

IN-DEPTH ANALYSIS

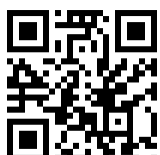
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# Excess liquidity in the euro area: sources and remedies

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Economic Governance and EMU Scrutiny Unit (EGOV)  
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# Excess liquidity in the euro area: sources and remedies

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## **Abstract**

The excess liquidity in the euro area is a product of a long period of quantitative easing. It changed the operational framework of the European Central Bank (ECB)'s monetary policy from the scarce reserves system (SRS) to the abundant reserves system (ARS). To eliminate excess liquidity and return to the SRS, the ECB must intensify quantitative tightening, which is also essential for successful disinflation. Fiscal adjustment can help in this process and mitigate the risk of financial instability.

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### **AUTHOR**

Marek DABROWSKI, CASE – Center for Social and Economic Research, Warsaw

### **ADMINISTRATORS RESPONSIBLE**

Drazen RAKIC

Giacomo LOI

Maja SABOL

### **EDITORIAL ASSISTANT**

Adriana HECSER

### **LINGUISTIC VERSIONS**

Original: EN

### **ABOUT THE EDITOR**

The Economic Governance and EMU Scrutiny Unit provides in-house and external expertise to support EP committees and other parliamentary bodies in shaping legislation and exercising democratic scrutiny over EU internal policies.

To contact Economic Governance and EMU Scrutiny Unit or to subscribe to its newsletter please write to:

Economic Governance and EMU Scrutiny Unit

European Parliament

B-1047 Brussels

E-mail: [egov@ep.europa.eu](mailto:egov@ep.europa.eu)

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## LIST OF ABBREVIATIONS

|                 |  |
|-----------------|--|
| <b>ABSPP</b>    | Asset-Backed Securities Purchase Programme |
| <b>AEs</b>      | Advanced economies                         |
| <b>APP</b>      | Asset Purchase Programme                   |
| <b>ARS</b>      | Abundant Reserves System                   |
| <b>BoE</b>      | Bank of England                            |
| <b>BoJ</b>      | Bank of Japan                              |
| <b>CAR</b>      | Capital Adequacy Ratio                     |
| <b>CB</b>       | Central bank                               |
| <b>CBPP3</b>    | Third Covered Bond Purchase Programme      |
| <b>CHF</b>      | Swiss franc                                |
| <b>CJEU</b>     | Court of Justice of the European Union     |
| <b>COVID-19</b> | Coronavirus Disease 2019                   |
| <b>CSPP</b>     | Corporate Sector Purchase Programme        |
| <b>DF</b>       | Deposit Facility                           |
| <b>DFR</b>      | Deposit Facility Rate                      |
| <b>ECB</b>      | European Central Bank                      |
| <b>EFC</b>      | European Financial Crisis                  |
| <b>EMEs</b>     | Emerging market economies                  |
| <b>EONIA</b>    | Euro Overnight Index Average               |
| <b>EU</b>       | European Union                             |
| <b>EUR</b>      | Euro                                       |
| <b>Fed</b>      | (US) Federal Reserve Board                 |
| <b>FFR</b>      | Federal Fund Rate                          |

|               |                                       |
|---------------|---------------------------------------|
| <b>FSB</b>    | Financial Stability Board             |
| <b>GDP</b>    | Gross domestic product                |
| <b>GFC</b>    | Global Financial Crisis               |
| <b>HQLA</b>   | High-quality liquid assets            |
| <b>IMF</b>    | International Monetary Fund           |
| <b>IORB</b>   | Interest on reserve balances          |
| <b>JPY</b>    | Japanese yen                          |
| <b>LCR</b>    | Liquidity Coverage Ratio              |
| <b>LHS</b>    | Left-hand side                        |
| <b>M1, M2</b> | broad money aggregates                |
| <b>MLF</b>    | Marginal Lending Facility             |
| <b>MRO</b>    | Main Refinancing Operations           |
| <b>NDAs</b>   | Net Domestic Assets                   |
| <b>NFAs</b>   | Net Foreign Assets                    |
| <b>OIN</b>    | Other Items Net                       |
| <b>OMOs</b>   | Open market operations                |
| <b>OMT</b>    | Outright Monetary Transactions        |
| <b>PEPP</b>   | Pandemic emergency purchase programme |
| <b>PSPP</b>   | Public Sector Purchase Programme      |
| <b>QE</b>     | Quantitative Easing                   |
| <b>QFAs</b>   | Quasi-Fiscal Activities               |
| <b>QT</b>     | Quantitative Tightening               |
| <b>RHS</b>    | Right-hand side                       |
| <b>SMP</b>    | Security Market Programme             |

|              |   |
|--------------|---|
| <b>SRS</b>   | Scarce Reserves System                          |
| <b>SNB</b>   | Swiss National Bank                             |
| <b>SVB</b>   | Silicon Valley Bank                             |
| <b>SWF</b>   | Sovereign Wealth Fund                           |
| <b>TFEU</b>  | Treaty on the Functioning of the European Union |
| <b>TLTRO</b> | Targeted longer-term refinancing operations     |
| <b>UK</b>    | United Kingdom                                  |
| <b>UMPMs</b> | Unconventional monetary policy measures         |
| <b>US</b>    | United States                                   |
| <b>USD</b>   | US dollar                                       |
| <b>YCC</b>   | Yield curve control                             |
| <b>€STR</b>  | Euro short-term rate                            |



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## EXECUTIVE SUMMARY

- **As in other advanced economies, excess liquidity in the euro area financial system is a relatively new phenomenon.** It became a permanent feature in 2015 after the European Central Bank (ECB) launched mass-scale quantitative easing (QE).
- **Before the global financial crisis (GFC) of 2007–2009,** the ECB’s monetary policy was conducted within the scarce reserves system (SRS), also called the “corridor” system. Commercial banks operated in an environment of structural liquidity deficit. The ECB supplied them with liquidity through open market operations (repo transactions). It allowed a single monetary policy instrument to be applied: the main refinancing operations (MRO) rate.
- **Adopting unconventional monetary policy measures (UMPMs) after the GFC, particularly QE, led to a significant increase in the ECB’s balance sheet and excess liquidity in the financial system.** To absorb part of this excess liquidity, the ECB had to use the deposit facility rate (DFR) and reverse repo transactions, moving from the SRS to the abundant reserves system (ARS), also called the “floor” system.
- **The SRS has several operational and institutional advantages over the ARS.** The start of the monetary tightening cycle in 2022, including the downsizing of the ECB’s balance sheet, creates an opportunity to return to the SRS.
- **Returning to the SRS requires the continuation of quantitative tightening (QT)** but at a much faster pace than to date. The current rate of reduction in securities holdings (EUR 27 billion per month) will allow a return to the pre-pandemic level of ECB assets no earlier than eight years from now.
- **Intensification of QT is also essential for completing the disinflation process in a relatively short time and reducing the ECB’s fiscal dependence.**
- **Other measures aimed at reducing excess short-term liquidity** in the euro area, such as gradual repayment of the targeted longer-term refinancing operations (TLTRO) (ongoing), increasing minimum reserve requirements, or conversion of overnight deposits at the ECB into long-term ECB liabilities, can play a supportive role in the transition to the SRS but cannot substitute large-scale QT.
- **Monetary policy tightening often involves a risk of financial instability.** In the current tightening cycle, this risk is magnified by a long period of near-zero interest rates, abundant liquidity, and a record-high level of public debt in advanced economies (AEs). The latter is detrimental to the stability of government finances and indirectly to commercial banks and non-banking financial institutions heavily exposed to government bonds.
- Therefore, **in the most indebted countries, fiscal adjustment must be seen as the primary flanking measure,** decreasing the risk of financial instability in the euro area during monetary tightening and QT. Other safeguard measures should include strengthening financial supervision and macroprudential regulations.

# 1. INTRODUCTION

As in other advanced economies (AEs), excess liquidity in the euro area financial system is a relatively new phenomenon. It appeared as a permanent feature in 2015 after the European Central Bank (ECB) launched a mass-scale asset purchase programme (APP), popularly called quantitative easing (QE). It substantially changed the operational conditions of the euro area's monetary policy. The pace of the ECB's base money<sup>1</sup> growth significantly exceeded the banking sector's demand, resulting in the rapid growth of excess reserves of commercial banks at the ECB. In such a situation, continuing the hitherto scarce reserves system (SRS) with the crucial role of the main refinancing operations (MRO) rate was no longer possible. It had to be replaced with an abundant reserves system (ARS) in which the deposit facility rate (DFR) became the key ECB instrument (Borio, 2023; Schnabel, 2023).

Several questions arise with the ongoing monetary policy tightening and the Eurosystem's balance sheet reduction, popularly called quantitative tightening (QT). First of all, how far should the QT should go? Second, what are the risks for the euro area financial system? Third, how can these risks be mitigated? Fourth, should the QT be accompanied by a return to the previous operational regime of monetary policy (SRS)? Fifth, is a return to the SRS possible without substantially reducing the Eurosystem's balance sheet?

This paper argues that: (i) from the operational and institutional perspectives, the SRS has several advantages over the ARS; (ii) a return to the SRS would be difficult without a substantial reduction of the Eurosystem's balance sheet, (iii) QT is also essential for the success of disinflation policy in the euro area, and (iv) the risks to financial stability can be mitigated primarily by fiscal adjustment in the euro area, especially in the most indebted countries.

The paper is organised as follows. Section 2 briefly analyses excess liquidity from an operational monetary policy perspective and its roots and consequences. Section 3 presents a history of building excess liquidity in the euro area and its dynamics over time. Section 4 discusses how to move back from the ARS to the SRS and presents other arguments favouring QT along with flanking measures, mainly in fiscal policy. Section 5 presents a summary of the analysis and policy recommendations.

When possible and justified, the situation of the ECB is compared with other major CBs in AEs, in the first instance, the Federal Reserve System (Fed) of the United States (US). The analysis uses the statistical data of the ECB, the International Monetary Fund (IMF), the Fed and other central banks.

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<sup>1</sup> Base money is money created by a central bank (CB). Alternatively, in economic literature it is called reserve money, monetary base, central bank money, and high-powered money.

## 2. EXCESS LIQUIDITY: CONCEPTUAL ISSUES

In this section, we discuss the definition of excess liquidity (Subsection 2.1), its sources (Subsection 2.2), the impact of the size of the CB balance sheet on operational conditions of monetary policy (Subsection 2.3), differences between the SRC and ARC and their impact on the effectiveness of monetary policy (Subsection 2.4), and CB independence (Subsection 2.5).

### 2.1. Definition

Excess liquidity has various meanings, depending on whether one is analysing the micro or macro level, financial or non-financial sector, aggregate demand/money supply or CB liabilities. Due to its thematic agenda, this paper looks at the macroeconomic and macro-financial levels: the entire economy of a given currency area, the CB balance sheet, and the aggregate balance sheet of the banking/financial sector.

Within such a thematic scope, one can distinguish two kinds of definitions. The first and broader one refers to the excessive aggregate money supply in a given economy or globally, that is, exceeding economic agents' demand for money balances (see, e.g. Rueffer and Stracca, 2006), which leads to inflationary consequences. The second, narrower, refers to banking system liquidity exceeding the current liquidity needs of commercial banks and is reflected in the CB's liabilities. This is how the ECB defines excess liquidity<sup>2</sup>.

Given the topic of this paper, our analysis concentrates on the narrower (or operational) second definition of excess liquidity. However, both concepts of liquidity (broader and narrower) are interlinked. As shown in Subsection 2.2, the excess liquidity in a narrower, operational sense is, in most cases, impossible without excessive money creation by the CB or banking system. Conversely, the excess liquidity of the banking system, if not effectively sterilised by the CB, may lead to excessive money supply and inflationary consequences. Therefore, we cannot avoid analysing excess liquidity in a broader sense.

### 2.2. Sources of excess liquidity

To understand sources of excess liquidity in a narrower, operational sense, one must start the analysis from the structure of the CB balance sheet (Figure 1).

**Figure 1:** Stylised CB balance sheet

| Assets  | Liabilities                        |
|---|------------------------------------|
| Net foreign assets (NFAs)                                 | Cash in circulation                |
| Net domestic assets (NDAs), of which                      | Commercial bank reserves, of which |
| net credit to the government                              | mandatory reserves                 |
| net credit to commercial banks/<br>financial institutions | voluntary (excess) reserves        |
| Other items net (OIN)                                     | CB capital                         |

Source: Rule (2015) and author's own elaboration.

Analysis of the liabilities side suggests that voluntary (excess) reserves have a residual character at a given size of the CB balance sheet. There is no room for excess reserves if the CB balance sheet is small (because other factors determine CB capital, cash in circulation and mandatory reserves). When it grows beyond the demand for CB base money, it creates room for this item, other things being equal.

<sup>2</sup> See [https://www.ecb.europa.eu/ecb/educational/explainers/tell-me-more/html/excess\\_liquidity.en.html](https://www.ecb.europa.eu/ecb/educational/explainers/tell-me-more/html/excess_liquidity.en.html)

Alternatively, the additional supply of CB base money can be wholly or partly absorbed by the banking sector, that is, converted into broader money aggregates (for example, M2 and M3). If not matched by an increasing demand for money from economic agents, such an increase in broad money leads to higher inflation.

The total CB balance sheet increase can originate from a rise in NFAs or NDAs. In the second case, it may be a net credit to the government or a net credit to commercial banks and other financial institutions.

Historically, a rapid increase in CB base money was observed in several emerging-market economies (EMEs), particularly from the 1970s to the 1990s. It led to several episodes of high inflation, hyperinflation, and currency crises. In most cases, the excessive growth in base money was brought about by the monetary financing of a budget deficit, generous credit support for the banking sector, and CB quasi-fiscal activities (QFAs). In the early 21<sup>st</sup> century, monetary and fiscal policies in most EMEs became more prudent. As a result, excessive increases in NDAs were less frequent. However, the desire to increase resilience against adverse shocks led to the accumulation of large precautionary foreign exchange reserves by many EME CBs. Other EMEs built up large foreign exchange reserves for other policy reasons, such as stimulating exports via undervalued currency (which could be called a mercantilist policy) or avoiding currency appreciation during the commodity boom (favourable terms of trade shock).

Whatever the reason for increasing CB foreign exchange reserves, it leads to growing NFAs and CB balance sheets (base money). Suppose a CB wants to limit the absorption of additional base money by commercial banks and, therefore, the entire economy (to avoid inflationary consequences). In that case, it must “sterilise” its part by draining the excess liquidity, that is, voluntary commercial bank deposits in the CB. Suppose the increase in NFAs is accompanied by budget surpluses and the creation of sovereign wealth funds (SWFs), which invest their financial assets abroad. In that case, the “sterilisation” task becomes more manageable and less costly for the CB (see Subsection 2.4).

Between the 1980s and 2008, the CBs in most AEs did not experience the problem of excess liquidity. Their balance sheets were modest. They did not finance fiscal deficits or conduct QFAs. They did not need to hold large foreign exchange reserves because they followed floating exchange rate regimes after the demise of the Bretton Woods system in 1971<sup>3</sup>, and their currencies enjoyed high credibility. Hence, both NDAs and NFAs were limited in size. Changes in net credit to commercial banks and other financial institutions were the main channel of money supply to the banking sector and the entire economy. Commercial banks were in the position of a structural liquidity deficit. As such, they were net borrowers from CBs.

The global financial crisis (GFC) of 2007–2009 fundamentally changed this situation. The collapse of financial intermediation increased the demand for CB base money from commercial banks and other financial institutions. The comprehensive reform of financial regulations after the GFC further increased this demand (see Box 1).

CBs first reacted conventionally, that is, by cutting their interest rates. However, this proved insufficient to satisfy the rapidly growing demand for CB base money and avoid deflation. CBs in AEs had to launch unconventional monetary policy tools, including APPs, which rapidly expanded NDAs and CB balance sheets.

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<sup>3</sup> See <https://www.imf.org/external/about/histend.htm>

CBs treated APP/ QE as a monetary policy tool aimed at increasing the liquidity of the financial sector and its lending capacity. However, given the dominance of Treasury bonds in the purchased assets, they can be seen as an additional credit to the government (Dabrowski, 2022).

The Swiss National Bank (SNB) chose another strategy similar to the CBs in some EMEs. The rapid increase in international demand for the Swiss franc (CHF) and associated appreciation pressure led to interventions in the foreign exchange market and increased foreign exchange reserves/ NFAs. However, the implications for excess liquidity were the same as in the case of increasing NDAs.

The excess liquidity in the main currency areas since 2008 results from a rapid increase in CB balance sheets.

**Box 1:** Impact of post-GFC reform of financial regulation on CB balance sheets

Weak and outdated financial regulations were broadly considered one of the causes of the GFC. Therefore, adopting new, much stricter and more comprehensive financial regulations was the natural reaction to the crisis. Such regulations were adopted in individual jurisdictions, for example in the United States, European Union (EU), United Kingdom (UK), Switzerland, Japan, Canada, Sweden, other AEs, and several EMEs. However, there was also a coordinated effort within the G20 and the Financial Stability Board (FSB) to agree global regulatory standards, which resulted in a new set of regulations popularly called the Basel 3 standards.

The new banking regulations introduced, among other things, tighter capital adequacy ratios (CARs), liquidity coverage ratios (LCRs), and countercyclical capital buffers. All these regulations curbed commercial banks' room for lending expansion, and increased their demand for CB base money. On the one hand, they pushed for expansion of CB balance sheets (to meet a higher demand for base money). On the other, they neutralised the potential inflationary impact of rapid growth in CB assets via declining money multiplier.

The deflationary character of new financial regulations was disregarded by most monetary policy analysts for a quite long time (Dabrowski, 2023)

Source: Dabrowski (2015; 2023); <https://www.bis.org/bcbs/basel3.htm?m=2572>

### 2.3. Impact of the size of CB balance sheets on operational conditions of monetary policy

Suppose a CB's balance sheet is relatively small and the CB does not have sizeable voluntary deposits of commercial banks in its liabilities. In that case, the banking sector is in a structural liquidity deficit. The CB must conduct active credit operations to satisfy its liquidity needs (demand for base money), which means operating the SRS regime. The exact monetary policy instruments can differ between individual CBs. However, in the case of AEs, repo operations usually perform the primary role. They serve the purpose of aggregate liquidity supply to the banking sector. The key CB interest policy rates, such as the MRO rate of the ECB and the federal funds rate (FFR) of the US Fed, determine the banking sector's demand for liquidity supplied by CBs via open-market operations (OMOs) and its price (Luther, 2018).

Naturally, a CB looks at the aggregate situation of the financial sector. The position of individual commercial banks can differ depending on their business model and short-term factors. At a given time, some of them can have extra liquidity needs while others have a liquidity surplus. Usually, the interbank money market helps meet individual banks' demand and supply needs. CBs only satisfy marginal requirements via the overnight marginal lending and deposit windows. They are called the

marginal lending facility (MLF) and DF of the ECB<sup>4</sup>. At the US Fed, this role is played by the Discount Window and Overnight Reverse Repurchase Agreement Facility<sup>5</sup>. The marginal lending and deposit rates set the width of the interest rate corridor, while the key policy rate usually operates in the middle of this corridor. Hence, the SRS is often called a “corridor” system.

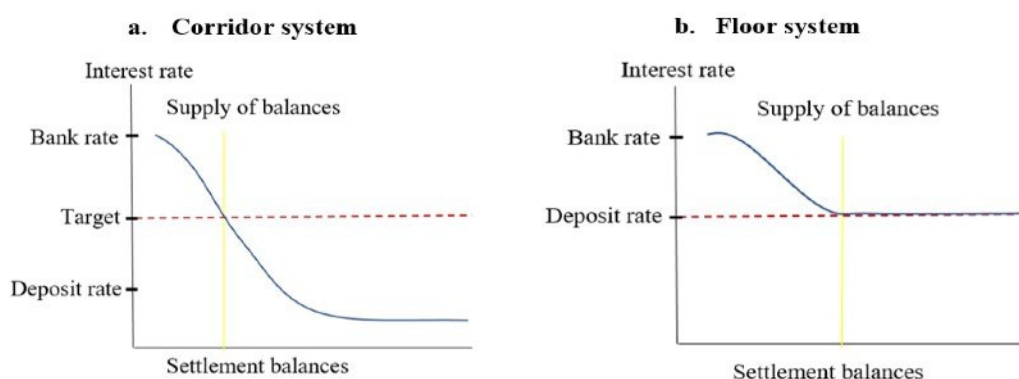
Operating SRS is impossible when a CB balance sheet is large because the banking system functions with a structural liquidity surplus. This is reflected in excess reserves (above the mandatory levels) in the CB balance sheet. The CB must borrow from commercial banks to conduct monetary policy instead of lending to them. Again, specific instruments can differ between currency areas (reverse repo, various deposit facilities, CB bonds, etc.), but the operational conditions of monetary policy change radically. The ARS replaces the SRS, and the deposit/reverse repo rate becomes the main monetary policy instrument. The interest rate corridor does not matter any longer. Therefore, the “corridor” system is replaced by a “floor” system, another term for the ARS. Commercial banks can decide how much liquidity they need and offer their surplus to the CB. The interbank market loses its importance and often dies.

## 2.4. Differences between the SRS and ARS and their impact on monetary policy effectiveness

Empirical experience demonstrates that monetary policy can be conducted operationally within the SRS and the ARS (Figure 2). However, there are differences between the two systems.

First of all, there is usually one policy instrument (a CB interest rate) under the SRS (“corridor system”). Under the ARS (“floor system”), monetary policy also regulates the size of the CB balance sheet (base money) via QE or QT (or their absence). Baglioni (2023) considers the availability of two instruments an advantage. He argues that *“the floor system gives central banks one more degree of freedom, since the interest rate policy and the balance sheet policy become two independent instruments, that can be targeted to different objectives.”* However, others may see this argument as a disadvantage of ARS because it assumes a multi-task mandate of the CB, under which some tasks (supporting growth or rescuing insolvent banks) can contradict a price stability mission (Cukierman, 1996; Dabrowski, 2023) and compromise CB independence (see Subsection 2.5).

**Figure 2: Operational differences between SRS (“corridor” system) and ARS (“floor” system)**



<sup>4</sup> See [https://www.ecb.europa.eu/stats/policy\\_and\\_exchange\\_rates/key\\_ecb\\_interest\\_rates/html/index.en.html](https://www.ecb.europa.eu/stats/policy_and_exchange_rates/key_ecb_interest_rates/html/index.en.html)

<sup>5</sup> See <https://www.federalreserve.gov/monetarypolicy.htm>

Source: Gravelle et al. (2023)

In turn, when a CB has a single mandate (price stability), using more than one instrument contradicts the Tinbergen (1952) Rule, which says that optimally the number of policy tools should equal the number of policy targets.

Second, the SRS stimulates the development of the interbank money market (the broader the interest rate corridor, the more room there is for interbank transactions). The ARS makes the interbank market redundant (Schnabel, 2023; Borio, 2023) because it is easier and less risky for commercial banks to put surplus liquidity on a CB deposit account than to lend it to other banks. On the other hand, situations where commercial banks are short of liquidity are relatively rare (compared to the SRS).

Third, under the ARS, commercial banks may be more sluggish in their response to CB interest rate changes than under the SRS. This makes the monetary policy transmission mechanism less efficient. Borio (2023) argues that, in the SRS, commercial banks' demand for reserves is purely for settlement purposes, so the CB policy rate plays an important signalling role. In the ARS, commercial banks consider CB reserves as the store of value, and the market signalling role disappears. Borio (2023) also points to the possibility of a "leaking floor", i.e. the market rate below the CB deposit rate. Such a situation indicates a disturbance in the monetary policy transmission mechanism.

Fourth, the ARS makes commercial banks less interested in bringing deposits as they rely on excess liquidity, which leads to higher spreads between commercial banks' lending and deposit rates. As a result, it creates a political temptation to tax commercial banks' "windfall" profit generated by higher spreads, a phenomenon broadly observed in contemporary Europe. Such taxation has, of course, a distortive impact on financial intermediation. Besides, higher spreads mean a less effective monetary transmission mechanism (see above).

Finally, to effectively execute its price stability mandate, a CB must sterilise excess liquidity. Regardless of the instrument used (reverse repo, deposit facility, CB bonds), this involves costs and may be detrimental to the CB's financial result (profit or loss). Of course, this result depends on the effective interest rate paid by the CB for its deposits/reverse repo operations/yields on issued bonds vs. income generated by its assets. They may change depending on the financial market situation and sentiments. When commercial banks' demand for base money is high, and they are ready to keep high deposits in the CB unremunerated or even for negative interest rate (the case of the ECB between 2014 and 2022, the SNB between 2015 and 2022, and the Bank of Japan (BoJ) between 2016 and 2023), it is a "profitable" business for the CB. However, when demand for base money decreases, the CB must offer sufficiently high interest to bring in commercial bank deposits.

## **2.5. The potential impact of the CB operational system on its independence**

Under certain circumstances, the ARS can question the CB's reputation and independence.

Subsection 2.4 described one such situation: costly sterilisation of excess reserves, leading to CB financial losses. The political community and broad public opinion can have problems understanding the arcane world of CB balance sheets and financial accounts, leading to a negative attitude towards a loss-making CB. Remember that high sterilisation costs are not the only potential reason for a CB's financial losses. It may also be the valuation effect of sizeable foreign exchange reserves when domestic currency appreciates. Much depends on the CB's specific accounting standards and formal interlinks between the CB's financial accounts and the state budget.

Borio (2023) also suggests that the ARS can create a perception of the CB subsidising commercial banks, with all the negative political implications.



However, the biggest challenge to the CBs' independence comes from their large balance sheets, especially if these have been the product of QE. The length and size of QE in AEs after the GFC and during the COVID-19 pandemic unavoidably led to the domination of government bonds in CB assets (due to a limited supply of other high-quality liquid assets – see Dabrowski, 2022; 2023). Even if motivated by monetary policy considerations, the CBs in AEs have become *de facto* large net creditors to governments (see Subsection 4.2) and hostages to fiscal policies. Their room for manoeuvre in monetary policy tightening has been significantly narrowed (Dabrowski, 2023). Ironically, the structure of their balance sheets is similar to that of CBs in EMEs in the last quarter of the 20<sup>th</sup> century. We will return to this matter in Section 4.

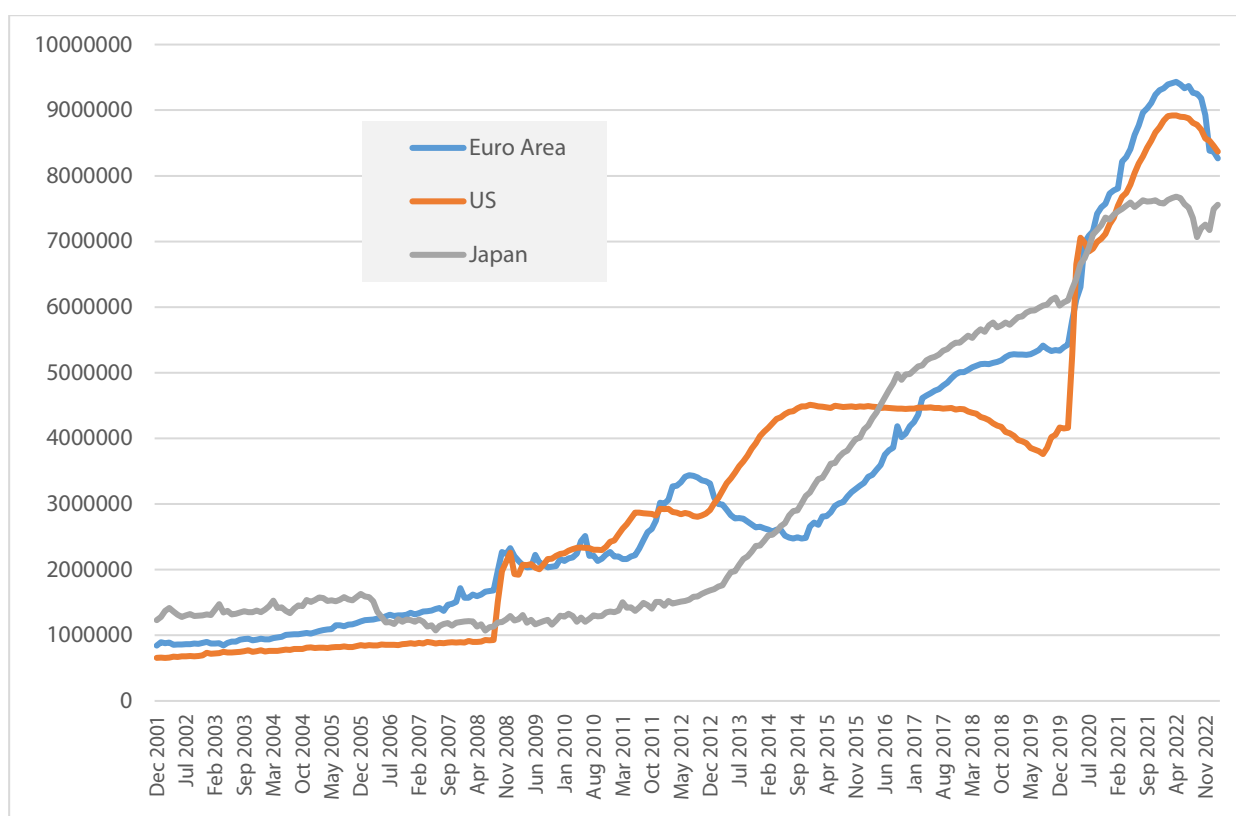
### 3. EXCESS LIQUIDITY IN THE EURO AREA

This section presents the history of the accumulation of excess liquidity in the euro area after the GFC of 2007–2009, the European financial crisis (EFC) of 2010–2015, and during the COVID-19 pandemic (2020–2022) followed by recent attempts (since 2022) to reduce the ECB’s balance sheet. It is divided into three subsections. First, we present the Eurosystem’s balance sheet expansion since the GFC (Subsection 3.1). This is followed by an analysis of the excess liquidity (Subsection 3.2) and the transition from the SRS to ARS (Subsection 3.3), both being the consequence of UMPMs, primarily QE. For comparison, we also analyse similar developments in the Fed and BoJ.

#### 3.1. Expansion of the ECB balance sheet

Before the GFC, the Eurosystem’s balance sheet represented a modest size (Figure 3), compatible with a structural liquidity deficit in the euro area’s banking sector and SRS. A similar situation was observed in most AE CBs.

**Figure 3:** Central bank assets, euro area in EUR million, United States in USD million, Japan in JPY hundred million, December 2001 – February 2023



Source: IMF International Financial Statistics, and author’s own elaboration.

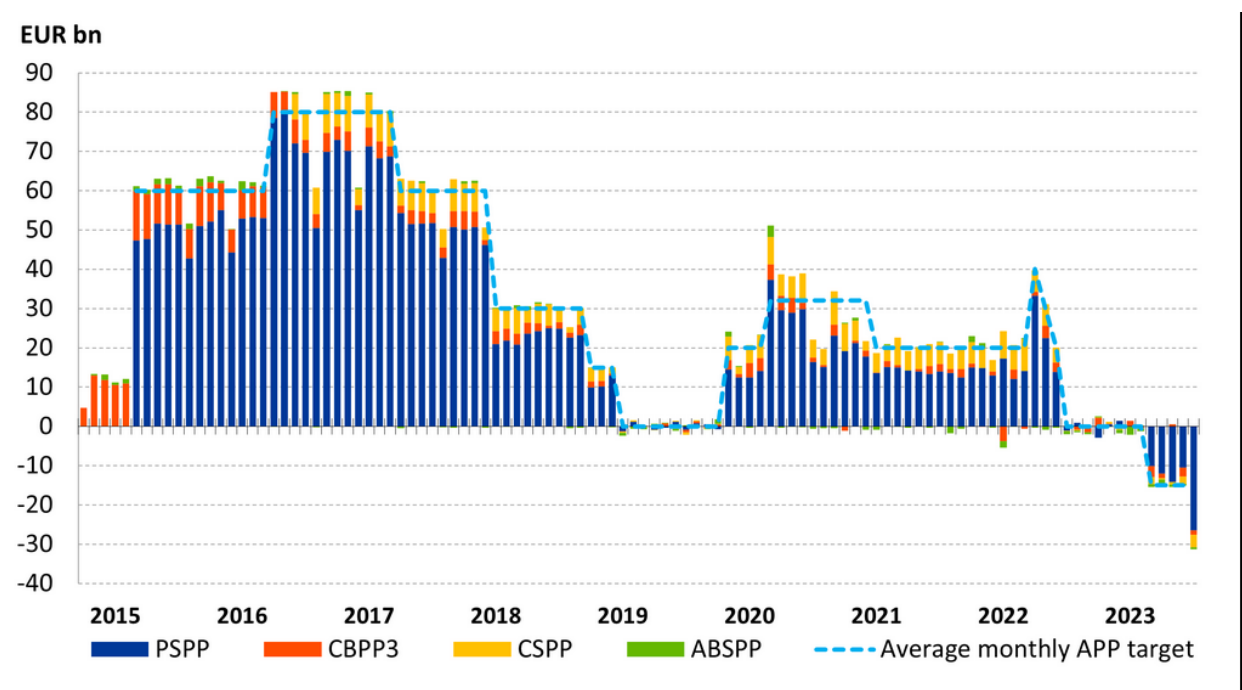
The situation started to change with the full-blown outbreak of the GFC in September 2008, following the Lehman Brothers’ bankruptcy. After cutting interest rates to a near-zero level and facing the necessity of continuing monetary expansion, CBs in AEs applied unconventional monetary policy measures (UMPMs) (Joyce et al., 2012). The Fed was the first to launch QE in Q4 2008 (D’Amico et al., 2012). The Bank of England (BoE) was next, starting QE in March 2009 (Joyce and Tong, 2012). The BoJ, which experimented with QE in 2001–2006, returned to this policy tool on a low scale in October 2010 but significantly intensified it from April 2013. The adoption of QE led to a rapid increase in CB assets, as seen in Figure 3.

The SNB did not resort to purchasing long-term assets. However, as mentioned in Subsection 2.2, it expanded its balance sheet by several rounds of interventions in the foreign exchange market to prevent further CHF appreciation. It also provided additional liquidity to commercial banks (Christensen and Krogstrup, 2015).

Like the SNB, the Eurosystem expanded its balance sheet primarily by providing additional liquidity to the banking sector. This was done, among others, by extending maturities and easing collateral requirements of the ECB lending programmes (Constancio, 2018; Hartmann and Smets, 2018). On the other hand, the Securities Market Programme (SMP) provided for the crisis-affected countries of the euro area periphery was an APP-type instrument applied between 2010 and 2012. However, the monetary effects of this policy tool were fully sterilised. The SMP's successor, the Outright Monetary Transactions (OMT) programme, was never activated.

Despite the marginal use of APP-type instruments, the Eurosystem's assets more than doubled between August 2008 and July 2012 (Figure 3). However, between July 2012 and August 2014, they shrank by almost 30%.

**Figure 4:** The ECB's APP, net monthly purchases in EUR billion, 2015–2023



Source: European Central Bank – see <https://www.ecb.europa.eu/mopo/implement/app/html/index.en.html#pspp>.

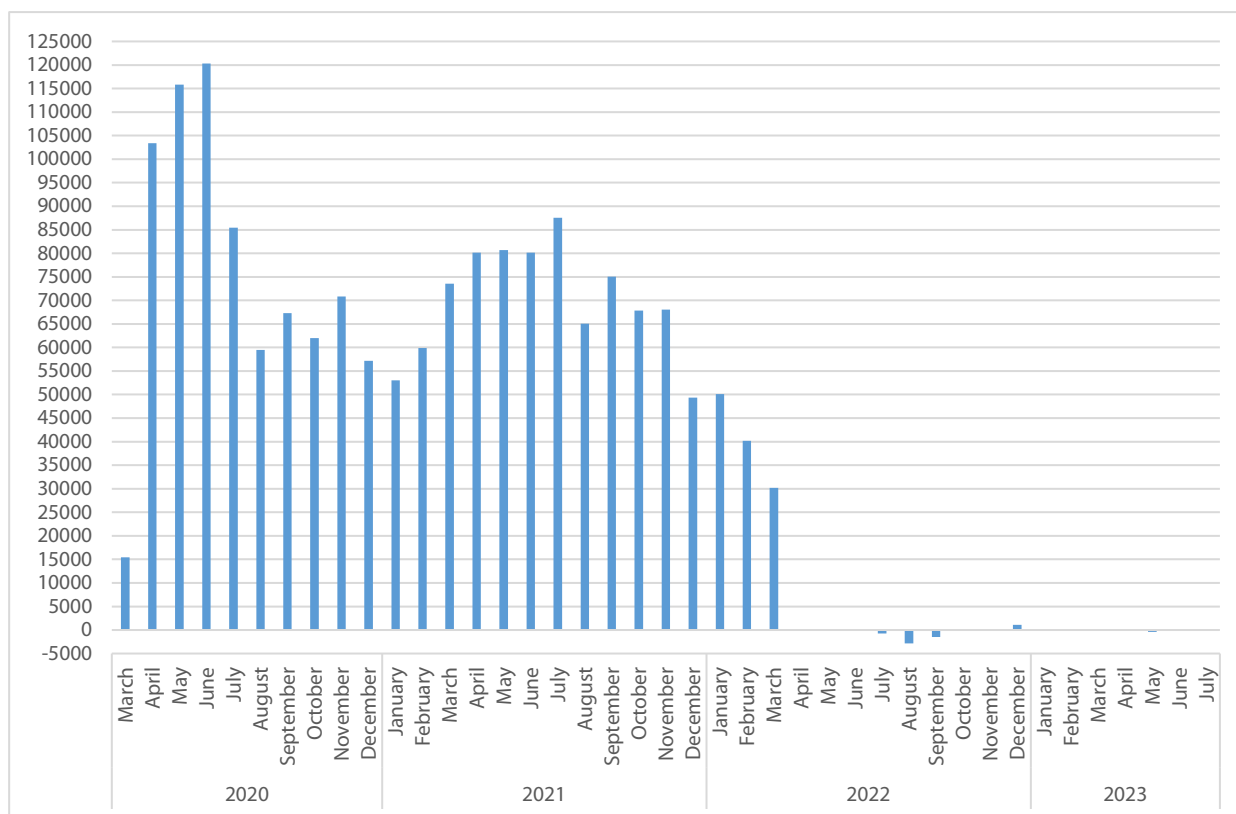
Notes: PSPP – public sector purchase programme, CBPP3 – third covered bond purchase programme, CSPP – corporate sector purchase programme, ABSPP – asset-backed securities purchase programme.

The turning point came in October 2014, when the ECB's Governing Council decided to launch a large-scale APP. Avoiding the risk of deflation served as the primary justification for this decision (Constancio, 2018). The highest intensity of net purchases was recorded between March 2015 and December 2017. In 2018, the pace of monthly purchases decelerated and stopped entirely in the first ten months of 2019 (Figure 4). The APP was resumed in November 2019, to be intensified in March and April 2020 after the outbreak of the COVID-19 pandemic.

The outbreak of COVID-19 triggered a new wave of monetary policy easing in the euro area (similar to other currency areas). Apart from the continuation and intensification of the standard APP, the ECB launched the Pandemic Emergency Purchase Programme (PEPP) (Figure 5), which resulted in the total

purchase of an additional EUR 1,700 billion assets in 2020-2022<sup>6</sup>, primarily government securities. The highest monthly net purchases were recorded between April and July 2020 and March and September 2021.

**Figure 5:** The ECB’s PEPP, net monthly purchases in EUR million, March 2020–July 2023.



Source: ECB [https://www.ecb.europa.eu/mopo/pdf/PEPP\\_purchase\\_history.csv?b403919ca5d9c7f5c08e9a7ee1a549af](https://www.ecb.europa.eu/mopo/pdf/PEPP_purchase_history.csv?b403919ca5d9c7f5c08e9a7ee1a549af).

As a result of the APP and PEPP, the Eurosystem’s assets almost quadrupled between August 2014 and April 2022, when they reached their maximum. Since then, there has been a slow trend of decreasing Eurosystem assets. Between April 2022 and February 2023, they fell by 12.4%.

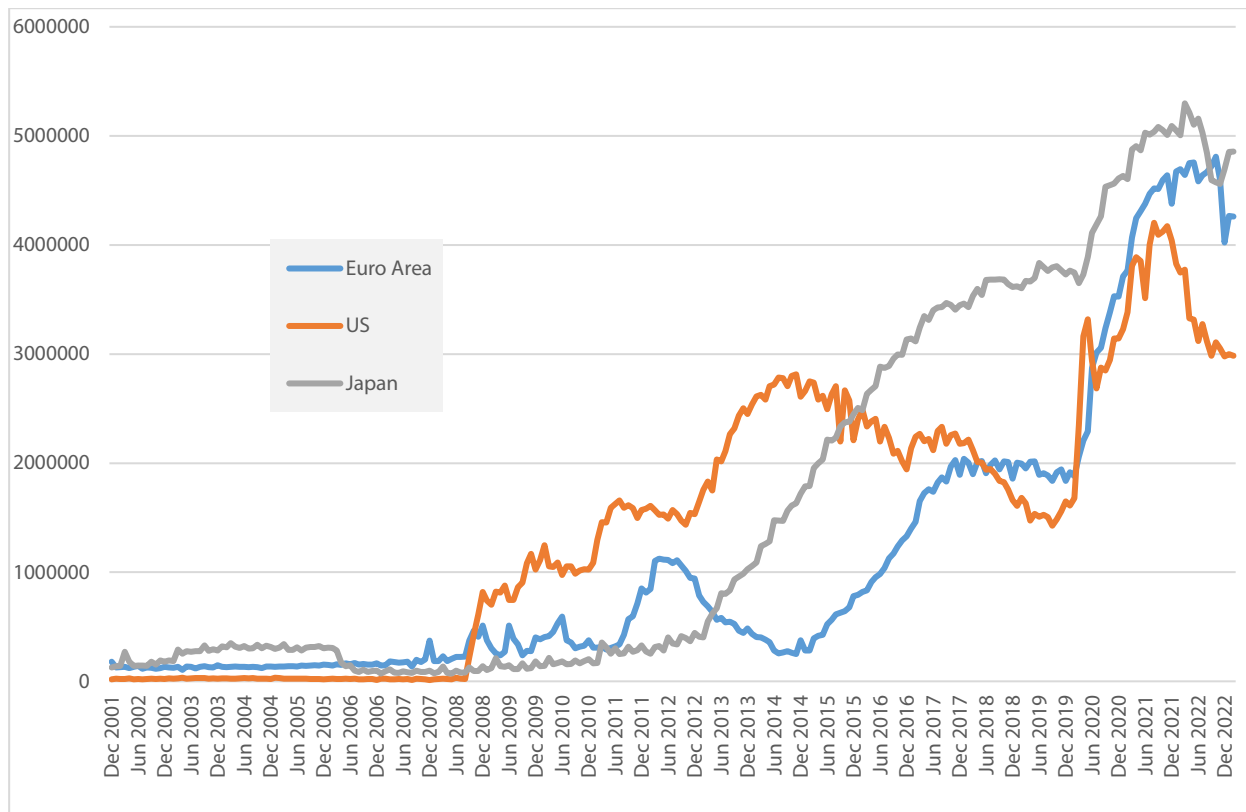
Figure 3 shows the similarity between the ECB and two other large CBs (Fed and BoJ) in terms of the growth of their assets after the GFC. However, there are striking differences in timing, particularly between the ECB and the Fed. The ECB launched its full-scale QE at the turn of 2014 and 2015 when the Fed stabilised its balance sheet and was about to start modest QT. Unlike the Fed, the Eurosystem did not reduce its assets in the inter-crisis period in the second half of the 2010s. In the post-COVID-19 period, it started tightening monetary policy, including reducing its balance sheet. However, this reduction has been slower than in the Fed (see Subsection 4.4).

### 3.2. Large balance sheets and excess liquidity

Figure 6 shows the dynamics of CB liabilities to other depository corporations (commercial banks), that is, a measure of excess liquidity in a narrow, operational sense (see Subsection 2.1).

<sup>6</sup> See <https://www.ecb.europa.eu/mopo/implement/pepp/html/index.en.html>.

**Figure 6:** CB liabilities to other depository corporations, euro area in EUR million, United States in USD million, Japan in JPY hundred million, December 2001–February 2023



Source: IMF International Financial Statistics, and author's own elaboration.

By comparing Figure 6 with Figure 3, one can conclude that the size of commercial bank deposits in the CBs in the three analysed economies (the euro area, the United States, and Japan) followed the changes in CB assets. Before the GFC, they were recorded at the BoJ, which resorted to QE in the early 2000s (see Subsection 3.1). They were virtually non-existent at the Fed and minimal (but increasing) in the ECB. The situation has changed radically since the GFC, with the adoption of UMPMs, particularly QE. The size of CBs' liabilities to other depository corporations grew rapidly. However, these liabilities fell when CBs reduced their balance sheets (the ECB between 2012 and 2014, the Fed between 2014 and 2019, and all three CBs in 2022-2023).

The above observation triggers two interesting questions. The first concerns commercial banks' behaviour. Why were they ready to deposit such large amounts of money in CB accounts, especially at negative interest rates, as in the case of the ECB and BoJ<sup>7</sup>? Why did they not invest surplus resources in commercial lending or purchasing government and commercial papers? Due to the absence of comprehensive empirical research on this phenomenon, we will limit ourselves to just a few hypotheses.

First, new banking and financial sector regulations introduced after the GFC (the so-called Basel 3 rules), with notably higher LCRs<sup>8</sup>, forced commercial banks and other financial institutions to hold more high-quality liquid assets (HQLA) than before the GFC (Cecchetti and Schoenholtz, 2019). Second, given the fresh memory of the GFC, commercial banks might have preferred to keep higher liquidity buffers

<sup>7</sup> The situation in the United States was different: since the GFC, the Fed introduced a positive interest rate for commercial banks' excess reserves, which were unremunerated before 2008 (see Cecchetti and Schoenholtz, 2019).

<sup>8</sup> See <https://www.bis.org/publ/bcbs238.htm>

(above those determined by LCRs and other banking regulations) to meet unexpected deposit withdrawals, cushion the negative consequences of non-performing loans (NPLs), and for other instances of financial instability (Berrospide, 2012). Third, the reduced role of the interbank market after the GFC forced banks to rely on their liquid resources deposited in CBs.<sup>9</sup> Interestingly, one can detect a sort of vicious circle here. The increased CB liquidity and ARS were supposed to take the role of the short-term interbank market heavily damaged during the GFC. However, as long as the ARS exists, commercial banks are not incentivised to rebuild an interbank market. Fourth, declining growth rates in AEs (Dabrowski, 2023) diminish the number and size of profitable and not excessively risky lending projects that commercial banks can finance. However, negative interest rates on commercial banks' deposits in CBs seemed to have a stimulating effect on their lending activity, other things being equal. At least such a development was observed in the euro area (Demiralp et al., 2019; Claeys, 2021).

The second question relates to the monetary policy effects of QE and the effectiveness of this policy instrument. Continuation of monetary expansion when CB interest rates had already reached a zero or near-zero level was the primary justification of QE. CBs assumed that the newly created base money would be absorbed by commercial banks and transformed into broad money aggregates, contributing to higher aggregate demand. However, when commercial banks deposited most of this newly created base money into CB accounts, this policy goal was only partly accomplished. The growth of broad money aggregates (M2 and M3) remained modest, and the money multiplier declined rapidly (Dabrowski, 2023).

On the other hand, the self-defeating mechanism of QE protected the economy against the inflationary consequences of a rapid increase in base money, at least until a certain point. If commercial banks and the real sector had absorbed the newly created base money faster, higher inflation would have come earlier than in 2021–2022.

One may ask why the QE was continued for so long despite its limited effectiveness for monetary expansion. One answer relates to the widespread belief that monetary aggregates, especially base money, do not matter in the contemporary economy<sup>10</sup>. Instead, policy focused on flattening the yield curve, i.e. decreasing long-term interest rates (Belz and Wessel, 2020). Another explanation may relate to the fiscal consequences of QE. Because purchases of government bonds dominated APPs, public debt service costs fell (Dabrowski, 2022). In other words, large-scale QE was, in fact, of a quasi-fiscal character, even if motivated by monetary policy considerations.

### 3.3. Excess liquidity and moving from the SRS to ARS

As discussed in Subsection 2.3, the rapid increase in CB assets and building up structural liquidity surplus had to impact the operational conditions of monetary policy. Continuation of the SRS (a “corridor” system) was no longer possible, and CBs had to move to the ARS (a “floor” system). In the Fed, it happened immediately after the GFC outbreak and the launching of QE in Q4 2008 (Mulligan, 2021). The effective FFR was quite often below the “floor”, i.e. interest on reserve balances (IORB), which could suggest the “leaking floor” phenomenon (Borio, 2023; see also Subsection 2.4). In 2019, the Fed declared the continuation of the ARS<sup>11</sup> because excess liquidity did not allow returning to SRS despite the QT conducted between 2015 and 2019.

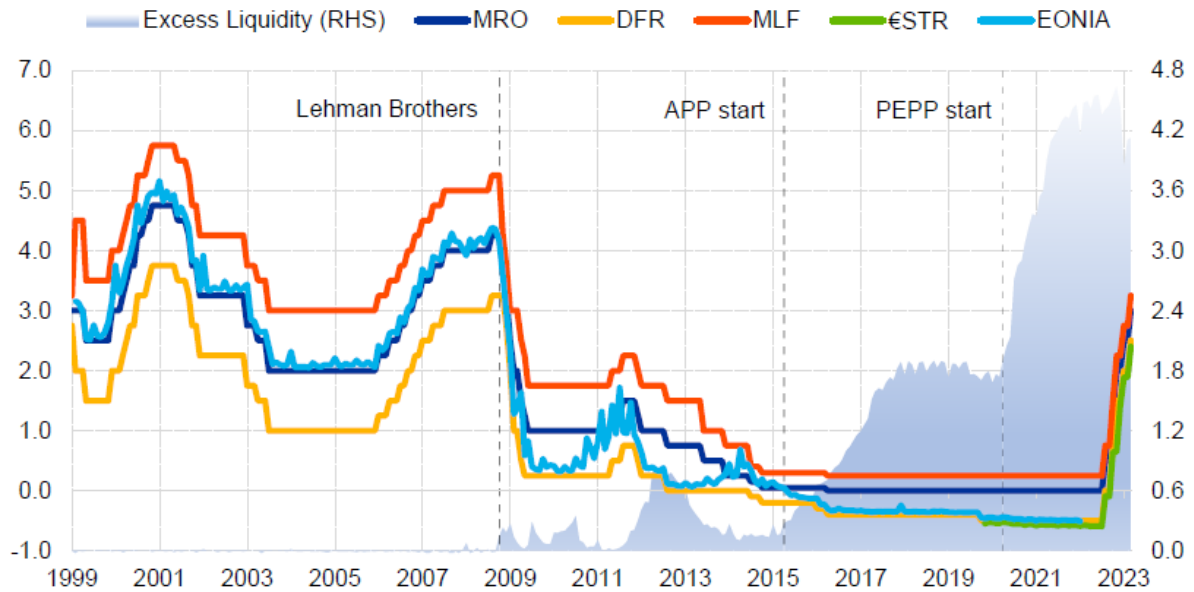
<sup>9</sup> The same concerned liquidity storage needs of non-banking financial institutions satisfied via commercial banks.

<sup>10</sup> See e.g. the presentation of Lucrezia Reichlin during the Monetary Dialogue Preparatory Meeting at the Committee on Economic and Monetary Affairs of the European Parliament on 15 March 2021 - [https://multimedia.europarl.europa.eu/en/econ-monetary-dialogue-preparatory-meeting-live-later-due-to-technical-problems\\_20210315-1430-COMMITTEE-ECON\\_vd](https://multimedia.europarl.europa.eu/en/econ-monetary-dialogue-preparatory-meeting-live-later-due-to-technical-problems_20210315-1430-COMMITTEE-ECON_vd)

<sup>11</sup> <https://www.federalreserve.gov/monetarypolicy/2019-02-mpr-part2.htm>

At the ECB, moving to the ARS coincided with periods of rapid growth in its balance sheet and the emergence of excess liquidity, i.e. voluntary deposits by commercial banks (Figure 7). However, the transition to the ARS was completed by launching large-scale APPs in 2015 (Schnabel, 2023).

**Figure 7:** ECB key policy rates, overnight market rates (LHS: in %) and excess liquidity (RHS: in EUR trillion), 1999–2023



Source: Schnabel (2023).

Notes: EONIA – Euro Overnight Index Average; €STR – the euro short-term rate; MRO – Main Refinancing Operation (rate); MLF – Marginal Lending Facility (rate); DFR – Deposit Facility Rate.

The CB balance sheets and excess liquidity reduction policies in 2022–2023 have been too limited to enable a return to the SRS. That would require more radical policy actions, which will be discussed in Subsection 4.1.

## 4. MOVING BACK FROM THE ARS TO SRS, AND QUANTITATIVE TIGHTENING

In this section, we will discuss the perspective of reducing excess liquidity and returning to the SRS in the context of the ongoing monetary policy tightening in major currency areas and attempts to reduce CB balance sheets (QT). To begin with (Subsection 4.1), we analyse whether QT is necessary for a return to the SRS. In Subsection 4.2, we discuss other (monetary policy-related) arguments favouring QT. Subsection 4.3 is devoted to financial stability risks associated with QT and preventive measures that can mitigate these risks. Subsection 4.4 analyses the pace and instruments of QT undertaken by three major CBs and assesses their effectiveness.

### 4.1. Is QT a necessary condition for returning to the SRS?

In Subsections 2.4 and 2.5, we presented the advantages of the SRS (a “corridor” system) over the ARS (a “floor” system). They indicate that moving back to the SRS from the ARS, which now dominates the CB operational frameworks of monetary policy, would help improve monetary policy’s transmission mechanism, restore the short-term interbank market, and enhance the perception of CB economic independence. Given the record-high CB balance sheets and excess liquidity, one could ask whether this is possible without their substantial reduction, i.e. large-scale QT.

Looking at CB liabilities (Figure 1), there is one hypothetical option for reducing excess short-term liquidity without a radical downsizing of CB balance sheets: a maturity conversion of a substantial part of CB liabilities. They are currently of a predominantly short-term character, for example, overnight deposits of commercial banks in the CB or reverse repo operations with a short maturity. If the current voluntary overnight deposits of commercial banks in the CB could be converted into long-term deposits or CB bonds with long-term maturity, it would enable a return to structural liquidity deficit in the banking systems and restore the SRS, in which the CB would satisfy the current liquidity needs of commercial banks via short-term repo operations, refinancing credit, and other liquidity supply tools (see Borio, 2023).

However, such a hypothetical model has some potential shortcomings. First, during the decade and a half since the GFC, commercial banks have become addicted to excess liquidity and the ARS. They might not be interested in parking a substantial part of this liquidity in CB accounts for the long term. Second, the cost of such a parking operation (CB bond yields or interest rate on long-term deposits) could be high for the CB, exceeding potential revenue from repo operations or refinancing lending and yields on government bonds held in the CB portfolio. Third, the CB would have to use several monetary policy instruments (short-term rates, interest rates/CB bond yields for its long-term liabilities, and determination of the size of its balance sheet) simultaneously. As mentioned earlier (see Subsection 2.4), that would contradict the Tinbergen rule and decrease monetary policy transparency.

Given the above shortcomings, it is challenging to recommend the large-scale maturity conversion of CB liabilities as the main avenue of restoring the SRS. Instead, such a conversion could be considered a supplementary and temporary tool accompanying the QT, which would play a decisive role.

Increasing minimum (mandatory) reserve requirements, especially when either unremunerated or remunerated below the market rate, is a less costly way to reduce excess liquidity than offering long-term deposits in CB or CB bonds. However, there are limits to using this instrument, which plays the role of an implicit tax on commercial bank deposits.



## 4.2. Other arguments in favour of QT

The QT is also important for speeding up the disinflation process and making it sustainable. Restoring price stability in an environment of large CB sheets and the resulting overhang of base money and short-term liquidity will be difficult. Commercial banks' high demand for base money, which prevailed in the 2010s and which mitigated the potential inflationary impact of this overhang (see Subsection 3.2), was, to a certain extent, of a one-off nature (legacies of the GFC and EFC, adaptation to Basel 3 regulatory standards), and will not necessarily continue in the future. Furthermore, a new round of QE during the COVID-19 crisis went beyond the actual demand for base money, which was reflected in the inflation surge in 2021–2023 in almost all AEs. A gradual increase in short-term CB lending and deposit rates may not prevent excess liquidity from "leaking" into the banking sector and economy. The relatively slow disinflation process in AEs suggests that additional policy actions are needed to accelerate it. QT could play an essential role by increasing long-term interest rates and draining excess liquidity.

Ideally, monetary policy tightening should start with shrinking CB balance sheets (QT) as the primary disinflation instrument, followed by a hike in short-term policy rates. Regretfully, CBs chose a different sequence of monetary tightening. First, they started raising short-term interest rates and only then began to downsize their balance sheets. Worse, the pace of QT has been relatively slow so far (see Figure 3 and Subsection 4.4).

Large liquidity "overhang" creates the risk of its unexpected rapid absorption by the banking system and real economy when their demand for base money suddenly decreases (money velocity increases), leading to inflationary consequences. Furthermore, as argued in Subsection 2.4, the monetary policy transmission mechanism works slower and less effectively in excess liquidity.

Therefore, unless the pace of QT is accelerated, the disinflation in leading currency areas may become a long and economically painful process (due to the building up of inflationary inertia).

Apart from inflation-related concerns, there are also other arguments in favour of QT. They relate to legal aspects of the functioning of CBs (Whelan, 2023). Most CB statutes prohibit the monetary financing of fiscal deficits. This ban is firm in the case of the ECB. Article 123 of the Treaty on the Functioning of the European Union (TFEU) states the following:

*"Overdraft facilities or any other type of credit facility with the European Central Bank or with the central banks of the Member States (hereinafter referred to as "national central banks") in favour of Union institutions, bodies, offices or agencies, central governments, regional, local or other public authorities, other bodies governed by public law, or public undertakings of Member States shall be prohibited, as shall the purchase directly from them by the European Central Bank or national central banks of debt instruments."*

While Article 123 has been interpreted as a ban on the direct purchase of government bonds on the primary market, bond purchases on the secondary market as part of the QE and the resulting accumulation of a large stock of government bonds in the Eurosystem's portfolio led to legal challenges. The ECB had to defend its APPs in two cases before the Court of Justice of the European Union (CJEU). Although the CJEU rulings did not question the ECB's policies, legal doubts remained (Whelan, 2023). In this context, QT can help diminish the perception of the ECB's (and other CBs') fiscal dependence. We will return to this question in Subsection 4.3.

### 4.3. Financial instability risks associated with QT

Monetary policy tightening always involves the risk of financial instability because the debt service costs of commercial banks, other financial institutions, non-financial corporations, households and governments increase accordingly. It is even more challenging after a long period of ultra-loose monetary policy, as during the current tightening cycle. The reason is simple: Debtors become addicted to inexpensive borrowing and excess liquidity (Hussman, 2023).

Interestingly, the tightening “shock” is an overlooked aspect of macroeconomic fine-tuned asymmetry. Another relates to political economy considerations. For both reasons, policy easing is more politically affordable and less risky regarding undesired side effects (at least in a short time) than its reversal (policy tightening).

Besides, a complete policy cycle (easing followed by tightening) cannot always be symmetrical because the situation in the regulated sphere has changed. This is evident in the case of the ongoing QT (Schnabel, 2023): it will not bring CB assets down to the pre-GFC level because the demand for base money has increased significantly since then.

In the current situation, tightening monetary policy – and particularly intensifying QT – could create challenges for two sectors: the financial sector (commercial banks) and the government.

The risks for commercial banks and other financial institutions can have a variety of origins. First, all assets (banks’ loans extended to their clients, bonds and others) accumulated during ultra-loose monetary policy must be reassessed regarding market price and riskiness when market interest rates increase. Second, the profitability of banks’ clients can decline in tighter macroeconomic conditions (lower aggregate demand), and their ability to repay loans will diminish. This can increase NPLs and deteriorate the quality of banks’ assets. Third, refinancing bank liabilities will become more expensive, and their access to short-term liquidity will be more restricted. The money market tensions in mid-September 2019 (Anbil et al., 2020) and the Silicon Valley Bank (SVB) failure in March 2023 (Merler, 2023) are good examples of the materialisation of such risks.

The risk to government finances comes from excessive public debt, which reached a record-high peacetime level (Dabrowski, 2022). Monetary tightening, either by hiking short-term CB interest rate, QT, or both, increases interest payments, i.e. debt servicing costs. On the other hand, high inflation depreciates the real value of debt stock. However, the higher inflation and negative real interest rates in 2021–2023 have not yet reduced the public debt-to-GDP ratio in most AEs. There are at least two reasons for this: continuous large primary deficits and slow GDP growth or stagnation.

The vulnerability of government finances spreads to commercial banks, which hold a substantial portion of public debt. Furthermore, in many jurisdictions, financial regulations treat government bonds as HQLAs, collateral for CB loans and riskless assets. Therefore, fear concerning government solvency can immediately spill over to the banking sector and cause a systemic banking crisis. Such a development was observed, for example, during the EFC in the first half of the 2010s, particularly in Greece.

Hence, fiscal adjustment (elimination of budgetary deficits and reduction of public debt-to-GDP ratios) should be the primary antidote for mitigating the risk of financial instability during the implementation of QT and, more generally, monetary policy tightening. It would protect government finances and, indirectly, the financial sector against potential turbulence from higher debt servicing costs. Another measure should involve further strengthening banking supervision and updating its tools to the reality of contemporary digital banking (Merler, 2023) and banks’ increased exposure to government bonds.

In particular, the stress tests should adopt more realistic and cautious assumptions regarding sovereign insolvency risks.

Many authors (e.g. Schnabel, 2023; Whelan, 2023) advocate a gradual implementation of QT as the primary safeguard against financial instability. Such a recommendation sounds reasonable but with two caveats.

First, a gradual approach does not always prevent crisis development, as demonstrated by the abovementioned episodes of instability in September 2019 and March 2023. This is because economic agents who need stronger signals to adjust their behaviour overlook the slow pace of policy or regime change. The second is the slow pace of QT, which may prove insufficient for quickly bringing annual inflation down to 2% and reducing the excess liquidity to an extent that would allow a return to the SRS in the foreseeable future (see Subsection 4.4).

#### 4.4. Actual pace and instruments of QT

Figure 3 shows that the three largest CBs in AEs started reducing their balance sheets in Q2 2022. This was first done by discontinuing specific emergency lending programmes of the COVID-19 era and their repayment by borrowers. In the case of the ECB, it was the repayment of outstanding longer-term refinancing operations (TLTROs) loans by commercial banks (Schnabel, 2023).

On 4 May 2022, the Fed announced a plan to reduce its balance sheet via outright QT<sup>12</sup>. Starting in June 2022, it was USD 47.5 billion per month for the first three months, doubling to USD 95 billion per month. The Fed's balance sheet reduction was temporarily reversed after the SVB crisis in March 2023 (due to short-term emergency lending) but returned to the previous pace after approximately two weeks.

The ECB announced a plan to reduce the Eurosystem's security holdings nine months later, on 2 February 2023<sup>13</sup>. Its implementation started in March 2023. However, the pace of this reduction has been relatively slow, at EUR 15 billion per month until June 2023, accelerated to EUR 27 billion per month on average for the next 12 months.<sup>14</sup> Interestingly, the QT affected the "old" APP, while the PEPP asset holdings will be fully reinvested by 2024.

The BoJ is at the stage of a comprehensive review of its previous policies (Guo and Zhu, 2023). It will implement its yield curve control (YCC) strategy with greater flexibility, especially at the long-term end of the yield curve. Although it is continuing its policy of monetary easing, it also intends to return corporate bond stock to the pre-pandemic (lower) level<sup>15</sup>.

With the current pace of QT, returning to the pre-pandemic size of CB balance sheets (at the end of February 2020), which may be taken as a reasonable policy goal, will take a long time. In the case of the Fed, with the monthly amount of QT equal to USD 95 billion, this goal could be accomplished by around October 2026. However, with an average monthly QT rate of EUR 27 billion, the ECB will require eight years.

This means that a substantial reduction of CB assets, which could facilitate a return to the SRS, is still a distant perspective, especially in the euro area, unless the pace of QT is radically accelerated. It can explain why most CBs do not raise the question of returning to the SRS yet or even explicitly declare continuation of the ARS, as in the case of the Bank of Canada (Gravelle et al., 2023).

<sup>12</sup> See <https://www.federalreserve.gov/newsevents/pressreleases/monetary20220504b.htm>

<sup>13</sup> See <https://www.ecb.europa.eu/press/pr/date/2023/html/ecb.pr230202~1a4ecbe398.en.html>

<sup>14</sup> See <https://www.ecb.europa.eu/mopo/implement/app/html/index.en.html>

<sup>15</sup> See [https://www.boj.or.jp/en/mopo/mpmdeci/mpr\\_2023/k230728a.pdf](https://www.boj.or.jp/en/mopo/mpmdeci/mpr_2023/k230728a.pdf)

## 5. CONCLUSIONS

After more than a decade of ultra-loose monetary policy, UMPMs, including QE, contributed to the unprecedented expansion of CB balance sheets and radically changed the operational settings of CBs in AEs, bringing them, in many respects, close to the experience and policy dilemmas typical of CBs in EMEs. Due to the excess liquidity, the SRS, the dominant operational setting in AEs before the GFC, had to be replaced by the ARS. The single monetary policy tool (interest rate for short-term open market operations) was supplemented by longer-term interest rates charged under special lending facilities (such as the TLTRO in the ECB), and quantitative targets of asset purchases. The behaviour of commercial banks and non-banking economic agents adjusted to the new monetary environment.

As the SRS has several advantages over the ARS (see Subsection 2.4), returning to it would be a desirable policy goal. However, it requires a far-going reduction in CB assets and excess liquidity to be feasible. Such a reduction is also necessary to make the disinflation policy successful (quickly bringing down annual inflation to the targeted level of 2%).

Reducing CB securities holdings (QT) is the primary avenue for achieving the above policy goal. Other instruments, such as the termination of the special lending facilities created during the COVID-19 pandemic, can be helpful, especially in the initial stages of monetary tightening, but have limited potential. Similarly, converting a part of CBs' short-term liabilities into long-term ones could speed up the transition to the SRS but cannot entirely substitute QT.

Looking at the current pace of QT, a reduction in excess liquidity sufficient for enabling a return to the SRS looks like a distant perspective. The above is especially true in the case of the ECB, which started monetary tightening and QT later than the US Fed and moved slowly in this direction. Thus, unless the pace of QT is accelerated, the ECB will not be able to return to the SRS in the foreseeable future.

Every monetary tightening involves a risk of financial instability. In the current tightening cycle, this risk is magnified by a long period of near-zero interest rates, abundant liquidity, and a record-high level of public debt in AEs. The latter negatively affects the stability of government finances and indirectly affects commercial banks and non-banking financial institutions heavily exposed to government bonds. Therefore, a fiscal adjustment must be seen as the primary flanking measure, decreasing the risk of financial instability during monetary tightening.

Other measures should involve stricter financial supervision ready to address specific problems of contemporary (frequently digital) banking and reassess the role of government bonds as "safe" and highly liquid assets.

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The excess liquidity in the euro area is a product of a long period of quantitative easing. It changed the operational framework of the European Central Bank (ECB)'s monetary policy from the scarce reserves system (SRS) to the abundant reserves system (ARS). To eliminate excess liquidity and return to the SRS, the ECB must intensify quantitative tightening, which is also essential for successful disinflation. Fiscal adjustment can help in this process and mitigate the risk of financial instability.

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