Monetary policy of the Eurosystem and the OeNB's balance sheet

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Monetary policy in the euro area is decided by the Governing Council of the European Central Bank (ECB) but implemented through the balance sheets of the 19 national central banks (NCBs) of the Eurosystem. While the consolidated financial statement of the Eurosystem is the primary source of information for monetary policy in the euro area, this article takes the Oesterreichische Nationalbank as an example and argues that a disaggregated view offers additional perspectives. During the financial crisis, the balance sheets of the NCBs reflected to what extent and through which channels national banking systems were affected by the crisis. At the same time, however, NCBs' balance sheets are driven by structural factors and contingencies completely unrelated to monetary policy. In Austria's case, for example, the country's special position in international banknote logistics is the key driving force behind the OeNB's large liabilities in TARGET2. Overall, we conclude that the NCBs' balance sheets contain valuable information on both the implementation of monetary policy as well as the operations of the financial and payment system more broadly; nevertheless, the NCBs' balance sheets must be read with due care.

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On January 1, 1999 the power to decide on monetary policy was transferred from the national level – in the case of Austria from the General Council (Generalrat) of the Oesterreichische Nationalbank (OeNB) – to the Governing Council of the European Central Bank (ECB). While monetary policy decisions have been taken in Frankfurt since, it is the national central banks (NCBs) of the Eurosystem that continue to implement these decisions. Through their operations, the NCBs ensure that market interest rates align with the policy rate decided by the ECB Governing Council and, more generally, make sure that market conditions reflect the desired policy stance.

Monetary policy operations therefore show up in the balance sheets of the (currently 19) NCBs of the Eurosystem. It is also the NCBs that issue banknotes and administer the current accounts held by commercial banks. In this article, we trace how the OeNB's balance sheet has evolved and has reflected monetary policy over the past 20 years. Moreover, we show that the composition of a single NCB's balance sheet can deviate quite substantially from the consolidated balance sheet of the Eurosystem. Alongside the Federal Reserve System of the United States, the Eurosystem is the only decentralized central bank system currently in existence, and effectively the only monetary union organized in a decentralized system (see Schollmeyer, 2019). We argue that a proper understanding of the decentralized set-up is crucial for the interpretation of monetary policy implementation in the

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euro area, as has been shown by the drawn-out and often confused debate on the significance of intra-Eurosystem claims and liabilities relating to TARGET2 (for a recent summary of the debate in Germany, see e.g. Hellwig, 2018).

The article is structured as follows: Section 1 gives a brief overview over the most important components of central banks' balance sheets and their relation to monetary policy. Section 2 discusses the specificities of the decentralized set-up of the Eurosystem and shows how they are reflected in the balance sheets of the NCBs. Sections 3 and 4 describe the main determinants of the OeNB's balance sheet before and after Austria adopted the euro. Section 5 concludes.

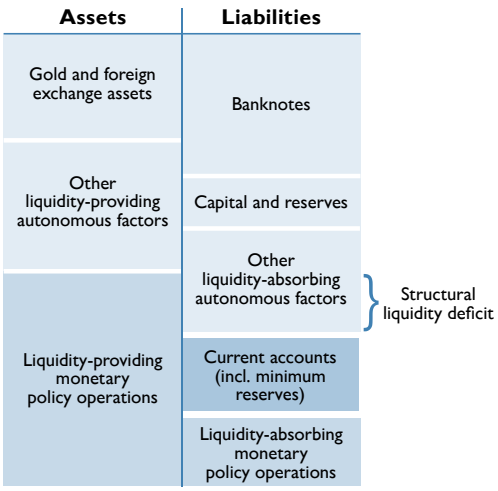
1 A brief introduction to a central bank's balance sheet

Central banks issue central bank money either physically in the form of banknotes or electronically in the form of current account holdings by commercial banks. Commercial banks need current account holdings – often referred to as central bank liquidity or central bank reserves – to make payments in the financial system and obtain banknotes for their customers. Therefore, the interest rate banks pay to obtain deposits at the central bank is a key interest rate in the financial system. Very often, central banks implement monetary policy by adjusting the demand and supply of central bank liquidity in such a way that its price – the short-term interest rate – reflects the desired stance of monetary policy (see Bindseil, 2004).

The analysis of a central bank's balance sheet usefully distinguishes between items actively managed by central banks (monetary policy operations), items that central banks take as a given (autonomous factors), and lastly the current accounts held by commercial banks. Figure 1 highlights in different shades of blue the three different classes of assets/liabilities. The most important autonomous factor is the demand for banknotes. Normally, central banks meet the demand for banknotes in full and consequently their amount is beyond the central bank's control. Other liquidity-absorbing autonomous factors include capital and reserves as well as e.g. government deposits. Gold, foreign exchange assets and financial assets purchased for generating income or for covering pension liabilities are prominent examples for liquidity-providing autonomous factors.

Figure 1

Simplified central bank's balance sheet



Source: Authors' compilation.

From a monetary policy perspective, a key characteristic of the balance sheet is the structural liquidity position of the banking system. When autonomous factors provide less liquidity than they absorb, we speak of a structural liquidity deficit. In figure 1, the banking system faces a structural liquidity deficit, because more liquidity is absorbed by the demand for banknotes, capital, reserves and other liquidity-absorbing autonomous factors than is provided through gold, foreign exchange assets and all other liquidity-providing autonomous factors. This was the situation in the

euro area after 1999. Conversely, we speak of a structural liquidity surplus when all non-monetary policy items provide more liquidity than they absorb. This was the situation in Austria before 1999.

When implementing monetary policy, central banks take the net demand for central bank liquidity provided by the autonomous factors as a given and adjust the supply and price of liquidity in their monetary policy operations in such a way that commercial banks hold their desired amount of current account balances. Depending on the amount of reserves demanded by the commercial banks and the structural liquidity position of the banking system, monetary policy operations have to either provide or absorb liquidity. To create liquidity, central banks purchase assets or grant collateralized loans to commercial banks. To absorb liquidity, central banks sell assets or borrow from banks. They can also require banks to hold more reserves by imposing minimum reserve requirements. Bindseil (2016) argues that before 2007 the consensus view was that market interest rates could be steered most effectively through liquidity-providing operations and thus in a liquidity deficit situation. Whether this still holds true after the crisis is subject to debate (see Gagnon and Sack, 2014).

2 The hybrid nature of NCBs' balance sheets within the Eurosystem

In the case of the Eurosystem, the relevant information on the creation and absorption of liquidity is given by the consolidated balance sheet – i.e. the sum of the balance sheets of all NCBs and the ECB[2] – which is published weekly on the ECB's website. NCBs' balance sheets reflect the NCBs' contributions to the common monetary policy of the Eurosystem, but for three reasons these contributions can differ significantly from one NCB to another:[3]

First, autonomous factors might be higher or lower than on average, e.g. because of higher or lower gold and foreign exchange holdings (which had been built up before the introduction of the euro in most cases), capital and reserves, or high and volatile government deposits for those central banks that act as cashiers for their national governments. Second, liquidity creation in refinancing operations depends on the demand of individual banks, which is why claims from monetary policy operations might be higher or lower in some jurisdictions than in others. Third, central bank money flows freely within the monetary union. This is true of both cash and electronic central bank money.

As far as banknotes are concerned, the Eurosystem's accounting rules state that NCBs shall not report the amount of banknotes put into circulation minus the amount of banknotes withdrawn from circulation (as has been the case before 2002), but shall distribute the total amount of banknotes in circulation among NCBs and the ECB according to an allocation key.[4] The OeNB, for example,

[2] *The consolidated balance sheet of the Eurosystem is the sum of all NCBs' balance sheets with intra-Eurosystem claims and liabilities canceling each other out.*

[3] *Compared to NCBs, the ECB's balance sheet itself plays a limited role in the implementation of monetary policy. Exceptions from this rule include private and public asset purchase programs that have been introduced since 2009. Within the framework of these programs, both the NCBs and the ECB have bought shares of assets and hold them on their balance sheets.*

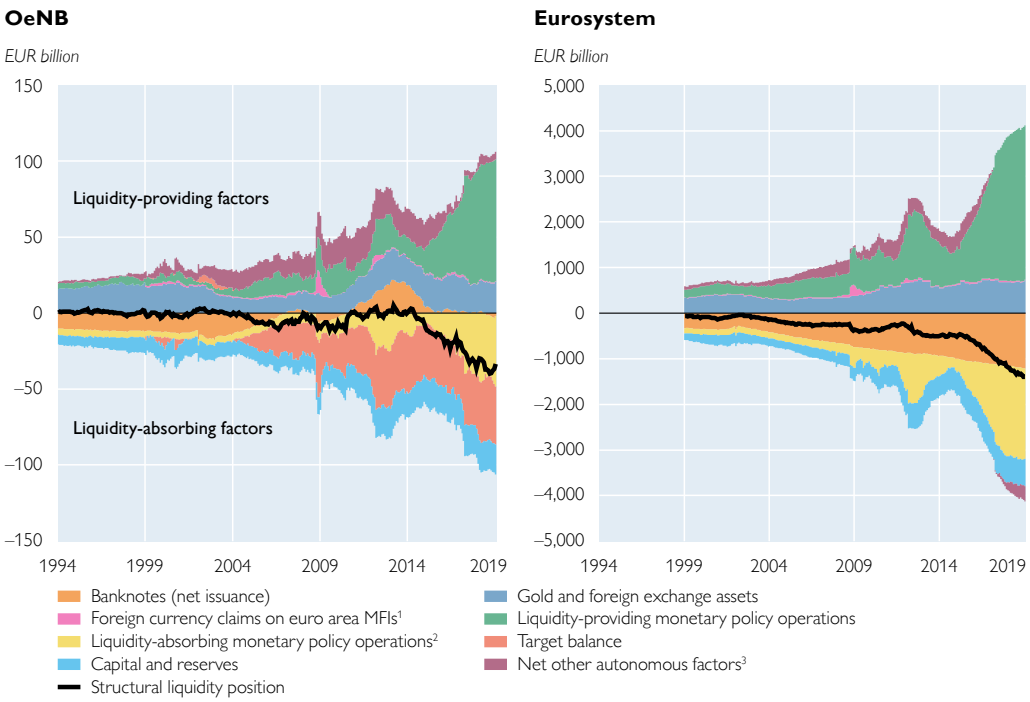
[4] *The banknote allocation key is based on the share of each NCB in the capital of the ECB. The ECB is attributed 8% of the total value of euro banknotes in circulation; the remaining 92% of the value of euro banknotes in circulation are allocated to the NCBs of the Eurosystem in proportion to the respective NCB's share in the subscribed capital key (see Krsnakova and Oberleithner, 2012).*

currently reports 2.7% of all euro banknotes in circulation in its balance sheet, regardless of how many banknotes it has actually issued itself or how many banknotes are circulating within the territory of Austria. However, this raises the issue of how NCBs' balance sheets handle the case when an NCB issues more (or less) banknotes, which is – as argued before – outside the control of the NCB. The difference between the banknotes in circulation allocated to the NCB in accordance with the banknote allocation key and the banknotes actually put into circulation by the NCB are recorded in its balance sheet either as an intra-Eurosystem liability or claim, depending on whether actual issuance is above or below the allocation key (see Krsnakova and Oberleithner, 2012). Thus, if we are interested in the net amount of banknotes actually put into circulation by an NCB, we have to add the item "banknotes in circulation" to the (positive or negative) item "net liabilities/net claims related to the allocation of euro banknotes within the Eurosystem." The result can be referred to as net issuance of banknotes.

International movements of electronic central bank money, i.e. transfers between current accounts at different NCBs, are executed via the payment system TARGET2. If e.g. an Austrian commercial bank (holding its current account with the OeNB) buys a financial asset from a German commercial bank (holding its current account with the Deutsche Bundesbank), it can pay via a TARGET2 transfer. In the course of the transaction, its account at the OeNB is debited, while the account of the German commercial bank at the Deutsche Bundesbank is credited. To balance the

Chart 1

A net view on the main categories of the OeNB's and the Eurosystem's balance sheets



Source: OeNB, ECB.

[1] *Includes monetary policy operations in foreign currencies (USD, CHF).*
[2] *Includes current accounts.*
[3] *Includes, among others, securities held for investment purposes and other financial assets, provisions and government deposits.*

transfer, the Bundesbank obtains a claim, while the OeNB builds up a liability in TARGET2.[5] The flows accumulate over time. As a result, the TARGET2 position of every NCB indicates the total net inflows and outflows of its country since the inception of the euro in 1999.

When the balance sheets of all NCBs and the ECB are aggregated, the claims and liabilities arising from both net claims or net liabilities related to the allocation of euro banknotes as well as net claims or net liabilities related to TARGET2 cancel each other out. Consequently, the consolidated balance sheet of the Eurosystem does not contain any intra-system positions and can be described similar to that in figure 1.

3 The balance sheet of the OeNB before 1999

Before 1999, Austria pegged its schilling to the Deutsche mark (see Jobst and Kernbauer, 2016) and kept high foreign exchange reserves accordingly.[6] With the transition to the euro in 1999, the OeNB became part of the Eurosystem with a price stability target, in which foreign reserves are of secondary importance only.

In the three years before the introduction of the euro, the balance sheet total of the OeNB amounted to EUR 26.4 billion on average.[7] The asset side was clearly dominated by gold and foreign exchange assets valued at EUR 18.7 billion.[8] Foreign exchange assets were thus significantly larger than banknotes in circulation (EUR 11.7 billion), enhancing the credibility of the schilling's peg to the Deutsche mark. The counterpart of the "excess coverage of banknotes by foreign exchange assets" was capital and reserves, amounting to EUR 8.5 billion. Thus, in total, slightly more liquidity was provided through gold, foreign exchange assets and all other non-monetary policy assets (autonomous factors) than what was absorbed by banknotes, capital, reserves and all other non-monetary liabilities.[9] Austria was therefore characterized by a structural liquidity surplus.

[5] *According to the conventions of the Eurosystem (see ECB, 2012), the claims and liabilities are not recorded on a bilateral basis but transferred to the ECB and netted out. At the end of each day, therefore, all NCBs only hold claims or liabilities against the ECB. For more details on the balance sheet implications of cross-border transactions in TARGET2, see e.g. Jobst et al. (2012b).*

[6] *Historically, the reporting format of the OeNB's balance sheet was based on the legally defined concept of reliable coverage ("Deckung"). Assets were classified according to whether they qualified for the coverage of banknotes in circulation and sight liabilities. The balance sheet was published in Austria's official gazette ("Wiener Zeitung") on a weekly basis to create trust for currency users. On December 31, 1998, coverage of total banknotes in circulation ("Deckung des Gesamtumlaufs") according to Article 62 Federal Act on the Oesterreichische Nationalbank 1984 as amended in 1998 was 147.3%, of which 133.4% consisted of foreign exchange assets.*

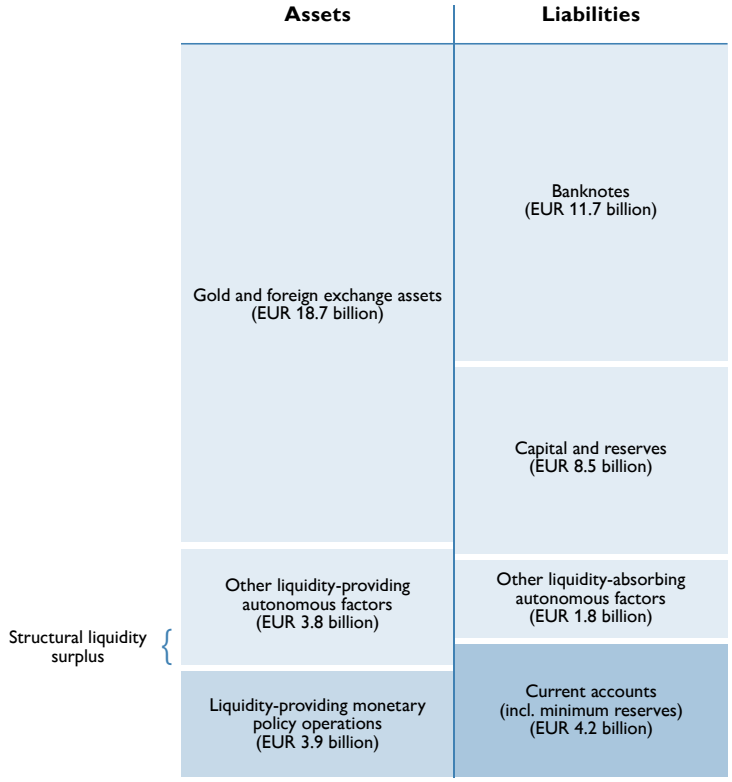
[7] *All numbers given in this section are three-year averages (1996–1998). Originally, the unit of account was Austrian schilling (ATS). However, to ease comparisons with the post-1999 period we converted schillings into euro, using the official conversion rate of ATS 13.7603.*

[8] *Note that gold was valued at a fixed balance sheet valuation price of ATS 60,000 per kg of fine gold (around EUR 4,360 per kg of fine gold). This was considerably below the market value of ATS 108,993.67 per kg of fine gold as on December 31, 1998. The fixing of the valuation price rule has been applied as a prudence principle to avoid valuation volatility effects in profits and losses since the 1970s (see OeNB, 1999).*

[9] *Other net assets contributed EUR 1.8 billion of liquidity.*

Figure 2

The structure of the OeNB's balance sheet from 1996 to 1998 (averages of weekly statements, converted into euro)



Source: OeNB, financial statements, authors' calculations.

In order to create a liquidity deficit, the OeNB imposed minimum reserve requirements (see Pfeiffer and Quehenberger, 1996) that absorbed EUR 4.2 billion on average between 1996 and 1998.[10] The resulting liquidity deficit created the necessary demand in the liquidity-providing operations (EUR 3.9 billion) and allowed the OeNB to steer market interest rates. Traditionally, the OeNB used standing facilities to provide its banking system with central bank liquidity. It was only in 1996 and in preparation for the future framework of the Eurosystem that a weekly open market operation was introduced (see OeNB, 1996; Pfeiffer und Quehenberger, 1996).

4 Key trends in the OeNB's balance sheet from 1999 to 2018

The Eurosystem took over responsibility for monetary policy operations on January 1, 1999. The establishment of the Eurosystem together with the introduction of the euro had several significant consequences for the balance sheet of the OeNB.

4.1 New reporting rules and formats from 1999 onward

As a prerequisite for drawing up a consolidated balance sheet for the Eurosystem, financial reporting and balance sheet valuation rules had to be harmonized based on Article 15.2 of the ESCB/ECB Statute (reporting commitments), which required a weekly "consolidated financial statement" to be published from January 1, 1999 onward. According to Article 26.4 of the ESCB/ECB Statute (financial accounts), rules for standardizing the accounting and reporting of the NCBs' operations were set up and new items entered the NCBs' balance sheets reflecting the framework that the Eurosystem used to steer interest rates. Due to the shift from domestic to Eurosystem accounting and reporting rules, the OeNB's balance sheet from December 31, 1998 and that from January 1, 1999 are not directly comparable. Most importantly, all assets and liabilities were revalued and recorded at market prices. The resulting unrealized gains of EUR 3.7 billion were transferred to revaluation accounts, included in "capital and reserves" in chart 1 (see OeNB, 2000).

[10] *Unlike after 1999, minimum required reserves were not remunerated and imposed a tax on the Austrian banking system. To support the banks' international competitiveness, reserve requirements were significantly lowered in 1995, but kept at a level that ensured a liquidity deficit (see Hanisch, 1995). At times, the OeNB also issued liquidity-absorbing debt certificates, whose amounts, however, were relatively small. Between 1996 and 1998, debt certificates, which are subsumed under "current accounts" in figure 2, amounted to EUR 80 million on average.*

4.2 Monetary policy operations in the first years of EMU

Unlike Austria and some other countries joining European Economic and Monetary Union (EMU), the Eurosystem as a whole faced a structural liquidity deficit, and monetary policy operations were organized accordingly (see Galvenius and Mercier, 2011). Initially, the liquidity deficit amounted to around EUR 70 billion and was further increased by imposing a minimum reserve requirement of 2% of the reserve base, in particular deposits and debt securities with a maturity of up to two years, or roughly EUR 115 billion (annual average for 1999).

Starting on January 7, 1999, liquidity in the euro area was provided in weekly main refinancing operations (MROs)[11] and monthly longer-term refinancing operations (LTROs) with a maturity of three months (see ECB, 1999). The volumes in these open market operations were set by the Eurosystem according to estimates of the autonomous factors and the likely size of the liquidity deficit. The liquidity was allocated competitively based on interest rate bids by participating banks (see ECB, 2011).[12]

While the total volume allocated in MROs and LTROs was set by the Eurosystem, the allocation among the NCBs was determined by the interest rates that participating commercial banks had bid in the different jurisdictions. As a result, allocations at the national level were not necessarily proportional to the size of the national banking systems and also fluctuated between operations. Chart 2 shows the absolute amount of central bank liquidity allocated by the OeNB (left panel) as well as the OeNB's share in total central bank liquidity allocated by the Eurosystem (right panel). Except for short periods in 2001 and 2003, the amounts tendered by the OeNB in MROs and LTROs increased until 2007, broadly in line with the rising banknote circulation and liquidity deficit at the euro area level. Most of the time, Austrian banks accounted for a lower share of total tender operations than the OeNB's share in the ECB's capital as well as their share in minimum reserves.

4.3 Monetary policy operations during the Great Financial Crisis

First signs of the financial crisis in Europe appeared in August 2007.[13] Interbank-market functioning suffered and banks started to hoard central bank liquidity. The ECB reacted by shifting tender volumes from the weekly MROs to the three-month LTROs. At the OeNB, volumes in the LTROs came to exceed volumes in the MROs, even though the shift was less pronounced in Austria than at the euro area level. After the failure of Lehman Brothers in October 2008, the ECB further eased access to central bank liquidity by fully allotting all bids at the policy rate in both MROs and LTROs, effectively guaranteeing commercial banks access to central bank money, on condition that counterparties provided enough eligible collateral.[14] The procedure – called fixed-rate full allotment – has remained in

[11] *Originally, the MROs had a maturity of two weeks. In March 2004, however, the maturity was shortened to one week (see ECB, 2003).*

[12] *Initially, the MROs were tendered in a fixed-rate procedure. On June 8, 2000 the ECB announced that, starting from the operation to be settled on June 28, 2000, the MROs would be conducted as variable rate tenders (see ECB, 2000; Papadia and Välimäki, 2011).*

[13] *For the following chronology of monetary policy at the euro area level, see Hartmann and Smets (2018), in particular.*

[14] *In October 2009, the list of assets eligible as collateral in Eurosystem operations was expanded. Thereafter, it was adjusted time and again. The expanded and adapted collateral list is still in place.*

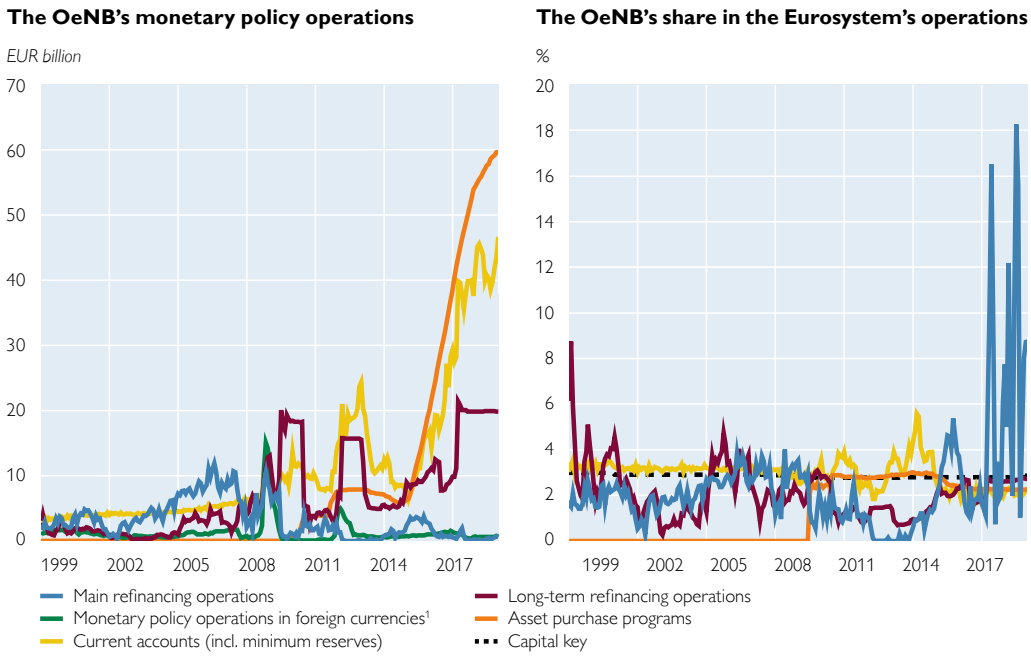
place ever since. To provide banks with sufficient liquidity also at longer maturities, the Eurosystem added LTROs with a maturity of the length of one maintenance period and with a maturity of six months to its toolbox and offered a series of one-year operations starting in June 2009. Moreover, the Eurosystem started to purchase euro-denominated covered bonds to ease funding conditions for banks, encouraging them to maintain and expand their lending to customers (see ECB, 2009).

Last but not least, the ECB and the central banks of Switzerland and the U.S.A. introduced swap facilities to help European banks refinance their liabilities in Swiss francs and U.S. dollars (see chart 1, Allen and Moessner, 2010).[15] Austrian banks, which had a large portfolio of loans denominated in Swiss francs in Austria and Central, Eastern and Southeastern European (CESEE) countries, either had intensive recourse to these facilities or profited indirectly (see Pann et al., 2010).

From late 2009 onward, the financial crisis spilled over to the markets for government debt. In May 2010, the Eurosystem introduced the Securities Markets Programme (SMP) and started to buy Greek, Irish, Italian, Portuguese and Spanish sovereign bonds. When the sovereign debt crisis intensified in 2011, a second purchase program for covered bonds followed. Moreover, in December 2011 and March 2012, the Eurosystem offered two three-year LTROs, allotting in total more than EUR 1 trillion. Ultimately, the crisis abated only after ECB President

Chart 2

The OeNB participates in the Eurosystem's monetary policy operations



Source: OeNB, ECB.

[1] Includes also other foreign currency claims. The OeNB's share in the Eurosystem total can therefore not be interpreted as a share in policy operations and is not displayed in the right panel.

[15] USD and CHF reverse operations were booked under the item A3.1 "claims on euro area financial sector counterparties denominated in foreign currency". As A3.1 contains other items as well, no time series can be drawn for USD and CHF operations. End-of-year values can, however, be obtained from the comments in the end-of-year financial statements of the OeNB.

Mario Draghi assured markets on July 26, 2012, that "[w]ithin our mandate, the ECB is ready to do whatever it takes to preserve the euro" (see Draghi, 2012) and the ECB Governing Council announced the Outright Monetary Transactions (OMT) program in September 2012. The OMT led to a decline in tensions on the financial markets, without a single purchase taking place.

During this phase, financial tensions concentrated in the peripheral members of the euro area. While demand by Austrian banks in the LTROs was high in absolute terms, the share of the OeNB in Eurosystem operations declined after 2009, falling to a low of 1% in 2014. The decline was further accentuated by Austrian banks using the possibility to repay early some of the funds borrowed in the three-year LTROs. In the asset purchase programs, on the other hand, volumes were typically parcelled out among NCBs according to the capital key set by the ECB, meaning that the OeNB's share hovered around 2.9% from 2009 to 2014 (see chart 2).

Toward the end of 2013, the focus of policymakers shifted to sluggish economic growth, low inflation and a perceived risk of deflation. In addition to a further lowering of key policy rates, the ECB Governing Council reacted by offering a new series of refinancing operations with a built-in incentive for banks to increase their lending to the private sector. These targeted longer-term refinancing operations (TLTROs) started in June 2014 and were equipped with a maturity of four years. In these operations, Austrian banks participated roughly in line with the capital key. In the meantime, the weekly main refinancing operation (MRO) had lost all of its importance, declining from more than EUR 300 billion before the crisis to about EUR 5 billion in early 2019.[16]

The TLTROs were complemented by a series of securities purchase programs that culminated in the announcement of the Expanded Asset Purchase Programme (APP) in January 2015. Between March 2015 and December 2018, the Eurosystem bought public and private assets amounting to EUR 2.6 trillion. Unlike in earlier operations, the ECB participated in these purchases alongside the NCBs. Moreover, the implementation of some programs was delegated to specialized groups of NCBs operating on behalf of the entire Eurosystem. As a result, the share of the OeNB in all asset purchase programs declined somewhat after 2015 and has stabilized thereafter at around 2.3%. At the end of 2018, the OeNB's contribution to liquidity-providing monetary policy operations amounted to roughly EUR 80 billion. Of this amount, the TLTROs accounted for EUR 19.8 billion, the MROs for EUR 1.3 billion, the SMP for EUR 1.9 billion, the two remaining Covered Bonds Purchase Programmes (CBPP 2+3) for EUR 7.2 billion and the Public Sector Purchase Programme (PSPP) for EUR 50.3 billion (see OeNB, 2019).

By lending to banks and purchasing assets, the Eurosystem created more central bank liquidity[17] than the banking sector needed to cover the structural liquidity deficit and to fulfil the minimum reserve requirement. In addition, the Eurosystem lowered the minimum reserve requirement from 2% to 1% from January 18, 2012.

[16] *The low total volume also explains the high and volatile share of the OeNB visible in chart 2.*

[17] *The only exception was the SMP. Initially and to signal that the SMP was not designed to alter the stance of monetary policy, purchases under the SMP were sterilized through fixed-term deposits. Sterilization was discontinued in June 2014 to ensure a sufficiently large amount of excess liquidity to stabilize short-term money market rates close to the rate on the deposit facility (see ECB, 2014).*

Chart 2 tracks the changes in banks' current accounts (including minimum reserves and the deposit facility) at the OeNB. Until 2015, current account holdings were mainly determined by the banking sector's demand for lending programs. With the start of the APP, the Eurosystem actively drove up the amount of central bank liquidity holdings. Despite these many factors, the share of Austrian banks in total reserves remained relatively stable at 2% to 3% both before and after 2008.

4.4 Austria as a net banknote-importing country

Banknotes are the most important autonomous factor and driver of demand for central bank liquidity. Traditionally, Austrians are heavy users of cash (see Jobst and Stix, 2016; Ritzberger-Grünwald and Stix, 2018), which is why the OeNB entered the euro with a high circulation of banknotes compared to the euro area average. From 1999 until the introduction of euro banknotes and coins in January 2002, the OeNB continued to report in its balance sheet the actual amount of schilling notes in circulation. From January 2002 onward, however (as explained in section 2 above), euro banknotes in circulation were distributed among NCBs according to the banknote allocation key. As a result, banknotes in circulation, as reported by the OeNB in its balance sheet, fell from a peak of EUR 12.7 billion (ATS converted into euro, average over 2000 and 2001) to EUR 7.6 billion in 2002 (see chart 3). In the following years, the total circulation of euro banknotes increased gradually to EUR 1.2 trillion, of which roughly EUR 30 billion were reported in the balance sheet of the OeNB in 2018.[18]

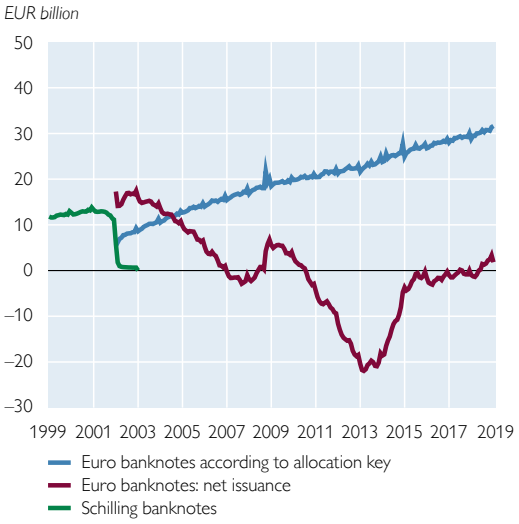
Initially in 2002, the volume of banknotes actually put into circulation by the OeNB (net issuance) was much higher, as is well visible in the difference between the purple and the blue line in chart 3. In the following years however, the pattern reverted, and net issuance of banknotes fell below the share of the OeNB according to the banknote allocation key. Since Austria is a small country within EMU, developments in cash circulation are less influenced by domestic demand than by in- and outflows from abroad. An example would be foreign tourists who withdraw money in their home country, spend their cash in Austria where it is deposited by Austrian hotels and merchants at Austrian banks and where the surplus banknotes ultimately flow to the OeNB (see Jobst et al., 2012a). Another, and at times more important, source of banknote inflows is related to the widespread use of euro cash in CESEE (see Ritzberger-Grünwald and Scheiber, 2012). Most of this cash is shipped out through the Deutsche Bundesbank and Frankfurt airport. However, some of the return flows – cash is shipped both in and out of the euro area and gross flows are much larger than net flows – pass through Austrian banks and end up at the OeNB. As a result, starting right after the introduction of the euro, the OeNB received more banknotes than it put into circulation (see Jobst et al., 2012a) and in 2007 net issuance even became negative. This trend continued until 2013 with a brief interruption in 2008 when, in the wake of the financial crisis, the demand for euro cash in Central and Eastern Europe soared and large amounts of banknotes were shipped there (see ECB, 2009), partly through the intermediation of the OeNB. A similar period of large outflows can be observed at the height of the political crisis in Ukraine in 2014 (see ECB, 2015). Between October 2013 and December 2014, net issuance of the OeNB increased by more than EUR 16 billion.

[18] *Under liability item L1 "banknotes in circulation."*

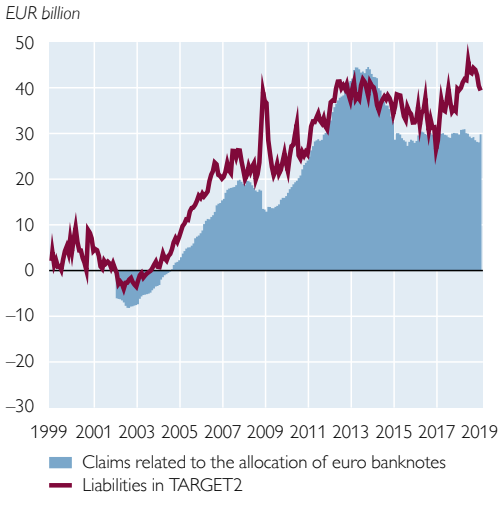
Chart 3

Banknotes and TARGET2 balances in the OeNB balance sheet

Austrian schilling and euro banknotes



Banknotes drive the OeNB's TARGET2 balance



Source: OeNB, ECB.

After the Ukrainian crisis, however, the OeNB did not return to the previous pattern of large net inflows of cash. This is most likely due to the changing role of Austrian banks in international banknote logistics, with incoming and outgoing shipments roughly balancing out today. As a result, net issuance has been roughly stable since 2015.

4.5 Claims and liabilities in TARGET2 as balancing item[19]

The continuing net inflow of banknotes had significant ramifications for the structure of the OeNB's balance sheet. By 2013, the OeNB had accumulated claims worth close to EUR 44 billion on the Eurosystem resulting from banknotes that had been issued elsewhere in the euro area but had been redeemed at the OeNB (see right panel of chart 3). In 2013, these EUR 44 billion amounted to 43% of total assets of the OeNB. The inflows of banknotes, in turn, became an important determinant of the OeNB's balance in TARGET2. Austrian banks delivering banknotes to the OeNB saw their current accounts credited by the same amount. According to the interpretation in Jobst et al. (2012a), these banknotes were paid in on behalf of (mostly) foreign banks using the services of Austrian banks. The amounts credited to the accounts at the OeNB were therefore swiftly transferred via TARGET2 to other countries within the euro area. Until 2004, the liabilities, then claims, of the OeNB in TARGET2 were relatively modest. After 2004, however, and until 2013, continuous outflows via TARGET2 caused the OeNB's liabilities to increase to about EUR 40 billion in 2013.[20] As can be seen in chart 3, the increase in TARGET2

[19] *The euro payment system TARGET was first launched as a fully decentralized framework in 1999 and subsequently replaced by TARGET2 in 2008. For reasons of simplicity, we use the term "TARGET2" throughout the article.*

[20] *The spike in 2008/2009 is due to the CHF and USD operations mentioned above. In these operations, the OeNB lent CHF and USD to Austrian banks (see foreign currency claims in chart 1), which it had itself swapped against euro with the ECB. The euro leg of these operations showed up as TARGET2 liability to the ECB.*

liabilities broadly matched the inflow of banknotes between 2002 and 2013. When, as noted above, banknote flows became more balanced after 2013, the liability position in TARGET2 stabilized as well. In late 2016, TARGET2 liabilities of the OeNB started to increase again, which was probably related to asset purchases within the framework of the APP. A significant share of the securities bought by the OeNB under the APP came from foreign counterparties that may have transferred the newly created liquidity abroad, again through TARGET2. This phenomenon is well documented for the euro area as a whole (see ECB, 2016 and ECB, 2017) and applies to Austria as well.

4.6 Items not directly related to monetary policy

Last but not least, the balance sheet of the OeNB comprises a number of elements that are not directly related to monetary policy or the flow of cash and non-cash central bank money within the euro area. A key asset traditionally held by central banks is gold. During the 1950s and 1960s, the OeNB built up a total stock of about 650 tons of gold, which it kept – with slight fluctuations – constant until the early 1990s. The important role of gold is not fully visible in the OeNB's balance sheet as gold was valuated at a constant price, typically far below market prices. Following an international trend in central bank reserve management that had started in the 1970s and had led to the reallocation of reserves toward assets perceived to offer more attractive risk-adjusted returns (see Wooldridge 2006), the OeNB started to decrease its gold holdings in 1992. By 2007, the OeNB had sold more than half of its gold, most of which was used for the production of gold bullion coins – the Vienna Philharmonics – produced by the Austrian Mint. Since 2007, gold reserves have been held constant at 280 tons.

Regarding claims in foreign currency and securities held for investment purposes, developments are more difficult to track due to regular reclassifications of these assets. Between 2002 and 2004, a significant portion of securities denominated in foreign currency was shifted to "other financial assets." As can be seen in chart 1, the decline in "gold and foreign reserve assets" in these years roughly matches the increase in "net other autonomous factors." After 2009, "gold and foreign reserve assets" increased again, mainly driven by valuation gains due to the rising gold price, a sharp increase in claims on the International Monetary Fund (IMF) in 2009 and renewed investments in foreign securities between 2010 and 2014.

Finally, "net other autonomous factors," which had increased due to the transfer of foreign currency securities from 2002 to 2004 and renewed purchases in 2009, fell sharply after 2015 as deposits from the Austrian government and deposits related to the resolution of bad banks, which are liabilities for the OeNB, increased.

5 Conclusion

Monetary policy in the euro area is decided by the ECB Governing Council but implemented mostly through the balance sheets of the 19 NCBs of the participating countries. The primary source of information on monetary policy operations in the euro area is the consolidated financial statement of the Eurosystem. Using the OeNB as an example, this article argues that a disaggregated view affords an additional perspective on both the implementation of monetary policy as well as the operations of the financial and payment system. During the financial crisis, the NCBs' balance sheets reflected not only the different extent to which, but also the different channels

through which, national banking systems had been affected. In Austria's case, CHF and USD swap facilities operated by the Eurosystem played an important stabilizing role. What is more, the specific composition of the OeNB's balance sheet also reflects idiosyncratic factors, notably the role of Austria in international banknote logistics, at least until 2013. Taken together, these factors show that the balance sheets of NCBs are driven by both local shocks related to, and contingencies completely unrelated to, monetary policy. The high TARGET2 liabilities of the OeNB, for example, are neither related to problems in the banking sector nor to capital flight, as has been the case in other euro area member countries; rather, the OeNB's TARGET2 liabilities essentially constitute the counterpart of international euro banknote flows. To conclude, NCBs' balance sheets contain valuable information; yet, they have to be read with due care.

References

Allen, W. and R. Moessner. 2010. Central bank co-operation and international liquidity in the financial crisis of 2008-9. BIS Working Paper 310. June.

Bindseil, U. 2004. Monetary Policy Implementation. Theory – Past – Present. New York: Oxford University Press.

Bindseil, U. 2016. Evaluating monetary policy operational frameworks. Jackson Hole Economic Policy Symposium, Federal Reserve Bank of Kansas City. August.

Draghi, M. 2012. Verbatim of the remarks made by Mario Draghi at the Global Investment Conference. London. July 26.

ECB. 1999. Euro area statistics. ECB Monthly Bulletin. January to December 1999. Frankfurt am Main.

ECB. 2000. The switch to variable rate tenders in the main refinancing operations. In: ECB Monthly Bulletin. July. 37–42.

ECB. 2003. Changes to the Eurosystem's operational framework for monetary policy. In: ECB Monthly Bulletin. August. 41–54.

ECB. 2009. The international role of the euro. July. Frankfurt am Main.

ECB. 2009. The implementation of monetary policy since August 2007. In: ECB Monthly Bulletin. July. 75–89.

ECB. 2010. The ECB's response to the financial crisis. In: ECB Monthly Bulletin. October. 59–74.

ECB. 2011. The monetary policy of the ECB. Frankfurt am Main.

ECB. 2012. Guideline of the European Central Bank of 5 December 2012 on a Trans-European Automated Real-time Gross settlement Express Transfer system (TARGET2). ECB/2012/27.

ECB. 2014. Introductory statement to the press conference (with Q&A). Mario Draghi. June 5. Frankfurt am Main.

ECB. 2015. The international role of the euro. July. Frankfurt am Main.

ECB. 2016. TARGET balances and the asset purchase programme. In: ECB Economic Bulletin 7/2016. 20–23.

ECB. 2017. The ECB's asset purchase programme and TARGET balances: monetary policy implementation and beyond. In: ECB Economic Bulletin 3/2017. 22–26.

Escriva, J. L. and F. P. Fagan. 1996. Empirical assessment of Monetary Policy Instruments and Procedures (MPIP) in EU Countries. Papers 2. European Monetary Institute.

Gagnon, J .E. and B. Sack. 2014. Monetary Policy with Abundant Liquidity: A New Operational Framework for the Federal Reserve. Peterson Institute for International Economics Policy Brief PB14-4.

Galvenius, M. and P. Mercier. 2011. The story of the Eurosystem framework. In: Mercier, P. and F. Papadia (eds.). The Concrete Euro. Implementing Monetary Policy in the Euro Area. Oxford: Oxford University Press. 115–214.

Hanisch, E. 1995. Maßnahmen der OeNB auf dem Gebiet der Mindestreserve. In: Berichte und Studien der Oesterreichischen Nationalbank 4/1995. 43–46.

Hartmann, Ph. and F. Smets. 2018. The First Twenty Years of the European Central Bank: Monetary Policy. ECB Working Paper 2219. January.

Hellwig, M. 2018. Target-Falle oder Empörungsfalle? Zur deutschen Diskussion über die Europäische Währungsunion. In: Perspektiven der Wirtschaftspolitik 19(4). 345–382.

Jobst, C., Handig, M. and D. Schneeberger. 2012a. The Cross-Border Movement of Euro Banknotes and Austria's TARGET2 Liabilities. In: OeNB. Monetary Policy & the Economy Q4/2012. 32–52.

Jobst, C., Holzfeind, R. and M. Handig. 2012b. Understanding TARGET2: The Eurosystem's Euro Payment System from an Economic and Balance Sheet Perspective. In: OeNB. Monetary Policy & the Economy Q1/12. 81–91.

Jobst, C. and H. Kernbauer. 2016. The Quest for Stable Money. Central Banking in Austria, 1816–2016. Frankfurt am Main: Campus Verlag.

Jobst, C. and H. Stix. 2016. Florin, crown, schilling and euro: an overview of 200 years of cash in Austria. In: OeNB. Monetary Policy & the Economy Q3–4/16. 94–119.

Krsnakova, L. and M. Oberleithner. 2012. How Euro Banknotes in Circulation Affect Intra-Eurosystem Balances. In: OeNB. Monetary Policy & the Economy Q1/12. 70–80.

OeNB. 1996. Die Entwicklung des geld- und währungspolitischen Instrumentariums der Oesterreichischen Nationalbank. In: Berichte und Studien der Oesterreichischen Nationalbank 2/1996. 7–14.

OeNB. 1999. Annual report and financial statements for the year 1998. Vienna.

OeNB. 2000. Annual report and financial statements for the year 1999. Vienna.

OeNB. 2019. Annual report and financial statements for the year 2018. Vienna.

Papadia, F. and T. Välimäki. 2011. Functioning of the Eurosystem framework since 1999. In: Mercier, P. and F. Papadia (eds.). The Concrete Euro. Implementing Monetary Policy in the Euro Area. Oxford: Oxford University Press. 215–342.

Pann, J., Seliger, R. and J. Übeleis. 2010. Foreign currency lending in Central, Eastern and Southeastern Europe: the case of Austrian banks. In: OeNB. Financial Stability Report. December 2010. 56–76.

Pfeiffer, M. and M. Quehenberger. 1996. Internationale Erfahrungen mit geldpolitischen Instrumenten. In: Berichte und Studien der Oesterreichischen Nationalbank 4/1996. 48–61.

Ritzberger-Grünwald, D. and T. Scheiber. 2012. Euro Cash in Central, Eastern and Southeastern Europe. In: OeNB. Monetary Policy & the Economy Q1/12. 41–55.

Ritzberger-Grünwald, D. and H. Stix. 2018. How Austrians bank and pay in an increasingly digitalized world – results from an OeNB survey. In: OeNB. Monetary Policy & the Economy Q3/18. 52–89.

Schollmeyer, U. 2019. Payment systems in a multinational currency union. Paper presented at the conference "The Economics of Monetary Unions. Past Experiences and the Eurozone". Buckingham, February 21–22, 2019.

Wooldridge, Ph. 2006. The Changing Composition of Official Reserves. BIS Quarterly Review. September. 25–38.