notes: The impacts are derived from an affine arbitrage-free model of the term structure with a quantity factor (see Eser et al., op. cit.) and an alternative version of the model recalibrated so that the model-implied yield reactions to the March PEPP announcement match the two-day yield changes observed after 18 March 2020. The model results are derived using GDP-weighted averages of the zero-coupon yields of the big-four sovereign issuers (DE, FR, IT and ES). The continuous line represents estimates based on real-time survey expectations. The dashed line is based on projections of the Eurosystem's holdings of big-four sovereign bonds in the APP and PEPP as informed by the ECB's December 2024 Survey of Monetary Analysts. The model abstracts from any potential holdings in a structural portfolio of securities. The latest observations are for January 2025 (monthly data).

According to ECB research, an expected €1 trillion reduction in bond holdings may raise long-term risk-free interest rates by about 35 basis points (Chart 9).[19]

Chart 9

Expected term premium impact from running down the asset portfolio by €1 trillion

(basis points)



Sources: ECB December 2024 Survey of Monetary Analysts (SMA) and Akkaya, Y. et al., op.cit.

Notes: The chart depicts the expected effect on the term premium of various assets with a ten-year maturity resulting from an expected €1 trillion decrease in the ECB's bond holdings. Results are based on individual SMA responses from December 2022 until December 2023.

Second, an environment marked by declining levels of central bank liquidity may constrain banks' ability to extend credit.

Research documents the strong relationship between loan supply and structural sources of liquidity, such as reserves obtained through credit easing programmes or those injected through quantitative easing interventions.

More specifically, a €1 change in non-borrowed reserves or credit easing reserves is associated with a corresponding change in credit of approximately 15 cents or 10 cents respectively.[20] In other words, a €500 billion drop in non-borrowed reserves – similar to the one expected in 2025 as a result of the decline in our APP and PEPP holdings – is associated with a €75 billion decline in credit supply, equivalent to about 0.6 percentage points of downward pressure on loans to the non-financial private sector.[21]

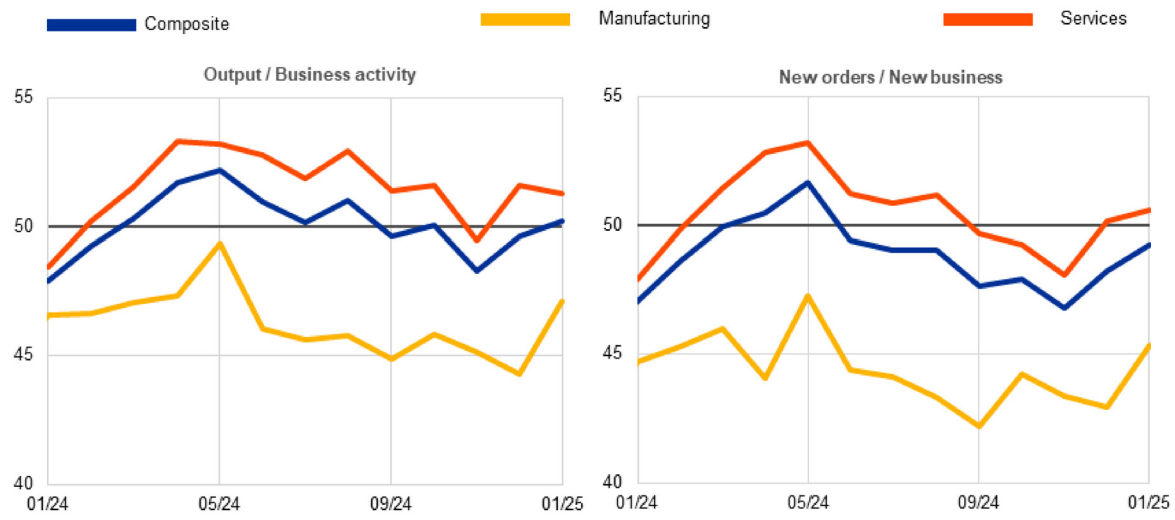
Accordingly, as central bank liquidity declines, we may see tighter credit conditions in the economy. This could slow down investment and consumption, with firms cutting back on capital expenditure and consumers reducing purchases of big-ticket items that require financing.[22]

Incoming data suggest that euro area GDP growth will remain subdued in the short term. Industrial production decreased notably in December and surveys indicate that manufacturing is continuing to contract, whereas services activity is expanding at a moderate pace (Chart 10).

Chart 10

Purchasing Managers' Index

(diffusion indices)



Source: S&P Global.

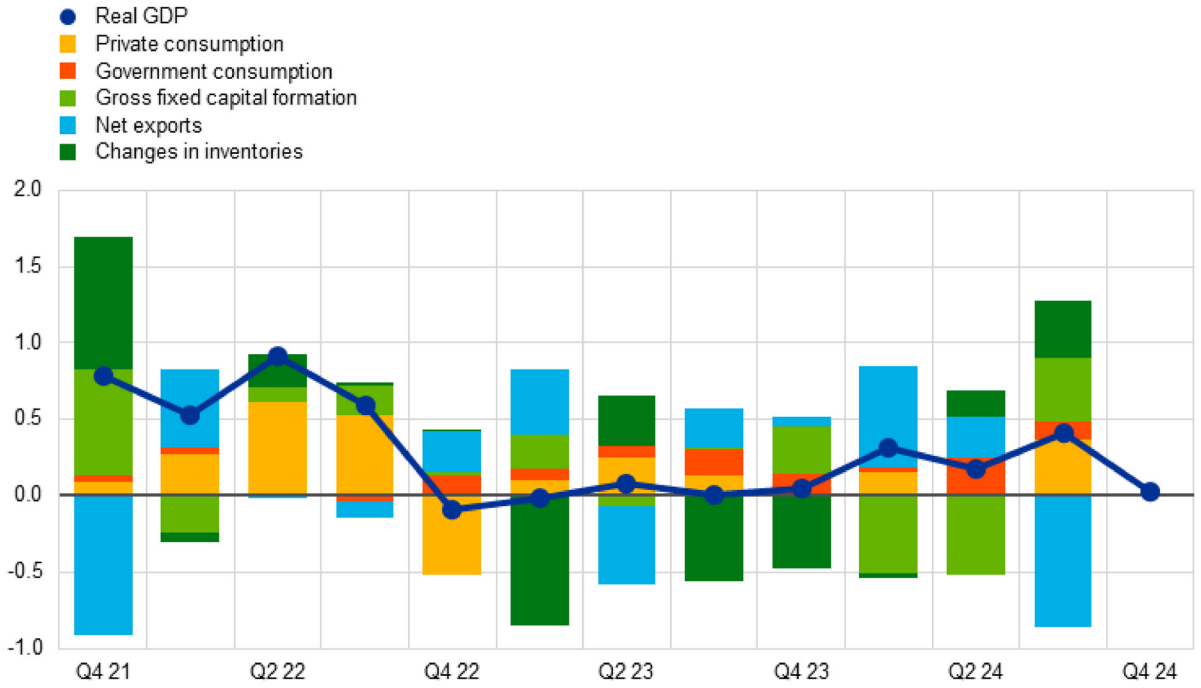
Notes: "Output" and "New orders" correspond to the manufacturing and composite indices, and "Business activity" and "New business" to the services index. The latest observations are for January 2025.

Given the uncertain economic environment, we are yet to see a sustained rebound in investment (Chart 11).[23] And while we continue to expect consumption to be the main driver of the recovery, rising real incomes have not yet encouraged households to increase their spending in a commensurate manner (Chart 12).[24] In the face of subdued domestic demand, our latest staff projections forecast a slower economic recovery than had been forecast in the September projections.[25]

Chart 11

Detailed decomposition of euro area real GDP

(quarter-on-quarter percentage changes and percentage point contributions)



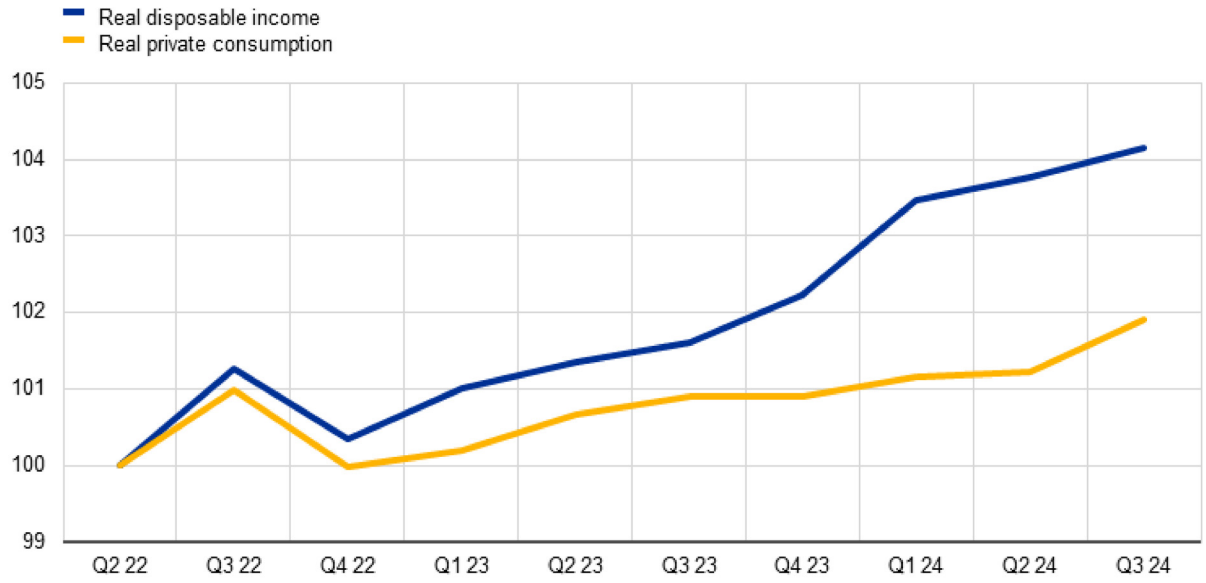
Sources: Eurostat and ECB staff calculations.

Note: The latest observations are for the fourth quarter of 2024 for real GDP, and for the third quarter of 2024 for the other components.

Chart 12

Real household disposable income and consumption

(second quarter of 2022 = 100)



Sources: Eurostat and ECB staff calculations.

Note: The latest observations are for the third quarter of 2024.

Moreover, geopolitical risks may create further headwinds for the recovery, which we will need to monitor carefully. Forthcoming findings from the ECB's Consumer Expectations Survey (CES) suggest that consumers' concerns about geopolitical risks are negatively affecting economic sentiment – leading to more pessimistic expectations, more elevated income uncertainty and, ultimately, a lower propensity to consume.

We are determined to ensure that inflation stabilises sustainably at our 2% medium-term target. As we gradually cut rates towards neutral territory, we need to be mindful of the fact that we now have two monetary policy tools working in opposing directions, given our ongoing quantitative tightening. This is a first in our history at the ECB.

We therefore need to ensure that we factor in the tightening of our balance sheet when calibrating our rate cuts to achieve our inflation aim. This is because the stance effects stemming from our rate cuts will be somewhat dampened by the tightening induced by the normalisation of our balance sheet.

This is an important consideration when discussing the appropriate policy rate path.

Risks to the transmission of our monetary policy

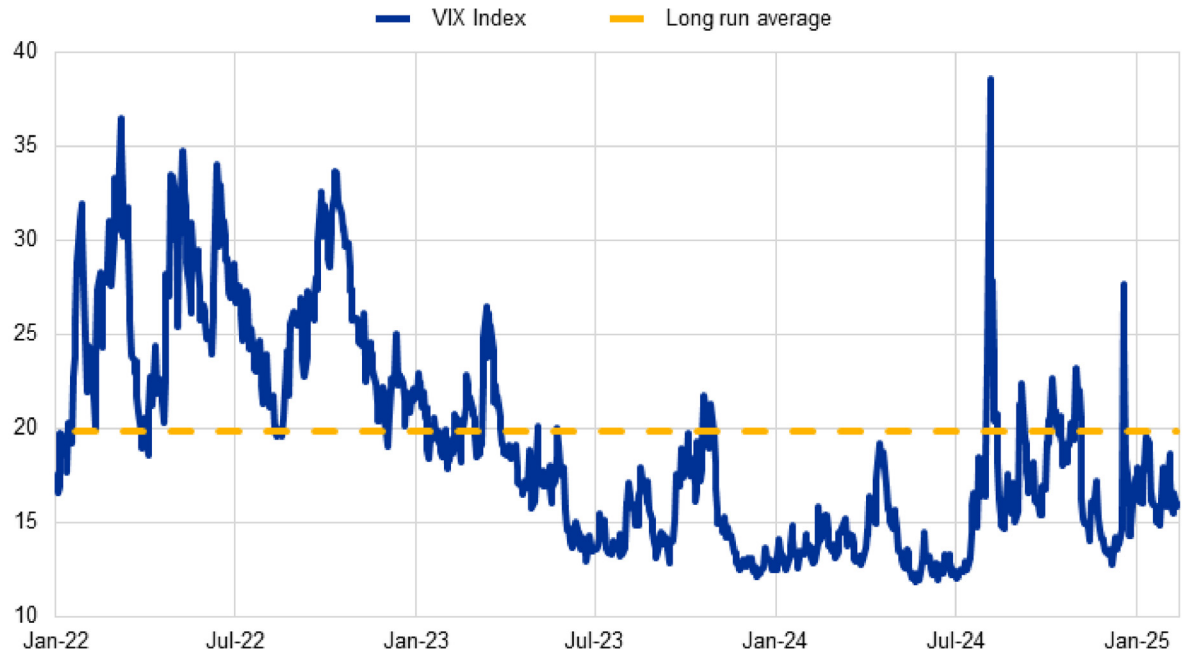
Similarly, we need to be mindful of the possible risks to the transmission of our monetary policy to the real economy in view of the prevailing uncertainty and potential risks to financial stability.

This cautious approach is crucial, especially given historical precedents where central banks faced unexpected challenges.

In late 2019, for instance, the Federal Reserve System was unexpectedly forced to temporarily reverse its balance sheet retrenchment due to liquidity challenges in financial markets.[26] In 2022 the Bank of England halted quantitative tightening and launched emergency gilt purchases to safeguard financial stability after pension funds' liability-driven investment strategies exposed systemic risks.[27] Recent bouts of market volatility also underscore that we should remain alert to the emergence of financial stability risks that may endanger transmission. Last August several factors converged to spark substantial market volatility.[28] The VIX, a market index that measures the implied volatility of the S&P 500 index, recorded its largest ever one-day spike (Chart 13).[29]

Chart 13
VIX index

(percentages)



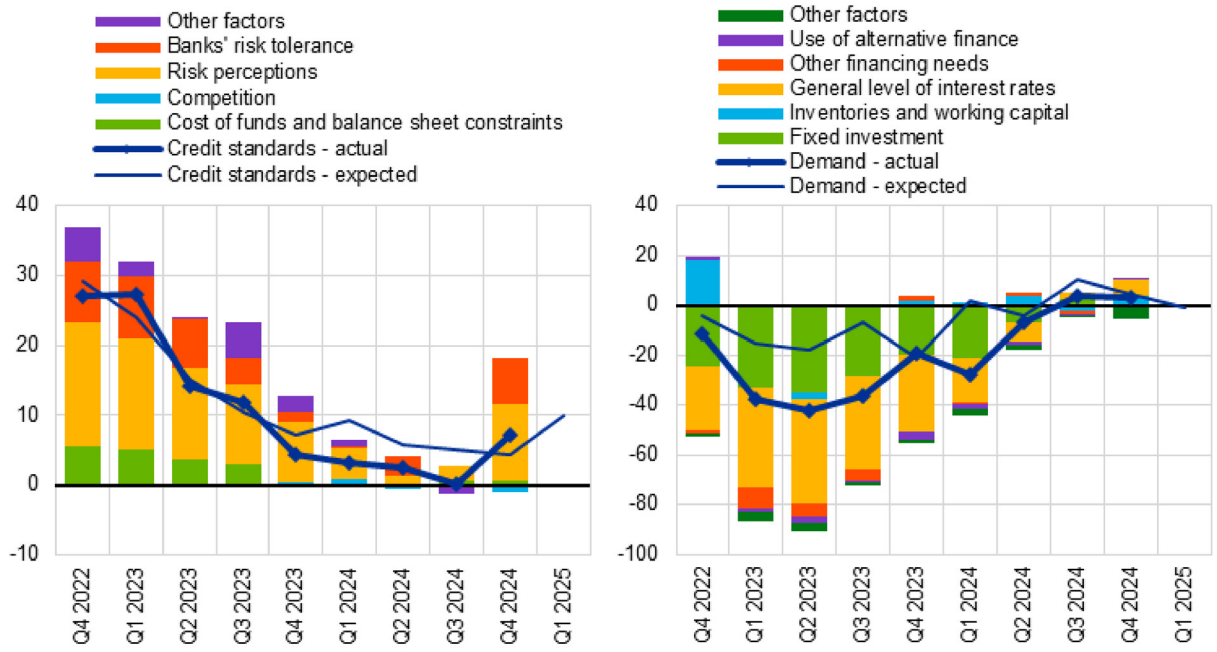
Source: ECB staff calculations.
Notes: Long run average calculated since January 2000. The latest observations are for 7 February 2025.

Faced with such episodes of volatility, the further decline in our balance sheet must remain on a gradual and predictable path to avoid financial amplification effects.[30] This is especially important in an environment where euro area banks are already tightening their credit standards, especially for firms and consumer credit, due to higher perceived risks related to the economic outlook (Chart 14).[31]

Chart 14

Credit standards, demand for loans to firms and contributing factors

(net percentages)



Source: ECB (bank lending survey).

Notes: “Actual” values are changes that have occurred, while “expected” values are changes anticipated by banks. Net percentages for the questions on credit standards for loans are defined as the difference between the sum of the percentages of banks responding “tightened considerably” and “tightened somewhat” and the sum of the percentages of banks responding “eased somewhat” and “eased considerably”. Net percentages for the questions on demand for loans are defined as the difference between the sum of the percentages of banks responding “increased considerably” and “increased somewhat” and the sum of the percentages of banks responding “decreased somewhat” and “decreased considerably”. “Other financing needs” as unweighted average of “M&A and corporate restructuring” and “debt refinancing/restructuring and renegotiation”; “Use of alternative finance” as unweighted average of “internal financing”, “loans from other banks”, “loans from non-banks”, “issuance/redemption of debt securities” and “issuance/redemption of equity”. The net percentages for “Other factors” refer to an average of the further factors which were mentioned by banks as having contributed to changes in credit standards or changes in loan demand, respectively. The latest observations are for the fourth quarter of 2024 (January 2025 bank lending survey).

Our balance sheet policy instruments continue to be a crucial item in our toolbox. The expectation that we will use them if necessary protects the smooth transmission of our monetary policy and reduces the likelihood that we will need to use these tools in the first place.

Moreover, in an environment of heightened uncertainty, even in the context of excess liquidity, we need to remain prudent and be ready to step in should another shock emerge. We should maintain the flexibility to swiftly expand liquidity facilities if stressful conditions arise.

Conclusion

Let me conclude.

The ECB's experience with balance sheet policies to date demonstrates their importance both for the monetary policy stance and for the transmission of our monetary policy to the real economy. They are a vital part of our toolkit.

While policy rates remain our primary instrument for adjusting the monetary policy stance, we should also consider the role played by quantitative tightening in influencing overall financial and financing conditions – be it through the yield curve or through the bank lending channel.

To strike the right balance, we should ensure that our rate decisions adequately compensate for the tightening induced by the reduction of our balance sheet.

Thank you.

Annexes

18 February 2025

Slides

1.

In December 2021 the Governing Council decided to discontinue net asset purchases under the pandemic emergency purchase programme (PEPP) at the end of March 2022 and adjusted the path of net asset purchases under the asset purchase programme (APP). In addition, in October 2022 the Governing Council decided to recalibrate the third series of targeted longer-term refinancing operations (TLTRO III) as part of the monetary policy measures adopted to restore price stability over the medium term.

2.

The tightening of policy expectations and long-term rates in the US over the fourth quarter of 2024 and the first weeks of 2025 has exerted upward pressure on euro area long-term yields.

3.

See, for instance, Rostagno, M. et al. (2021), *Monetary policy in times of crisis: A Tale of Two Decades of the European Central Bank*, Oxford University Press; Arce, Ó. et al. (2020), "A Large Central Bank Balance Sheet? Floor vs. Corridor Systems in a New Keynesian Environment", *Journal of Monetary Economics*, Vol. 114, October, pp. 350-67; Andrade, P. et al. (2016), "The ECB's asset purchase programme: an early assessment", *Working Paper Series*, No 1956, ECB, Frankfurt am Main, September; Rostagno, M. et al. (2021), "Combining negative rates, forward guidance and asset purchases: identification and impacts of the ECB's unconventional policies", *Working Paper Series*, No 2564, ECB, Frankfurt am Main, June; and Sims, E. and Wu, J.C. (2021), "Evaluating Central Banks' tool kit: Past, present, and future", *Journal of Monetary Economics*, Vol. 118, March, pp. 135-160.

4.

Benetton, M. and Fantino, D. (2021), "Targeted monetary policy and bank lending behavior", *Journal of Financial Economics*, Vol. 142, No 1, October, pp. 404-429; Altavilla, C. et al. (2020), "Mending the broken link: Heterogeneous bank lending rates and monetary policy pass-through", *Journal of Monetary Economics*, Vol. 110, April, pp. 81-98; Barbiero, F. et al. (2024), "Targeted monetary policy, dual rates, and bank risk-taking", *European Economic Review*, Vol. 170, November.

5.

Proportionality is a fundamental principle of EU law that requires that any action taken by the ECB is suitable, necessary and proportionate to the objectives pursued. See Chiti, M.P. et al. (2020), "The Principle of Proportionality and the European Central Bank", *European Public Law*, Vol. 26, No 3.

6.

ECB (2021), "An overview of the ECB's monetary policy strategy", July; Altavilla, C. et al. (2021), "Assessing the efficacy, efficiency and potential side effects of the ECB's monetary policy instruments since 2014", *Occasional Paper Series*, No 278, ECB, Frankfurt am Main, September.

7.

"Animal spirits" is a Keynesian expression referring to human psychological factors influencing investment decisions. See also Akerlof, G. and Schiller, R. (2009), *Animal Spirits: How Human Psychology Drives the Economy, and Why It Matters for Global Capitalism*, Princeton University Press.

8.

Historically, the main concerns surrounding a large market footprint have been that: (i) it exerts downward pressure on term and credit risk premia, thereby flattening the yield curve; (ii) it may increase collateral scarcity and thus lead to strains in repo markets; (iii) it may reduce the space to undertake monetary policy easing in the future in times of stress or when rates are at the effective lower bound; and (iv) it should not become larger than needed to steer rates.

9.

Financial Stability Committee (FSC) high level task force on NBFI (2024), "Eurosystem response to EU Commission's consultation on macroprudential policies for non-bank financial intermediation (NBFI)", November.

10.

Work stream on non-bank financial intermediation (2021), "Non-bank financial intermediation in the euro area: implications for monetary policy transmission and key vulnerabilities", *Occasional Paper Series*, No 270, ECB, Frankfurt am Main, September.

11.

ECB (2024), "Changes to the operational framework for implementing monetary policy", 13 March.

12.

All TLTRO III loans were paid back in full by the end of 2024.

13.

Bańbura, M. and Bobeica, E. (2020), "PCCI – a data-rich measure of underlying inflation in the euro area", *Statistics Paper Series*, ECB, No 38, October.

14.

In addition, the aggregate lending rate can be influenced by composition effects. First, a loan's price is only observed if the borrower is not discouraged and the lender does not reject the application. Second, a significant shift from riskier to safer borrowers can exert downward pressure on lending rates – without this rebalancing, rates would be higher. Evidence from both hard and soft data supports the presence of such downward pressure.

15.

In December, the annual growth rate of lending to firms edged up to 1.5% – still well below the historical average of 4.3%.

16.

In December, housing loans grew at an annual rate of 1.1% – significantly below the long-term average of 5.1%.

17.

Recent evidence indicates that interest rates remain sensitive to quantitative tightening surprises even during periods of market calm and positive economic growth (see D'Amico, S. and Seida, T. (2024), "Unexpected Supply Effects of Quantitative Easing and Tightening", *The Economic Journal*, Vol. 134, No 658, February, pp. 579-613; and Lloyd, S. and Ostry, D. (2024), "The asymmetric effects of quantitative tightening and easing on financial markets", *Economics Letters*, Vol. 238, May).

18.

The sovereign bond yield here relates to an average of the "big four" economies, i.e. Germany, France, Italy and Spain.

19.

Akkaya, Y. et al. (2024), "Quantitative Tightening: How do shrinking Eurosystem bond holdings affect long-term interest rates?", *The ECB Blog*, 14 November. Similar results are obtained in Costain, J., Barrau, G.N. and Thomas, C. (2024), "The term structure of interest rates in a heterogenous monetary union", *BIS Working Papers*, No 1165, Bank for International Settlements, 1 February. Importantly, these results underscore that the estimated impact of quantitative tightening on long-term interest rates is broadly comparable in magnitude to the inverse effects of quantitative easing documented in previous studies (see, for example, Eser, F. et al. (2023), "Tracing the Impact of the ECB's Asset Purchase Program on the Yield Curve", *International Journal of Central Banking*, Vol. 19, No 3,

August; and Altavilla, C. et al. (2021), “Asset Purchase Programs and Financial Markets: Lessons from the Euro Area”, *International Journal of Central Banking*, Vol. 17, No 4, October).

20.

Altavilla, C., Rostagno, M. and Schumacher, J. (2024), “When banks hold back: credit and liquidity provision”, *Working Paper Series*, No 3009, ECB, Frankfurt am Main.

21.

A similar quantification is obtained in Altavilla, C. et al., “Central Bank Liquidity Reallocation and Bank Lending: Evidence from the Tiering System”, *Journal of Financial Economics* (forthcoming). The findings of this paper highlight that a reduction in central bank reserves affecting banks with lower liquidity holdings can have significant contractionary effects on loan supply.

22.

For theoretical and empirical evidence on how quantitative tightening affects the real economy, see Kumhof, M. and Salgado-Moreno, M. (2024), “Quantitative easing and quantitative tightening: the money channel”, *Staff Working Papers*, No 1090, Bank of England, August; and Altavilla, C. et al. (2024), op. cit.

23.

In the third quarter of 2024, investment growth was entirely explained by an exceptional rise in Irish non-construction investment. Excluding Ireland, investment contracted by 0.6% in the third quarter. See Cipollone, P. (2025), “Interview with Reuters”, 6 February.

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Baumann, A. et al. (2025), “Are real incomes increasing or not? Household perceptions and their role for consumption”, *Economic Bulletin*, Issue 1, ECB.

25.

ECB (2024), “Eurosystem staff macroeconomic projections for the euro area, December 2024”, December.

26.

Anbil, S. et al. (2020), “What Happened in Money Markets in September 2019?”, *FEDS Notes*, Board of Governors of the Federal Reserve System, 27 February.

27.

Pinter, G. (2023), “An anatomy of the 2022 gilt market crisis”, *Staff Working Papers*, No 1019, Bank of England, March.

28.

These included a weaker-than-expected US jobs report, diminished market liquidity during the summer break and a rapid unwinding of yen-funded carry trades.

29.

Todorov, K. and Vilkov, G. (2024), "Anatomy of the VIX spike in August 2024", *BIS Bulletin*, No 95, Bank for International Settlements, 29 October.

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On the interaction between liquidity and the external finance premium, see Altavilla, C. et al. (2024), "Macro and micro of external finance premium and monetary policy transmission", *Journal of Monetary Economics*, Vol. 147, Supplement, October.

31.

See ECB (2025), "The euro area bank lending survey – Fourth quarter of 2024", January.