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Prepared in the Market Operations Department under the direction of Niko Herrala, Head of Division.

Authors
Niko Herrala
Matti Ilmanen
Katri Järvinen
Juha Niemelä
Aleksi Paavola
Kristian Tötterman
Vesa-Ville Virtanen
Tuomas Välimäki

Translation and editing
Bank of Finland Language Services,
Bank of Finland Communications

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SIMPLY SHORT

European Central Bank to review how it controls interest rates

29 Aug 2023 – Simply Short – Monetary policy

The European Central Bank (ECB) tightens or loosens financing conditions in the economy primarily through raising or cutting its key interest rates. These key ECB interest rates, or policy rates, directly affect short-term money market interest rates, as policy rates determine the interest paid by banks when borrowing from the central bank and the interest banks receive when making deposits with the central bank. In recent years, with the ECB's asset purchase programmes and credit granted to banks, the ECB's deposit facility rate has become the principal policy rate. The gradual reduction in the asset purchase programmes and in the volume of credit have prompted the ECB to review how it will control short-term money market interest rates in the future. It must also consider how to take climate change into account in its implementation of monetary policy.

- The ECB´s key interest rates are again prominent in monetary policy. The most important of these is the deposit facility rate.
- The Eurosystem´s balance sheet is shrinking gradually and predictably.
- The time is right to review how the ECB controls interest rates and how it will take climate change into account.

To efficiently transmit its monetary policy measures to the economy, the ECB has to be able to steer short-term money market interest rates towards the desired level through the use of its key interest rates.

The ECB has three key interest rates: the marginal lending facility rate, the main refinancing operations rate and the deposit facility rate.

The marginal lending facility rate and the deposit facility rate form the upper and lower limits of the 'interest rate corridor' for the short-term money market rates. The marginal lending facility rate is paid by banks when they borrow from the central bank overnight, and the deposit facility rate is the rate received by banks when depositing money (reserves) with the central bank overnight. The main refinancing operations rate is the interest rate banks pay when borrowing from the central bank for one week.

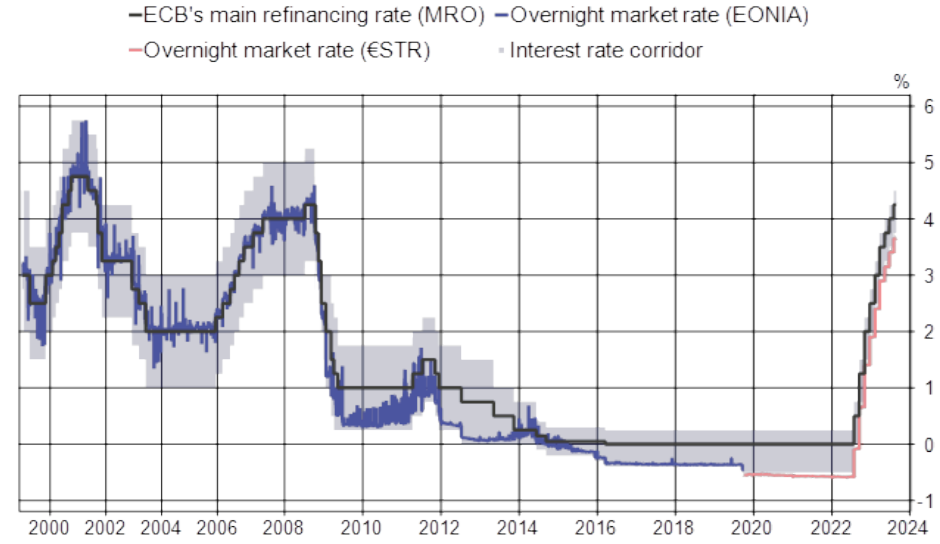
Before the 2008 global financial crisis, the ECB restricted the supply of reserves and thus steered short-term money market interest rates towards the level of the main refinancing operations rate. Over the past 15 years, the euro area economy and the financial markets have faced a number of crises, including the euro area sovereign debt crisis and the COVID-19 pandemic. Inflation was low for a long time. To maintain price stability, the ECB reduced interest rates as much as possible, even to the point where they were in negative territory. This was not, by itself, sufficient, however. To further improve (i.e. loosen) financing conditions across the economy, the ECB purchased a substantial amount of bonds, especially those issued by national governments (sovereign bonds), and granted banks long-term loans on favourable terms. As a result, reserves held by banks grew considerably, and the banks then deposited excess reserves with the central bank. This led to a decrease in short-term money market interest rates from the level of the main refinancing operations rate to the ECB's deposit facility rate.

Since autumn 2021, inflation has been rising sharply, driven up by the pandemic recovery and Russia's war in Ukraine. The ECB has responded to this by rapidly raising its key interest rates. The most important of these, the deposit facility rate, is now at 3.75%, whereas in June 2022 it was still negative, at -0.5%. Nevertheless, short-term

money market interest rates have still not reached their previous euro-era high. In 2000, short-term money market rates followed the main refinancing operations rate, which at that time was 4.75%. Now they follow the deposit facility rate.

Chart 1.

Key ECB interest rates have been raised rapidly but short-term money market interest rates are still not as high as in 2000



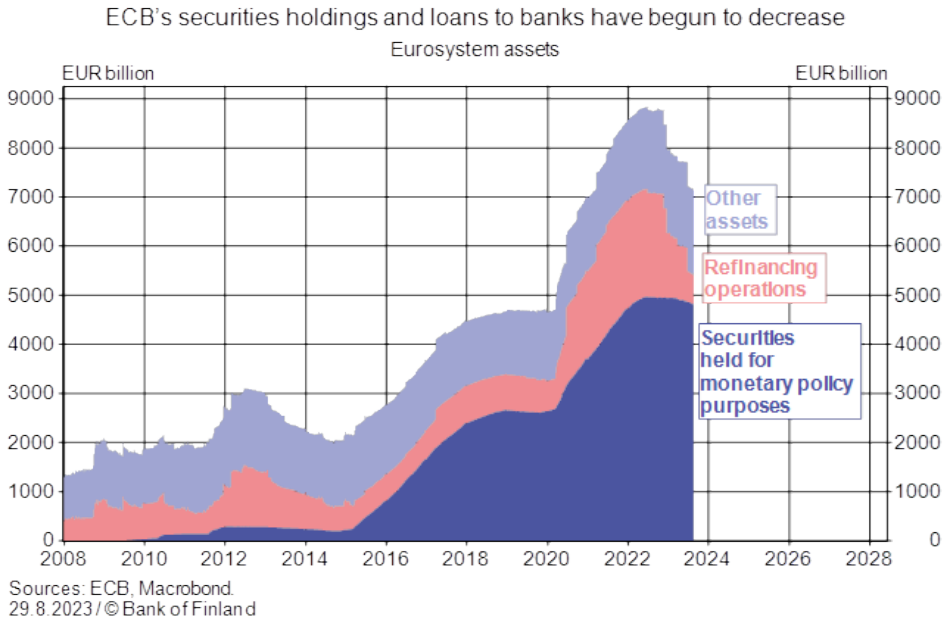
Sources: Macrobond, ECB, Bloomberg.
29.8.2023 / © Bank of Finland

Besides raising its key interest rates, the ECB has also reduced its securities holdings and its lending to banks over the past year. Securities holdings maturing from the asset purchase programme (APP) are no longer reinvested in the market. Furthermore, most of the favourable long-term loans granted to banks (targeted longer-term refinancing operations, TLTROs) have already matured or have been repaid early. The intention is to continue with the reinvestment of maturing principal payments from securities purchased under the pandemic emergency purchase programme (PEPP) until at least the end of 2024.

The ECB stands ready to respond to harmful tensions arising on the sovereign bond market or money market. However, so far, monetary policy tightening has proceeded smoothly on the financial markets. The Bank of Finland's securities holdings, which focus strongly on Finnish government bonds, and its lending to Finnish banks have also been reduced.

With the decrease in the Eurosystem's securities holdings and loans to banks, there is a decline in the volume of banks' deposits with the central bank. When deposits have decreased sufficiently, short-term money market interest rates will begin to rise from the deposit facility rate towards the main refinancing operations rate. Before this, however, the ECB is reviewing how it will control interest rates in the future.

Chart 2.



Each country has its own practices for controlling short-term money market interest rates. The ECB is examining which practices are best suited to the euro area in view of its specific characteristics. These characteristics include a bank-centric financial system and the euro area's vulnerability to interest rate differentiation between member countries.

The choice of how to control interest rates will affect the volume and composition of the Eurosystem's assets and liabilities. In any event, the Eurosystem balance sheet will be significantly larger than before the global financial crisis, as the amount of banknotes in circulation and other liabilities have grown. For this reason, the ECB should consider establishing a structural securities portfolio. The composition of this portfolio could also reflect the ECB's climate strategy objectives.

Chart 3.

Back to the old normal? Monetary policy implementation in a landscape of rising interest rates and a shrinking Eurosystem balance sheet

Today – Analysis – Monetary policy

Juha Niemelä
Head of Market Operations

Tuomas Välimäki
Member of the Board

The past two years have seen a strong surge in inflation. In response, the European Central Bank (ECB) has tightened its monetary policy considerably: the key ECB interest rates have been raised by altogether 4.25%, and securities holdings and the volume of credit granted to banks have been allowed to shrink significantly. With monetary policy normalisation proceeding, the ECB has begun a review of how it will implement monetary policy in the future. Will the deposit facility rate continue to be the key tool to control the level of financing costs? And how far should the Eurosystem balance sheet be allowed to shrink? Maintaining a larger Eurosystem balance sheet than before would enable the consideration of climate factors in the years ahead.

‘Old normal’ in monetary policy

Monetary policy aimed at ensuring price stability is ultimately all about the central bank pursuing a particular policy stance that it believes will bring inflation to its target in the medium term, and this means setting key interest rates, or policy rates, at the required level. The monetary policy framework, in turn, is made up of actions and procedures with which the central bank seeks to bring short-term money market interest rates in line with its policy rates.

A prerequisite for the efficient transmission of monetary policy is that the central bank is able to steer market interest rates to a level that meets its policy objective and that the risk premia in market rates are sufficiently stable. In this regard, euro area monetary policy and its implementation were very effective up to the 2008 global financial crisis.[1]

By keeping banks’ central bank reserves scarce, it was possible to steer short-term money market interest rates[2] efficiently towards the level of the main refinancing operations rate[3] and to minimise the size of the Eurosystem balance sheet[4]. Through limiting the balance sheet size, the aim was to minimise the central bank’s market footprint and its market risks.

How did the deposit rate become the ECB’s most important policy rate?

The ECB’s monetary policy framework changed considerably after the global financial crisis as it sought to respond to the later financial market crises and the era of persistently low inflation and slow growth.

Central banks cannot cut their nominal interest rates very far into negative territory, because the negative side effects of such a policy could increase significantly. The effectiveness of this interest rate floor in times of crisis is revealed by analyses based on the Taylor rule and shadow interest rates, among other things. In 2014, the ECB began making extensive asset purchases, which were used to affect longer term interest rates directly and indirectly via expectations and to improve the capacity of financial markets for ensuring that the easing of financing conditions is transmitted to the real economy.

The Eurosystem purchased a substantial amount of securities from the markets. The

1. See e.g. Papadia and Välimäki (2018).
2. The euro area’s main overnight market rate was previously the EONIA (euro overnight index average) rate. In October 2019, the €STR (euro short-term rate) replaced the EONIA rate.
3. Before the global financial crisis, interest rate control in the Eurosystem was based on an *interest rate corridor*. The upper and lower limits of the interest rate corridor were formed by the ECB’s marginal lending facility rate and its overnight deposit facility rate paid on banks’ reserves. The ECB then lent banks, at the main refinancing operations rate set at the middle of the corridor, an amount of reserves at which the banks had an equal probability of having to deposit money with the central bank at the day’s end as having to borrow reserves in the marginal lending facility to meet their minimum reserve requirement on average across the reserve maintenance period.
4. In practice, the balance sheet was not expanded beyond what was required by the central bank’s natural liabilities (e.g. banknotes and net assets).

asset purchases were funded through an increase in the volume of central bank deposits made by banks (reserves). When there is an abundance of central bank money in the system, banks will no longer need to borrow money from the Eurosystem but will instead deposit excess reserves with national central banks. This was the case at the Bank of Finland as well, where the balance sheet expanded substantially.

As a consequence of the growth in the amount of reserves, the deposit facility rate paid to banks became the ECB's principal money market policy rate, in place of the main refinancing operations rate charged to banks. Judging by data on, for example, interest rate volatility, the transmission of the central bank's policy rate to money market rates was not weakened by this change, which had been brought on by force of circumstances. In recent years, the overnight euro short-term money market rate (€STR) has closely followed the ECB's deposit facility rate.

Return to interest rate control

The economy and the price outlook have experienced a fundamental change over the past two years. First, the COVID-19 pandemic disrupted demand and supply factors in the economy, and later Russia's illegal war in Ukraine quickly produced a further powerful surge in inflation.

During 2022, euro area inflation climbed to just over 10%, and despite a significant slowing, it is still distinctly above the 2% target.

In this transformed environment, the Eurosystem began to tighten its monetary policy.[5] Monetary policy net purchases of securities have been ended completely, reinvestments of maturing assets have been largely discontinued[6], and the volume of low interest loans granted to banks during the pandemic is declining rapidly[7]. Raising key ECB interest rates has therefore returned to the focus of monetary policy.

Many of the operating mechanisms in the economy and in the financial markets have changed fundamentally in the past 15 years. It is not clear whether, in the future, the pre-financial crisis approach to controlling interest rates would be effective or even possible. Factors contributing to the changed environment include a decline in the equilibrium real interest rate, significant growth in indebtedness in all sectors of the economy, the euro area's vulnerability to interest rate differentiation between member countries and between banks, and stricter regulation concerning financial markets and especially banks. Central bank balance sheets have also expanded and their composition has altered in comparison with the situation 15 years ago.

Due to the changes in the operating environment, the ability and willingness of banks to

5. For more detail, see article by Ilmanen, Järvinen and Paavola: Eurojärjestelmän tase pienenee rahapolitiikan kiristyessä ('Eurosystem balance sheet shrinking as monetary policy tightens').
6. Reinvestments under the Eurosystem's monetary policy purchase programmes were discontinued in July 2023, with the exception of the pandemic emergency purchase programme (PEPP). The ECB's Governing Council intends to continue PEPP reinvestments until December 2024.
7. The volume of outstanding targeted longer-term refinancing operation (TLTRO) loans has fallen in less than a year to approximately EUR 600 billion from just over EUR 2 trillion.

distribute liquidity between them on unsecured money markets has diminished considerably and may no longer return to the level on which interest rate control was based before the global financial crisis. Due to the uncertainty surrounding liquidity, among other things, banks ought to find it advantageous to keep more liquid assets (reserves) on their balance sheet than before.

In today's circumstances, it is no longer possible for the central bank to assess accurately the demand for reserves within the entire banking system by anticipating developments in its own balance sheet. The effectiveness of the previous operating model, which was based on regulating the amount of central bank reserves, relied heavily on efficiently functioning financial markets and the predictability of the demand for reserves. There is good reason for the Eurosystem to examine how the operating model for controlling interest rates should be 'normalised' in a situation where the balance sheet is being reduced and interest rate control is again at the focus of the monetary policy stance.[8], [9]

Monetary policy implementation in the future

In the future, too, monetary policy implementation will take place amid great uncertainty. The policy implementation arrangements will therefore need to be, above all else, flexible. The Eurosystem will have to be able to tighten and loosen financing conditions under all kinds of circumstances, and in a manner consistent with the price stability objective.

Control of money market interest rates and the transmission of these rates to the real economy remain the most important goals for monetary policy implementation. In practice, however, a central bank must balance the tightness of its interest rate control against its market footprint (balance sheet size).

When contrasting the expansion of central bank balance sheets following recent crises with their ongoing contraction, the question arises as to whether a return to pre-crisis balance sheet levels is a prerequisite for monetary policy normalisation and effective interest rate policy. Furthermore, is such a goal even desirable given the size of central banks' balance sheets currently and the effectiveness of interest rate policy.

The Eurosystem can control the formation of short-term interest rates both through its central bank lending operations and its deposit facility. The experience of recent years still supports the notion that a central bank should maintain a slim balance sheet to avoid creating an unintended market footprint.

It is also clear that price stability and financial stability occasionally require that the central bank step up its role by conducting market operations and refinancing operations that increase the Eurosystem's assets and banks' reserves considerably. Here it is important to understand the interaction between a central bank's control of interest rates and the management of its balance sheet.

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8. See Bulletin article by Herrala and Tötterman: How will the European Central Bank control interest rates in the future?

9. In December 2022 the ECB's Governing Council announced that it would be reviewing the arrangements with which it controls the path taken by short-term interest rates.

If the future monetary policy stance does not require new measures that substantially affect the central bank's balance sheet, then the current floor system of interest rate control based on the deposit facility rate may well remain effective for the next few years. In other words, money market interest rates would be determined by the central bank's deposit facility rate without any undue volatility.

The situation will change over time as the Eurosystem's previously acquired securities begin to mature and the volume of banks' excess reserves begins to shrink towards levels determined by their demand for buffers. It will then become more likely that banks will again begin participating increasingly in the central bank's main refinancing operations.

In this situation, the respective weights of the ECB's main refinancing operations rate (lending rate) and its deposit facility rate in determining money market rates may fluctuate even over a short period, potentially resulting in a significant increase in daily market rate volatility. This, in turn, could complicate the communication and assessment of the monetary policy stance considerably.

The Eurosystem has several options for preventing such an outcome. It could take steps to weaken the response of market rates to changes in the volume of banks' reserves, for example by narrowing the gap between its lending rate and deposit facility rate (*interest rate corridor*) or by ensuring that the quantity of excess reserves in the banking system will, in practice, always continue to exceed banks' demand for reserves (*structural operations*).[10]

Towards a narrow interest rate corridor?

As a result of the higher uncertainty surrounding banks' demand for reserves, the ECB may find it rather difficult to estimate the quantity of reserves needed for balancing the money market. If the central bank wished to, it could directly offset the resulting rise in market rate volatility by narrowing its interest rate corridor. Sveriges Riksbank has followed this approach.[11] In Sweden, the width of the interest rate corridor is 0.2 percentage points, which corresponds to just one tenth of the euro area's normal interest rate corridor width before the global financial crisis.

In the current environment, where there is an abundance of excess reserves in the banking system, virtually all banks deposit excess reserves with the central bank, and so the width of the interest rate corridor makes little difference. In these circumstances, the deposit facility rate will control the money market irrespective of the corridor's width.

As the volume of excess reserves in the banking system eventually shrinks towards levels

10. Aside from these measures, the averaging provision for minimum reserves was an important tool for curbing volatility in the shortest rates in the early years of the Eurosystem. The mechanism did well in an environment where the money market operated efficiently, banks did not have significant demand for reserve buffers, and reserve holdings were remunerated at the main refinancing operations rate, which corresponded to the market rate. All of these factors have since changed, so the Eurosystem must evaluate the effectiveness of its minimum reserve system in the current environment as part of the review of its operational framework for controlling interest rates.

11. For more details, see the Bulletin article by Herrala and Tötterman.

consistent with banks' neutral demand, banks in need of additional reserves will tend to borrow them from the central bank, and those with excess reserves will tend to deposit them with the central bank. With a narrow interest rate corridor, both will take place at virtually the same interest rate.

Although the benefit of a narrow interest rate corridor is reduced market rate volatility, the downside is that there is reduced scope for interbank money market activity and at least some of this activity 'shifts' onto the central bank's balance sheet. The ECB will have to weigh the pros and cons of these effects as it considers its future operational framework.

Structural refinancing operations for stronger interest rate control and improved financial stability

Structural operations can prevent a rise in market rate volatility and potentially diminishing control over interest rates caused by maturing monetary policy assets. They would ensure that the banking system has sufficient reserves to essentially anchor the shortest money market rates at the level of the central bank's deposit rate, as is currently the case. These operations might take the form of longer-term refinancing operations or securities purchases on the markets.

In the Eurosystem, credit is only provided to banks against collateral. The Eurosystem accepts a considerably broader range of securities as collateral than the euro area repo market and even accepts bank loans. In order to avoid undue risk, the Eurosystem applies valuation haircuts to these assets based on their creditworthiness and liquidity characteristics.

Because the financial markets in the euro area are fragmented and because the regulation of banks has been tightened, it can be assumed that a larger proportion of banks will seek funding from the central bank in the future and will also hold liquidity buffers in the form of reserves.

The Eurosystem could take advantage of the higher demand for reserves and strengthen the deposit facility rate's position as the main policy rate by providing longer term refinancing to banks under its current broad collateral framework.

The provision of longer term refinancing against illiquid collateral would raise the level of demand in the central bank's refinancing operations, which, in turn, would guarantee an abundance of reserves in the banking system. Consequently, the deposit facility rate would function as the main policy rate, setting the floor for money market interest rates.

If the structural refinancing operations were conducted as variable rate procedures and within the maximum level set by the ECB, then the more extensive pool of collateral (compared with the money market) and the longer maturities (compared with the one week for main refinancing operations) would be taken into account directly in the price of the funding received by banks. This would help offset the risk carried by the central banks and would prevent the operations from having an undesirable impact on market risk premia.

Structural refinancing operations could also be combined with a narrow interest rate corridor if so desired. The central bank would be able to exert maximal control over market rates if it were willing to both receive deposits and provide short-term refinancing at its main policy rate.[12] In order that tight control of interest rates does not lead to financial intermediation shifting excessively onto the central bank's balance sheet and to supporting banks' liquidity requirements, this approach would require a significant reduction in the ECB's current pool of collateral for its weekly main refinancing operations. In effect, eligibility would be limited to assets that are accepted as collateral against repos on the money market and which are classified as high quality liquid assets in the liquidity regulatory framework.[13] Once calibrated correctly, the use of structural refinancing operations and the separation of collateral criteria by operation type would prove effective in tightening the control of market rates and strengthening the financial stability of the euro area banking system.

Structural securities portfolio could strengthen control of interest rates

If the ECB's ability to control interest rates and transmit its monetary policy stance to the economy were to be impaired due the reduction in its monetary policy asset portfolios, then the simplest response from the Eurosystem would be to set up a structural securities portfolio instead of engaging in monetary policy asset purchases. A structural securities portfolio would, in practice, allow the current monetary policy implementation framework to continue even as previously acquired assets reach maturity. This is the model which the US Federal Reserve is currently striving to use for implementing its interest rate policy.

Calibrating the size of the structural securities portfolio would not be a simple exercise due to the uncertainty associated with the banking sector's demand for buffers of reserves. If the portfolio were too small, it would not prevent an increase in market rate volatility, but if it were unnecessarily large, it would strengthen the Eurosystem's impact on the market beyond the needs of monetary policy. In addition, setting up a structural securities portfolio in the euro area would not be as straightforward as in the United States, where the structural portfolio consists of low-risk federal bonds with fairly short maturities.

The quantitative easing conducted by central banks in the form of large-scale asset purchases has been criticised more recently due to losses generated. Following the easing of monetary policy during the prolonged period of below-target inflation, long-term interest rates were at their lowest level and, correspondingly, long-term bond yields at their highest. In these circumstances, central bank operations sought to transfer interest rate risk from the markets to the central bank balance sheet. This would not be the case with structural portfolios, since purchases would generally be conducted in all the interest rate environments. Interest rate risk would also be easier to manage by, for

12. Last year the Bank of England adopted an approach where it offers reserves to banks at the same interest rate with which it remunerates deposits.
13. In the Liquidity Coverage Ratio (LCR) framework, high quality liquid assets (HQLA) comprise excess reserves deposited with the central bank, sovereign bonds, and certain other securities with restrictions applied, including covered bonds, corporate bonds and asset backed securities.

example, acquiring bonds with shorter maturities.

In addition to market risk, attention should also be paid to credit risk in structural portfolios. The Eurosystem's asset purchases have traditionally focused on a considerable range of issuers. This is in line with the principle applied in the Eurosystem's collateral framework, namely that the Eurosystem may not favour public sector over private sector issuers.

A portfolio that consists of public and private issuers should be able to meet a variety of partially conflicting requirements. A structural portfolio should be market neutral in a way that asset purchases do not impair the efficient functioning of the bond market, distort price formation, adversely affect incentives for responsible management of finances or weaken market liquidity. The ECB's new monetary policy strategy, adopted in 2021, also highlighted the key importance of tackling climate change. By setting up a structural securities portfolio, the ECB could take concrete measures to reduce climate risks in the Eurosystem's balance sheet by minimising the carbon footprint of monetary policy implementation. At the same time, development of green finance in the euro area could be promoted. With these factors in mind, the rest of the article below focuses on the consideration of climate risks in a central bank's securities holdings.

Climate risks can be taken into account in times of balance sheet reductions, too

The Eurosystem's primary objective is to maintain price stability. Climate risks and the green transition are interlinked with the general trend in the euro area economy and prices, and therefore with the operating environment for monetary policy. Consequently, climate change also impacts the risks in the Eurosystem's balance sheet and the value of its assets, especially in the long term.[14]

Although the majority of the Eurosystem's monetary policy purchases have focused on euro area public sector debt securities[15], the size of the corporate bond portfolio acquired under monetary policy purchase programmes is substantial, at approximately EUR 390 billion. In climate risks related to the Eurosystem's monetary policy purchases, the current focus is on these corporate bond purchases.[16]

Most of the corporate bond holdings are maturing, but securities maturing from the pandemic emergency purchase programme (PEPP) are being reinvested for the time being. This will lead to a rapid reduction in the portfolio's absolute carbon emissions by the end of the decade. However, as total carbon emissions do not adequately capture

14. For more details, see the article Rahapolitiikan yrityslainaostojen hiilijalanjälki pienenee ('Carbon footprint of corporate bond purchases under monetary policy growing smaller') by Virtanen in this issue of the Bank of Finland Bulletin's Finnish equivalent, Euro & talous.
15. Euro area government bonds and bonds issued by recognised agencies and supranational organisations account for approximately 85% of the Eurosystem's total bond holdings.
16. Public sector bond purchases are allocated according to monetary policy considerations. The purchases are largely guided by the capital key of each country, reflecting country-specific population and gross domestic product (GDP) figures. In the future, it is possible that climate risks will be addressed more directly in purchases of public sector bonds, too (Virtanen, 2023).

climate impacts, the ECB has begun to measure the carbon intensity of these holdings.

Until October 2022, besides being based on the issuer's credit rating, the allocation of the Eurosystem's corporate bond purchases under monetary policy purchase programmes was principally based on the amount of eligible bonds a company had in the market. At that time, a company-specific climate score was included as a factor determining corporate bond purchase limits, the overall climate score depending on the company's current emissions, the level of ambition of its emission targets and the quality of its emission disclosures. This change has proved to be a very successful, effective and quick method to reduce the carbon intensity of monetary policy portfolios, and therefore to reduce the environmental burden of monetary policy purchases.

The sizeable reduction and eventual discontinuation of new monetary policy purchases will slow the decrease in the portfolio's carbon intensity. At the same time, the Eurosystem's ability to manage climate risks associated with the portfolio will weaken. Although progress in reducing climate risks in the Eurosystem corporate bond portfolio seems good at present, in some scenarios the carbon content of the holdings will, over time, be inconsistent with the emission goals of the Paris Agreement. How can the Eurosystem prevent this and keep the portfolio aligned with the Paris Agreement?

As new bond purchases are no longer being made – except for the PEPP reinvestments – the level of the portfolio's climate risks largely depends on the actions of businesses themselves to improve their carbon footprint. Although there has recently been a favourable trend in this respect, the matter cannot be left in the hands of external actors alone.

The Eurosystem could actively tilt its holdings in the maturing portfolio towards issuers with a better climate performance. In this alternative, the profile of the existing portfolio would be adjusted by selling bonds of 'brown' businesses and purchasing green corporate bonds on the basis of, for example, company-specific climate scores. There are, however, some open questions regarding this approach. There would likely be a rise in the financing costs of the issuers whose bonds are being sold, on account of the increase in sales. It would therefore be important for the central bank to assess whether the scale of impacts would conform with the principle of proportionality, whether the corporate bond market could absorb the incoming bonds without problems, and whether the measure would serve the green transition without jeopardising the objectives of monetary policy.

There is also the question whether the potential rise in brown companies' financing costs would be beneficial or detrimental to the green transition itself. Businesses which do not currently meet the sustainability criteria but have the potential to do so by making changes in their business practices would be a key part of the green transition and the related need for financing. Nevertheless, portfolio rotation would be a viable option if carefully planned, and could ensure that the portfolio remains aligned with the goals of the Paris Agreement.

The climate impacts of the Eurosystem's current corporate bond portfolio are of a fixed duration, whereas climate change is a long-term issue.[17] So how can the ECB, within its

17. See Mark Carney: Breaking the tragedy of the horizon - climate change and financial stability (bis.org).

mandate, mitigate climate change in the longer term, too?

Price stability is practically essential for the success of the green transition. Therefore, unquestionably the most important and the most effective channel through which the ECB can support the green transition and combat climate change is its primary objective – maintenance of price stability. Where there is price stability, the level of inflation and inflation expectations will be moderate, and fluctuations will not be excessive. This will avoid disruptions to the consumption and investment decisions of consumers, businesses and the public sector.

A structural, or permanent, securities portfolio promoting a green transition will have many appealing features that nevertheless require further research. As stated earlier, a structural portfolio could allow the ECB to prevent a future increase in interest rate volatility stemming from a decrease in excess reserves. At the same time, by adjusting the portfolio's composition, the ECB could manage the allocation of central banks' assets across asset classes and climate parameters. With a separate structural portfolio, the ECB would also have the option to take a more active role in supporting the green transition and in mitigating climate change.

The composition of the structural portfolio could be tailored in a very flexible way in respect of its risk parameters: portfolio size, construction of the portfolio and the related timetable, acceptable asset classes and instruments, maturity limits and other risk limits – all these factors could be determined according to targets and risk preferences. In the case of corporate bonds, for example, it would be natural to use the company-specific climate score in the allocation of purchases, as this has already proven its value. By focusing the portfolio's purchases on businesses with a high climate score, the costs of finance for these firms could be reduced. This would provide them with a positive incentive (carrot rather than stick) for reducing their carbon footprint, setting climate targets and publicly disclosing their climate risks.

Conclusion

The surge in inflation has brought interest rate control back to the focus of monetary policy. As the Eurosystem no longer grants financing to banks under low interest terms or purchases securities in support of monetary policy, the size of its balance sheet will shrink substantially. For this reason, the ECB will need to reassess the future policy arrangements for implementing its monetary policy stance in the markets.

Monetary policy normalisation does not necessarily mean a return to the old monetary policy implementation framework. Despite the changes in the operating environment, the need to ensure the ECB's ability to control interest rates will remain the key element in the implementation framework. This can be achieved with a variety of arrangements. One method of containing excessive volatility in short-term interest rates and simultaneously limiting bank exposures to liquidity risk could be a combination of significantly narrowing the central bank's interest rate corridor between the lending rate and the deposit facility rate, and differentiating collateral eligible for central bank refinancing operations by collateral type.

As the monetary policy asset portfolios are diminishing, this will pose a challenge for

keeping them consistent with the goals of the Paris Agreement in the future. The Eurosystem could address the foreseeable increase in the carbon intensity of its holdings by setting up a structural securities portfolio. The size of this could be determined on the basis of banks' structural liquidity needs, and its composition could take climate considerations into account.

Tags

ECB, monetary policy framework, ESTER, monetary policy

ANALYSIS

How will the European Central Bank control interest rates in the future?

29 Aug 2023 – Analysis – Monetary policy

Niko Herrala
Head of Division

Kristian Tötterman
Market Analyst

The European Central Bank's (ECB) monetary policy stance is implemented through market operations and other measures that aim to steer short-term money market interest rates towards the level set by the ECB's Governing Council. Before the global financial crisis, money market interest rates were steered close to the ECB's main refinancing operations rate. With the implementation of quantitative easing and longer-term refinancing operations, the ECB's overnight deposit rate has become the most important policy rate of the Eurosystem in recent years. Last December, the ECB announced that it will review how it is to control interest rates in the future. The outcome of the review will also impact the size and composition of the Eurosystem's balance sheet in the future.

Money market guided by Eurosystem monetary policy implementation framework

The monetary policy implementation framework refers to the operations through which the ECB steers short-term money market interest rates close to its target policy rate. Short-term money market rates are at the heart of interest rate control, as they also effectively transmit interest rate policy to other interest rates, thus broadening the impact of monetary policy across the economy as whole.

The euro short-term rate (€STR)[1] is the primary indicator for short-term money market rates. This reference rate reflects the average costs paid by euro area banks for wholesale euro unsecured overnight borrowing. In addition to the unsecured money market rates, secured money market rates, such as repo rates[2], are also important for the efficient transmission of monetary policy.

The control of short-term interest rates is based on banks' deposits with the central bank (reserves), which the banks need for making interbank payments and fulfilling the minimum reserve requirement. Although individual banks can borrow reserves from each other, the banking system as a whole cannot borrow reserves from anywhere other than the central bank.

This means that the central bank has a monopoly on providing reserves and can therefore decide the price, i.e. the interest rate, and the volume of reserves supplied to the banking system. These decisions, in turn, have a direct impact on the functioning of the money market, the interest rate at which banks trade reserves on the money market

1. Read more about the €STR reference rate in Jukka Lähdemäki's blog post EKP:n uusi viitekorko otti paikkansa markkinoiden ytimessä ('ECB's new reference rate has found its place at the heart of the money market').
2. A repo rate, short for repurchase agreement rate, is a secured interest rate where the market participant borrows money while providing the other market participant with securities as collateral. The securities are usually government bonds.

and, ultimately, on the interest rate at which banks lend money to households and businesses.

The Eurosystem's operational framework consists of the minimum reserve requirement, refinancing operations and the collateral used in these, and the standing facilities.[3] The ECB policy rates are linked to these instruments. The minimum reserve requirement obliges euro area banks to hold a certain amount of reserves relative to their balance sheet in their national central bank.

The reserve requirement specifies precisely the minimum amount of reserves that banks must hold over a period of just over one month, i.e. the reserve maintenance period[4]. Refinancing operations are usually used to increase the reserves in the banking system. As a general rule, banks may borrow reserves from the refinancing operations against collateral at the main refinancing operations rate.

Together, the deposit facility and the marginal lending facility constitute the standing facilities, which allow banks either to deposit reserves with the central bank at the overnight deposit rate or to borrow reserves from the central bank at the marginal lending facility rate. The standing facilities create a framework for the interest rate at which banks trade reserves with one another, in addition to having a broader impact on the pricing and functioning of the money market.

From the introduction of the euro until the global financial crisis in 2008, the implementation framework was based on the fact that without refinancing operations, banks did not have sufficient reserves to fulfil their minimum reserve requirements. There was a liquidity deficit in the banking system relative to the central bank. Banks were therefore compelled to borrow reserves from refinancing operations through tender procedures, where they were allocated reserves that only slightly exceeded the minimum reserve requirements of the banking system as a whole.

Before the global financial crisis, the banking system was almost devoid of any excess reserves or liquidity. The banks evened out the scarce reserves by trading them with one another to the point where all banks were only just able to fulfil their minimum reserve requirements. The interest rate corridor was wide, usually up to 2 percentage points[5], thereby encouraging banks to trade in interbank markets instead of resorting to the central bank.

The monetary policy implementation framework that was used up to the global financial crisis is referred to as a *classical corridor*. In this type of system, short-term money market interest rates are steered close to the policy rate in the middle of the interest rate corridor, i.e. the main refinancing operations rate, by keeping the supply of reserves in the banking system scarce, which keeps banks' incentives to lend reserves to and from

3. If necessary, securities portfolios may also be used.

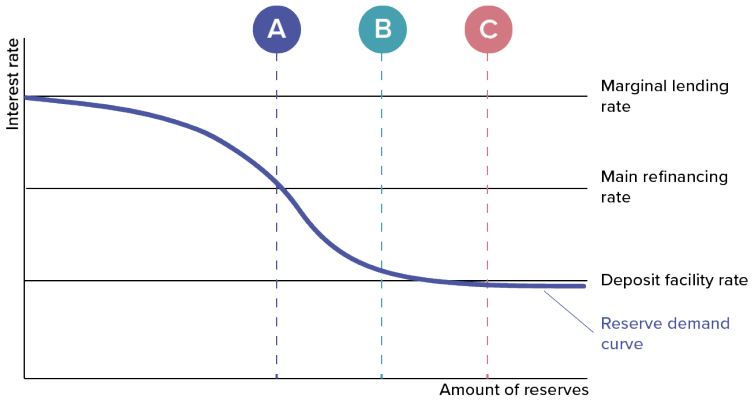
4. The year is divided into eight reserve maintenance periods, each of them starting on the Wednesday following the Governing Council's monetary policy meeting. Over the maintenance period, banks must hold reserves in the account that on average amount to the minimum reserve requirement.

5. The deposit facility rate was 1 percentage point lower than the main refinancing operations rate, while the marginal lending facility rate was 1 percentage point higher than the main refinancing operations rate.

each other in balance (Chart 1, a).

Chart 1.

Money market interest rates in a corridor under scarce and ample reserves



A — By holding the supply of reserves scarce, market interest rates can be steered to the middle of the interest rate corridor.

B — By offering ample reserves, market interest rates start to drop to the bottom of the interest rate corridor.

C — With abundant reserves market interest rates are at the bottom of the interest rate corridor or even below it.

Change in Eurosystem monetary policy after global financial crisis

The Eurosystem's monetary policy has changed substantially since the global financial crisis. The biggest change in the implementation framework has been that in its accommodative monetary policy, the Eurosystem has repeatedly relied on asset purchase programmes, i.e. quantitative easing and targeted (TLTROs) or other longer-term refinancing operations, to create significant volumes of new reserves in the banking system.[6] Due to these measures, the banking system now contains considerable excess reserves, i.e. reserves that exceed the minimum reserve requirements.

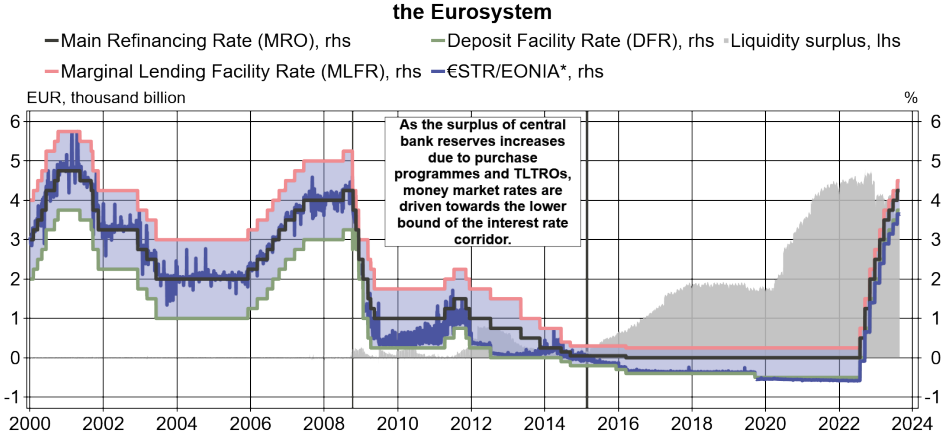
With the growth of excess reserves, euro area banks have no longer needed to borrow reserves from each other because almost all of them have reserves that exceed their own needs. This is why banks are unwilling to pay an interest rate higher than the deposit rate on the reserves, which is reflected as a decline in money market rates towards the bottom of the interest corridor, close to the deposit rate, or even below it[7] (Chart 1, b and c).

6. Such measures were previously referred to as 'unconventional', but in the ECB's 2021 strategy review, these measures were included in the conventional toolkit applicable when interest rates are near the lower bound.
7. To read more about the behaviour of money market interest rates in the context of excess reserves and how they

A system in which money market interest rates are steered towards the bottom of the interest rate corridor by keeping an ample or even abundant supply of reserves is called a *floor system*. The Eurosystem has, in practice, been operating with a floor system since 2015, when excess liquidity increased as a result of the asset purchase programmes and TLTROs. Since then, money market interest rates have followed the deposit facility rate rather than the main refinancing operations rate. *Therefore, the deposit facility rate has long been the ECB's most important policy rate*, with the most direct impact on money market interest rates (Chart 2).

Chart 2.

Euro area overnight money market rates, ECB's interest rate corridor and excess liquidity in the Eurosystem



*In October 2019, €STR replaced EONIA as the overnight reference rate.
Source: ECB, Bloomberg.
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Normalisation of monetary policy is a natural time to review the policy implementation framework

Since December 2021, the Eurosystem has been normalising and tightening its monetary policy at an unprecedented pace in order to bring inflation back to its target of 2% in the medium term. This has been done mainly by raising the policy rates. At the same time, the Eurosystem has also begun to wind down the other stimulus measures that were utilised to stimulate economic recovery when the effective lower bound for short-term interest rates limited the use of interest rate policy. As shown in the article Eurojärjestelmän tase pienenee rahapolitiikan kiristyessä ('Eurosystem balance sheet shrinking as monetary policy tightens'), the Eurosystem's balance sheet has contracted since last autumn due to TLTRO loans maturing or being repaid early and the reduced pace of asset purchase programme reinvestments. This has also reduced the number of excess reserves in the banking system.

With time, the decline in excess reserves resulting from the shrinking balance sheet will begin to push up money market interest rates towards the main refinancing operations rate. The consequence of this would then be a gradual return of the monetary policy implementation framework to the corridor system that preceded the global financial

have declined to below the deposit rate, see Niko Herrala's blog post Miten korkoja nostetaan? ('How to raise interest rates').

crisis. However, before this point is reached, the Eurosystem will have to consider whether a return to the old monetary policy implementation framework is desirable, or if a system similar to the current framework, where there are more reserves and money market rates follow the deposit rate, would be a better fit for the modern environment.

In December 2022, the ECB's Governing Council announced that it would be reviewing its operational framework for implementing monetary policy in the future. Specifically, the assessment will consider how short-term interest rates should be controlled in the euro area once the normalisation of monetary policy has been completed.

The normalisation of monetary policy is a natural time to review the policy implementation framework. The assessment will provide a clearer picture of the effects of shrinking the balance sheet and the desired end point of this shrinking.

The necessary balance sheet size will depend on which implementation framework the ECB chooses, as this will affect the size required for controlling interest rates and transmitting monetary policy efficiently.

The choice will also shape other details of the future implementation framework, such as whether reserves should be supplied to the banking system primarily through asset purchases or credit operations.

Several central banks have renewed their monetary policy implementation frameworks

The ECB is by no means the only central bank reassessing its monetary policy implementation framework. A number of other central banks have been confronted by the same question in recent years. The pandemic then finally triggered the global use of asset purchases and various credit operations in monetary policy stimulus, resulting in a worldwide growth in reserves. In winding down the stimulus measures, each central bank has been forced to consider how to best control short-term market interest rates in the new environment. Interestingly, different central banks have decided on very different approaches to reforming their implementation framework.

The US Federal Reserve System announced already in January 2019 that it intends to continue the use of a floor system, steering short-term money market interest rates close to the interest rate paid to banks and other money market participants[8]. In its framework, the Federal Reserve continuously assesses the necessary amount of reserves in the banking system to keep money market interest rates at the bottom of the interest rate corridor. However, given the considerable uncertainty surrounding the assessment, the amount of reserves supplied to the system must always exceed this in order to ensure stable operation of the framework. More precisely, the Federal Reserve framework is called a *supply-driven floor system*, as the central bank decides the amount of reserves supplied.

8. In the United States, there are many other participants in the money market besides banks. Therefore, an essential part of the Federal Reserve's monetary policy implementation framework, in addition to the interest paid on bank reserves, is the *overnight reverse repo facility*, which is also available to certain money market participants other than banks, such as money market funds.

Many other central banks too, for example the Bank of England, the Bank of Canada and the Reserve Bank of New Zealand, have announced since the pandemic that they will apply the floor system for controlling interest rates. Whereas the implementation frameworks of the Bank of Canada and the Reserve Bank of New Zealand are very similar to that of the Federal Reserve, the Bank of England has a different approach to the level of reserves needed in the banking system.

The Bank of England does not take a stand at all on the level of reserves, but instead allows banks to decide themselves on the level of their reserves by providing them the possibility to borrow reserves freely at the same rate paid by the Bank on reserves. The Bank of England's justification for its decision was the uncertainty related to the level of reserves needed. The framework is a *demand-driven floor system*.

Sveriges Riksbank and Norges Bank are, in turn, examples of central banks that continue to implement monetary policy using the corridor system, in which the supply of reserves is kept scarce. This encourages banks to trade actively on the money markets. To encourage trading activity, Sveriges Riksbank and Norges Bank have nevertheless ended up with very different interest rate corridors. The interest rate corridor of Norges Bank is as wide as 2 percentage points, whereas that of Sveriges Riksbank is only 0.2 percentage points.

The variety of implementation frameworks underlines well the fact that the problem can be resolved in many ways. Moreover, the best solution is not necessarily a universal one. Instead, the implementation framework most suitable for a central bank depends very much on the special characteristics of the banking system and financial markets of the country or economic area in question.

The number of participants in the banking system, the preferences of these participants, and whether the group of participants is heterogeneous or homogeneous, are all examples of questions whose answers will very much shape the optimal implementation framework.

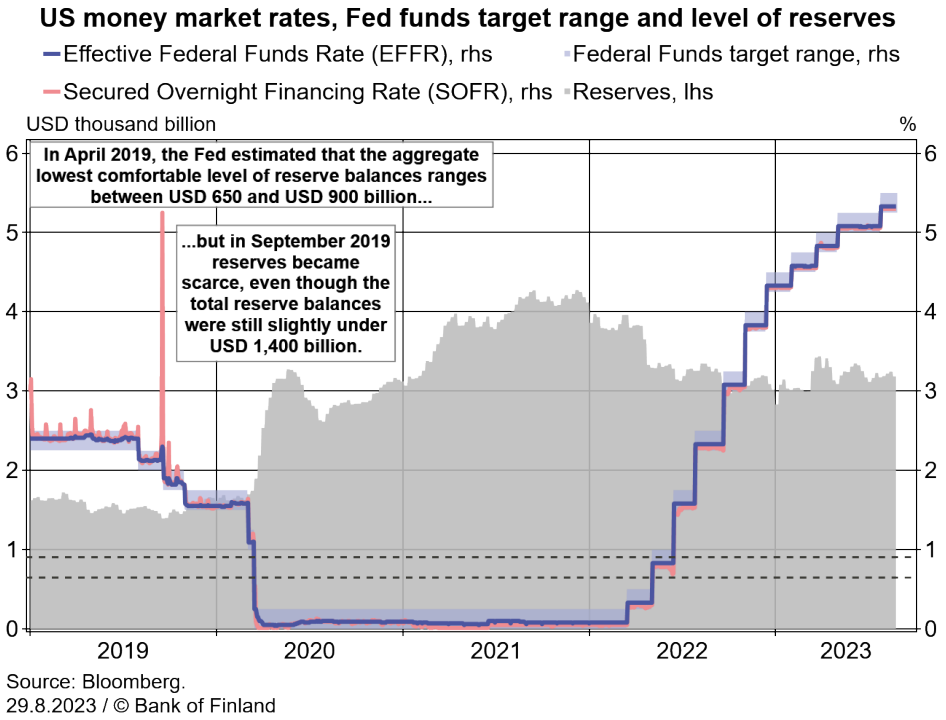
Suitable level of reserves difficult to estimate

Choosing a suitable implementation framework essentially involves the question of the level of reserves needed in the banking system. To determine the level of reserve balances, the central bank must be able to estimate the demand curve for reserves. In other words, a central bank must have some kind of an estimate of the stage at which a contraction in reserves will become visible as a rise in money market rates from the bottom of the interest rate corridor towards the main refinancing operations rate. The task is challenging, as the amount of excess reserves in the euro area banking system has remained considerable since 2015.

The Federal Reserve was faced with this challenge in a very concrete manner in September 2019 when monetary policy normalisation and the related reduction of its balance sheet came to an abrupt halt as short-term money market rates rose sharply despite the fact that the level of reserves in the banking system was still significantly higher than that which the Federal Reserve and the banks themselves had estimated as being the lowest comfortable level of reserves (LCLoR).[9]

In the United States, the largest increases were in secured rates, due to the significant shortage of collateral, but unsecured money market rates also rose briefly above the Federal Reserve's target range used for interest rate control (Chart 3). Even though the Federal Reserve took swift action to remedy the situation by feeding reserves into the banking system through conducting securities purchases and providing credit, it briefly lost its hold on controlling interest rates.

Chart 3.



Source: Bloomberg.
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There are several reasons for the events in September 2019[10], but ultimately it was a question of the Federal Reserve and the banks having made a very low estimate of the level of reserves needed. The estimate failed to take sufficient account of the fact that, in a post-financial crisis world, the level of reserves needed is considerably higher than before.

On the same grounds, the need for excess reserves in the banking system has probably increased in the Eurosystem, too. In the pre-financial crisis period, a surplus of reserves of as little as a couple of billion euros towards the end of the maintenance period were sufficient to push the overnight rate (EONIA) close to the deposit facility rate, and a shortfall of reserves of a similar size had the opposite effect, i.e. interest rates rose close to the main refinancing operations rate.

Nowadays, a significantly higher level of excess reserves would be needed to keep the

9. The Federal Reserve estimated in April 2019 that the lowest level of reserve balances in the banking system ranges between USD 650 billion and USD 900 billion. The estimate was based on a September 2018 survey of banks and calculations made based on the responses.
10. The Federal Reserve provides a very detailed account of the events of autumn 2019 in the article What Happened in Money Markets in September 2019?

money market rates close to the deposit facility rate. Excess liquidity would also be needed today when steering money market rates to the middle of the interest rate corridor, as there would probably be demand among banks for excess liquidity that is not sensitive to changes in interest rates.

The higher demand for reserves is due, in particular, to the introduction in 2015 of the liquidity coverage ratio (LCR) requirement in the EU, under which banks must hold sufficient liquid assets on their balance sheet to meet their net liquidity outflows.[11] Even though certain securities, such as government bonds, are also considered liquid assets, reserves are the easiest and safest way for banks to fulfil the regulatory requirements.[12] The higher demand for reserves also reflects, for example, advances in payment systems and the increase in collateral needs, as they require banks to keep assets in a form that is as liquid as possible.

Demand for reserves is also endogenous, i.e. the selected monetary policy implementation framework and detailed content also have an impact on the demand for reserves. The mechanism operates in particular via the remuneration rate on reserves: the closer the remuneration rate on excess reserves is to money market rates, the larger the demand for reserves by banks, and vice versa.

However, tighter regulation has made money market trading between banks more expensive, which limits the banks' ability to effectively balance reserves between themselves. Even substantial incentives for balancing reserves may thus not encourage banks to balance reserves as efficiently as before. This contributes to a structural increase in the level of reserves needed in the banking system.

Estimating the level of reserves needed in the euro area is particularly challenging due to the fact that at least currently, the reserves are distributed very unevenly among banks and among countries. Moreover, in the eyes of the markets, there is still a 'sovereign-bank nexus', which could cause an outflow of reserves from a country whose economy the markets consider a case for concern. An uneven distribution of reserves could thus push up money market rates throughout the euro area if a large proportion of banks have to acquire financing from the money markets at considerably high interest rates.

A fragmentation of the euro area could therefore contribute to an increase in the structural demand for reserves. It could also increase fluctuations in the demand for reserves over time. Other elements increasing fluctuations in the demand for reserves include growth in autonomous factors, such as banknotes.

As uncertainty increases, the level of reserves needed may be considerably higher than in normal conditions. As a result, in addition to the sufficient level of reserves during normal times, the banking system may need an additional buffer of reserves. Alternatively, or to supplement the buffer, the terms of refinancing operations could be

11. The LCR requires banks to hold sufficient liquid assets to meet their net liquidity outflows during a 30-day stress period. The LCR requirement was first introduced in 2015, and it was implemented in full on 1 January 2018.
12. In December 2022, 60% of the euro area banks' high quality liquid assets (HQLA) under the LCR regulation were central bank reserves.

formulated to make the supply of reserves flexible and responsive to changes in demand, to avoid excess volatility in money market rates.

Choice of monetary policy implementation framework depends on many factors

The primary objective of the implementation framework is to control short-term money market rates, which is a prerequisite for the effective transmission of monetary policy to the economy. Short-term rates must be controlled in a sufficiently stable manner so that their volatility does not affect longer term rates on the yield curve, such as Euribor rates or government bond yields. Excess volatility in short-term interest rates may increase interest rate uncertainty, which would be reflected as a general rise in risk premia. A rise in risk premia would, in turn, weaken the transmission of monetary policy and create unnecessary extra costs for the financing of the real economy.

Interest rate control must also be resilient to changes in the level of reserves. As stated above, the level of reserves needed in the banking system can increase in a crisis very strongly in a very short period of time. The implementation framework must also be able to respond to these changes without significant shifts in short-term interest rates.

Despite the considerable rise in interest rates in the past year, the natural rate of interest in the euro area is estimated to be still well below its earlier level.[13] The lower level of the natural rate and the ECB's monetary policy strategy review statement, according to which the asset purchases, negative interest rates and longer-term refinancing operations can be used on the effective lower bound for short-term interest rates, mean that in future we could more often end up in a situation in which the level of reserves will increase as a result of accommodative monetary policy. It is also possible that measures to increase the level of reserves could become necessary in an environment of positive interest rates as well, as a way of securing the transmission of monetary policy.

The more a central bank wants to contain volatility of short-term money market rates, the more market operations it must conduct and the larger its balance sheet must be. The interbank money market does not operate as efficiently as before the financial crisis, and therefore more measures are needed for containing volatility in interest rates.

Central bank actions on the markets will displace private markets. Lower trading activity may, in turn, also influence the determination of interest rates. Having a larger balance sheet may also increase the risks to the central bank. The monetary policy implementation framework must therefore strike a balance between the volatility of money market rates and the central bank's market footprint, while taking into account the need for sufficient control of interest rates. This is because maintaining price stability by means of the monetary policy stance (i.e. in normal conditions, controlling interest rates) is the ECB's primary objective.

In estimating the appropriate size of the central bank's balance sheet, it is important to

13. For a more detailed analysis of the natural rate of interest and its outlook, see e.g. Olli Rehn's speech Whither r*? The outlook for the natural rate of interest under short-run inflationary pressures and structural shifts.

remember that the Eurosystem's balance sheet will in any case be considerably larger than in the pre-financial crisis period, due to growth in autonomous factors. In addition, the difference in excess liquidity between the corridor and floor systems is not necessarily huge relative to the balance sheet total, even though it will probably amount to several hundred billion euros. The balance sheet total is likely to be at least EUR 3,000 billion also in the foreseeable future.

Due to the increase in the balance sheet, structural operations, such as securities holdings or long-term refinancing for banks, will probably be necessary, irrespective of the implementation framework selected. The Eurosystem's operations on the financial markets will thus in any case be more extensive than in the pre-financial crisis era, irrespective of how interest rates are controlled.

In addition to interest rate control and the reduction of market footprint, the clarity and operational efficiency of the framework must also be taken into consideration. Clarity contributes to communication of the monetary policy stance to the general public and to market participants, and also facilitates the operation of market participants, particularly on the money markets. Operational efficiency, in turn, reduces the need of the central bank and of market participants for resources connected with monetary policy implementation.

Tags

ECB, monetary policy implementation