

Excess liquidity in the euro area? Assessment and possible ways forward



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Abstract

This paper analyses the operational frameworks adopted by the ECB and the consequences of a shift from the floor to the corridor system. The concept of excess liquidity in the euro area is examined, alongside discussions on market liquidity and funding liquidity. The paper emphasises the need to evaluate the implications for monetary policy effectiveness and financial stability of the different frameworks, shedding light on the role of liquidity in maintaining well-functioning financial markets.

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LIST OF ABBREVIATIONS

APP	Asset purchase programme
DFR	Deposit facility rate
ECB	European Central Bank
EONIA	Euro Overnight Index Average
€STR	Euro short-term rate
HQLA	High-quality liquid assets
LCR	Liquidity coverage ratio
LTRO	Longer-term refinancing operations
MFIs	Monetary and financial institutions
MRO	Main refinancing operations
NBFI	Non-bank financial intermediaries
NCBs	National central banks
PEPP	Pandemic emergency purchase programme
PELTRO	Pandemic emergency longer-term refinancing operations
TLTRO	Targeted longer-term refinancing operations

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EXECUTIVE SUMMARY

- Following the global financial crisis (GFC), central banks adopted asset purchases and additional liquidity operations to support expansionary monetary policy and enhance financial stability. Meanwhile, **the ECB's operational framework has shifted from a corridor system to a floor system, resulting in the accumulation of excess liquidity by banks.**
- **The paper examines different forms of liquidity (market liquidity, funding liquidity) and explains how their interdependence can impact asset values and overall market stability.** It also delves into the evolving nature of liquidity and the potential misconceptions about liquidity enhancement through asset purchase programs.
- **As the ECB turned its monetary stance into restrictive, excess liquidity has remained relatively high, prompting questions about the most suitable operational framework for the euro area.**
- **Whatever the system – corridor or floor –, the ECB will be able to steer the overnight rate (the short end of the yield curve) and to influence the long end of the yield curve.** Consequently, this choice would not be a crucial issue for monetary policy.
- **However, reverting to a corridor system will translate into a *de facto* tightening of monetary policy as the overnight interest rate would jump from the deposit facility rate (DFR) (the policy target in the floor system) to the main refinancing operations (MRO) rate (the policy target in the corridor system).** It would also entail a reduction of the size of Eurosystem's balance sheet. The implied quantitative tightening would not be neutral for the stance of monetary policy. The ECB would have to deliver clear communication on this policy shift.
- The rise of excess reserves was mainly demand-driven in the context of the GFC and then the sovereign debt crisis. Reverting to the corridor system should be conditional on the ability of the interbank market to channel liquidity among commercial banks. **As the role of interbank market has sharply decreased, there is uncertainty about the risk of reverting to a corridor system.**
- **Commercial banks may desire to hold a higher share of liquid and safe assets.** Central banks are able to provide an additional source of safe assets that would be an alternative to other safe securities such as short-term Treasury bills.
- **In a system of abundant reserves, the ECB would need to either opt for maintaining asset purchases or for providing ample liquidity to commercial banks through liquidity operations.** Asset purchase for financial stability motives may interact with monetary policy decisions. Liquidity operations are demand-driven and thus more easily adjusted to banks' needs of liquid assets.

1. INTRODUCTION

The transmission of monetary policy hinges on the effect of central banks decisions on financing conditions faced by households and non-financial corporations. To that end, central banks usually set a target for the short-term interest and conduct open-market operations to ensure that the effective overnight interest rate remains close to that target. Those operations also matter for financial stability since they enable the central banks to adjust liquidity in the money market. Until the global financial crisis (GFC), the operational framework within which liquidity provisions took place were usually viewed as a technical dimension of central banking that did neither really matter for the understanding of monetary policy nor of its effects.

To deal with the challenges raised by the GFC, central banks have resorted to asset purchases and to additional liquidity operations to reinforce the expansionary stance of monetary policy and to improve financial stability. The European Central Bank (ECB) has changed the framework through which monetary policy is implemented by moving from a corridor system to a floor system, where banks accumulate so-called “excess liquidity”, meaning liquidity amounts exceeding those consistent with minimum reserve requirements¹.

The level of liquidity in the financial system matters for financial stability. But liquidity may sometimes be an elusive notion. To that end, we first come back to the definition and measurement of liquidity in the euro area. It is interesting to note that so far, the ECB’s shift towards a restrictive stance (policy rates have increased substantially, with the deposit facility rate reaching its highest level ever after a decision on 14 September 2023, see Figure 9 in the Annex) has had only a little impact on excess liquidity.

While the resurgence of inflation has brought the Governing Council to increase interest rates and to engage in a reduction of the size of the Eurosystem’s balance sheet, a few questions arise as to what operational framework – corridor or floor system – would be best suited to the euro area economic and financial situation. Does the return to a “normal” situation (with positive interest rates) call for a return to the pre-crisis framework for the implementation of monetary policy? Does it matter for the stance of monetary policy if the ECB maintains the floor system or if it turns back to the corridor system? What would be the consequences for financial stability if excess liquidity is withdrawn as it would be the case under the corridor system?

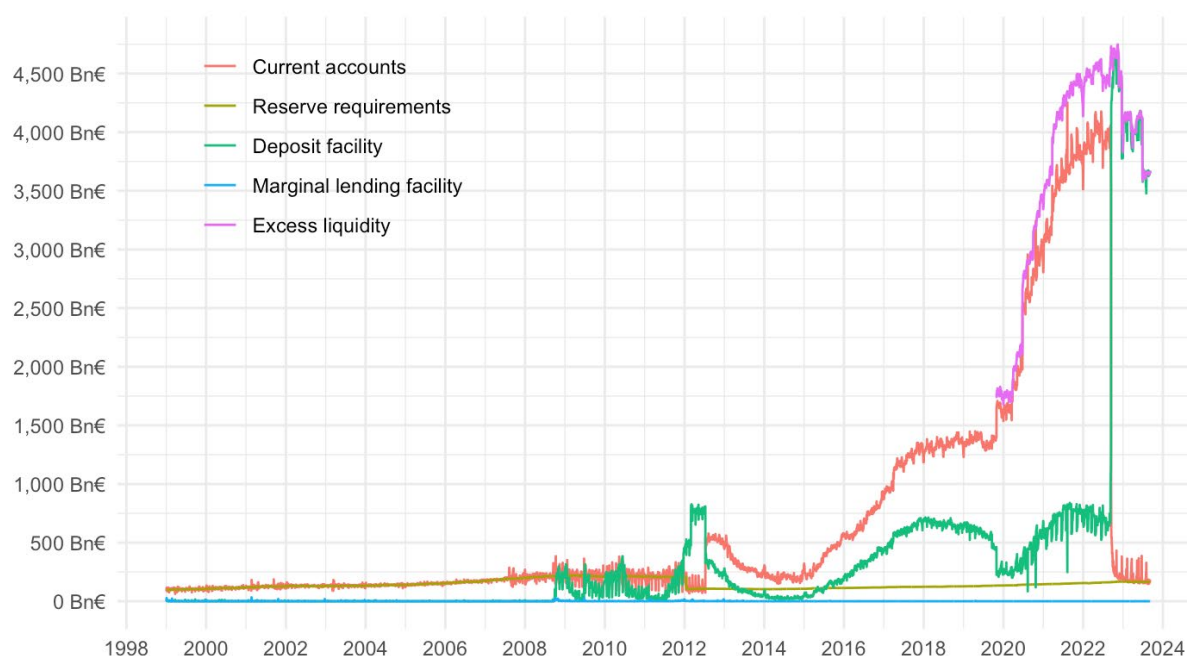
¹ Banks holding minimum reserves are meant to be better equipped in case of deposit withdrawals, therefore reducing uncertainty on the side of depositors of bank liquidity risk and ultimately limiting the risk of bank runs by depositors. While minimum reserve requirements are common monetary policy tools – the ECB sets a rate of 1% of bank deposits –, the US Fed, the Bank of Canada or the Swedish Riskbank do not apply them. In the euro area, minimum reserves have long been remunerated at the main refinancing operations (MRO) rate but in October 2022, after all ECB policy rates returned to positive territories, the ECB decided that minimum reserves would be remunerated at the deposit facility rate (always lower than the MRO). Finally, the ECB announced in July 2023 that it will stop paying interest on required reserves effective on 20 September 2023.

2. SIZING UP EXCESS LIQUIDITY IN THE EURO AREA

In the context of the ECB, excess liquidity corresponds to liquidity in the financial system in excess of banks' liquidity needs, which come from regulatory purposes (reserve requirements) and for managing day-to-day liquidity. It is thus the sum of two parts: banks' reserves above the reserve requirements ("excess reserves"), and the recourse to the deposit facility net of the recourse to the marginal lending facility.

Banks' reserves (also referred to as "current accounts") can be thought of as commercial banks' accounts at the central bank. The first component of excess liquidity therefore consists in excess reserves, or reserves in excess of reserve requirements. As shown on in Figure 1, in the first years of the euro, current accounts consisted mainly of reserve requirements, so that "excess reserves" were close to zero while deposit and marginal lending facility were not used. In other words, there was essentially no excess liquidity. Since the GFC, the deposit facility has started to be used, and has since around mid-2022 shot up to an unprecedented level, now representing the bulk of excess liquidity. Another major development is that excess reserves has also gone up quite a bit also since the GFC but even more importantly since the COVID-19 crisis and the major liquidity-providing operations (more on this below). Since mid-2022 however, excess reserves have essentially disappeared whereas excess liquidity remains at a high level. The recent decline of the latter owes to the gradual repayment of target long term refinancing operations (TLTRO III).

Figure 1: Decomposing excess liquidity: current accounts, reserve requirements, deposit facility, marginal lending facility, in € bn (from 1999)



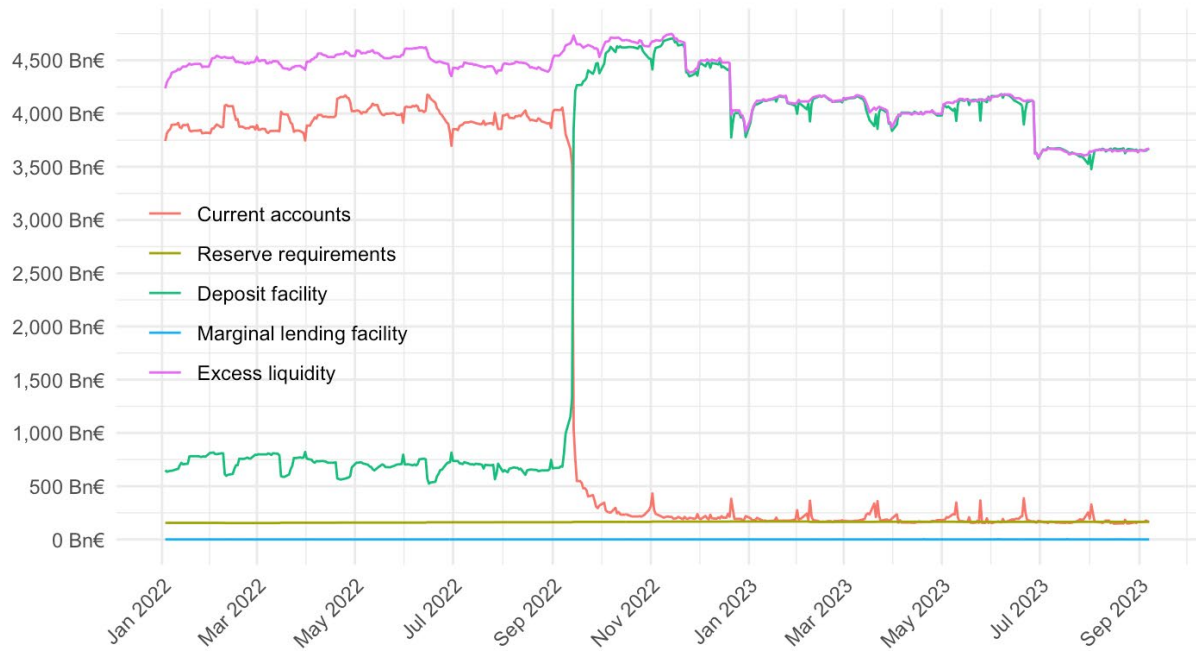
Source: ECB, authors' calculation.

Note: Excess liquidity = (Current accounts)-(Reserve requirements) + (Deposit facility – Marginal lending facility)

Such an important switch from banks' current accounts at the central bank to the deposit facility is in fact not that surprising. As shown on Figure 2, which is simply zooming in on Figure 1 starting in early 2022, it happened on 14 September 2022 when the deposit facility rate (DFR) went from 0% to 0.75%,

and so it became worthwhile to move banks' excess liquidity onto the deposit facility rather than keep it in current accounts at the central bank².

Figure 2: Decomposing excess liquidity: current accounts, reserve requirements, deposit facility, marginal lending facility, in € bn (from 2022)



Source: ECB, authors' calculation.

² From 2014 until September 2022, current accounts (or excess reserves) were remunerated at the DFR but in September 2022, the ECB announced that the remuneration rate would go back to zero.

3. MARKET AND FUNDING LIQUIDITY

While the ECB has provided liquidity that is now in excess, central banks are not the only supplier of liquidity. Banks are able to provide liquidity to one another, to households, potentially against assets as collateral. However, such liquidity can also quickly evaporate, for example during financial crises such as the GFC of 2007-2009, which is where the central bank can start to play an essential role.

3.1. Some theory: different forms of liquidity

From a theoretical standpoint, there are many ways to define liquidity, although the term is used interchangeably by financial market practitioners and central bank policymakers. In a Diamond & Dybvig (1983) model of bank runs for example, liquidity shocks refer to the need to sell an asset in order to consume early, in which case there is a need to “liquidate” the asset. Financial institutions are then useful in that they provide the type of liquidity which consumers need in order to fulfill those needs, while allowing a long-term financing of the economy (Farhi et al., 2009). Liquidity is therefore foundational to banking and henceforth, to central banking.

Liquidity comes in different flavors. Market liquidity refers to the ease to sell an asset without altering its price, while funding liquidity refers to the ease with which one can borrow against solvent assets. Treasury securities provide both for market and funding liquidity in that the market for Treasury debt is very liquid (Treasuries sell at a very small discount from their face value). This is why Treasury securities are also very good collateral.

Liquidity is important for the smooth functioning of financial markets. When liquidity dries up abruptly, a severe financial crisis can ensue and one function of central banks is then to intervene to restore liquidity in order to restore an orderly flow of funds towards needing borrowers. In fact, historically, this has even been the main function of central banks as the “lender of last resort”, even before setting short-term interest rates through the supply of liquidity on money markets (Bagehot, 1873; Monnet 2014): according to Bagehot’s dictum, during financial crises central banks should lend freely, at a penalty rate, against good collateral.

As the Silicon Valley Bank (SVB) collapse has helped show, central bank collateral policy can in fact determine what is being considered money (liquidity) and what is not. By being a provider of the ultimate form of liquidity and being able to create an unlimited supply of it, central banks can therefore make any asset potentially liquid. Another example closer to Europe is that of Greek bonds in early 2010: whether Greek bonds would be eligible for refinancing at the ECB was very important for Greek banks in desperate need for liquidity. As this example and that of SVB also show, there is never such a thing as a pure liquidity crisis: the question always is to ask whether assets sell (or refinance) for too low prices because liquidity has evaporated or because assets are poor quality. Moreover, there is also an important problem of moral hazard which the “lender of last resort” creates: if there is an anticipation of bail out, there is a contradiction between rescuing banks ex-post (for example through lower short-term interest rates) and providing good incentives ex-ante (Farhi & Tirole, 2009).

The same questions arise today, as central banks such as the ECB are withdrawing liquidity at an unprecedented pace, which could potentially trigger a liquidity crisis (although these fears have been alleviated for now and banks do not show a higher appetite for MROs, now at around EUR 7 billion, against EUR 100-300 billion before 2015 as shown on Figure 10³). But not withdrawing support now could also sow the seeds of future risk-taking by banks, encouraging them to be too illiquid.

³ See the data at https://sdw.ecb.europa.eu/quickview.do?SERIES_KEY=123.ILM.W.U2.C.A050100.U2.EUR.

3.2. Interplay between funding and market liquidity

To make matters worse, there is also an interplay between market and funding liquidity: indeed, assets used as collateral can see their values drop when market liquidity evaporates. Funding liquidity then also lowers, as the value of collateral drops, and this further leads to a decrease in market liquidity.

We can take an example for the housing market: as lending in the housing market becomes scarcer, it becomes more and more difficult to sell a house without a loss in value (market liquidity). At the same time, this implies that banks may be more reluctant to lend using housing as collateral, because the price of housing might drop even further in value. As a consequence, deteriorating market liquidity leads to deteriorating funding liquidity for housing. In turn, when it becomes harder to lend against housing collateral, new homeowners are more credit constrained and can bid up the price of housing less, which leads to a further drop in housing values (Geerolf, 2018). These mechanisms were very much operating during the global financial crisis (Brunnermeier, 2009). Market and funding liquidity are shown to feedback on each other through a self-reinforcing “liquidity spiral” (Brunnermeier & Pedersen, 2009).

3.3. How is liquidity evolving?

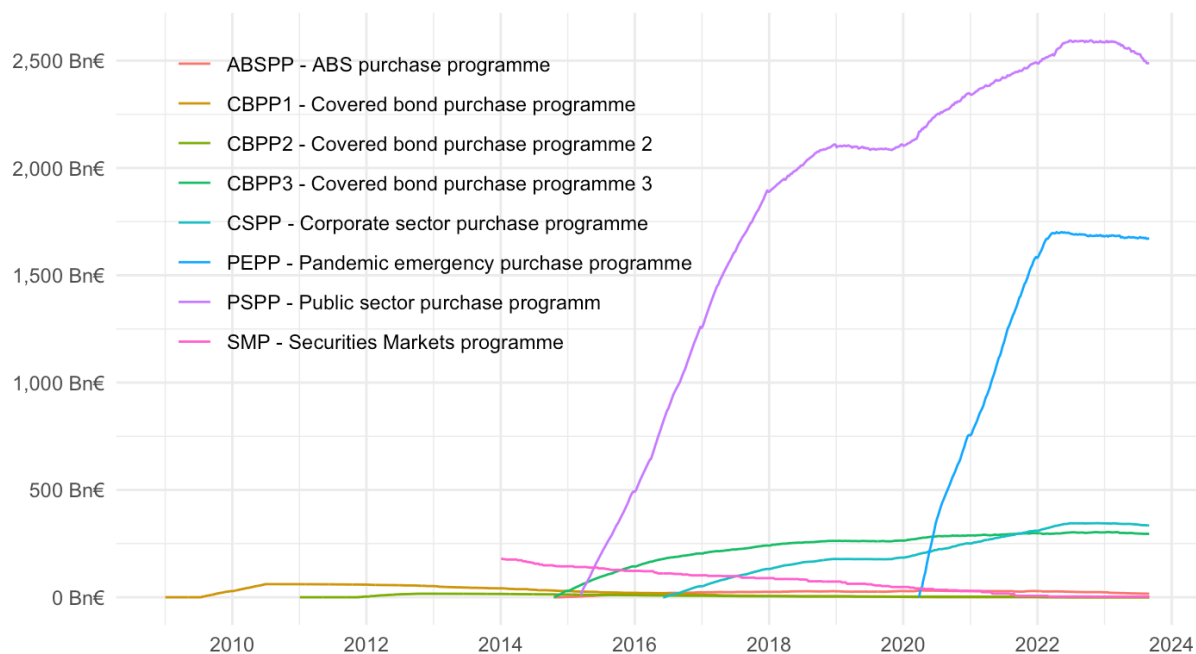
Of course, the above discussions may seem a bit abstract but they are actually essential if one wants to interpret the data well. For example, do asset purchase programmes shown in Figure 3 clearly add liquidity to the financial system? They do add to excess liquidity according to the most standard definition of liquidity, which was mentioned before.

At the same time, if one takes a more economic view of liquidity, centering around a liquid instrument created in the market, then central banks buying assets which were already liquid, are not clearly adding much liquidity to the system. Lending against a Treasury bond creates liquidity but only if that Treasury bond was not being used elsewhere as helping provide liquidity. Some economists even consider that Treasury bonds are a form of money (Krishnamurthy & Vissing-Jorgensen, 2012). Similarly, if a central bank buys collateral which is already high quality, and liquid in itself on financial markets, then it's not clear whether swapping such an asset with central bank money really adds much liquidity to the system. For this reason, the numbers for “excess liquidity” given before should perhaps be put into some perspective depending on one's definition of liquidity.

Finally, Figure 4 shows the annual growth rate in monetary aggregates, with an unprecedented decline at least since 1980 in M1 as well as a large drop in M3⁴. This large decline in M1 reflects the repayment of TLTROs, as well as the effects of (very gradual) quantitative tightening. The drop in lending by banks reflected in M3 is also not surprising given the increase in interest rates which is discouraging borrowing by both firms and households. Monetary policy transmission is thus quite effective in that the rise in short term rates does indeed transmit into the higher end of the yield curve (higher long-term rates) as well as lower lending volumes by both firms and households, which is used to slow down the euro area economy.

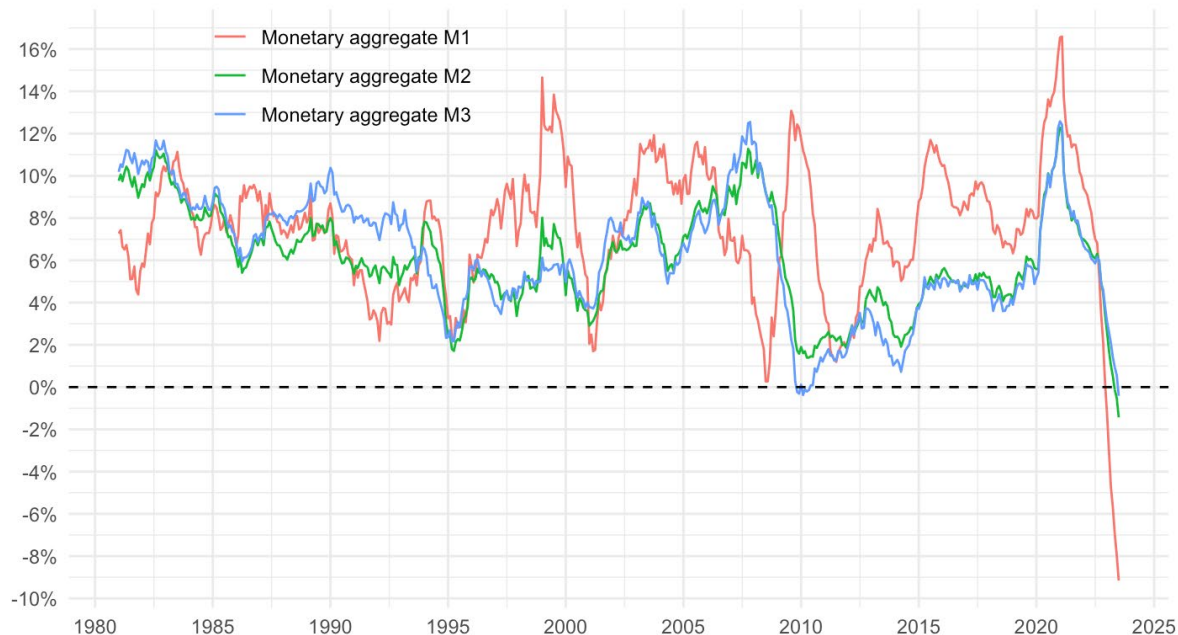
⁴ M1 is the sum of the most liquid liabilities of both the central bank and commercial banks (currency in circulation, overnight deposits). M3 also includes deposits with a longer maturity (up to 2 years), repurchase agreements and money market instruments.

Figure 3: ECB's asset purchase programmes (ABSPP, CBPPs, CSPP, PEPP, PSPP, SMP), holdings



Source: ECB, authors' calculation.

Figure 4: Annual growth rate in monetary aggregates: M1, M2, M3



Source: ECB, authors' calculation.

4. KEY ISSUES AND IMPLICATIONS OF THE FLOOR AND CORRIDOR SYSTEMS

The rise of excess liquidity that the former sections have discussed has been an indirect consequence of the shift of the monetary stance towards more accommodation when policy rates had hit the zero (or effective) lower bound. It is this change in the monetary stance that has required a change in the operational framework of the ECB.

The operational framework depends on the structure of the financial system, notably the role of banks and financial markets in the financing of non-financial agents. The operational framework has implications on the ability of central banks to control the interest rate that matters for monetary policy and on the provision of liquidity that matters for financial stability. The money supplied by central banks – also called monetary base or high-powered money – consists in banknotes, held by the public, and reserves, which can only be held by commercial banks as deposits at the central bank. While the public needs banknotes for transactions, banks use reserves to comply with required minimum reserves, make transactions with other banks and satisfy their objective of liquid assets holding. For central banks, liquidity management boils down to the setting of the appropriate amount of reserves supplied to the financial system.⁵

Central banks may then either opt for a corridor system or for a floor system.⁶ As will be explained below, the nature of the equilibrium for overnight interest rates crucially depends on the system adopted by the central bank.⁷

4.1. Monetary policy with or without abundant reserves

In the euro area, the ECB sets three policy rates: marginal lending facility rate (MLF), MRO rate and DFR. The MRO rate is the minimum interest rate applied to weekly liquidity operations proposed by the ECB. Commercial banks can also obtain overnight liquidity or place overnight deposits through the standing facilities – lending and deposits – at interest rates respectively above and below the MRO rate. Thus, in a corridor system, the interest rate on the MLF normally provides a ceiling for the overnight interbank market interest rate and the DFR provides a floor.

The ECB requires commercial banks to hold required minimum reserves and provides them with liquidity through regular main and longer-term refinancing operations. Banks may also hold deposits above required reserves. These excess reserves may be transformed into deposit facilities or remain on the current account as excess reserves.⁸

In both the corridor and the floor systems, the demand for reserves (by banks) decreases with the overnight interest rate. Under the corridor system, the ECB adjusts the supply of reserve through liquidity operations to bring the euro area market overnight interest rate (EONIA before October 2019 and the Euro Short-Term Rate, €STR, after October 2019) as close as possible to the MRO rate. Thus, the MRO is the interest rate targeted by the ECB to signal the stance of monetary policy. The supply of

⁵ In practice, the ECB sets the amount allotted through refinancing operations – MRO and LTRO – and may decide to purchase securities. Reserves are thus the counterparts of these liquidity operations and asset purchases.

⁶ See Keister (2012) for a presentation of the two systems.

⁷ The overnight interest rate is a market rate at which banks borrow and lend to each other overnight.

⁸ The remuneration of excess reserves and deposit facilities may differ, thus triggering trade-offs.

reserves is calculated to avoid excessive fluctuations of the overnight interest rate.⁹ Consequently, the ECB needs to anticipate the liquidity needs of banks. In such a system, there is no – or only a small amount – of reserves beyond required reserves. Under the floor system, the supply of reserves exceeds the demand from banks and therefore results in excess reserves and extra deposit facilities.¹⁰ As a consequence, the market overnight interest rate is in theory stuck to the DFR, which becomes de facto the target policy rate of the ECB. Things are somewhat more complicated in practice due to the so-called “leaky floor” issue: as shown on Figure 5, the overnight interest rate can in fact go below the deposit rate, because non-bank financial institutions which do not have access to the central banks’ facilities cannot deposit at the central bank. To deposit their funds at the central bank, non-banks have no other choice than to lend to banks on the money market, and in so doing pay an intermediation fee in the form of a lower interest rate. In such a situation, the overnight interest rate can go lower than the deposit rate.

Figure 5 illustrates the difference between the two systems. From January 1999 to October 2008, the overnight interest rates closely fluctuated around the MRO rate and the amount of excess reserves (plus deposit facilities) was close to zero on average.¹¹ The implementation of non-standard measures after October 2008 has triggered an increase in the amount of reserves exceeding required reserves and pushed the overnight rate down to the DFR.

While the introduction of the floor system coincided with the introduction of unconventional measures during the GFC, there is no a priori reason that the system may not subsist in a “normal” situation. Indeed, the floor system has neither prevented the ECB from tightening monetary policy since July 2022, by increasing the MRO rate and the DFR, nor from starting the phasing out unconventional measures.¹² As illustrated in Figure 1, the €STR has largely increased after the decisions of the ECB to tighten monetary policy. In August, it was around 3.75%, the DFR, which remains de facto the target for the policy rate.

It is noteworthy that whatever the monetary policy system – corridor or floor –, the ECB will still be able to steer the overnight rate (the short end of the yield curve). Moreover, monetary policy decisions on the policy rate have also been passed-through the long end of the yield curve (Figure 6).¹³ Consequently, the choice of the system does not seem to impinge on the transmission of interest rate decisions. However, if the ECB aims at keeping asset purchases in its toolbox, it will have to maintain the floor system. The choice of the system is related to the choice of the instrument of monetary policy but in both systems, the transmission channels of decisions are unaffected.

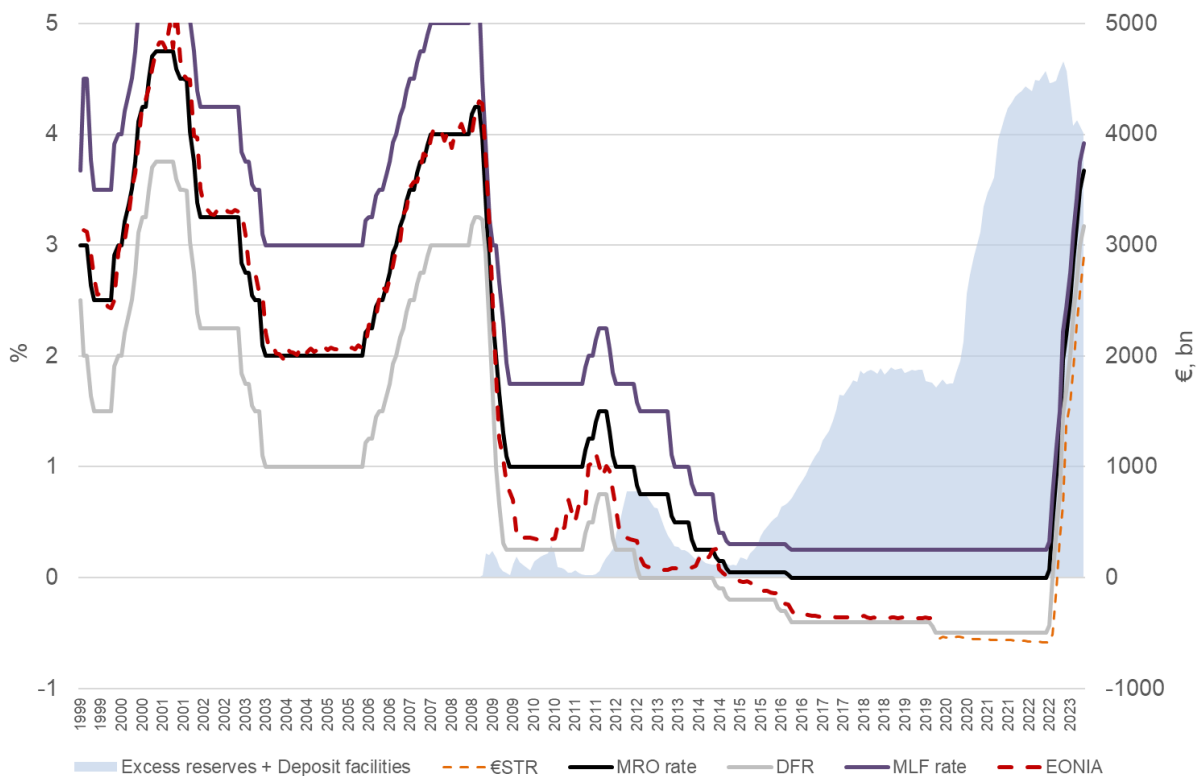
⁹ To that end, the Eurosystem mainly needs to assess the components determining the demand for reserves of the banking system. It depends on minimum required reserves but also on the autonomous factors, not controlled by the central bank.

¹⁰ It may be noticed that under the floor system, banks have a large access to liquidity notably because of the Fixed-rate / Full-allotment policy (FR/FA). All liquidity needs are satisfied by the ECB. However, in reality, the access to central bank’s liquidity is not unlimited since commercial banks may obtain liquidity as long as they are able to provide collateral.

¹¹ On a daily basis, fluctuations of the overnight rate around the MRO are more volatile (See Figure 11 in Appendix) and excess reserves also exhibit some volatility around zero before October 2008 (See Figure 12 in the Appendix).

¹² The implementation of non-standard measures aimed at providing additional liquidity to reduce financial instability and to circumvent the zero lower bound.

¹³ Even though we observe a reversion of the yield curve, it is not specific to the floor system and such a feature has already been observed before.

Figure 5: Excess reserves and deposit facilities in the euro area, in EUR billion

Source: ECB.

Note: the EONIA rate was the reference for the overnight interbank market until September 2019. The €STR replaced the EONIA as a reference since October 2019 as the regulator considered that the EONIA was not robust and reliable. The €STR is exclusively based on borrowing transactions in euro conducted with financial counterparties (including non-bank financial institutions) that banks report to the ECB.

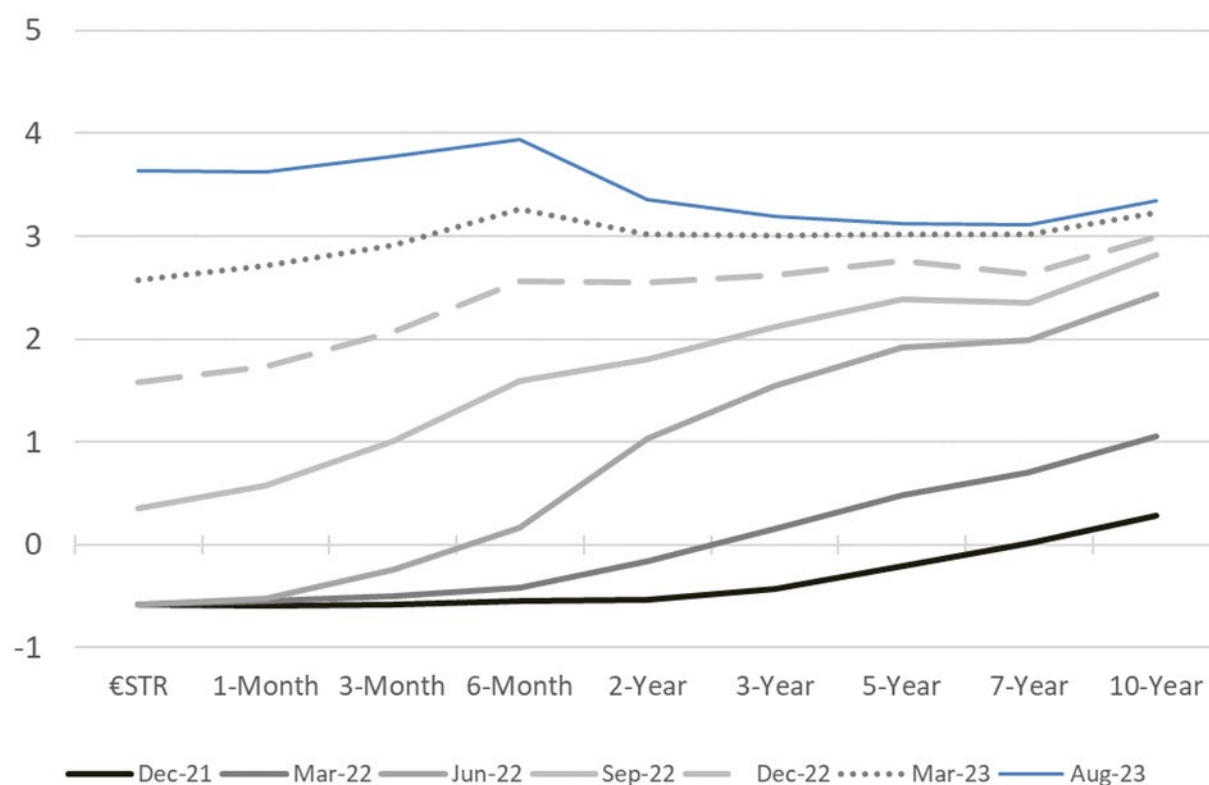
It is noteworthy as well that changes in the amounts of excess reserves and the transmission of monetary policy decisions have been disconnected. While returning to a corridor system can only be realised if the amount of excess reserves converges to zero, the recent decrease in excess reserves following the repayment of liquidity operations (TLTRO III) has not been reflected in the overnight rate since excess reserves and deposit facilities remain positive, as a counterpart to the holding of securities (mainly Treasuries) held for monetary purposes within the APP (See Figure 13 in the Annex).

Consequently, the choice between a corridor and a floor system would apparently not be a crucial issue for monetary policy. Yet, reverting to a corridor system will translate into a de facto tightening of monetary policy of $\frac{1}{2}$ point that corresponds to the convergence of the overnight interest rate from the DFR (where it stands under the floor system) to the MRO rate (where it will stand under the corridor system). In this respect, the ECB will have to deliver clear communication on this policy shift. This decision also necessarily involves a sharp reduction of the size of the Eurosystem's balance sheet via the decrease of securities holdings. Such a decision involving quantitative tightening will not be neutral for financing conditions and thus for the implicit stance of monetary policy. Choi et al. (2022) have quantified the effect of the phasing out of US non-standard measures by the Fed. To that end, they calculate a proxy for policy rate accounting for non-standard measures and suggest that this implicit policy rate would have been 2 points higher than the Fed funds target in September 2022.

To sum up, the transition from a floor system to a corridor system could matter for the stance of monetary policy but less so on the channels of transmission. It remains to be discussed whether such a

transition could hamper financial stability since it would imply a reduction in the liquidity provided by the ECB.

Figure 6: The term structure of interest rates for the euro area, in %.



Source: Refinitiv Eikon Datastream.

4.2. Issues beyond monetary policy

As indicated above, the floor system inherently entails a supply of excess reserves. What are the benefits of maintaining excess reserves? Conversely, are there costs associated with a persistent level of excess reserves?

Commercial banks may desire to hold reserves beyond the need to fulfill minimum reserve requirements and for transactions with other banks. GFC has highlighted the key role of liquidity for financial stability and regulation has been strengthened to improve the ability of banks to deal with adverse liquidity shocks. Within Basel III post-crisis reforms, banks are now required to hold a sufficient reserve of high-quality liquid assets (HQLA) to ensure that they would be able to survive a period of liquidity stress. The Liquidity Coverage Ratio (LCR) should reach at least 100% of the total net cash flows over the next 30 calendar days. Reserves held at the ECB are considered as an asset that can be included in HQLA without limit. Beyond prudential regulation, commercial banks may have their own objectives of liquid assets creating a potential additional demand for reserves.

Borio (2023) emphasizes three potential costs if the floor system is maintained. First, as banks have a full access to the central bank's liquidity, they do not need to trade on the overnight market, which becomes withered. In a way, the floor system "kills" the overnight market. Borio (2023) also claims that transactions beyond the overnight market may be affected. Thus, we may fear that some skills have been lost if desks operating on the overnight market have been dismantled. This feature may be detrimental to non-bank financial intermediaries (NBFI) as they are more reliant on the interbank

market to have access to liquidity.¹⁴ Second, even if banks have full access to central bank's liquidity, the demand for reserves may be bound by available eligible collateral. The higher the demand for reserves, the higher banks need to pledge collateral. The floor system may thus trigger collateral scarcity and market distortions.¹⁵ The shortage of a good collateral may negatively affect access to liquidity and thus capital markets financing. Meanwhile, the PSPP also reduces the available collateral as more public securities are held by the ECB and less become traded between other financial investors. Finally, the provision of abundant liquidity at low cost – and even negative costs for some TLTRO operations – may be seen as a subsidy to the commercial banks.

4.2.1. Is interbank market frozen or “dead”?

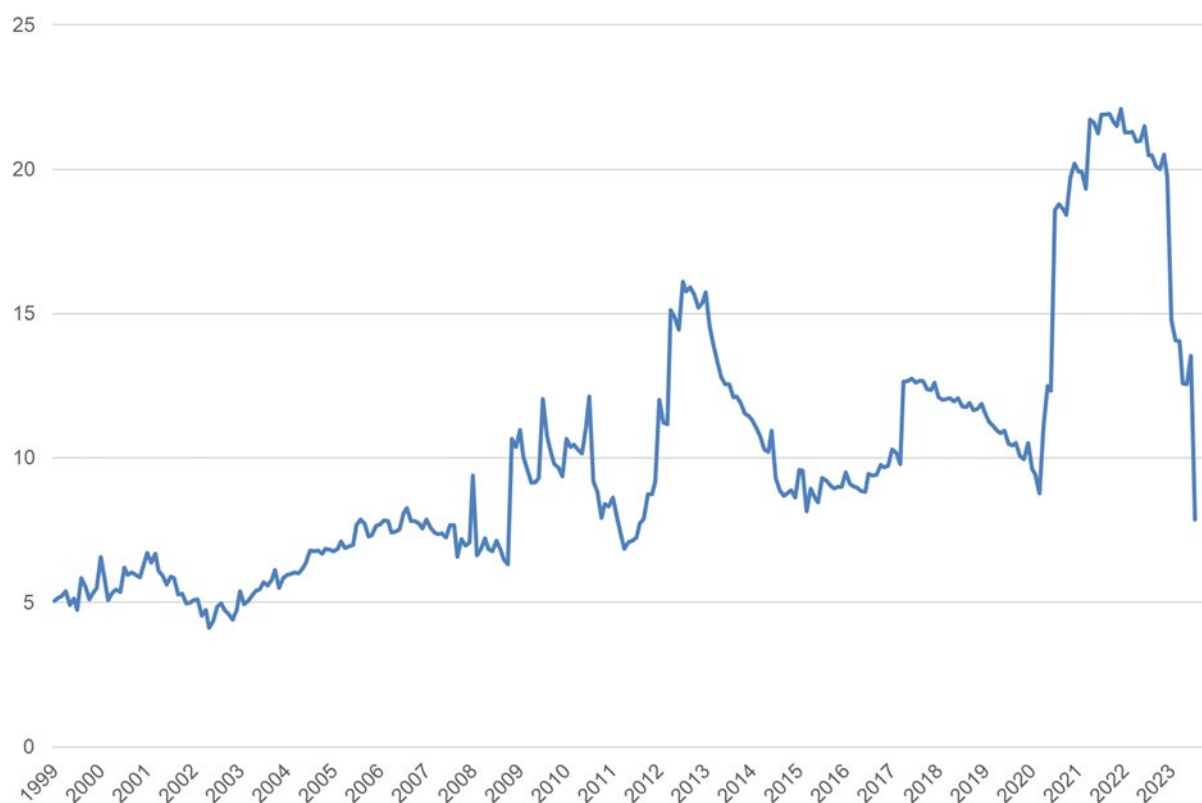
If the overnight market has been “killed” by excess reserves, it may be hard to revert to the corridor system. But the skills that have been lost can be found as long as banks are prepared, and a transition period is scheduled. The key issue is not about banks' capacities to trade in the overnight market but their willingness to trade. In the euro area, the floor system started because of important liquidity needs of banks that were not satisfied by the interbank market. The initial causality was thus reversed and excess reserves were needed because the overnight market was already “dead”. The rise of excess reserves was mainly demand driven in the context of the GFC and then the sovereign debt crisis. Banks with high liquidity were reluctant to lend to banks with liquidity needs. The banking system required more intermediation from the ECB, especially banks in the periphery that had lost the ability to get refinancing from other banks. The role of the ECB was to meet this demand by changing the operational framework in order to provide abundant liquidity and thus avoid a widening of the financial stress. For instance, it proposed two liquidity operations in December 2011 and February 2012 with a three-year maturity (VLTRO). Those operations notably benefited banks in Italy and Spain that were the main bidder whereas German banks did not take much part to it (BIS, 2012). It resulted in a higher share of refinancing intermediated by the ECB, which reached a first peak above 15% (Figure 7). The ECB's intermediation has gained further importance for MFIs during the pandemic period as a consequence of the PELTRO and TLTRO.

Is the interbank market still alive? It is hard to answer the question since it is of no utility in the current floor system with excess reserves. However, one can observe that the share of refinancing intermediated by the ECB has shrunk since the start of 2023 as some of those liquidity operations have come to an end. Such a reduction may be interpreted as a reduction in the demand for reserves in the banking system. However, the level of banks' current account balances exceeding required reserves remains high because of the APP so that banks still benefit from abundant liquidity that was so far mostly supply-driven. The key issue is thus whether there may still be financial stress on interbank and sovereign markets that would require the floor system to remain in place.¹⁶

¹⁴ NBFIs have no access to the ECB liquidity operations.

¹⁵ See Arrata et al. (2020).

¹⁶ The sovereign debt crisis in the euro has highlighted how sovereigns and banks are interconnected. See Shambaugh (2012).

Figure 7: Interbank refinancing intermediated by the ECB, in %

Sources: ECB, authors' calculations.

Notes: the ratio of ECB's intermediation is computed as the share of ECB lending to euro area monetary financial institutions (MFI) on MFI's total deposits.

As a consequence, there is uncertainty about the risk of reverting to a corridor system. The weakness of interbank markets mainly reflects the fact that reserves are still abundant as a consequence of the floor system. It cannot strictly be interpreted as the evidence of a fragmented euro area interbank market. It remains that money markets may be less predictable than in the past. In September 2019, a sudden stress in the US repo market led the Federal Reserve to intervene and supply more reserves interrupting the reduction of its balance sheet, which had been initiated in the end of 2017. The bankruptcy of some important but not major banks in the US and the troubles of Credit Suisse in Europe have revived concerns about banks' fragility. Although this episode cannot be compared to the banking system crisis of 2007-2008, it recalls that financial stability cannot be overlooked.¹⁷

4.2.2. The need of excess reserves to satisfy the demand for liquid/safe assets

Beyond the need to satisfy the LCR, commercial banks may desire to hold a higher share of liquid and safe assets. Central bank reserves meet these two features of being liquid and safe. Greenwood, Hanson & Stein (2013) claim that there may be some benefits of keeping abundant reserves for financial stability. As central banks have the monopoly power to issue reserves, they are able to provide an additional source of a safe assets that would be an alternative to other safe securities such as short-term Treasury bills. This would notably matter if the stock of Treasury securities is limited. The supply of reserves by central banks does not face the same constraints which may make them an appealing source of liquidity especially if governments aim to reduce public debt – and thus issue less securities

¹⁷ In September 2019, a sudden stress in the US repo market has led the Federal Reserve to intervene and supply more reserves interrupting the reduction of its balance sheet.

– or if financial investors do not view all Treasury securities as safe assets. Caballero et al. (2017) argue that the list of safe assets has been reduced after the GFC, with the notable exclusion of Italian and Spanish sovereign securities.

In the extreme case where Italian and Spanish short-term Treasury securities are not be considered as a safe asset, only French and German Treasury bills would satisfy the demand for liquid and safe assets. If we consider that demand for liquid grows with the size of MFIs, Treasury bills may represent at least a constant share of their balance sheet.¹⁸ In 2007, securities issued by the four major euro area countries (considered safe assets at the time) represented 16.7% of the MFIs balance-sheet. In 2022, if only the German and French bonds are viewed as safe and liquid, the demand for liquid and safe assets would not be satisfied as both securities represent 14% of the balance sheet (Figure 8).¹⁹ Consequently, if the French and the German governments do not increase their supply of securities, there may be a lack of safe and liquid assets denominated in euros.²⁰ It remains that the rise of public debt is not compatible with existing fiscal rules. In practice, only Germany might be able to issue additional safe assets as German public debt is below 70% of GDP in 2022 (and close to the debt target at 60% of GDP) whereas France, Italy and Spain exceed 110% of GDP. But German national fiscal rules may certainly impede the supply of debt so that maintaining a floor system with abundant reserves issued by the ECB could be viewed as an alternative: it would permit banks to continue holding excess reserves for financial and banking stability reasons in a lower public debt environment.

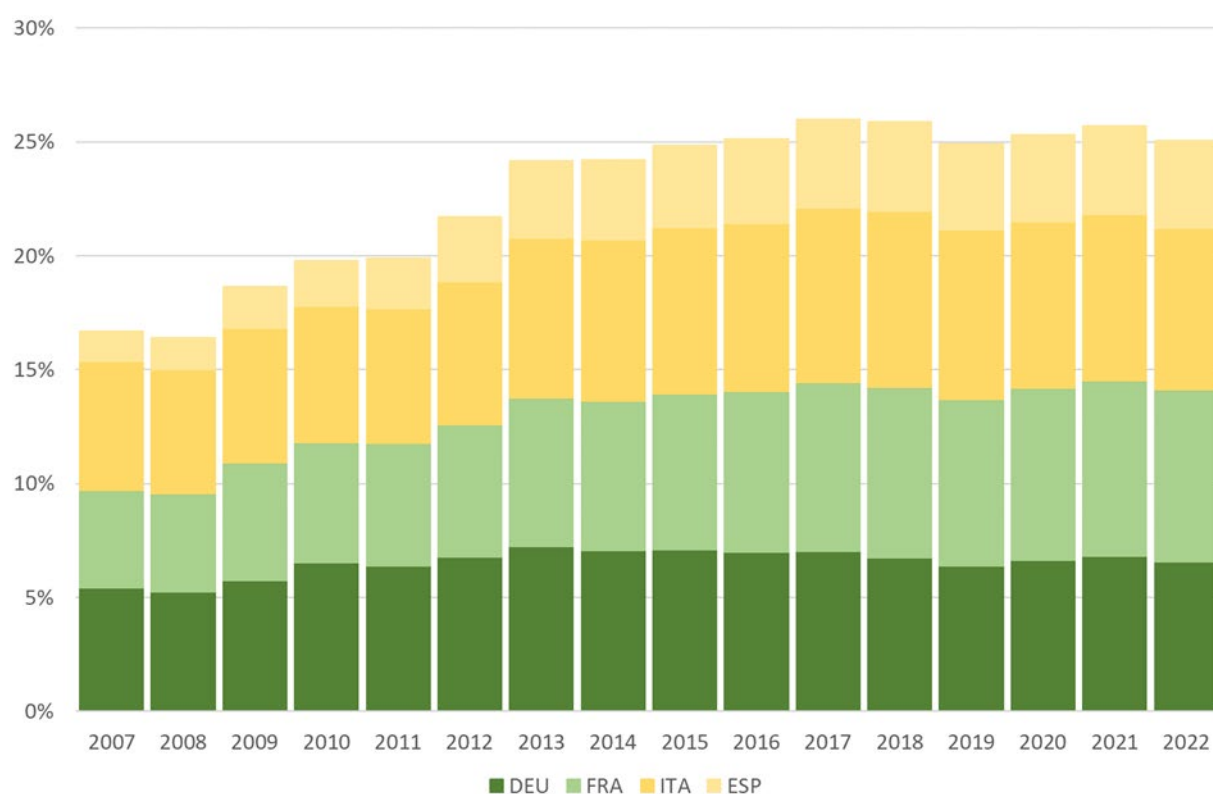
4.2.3. Supplying excess reserves through asset purchases or liquidity operations

In the case where it would be desirable to maintain an abundant level of central bank reserves, the ECB should decide whether those reserves are created through asset purchases or by liquidity operations. If the ECB needed to adjust asset purchases in order to meet the need of liquid asset. It would entail an alternance of periods of QE and QT that may interact with the decisions on the short-term policy rate. For instance, the ECB may decide to tighten monetary policy but need to issue additional reserves through purchases of additional long-term debt. Decisions on the short-term policy rate would be for monetary purpose whereas asset purchases would be taken for financial stability. As the transmission of monetary policy hinges on its pass-through to other interest rates, there would be inevitably interactions between the price stability objective and the financial stability objective.

¹⁸ Actually, it may even be a growing share of the financial system.

¹⁹ Public debt is measured as the total debt of the public sector, including federal and local governments.

²⁰ It is not yet clear what would be the share of public securities held by MFIs if the Eurosystem would not have bought a large share of newly issued Treasury securities.

Figure 8: Public debt in % of the size of MFIs total assets

Sources: ECB, Eurostat, authors calculations.

Moreover, the purchase of public securities by the Eurosystem would reinforce the scarcity effects emphasized above, particularly for less abundant securities such as German bonds. Therefore, it is not clear that this option would solve the problem of availability of safe liquid assets.²¹ To circumvent this shortcoming, it would be needed to buy public securities issued by countries where securities are not viewed as safe assets by financial investors. In other words, the ECB would transform “unsafe” securities issued by Italy and Spain into “safe” reserves. This option entails regular and even permanent deviations from capital keys and thus potential distributive effects of ECB decisions.

The alternative is to provide reserves through liquidity operations. In that case, the ECB would offer important amount of refinancing by maintaining “special” (targeted or long-term) refinancing operations (with full allotment) to satisfy a potential demand. There would be no distortions on sovereign markets and it would be demand driven whereas it is supply driven if it is related to asset purchases. This scenario is close to the choice made by the ECB at the beginning of the GFC. Liquidity operations would be decoupled from the monetary policy stance. A separation principle would prevail.²²

In both cases, there is uncertainty concerning the equilibrium level of reserves that would be needed to maintain the floor system and meet the demand of safe liquid assets. At the end, it crucially depends on the level of excess reserves needed to reach the flat part of the demand curve. However, estimating the floor level of excess liquidity is a tricky issue (Åberg et al., 2021).

²¹ The constraint may be less binding if one considers that keeping an asset purchase programme may not imply rising purchases. The system may be maintained but with periods of QE and periods of QT. The Eurosystem would hold a variable amount of Treasury securities and adjust its purchases according to financial stability motives.

²² Bordes & Clerc, 2013.

5. CONCLUSION

The transmission of monetary policy and the management of liquidity play crucial roles in ensuring adequate financing conditions for households and non-financial corporations. The global financial crisis prompted central banks, including the ECB, to adopt unconventional measures, such as asset purchases and liquidity operations, to support expansionary monetary policy and enhance financial stability.

The ECB's shift from a corridor system to a floor system resulted in the accumulation of excess liquidity by banks, contributing to the ongoing challenges in defining and measuring liquidity in the euro area. The ECB has made efforts to implement a more restrictive stance. Meanwhile, excess liquidity has remained at a relatively high level, prompting questions about the most appropriate operational framework for the euro area. But given the size of the Eurosystem's balance sheet (and taking into account the current gradual approach to QT), excess liquidity is here to stay as it will take some time to reduce holdings of those securities without triggering large asset price swings.

This paper highlights the importance of evaluating the long-term implications of different operational frameworks on monetary policy effectiveness and financial stability. The interplay between market liquidity and funding liquidity further emphasizes the need for a comprehensive understanding of liquidity dynamics in order to anticipate and mitigate potential risks.

To ensure a "normal" situation with positive interest rates, it is vital to consider the potential consequences of returning to pre-crisis frameworks for the implementation of monetary policy. Whether the ECB maintains the current floor system or reverts to the corridor system, thorough assessments of their impact on financial stability should be conducted.

Furthermore, a holistic perspective on liquidity, taking into account both central bank liquidity provision and liquidity provided by financial institutions, to both banks and non-banks which do not currently have access to central banks' facilities, is essential for maintaining smooth functioning of financial markets and avoiding potential liquidity crises. Understanding the intricate relationship between market liquidity and funding liquidity provides important insights into the dynamics of asset values and their impact on market stability.

In summary, this paper emphasizes the significance of liquidity management in the context of monetary policy transmission and financial stability. By critically examining operational frameworks, liquidity definitions, and the interdependence between different forms of liquidity, policymakers and market participants can make informed decisions to foster stable and resilient financial systems.

Finally, it can be stated that in a way, monetary policy has been successful in achieving the objectives it had set for itself. Liquidity has started to dry up, which is what the ECB wanted, probably in order to cool lending and, from a monetary perspective, to decrease inflationary pressures. However, one can wonder whether such a decrease in lending should be seen as good news given that inflationary pressures have been triggered by a negative supply shock, and that the euro area is approaching closer to recessionary territories.

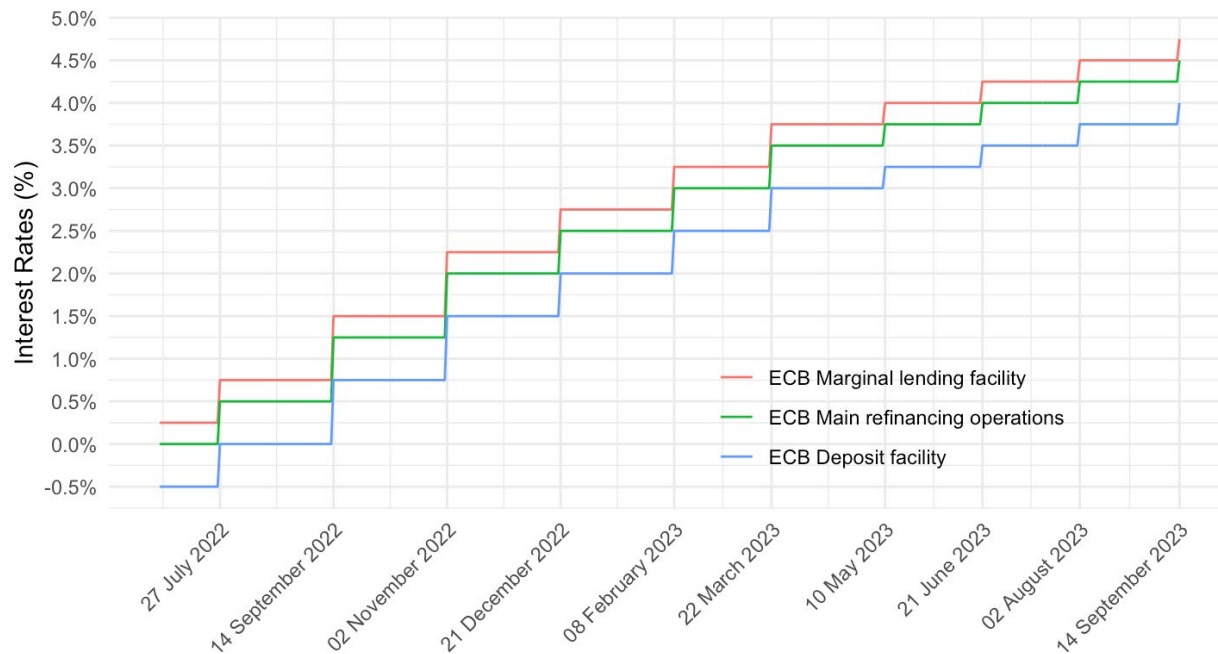
REFERENCES

- Åberg, P., Corsi, M., Grossmann-Wirth, V., Hudepohl, T., Mudde, Y., Rosolin, T., & Schobert, F. (2021). [Demand for central bank reserves and monetary policy implementation frameworks: the case of the Eurosystem](#). *ECB occasional paper*, (2021/282).
- Arrata, W., Nguyen, B., Rahmouni-Rousseau, I., & Vari, M. (2020). [The scarcity effect of QE on repo rates: Evidence from the euro area](#). *Journal of Financial Economics*, 137(3), 837-856.
- Bagehot, W. (1873). [Lombard Street. A Description of the Money Market](#).
- BIS (2012). [European bank funding and deleveraging](#). *BIS Quarterly review*, March, 1-12.
- Bordes, C., & Clerc, L. (2013). [The ECB's separation principle: does it 'rule OK'? From policy rule to stop-and-go](#). *Oxford Economic Papers*, 65(suppl_1), i66-i91.
- Borio, C. (2023). [Getting up from the floor](#). *BIS Working Papers*, n°1100.
- Brunnermeier, M. K. (2009). [Deciphering the Liquidity and Credit Crunch 2007—2008](#). *Journal of Economic Perspectives*, 23(1), 77-100.
- Brunnermeier, M. K., & Pedersen, L. H. (2009). [Market Liquidity and Funding Liquidity](#). *The Review of Financial Studies*, 22(6), 2201-2238.
- Caballero, R. J., Farhi, E., & Gourinchas, P. O. (2017). [The safe assets shortage conundrum](#). *Journal of economic perspectives*, 31(3), 29-46.
- Choi, J., Doh, T., Foerster, A., & Martinez, Z. (2022). [Monetary Policy Stance Is Tighter than Federal Funds Rate](#). *FRBSF Economic Letter*, 30.
- Dang, T. V., Gorton, G., & Holmström, B. (2020). [The Information View of Financial Crises](#). *Annual Review of Financial Economics*, 12(1), 39-65.
- Diamond, D. W., & Dybvig, P. H. (1983). [Bank Runs, Deposit Insurance, and Liquidity](#). *Journal of Political Economy*, 91(3), 401-419.
- ECB (2012). [ECB Monthly Bulletin](#), February 2012. Box 2.
- Farhi, E., Golosov, M., & Tsyvinski, A. (2009). [A Theory of Liquidity and Regulation of Financial Intermediation](#). *Review of Economic Studies*, 76, 973-992.
- Farhi, E., & Tirole, J. (2009). [Leverage and the Central Banker's Put](#). *American Economic Review*, 99(2), 589-593.
- Farhi, E., & Tirole, J. (2012). [Bubbly Liquidity](#). *The Review of Economic Studies*, 79(2), 678-706.
- Fleming, M. J. (2012). [Federal Reserve Liquidity Provision during the Financial Crisis of 2007–2009](#). *Annual Review of Financial Economics*, 4(1), 161-177.
- Geerolf, F. (2018). [Leverage and Disagreement](#). Working Paper, UCLA.
- Gorton, G., & Metrick, A. (2012). [Securitized banking and the run on repo](#). *Journal of Financial Economics*, 104(3), 425-451.
- Greenwood, R., Hanson, S. G., & Stein, J. C. (2016). [The Federal Reserve's balance sheet as a financial-stability tool](#). *Proceedings of the Jackson Hole Economic Symposium of the Federal Reserve Bank of Kansas City*
- Keister, T. (2012). [Corridors and floors in monetary policy](#). *Liberty Street Economics*, 4.

- Krishnamurthy, A., & Vissing-Jorgensen, A. (2012). [The Aggregate Demand for Treasury Debt](#). *Journal of Political Economy*, 120(2), 233-267.
- Monnet, E. (2014). [Monetary policy without interest rates: Evidence from France's Golden Age \(1948 to 1973\) using a narrative approach](#). *American Economic Journal: Macroeconomics*, 6(4), 137-169.
- Shambaugh, J. C. (2012). [The euro's three crises](#). *Brookings papers on economic activity*, Spring, 157-231.
- Tirole, J. (2006). [The Theory of Corporate Finance](#). Princeton University Press.

ANNEX

Figure 9: Dates of change of Key policy interest rates



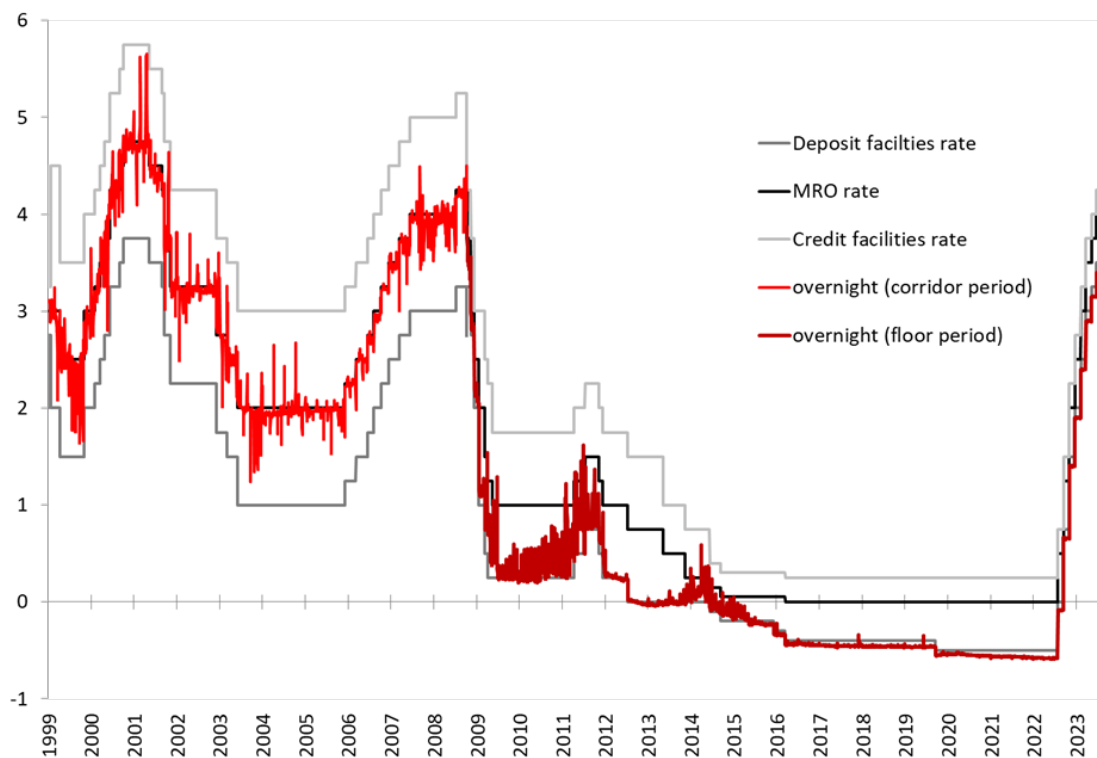
Sources ECB.

Figure 10: Main refinancing operation in the Eurosystem



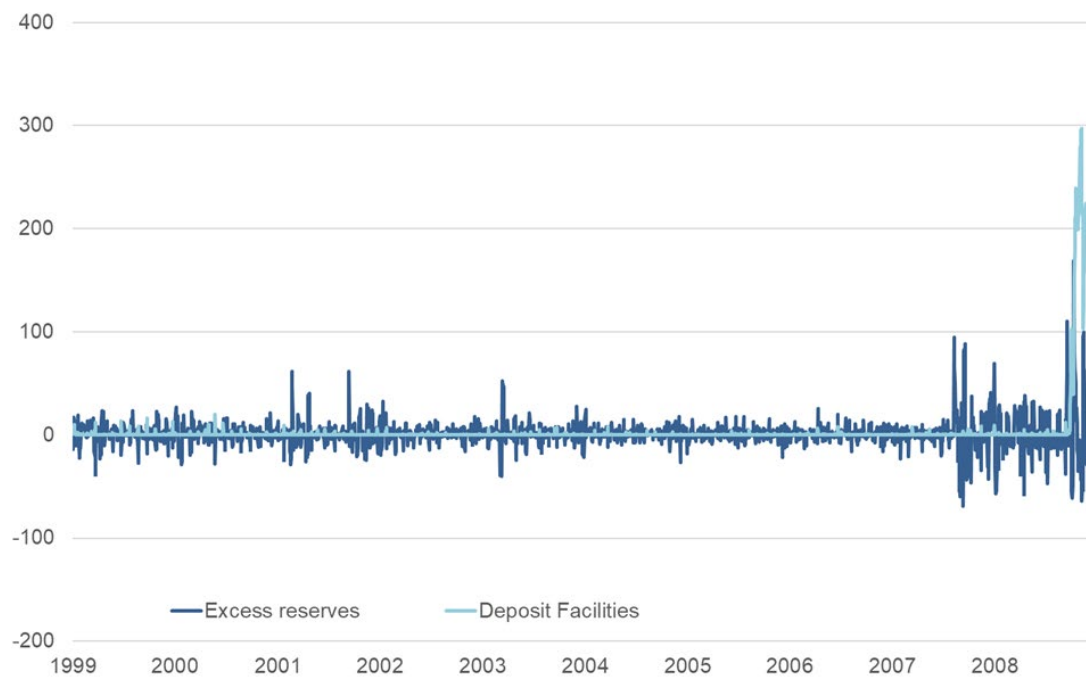
Sources ECB.

Figure 11: Overnight and policy rates, in %



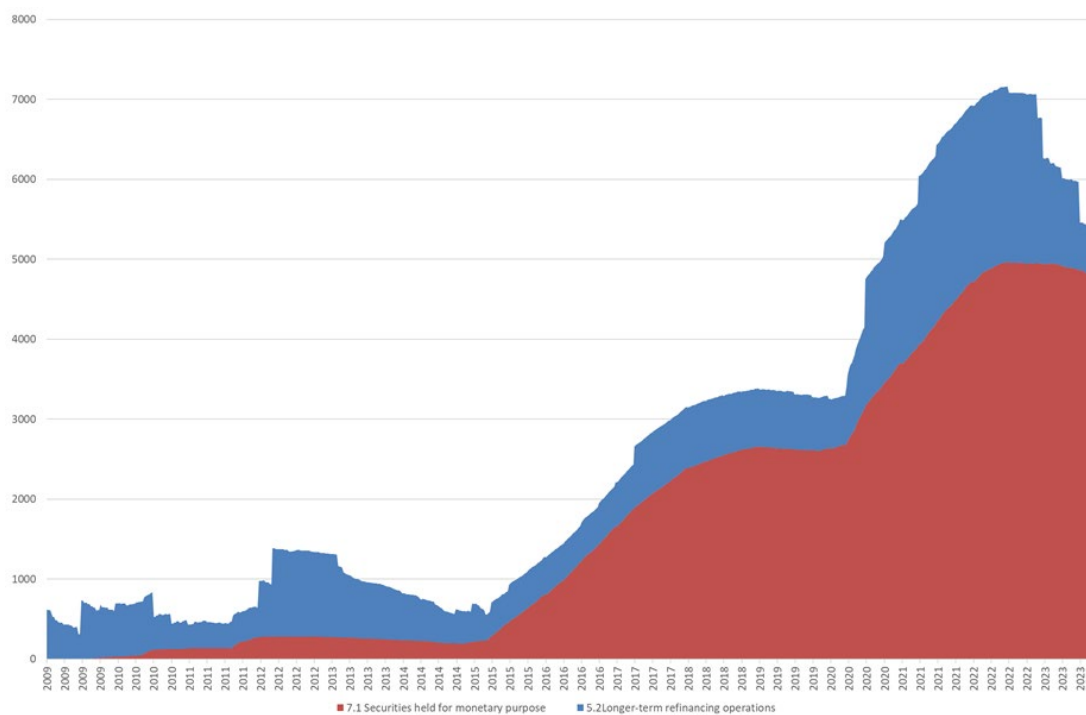
Sources ECB.

Figure 12: Reserves and deposit facilities, in € bn



Sources ECB.

Figure 13: Main counterparties to excess reserves and deposit facilities, in € bn



Sources ECB.

Abstract. This paper analyses the operational frameworks adopted by the ECB and the consequences of a shift from the floor to the corridor system. The concept of excess liquidity in the euro area is examined, alongside discussions on market liquidity and funding liquidity. The paper emphasises the need to evaluate the implications for monetary policy effectiveness and financial stability of the different frameworks, shedding light on the role of liquidity in maintaining well-functioning financial markets.

This paper was provided by the Economic Governance and EMU Scrutiny Unit at the request of the Committee on Economic and Monetary Affairs (ECON) ahead of the Monetary Dialogue with the ECB President on 25 September 2023.
