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The role of net financial assets in the euro area in the scope of Agreement on Net Financial Assets (ANFA)

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Abstract

The Agreement on Net Financial Assets (ANFA) is an important element of the European Economic and Monetary Union (EMU) and is supposed to grant national central banks a large degree of autonomy in the management of some of its assets and liabilities. Until the turn of 2015 and 2016, very little was known about both this agreement and the way it works. It was not until the eruption of the last phase of the Greek crisis in 2015 when certain rumours started to circulate, according to which the ANFA was to become an instrument aimed to alleviate fiscal tensions. This kind of claims incentivized the ECB in February 2016 to disclose the content of the ANFA. If all the rumours concerning the possibilities of financing debt proved to be unfounded, the ANFA seems not only to grant autonomy in the management of a given national central bank's assets and liabilities, it also offers room for these banks to manage their liquidity needs. This paper is aimed at presenting the importance of the net financial assets (NFAs which are the subject of the ANFA) for the Eurosystem from two different perspectives. The first one focuses on the NFA perception from the point of view of the balance sheet of different national central banks which are part of the Eurosystem. The second scrutinises the link involving net financial assets and liquidity management. The conclusions drawn upon the content of this paper indicate that thanks to the ANFA, national central banks enjoy a large degree of autonomy within the Eurosystem, and its use helps to preserve integrity of the EMU.

Keywords: European Central Bank, agreement on net financial assets, liquidity management

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1. Introduction

When the Economic and Monetary Union came into force, it seemed that monetary policy (unlike fiscal policy) would be the cohesive force binding the then eleven countries together.[1] However, as it turned out, conducting a single monetary policy was not synonymous with the situation in which the central bank exercises full control over the money supply. Suffices to mention that the lion's share of foreign exchange reserves of the euro area countries remained beyond the control of the ECB, which was of great significance from the point of view of the development of the monetary base.[2]

The euro area could have been created according to two scenarios. The first is one in which the Eurosystem would take over the activities conducted up to then by the national central banks. However, this scenario would have a series of drawbacks. Firstly, it would reduce the role of the individual national central banks to regional branches of the ECB. This could have far-reaching repercussions of a political nature and would be unacceptable for many countries (especially the large ones). Secondly, it would prevent the newly-forming monetary union from having the necessary symmetrical character (where at least in theory the vote of each country has the same weight (until 2014)). In turn, it would be hard for the small countries to accept.

Therefore it was necessary to find a second alternative scenario that would ensure the symmetrical character of the euro area. Such a symmetrical character could be guaranteed only in the case of the creation of a monetary union based on the capital key (see Appendix, The ECB capital key). However, invoking the capital key meant a lack of full control over the money supply.

While from the economic point of view the entry into force of the first scenario would probably be the more favourable solution, from the political point of view it was unacceptable. This is why the second scenario was chosen. Therefore, once again politics took precedence over economic considerations.

In the light of the choice of the second scenario, the national central banks were given a large degree of autonomy. The point is that at the moment the euro area came into force, these banks were still responsible for a very large part of the financial assets, and could *de facto* manage them without prior consultation with the ECB (see Figure 1).

However, didn't the maintenance of even the slightest degree of autonomy for the national central banks undermine the "single" character of the single monetary policy conducted by the ECB?

The answer to this question seems obvious. Therefore, there was an urgent need to reach an agreement which, on the one hand, would guarantee the national central banks a sufficient degree of autonomy, and on the other hand would ensure the ECB the efficient performance of its duties, in other words, so that the autonomy of the national central banks would not infringe on the monetary policy conducted by the ECB. This is the purpose of the ANFA, the Agreement on Net Financial Assets.

The aim of this study is to analyse the net financial assets of the national central banks that are not directly connected to the conducted monetary policy of the Eurosystem. In particular, the subject of our interest will be an attempt to identify the factors influencing the size and structure of net financial assets of the whole of the Eurosystem and selected national central banks. Moreover, the significance of the ANFA will be presented from the point of view of the management of liquidity in the euro area, and thus for the monetary policy transmission mechanism.

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[1] i.e. as at 1 January 1999.

[2] More about the Eurosystem monetary base see Appendix (The monetary base of the euro area).

We have attempted to verify in the paper the following hypotheses on the basis of an analysis of the development of net financial assets of the whole of the Eurosystem and previously selected national central banks: two large ones – Germany and Italy – as well as two small ones – Finland and Austria. The first hypothesis states that the size and variability of the net financial assets are influenced by the financial assets, liabilities arising from clients' accounts and the bank's equity. Whereas, in the case of equity, due to factors affecting the level and variability of this item and its impact on net financial assets, it became significant only since the outbreak of the financial crisis, when along with the growth of the balance sheets of the central banks the banks' equity also grew. According to the second hypothesis we try to verify, if the central bank possesses assets that correspond to equity, then only the development of the items of financial assets and liabilities arising from clients' accounts has an impact on the level and variability of the net financial assets. The third hypothesis assumes, that if the bank does not conduct an active policy of management of its financial assets, the level and variability of net financial assets is a result of the decisions made by the bank's clients regarding the level of funds held at the central bank. Finally we take a close look at the performance of NFAs in the wake of an unprecedented increase in the liquidity surplus (2015–2022) and its subsequent reversal in the first year of the monetary tightening following the end of the pandemic crisis.

The paper is divided into eight sections. In the second and third section a detailed presentation of net financial assets from the point of view the Eurosystem balance sheet is made. Bearing in mind that the ANFA is all about management of net financial assets by domestic central banks, the focus of attention is put on them and their pecking order of assets under review (central banks of Germany, Italy, Finland and Austria). The selection of these banks was made in a way which gives the reader the possibility to understand the logic of such a pecking order for both large and small domestic central banks. This analysis is accompanied by a historical presentation which helps to explain the origins of many of these assets. The following four sections of this paper perceives NFAs from the point of view of liquidity management. It is compared to another ECB liquidity's indicator, namely net effect of Net liquidity effect from Autonomous Factors and Monetary Policies portfolios. Even if NFA do not include the largest autonomous factor (banknotes in circulation), there seems to be a clear link between these banknotes and the NFA.[3] In the early days of the Eurosystem, the ANFA stipulated clearly the role of NFAs under review. At the time of reserves scarcity, their role was significant. The outbreak of the Great Financial Crisis in 2008 and the pandemic crisis twelve years later generated an unprecedented increase in the liquidity surplus to such an extent that both the role and importance of NFAs started to blur. For the time being nothing points towards a reversal of liquidity surplus toward levels observed prior to 2008. This state of affairs may cast some shadow on the relevance of NFAs and the agreement foreseeing their appliance. Nevertheless, an analyses of NFA performance during the time of ultralow interest rates (2015–2022) and the period immediately afterwards (where a sharp increase in the ECB rates contrasted with a rather slow reversal of the liquidity surplus) leads to interesting conclusions concerning links between NFAs and liquidity management.

[3] The ECB seems to scrutinise a relationship involving NFAs and banknotes in its publication *What is ANFA*? (http//www.ecb.europa.eu/ecb/educational/explainers/tell-me-more/html/anfa_qa.en.html) closely. However, our reviewers from the Bundesbank pointed out that the performance of both NFAs and the banknotes' volumes should be perceived rather as an outcome of the large liquidity surplus (with negative interest rates pursued between 2014 and 2022 as one of the most important reasons behind this surplus).

2. The balance sheets of the Eurosystem and the national central banks

An element of our considerations will be the balance sheet of the central bank (see Table 1). We shall look at the consolidated balance sheet of the Eurosystem and the balance sheets of selected national central banks of the euro area.

The Eurosystem balance sheet was created by combining the balance sheets of the individual national central banks of the Eurosystem and the ECB (the balance sheets of the national central banks and the ECB additionally contain items related to intra-Eurosystem settlements). The structure of assets and liabilities in the balance sheet results from the application of three criteria relating to claims and liabilities, i.e. of the counterparty (seat of the entity – resident/non-resident, type of entity – credit institution / government sector / remaining entities), of the currency (euro / foreign currency / gold) and of the purpose of holding the claims and liabilities (monetary policy operations / other purposes). Such a structure of the balance sheet of the Eurosystem allows various cross-sectional analyses. And so, taking monetary policy as the criterion, on the assets side, claims related to monetary policy operations are presented in item A.5 – Lending to euro area credit institutions related to monetary policy operations denominated in euro and in item A.7.1 – Securities held for monetary policy purposes. In turn, on the liabilities side, liabilities related to monetary policy are presented in item L.2 – Liabilities to euro area credit institutions related to monetary policy operations denominated in euro. Moreover, liabilities related to banknotes in circulation can also be included in the liabilities related to monetary policy (item L.1).

Therefore, let us look at the development of the consolidated balance sheet of the Eurosystem. Continuing the analysis of the consolidated balance sheet as proposed in the introduction according to the criterion of the relation to monetary policy, we present in Figure 2 the development of the consolidated balance sheet of the Eurosystem from 2002 (i.e. since the introduction of euro banknotes) to 2023 (January), where the components of assets and liabilities were divided into those related to monetary policy operations and others.

The first conclusion to be drawn from the analysis of Figure 2 is mainly the significant fluctuations in the consolidated balance sheet of the Eurosystem beginning from 2008, i.e. the beginning of the financial crisis (the last upward fluctuation was seen in the pandemic era in 2020). The second conclusion is that the changes in the balance sheet are dictated above all by changes in the components of the balance sheet related to monetary policy. As can be easily noticed, assets and liabilities not related to monetary policy do not show significant fluctuations during the observed period. The third conclusion to be drawn is the significant share of financial assets not related to monetary policy operations in the total assets. During the whole observed period until January 2016 they constituted over 50% of the balance sheet of the Eurosystem (since February 2016 the share of financial assets not related to the monetary policy has fallen below 50% of total assets). At the same time, there was a relatively low share in the balance sheet of liabilities not related to monetary policy operations (there was no instance where they exceeded 50% of total liabilities).

However, the above analysis concerns the whole Eurosystem. Therefore let us also look at the balance sheets of the individual national central banks belonging to the euro area. With this aim in mind, four banks were selected, consisting of Germany, Italy, Finland and Austria. The justification for choosing these four central banks was related to the volume and structure of their balance sheets. As related to the volume of balance sheets the analysed sample consists of two large banks (Germany

and Italy) and two small banks (Finland and Austria). Moreover, there are two central banks that are treated as holiday destinations (Italy, Austria), which affects the structure of their intra-Eurosystem balances. Finally, the selected central banks can be characterised by a different evolution of volume and structure of their net financial assets throughout the analysed period.

As we have already mentioned, the structure of the balance sheet of the national central bank corresponds to the structure of the balance sheet of the Eurosystem with one exception: the balance sheet of the national central bank additionally contains items related to intra-Eurosystem settlements. The settlements related to the TARGET2 system and the allocation of euro banknotes were treated as a component of the assets (claims) and/or liabilities (liabilities) related to monetary policy operations. The size and structure of the balance sheets of the above-mentioned central banks is presented in Figures 3–6.

Even after a preliminary analysis of Figures 3–6, one can notice that the trend of changes in the balance sheet totals of selected national central banks reflects the trend observed for the balance sheet of the whole of the Eurosystem. This means that starting from 2008, significant fluctuations in the balance sheet totals occur, and also two large increases in the balance sheets – one between 2012–2013 and the second starting from 2015, supplemented with a skyrocketing increase during pandemic.

In each of the banks, the items of assets and liabilities related to monetary policy operations are responsible for the changes in the balance sheet totals.

Let us now take a closer look at the structure of the balance sheets of the national central banks, taking as the criterion of the analysis the separation of their balance sheet totals into assets/liabilities related to monetary policy operations and others. Beginning with the large banks, it should be noted that in the recent period assets and liabilities not related to monetary policy operations have constituted a negligible element of the balance sheet total in the Bundesbank. Moreover, while the liabilities fluctuate around 20% of the balance sheet total, in the case of assets there is a visible downward trend, from 49% at the beginning of 2002 to 11% at the end of 2022. In the case of Banca d'Italia we can observe a similar trend. Assets not related to monetary policy operations were a significant component of the balance sheet total until 2016 (before 2008 they exceeded even 80% of the balance sheet total), but since then their share in the balance sheet total has dropped to just 25%. At the same time, a downward trend is observed for liabilities not related to monetary policy operations, from 60% at the beginning of 2002 to just 20% at the end of 2022.

Let us therefore examine the structure of the balance sheets of small central banks. In the case of the central bank of Finland, a downward trend is observed on the side of assets not related to monetary policy operations, as in the case of the previous analysed central banks. The share of assets not related to monetary policy operations fell from 90% at the beginning of 2002 to only 9% in December 2022. Nevertheless, while in the case of the Bundesbank, liabilities not related to monetary policy operations remain at a stable level (approx. 20%), in the case of the central bank of Finland, a downward trend is observed from 47% at the beginning of 2002 to 13% in December 2022. A similar trend in changes in assets and liabilities not related to monetary policy operations is also observed in the case of the central bank of Austria. Here too, the share of assets not related to monetary policy operations fell from 90% at the beginning of 2002 to almost 21% at the end of 2022. The share of liabilities not related to monetary policy declined similarly, from 50% at the beginning of 2002 to 20% at the end of 2006 and has fluctuated since that time around that level, increasing to 16% at the end of 2022.

3. Source of origin of financial assets of national central banks

Before their accession to the euro area, the national central banks differed from each other in many respects. Therefore it is not surprising that the activities of policy-makers focused on finding a common denominator necessary for conducting a single monetary policy. What did this common denominator look like? It seems necessary here to refer to the balance sheet of the central bank. On the side of assets, it will be item A.5, which according to ECB methodology is called Lending to euro area credit institutions related to monetary policy operations denominated in euro. This item covers the receivables of national central banks from euro area credit institutions related to operations supplying them with liquidity. In turn, on the side of liabilities it will be item L.2, titled Liabilities to euro area credit institutions related to monetary policy operations denominated in euro, where credit institutions, as it were, keep the obtained liquidity, either in the form of balances on current accounts (taken into account when calculating the reserve requirement), or deposits with the national central bank (in the case of absorption of the liquidity created). As can be easily noticed, this is the denominator through which the central bank may carry out open market operations. All other items in the balance sheet total of the central bank are components of so-called autonomous factors (including securities in monetary policy portfolios). Their net effect on liquidity is the difference between item A.5 and L.2.

Autonomous factors are defined as the type of factors that develop beyond the direct control of the central bank (except for the mentioned securities in monetary policy portfolios). However, the fact that the central bank does not have an influence on their development does not mean that it is indifferent to how they develop. Likewise, the ECB is not indifferent to the cash needs reported by the national central banks.

The remaining elements of the total balance sheet (i.e. after excluding items A.5, A.7.1, L.2 and the amount of cash in circulation), constitute the so-called net financial assets. These are the balance sheet total minus the above-mentioned items of the assets and liabilities of the central bank. In the framework of net financial assets, besides the items the development of which the national central bank may only observe, we also have those on whose development the central bank may exert a significant influence. This concerns, above all, the three types of assets that are the result of historical processes.

The first of these was the development of the foreign currency reserves before the creation of the euro area. National central banks were obliged to transfer only the part of the foreign exchange reserves that corresponded to the capital key designated by the ECB.[4] The rest was still controlled by the national central bank. These were significant amounts (see Figure 7).

Another factor was related to the equity of the central banks. The national central banks of the euro area possess equity, often creating at the same time specific provisions. While the equity itself is recorded on the side of the liabilities, their mirror reflection on the side of the assets is extremely important (from the point of view of the assets possessed by the national central banks). This "mirror reflection" on the side of the assets is often portfolios of financial assets (so called "earmarked assets"[5]).

Another factor was the ties of the given national central bank with the ministry of finance of its country, i.e. the fulfilment through it of the function of a bank of the state (fiscal agent). The receivables of the national central bank from the government, arising before the prohibition of the monetisation

[4] It is worth mentioning that national central banks present on their balance sheets euro-denominated claims on the ECB in respect of transfers of foreign exchange reserves.

[5] They will be further elaborated in more detail.

of the budget deficit came into force, have the right to be situated here. Despite accession to the euro area, such receivables still remain the prerogative of the given national central bank.

In order to understand the significance of financial assets, one should look at what percentage they constitute of the total balance sheet of the given national central bank. This will enable their significance to be estimated from the point of view of autonomy of the national central bank. And so the moment that the monetary union was created in 1999, the share of the assets described above was approx. 3/4 of the whole of the consolidated balance sheet of the Eurosystem (see Figure 1 – assets not related to monetary policy operations). Although much has changed since 1999 (mainly due to the purchase of debt securities by the ECB since 2009), the analysed assets constitute almost 18% of the balance sheet total of Banca d'Italia (as at the end of 2022). In the case of the German Bundesbank, it is already approx. 8% (as at the end of 2022). These are maybe not large sums, but still material which the ECB does not have direct control over.

In the light of the structure described above, we see that the national central bank in the euro area plays two roles. In the framework of the single monetary policy, it carries out the decisions taken by the ECB. In turn, in the case of the management of their financial assets, it takes on more the role of an investment bank. The ANFA agreement concluded in 2003 aims to separate these two roles. Above all, the aim is to ensure that the role of an investment bank that the national central bank plays does not interfere with the monetary policy transmission mechanism in the euro area.

Since we already know what makes up the main components of the net financial assets (NFA) of the central bank, we shall now take a closer look at the factors determining their level and variability. We shall base our analysis on the balance sheet approach, which means that we shall discuss the possible variability of the component elements of the NFA.

At the outset, we must stress that the influence of the central bank on the individual components of the net financial assets varies. Further, we shall discuss the following components of the net financial assets of the bank:

– financial assets which do not correspond with selected items of the liabilities (FA[6]),

– financial assets corresponding to selected items of liabilities (FAL[7]),

– bank equity (E),

– liabilities arising from accounts of clients held by the bank (CA) other than accounts of credit institutions obliged to maintain reserves (e.g. accounts of the general government sector and central banks outside the euro area).

Accordingly, the net financial assets of the bank can be described in simplified form with the help of the following formula:

$$NFA = FA + FAL - E - CA$$

where the symbols correspond as above.

The components of the financial assets which do not correspond with selected items of the liabilities (FA), are mainly foreign exchange reserves of the central bank,[8] as well as securities portfolios created

[6] In the rest of the paper the reference to this item will be named interchangeably with the notion: "financial assets".

[7] In the rest of the paper the reference to this item will be named interchangeably with the notion: "financial assets earmarked to selected items of liabilities".

[8] For the purpose of this study, financial assets in foreign currency (balance sheet items A1, A2 and A3) have been reduced by liabilities in foreign currency (balance sheet items L7, L8 and L9).

in euro. In principle, the central banks have full freedom to influence these components of the balance sheet.[9] As a reminder, we shall point out that a decision to increase the amount of foreign reserves or increase the debt securities portfolio in euro will result in an increase in net financial assets. In turn, a decision to sell these assets for euro will result in the opposite – a reduction in the net financial assets. Remaining for a while with these components of the bank's assets, one can notice that the change in their valuation (unrealised gains / losses) is neutral from the point of view of NFA. This is because the effects of valuation[10] are also an element of NFA.

Financial assets corresponding to selected items of liabilities (FAL, "earmarked assets") are as a rule portfolios of assets created by the bank, whose value corresponds to selected items of the bank's capital. Therefore they may be securities portfolios of a value corresponding to the capital, reserve funds and/or provisions equivalent to capital of the bank. They may also be financial assets managed in the framework of pension funds of central bank's employees (in this case on the side of liabilities the corresponding item is provision for liabilities to employees). Here, two issues should be noted. Firstly, not every central bank creates and holds such assets. Secondly, since both such assets and their corresponding liabilities are components of NFA, their size and their variability is neutral from the point of view of the size and variability of NFA.

The central bank's equity (E) is made up of capital, reserve funds, and also provisions equivalent to reserves as well as revaluation accounts. They are presented on the liabilities side of the bank's balance sheet, and thus they reduce NFA. Banks have a limited impact on their size. This is due to at least two reasons. Firstly, the size of the capital and the reserve funds is generally established in the legal regulations establishing the central banks. A change of these values is most often possible only by way of distribution of the profit of the bank. In turn, the rules for the distribution of the profit are also often defined in these legal regulations. Secondly, as already mentioned in the case of financial assets, the size of one of the capital components – the revaluation account – is influenced by factors which the bank has only an indirect impact on (unrealised gains). Besides, as we have also noted, a change in this item of equity does not influence the size of NFA.

The fourth, last component of NFA is liabilities of the bank arising from accounts of clients held by the bank other than accounts of domestic credit institutions (CA). As an item of the liabilities, they reduce the size of NFA. It seems that the central bank has an insignificant influence both on the level and variability of the size of these accounts. This is because they are a result of individual decisions of individual clients of the bank. Thus the item of liabilities under discussion could have a significant impact on the development of the size and variability of the central bank's NFA. And so, in the case of the decision of clients to increase the level of funds held on the account at the central bank, there will be an increase in liabilities to clients and accordingly a reduction in NFA. In turn, in the opposite case, when the bank's clients decide to reduce the level of funds held at the central bank, there will be a corresponding reduction in the corresponding liabilities of the central bank. Therefore this will mean an increase in the bank's NFA.

[9] The term "in principle" is used since, for example, there may be internal rules that constrain the volume of foreign exchange reserves, there is in EU law the formal prohibition of monetary financing by national central banks and when national central banks carry out domestic operations in assets and liabilities on their own initiative they have to meet the rules prescribed in the ECB (2014b).

[10] Unrealized gains are presented in balance sheet item L11 (Revaluation accounts), while unrealized losses at year-end are taken to the financial result.

The above analysis of factors influencing the level and size of NFA allows one to present the three hypotheses mentioned in the introduction. We recall them: firstly, the size and variability of the net financial assets are influenced by the financial assets (FA), liabilities arising from clients' accounts (CA) and the bank's equity (E). Secondly, if the central bank possesses assets that correspond to equity (FAL), only the development of the items of financial assets (FA) and liabilities arising from clients' accounts (CA) has an impact on the level and variability of the net financial assets. Thirdly, if the bank does not conduct an active policy of management of its financial assets (FA), the level and variability of NFA is a result of the decisions made by the bank's clients regarding the level of funds held at the central bank (CA). Below, we attempted to verify the above hypotheses on the basis of an analysis of the development of net financial assets of the whole of the Eurosystem and the previously selected national central banks: two large ones – Germany and Italy – as well as two small ones – Finland and Austria.

First, we shall take a look at the net financial assets of the Eurosystem. As we have already mentioned, our analysis is based on the items of the balance sheets of the Eurosystem / national central banks. Therefore we shall examine the Figure 8, where the development of net financial assets is presented as well as their components, where:

– financial assets which do not correspond with selected items of the liabilities (FA) are understood as the sum of the following balance sheet items: A.1 + A.2 + A.3 + A.4 + A.5.6 + A.6 + A.7.2 + A.8 – L.2.5 – L.3 – L.7 – L.8 – L.9;[11]

– liabilities to clients (CA) will be the sum of the following items of liabilities: L.5 + L.6;

– we shall treat "other assets", i.e. item A.9 in the Eurosystem balance sheet and A.11 in the balance sheet of the national central banks,[12] as assets that correspond to the liabilities (FAL);

– equity (E) is the sum of the items of capital from L.10 (other liabilities, where, among others, the bank's profits and provisions are included) to L.12 (capital and reserves).

As can be seen from Figure 8, net financial assets are influenced by all the components discussed above. Without a doubt, financial assets and equity have the greatest impact on the level of NFA (positive and negative accordingly). However, liabilities to customers have recently had the dominant role in the amount and sign of the net financial assets. What is more striking is that due to the growth of these liabilities, we observed a change of net financial assets – from positive (until 2017) to negative. This means that net financial assets have been used since 2018 as a kind of tool for absorbing surplus liquidity created by the purchase of securities within monetary policy portfolios. Nevertheless, it seems that assets that correspond to selected items of liabilities have the smallest impact on the size of NFA.

The large impact of equity on NFA is striking. This is particularly strange since when discussing the role of equity, we proposed the hypothesis that its impact on the level and variability of NFA should be insignificant. This is also why here we shall take a closer look at this item of liabilities.

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[11] The detailed allocation of individual balance sheet items to NFA has been presented in Appendix (Arithmetic of the Eurosystem balance sheet).

[12] According to the ECB (2016), in balance sheet item A11.3 (other financial assets) are presented *inter alia* assets held as an earmarked portfolio for selected liabilities ("earmarked assets", as it was mentioned – assets that match an identifiable item on the liabilities side of the balance sheet, irrespective of whether there is a legal, statutory or other constraint, e.g. pension funds, severance schemes, provisions, capital, reserves). For simplicity, in the analysis of Eurosystem and individual national central banks, the whole item A9 (Eurosystem) and A11 (national central banks) are treated as earmarked assets.

In Figure 9, the elements of equity[13] are presented against the development of their corresponding assets[14] and NFA.

During the whole observed period the item capital and reserves remained at a similar level, and its variability can be considered to be negligible when compared to the variability of NFA. However, the situation is the opposite in the case of revaluation accounts, which not only runs at a high level, but also features high variability.[15] Nevertheless, as we have already indicated, this item does not affect the size of NFA, since it only reflects the results of valuations of financial assets, which are also components of NFA (i.e. those financial assets that are valued mark-to-market). In other words, the growth or decline of financial assets as a result of depreciation/appreciation of the euro or a fall/rise in the yields of securities is approximately reflected in a change in the item – revaluation accounts.[16] In turn, other liabilities, which until the outbreak of the financial crisis was a stable item of equity, has displayed growth starting in 2008. This can be explained by the creation by the banks of provisions against various types of risk, which are presented in this item. Their aim is to, among others, safeguard equity against the adverse impact of a fall in the value of the bank's assets.

Let us also take a look at the development of the brown line, illustrating the difference between other assets, which we assumed constitute the equivalent of selected items of liabilities, and the capital and reserves as well as other liabilities. Besides the period covering 2007–2009 and 2011–2012, the size fluctuates around zero. Starting from 2012 it is even negative. Such large fluctuations observed at the end of 2008 and in April 2012 are a result of the accounting reclassification that was carried out.[17] The above observations are evidence that equity and assets that correspond to selected liabilities have a negligible impact on net financial assets. However, this in turn leads us to the conclusion that financial assets which do not correspond with selected items of the liabilities (FA) and clients' accounts (CA) have the main impact on NFA.

Let us therefore take a look at the modified Figure 9, presented in Figure 10. Here, we subtracted the value of revaluation accounts from financial assets, and we subtracted the value of capital and reserves and other liabilities from assets corresponding to selected liabilities.

As can be seen in Figure 10, until the critical years 2008/2009, the growth of NFA was a result of the growth of financial assets.[18] However, in the years 2009–2012 the fluctuations in NFA were the result of changes in both financial assets and clients' accounts; meanwhile, since 2013 changes in NFA have mainly been due to changes in clients' accounts. This is even more noticeable in Figure 11, where the accumulated changes in NFA and its components are presented.

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13 The sum of following liabilities are treated as equity: L12 (Capital and reserves), L11 (Revaluation accounts) and L10 (Other liabilities).

14 A9 (Other assets).

15 This item is changed at the end of quarter when foreign exchange and price revaluation of selected assets and liabilities is made.

16 The term "approximately" is used as unrealized losses at year end are taken to the financial result.

17 The accounting reclassification that took place at the end of 2008 concerns securities that were previously disclosed under other assets (A9). The reclassification related only to securities that were not designated as part of an earmarked portfolio (see ECB 2009a). The aim of the accounting reclassification that took place in April 2012 was to harmonise the disclosure of the Emergency Liquidity Assistance (ELA) provided by Eurosystem central banks to domestic credit institutions under other claims on euro area credit institutions denominated in euro (A6). The result of this reclassification was a decrease of other assets (A9) (see ECB 2012).

18 As mentioned, the observed increase in FAL – Capital and reserves – Other liabilities resulted from recording in this item securities portfolios that were subsequently (at the end of 2008) reclassified to balance sheet item A7.2 (Other securities of euro area residents denominated in euro).

Now that we have identified and defined the impact of the individual components on the size of NFA of the whole Eurosystem, let us take a look at the size of NFA of individual national central banks. As mentioned before, for the analysis we selected the central banks of Germany, Italy, Finland and Austria. As it turned out, the impact of each of the factors is different in each of the analysed cases.

In Figure 12 we present the development of the net financial assets of the Bundesbank.

Of particular interest is the case of the central bank of Germany (the Bundesbank). Firstly, as we have already noticed, the share of assets and liabilities not related to monetary policy operations does not constitute a significant part of the bank's balance sheet total (see Figure 3). Hence, the size of the net financial assets of the Bundesbank had been insignificant until 2015, and since then they have been increasingly negative (taking as a point of reference the balance sheet total of the bank, the share of NFA fluctuated from almost -23% at the end of 2021[19] to 20% at the end of 2002[20]).

Secondly, as we noticed initially, in the case of the Eurosystem, it seems that the size of the net financial assets is determined by the financial assets and the bank's equity, but recently mainly by the clients' accounts. Let us therefore take a look, as we did for the Eurosystem, at the items of the Bundesbank's equity. The results of our analysis are presented in Figure 13.

In the case of the Bundesbank, capital and reserves did not change in the period under analysis. The growth in provisions for future liabilities was the result of the creation of provisions for general risk. It should be stressed that the Bundesbank maintains on the assets side a portfolio of financial instruments which correspond to capital, provisions for general risk and employee provisions. As can be noticed in Figure 13, the difference between these assets and capital, reserves and provisions for future liabilities fluctuates around zero, therefore their influence on NFA is negligible.

However, we observe rather large fluctuations for revaluation accounts, but these – as we have already shown – are offset by some of the changes in the value of financial assets. It should be borne in mind that the primary component of assets is foreign exchange reserves, including, above all, gold. Changes in the size of the foreign exchange reserves are mainly caused by fluctuations in their valuation (changes in the price of gold, exchange rates, prices of securities). A change in the value of the foreign exchange reserves also means a change in the financial assets (increase in the valuation of the foreign exchange reserves – increase in net financial assets, fall in the valuation of foreign exchange reserves – fall in net financial assets). Changes in the unrealised gains are recorded in the bank's balance sheet in the liabilities item revaluation accounts, and thus they offset the impact of this determinant on the change in NFA.

Since we have managed to establish the negligible impact of the Bundesbank's equity on the size and variability of NFA, we shall now analyse which of the remaining components of NFA – financial assets or clients' accounts – have a significant impact on the level and variability of NFA. Therefore, let us take a look at Figure 14.

The size of the financial assets minus the revaluation accounts, apart from at the end of 2008 and 2011, run at the level of approx. EUR 60 billion. Such a large increase in financial assets at the end of 2008 and 2011 was the result of operations carried out by the Bundesbank supplying the domestic banking sector with foreign currency liquidity in USD.

Therefore, apart from these two cases, the NFA of the Bundesbank in the years 2002–2007 and 2009–2010 remained at a similar level, whose source was above all the bank's financial assets. Their

[19] NFA amounted to almost EUR -690 billion, while the balance sheet was EUR 3012 billion.
[20] NFA amounted to almost EUR +48 billion, while the balance sheet was EUR 240 billion.

source was primarily reserve assets in foreign currency. As can be seen in Figure 14, their level did not change significantly (apart from the already mentioned changes in their valuation). However, in the years 2011–2022 a significant variability in the Bundesbank's NFA is observed. The source of this variability is the liabilities arising from accounts held for clients other than banks (including general government institutions, other central banks outside the euro area). The significant increase in these liabilities at the end of 2011 and in 2012, and then starting from the end of 2015 resulted in a negative value of net financial assets.[21] It should be noted that from the end of 2011 these liabilities not only have a significant value, but are also characterised by significant volatility. At the same time, apart from at the end of 2011, we can observe that the other components of net financial assets were stable.

Banca d'Italia is the other large national central bank of the euro area whose net financial assets are analysed here. On the Figure 15 we present the development of the size of the bank's NFA along with its basic components. Between the years 2002–2015 an increase in the size of net financial assets is observed. It seems that the main components of NFA are above all financial assets which do not correspond with selected items of the liabilities (FA) and equity (E). It seems that liabilities from clients' accounts (CA) and assets corresponding to selected items of liabilities (FAL) play a smaller role.

Therefore let us take a look at the beginning at equity of the bank, which in Figure 16 is contrasted with the items of financial assets corresponding to selected items of liabilities. As we see, the assets remain at a relatively stable level, starting to increase in the recent years, while capital and reserves as well as provisions grew in the analysed period. As a result, at the end of 2014 the difference between the analysed assets and the items of capital was only EUR -0.8 billion, and at the end of 2015, EUR -8 billion, while at the end of 2022 it was EUR -2.1 billion. This allows us to conclude that the total impact of both of these items on the size of the net financial assets of Banca d'Italia is negligible.

However, in this discussion we cannot ignore another significant item of equity, which is unrealised gains from exchange rate and price revaluation, i.e. the item revaluation accounts. An increase of this item is observed to over EUR 80 billion at the end of 2011 and 2012, as well as its high volatility in the period under analysis (it had a value of barely EUR 9 billion in the years 2002–2004). Nevertheless, as we noticed earlier, the impact of this item on the size of Banca d'Italia's NFA cannot be analysed in isolation from the size of the bank's financial assets. This is why in Figure 17 we also present the development of the primary components of financial assets of Banca d'Italia against the background of revaluation accounts.

As we may notice, some of the fluctuations in the level of the bank's financial assets (increase in the years 2005–2012, 2014–2017 and in the years 2019–2022, as well as a decrease in 2013 and 2018) corresponded with the change in their valuation, either in exchange rate or price. Moreover, in Figure 18 we can observe that the volatility of the financial assets, after excluding the revaluation accounts, was comparable to the volatility of the net financial assets of the bank.

However, let us return to the analysis of the structure of the financial assets. Its most important component is assets in foreign currency. However, at the same time the significance of the euro denominated securities portfolio is growing. While the assets in foreign currency have increased four-fold since 2002 (from the level of approx. EUR 50 billion to more than EUR 211 billion), the securities portfolio grew over the same period by over 4000% (from EUR 1.5 billion at the end of 2002 to over EUR 64 billion at the end of 2022). Meanwhile, other financial assets were insignificant (their increase

[21] The reasons for the increase in liabilities will be elaborated further in more detail.

to over EUR 32 billion at the end of 2013 was the result of, among others, the growth of claims on credit institutions related to the provision of Eurosystem Reserve Management Services (ERMS) and liquidity--providing operations with national counterparties outside the Eurosystem operations for monetary policy purposes).

As we can observe in Figure 18, the primary source of net financial assets of Banca d'Italia – both in terms of level and volatility, is financial assets, in which the portfolio of euro-denominated securities plays an ever-increasing role. In turn, the role of equity and the earmarked assets should be regarded as negligible in recent years. Liabilities arising from clients' accounts also have an impact on the volatility of the net financial assets, in the last five years of observations they have evolved at a relatively high level. Similarly as in the case of the central bank of Germany, we can notice a downward trend in the share of NFA of Banca d'Italia in its balance sheet total but positive (from the level of 50% at the end of 2002 to almost 23% at the end of 2015, and only 5% at the end of 2022). Meanwhile, NFA rose by almost 43%, while the bank's balance sheet grew by as much as more than 700%.

Above we analysed the net financial assets of two selected large national central banks of the Eurosystem. Let us therefore now take a look at the smaller central banks of the Eurosystem, of which the central bank of Finland is one of the representatives. Figure 19 illustrates the development of the size of the net financial assets of this bank along with its primary components.

In the years 2002–2005, the net financial assets of the central bank of Finland remained at a steady level of just over EUR 5 billion. Growth of NFA to the level of approx. EUR 10 billion was observed in the years 2006–2008. In the following years, with the exception of April 2009 and 2013, the net financial assets remained at this same level. Starting from 2017 we can observe a steady decline of NFA mainly due to the growth of client's accounts. Since the beginning of 2018 it has been negative and quite volatile, reaching even EUR 20 billion in the middle of 2022.

The main source of the size and volatility of NFA is financial assets which do not correspond with selected items of the liabilities (FA) and equity (E). However, as in the case of the Bundesbank, clients' accounts (CA) have recently been a significant component of NFA. Let us take a closer look at the financial assets of the central bank of Finland. As we can notice in Figure 20, the main reason for the growth in financial assets beginning from the previously mentioned year of 2006 is the portfolio of euro-denominated securities. Just the increase of the latter resulted from the changes in investment policy in relation to the bank's financial assets introduced in 2006. The central bank of Finland sold part of its foreign exchange reserves held in Swedish crowns and Danish crowns and in return purchased euro-denominated debt securities. However, since 2020 the portfolio of euro-denominated securities (other than monetary policy portfolio) has played a negligible role.

The second most significant determinant impacting on the central bank of Finland's net financial assets was the bank's equity. As we can see in Figure 21, capital and reserves exceed assets that are supposed to offset them (FAL). This is because assets that are supposed to correspond to selected items of liabilities are mainly investment assets of the bank's pension fund.

Figure 22 presents a summary of the discussion so far on the central bank of Finland's net financial assets. These are primarily the result of the development of the financial assets of the bank, which have recently been overwhelmed by liabilities related to the balances of client's accounts. In other words, the demand for deposits from clients other than credit institutions is the main factor responsible for negative NFA. The volatility of NFA is primarily dependent on the volatility of both the balance sheet items.

If we look at the share of net financial assets in the bank's balance sheet total, we can notice that despite only slight changes in the level of NFA, the bank's balance sheet total fluctuated significantly (compare Figure 5). The volatility of the bank's balance sheet total was dictated by assets and liabilities related to the monetary policy conducted by the ECB.

Another representative of the small central banks of the Eurosystem, which like the central bank of Finland was a co-founder of the euro area from the beginning of its existence, is the central bank of Austria. Let us therefore take a look at the evolution of the size of the net financial assets of the central bank of Austria over the years 2002–2022. In Figure 23 we present the size of NFA and its primary components.

First, let us take a look at the size of NFA over the period under analysis. Generally, the net financial assets of the central bank of Austria increased from the level of EUR 15 billion in 2002 to over EUR 20 billion in the years 2012–2014, then fell to EUR 16 billion at the end of 2015, even slightly negative level at the end of 2021 and grew to EUR 13 billion at the end of 2022. It should be noted that in the period under analysis there were three atypical situations. Both at the end of 2008 and the end of 2011 there was a sudden increase in NFA to EUR 35 billion and EUR 27 billion, accordingly. In both cases the increase in financial assets was a result of operations supplying the domestic banking sector with liquidity in US dollars. These operations were carried out in the form of reverse repo transactions. In the central bank of Austria's balance sheet these operations resulted in an increase in claims on euro area residents denominated in foreign currency (item A.3). In addition, in 2008 the increase in net financial assets was also a result of the creation of claims arising from the central bank providing liquidity to credit institutions (central bank of Austria as lender of last resort).

However, since 2014 there has been a steady fall in net financial assets as a result of an increase in liabilities arising from accounts held by the bank for the bank's clients (including the general government sector, enterprises and credit institutions that are not required to hold required reserves at the central bank).

With the above in mind, we can now state that it is mainly financial assets that affect the size of NFA. The bank's equity and assets corresponding to selected items of liabilities also play an important role, while in recent years liabilities arising from clients' accounts have also affected NFA. Therefore let us verify the role of the bank's equity and assets corresponding to selected items of liabilities. In Figure 24 we can notice that starting from the end of 2009, capital and reserves along with provisions for future liabilities were almost completely offset by assets corresponding to them. Therefore these values taken together have a negligible impact on the size of the net financial assets of the central bank of Austria.

In the item under discussion – equity – revaluation accounts are characterised by the greatest volatility (unrealised gains). They are not reflected in the previously mentioned assets corresponding to selected items of liabilities. Nevertheless, as we have already mentioned, the revaluation accounts should be considered together with the financial assets. In Figure 25 we have presented the structure of financial assets juxtaposed with the size of the revaluation accounts.

It can be noticed that the fluctuations of NFA corresponded to the fluctuations in the size of the financial assets apart from the time span beginning in 2015. We have already explained the large increase in assets in foreign currency at the end of 2008 and 2011 and other financial assets at the end of 2008. Financial assets in foreign currency are still the largest part of financial assets. However, in recent years the share and size of the euro-denominated debt securities portfolio has grown. While

in the years 2002–2009 it accounted for on average 20% of financial assets (approx. EUR 4 billion), since 2009 its share has risen to about 30% of financial assets (approx. EUR 10 billion).

The above considerations lead us to the following conclusions (see Figure 26). In the case of the central bank of Austria, the primary source of net financial assets is assets in foreign currency and in the recent period euro-denominated debt securities. In recent years there has been a noticeable increase in liabilities of the bank arising from accounts of clients held by the bank other than credit institutions obliged to maintain reserves at the central bank. The large increase in the level of NFA observed at the end of 2008 and 2011 was the result of operations supplying the domestic banking sector with foreign currency and the role that the central bank of Austria played as the lender of last resort. Taking into account the share in the balance sheet of the bank, apart from the above-mentioned exceptions, a downward trend is observed in the net financial assets. While at the end of 2003 NFA accounted for almost 50% of the balance sheet, at the end of 2015 it was just 15%, and at the end of 2022 it was as low as 5%. At the same time, the balance sheet of the bank grew by as much as 800%.

4. Net financial assets and liquidity management

From the moment of the monetary union's creation, the national central banks were already in possession of the assets under review. Their sale or purchase must therefore lead to changes in the Eurosystem liquidity. Therefore, does the volume of assets possessed by domestic central banks affect the liquidity in the euro area? And if yes, in what way does this link hold? This chapter aims to answer this question.

Net financial assets embrace almost all autonomous factors – with the notable exception of the amount of banknotes in circulation. Net financial assets cannot be controlled by the central bank's interest rates, but they are still sensitive to what happens to the price of money, as well as other decisions of the NCBs. As will be explained later in the text, in the case of certain autonomous factors, it is up to the ECB to what extent a given factor can be affected by the ECB's interest rates. The most prominent factor (but not the only one) – whose performance is interest-rate-dependent – is banknotes. The higher the level of interest rates, the less the incentive to keep them. A change in interest rates affects the composition of the Eurosystem's balance sheet and those changes are quickly translated into the above mentioned excess liquidity's pecking order and above all the base money (M0). That is why, NFA are an important component from the point of view of liquidity management.

Net financial assets tend to behave in a countercyclical manner as far as liquidity processes are concerned. A drop in interest rates gives way to higher liquidity but the net financial assets (by exerting downward pressure) tend to keep this rising trend under control. And the other way around: a sharp rise in interest rates tends to engineer a drop in excess liquidity. Net financial assets, however, tend to avoid a scenario under which either an excessive fall/rise in liquidity gets out of control from the point of view of steering the price of money within the interest rates corridor. They should increase whenever excess liquidity in the banking system falls and the other way around. Subsequently NFA tend to display a countercyclical role. In other words, net financial assets tend to play an important role in liquidity management.

Because of their significance from the point of view of liquidity management, it makes sense to compare the NFAs with perhaps the most important ECB indicator aimed at gauging and depicting liquidity processes taking place in the euro area, namely Net liquidity effect from Autonomous Factors and Monetary Policies portfolios – NLEfAFaMPp (see Table 2).

There is a significant overlap in between NLEfAFaMPp and NFAs. The key difference is that the former is adjusted by the amount of banknotes in circulation, while the latter is not. However, the dynamic of NFAs is still strongly influenced by the dynamic of value of banknotes in circulation.

Sticking to the NLEfAFaMPp, if we subtract monetary policy portfolios from this measure, it is ease to observe that the net liquidity effect from autonomous factors is nothing else than the value of cash adjusted by NFA (or NFAs equal cash adjusted by the net liquidity effect from the autonomous factors). Had it not been for the value of banknotes, NFAs would have been a mirror effect of the net liquidity autonomous factors.

The above statement implies that banknotes in circulation – in spite of being considered as yet another autonomous factor – in reality seem to be a factor of great relevance for the ECB in its liquidity analysis. The ECB admits implicitly that there is a link between the liquidity needs generated by banknotes in circulation and the liquidity generated by NFAs. If the former rises faster than the latter, the NFAs tend to fall (as it was the case in the second half of the 2010s). As the ECB explains in its ANFA description from 2023, the above-mentioned fall in the NFAs owes to the fact that area-wide liquidity needs generated by banknotes in circulation are higher than the liquidity-providing effect generated by Eurosystem NFA (ECB 2023). The link between banknotes and the liquidity needs of each of the areas in the euro area may be one of the reasons why export and import – within the Target 2 – takes place.

With interest rates between 2014–2022 being at a historic low, there was high demand for banknotes – which must be perceived as one of the key reasons behind NFAs reaching historical lows. And indeed the spectacular increase in demand for cash in the early days of Covid 19 saw the NFA falling to all-time record lows. And a reversal of demand for banknotes (which started in mid-2022) heralded a sharp recovery in the value of NFAs. This confirms the link between the NFAs and the liquidity management, even if the key reason behind the assessed relationship involving NFAs and banknotes is the large liquidity surplus.

Banknotes and minimum reserve requirements are an important factor in the pecking order of the monetary base, thus implying that the monetary base is influenced by the performance of NFAs. With the advent of the Asset Purchase Programmes (APP) and the Targeted longer-term refinancing operations (TLTRO), the share of banknotes and minimum reserves declined substantially. Even if it is not until a substantial reduction of the Eurosystem balance sheet that a further recovery of currency in circulation (banknote, and coins) plus minimum reserve requirements will take place, it is already worth pointing out the impact of the TLTRO repayments on the pecking order of the monetary base. Figure 27 illustrates the performance of the monetary base since early 1999 and mid 2023 along with its pecking order.

As it can be seen on Figure 28, the share of banknotes has rebounded slightly since mid-2022. Still, levels observed in July 2023 are far below pre-pandemic levels (not to mention levels before the start of the APP).

At the time of the outbreak of the crisis in 2008, the share of cash in the monetary base M0 was very stable and fluctuated around the level of 75% of the whole monetary base. The situation changed the moment the crisis broke out, when the banks began to increasingly place their funds in deposits (and the account of the ECB, once the remuneration of funds held at the deposit and the current account were equalled in July 2012).

This is why one may draw the conclusion that NFAs are positively correlated with the amount of banknotes in M0. If the share of banknotes in M0 grows, the amount of the NFA also grows. In turn,

a fall in the share of banknotes (in favour of funds held by the banks or in deposit or on the current account) causes an automatic fall in the share of NFAs.

The links between NFAs and liquidity management goes beyond the base money. Before they are discussed in more detailed manner, there is a need to refer further about certain parallels between the two indices (NFAs and NLEfAFaMPp) aimed at gauging liquidity processes. In spite of these two indices being driven by slightly different factors (with the amount of banknotes being the key difference), they tended to move throughout the period of ultra-low interest rates (2015–2022) in tandem.

The striking feature is the fact that once ultra-loose monetary policy came to an end (and a sharp tightening had been launched as result of it), the correlation between the two indices disappeared. While the NFA started to reverse their earlier losses, the NLEfAFaMPp was still moving into uncharted territories. That implies that the reduction of A5 is greater than the reduction of L2, namely liquidity surplus. The key conclusion is that the repayment of the TLTRO III (scheduled for a period between 2021 and 2024) took place until mid-2023 at a higher dynamic than the reversal of liquidity surplus. The latter may also be attributed to very slow repayment of the APP and reinvestment policies as far as the PEPP is concerned. The fall in the NLEfAFaMPp would have been even greater had it not been for a modest increase in the volume of MROs in the period under review.

If the Net liquidity effect from Autonomous Factors and Monetary Policies portfolios had been mainly driven by monetary factors (APP and TLTRO), the NFAs would have been driven by autonomous factors, of which not only demand for banknotes, but also the performance of deposits held by other euro area residents (L5, Liabilities to other euro area residents denominated in euro) and non-residents (L.6, Liabilities to non-euro area residents denominated in euro) exert a leading role in the way they tend to behave.

Moving back to the autonomous factors and in order to understand the issue of a link between NFAs and liquidity surplus better, a short historical review of tendencies as far as both NFAs and liquidity surplus is concerned will be presented along with a theoretical description whenever such a description is needed.

This historical preview must be, however, preceded by an important question stemming from the features of NFAs. As already demonstrated, the ECB provides the national central banks with relatively large freedom in the management of assets that remain under the jurisdiction of these banks. As these NFA are supposed to play a countercyclical role, there are strong arguments to believe that their performance is data dependent. Therefore, in the case of a national central bank, how large can these assets be?

Their countercyclical character gives reasons to believe that their performance depends on the amount of liquidity in the system, or to be even more precise, whether there is a liquidity deficit or liquidity surplus. In the early years of the Eurosystem, it was an intentional ECB policy to make liquidity scarce. Let us therefore recall what the ECB wrote on this agreement in its original version of the ANFA description:

"Before the crisis the most effective way to implement monetary policy was by making sure that banks had a need to come to the Eurosystem for liquidity. A liquidity shortage vis-à-vis the Eurosystem, also referred to as a «liquidity deficit», was the basis of monetary policy implementation. ANFA protected this liquidity deficit. When the financial crisis struck, it became necessary to provide banks with more liquidity than they actually needed to comply with minimum reserve requirements. Instead of operating with a liquidity deficit, the banking system is now operating with excess liquidity. In this

new environment, ANFA no longer protects the liquidity deficit, but ensures that excess liquidity does not surpass a level that the Governing Council sees as appropriate for its monetary policy stance." (ECB 2023).

For the sake of precision, it makes sense to explain the notion of liquidity needs. Out of principal, both the total value of banknotes in circulation and the amount needed to meet minimum reserve requirements generate a need for liquidity. By having at their disposal their respective NFA, domestic central banks could – with their help – cover these liquidity needs. However, the ANFA's aim was to prevent it. In other words, the total amount of NFA could not surpass the total value of banknotes augmented by the minimum reserves requirements. It was up to the monetary policy – steered entirely by the ECB – to fill the gap between the NFA and the missing liquidity (needed to fulfil all liquidity needs). In this particular case the gap was mainly filled with the operations recorded under position A5 of the Eurosystem balance sheet.

5. Moving from a deficit towards liquidity surplus – the history of liquidity surplus

This state of affairs prevailed until the eruption of the Great Financial Crisis, which heralded the advent of a new era, namely the era of large liquidity surpluses. That is why, from now on, the focus of attention in this chapter will be on the period of liquidity surplus which has prevailed in the euro area banking system ever since.

It must be borne in mind that the notion of liquidity surplus underwent a unique transition. A combination of financial crisis, followed by the pandemic crisis, saw the implementation of unconventional monetary policies stretching beyond the originally planned agenda. A massive purchase of assets conducted in the euro area between 2015 and 2022 witnessed liquidity levels reaching unprecedented values (amounting to even more than one third of euro area GDP). That is why there must be talk of a structural rise in liquidity and subsequently it is difficult to see liquidity levels returning to the levels prior to the outbreak of the financial crisis in 2008.

This state of affairs does not inhibit our analysis, even if it makes it a bit harder. By mid-2023, the ECB was in the middle of a process aimed at reversing some of the liquidity surplus (mainly with the help of the TLTRO III repayments and only a gradual reversal of the APP portfolio). But even this relatively small reversal in the liquidity surplus may be enough to detect an important feature of the NFA from the point of view of liquidity management.

For a better understanding of what happened with NFA after 2007 and for the needs of this study, it is worth introducing a new concept of overall excess liquidity. This will be the total of excess liquidity in the banking sector augmented by the NFA's amount. This concept will help to show how NFA impacted the excess liquidity. Its development is presented in Figure 31. With the help of this figure, the countercyclical role of NFA can be perceived. However, in the wake of enormous levels of liquidity in the early 2020s, this countercyclical role (from the point of view of interest rates) was neither detectable nor desirable.

The emergence of liquidity surplus has implied – in line with what the ECB wrote in its material about the ANFA – that there must be a level of excess liquidity which in the opinion of the ECB should not be surpassed. What is that level? As far as we know, the ECB does not specify it precisely.

In the advent of a new era, the performance of NFA will be presented here from the point of view of a prevailing liquidity surplus in the system. Focusing on liquidity surplus makes additional sense, as the period when the ECB intended to restrict liquidity within the banking system looks merely like a rather short episode in the history of the Eurosystem.

If in the early stages of the crisis era the rise in the liquidity surplus was rather slow and subject to interim reversals, the situation changed substantially following the implementation of PSPP in March 2015. Rising liquidity was accompanied by falling interest rates as both measures were aimed to address the post-financial crisis challenges. The suspension of the APP programme in 2019 proved to be short lived. It must be pointed out that the majority of excess liquidity was yet to be reversed when the euro area was hit by a global pandemic virus (Covid 19). The subsequent increase in liquidity surplus stemmed from massive purchases of different kinds of securities (with government bonds on top of them) and the targeted longer term refinancing operations. In the early 2020s the liquidity surplus surpassed well above the threshold of EUR 4500 billion – thus surpassing the GDP of the largest European economy. Such large levels of liquidity also supported the ECB in its efforts to keep rates at an all-time low.

Now it is time to depict the correlation between the NFAs and the liquidity surplus from the start of the Great Financial Crisis until now (mid 2023). This 15-year-long period can be divided into three subperiods:

1) the period stretching from the outbreak of the financial crisis until the start of the ECB programme APP (and PSPP in particular, thus launching eAPP),

2) the period stretching from the outset of PSPP to the outbreak of Covid 19,

3) the period stretching from the start of the pandemic until the end of 2022, when the first measures aimed at reversing the programmes (aimed at countering the pandemic effects) were announced.

The financial assets which are of interest to us began to grow at the beginning of 2007. Even then, on the side of financial assets there is rapid growth of the components of item A.6 – other claims on euro area credit institutions denominated in euro – which could indicate a turn to the banks for emergency financing in the framework of Emergency Liquidity Assistance (ELA). At the same time, we observe a strong growth of the item titled other assets. Interestingly, the item other assets was redefined at the end of 2008. As a result, as the ECB informs on its website:

"[…] an accounting reclassification took place for securities that were previously disclosed under **other assets** (asset item 9). The reclassification related only to securities that were not designated part of an earmarked portfolio. […] This led to increases in balance sheet items, as given below:

(a) EUR 147.7 billion in securities of euro area residents denominated in euro (asset item 7);

(b) EUR 9.7 billion in securities of non-euro area residents denominated in euro (asset item 4.1);

(c) EUR 9.9 billion in securities denominated in foreign currency issued by non-euro area residents (asset item 2.2); and

(d) EUR 4.7 billion in securities denominated in foreign currency issued by euro area residents (asset item 3).

The corresponding total decrease of EUR 172 billion is reflected under **other assets** (asset item 9). Securities designated part of an earmarked portfolio continue to be included in asset item A9." (ECB 2009a).

The year 2009 saw the modification of item A7, which the ECB confirmed in its press release:

"As announced on 7 May 2009, the Governing Council of the European Central Bank (ECB) has decided to purchase euro-denominated covered bonds issued in the euro area. For presentational purposes, asset item 7, entitled "Securities of euro area residents denominated in euro", has been divided into two items: asset item 7.1, entitled "Securities held for monetary policy purposes", which has been introduced in order to reflect the euro-denominated covered bond portfolio, which will commence in July 2009; and asset item 7.2, entitled "Other securities", which includes marketable securities that are not related to the monetary policy operations of the Eurosystem (which previously accounted for the whole of asset item 7). This week's consolidated financial statement has been drawn up in accordance with this new balance sheet format." (ECB 2009b).

Financial assets, which are of interest to us and were the subject of the above-described modification, were not the only factors to exert an influence on NFAs in the period of 2007–2011. In the time framework stretching from the beginning of 2008 to the end of 2009, we see a strong increase in item A3 (Claims on euro area residents denominated in foreign currency). In early 2008 this item still amounted to approx. EUR 30 billion. In December that same year it reached a record high of almost EUR 250 billion, only to return to the level of EUR 30 billion by the end of 2009. We should associate this turn of events with the credit line launched in cooperation with the Federal Reserve and SNB. This is the so-called Term Auction Facility which is aimed at discharging tensions resulting from a lack of US dollar liquidity (we recall that at the same time there was a very high disparity in interest rates between the euro and the US dollar; ECB 2008). A similar increase in the item discussed here occurs at the end of 2011 due to bilateral swaps that the ECB concluded with the Bank of Japan, Bank of Canada, Bank of England, the SNB and the Fed.

While the TAF aimed to support the problems with US dollar liquidity in the euro area, the ECB also engaged in measures aimed at discharging the euro liquidity problems beyond the euro area (ECB 2014a), which must have influenced the development of financial liabilities. The swap agreements were concluded with NBP, MNB, DNB, the Bank of Latvia and the Swedish Riksbank. Such measures had an immediate impact on item number 6 on the liabilities side (the so called L6, Liabilities to non-euro area residents denominated in euro). While up to the middle of September 2008 there was not quite EUR 80 billion on this item, at the end of the year it had risen to the level of approx. EUR 315 billion, only to return to the initial level of EUR 80 billion at the beginning of 2009 Q4.

That is why, due to the ECB's international obligations, in the period from 2007 to the end of 2011 we have a special period during which excess liquidity and NFA were moving in the same direction.

However, at the end of 2011 and with the launch of 3Y LTRO an increasingly visible counter-cyclical element began to appear. What was this about? The fact of the matter is that a decrease in excess liquidity usually generates an increase in the volume of NFAs. And conversely, an increase in excess liquidity causes a decrease in the amount of NFAs held by the national central banks. If we look at these two parameters altogether, we can see clearly that the increase in excess liquidity was accompanied by a clear fall in NFAs. A narrowing of the width of the interest rate corridors in May 2009 makes a comparative analysis (involving the situation prior and after the crisis) a bit more difficult. Still the analysis can be conducted with the use of the following criteria:

– the level of liquidity in the banking system,
– the deviation of the market rate (EONIA until September 2019 and the €STR afterwards),
– interest rate volatility in the money market.

The period immediately after the crisis saw a modest (by nowadays' standards) increase in liquidity, which, however, was accompanied by enormous volatility in the market. That is why rising liquidity barely translated into NFAs. Higher NFAs levels were generated by other financial assets and, above all, by falling financial liabilities (government accounts held at central banks).

An outbreak of sovereign crisis in late 2010 translated itself not only into higher volatility, but also a falling margin involving the EONIA and the MRO. In spite of this crisis, the ECB opted for two increases in its official rates. The first one (in April 2011) was rather quickly translated into market interest rates, with the former surpassing even on some occasions in the second quarter of 2011 the level set by the MRO reference rate. These events were most probably the reason behind a drastic increase in NFAs. In mid-December 2011 NFAs reached an all-time high of slightly above EUR 665 billion. As a result, the EONIA fell rather quickly below the reference rate.

This increase of NFAs was mainly engineered by higher financial assets, most probably stimulated by strong demand for ELA, which is contained in A6.[22] In the second half of 2011, the volume of A6 rose more than twice. A depreciation of the euro against the US dollar helped to generate a favourable trend (valuation effect) as far as Eurosystem's FX reserves are concerned. This rapid rise in NFAs could have been one more reason why the second increase in the ECB official rate (in July 2011) failed to be translated into the market.

In November 2011 Mario Draghi succeeded Jean Claude Trichet as the ECB governor. Among his first steps was to reverse the earlier increases in the official rates followed by an announcement of a new, longer term refinancing operations. A sharp rise in liquidity following the implementation of 3Y LTRO (done in two stages: in December 2011 and February 2012) saw NFA's gradually falling. The latter was caused by rising financial liabilities, stimulated mainly by higher government accounts at central banks. The fall in NFA lasted until early 2013, when the first banks started to repay in advance the 3Y LTRO contracted loans, thus contributing to a fall in liquidity. Subsequently, NFA started to rise again, as governments – in the wake of market normalization (understood as a narrowing of yield to bunds) – opted to keep less funds in central banks.

Figure 32 clearly shows that in the case of a fall in the EONIA (from a reference rate) gaining momentum (which is the result of the growth in excess liquidity of the banking sector generated by the APP), the dynamic of this decline is curbed by the shrinking amount of NFA. The latter clearly plays a similar role in relation to the foreign exchange reserves in the case of a long-term exchange rate depreciation. Thus, an increase in the positive deviation of the EONIA rate from the reference rate (the result of which EONIA > MRO, which may be analogous to the growth of appreciation pressure on the domestic exchange rate) causes an increase in the volume of NFA (the volume of the foreign exchange reserves of a given country), while an increase in the negative deviation (EONIA < MRO) of the EONIA rate from the reference rate (increase in appreciation pressure of the foreign exchange rates in relation to the domestic currency) leads to a fall in the volume of NFA (generated mainly by a fall in the volume of the foreign exchange reserves of the given country).

However, it should be remembered that an increase in liquidity started to generate a gradual process of marginalisation of MRO, which started to gather pace with the launch of APP in October 2014. As a result, the deposit facility rate in the mid-2010s became the new de facto point of reference. While

[22] As already written in the week ending 20 April 2012, an accounting reclassification took place in order to harmonise the disclosure of the Emergency Liquidity Assistance (ELA) provided by Eurosystem central banks to domestic credit institutions under other claims on euro area credit institutions denominated in euro (asset item 6). A6, however, may also contain various other positions as specified in Guideline ECB/2016/34, as amended.

in Figure 32 the deviations in the EONIA rate from the MRO reference rate were measured by the difference between MRO-EONIA, since September 2014 the point of reference has been the difference between the EONIA rate and the deposit facility rate (in other words EONIA – DFR). A massive increase in the liquidity volumes made the case for replacing MRO with the Deposit Rate even more visible (as a new informal refence point), as the EONIA rate started to trade much closer to the latter rate (compared to the distance against the MRO). In contrast to the EONIA rate, which could deviate from the MRO in both directions, the EONIA's deviations from the DFR could move in one direction only. The point is that at least theoretically the EONIA rate could not fall below the level of the deposit facility rate (DFR). As later explained, the successor of the EONIA, the €STR did fall below the DFR.

6. A period stretching from the outset of PSPP to the outbreak of Covid 19: determinants generating a fall in NFA after 2015

The launch of PSPP in March 2015 did not translate into a further imminent drop in NFAs. On the contrary, a further increase in NFAs was observed, with volumes reaching levels well above EUR 550 billion in the second half of 2015. This increase was most probably attributed to yet another recourse to the ELA by Greece. Indeed, the volume of A6 increased more than twice between early 2015 and autumn of 2015 (close to EUR 140 billion). Even, if A6 levels were significantly below the levels observed in 2012 (when a threshold of EUR 250 billion was hit on one occasion), the levels observed in 2015 prompted fears related to a threat stemming from monetary financing by central banks. On 3 December 2015, during a press conference, the ECB President, Mario Draghi, was asked the following question:

"The second question is on the ANFA [Agreement on Net Financial Assets] agreement between the ECB and national central banks. Some national central banks seem to have bought quite large amounts of assets during the past years, whilst others have not. Is that a cause for concern for you?

Draghi: On the second question, ANFA purchases are entirely a matter for national central banks. They decide their investment policy in complete independence. Often it's very hard to understand the purposes as to why they buy certain bonds. Often, for example, very often it's for their pension funds.

I would exclude completely – you didn't say that, but you may have thought about this in your mind – I would exclude completely any possibility of monetary financing. They are not buying from the primary market, and their investment policies are pretty broad-based. So it's a question that I think you should ask them." (ECB 2015).

Two months later, on 4 February 2016, the ECB disclosed its first explanation related to the way ANFA works, a step which helped to appease previously related fears of debt monetization. Coming back to the level of the NFA volumes, they were brought down by rising liabilities, namely government revenues. As the situation in Greece calmed down, the drawing fund from the ELA started to fall from its highs recorded in mid-2015. If in 2016 the fall was rather gradual, a year later it clearly gathered pace. By the end of 2017, the A6 fell below EUR 40 billion, to levels last seen in late 2010. Since 2018, A6 has fallen into a sort of irrelevance from the point of view of the pecking order of financial assets.

In the period under review, financial assets performed in a rather stable manner. In the wake of A6 moving into irrelevance, financial assets were exposed to opposing neutralising changes. In the period under review, many central banks tried to reduce their holdings of securities other than those used for monetary operations (known as A7.2), which led to overall lower financial assets (from around EUR 370

billion in 2015 to slightly above EUR 200 billion in early 2020). This fall was partially offset by increases in the remaining assets A.9 and the so-called valuation effects (stemming from changes to A.1 and A.2). The latter was an effect of the lower euro exchange rate, which depreciated substantially at the turn of 2014 and 2015 as a result of the ECB lagging behind the Fed in implementing unconventional policies.[23]

In the absence of a clear trend for financial assets in the period under review, the pendulum swung from financial assets into financial liabilities in shaping NFAs. The key factor proved to be government accounts held at central banks. Prior to the Great Financial Crisis in 2008, governments used to hold less than EUR 60 billion on average. In the period stemming from the outbreak of the financial crisis to the launch of PSPP, this volume doubled. But it was the beginning of the purchase of government bonds, which converted position L.5 into the key factor shaping financial liabilities and subsequently the whole NFAs. The same is true for L.6. These two positions in the early 2020s amounted to around half of the entire financial liabilities, until their share started to fall somewhat in late 2022. We will return to this particular issue in the part dedicated to the last sub-period.

In this sub-period under review, one of the parameters applied here, namely the EONIA rate, started its process of decay and thus sparked the need for a new, better benchmark aimed at gauging tendencies in the O/N market. The demise of EONIA was a result of the need to create a new benchmark for risk-free rates. In the aftermath of the LIBOR manipulation scandals, a coordinated global response guided the efforts to reform reference rates (ESMA 2023). In 2012 the vulnerabilities of the IBORs (interbank offered rates, which are unsecured interbank rates for longer tenors) became evident, with a sharp fall in liquidity in the interbank markets. This trend made rates an easy subject for manipulations. It became clear that the overreliance of global financial markets on these rates posed clear risks to financial stability. The ECB initially considered both the unsecured and secured segments in order to identify sufficient market activity to underpin the €STR and resolve the lack of sufficient representative underlying data that led to EONIA's demise. But as the ECB observed in its *Economic Bulletin*, "in the euro area, however, several important features meant that a benchmark reflecting the secured market would not always provide a clear indication of the cost of liquidity" (Huerga et al. 2022).

€STR was introduced in October 2019. The key reason behind its implementation was to reflect changes taking place in financial markets. Unlike EONIA, it is not confined to banks only. €STR is based on borrowing transactions in euro conducted by banks and financial institutions (pension funds, insurance companies and assets managers) with financial counterparties (including borrowing from non-euro area agents (Lietuvos Bankas 2023)). In other words, an institution which do not have access to deposits within the Eurosystem and hence these institutions are prepared to contract transactions on less preferential rates. As a result, a one-off adjustment took place which brought the new reference rate 8.5 basis points lower. Prior to October 2019, the spread between the EONIA and the ECB deposit rate had somewhat rebounded as a result of halting APP at the end of 2018. Subsequently, the spread increased from around 3 basis points to almost 5 basis points. Still this increase in the spread was not enough to offset the above-mentioned adjustment (resulting in subtracting 8.5 basis points from the market O/N rate). Subsequently, the introduction of €STR meant that the new reference rate started to trade below the deposit rate. Little had changed in the final months of the period under review as far as the size of the described spread is concerned.

In the third sub-period from the outbreak of Covid 19 to the end of 2022, an unprecedented pandemic crisis forced central banks to resort to unprecedented measures. As a result, in the space of

[23] At the time when the ECB launched its APP when Fed concluded its almost six-year-long purchases (October 2014).

about nine months, the liquidity surplus had doubled, from around EUR 1700 billion in mid-March 2000 to around EUR 3450 billion in early December 2000. During this period of uncertainty related to the further fate of disease, many central banks (the ECB including) remained vigilant. Programmes enacted in 2020 were running through 2021 and the first half of 2022. As a result, the liquidity surplus in early 2022 reached a magnitude above EUR 4500 billion.

Such a sharp increase in liquidity had an imminent effect on the spread between €STR and the ECB deposit rate. In the second half of 2020 it traded above minus 5 basis points. Throughout 2021 it rose to around minus 8 basis points. In the last year of our review it jumped further to around minus 10 basis points. That increase took place in spite of clear announcements coming from the ECB related to a reversal of the measure implemented in the early days of pandemic. Needless to add, the NFA started to fall again, stimulated also by a drastic increase in the demand for banknotes.

As far as the financial assets are concerned, their modest rise of around EUR 300 billion was mainly generated by valuation effects and changes to A9. But it was financial liabilities which yet again contributed to a further decrease in NFAs. At a certain point (the end of 2021), NFAs fell below the psychological threshold of minus EUR 1000 billion before stabilizing somewhat.

The outbreak of Covid 19 led to a drastic increase in the funds held by the euro area's governments. Suffice to point out that the disaggregated figures for Germany showed that the funds the German authorities held in the Bundesbank in mid-2020 were of almost a similar magnitude as the funds of all the euro area's government held in the Eurosystem just three years earlier.

Another position to show a strong increase was L6 (i.e. liabilities to non-residents in euro). From early 2015 to early 2023 it increased by approx. 640%, i.e. from approx. EUR 50 billion to levels above EUR 370 billion. Here we can look for three different reasons for the growth of this position.

First, it is the autonomous factors responsible for the increase in demand of non-residents for balances in Eurosystem central banks. Those non-residents are mainly non-euro central banks as well as international organisations like the European Commission. The latter, similar to governments, could hold increased balances with central banks stemming from issued debt securities. That is why the creation of two funds aimed at countering the effects of Covid 19 (Next Generation EU (NGEU) and Support to mitigate Unemployment Risks in an Emergency (SURE)) could be the key reason behind the jump of around 125% in the volume of funds held in L6 in the periods between the early 2020 and early 2022.

Second, especially during the pandemic and the increased volume of liquidity swap transactions between the ECB and the Fed, the balances of euro could be kept by the Fed with the ECB. This would explain at least partly the increased balances during this period (see Figure 33). And the third reason for such a strong increase of L6 could be the growing interest rates in the Eurosystem (from a negative level to a positive one), which stimulated at least recently the demand of eligible non-residents to keep their funds in euro-area central banks' accounts (starting from 2022, see Figure 38).

There were also increases (observed mainly in 2022) in L10 (Other liabilities), L11 (Revaluation accounts) and L12 (Capital and reserves). The growth of other liabilities (L10) and capital and reserves (L12) may imply that the Eurosystem as a whole (ECB and euro-area national central banks) is preparing to have funds to cover losses. This is why it has been increasing since 2015. However, in the case of revaluation accounts (L11), the situation seems to be different. The change of this item is correlated to the change of financial assets, which are also included in the calculation of NFA. Therefore, the level and change of revaluation accounts do not have any impact on NFA.

7. The end of ultraloose monetary policies. A sharp tightening along with a gradual reversal of the liquidity surplus

The NFA reached an all-time low at the turn of 2021 and 2022, mainly because of an interim (related to the end of a year) increase of L6. Ever since, NFA have been on a gradual decline. This infliction point was of a symbolical nature. It was in 2022 when the ECB started to tighten its extremely loose monetary policies. A rather sharp increase in the ECB rates (within one year, between 27 July 2022 and 2 August 2023, interest rates rose nine times by a cumulative increase by 425 basis points as a result of which the deposit rate in August 2023 levelled its all-time high recorded at the turn of 2000 and 2001) contrasted with a rather gradual reversal of liquidity.

More than eleven years were needed to witness an increase in the reference rate. If mid-July 2022 the deposit rate was still at minus 0.5%; it rose to 2% before the end of 2022. Such a sharp increase in the price of money in such a short interval had to – out of principle – affect NFAs. The value of banknotes in circulation – just prior to the first rate increase by the ECB in July 2022 – stood at around the record high of EUR 1608,7 billion. By the end of 2022, it fell to the level of EUR 1572 billion. The first four months of 2023 saw a further decline in the value of banknotes. In April it fell below EUR 1560 billion before stabilising at a level slightly above EUR 1560 billion. In the first twelve months following the first post pandemic increase in the rates, the amount of banknotes declined by approx. 2.5%. It must be emphasized that the fall in the demand for money was not confined to the euro area. Many countries experienced similar trends. Some of them opted for increasing the scale of absorption operations in an attempt to address this fall (i.e.: Narodowy Bank Polski). Regardless of the reaction to these tendencies, such a drastic fall in the demand for money posed unprecedented challenges for monetary authorities.

The ECB's inactivity in the area of absorption discussed here makes us believe that NFAs are most probably the tool with the help of which such absorption takes place. After all, as it was already said that rising demand for banknotes generates a constellation where NFA are lagging behind the liquidity need caused by such an increase. By the same token, a fall in the demand for banknotes helps NFAs to recover this time around, as liquidity needs (generated by demand for banknotes) are lagging behind the NFAs. The numbers talk for themselves. In the space of around one year (between July 2022 and July 2023), the NFAs diminished (in absolute terms) by approx. 90%, thus reaching levels similar to the level last observed prior to the outbreak of the pandemic. It is worth emphasizing that NFAs reached these pre-pandemic levels with the liquidity surplus reaching magnitudes twice as large (compared to the level before the pandemic). In other words, a decrease of liquidity surplus by approx. 22% (a fall from levels above EUR 4600 billion to level of approx. EUR 3600 billion), helped NFAs regain level last seen at the time when liquidity surplus was reaching value levels below EUR 1800 billion. What are the reasons behind this rapid recovery in the value of NFAs?

In order to answer the above question, it must be borne in mind that it would be a mistake to explore the reasons behind the performance in the NFAs in early 2020s by confining them to their link with the volume of banknotes. There is at least one more factor, which puts the performance at stake, when it comes to an assessment of NFA's performance. This concerns accounts at the ECB where funds of official organizations are deposited. In the balance sheet these two positions can be detected at positions L5 and L6, out of which sub-position L5.1 (here government funds are deposited) requires special attention.

As already pointed out, until the outbreak of the GFC, governments held rather negligible amounts of money. This was rather a deliberate decision aimed at encouraging governments to deposit their funds outside the Eurosystem. Both the GFC and later the introduction of negative interest rates in June 2014 affected the way the ECB made its settlements with governments. Prior to the drop of the deposit rate below zero %, government funds were kept in the Eurosystem at a fixed rate of zero %. With repo rates (governments often preferred the secured segment to the unsecured segment of money markets) falling outside the interest rate corridor and thus becoming negative well before the deposit rates approached the threshold of 0%, depositing their funds in the market was becoming expensive. That is why the ECB opted to intervene by making more and more adjustments of an administrative nature.

Following the introduction of negative interest rates, the ECB introduced a cap, which consisted of the introduction of a ceiling at a lower rate of the deposit facility and the prevailing money market rate for the period during which the deposit facility remained negative. This mechanism was to be changed in 2019. As a result of the ECB Guideline 2019/7 from April 2019 (which applies to the euro area NCBs and thus relevant accounts held with euro area NCBs; ECB 2019a) and the ECB Decision 2019/31 from October 2019 (applies to the ECB and thus relevant accounts held with the ECB; ECB 2019b), some of these deposits from the public sector were subject to the following rule:

"However, when deposits need to be held in those accounts in advance of the date on which a payment must be made in accordance with the legal or contractual rules applicable to the relevant facility, such deposits shall be remunerated during this advance period at zero per cent or the euro short-term rate (€STR), whichever is higher." (ECB 2019b).

Hence a new term was coined, namely 0% interest rate ceiling for remuneration of government deposits. As it can be rightly assumed, not all governments deposits were subject to the above-mentioned rule.

As specified in Article 4 1b of Guideline ECB/2019/7, a large part of government deposits were remunerated at a ceiling:

"[…]

1. The remuneration of government deposits shall be subject to the following ceilings:

(a) For overnight deposits, the unsecured overnight market rate; for fixed term deposits, the secured market rate with a comparable maturity or if that is not available the unsecured overnight market rate.

[…]

- in the case of deposits denominated in euro:
  i. if the deposit facility rate on the relevant calendar day is zero or higher, with an interest rate of zero percent;
  ii. if the deposit facility rate on the relevant calendar day is negative, with an interest rate no higher than the deposit facility rate.

[…]

(c) On any calendar day, if the rate applicable under point (b) is higher than the relevant market rate specified in point (a), all government deposits shall be remunerated at such market rate."

But even keeping government funds at a rate of €STR (as deposits were remunerated up to the deposit rate or €STR, whichever was lower) was a bargain, as government often opted for transactions settled in the secure segment of the money market (whose rates were often well below the rate of €STR). A combination of this ceiling along with funds originated in the wake of Covid 19 generated

a heavy increase in the financial liabilities of domestic central banks, thus exerting downward pressure on NFAs further (along with high demand for banknotes).

Once the expansionary monetary policy came to an end, an inflection point occurred as far as NFAs are concerned. The process of raising rates had affected the demand for banknotes. Furthermore, almost at the same time (8 September 2022), the ECB removed the 0% interest rate ceiling for remuneration of government deposits. As a result, until 30 April 2023 the rates were set either at the deposit rate or €STR (depending on which rate was lower). And on 7 February 2023 a new ceiling was announced, a new formula of the €STR minus 20 basis points, which entered into force in May 2023. This decision was intended to discourage the public sector from keeping their funds at the Eurosystem and subsequently offer them an incentive to look for market intermediation.

"This decision reflects the desire to encourage market intermediation, with the changes to the remuneration regime providing incentives for depositors to gradually phase out their holdings with the Eurosystem", the ECB said.[24]

Our analysis concludes that the NFAs are mainly driven by two factors. The first is the demand for cash, as NFAs are supposed to meet the liquidity needs stemming from the coverage of banknotes in circulation and minimum reserves. The performance of this factor should be perceived as a derivative of the ECB interest rates. There is a clear negative relationship between these two variables. The second factor is more of an administrative nature, as it concerns an arbitrary view of the ECB regarding its intention to remunerate deposits held by the official sector (and domestic government in particular).

It must be borne in mind that some central banks apparently link their decision process with the performance of their government bonds. In the third quarter of 2023, the yields of the German bonds recorded a drastic fall in their levels, thus making the German government institutions reconsider their approach towards depositing their funds at the Bundesbank. The latter (as a result of a further tightening of monetary policy by the ECB) had to pay interest according to the €STR benchmark – 20 basis points.

As already mentioned, in the space of NFAs a drastic recovery from levels close below minus EUR 900 billion to levels above minus EUR 100 billion (an increase of 90% in absolute terms). If this dynamic is preserved in the months to come, a scenario where NFA become positive, cannot be excluded. This possibility is due to a unique combination of a sharp increase in the price of money (the ECB reference rates) and the rather slow decline in the liquidity level (which may inhibit market rates from rising as much as the increase set by the reference rates). After all, it must be borne in mind that the last time the level of NFAs was close to the current one, the amount of liquidity in the banking system amounted to a half of the liquidity observed in July 2023 (following the repayment of the largest tender of the TLTRO III). Subsequently, the current situation may imply that the NFAs may not act in a countercyclical manner someday in the future, thus posing a challenge for the ECB – especially with liquidity well above levels seen prior to the outbreak of the GFC.

8. Conclusions

Net financial assets (NFA) along with liabilities due to euro banknotes in circulation automatically constitute the determinants of the creation/absorption of liquidity of the banking sector.

[24] ECB adjusts remuneration of certain nonmonetary policy deposits as of 1 May 2023 (europa.eu).

The Eurosystem as a whole has little influence on the direct development of demand for banknotes. However, the size of net financial assets falls within the competence of individual national central banks. The size of assets and liabilities not related to monetary policy operations is a significant part of the total balance sheet of both the whole of the Eurosystem and the individual national central banks. This is why there is a need to coordinate measures among the central banks regarding not so much the structure of these assets, but their size, and thus their impact on the size of the deficit/excess of liquidity of the banking sector in the euro area.

The analysis of the structure and dynamics of NFA over the last 20 years at the level of both the Eurosystem and selected central banks allows us to note that the determinants impacting on NFA are the following:

a) financial assets which do not correspond with selected items of the liabilities,

b) financial assets corresponding to selected items of liabilities (earmarked assets),

c) bank's equity,

d) liabilities arising from accounts of other clients (other than credit institutions).

At the level of the Eurosystem, the volatility of NFA is dictated by the volatility of two elements: financial assets which do not correspond with selected items of the liabilities and liabilities arising from clients' accounts. While financial assets had a decisive impact on the growth of NFAs until the turn of 2008/2009, in the years 2009–2012 fluctuations in NFAs were also a result of changes in financial assets and clients' accounts, and from 2013 changes in NFAs are mainly the result of changes of clients' accounts. The influence of the latter has been so material, especially since 2015, that it changed the level of NFA from positive to negative.

In turn, the national central banks apply a diversified policy in terms of NFA management. One can identify an active approach (e.g. Italy), as well as cases of passive management of NFAs (e.g. Germany). In the case of an active approach to NFA management, central banks influence the size of NFA through the development of portfolios of financial assets which do not correspond with selected items of the liabilities (in foreign currency, as well as in euro). However, in the case of passive management, it is mainly the decisions of the central bank's clients regarding the size of funds held in accounts at the central banks that determine the size of NFAs of a given bank. Regardless of the size and volatility of NFAs of individual national central banks, financial assistance provided under the ELA also has an impact.

In the case of liquidity management by the central bank, there is plenty of evidence to suppose that NFAs were and are an important component of the transmission mechanism on the part of the ECB. While until the outbreak of the crisis in 2007 the ECB maintained the so-called liquidity deficit with the help of NFAs, after 2011 NFAs guaranteed the national central banks a kind of countercyclicality against the processes underway in the banking system and influencing the shape of M0. In other words, the fall in excess liquidity leads to a growth in NFAs, and in turn, a growth in excess liquidity leads to a fall in NFAs (as is now the case). Recently we can even notice that NFAs is a kind of instrument responsible for absorption of excess liquidity in the credit institution sector. However, these are our assumptions, not supported by any official declarations on the part of the ECB.

To summarize, in the light of a lack of sufficient information it is very difficult to discuss further the role of net financial assets in shaping liquidity in the euro area. However, there is no doubt that the impact of the net financial assets described here certainly exists. The ANFA agreement seems to be a unique agreement on a worldwide scale and this is why we thought it appropriate to take a closer

look at its content, both from the point of view of the significance of such assets for the national central banks and their significance for the ECB from the point of view of liquidity management in the euro area.

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Appendix

Table 1
Structure of the consolidated annual balance sheet of the Eurosystem

Assets	Liabilities
1. Gold and gold receivables 2. Claims on non-euro area residents denominated in foreign currency 2.1. Receivables from the IMF 2.2. Balances with banks and security investments, external loans and other external assets 3. Claims on euro area residents denominated in foreign currency 4. Claims on non-euro area residents denominated in euro 4.1. Balances with banks, security investments and loans 4.2. Claims arising from the credit facility under ERM II 5. Lending to euro area credit institutions related to monetary policy operations denominated in euro 5.1. Main refinancing operations 5.2. Longer-term refinancing operations 5.3. Fine-tuning reverse operations 5.4. Structural reverse operations 5.5. Marginal lending facility 5.6. Credits related to margin calls 6. Other claims on euro area credit institutions denominated in euro 7. Securities of euro area residents denominated in euro 7.1. Securities held for monetary policy purposes 7.2. Other securities 8. General government debt denominated in euro 9. Other assets	1. Banknotes in circulation 2. Liabilities to euro area credit institutions related to monetary policy operations denominated in euro 2.1. Current accounts (covering the minimum reserve system) 2.2. Deposit facility 2.3. Fixed-term deposits 2.4. Fine-tuning reverse operations 2.5. Deposits related to margin calls 3. Other liabilities to euro area credit institutions denominated in euro 4. Debt certificates issued 5. Liabilities to other euro area residents denominated in euro 5.1. General government 5.2. Other liabilities 6. Liabilities to non-euro area residents denominated in euro 7. Liabilities to euro area residents denominated in foreign currency 8. Liabilities to non-euro area residents denominated in foreign currency 8.1. Deposits, balances and other liabilities 8.2. Liabilities arising from the credit facility under ERM II 9. Counterpart of special drawing rights (SDR) allocated by the IMF 10. Other liabilities 11. Revaluation accounts 12. Capital and reserves
Total assets	Total liabilities

Source: ECB (2016, Annex VII).

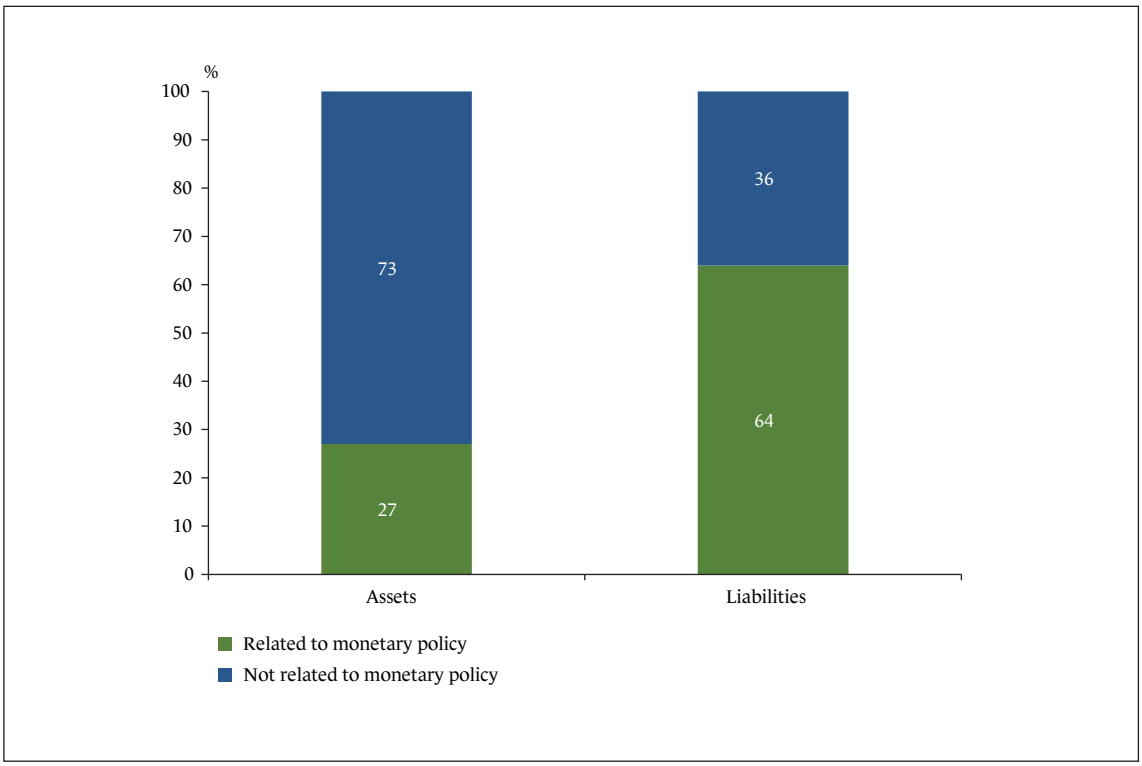
Table 2
Calculation of net liquidity effect from autonomous factors along with the net liquidity effect from autonomous factors and monetary policy portfolios (as at 14 July 2023)

Assets	EUR mn	Liabilities	EUR mn
Autonomous factors (I)		Autonomous factors (I)	
Net foreign assets (A1 + A2 + A3 – L7 – L8 – L9)	922,705	Banknotes (L1)	1,568,768
Domestic assets (A7.2) + A8	210,887	Other net autonomous factors L2.5 + L3 + L4 + L5.2 + L6 + L10 + L11 + L12 – A4 – A6 – A9	1,207,448
Sum AI	1,133,592	Sum LI	2,776,216
Monetary policy instruments (II)		Monetary policy instruments (II)	
A5.1 MRO	11,833	L2.1	156,445
A5.2 LTRO	597,985	L2.2	3,671,363
A5.5 MLF	51	L2.3	0
		L2.4	28
Sum AII	609,869	Sum LII	3,827,836
Sum AI and AII	1,743,461	Sum LI and LII	6,604,052
Net liquidity effect of autonomous factors (Sum LI – Sum AI)	1,642,624		
Monetary policy portfolio (A7.1)	4,860,591		
Net liquidity effect of autonomous factors + monetary policy portfolio (Sum LI – Sum AI – A7.1)	-3,217,967		

Balance sheet items are in line with Table 1.

Source: own calculations based on Maraffino (Euro Money Markets Weekly).

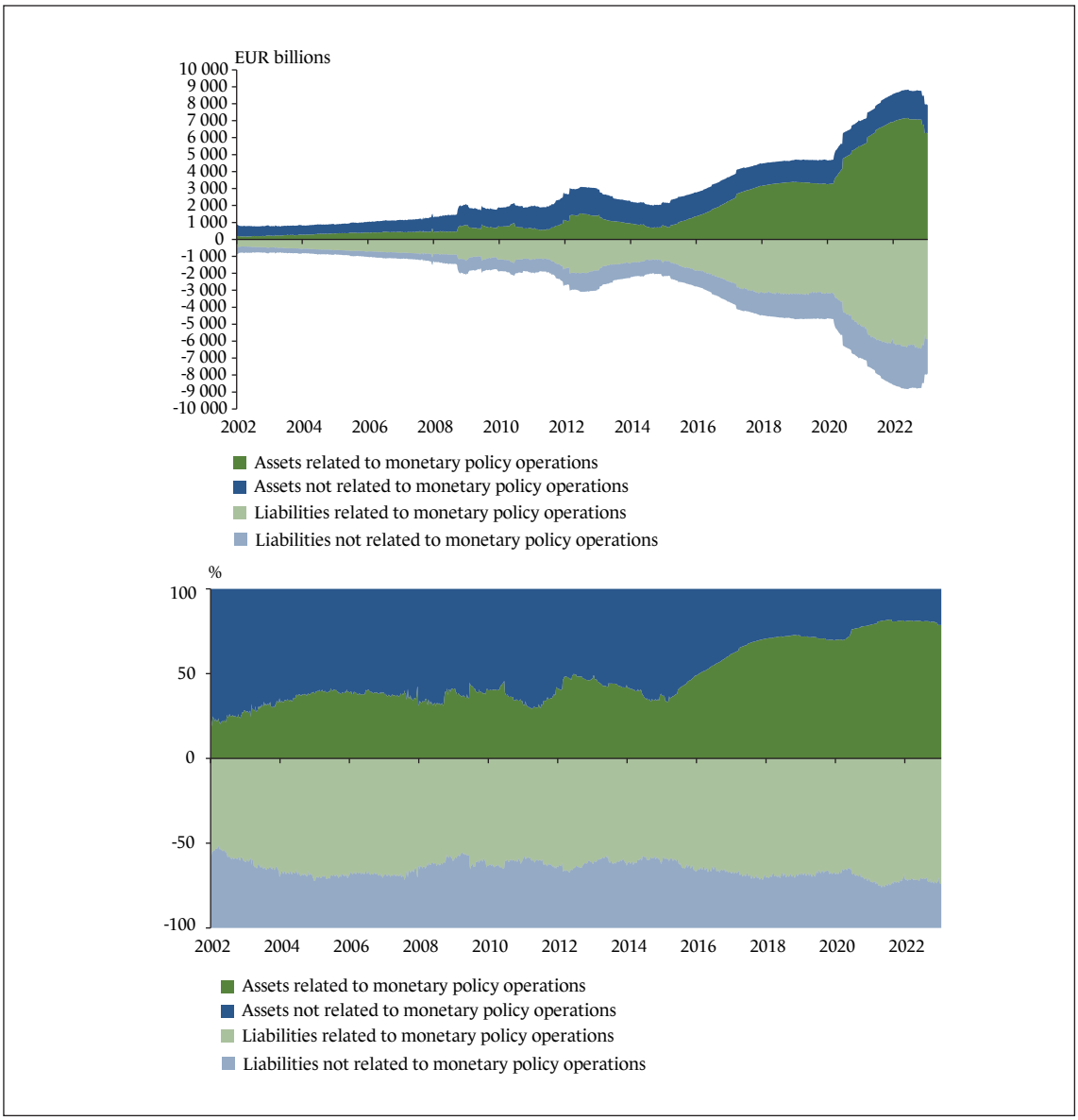
Figure 1
Structure of the opening consolidated balance sheet of the Eurosystem as at 1 January 1999



Note:
Assets related to monetary policy were calculated as the value of item A.5 (Receivables from credit institutions of the euro area related to monetary policy operations).
Liabilities related to monetary policy were calculated as the total in items: L.2 (Liabilities to euro area credit institutions related to monetary policy operations denominated in euro), L.4 (Debt certificates issued) and additionally L.1 (Banknotes in circulation).

Source: own calculations based on ECB (http://sdw.ecb.europa.eu).

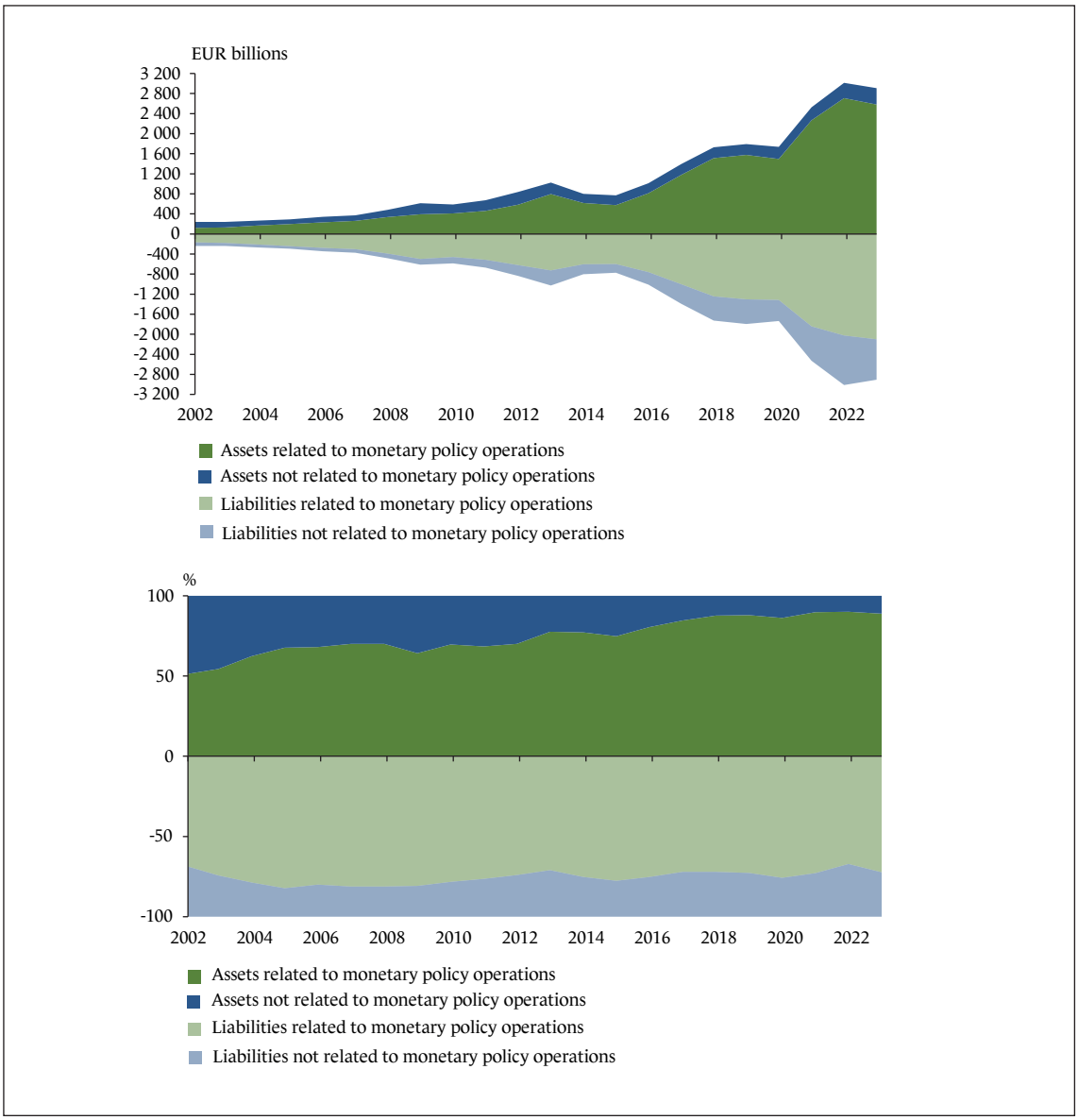
Figure 2
The structure of Eurosystem consolidated assets and liabilities according to their relationship with the monetary policy operations



Note:
The separation of assets and liabilities into those related and not related to monetary policy according to the principles described in Appendix (Arithmetic of the Eurosystem balance sheet).

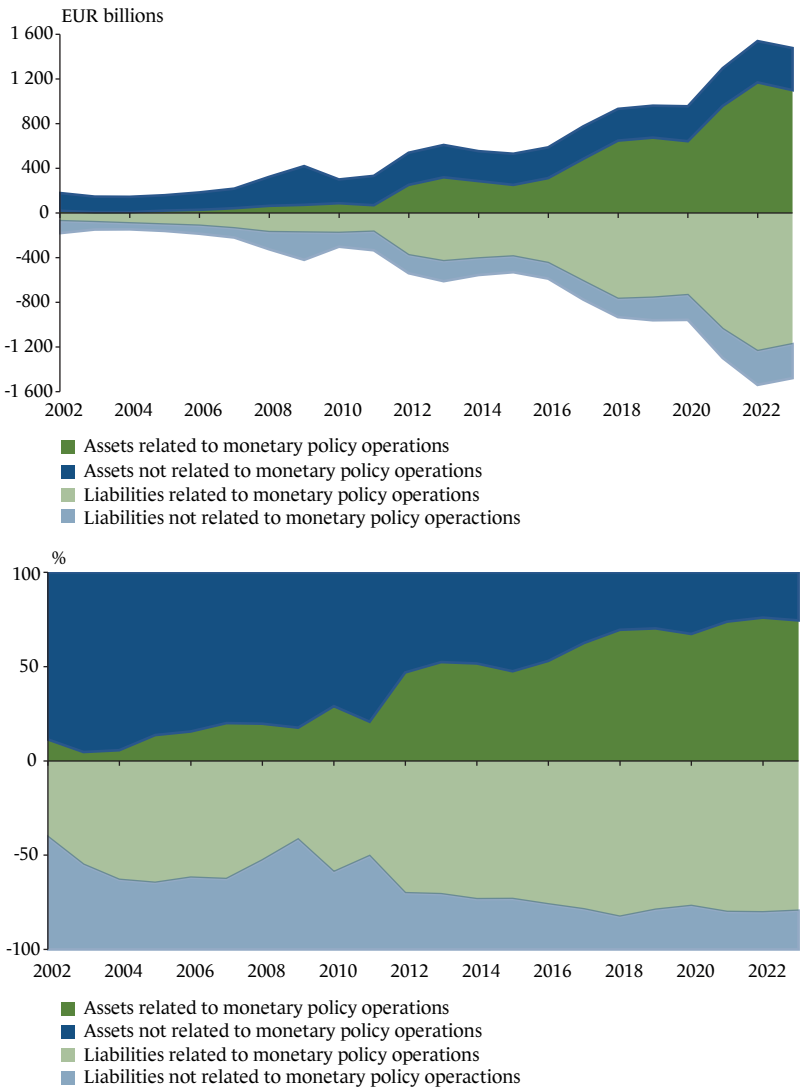
Source: own calculations based on ECB (weekly consolidated balance sheets of the Eurosystem; latest data from 27 January 2023.

Figure 3
The structure of Bundesbank consolidated assets and liabilities according to their relationship with the monetary policy operations



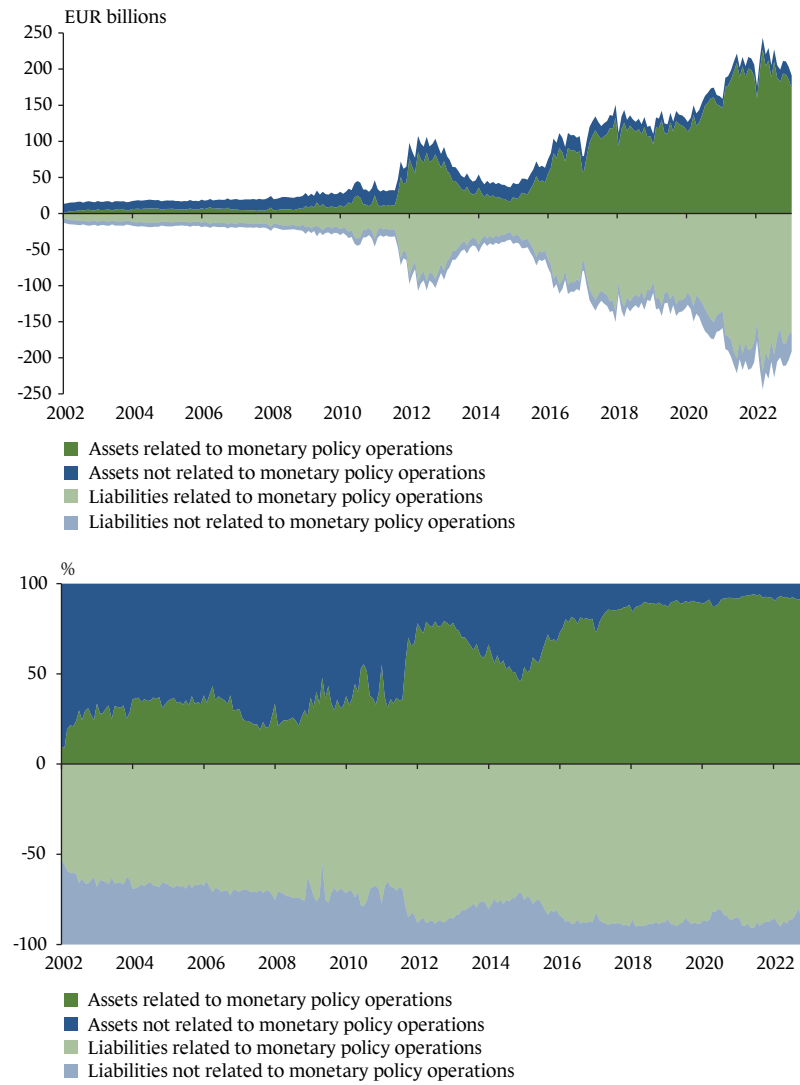
Source: own calculations based on: Bundesbank, Annual Reports, 2002–2022; ECB (https://sdw.ecb.europa.eu); latest data from 31 December 2022.

Figure 4
The structure of Banca d'Italia consolidated assets and liabilities according to their relationship with the monetary policy operations



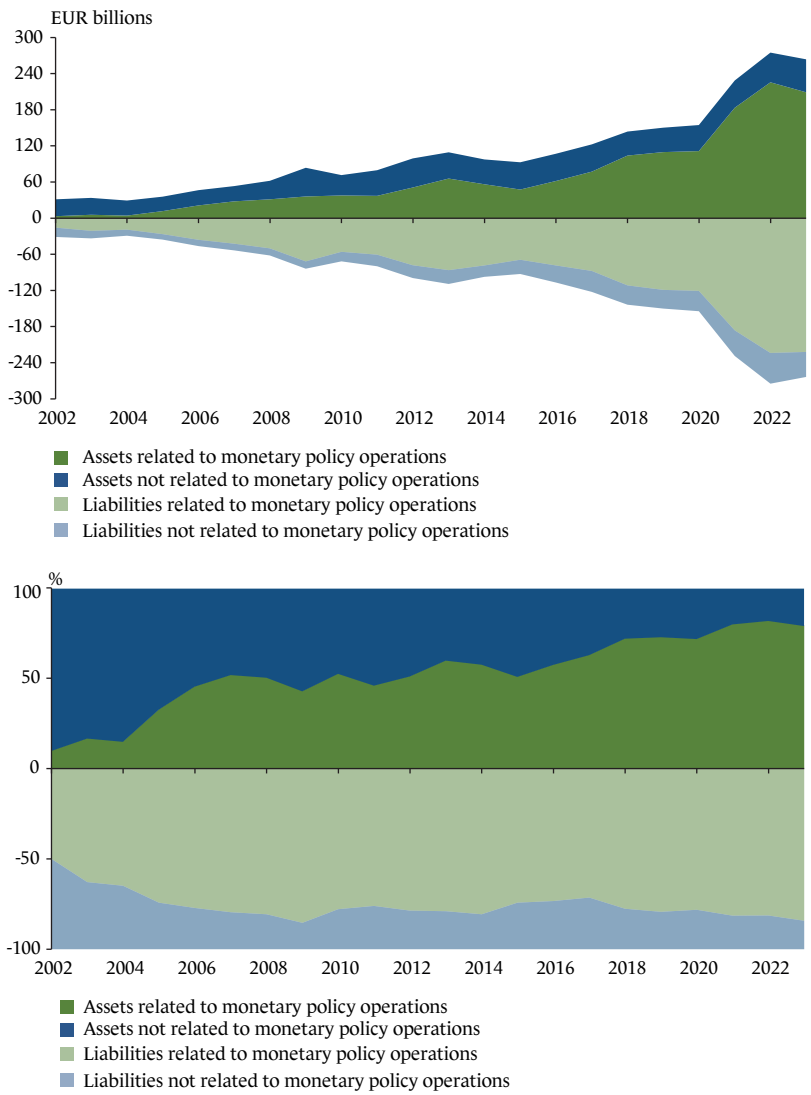
Source: own calculations based on: Banca d'Italia, Annual Reports, 2002–2022; ECB (https://sdw.ecb.europa.eu); latest data from 31 December 2022.

Figure 5
The structure of central bank of Finland consolidated assets and liabilities according to their relationship with the monetary policy operations



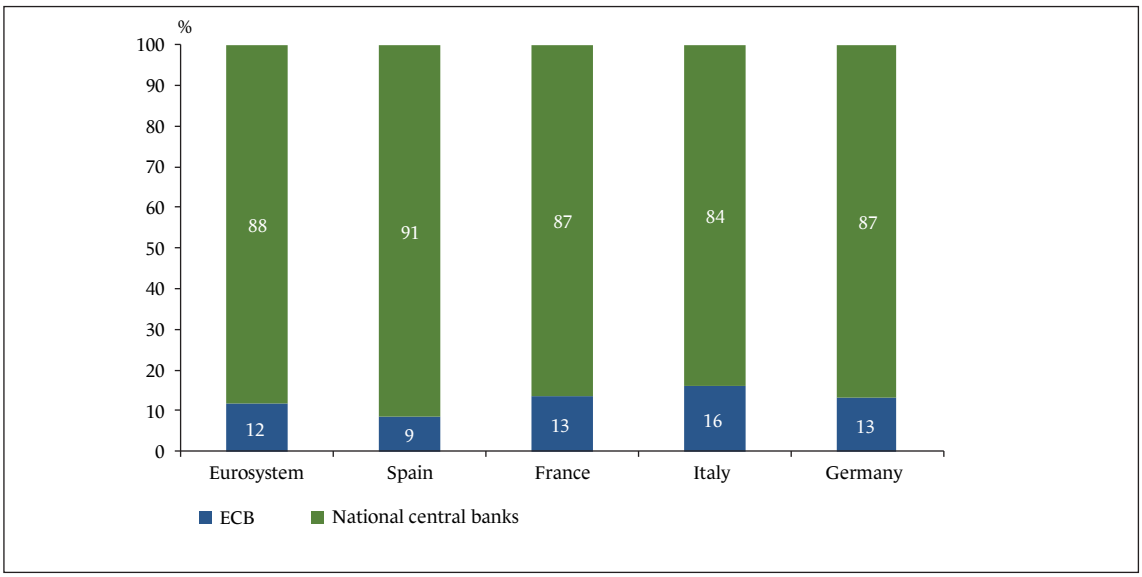
Source: own calculations based on: central bank of Finland, monthly Bank of Finland balance sheet (https://www.suomenpankki.fi/en/Statistics/mfi-balance-sheet/tables/rati-taulukot-en/ SP_tase_en/); latest data from January 2023.

Figure 6
The structure of central bank of Austria consolidated assets and liabilities according to their relationship with the monetary policy operations



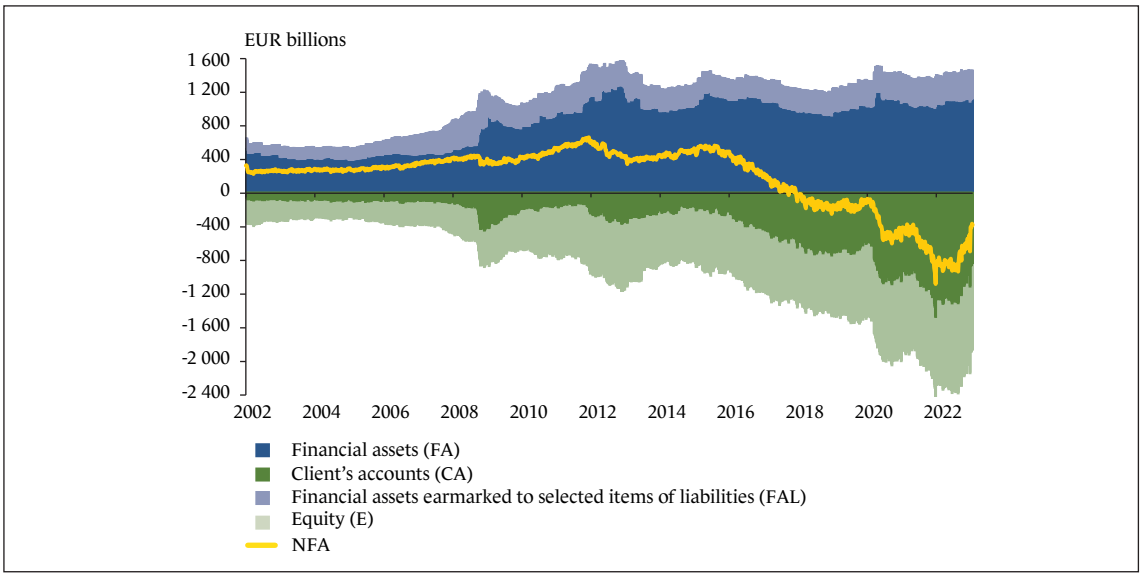
Source: own calculations based on: central bank of Austria, Annual Reports, 2002–2022; ECB (https://sdw.ecb.europa.eu); latest data from 31 December 2022.

Figure 7
Share of assets in foreign currencies transferred to the ECB in the total foreign exchange assets of the given national central bank (Eurosystem) in 1999



Source: own calculations based on ECB and Eurosystem central banks annual reports for 1999.

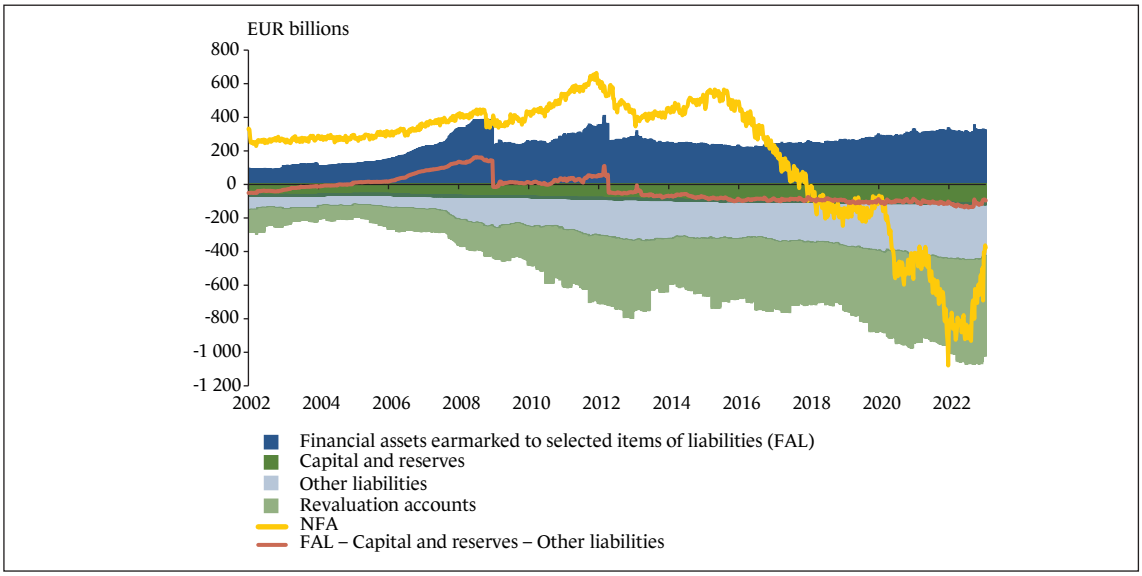
Figure 8
Net financial assets of the Eurosystem



Source: own calculations based on ECB (weekly balance sheets of the Eurosystem; latest data from 27 January 2023).

Figure 9

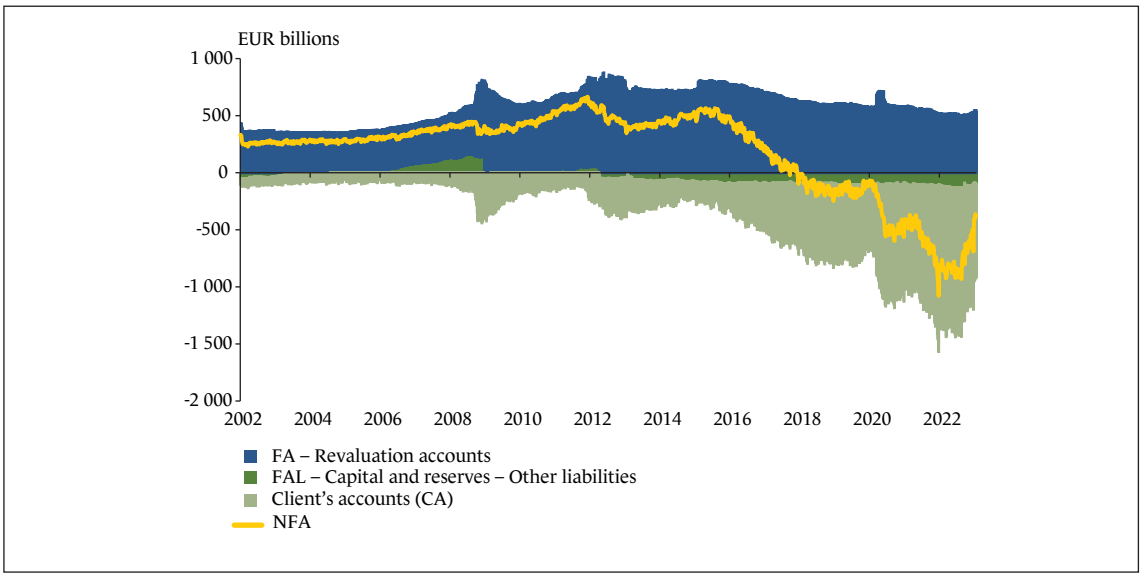
The impact of Equity on net financial assets of the Eurosystem



Source: own calculations based on ECB (weekly balance sheets of the Eurosystem; latest data from 27 January 2023).

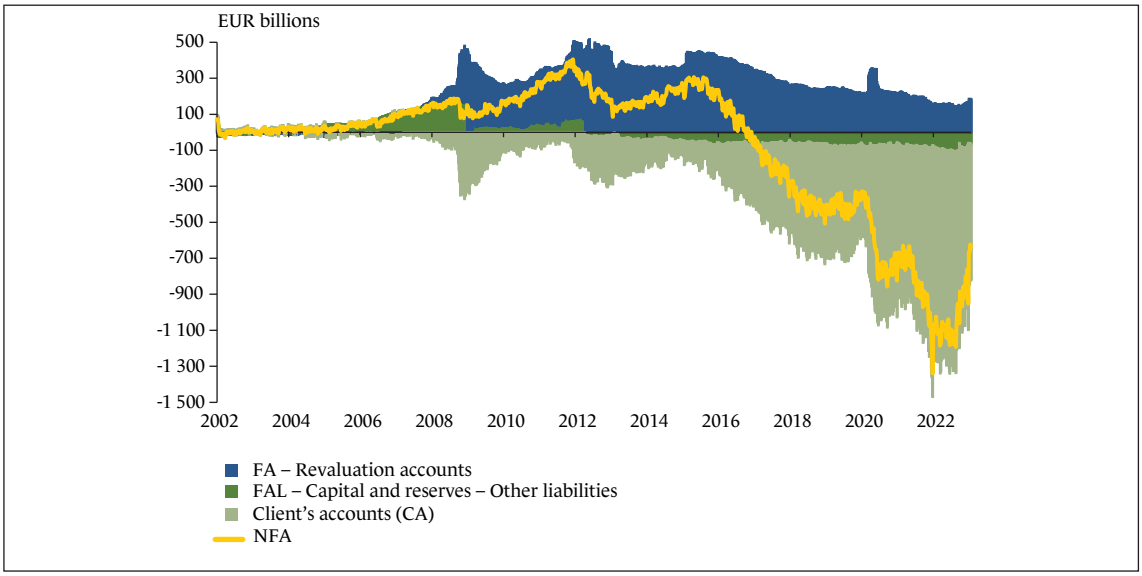
Figure 10

The impact of financial assets which do not correspond with selected items of the liabilities and client's accounts on net financial assets of the Eurosystem



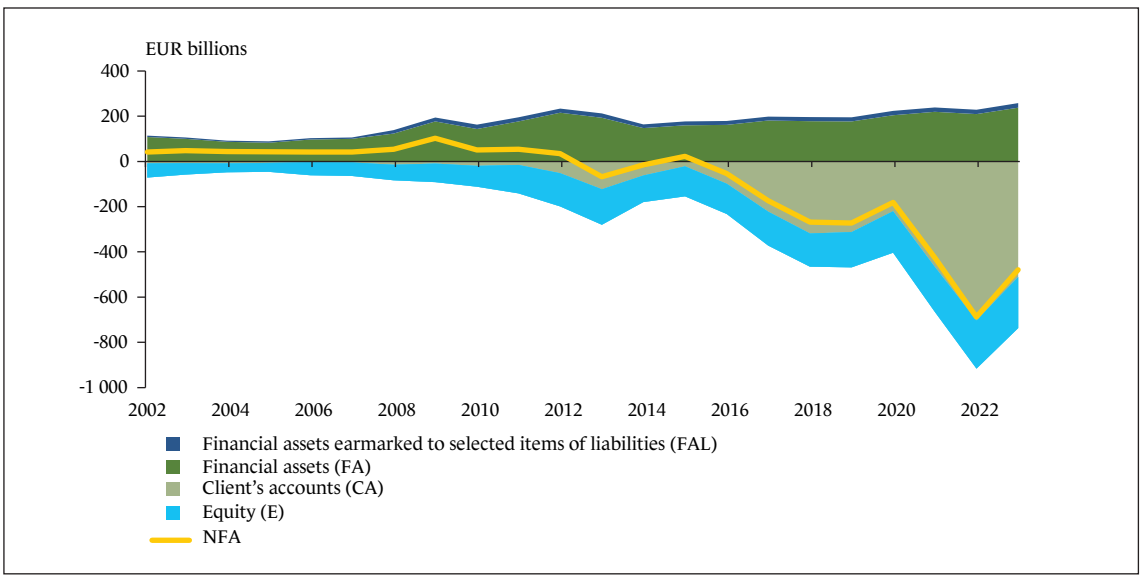
Source: own calculations based on ECB (weekly balance sheets of the Eurosystem; latest data from 27 January 2023).

Figure 11
Accumulated changes in net financial assets of the Eurosystem



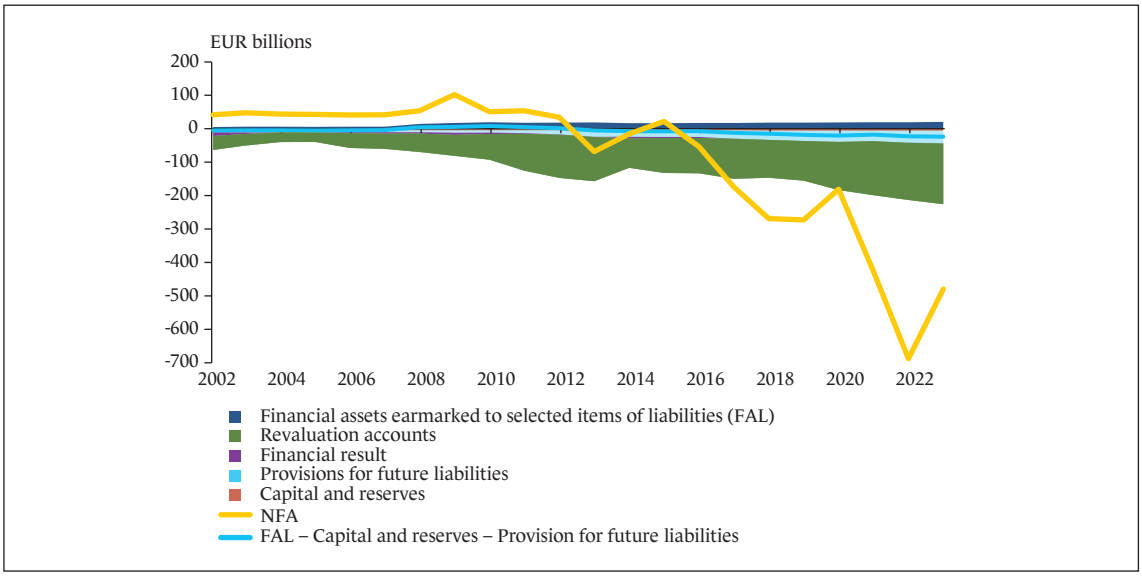
Source: own calculations based on ECB (weekly balance sheets of the Eurosystem; latest data from 27 January 2023).

Figure 12
Net financial assets of the Bundesbank



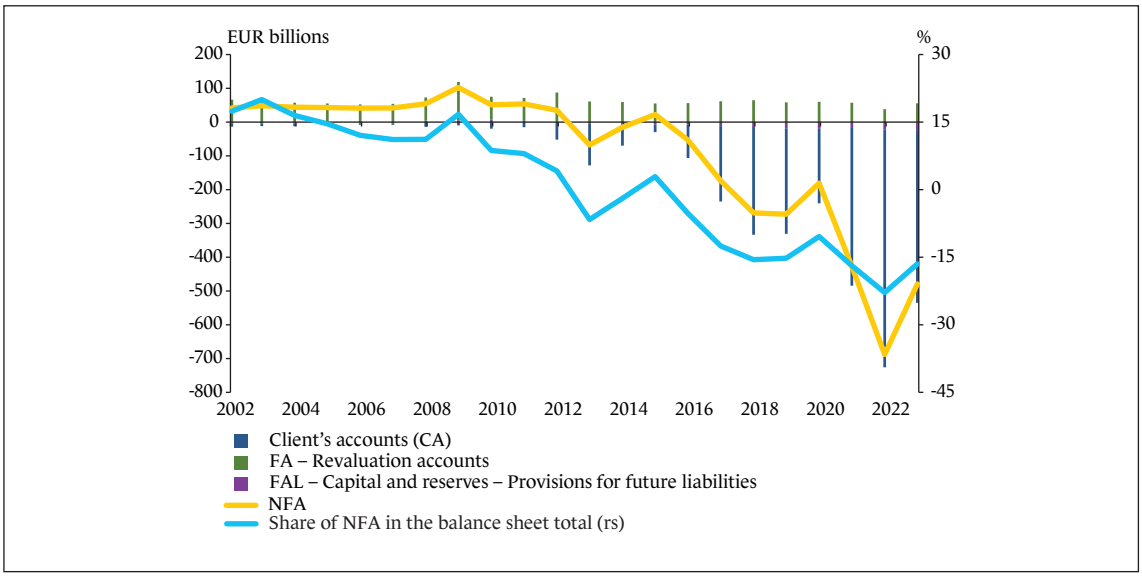
Source: own calculations based on Bundesbank, Annual Reports, 2002–2022 (annual data, the latest observation from 31 December 2022).

Figure 13
Equity of the Bundesbank related to the net financial assets of the Bundesbank



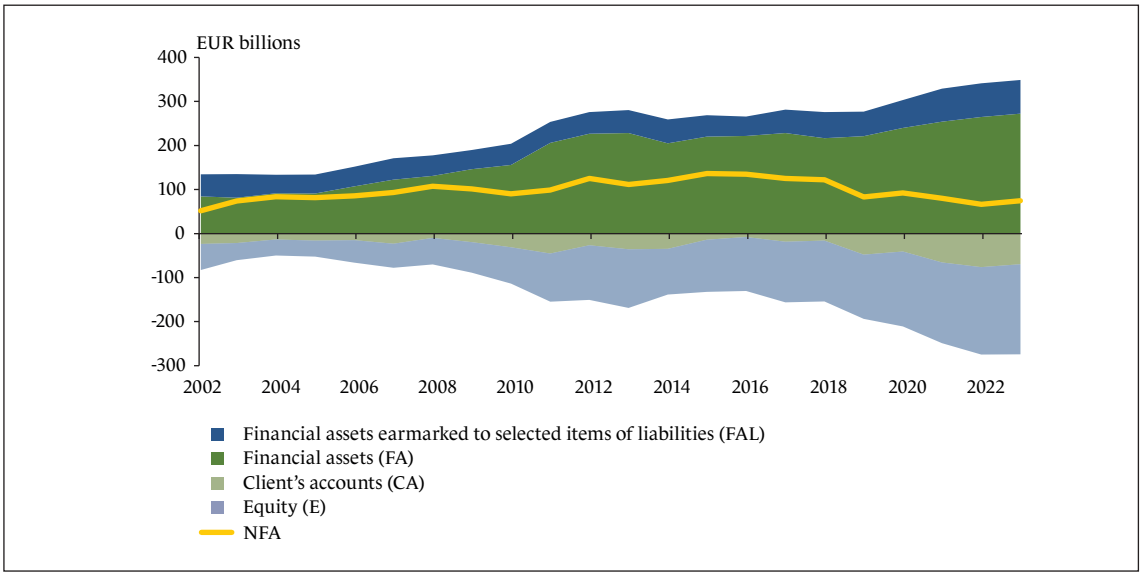
Source: own calculations based on Bundesbank, Annual Reports, 2002–2022 (annual data, the latest observation from 31 December 2022).

Figure 14
Financial assets which do not correspond with selected items of the liabilities and clients' accounts related to the net financial assets of the Bundesbank



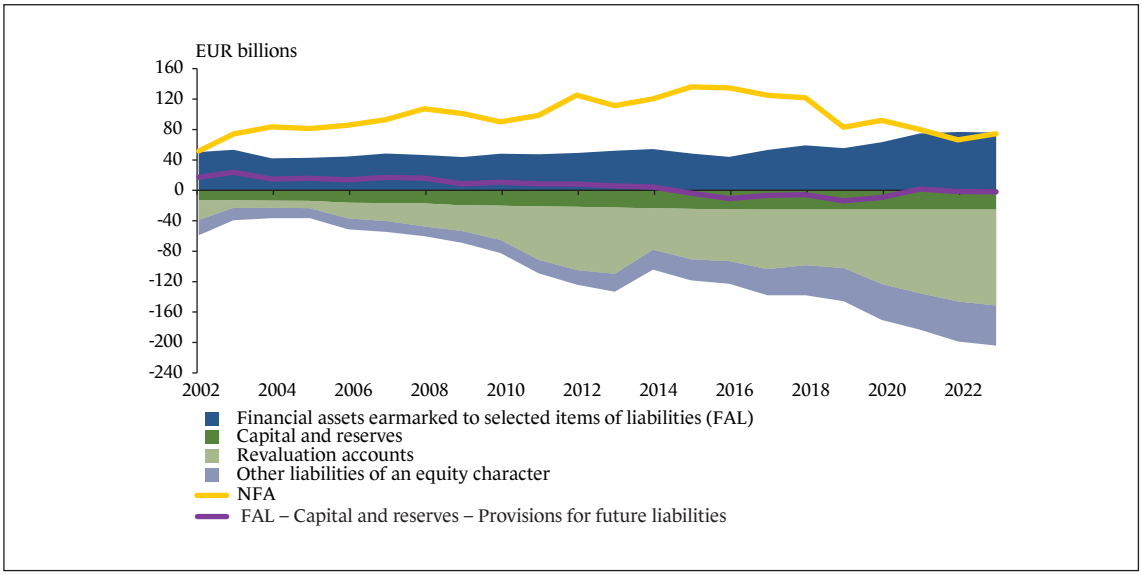
Source: own calculations based on Bundesbank, Annual Reports, 2002–2022 (annual data, the latest observation from 31 December 2022).

Figure 15
Net financial assets of the central bank of Italy



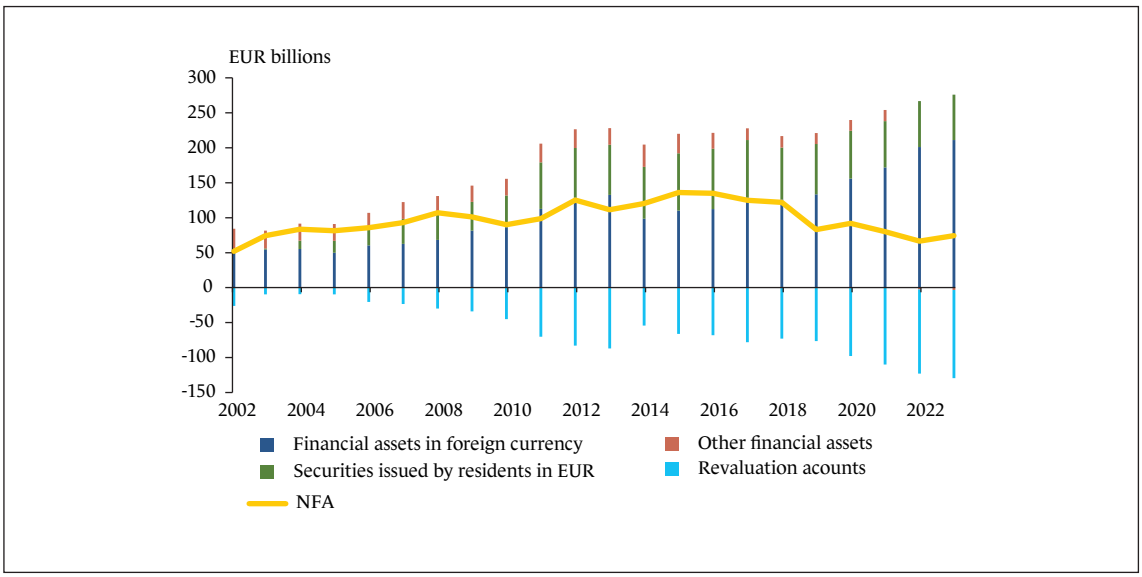
Source: own calculations based on Banca d'Italia, Annual Reports, 2002–2022 (annual data, the latest observation from 31 December 2022).

Figure 16
Equity of the central bank of Italy related to the net financial assets of the central bank of Italy



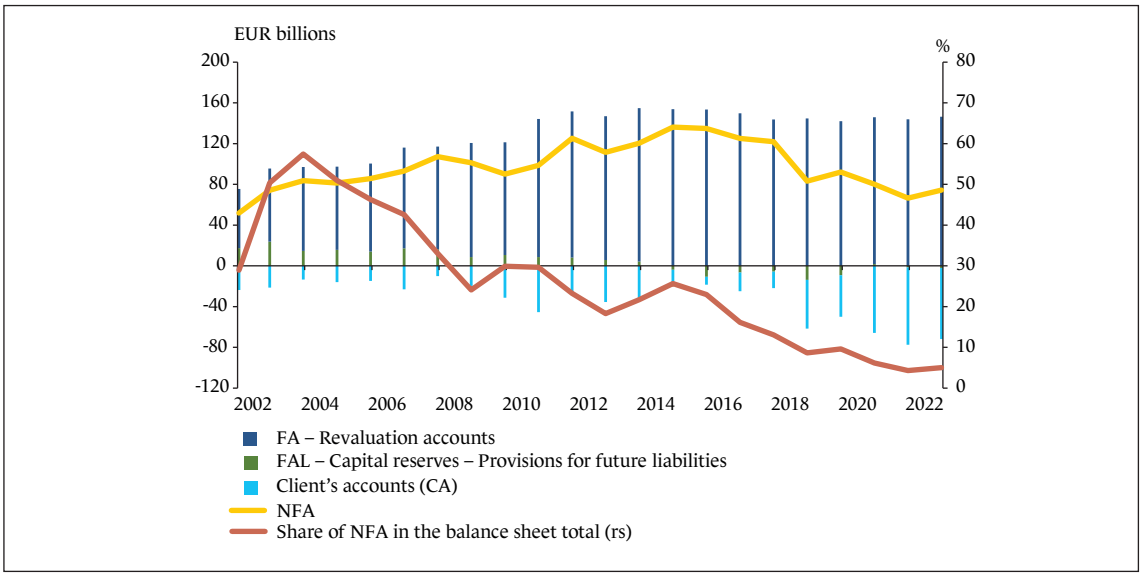
Source: own calculations based on Banca d'Italia, Annual Reports, 2002–2022 (annual data, the latest observation from 31 December 2022).

Figure 17
Structure of financial assets which do not correspond with selected items of the liabilities of the central bank of Italy



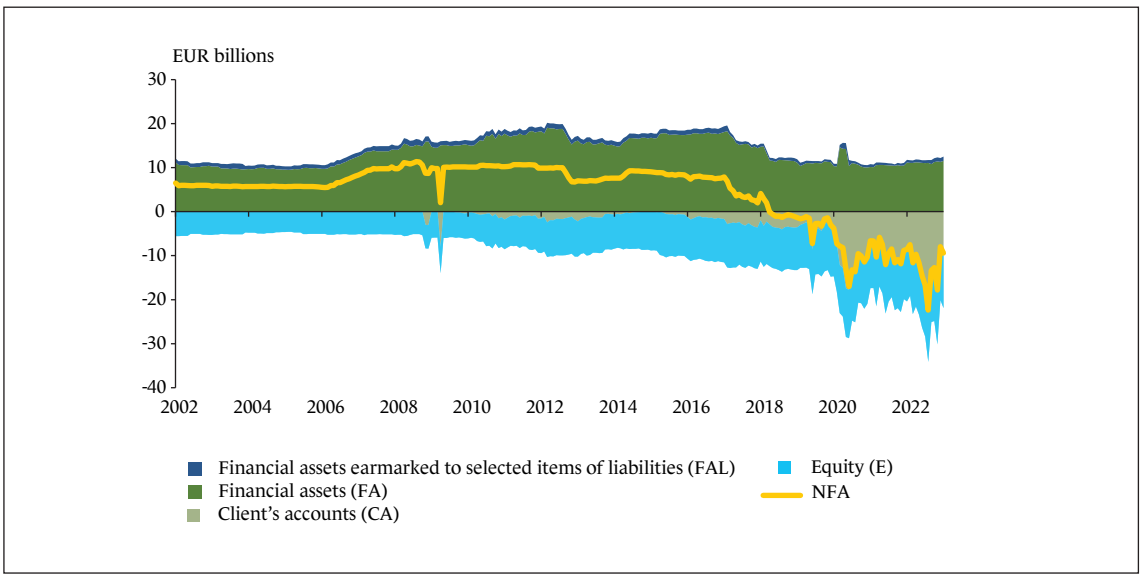
Source: own calculations based on Banca d'Italia, Annual Reports, 2002–2022 (annual data, the latest observation from 31 December 2022).

Figure 18
Main components of the central bank of Italy's net financial assets



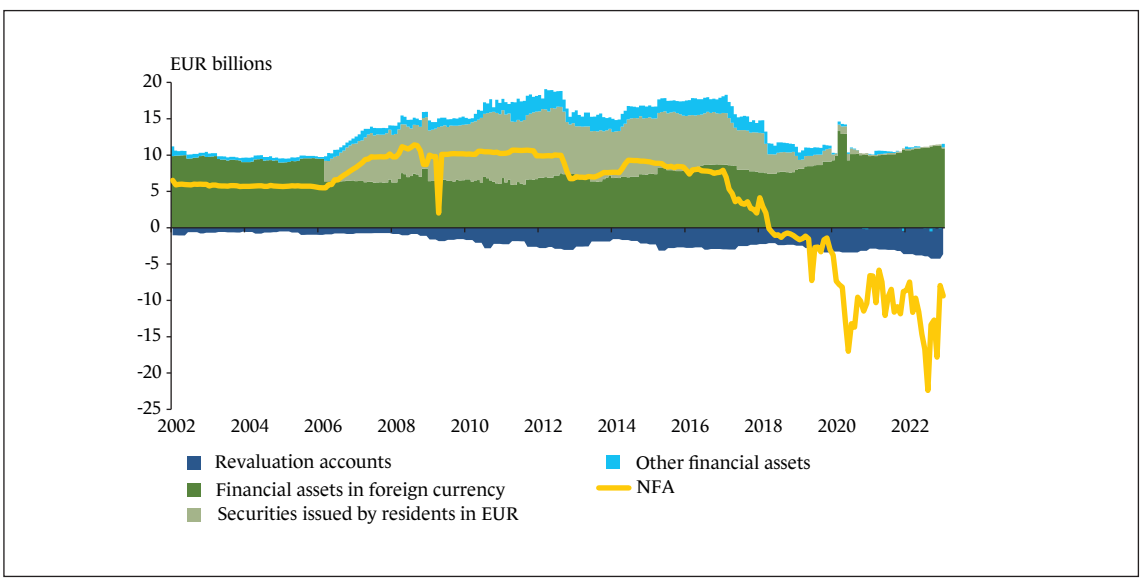
Source: own calculations based on Banca d'Italia, Annual Reports, 2002–2022 (annual data, the latest observation from 31 December 2022).

Figure 19
Net financial assets of the central bank of Finland



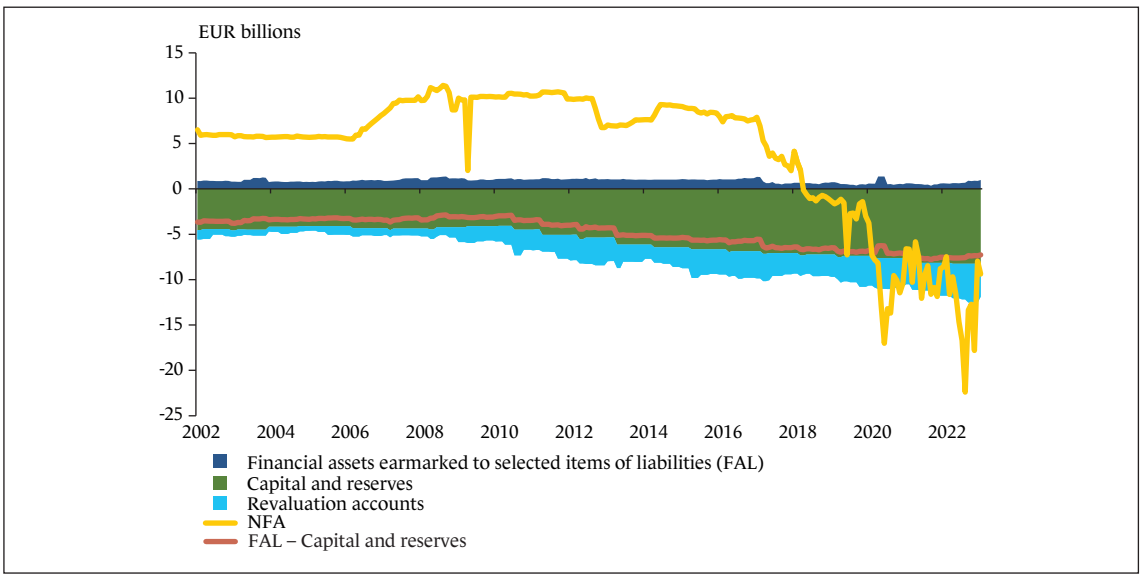
Source: own calculations based on: central bank of Finland, monthly Bank of Finland balance sheet (https://www.suomenpankki.fi/en/Statistics/mfi-balance-sheet/tables/rati-taulukot-en/ SP_tase_en/); latest data from January 2023.

Figure 20
Structure of financial assets which do not correspond with selected items of the liabilities of the central bank of Finland



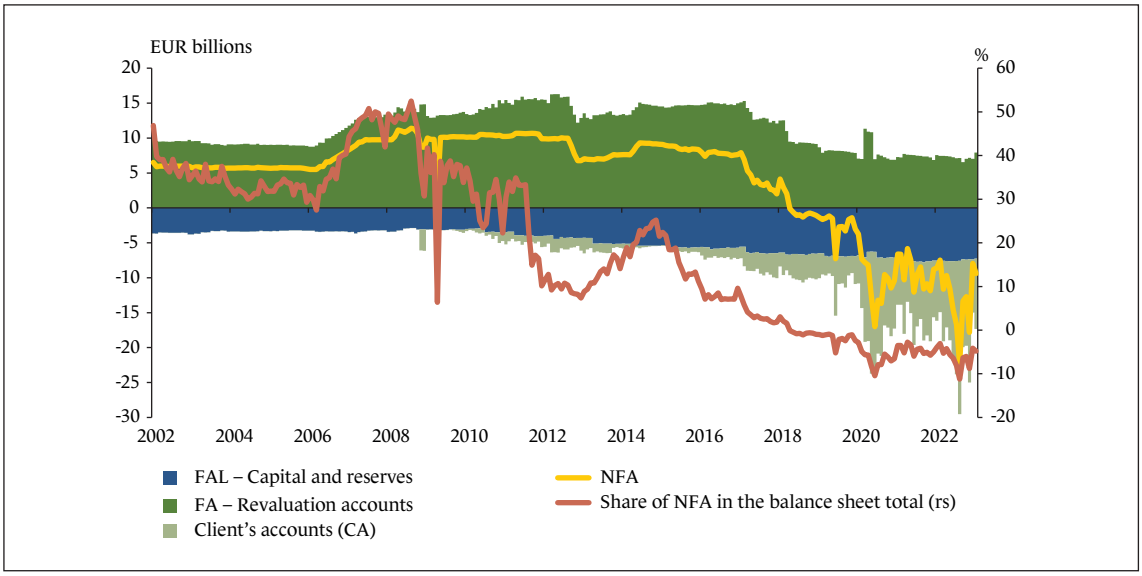
Source: own calculations based on: central bank of Finland, monthly Bank of Finland balance sheet (https://www.suomenpankki.fi/en/Statistics/mfi-balance-sheet/tables/rati-taulukot-en/ SP_tase_en/); latest data from January 2023.

Figure 21
Equity of the central bank of Finland related to the net financial assets of central bank of Finland



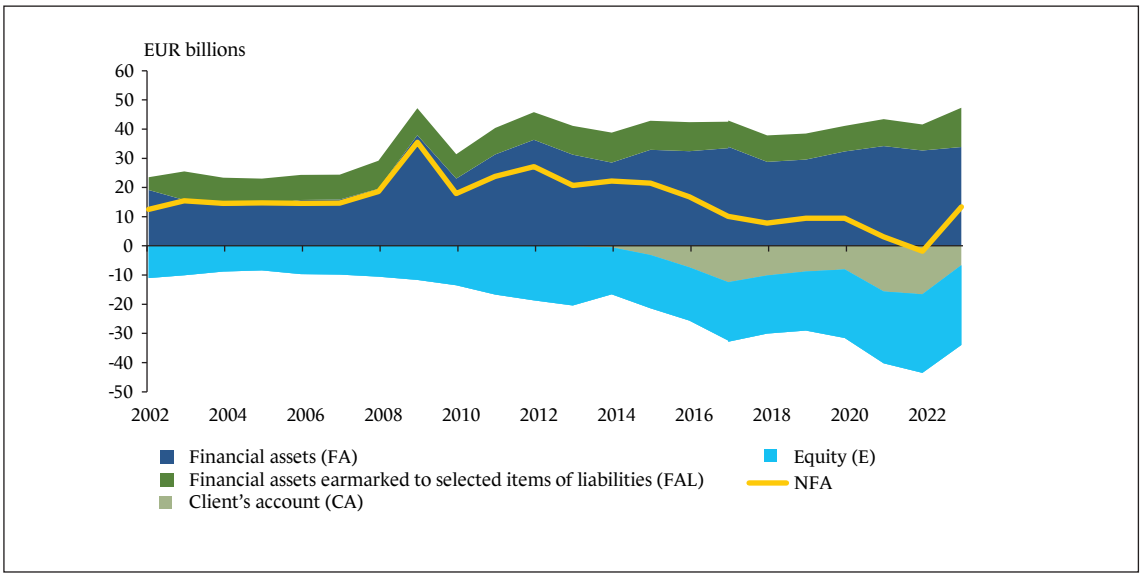
Source: own calculations based on: central bank of Finland, monthly Bank of Finland balance sheet (https://www.suomenpankki.fi/en/Statistics/mfi-balance-sheet/tables/rati-taulukot-en/ SP_tase_en/); latest data from January 2023.

Figure 22
Main components of the central bank of Finland's net financial assets



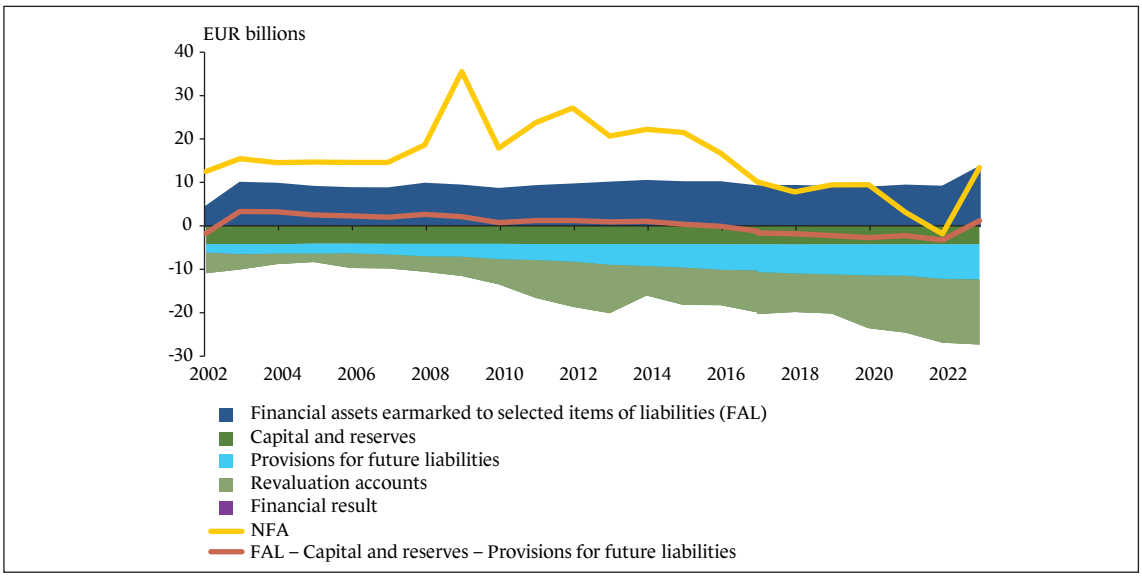
Source: own calculations based on: central bank of Finland, monthly Bank of Finland balance sheet (https://www.suomenpankki.fi/en/Statistics/mfi-balance-sheet/tables/rati-taulukot-en/ SP_tase_en/); latest data from January 2023.

Figure 23
Net financial assets of the central bank of Austria



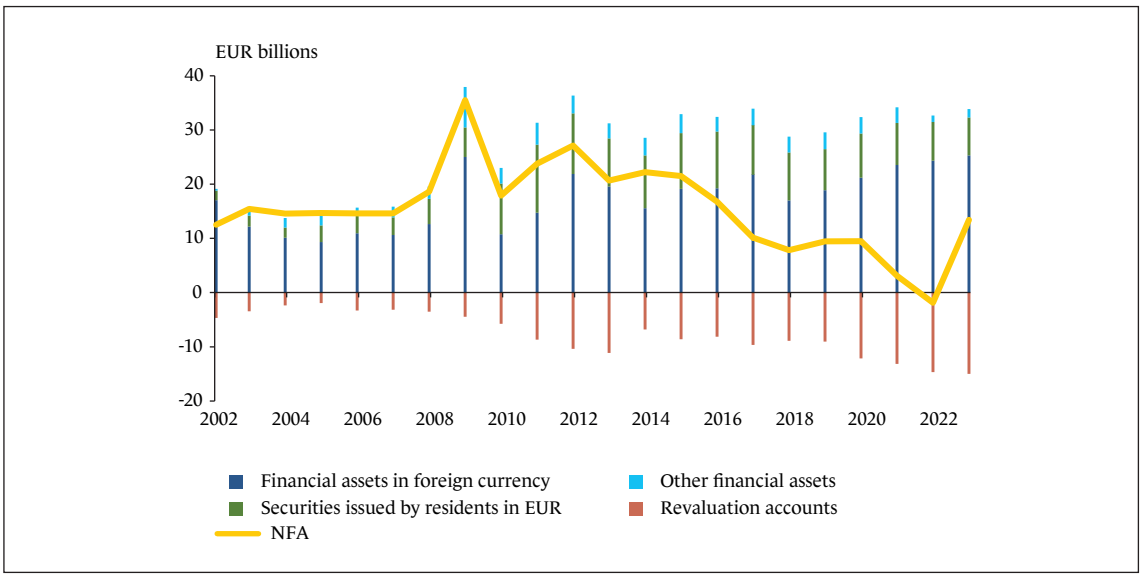
Source: own calculations based on central bank of Austria, Annual Reports, 2002–2022 (annual data; the latest observation from 31 December 2022).

Figure 24
Equity of the central bank of Austria related to the net financial assets of the central bank of Austria



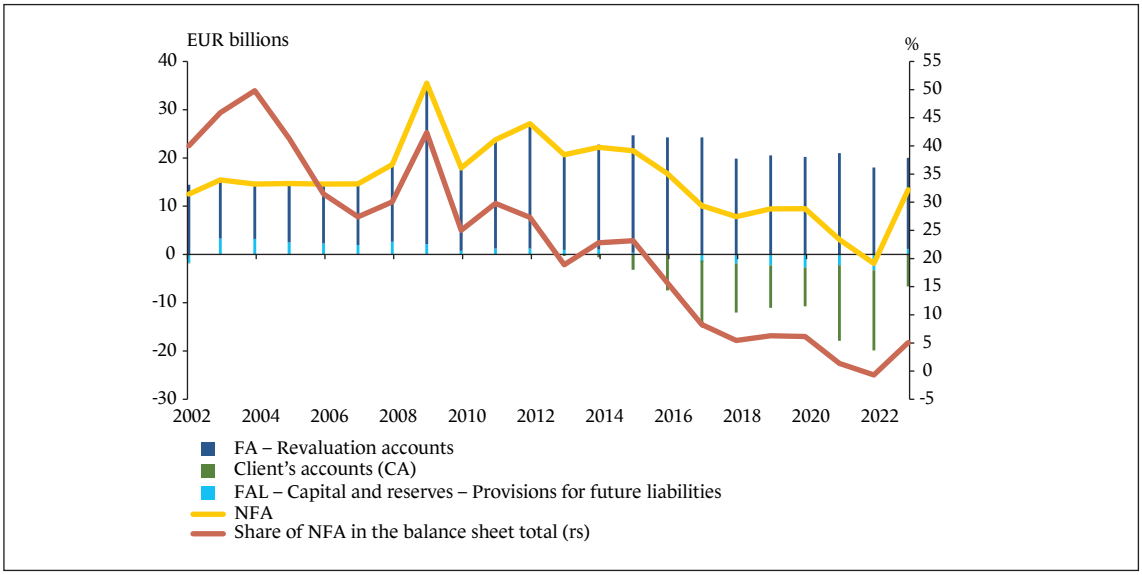
Source: own calculations based on central bank of Austria, Annual Reports, 2002–2022 (annual data; the latest observation from 31 December 2022).

Figure 25
Structure of financial assets which do not correspond with selected items of the liabilities of the central bank of Austria



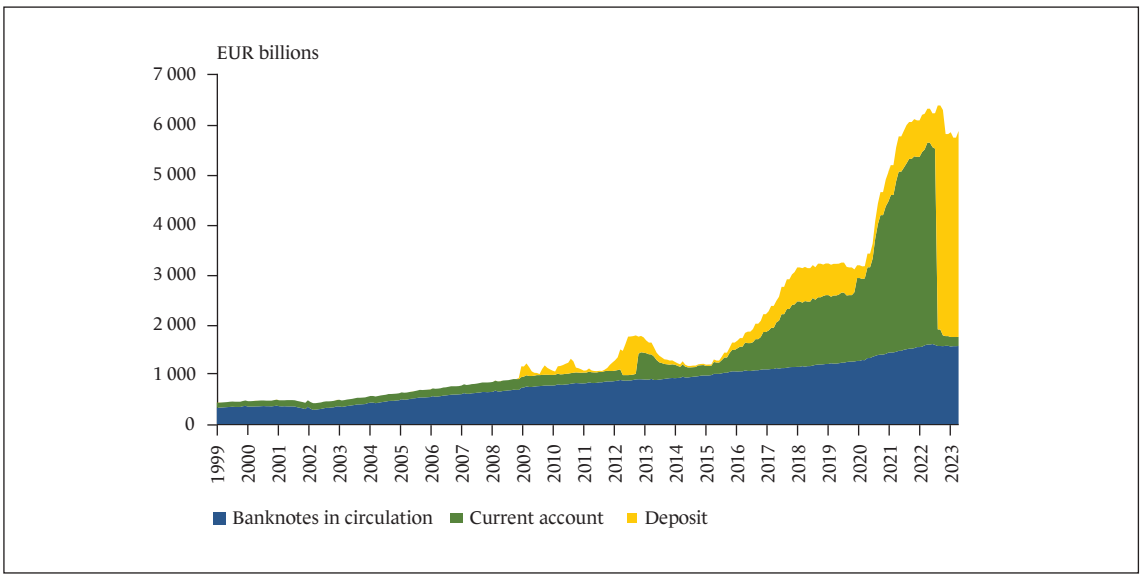
Source: own calculations based on central bank of Austria, Annual Reports, 2002–2022 (annual data; the latest observation from 31 December 2022).

Figure 26
Main components of the central bank of Austria's net financial assets



Source: own calculations based on central bank of Austria, Annual Reports, 2002–2022 (annual data); the latest observation from 31 December 2022.

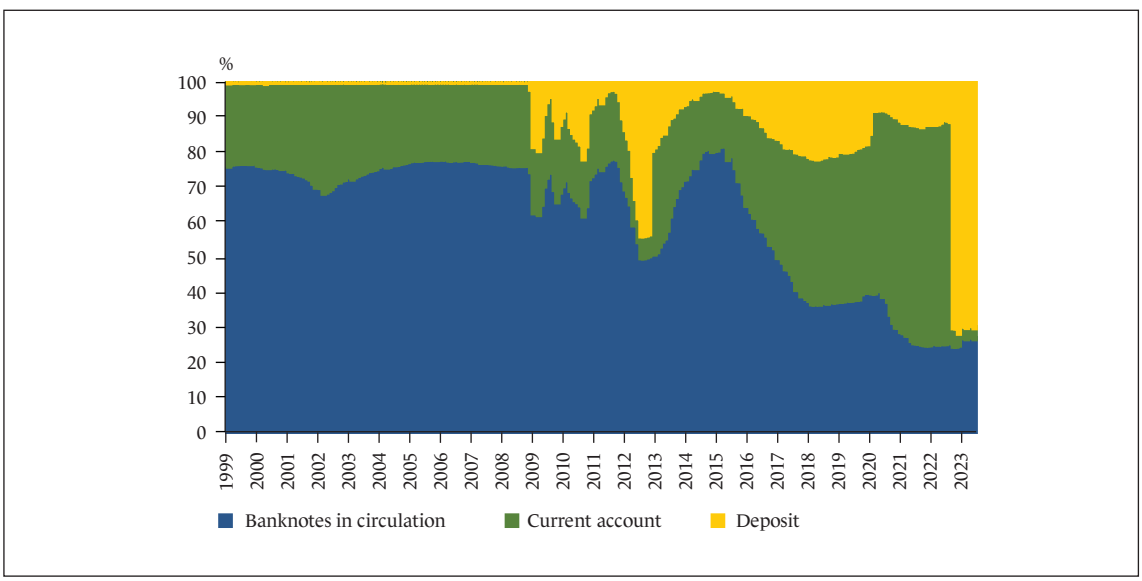
Figure 27
Monetary base in the Eurosystem, February 1999 – June 2023



Note:
Monetary base or "base money" is defined by the ECB in the following way: Currency (banknotes and coins) in circulation plus and any excess reserves they may voluntarily hold in the Eurosystem's deposit facility, all of which are liabilities on the Eurosystem's balance sheet. However, the notion currency in circulation is often alternately used as banknotes in circulation. Furthermore, banknotes in circulation often contain the minimum reserves credit institutions are required to hold with the Eurosystem – unless specified otherwise (as is the case with Figure 30).

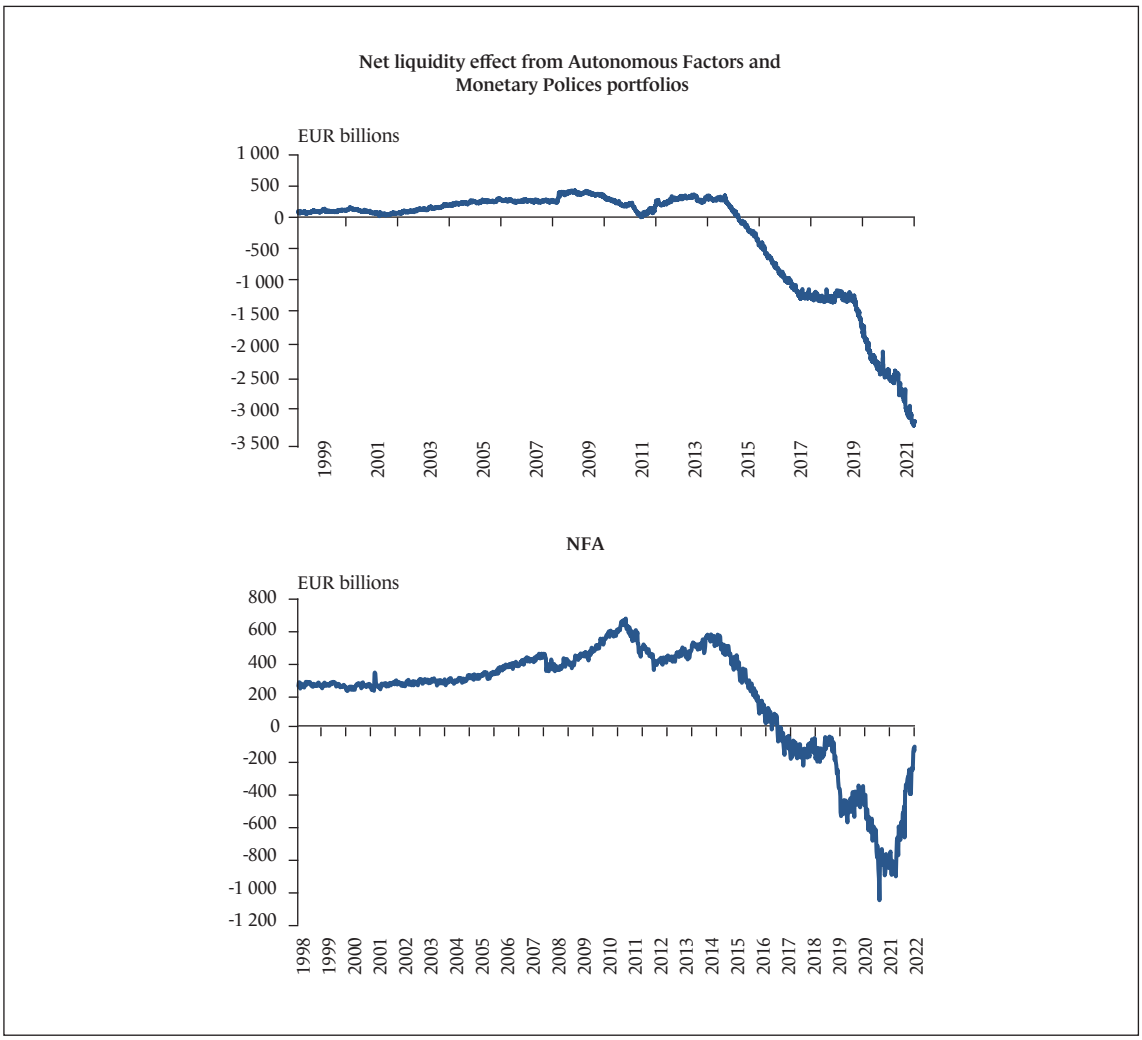
Source: ECB.

Figure 28
Monetary base (pecking order), February 1999 – June 2023



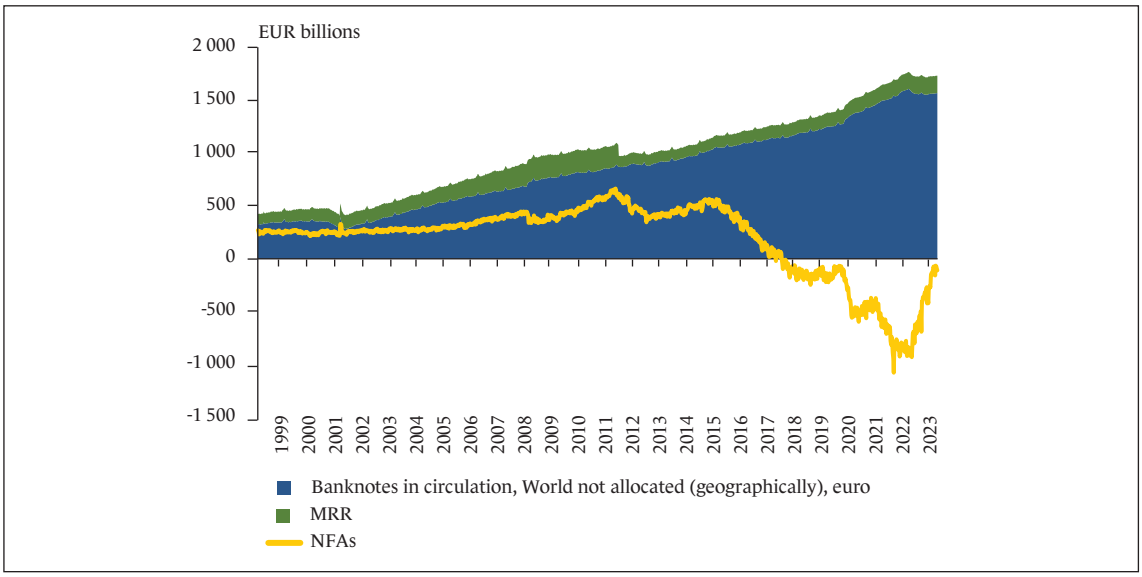
Source: ECB.

Figure 29
Net liquidity effect from Autonomous Factors and Monetary Policies portfolios and NFAs, 1999 – March 2023



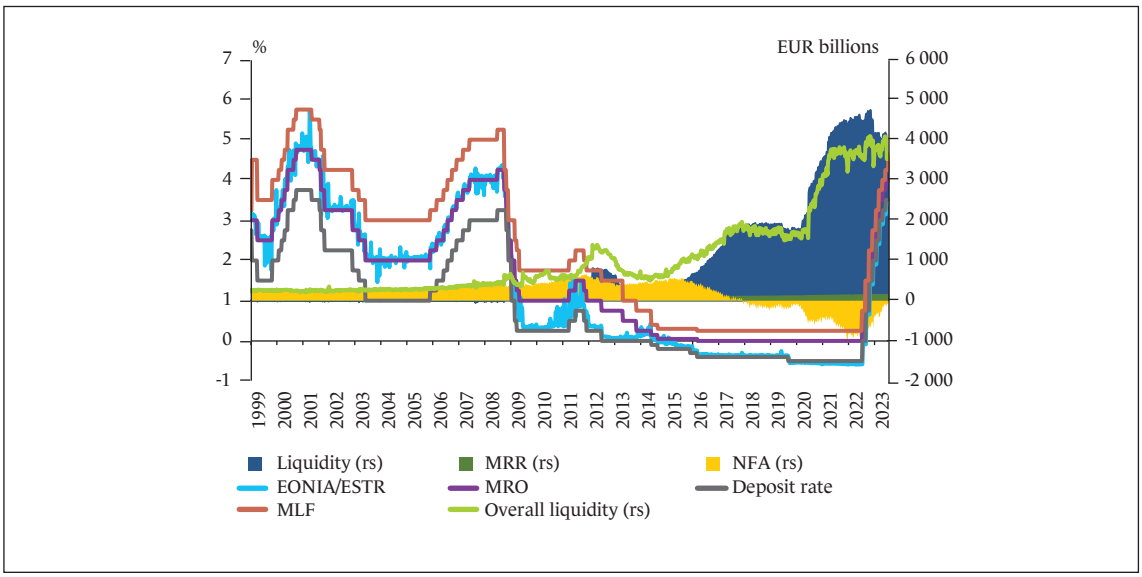
Source: ECB.

Figure 30
NFA and liquidity needs created by banknotes in circulation and minimum reserves, 1999 – July 2023



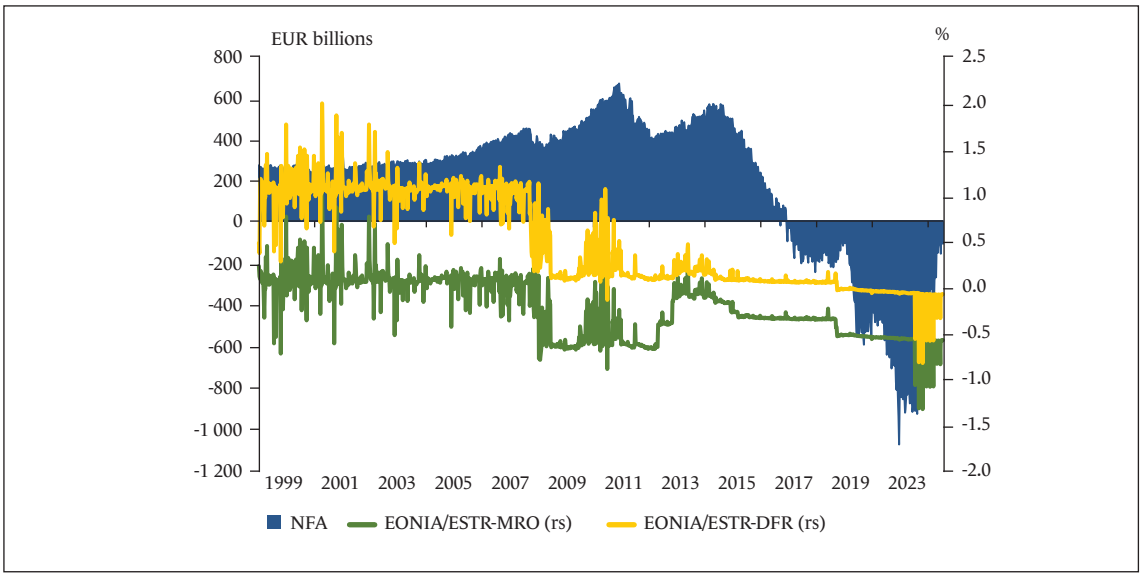
Source: ECB.

Figure 31
Overall excess liquidity, liquidity surplus, NFAs, EONIA/€STR and ECB interest rate corridor, 1999 – July 2023



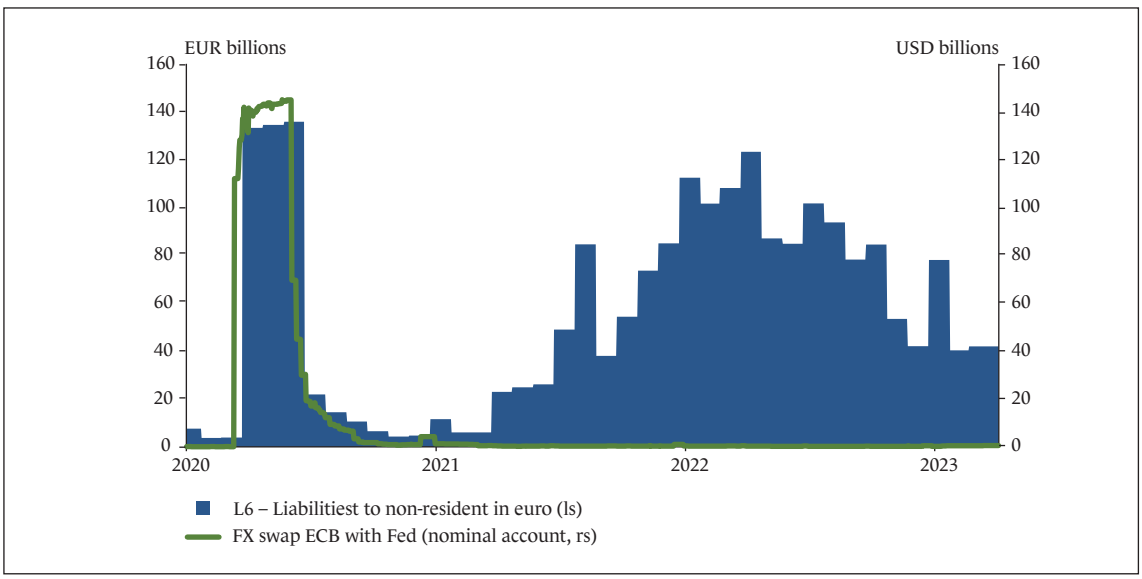
Source: ECB.

Figure 32
NFAs and the EONIA/€STR deviation from the MRO and DFR, 1999 – July 2023



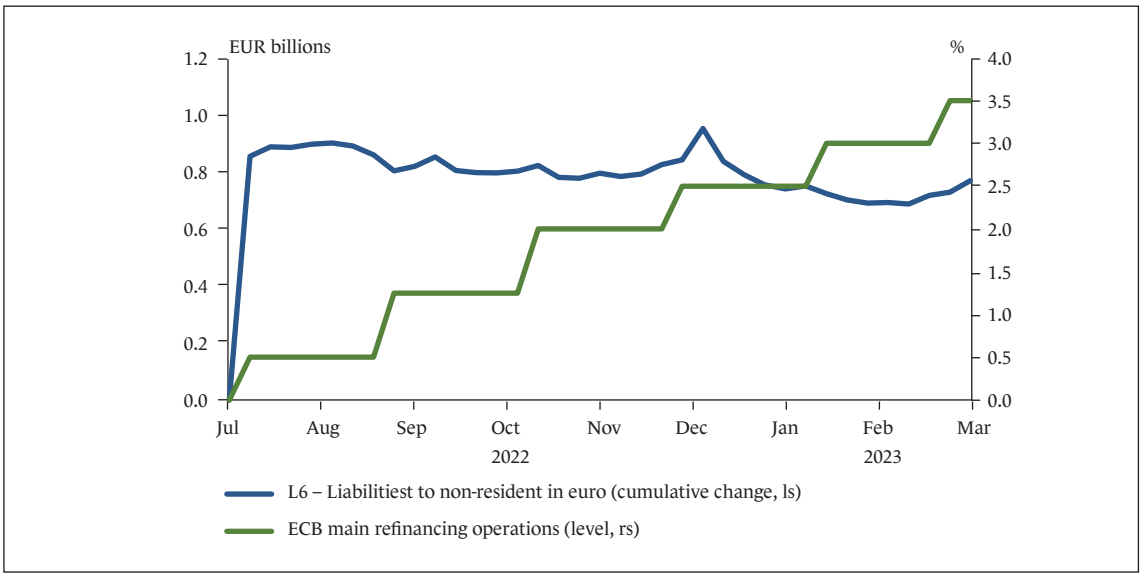
Source: ECB.

Figure 33
Liabilities of the ECB to non-residents in euro (L6) vs volume of FX Swaps between the ECB and the US Federal Reserve, 2020 – April 2023



Source: ECB and Fed (the last observation was on 12 April 2023).

Figure 34
Cumulative change of liabilities of Eurosystem to non-residents in euro (L6) vs ECB main refinancing operations (MRO), 2020 – March 2023



Source: ECB (the last observation was on 31 March 2023).

The monetary base of the euro area

Money issued by the ECB and national central banks of the euro area (the monetary base) may be analysed with the help of the consolidated balance sheet of the Eurosystem, both from the perspective of its components and the sources of its financing.

From the point of view of the components, the monetary base is made up of euro banknotes in circulation and the balances of commercial banks on the accounts held at the national central banks (current accounts, and deposit facilities). In short, from the point of view of its components, the monetary base of the euro area can be illustrated as in the formula below.

$$M0 = \text{cash} + \text{current account} + \text{deposit} \quad (1)$$

where:

M0 – monetary base;

cash – euro banknotes in circulation (item L.1 of the liabilities of the consolidated balance sheet of the Eurosystem);

current account – liabilities of national central banks arising from managing current accounts for commercial banks (item L.2.1 of the liabilities of the consolidated balance sheet of the Eurosystem);

deposit – liabilities of national central banks arising from the deposit facilities of commercial banks (item L.2.2 of the liabilities of the consolidated balance sheet of the Eurosystem).

From the point of view of sources of financing of the monetary base, it is possible to distinguish factors providing liquidity, as well as factors absorbing liquidity, as in the formula below.

$$M0 = \text{factors providing liquidity} - \text{factors absorbing liquidity} \quad (2)$$

Factors supplying liquidity for the monetary base are items of the assets of the consolidated balance sheet of the Eurosystem, among which assets denominated in foreign currency play a significant role.

$$\text{Factors providing liquidity} = \text{assets denominated in foreign currency} + \text{assets related to monetary policy} + \text{other assets} \quad (3)$$

where:

assets denominated in foreign currencies – gold, as well as claims on euro area residents and non-euro area residents denominated in foreign currency (sum of items A.1, A.2 and A.3 of the assets of the consolidated balance sheet of the Eurosystem);

assets related to monetary policy – claims on credit institutions related to monetary policy operations (sum of items A.5 and A.7.1 of the assets of the consolidated balance sheet of the Eurosystem);

other assets – other assets of the consolidated balance sheet of the Eurosystem (sum of the remaining items of the assets of the consolidated balance sheet of the Eurosystem).

In turn, factors absorbing liquidity for the monetary base are mainly liabilities related to monetary policy, liabilities related to the accounts of other clients denominated in euro, liabilities denominated in foreign currency, equity of the ECB and national central banks.

$$\text{Factors absorbing liquidity} = \text{liabilities related to monetary policy} + \text{accounts of other clients denominated in euro} + \text{liabilities denominated in foreign currency} + \text{equity of the central banks} \quad (4)$$

where:

liabilities related to monetary policy – term deposits of credit institutions (sum of items L.2.3 and L.4 of the liabilities of the consolidated balance sheet of the Eurosystem);

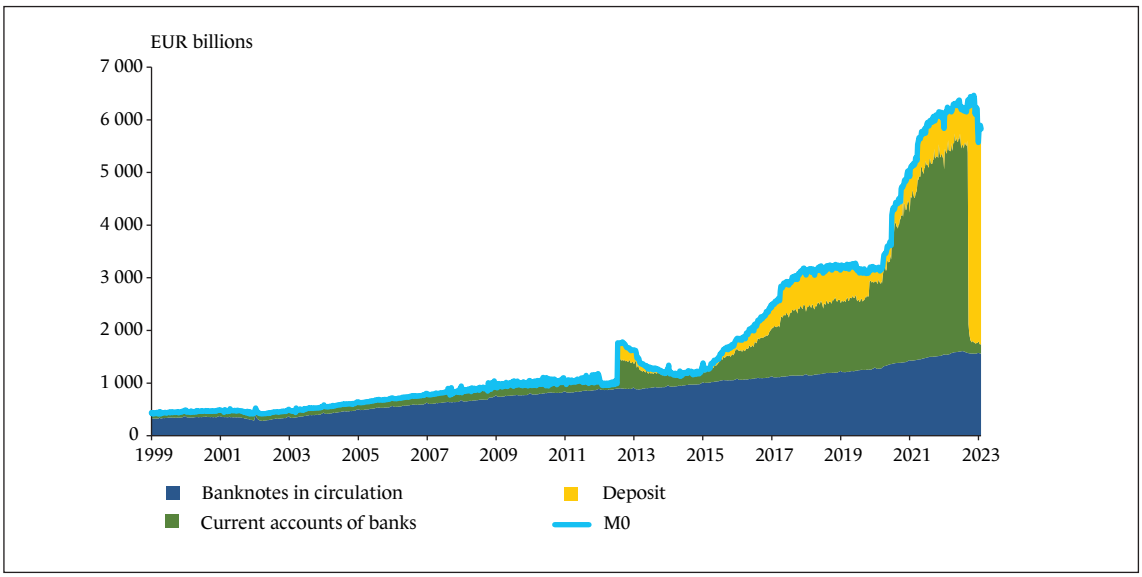
accounts of other clients denominated in euro – liabilities denominated in euro to clients other than credit institutions (sum of items L.5 and L.6 of the liabilities of the consolidated balance sheet of the Eurosystem);

liabilities denominated in foreign currency – liabilities to euro area residents and non-euro area residents denominated in foreign currency (sum of items L.7, L.8, and L.9 of the liabilities of the consolidated balance sheet of the Eurosystem);

equity of the central banks – capital and reserves, as well unrealised exchange rate and price gains (it can be assumed the sum of items L.10, L.11 and L.12 of the liabilities of the consolidated balance sheet of the Eurosystem).

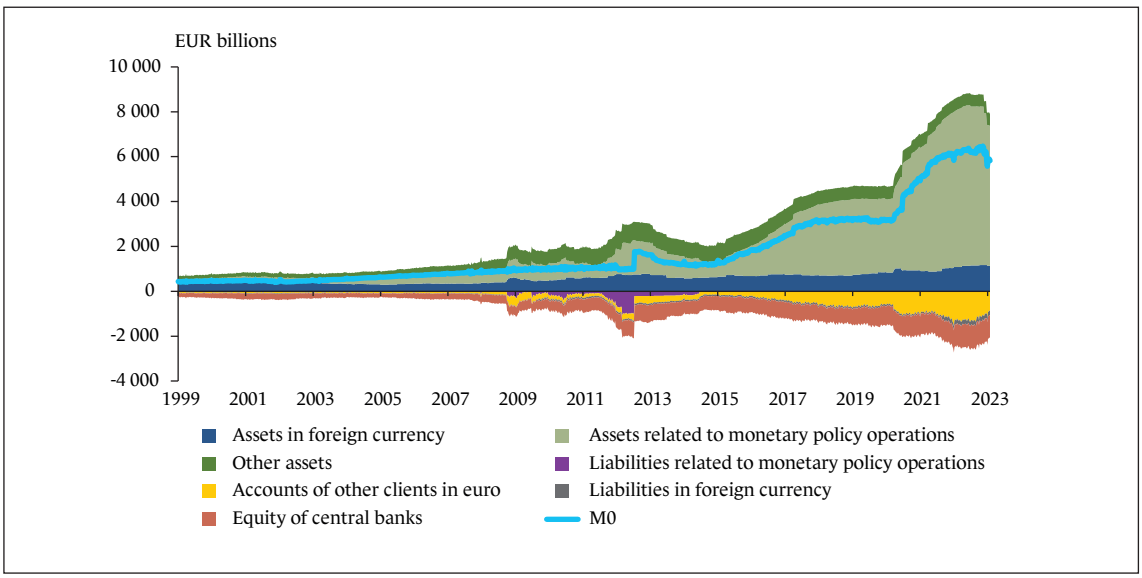
The development of the monetary base of the euro area is illustrated in the graphs below, both from the perspective of its components and also its sources.

Figure 35
Components of the monetary base of the euro area, 1999 – January 2023



Source: ECB (based on the weekly consolidated balance sheets of the Eurosystem; last data from 27 January 2023).

Figure 36
Sources of the creation of the euro area monetary base, 1999 – January 2023



Source: ECB (based on the weekly consolidated balance sheets of the Eurosystem; last data from 27 January 2023.

The ECB capital key

The Statute of the European System of Central Banks and of the European Central Bank provides that the national central banks of the European Union are entitled to subscribe to the ECB's capital (Art. 28). The capital of the ECB is subscribed according to the so-called capital key (Art. 29). Shares of national central banks in the ECB's capital correspond to the share of the individual Member States in the total population of the European Union (50% weighting) and in the total gross domestic product of the European Union countries (50% weighting). The shares of the national central banks may not be transferred, pledged or attached. The capital key is adjusted regularly every five years, as well whenever there is a change in the number of National Central Banks that contribute to the ECB's capital. The latest adjustment of the capital key took place on 1 February 2020 following the withdrawal of the United Kingdom from European Union.

The central banks of countries that belong to the euro area are obliged to pay in full the subscribed capital of the ECB, while the central banks that are outside the euro area are obliged only to cover the minimum percentage of subscribed capital of the ECB (3.75% of the share of the bank in question in the capital of the ECB), which is treated as a contribution to the operational costs of the ECB (the remaining 96.25% of shares is paid at the moment when the country in question joins the euro area).

The shares in the capital of the ECB that are fully paid up by the central banks of the euro area constitute the basis for establishing, among others, the following:

– shares in both the allocation of the profits and covering the losses of the ECB,
– shares in the so-called monetary income of the euro area,
– the size of the foreign exchange reserves transferred to the ECB,
– the size of liabilities arising from the issue of cash in circulation.

Table 3
The capital key and paid-up capital of the ECB as at 1 January 2023

National central bank	Capital key (%)	Paid-up capital (EUR)
Nationale Bank van België/ Banque Nationale de Belgique (Belgium)	2.9630	320,744,959.47
Deutsche Bundesbank (Germany)	21.4394	2,320,816,565.68
Eesti Pank (Estonia)	0.2291	24,800,091.20
Central Bank of Ireland (Ireland)	1.3772	149,081,997.36
Bank of Greece (Greece)	2.0117	217,766,667.22
Banco de España (Spain)	9.6981	1,049,820,010.62
Banque de France (France)	16.6108	1,798,120,274.32
Hrvatska narodna banka (Croatia)	0.6595	71,390,921.62
Banca d'Italia (Italy)	13.8165	1,495,637,101.77
Central Bank of Cyprus (Cyprus)	0.1750	18,943,762.37
Latvijas Banka (Latvia)	0.3169	34,304,447.40
Lietuvos bankas (Lithuania)	0.4707	50,953,308.28
Banque centrale du Luxembourg (Luxembourg)	0.2679	29,000,193.94
Central Bank of Malta (Malta)	0.0853	9,233,731.03
De Nederlandsche Bank (The Netherlands)	4.7662	515,941,486.95
Oesterreichische Nationalbank (Austria)	2.3804	257,678,468.28
Banco de Portugal (Portugal)	1.9035	206,054,009.57
Banka Slovenije (Slovenia)	0.3916	42,390,727.68
Národná banka Slovenska (Slovakia)	0.9314	100,824,115.85
Suomen Pankki – Finlands Bank (Finland)	1.4939	161,714,780.61
Total of national central banks of the euro area	**81.9881**	**8,875,217,621.22**

Table 3, cont'd

National central bank	Capital key (%)	Paid-up capital (EUR)
Българска народна банка (Bulgarian National Bank) (Bulgaria)	0.9832	3,991,180.11
Česká národní banka (Czech Republic)	1.8794	7,629,194.36
Danmarks Nationalbank (Denmark)	1.7591	7,140,851.23
Magyar Nemzeti Bank (Hungary)	1.5488	6,287,164.11
Narodowy Bank Polski (Poland)	6.0335	24,492,255.06
Banca Naţională a României (Romania)	2.8289	11,483,573.44
Sveriges Riksbank (Sweden)	2.9790	12,092,886.02
Total of national central banks outside the euro area	**18.0119**	**73,117,104.33**
Total of national central banks of the European System of Central Banks	**100.000**	**8,948,334,725.55**

Notes:
1. Since the start of Stage Three of Economic and Monetary Union on 1 January 1999, the capital key has changed eight times: a five-yearly update was made on 1 January 2004, on 1 January 2009, on 1 January 2014 and on 1 January 2019; additional changes were made on 1 May 2004 (when the Czech Republic, Estonia, Cyprus, Latvia, Lithuania, Hungary, Malta, Poland, Slovenia and Slovakia joined the EU), on 1 January 2007 (when Bulgaria and Romania joined the EU), on 1 July 2013 (when Croatia joined the EU) and on 1 February 2020 (following the withdrawal of the United Kingdom from the EU).
2. Hrvatska narodna banka (HNB) became a member of the Eurosystem following the entry of Croatia into the euro area on 1 January 2023. Therefore, on that date HNB paid up the remainder of its subscribed capital to the ECB.
3. The increased subscriptions from euro area NCBs as a result of the Bank of England's withdrawal from the European System of Central Banks (i.e. prior to the entry of Croatia into the euro area) were divided into two annual instalments (see ECB press release published on the ECB's website on 30 January 2020). The first of these two instalments was paid on 29 December 2021, and the last one on 28 December 2022.

Source: ECB (as at 10 April 2023).

Arithmetic of the Eurosystem balance sheet

Table 4
Allocation of individual balance sheet items to NFA (EUR millions)

			Monetary Policy (MP) / Net Financial Assets (NFA)	Components of NFA
Assets				
1	Gold and gold receivables		NFA	FA (Financial assets in foreign currency)
2	Claims on non-euro area residents denominated in foreign currency			
	2.1	Receivables from the IMF		
	2.2	Balances with banks and security investments, external loans and other external assets		
3	Claims on euro area residents denominated in foreign currency			
4	Claims on non-euro area residents denominated in euro			FA (Other financial assets)
	4.1	Balances with banks, security investments and loans		
	4.2	Claims arising from the credit facility under ERM II		
5	Lending to euro area credit institutions related to monetary policy operations denominated in euro			
	5.1	Main refinancing operations	MP	
	5.2	Longer-term refinancing operations		
	5.3	Fine-tuning reverse operations		
	5.4	Structural reverse operations		
	5.5	Marginal lending facility		
	5.6	Credits related to margin calls	NFA	FA (Other financial assets)
6	Other claims on euro area credit institutions denominated in euro			
7	Securities of euro area residents denominated in euro			
	7.1	Securities held for monetary policy purposes	MP	
	7.2	Other securities	NFA	FA (EU-denominated securities issued by residents)
8	General government debt denominated in euro			FA (Other financial assets)
9	Other assets			FAL
Total assets				

Table 4, cont'd

		Monetary Policy (MP)/ Net Financial Assets (NFA)	Components of NFA
Liabilities			
1	Banknotes in circulation	MP	
2	Liabilities to euro area credit institutions		
	2.1 Current accounts (covering the minimum reserve system)		
	2.2 Deposit facility		
	2.3 Fixed-term deposits		
	2.4 Fine-tuning reverse operations		
	2.5 Deposits related to margin calls	NFA	FA (Other financial assets)
3	Other liabilities to euro area credit institutions denominated in euro		
4	Debt certificates issued	MP	
5	Liabilities to other euro area residents denominated in euro	NFA	CA
	5.1 General government		
	5.2 Other liabilities		
6	Liabilities to non-euro area residents denominated in euro		
7	Liabilities to euro area residents denominated in foreign currency		FA (Financial assets in foreign currency)
8	Liabilities to non-euro area residents denominated in foreign currency		
	8.1 Deposits, balances and other liabilities		
	8.2 Liabilities arising from the credit facility under ERM II		
9	Counterpart of special drawing rights		
10	Other liabilities		FA (Other financial assets)
			E (Provisions for future liabilities)
11	Revaluation accounts		E (Revaluation accounts)
12	Capital and reserves		E (Capital and reserves)
Total liabilities			

Assets = Liabilities

Monetary Policy (MP) / Net Financial Assets (NFA)
Assets = Assets MP + Assets NFA
Liabilities = Liabilities MP + Liabilities NFA
Assets MP – Liabilities MP = Liabilities NFA – Assets NFA

Components of NFA
NFA = FA + FAL – CA – E
FA = Net financial assets in foreign currency + Euro denominated securities issued by residents (other than related to monetary policy operations) + Other net financial assets
E = Capital and reserves + Revaluation accounts + Provisions

Source: own calculations.

Znaczenie aktywów finansowych netto w strefie euro w świetle umowy ANFA

Streszczenie

Umowa dotycząca aktywów finansowych netto (Agreement on Net Financial Assets, ANFA) jest najprawdopodobniej jednym z najważniejszych (ale jak dotąd niezbyt szczegółowo omówionych) czynników regulujących funkcjonowanie europejskiej unii gospodarczej i walutowej (UGW). Umowa nie tylko przyznaje dużą autonomię krajowym bankom centralnym wchodzącym w skład Eurosystemu, lecz także reguluje, w jakim stopniu mogą one korzystać z tej autonomii przy okazji zarządzania wybranymi aktywami i pasywami znajdującymi się poza prerogatywą EBC, wpływając swoimi działaniami na płynność sektora bankowego. Wbrew obiegowej opinii rola tych banków centralnych jest istotna, co zostanie wykazane w niniejszym opracowaniu.

Trudno jest analizować umowę ANFA bez przedstawienia jej krótkiego rysu historycznego. Jeszcze na przełomie lat 2015 i 2016 niewiele było wiadomo zarówno na temat samej umowy, jak i tego, jak wpływa ona na zarządzanie płynnością w strefie euro. Jedynie sam fakt istnienia takiej umowy był powszechnie znany. Nieznajomość jej szczegółów dawała natomiast podstawy do (często nieprawdziwych) spekulacji na temat jej oddziaływania na funkcjonowanie Eurosystemu. Zwłaszcza wybuch ostatniej fazy greckiego kryzysu w 2015 r. (w ramach kryzysu zadłużeniowego, który dotknął strefę euro w pierwszej połowie drugiej dekady obecnego stulecia) zaczął potęgować pogłoski, że umowa mogła stać się instrumentem łagodzenia występujących wówczas napięć fiskalnych w strefie euro. Do takich właśnie konkluzji doszedł jeden z niemieckich doktorantów (Daniel Hoffman), który w swojej pracy dyplomowej usiłował dowieść prawdziwości hipotezy, że aktywa finansowe netto (będące przedmiotem tej umowy) generują impuls fiskalny dla całej strefy euro.

Tego rodzaju twierdzenia (podchwytywane przez eurosceptyczne środowiska niemieckie) zaczęły stanowić zagrożenie dla wiarygodności Europejskiego Banku Centralnego (EBC), tym bardziej że wspomniana praca dyplomowa wskazywała na Włochy jako największego beneficjenta omawianego tu impulsu fiskalnego. W czasie, kiedy prezesem EBC od listopada 2011 do listopada 2019 r. był Włoch Mario Draghi, tego rodzaju pogłoski jedynie potęgowały głosy krytyki pod adresem Eurosystemu ze strony niektórych niemieckich ośrodków akademickich.

Ta sytuacja spowodowała, że w lutym 2016 r. kierownictwo EBC ujawniło treść porozumienia ANFA. Było to jak najbardziej właściwe posunięcie, w efekcie którego wszystkie głosy wskazujące na możliwości generowania bodźca fiskalnego utraciły swoją merytoryczną argumentację. Dodatkowo opublikowanie postanowień umowy pozwoliło osobom analizującym politykę operacyjną Eurosystemu lepiej zrozumieć zakres autonomii, którą otrzymały krajowe banki centralne w chwili wejścia do Eurosystemu. Jak się okazało po opublikowaniu ANFA, *de facto* daje ona wszystkim krajowym bankom centralnym strefy euro znacznie większą swobodę w zarządzaniu płynnością sektora bankowego, niż w powszechnie sądzono. Rola tych banków centralnych na pewno nie uległa więc znaczącej marginalizacji.

Celem niniejszego artykułu jest przedstawienie, jakie znaczenie dla Eurosystemu mają aktywa finansowe netto (AFN) objęte analizowaną tutaj umową (ANFA). Dokonano tego z dwóch różnych perspektyw: gospodarki finansowej banków centralnych oraz zarządzania przez nie płynnością sektora bankowego. W analizie z perspektywy gospodarki finansowej banków centralnych skoncentrowano

się na postrzeganiu aktywów finansowych netto z punktu widzenia wolumenu i struktury bilansu wybranych krajowych banków centralnych wchodzących w skład Eurosystemu. Analiza polega na szczegółowym omówieniu wybranych części składowych tych sum bilansowych oraz ich znaczenia z punktu widzenia umowy ANFA. Jeśli chodzi o drugą perspektywę, analizie poddano powiązania pomiędzy aktywami finansowymi netto a zarządzaniem płynnością w Eurosystemie. W tym celu posłużono się analizą historyczną ukazującą specyfikę procesu zarządzania płynnością w strefie euro w ostatnim ćwierćwieczu. Wykazano i szczegółowo opisano również różnicę między aktywami finansowymi netto a czynnikami autonomicznymi (a zwłaszcza efektem płynnościowym netto generowanym przez te czynniki).

Wnioski płynące z niniejszego opracowania wskazują między innymi na to, że dzięki porozumieniu ANFA krajowe banki centralne cieszą się dużą autonomią w ramach Eurosystemu, a odwoływanie się do postanowień ANFA przyczynia się wręcz do zachowania integralności UGW. Dodatkowo, dzięki antycyklicznemu charakterowi opisywanych aktywów (wykazanemu w artykule) postanowienia ANFA ułatwiają EBC, a nie – jak sądzili jej krytycy – utrudniają, realizację zadań płynących z jego mandatu.

Słowa kluczowe: Europejski Bank Centralny, umowa dotycząca aktywów finansowych netto, zarządzanie płynnością