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The Banco de Portugal balance sheet expansion during the last two decades: a monetary policy perspective

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Abstract
This paper analyses the evolution dynamics of the Banco de Portugal balance sheet since the beginning of the Stage III of the EMU. Following the global financial crisis, the evolution of the Banco de Portugal balance sheet was initially driven by an increase in liabilities, namely in intra-Eurosystem liabilities related to TARGET and current accounts, reflecting the liquidity provided through monetary policy refinancing operations, which was either deposited in the central bank or transferred to euro area banks outside of Portugal. Since 2015, broader monetary policy decisions regarding the asset side of the balance sheet were designed to support economic growth and bring inflation back to the 2% target. Between 1999 and 2021, the Banco de Portugal balance sheet expansion was mostly driven by the asset purchase programmes and significant increases in central bank funding to banks and in intra-Eurosystem claims, the latter aggregate being explained by the inflow of banknotes related to the tourism activity in Portugal.

JEL: E41, E44, E51, E52, E58

Keywords: monetary policy, central bank balance sheet, quantitative easing.

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1. Introduction

The structure and evolution of a central bank balance sheet can be crucial to understand not only the policy goals of the central bank, but also its effectiveness in achieving them. In particular, while a point-in-time picture of the central bank balance sheet shows the current policy goals, a closer look on its evolution allows to understand the effectiveness in achieving them (Bindseil and Fotia 2021). Under a liquidity shortage environment, if a central bank has been successful in achieving its objective, one expects a stable growth of its balance sheet, as the increase in demand of central bank liabilities should be in line with the volume and value of economic transactions in the economy. Furthermore, a central bank balance sheet plays a key role in providing trust and supporting most forms of money in an economy (Rule *et al.* 2015).

The balance sheet dynamics is closely linked to the policy regime and institutional framework under which the central bank operates. Most central banks follow price stability objectives in their monetary policy strategy, which can either be an explicit inflation objective or a closely related monetary policy framework (Blinder 1998; Bindseil 2004).[1] To pursue its price stability objective, the central bank typically relies on an operational target, i.e. an economic variable that it controls closely through the use of its monetary policy instruments.[2] Under inflation targeting, the main policy tool is the short-term interest rate (Bindseil 2014). This case is commonly characterised by a shortage of liquidity and the central bank allows the exchange rate to float freely.

As the central bank achieves the price stability objective by adjusting its liabilities, a closer look to the central bank balance sheet size and composition is paramount to better understand the monetary policy implementation. For instance, the main liabilities of the central bank are banknotes and commercial bank reserves, which represent the ultimate means of settlement for all transactions in the economy (Rule *et al.* 2015). The level of commercial bank reserves is influenced by changes in the central bank balance sheet components that are exogenous to central banks. In this context, the central bank conducts monetary policy operations to guarantee a predetermined quantity of central bank reserves that is consistent with its operational target.

The central bank balance sheet size and composition are fundamentally determined by the macroeconomic environment and related monetary policy decisions. These

1. For instance, the ECB has an inflation objective, whereas the Federal Reserve has a dual mandate on both employment and inflation.

2. The operational target usually is a short-term interest rate. The monetary policy decision-makers of the central bank can periodically change the level of the operational target in each of its meetings, contributing to communicate the monetary policy stance to the public.

macroeconomic shocks, such as the monetary policy decisions, may be driven by the asset or the liability side of the central bank balance sheet.

In the case of an expansionary shock driven by the liabilities, the growth in the central bank balance sheet is triggered by the increase in demand for banknotes and central bank reserves, which *ceteris paribus* creates or enhances a liquidity shortage. This growth in the central bank balance sheet is commonly associated with an increase in nominal gross domestic product (GDP), as growing demand for central bank reserves fosters a credit supply increase by commercial banks. In order to meet higher demand for its liabilities while keeping short-term interest rates unchanged the central bank will need to increase the supply of reserves accordingly thereby also expanding the asset side of its balance sheet via monetary policy liquidity providing operations.

On the other hand, if the expansionary shock is driven by the assets, the growth in any of the main asset classes as a result of policy decisions exceeds the growth in demand for central bank liabilities thereby *ceteris paribus* enhancing or creating a liquidity surplus. Thus, the liabilities of the central bank can be either excess reserves or monetary policy operations to absorb such reserves. In order to steer short-term interest rates the central bank may either remunerate excess reserves or pay interest on liquidity absorbing monetary policy operations.

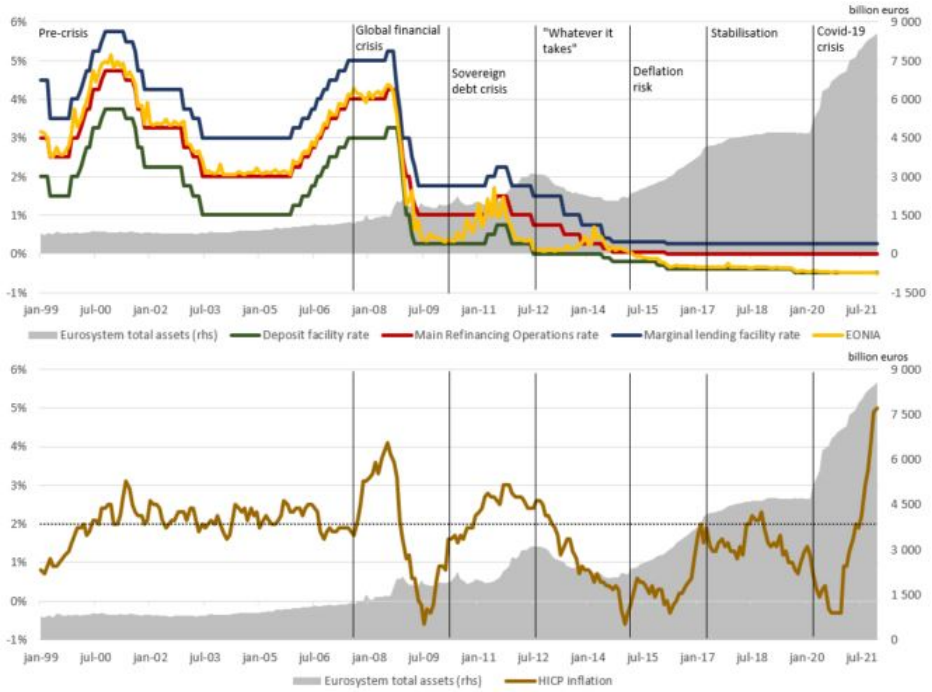
Since the global financial crisis (2007-2010)[3], cutting official interest rates alone proved to be not enough and the central banks' balance sheet, namely the Eurosystem balance sheet, begun to play a critical role for monetary policy, aiming at reaching its price stability objective: the return to an inflation rate close to 2% over the medium-term (Figure 1). The significant increase in the size of the major central banks' balance sheets, mostly due to the implementation of unconventional monetary policy measures, led to an increasing interest on the topic by monetary policy authorities and the academia. Quantitative easing (QE)[4] is the main unconventional monetary policy measure responsible for the very significant increase in the central banks' balance sheets since the global financial crisis. Empirical and theoretical research suggests that QE has contributed to a decrease in long-term interest rates, providing the required monetary stimulus (Bailey *et al.* 2020).

In the aftermath of the global financial crisis, macroeconomic effects of the balance sheet policies have been significant. For instance, the dynamics of real GDP and consumer prices indicates that the European Central Bank (ECB) unconventional

3. For the purpose of this paper, the global financial crisis runs from August 2007 to March 2010, a period that is slightly longer than in the literature (up to early 2009), since its effects were reflected in Banco de Portugal balance sheet until the end of the first quarter of 2010.

4. QE is a form of unconventional monetary policy in which a central bank purchases longer-term debt securities from the market in order to increase the money supply, lower interest rates and encourage lending, investment, consumption and, ultimately achieve the monetary policy goal.

balance sheet policies initially announced to counteract the effects of the financial crisis were effective in supporting the economy (Boeckx *et al.* 2014).



Source: ECB. Authors' calculations.

Figure 1: Evolution of the Eurosystem balance sheet, inflation, EONIA and ECB policy interest rates | 1999-2021

These unconventional monetary policy measures not only contributed to a significant increase in the central bank balance sheet, but also changed its composition, resulting in a mismatch between asset and liability maturities. While the asset side is mainly composed by sovereign bonds with longer maturities and long-term loans to credit institutions instead of short-term loans, the liability side, such as the excess reserves, continues to have a very short-term maturity. This mismatch between assets and liabilities ultimately impacts the level and volatility of central banks' profits. Furthermore, an 'exogenous' increase in the central bank balance sheet at the zero lower bound (ZLB) leads to a temporary increase in economic activity and consumer prices (Gambacorta *et al.* 2014). For the euro area, an exogenous expansionary balance sheet shock stimulates bank lending, reduces interest rate spreads, leads to a depreciation of the euro and has a positive impact on economic activity and inflation (Boeckx *et al.* 2014; Altavilla *et al.* 2022).

This paper analyses the dynamics of the Banco de Portugal balance sheet between the beginning of the Stage III of the EMU (1 January 1999) and 31 December 2021. We study the evolution of the main asset and liability balance sheet aggregates

to assess the main drivers of the very significant increase of the balance sheet during this period. We conclude that the purchase of securities for monetary policy purposes and the banks' recourse to central bank funding explain most of the expansion on the asset side. On the liability site, these transactions have been reflected in the TARGET balance. Banknotes and current accounts have also gained an increasing share in total liabilities of the central bank.

The remainder of the paper is organised as follows. Section 2 describes the main balance sheet components and their role as a monetary policy "tool" during the period under analysis, in particular during the global financial crisis. Section 3 introduces the data and the methodology we use to perform the analyses. Section 4 presents an overview of the Eurosystem and Banco de Portugal balance sheets during the last two decades and section 5 analyses the evolution of the Banco de Portugal balance sheet over seven subperiods. Section 6 concludes.

2. The balance sheet components and their role as a monetary policy "tool"

The use of the central bank balance sheet as a monetary policy "tool"[5] has been evolving over time from a relatively passive approach, with liquidity provision being determined by the central bank's forecast of credit institutions' aggregated demand, to a more active management of the size and composition of the balance sheet assets, through outright assets purchase programmes and large-scale longer-term refinancing operations.

In "normal" times[6], under a liquidity shortage environment originated by reserve requirements and autonomous liquidity factors[7], central bank's liquidity provision through monetary policy operations is determined by its estimate of credit institutions' aggregate demand, and the monetary policy target is usually pursued

5. The concept of "tool" when applied to the balance sheet is used for simplicity, since the balance sheet evolution is the result of the use of monetary policy instruments (i.e. open market operations, standing facilities, minimum reserve requirements, asset purchases and forward guidance), which are *de facto* the "tools".

6. Normal times are characterised by financial and economic stability and a liquidity shortage environment, as opposed to a crisis or a distress situation in markets (Bindseil, 2014).

7. Autonomous liquidity factors can be defined as the central bank balance sheet items, apart from monetary policy operations, that provide or absorb liquidity and thus affect the current accounts held by credit institutions with the central bank, which are used mostly to fulfil their minimum reserve requirements. Autonomous liquidity factors include liquidity providing factors, such as euro or foreign assets held for investment purposes, and liquidity-absorbing factors, such as banknotes and government deposits. Central banks have little or no control over these items. In the case of Banco de Portugal (as in the Eurosystem), the aggregated autonomous liquidity factors are a liability, i.e. they absorb liquidity. Thus, while the central bank contributes to the increase in excess liquidity through monetary policy operations, autonomous liquidity factors, in turn, they absorb part of that liquidity.

by setting an operational target for a short-term interest rate. The central bank steers short-term money market rates by signalling its monetary policy stance through its decisions on key interest rates[8] and by managing the liquidity situation in the money market.

A simplified balance sheet as depicted below summarises the main asset and liability components (Figure 2).

Assets	Liabilities
Autonomous liquidity factors (providing)	**Autonomous liquidity factors (absorbing)**
Euro and net foreign currency assets	Banknotes in circulation Government deposits Other autonomous factors (net)
	Current account holdings (incl. min. reserves)
Monetary policy instruments	**Monetary policy instruments**
Liquidity providing operations (short and longer-term) Overnight liquidity providing facility	Overnight liquidity absorbing facility Liquidity absorbing operations
Outright asset purchase programmes (e.g. sovereign bonds, covered bonds)	
Other assets not-related to monetary policy	**Other liabilities not-related to monetary policy**

Source: Banco de Portugal.

Figure 2: Simplified central bank balance sheet

The central bank is the single supplier of the monetary base, consisting of currency in circulation (banknotes and coins), reserves held by credit institutions with the central bank and recourse to the deposit facility, which is represented by liability items in the central bank balance sheet. Reserves held by credit institutions with the central bank can be broken down into required and excess reserves and are known as current account holdings. In the euro area, credit institutions are required to hold a minimum amount of reserves. These reserves create a liquidity shortage in the banking system that incentivises monetary policy counterparties to participate in monetary policy operations, which allows the central bank to steer money market interest rates more effectively by adjusting the supply of reserves accordingly. All reserves above the minimum required amount are considered excess reserves and

8. For the euro area, the Governing Council of the ECB sets 3 key interest rates:
   (a) the interest rate on the main refinancing operations (MRO);
   (b) the rate on the deposit facility, which banks may use to make overnight deposits with the Eurosystem;
   (c) the rate on the marginal lending facility, which offers overnight credit to banks from the Eurosystem.

credit institutions can hold them either in their current accounts or, in the case of monetary policy counterparties, in the overnight deposit facility.

To discourage credit institutions from hoarding reserves with the central bank, the amount in excess of the minimum reserves required is usually remunerated at a penalising rate (in the case of the euro area, the minimum rate between the deposit facility rate and zero interest rate), while the amount held in the deposit facility would benefit from a better interest rate (e.g. the deposit facility rate, usually a positive rate in "normal" times). Typically, credit institutions tend to hold small amounts of excess liquidity in their current accounts, except in situations of severe financial market tensions where credit institutions tend to accumulate reserves for precautionary reasons.

On the asset side of the balance sheet, the central bank registers the liquidity providing items, namely the liquidity providing autonomous factors, such as assets in foreign currency, as well as liquidity providing monetary policy operations. As mentioned before, due to its monopoly supplier role of monetary base, the central bank is able to control the money market liquidity situation and steer money market short-term interest rates by providing the necessary liquidity that allows credit institutions to fulfil their liquidity needs at a price in line with the monetary policy stance as reflected in the central bank's key interest rates.

Liquidity providing operations represent the key monetary policy instrument of the central bank (for the Eurosystem, main refinancing operations (MRO) used to be the core operations of the monetary policy framework). These operations typically have a short maturity (one week for MRO) and therefore are conducted regularly thereby allowing to respond to fluctuations in liquidity conditions. Additionally, in order to provide a more stable funding conditions to credit institutions, the central bank also conducts liquidity providing operations with longer maturities (the Eurosystem provides longer-term refinancing operations (LTRO), conducted monthly with 3-month maturity). These monetary policy operations represent a claim on credit institutions and therefore are an asset of the central bank (European Central Bank 2011).

Finally, to steer short-term interest rates in the money market and restrict their volatility, the central bank may also offer overnight facilities, as in the case of the Eurosystem, which offers the deposit facility and the marginal lending facility, both with an overnight maturity.[9] Therefore, since the composition and size of the central bank balance sheet in "normal" times results from the provision of reserves required to fulfil the liquidity needs from the banking system, the information provided by the central bank balance sheet about the monetary policy stance is limited, as it only

9. The central bank monetary policy framework comprises other operations, like fine-tuning operations and structural operations, which were not mentioned in this context. Outright purchases, a type of structural operation, and other LTRO will be introduced later in this section.

reflects the institutional characteristics of the central bank liquidity management (European Central Bank 2015).

When liquidity shortages and market impairments, resulting from high liquidity and credit risk premia, jeopardise the transmission of the intended monetary policy stance, and nominal interest rates are close to their effective lower bound (ELB)[10], central banks are encouraged to move away from their traditional operational frameworks to make active use of their balance sheets as a monetary policy "tool" (Constâncio 2017; Bailey *et al.* 2020).

Since the global financial crisis, central banks started to implement monetary policy operations to provide "funding reassurance" to credit institutions, i.e. credit easing measures to enable or improve the transmission of the monetary policy stance in the presence of market impairments. Moreover, central banks started to undertake large-scale purchases of securities to provide additional monetary policy accommodation at times when short-term nominal interest rates were at their ELB (European Central Bank 2015). During this period, central banks tended to provide liquidity in "excess" of the regular needs arising from autonomous liquidity factors and from reserve requirements. The rationale behind was to stabilise the banking system and to prevent an increase in short-term interest rates above levels consistent with the monetary policy stance. At the same time, by providing long-term liquidity, the central bank aimed to influence market conditions for term funding, stabilizing bank funding costs and credit spreads (Bindseil 2014; Bindseil and Fotia 2021).

As a consequence, the provision of long-term liquidity, either through longer-term refinancing operations[11] or asset purchases, implied a significant increase on the asset side of the central bank balance sheet, which in the Eurosystem was reflected in a correspondent increase in the credit institutions' current account holdings. While the recourse to the longer-term refinancing operations is counterparty driven, as monetary policy counterparties decide the amount they borrow from the central bank (subject to individual limits if applicable and collateral availability), asset purchases are central bank driven, as the Eurosystem decides the amount injected in the economy through asset purchases.[12] This increase may occur due to either

10. The ELB is the rate below which it becomes profitable for financial institutions to hold cash, even given the cash storage costs, instead of central bank reserves. Unconventional monetary policy measures are considered a substitute for standard interest rate policy, once the latter is no longer available because the ELB constraint is binding (De Fiore and Tristani 2019).

11. Since 2014, the Eurosystem conducted three series of targeted longer-term refinancing operations (TLTRO) with maturities between two and four years, on top of its longer-term refinancing operations (LTRO) with maturities between 1 month and 3 years.

12. Nevertheless, over the years, the ECB was able to influence the counterparty demand for central bank liquidity through specific monetary policy decisions, namely the implementation of the FRFA, changes in collateral eligibility criteria, TLTRO financing conditions, as well as the two-tier system for remunerating excess reserve holdings.

precautionary reasons, market fragmentation, the resulting difficulty to distribute central bank funds across credit institutions and reluctance to enter impaired markets in times of overall high risk aversion. Under such circumstances, the central bank has to intervene directly in the market, therefore independently of banks liquidity demand, in order to improve the market functioning of specific market segments deemed key for the financing of the real economy (sovereign bonds, ABS, corporate bonds, etc.). Large-scale asset purchases are thought to affect financial market prices through the reallocation of investors' portfolios, resulting in spillovers that may also affect prices in market segments not addressed by the central bank interventions, and through signalling the future path of the policy rate (forward guidance[13]).

In this view, the central bank increases its balance sheet via both securities purchased under outright asset purchase programmes (i.e. structural operations), taking particular attention to the composition of the assets, and longer-term liquidity driven by banks liquidity demand with a view to influencing market spreads and term funding conditions that may be impairing monetary policy transmission.

The policy reaction to the implications of the global financial crisis marked the transition of the central bank balance sheet from a reactive, or passive approach, to an active, or managed control of its size and composition. While in the first case the balance sheet dynamics were based on demand for liquidity provision and therefore focused on steering money market short-term interest rates, in the second case the central bank intended to address impairments in the transmission of monetary policy and provide policy accommodation when short-term nominal interest rates are at their ELB by directly intervening in a number of financial market segments (e.g. sovereign debt, corporate debt, ABS) and by providing long-term central bank funding.

3. Data and methodology

In order to perform our analysis we use ECB and Banco de Portugal balance sheet and monetary policy data. Furthermore, we study the main drivers of the Banco de Portugal balance sheet, splitting the whole period into seven subperiods according to the evolution path of the Banco de Portugal balance sheet, as follows:

1. The pre-crisis period (from January 1999 to July 2007);
2. The global financial crisis period (from August 2007 to March 2010);
3. The sovereign debt crisis period (from April 2010 to July 2012);

13. Forward guidance refers to the central bank´s communication about the state of the economy and likely future course of monetary policy stance/measures.

4. The "whatever it takes" period (from August 2012 to February 2015);
5. The deflation risk period (from March 2015 to March 2017);
6. The stabilisation period (from April 2017 to February 2020); and
7. The Covid-19 crisis period (from March 2020 to December 2021).

Furthermore, we analyse the balance sheet items in eleven main aggregates, following a monetary policy perspective. On the asset side, we present gold, monetary policy refinancing operations, monetary policy portfolios, intra-Eurosystem claims and other assets not-related to monetary policy. On the liability side, we present banknotes, current accounts, liquidity absorbing monetary policy operations, government deposits, intra-Eurosystem liabilities related to TARGET and other liabilities not-related to monetary policy.

Assets	Liabilities
Gold	Banknotes
	Current accounts
Monetary policy refinancing operations	
	Liquidity-absorbing monetary policy operations
Monetary policy portfolios	
	Government deposits
Intra-Eurosystem claims	Intra-Eurosystem liabilities related to TARGET
Other assets not-related to monetary policy	Other liabilities not-related to monetary policy

Figure 3: Balance sheet aggregates

Monetary policy refinancing operations include the total amount allotted in the MRO, the LTRO, the targeted longer-term refinancing operations (TLTRO), the marginal lending facility (MLF) and the fine-tuning operations (FTO). Monetary policy portfolios include securities market programme (SMP), the two covered bond purchase programmes (CBPP1 and CBPP2), the APP, which includes the third covered bond purchase programme (CBPP3) and the public sector purchase programme (PSPP)[14] and the pandemic emergency purchase programme (PEPP).

Other assets non-related to monetary policy include claims on euro area and non-euro area residents denominated in euro and foreign currency, such as euro and foreign currency assets held for investment purposes, and other residual items.

14. The APP includes two further programmes, the Asset-Backed Securities Purchase Programme (ABSPP) and the Corporate Sector Purchase Programme (CSPP), although purchases are conducted by national central banks other than Banco de Portugal and therefore not registered in its balance sheet.

Intra-Eurosystem claims include several items, namely the participating interest in the ECB, claims equivalent to the transfer of foreign reserves, claims related to the issuance of ECB debt certificates, claims related to TARGET balances and claims related to other operational requirements within the Eurosystem. In the case of Banco de Portugal, intra-Eurosystem claims registered on the balance sheet include the participating interest in the ECB, claims on the ECB in respect of initial and additional transfers of foreign reserves and claims related to the Capital Share Mechanism (CSM).

Banknotes are defined as the banknotes a national central bank (NCB) puts into circulation minus the banknotes returned to that NCB, adjusted by the application of the banknote allocation key[15], which is, by definition, a liability in the central bank balance sheet. As banknotes circulate among the euro area countries, they can be returned to a different NCB from which they have been issued. Thus, banknotes in circulation are offset by the creation of intra-Eurosystem balances, in order to ensure that each NCB presents the total value of euro banknotes according to the banknote allocation key on its balance sheet. Thus, the CSM corresponds to the difference between the amount of banknotes allocated by the banknote allocation key and the amount of banknotes that such NCB puts into circulation, net of the value of banknotes the NCB takes out of circulation, which represents a Eurosystem claim or liability that is recorded under these balance sheet items. In the case of Banco de Portugal, this difference is registered as a claim and represents around 98% of the total intra-Eurosystem claims. Moreover, the allocated share is higher than the unadjusted share, mostly due to tourism cash inflows from non-residents, as the amount of banknotes returned to Banco de Portugal is much higher than the amount of banknotes Banco de Portugal puts into circulation. Thus, the amount of banknotes presented on the liability side is adjusted by the Banco de Portugal capital key and grows at the same growth rate as total banknotes in the Eurosystem.

Current accounts are deposits held by credit institutions with Banco de Portugal, including minimum reserve requirements and excess reserves. Liquidity absorbing monetary policy operations comprehends the amount in the deposit facility, margin calls and fine-tuning operations[16], as well as, in the period between 1999 and 2004, the outstanding amount of the liquidity-absorbing instruments issued by Banco de Portugal prior to the euro. Government deposits are deposits held by the Portuguese Treasury and Debt Management Agency (IGCP), as well as the deposits held by other central government entities, such as the Portuguese deposit guarantee fund and the Portuguese resolution fund. Intra-Eurosystem liabilities related to

15. The amount of banknotes in the euro area is allocated to each NCB according to the banknote allocation key, which is calculated taking into account the ECB's share in the total euro banknote issue and applying the capital key (shares in the ECB's equity) to the NCBs' share in such total.

16. Fine-tuning operations are available to be executed by the ECB on an ad-hoc basis, in order to manage the liquidity situation in the market and to steer interest rates.

TARGET, in the case of Banco de Portugal, are intra-Eurosystem liabilities registered on the balance sheet and only includes the TARGET balance. The Banco de Portugal TARGET balance represents a liability vis-a-vis the ECB that results from private net cross-border payments. For instance, when a Portuguese bank receives liquidity from the monetary policy refinancing operations or from the asset purchase programmes, if this bank sends the money to other country (e.g. Germany), using the TARGET2 system, this transaction represents an increase in Banco de Portugal's TARGET liabilities vis-à-vis the ECB and an increase in the Bundesbank's TARGET claims vis-à-vis the ECB.[17] The remaining items related to the transfer of foreign reserves, the issuance of ECB debt certificates and other operational requirements within the Eurosystem are all null. Other liabilities non-related to monetary policy consist of liabilities to euro area and non-euro area residents denominated in euro and foreign currency, as other residual items.

4. An overview of Banco de Portugal and Eurosystem balance sheets

4.1. Eurosystem balance sheet

As a consequence of the non-standard measures adopted in response to the severe financial market tensions, the composition of the Eurosystem balance sheet[18] has changed and its size has increased. Prior to the global financial crisis, total assets/liabilities amounted to around 1.2 trillion euros (around 13% of the euro area GDP), whereas this amount reached 8 trillion euros at the end of December 2021 (around 65% of the euro area GDP) (Banco de Portugal 2022).

Before the United States subprime crisis and the subsequent bankruptcy of Lehman Brothers in September 2008, banks were able to finance themselves domestically or abroad at similar conditions across the euro area, as the monetary union contributed to the integration in financial markets and the interbank cross-border market (Cour-Thimann 2013). Thus, the Eurosystem's assets and liabilities non-related to monetary policy were the major items.

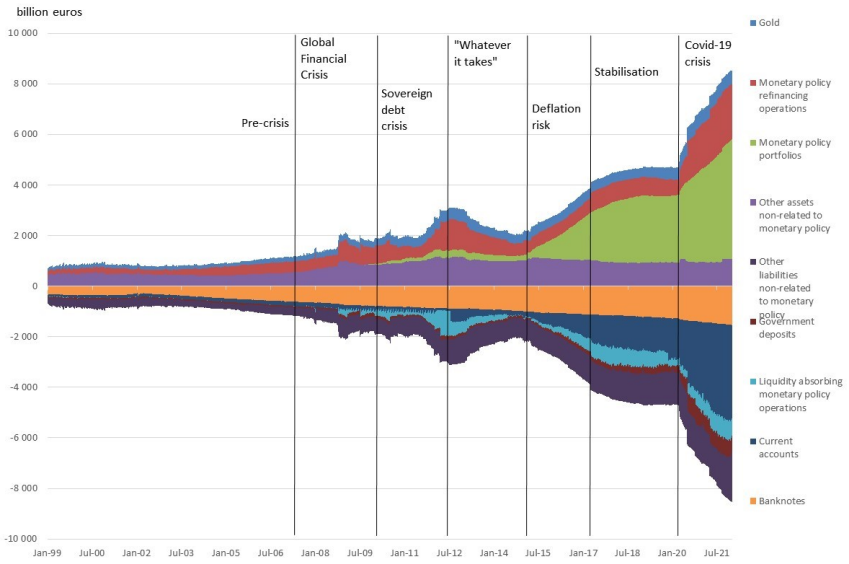
Following the onset of the global financial crisis, confidence between banks decreased significantly, resulting in an increase in the perceived credit risk. Therefore, cross-border outflows could no longer be compensated by inflows and

17. For more details about the Banco de Portugal TARGET balance, see Soares *et al.* (2020).

18. Note that the balance sheet referred to here is that of the consolidated balance sheet of the Eurosystem. The decentralised structure of the Eurosystem means that monetary policy operations are conducted by both the ECB and the participating NCB. The consolidated balance sheet comprises assets and liabilities of the euro area NCB and the ECB held at year-end vis-à-vis third parties. Claims and liabilities between Eurosystem central banks (intra-Eurosystem claims and liabilities) cancel each other out and are therefore not shown.

monetary policy refinancing operations started to prevail on the asset side. From October 2014 onwards, when the ECB launched its first outright purchases under the APP, monetary policy portfolios have gained increased importance, accounting for around 40% of total assets in the Eurosystem balance sheet as of end-2021.

On the liability side, the counterpart of these assets is mainly the monetary base in the form of current accounts held by commercial banks. Banknotes remained a significant component of liabilities, but with a declining relative share (18% at the end of December 2021, compared with around 50% at the beginning of the euro). Other items on the liability side include fine-tuning operations that were conducted in the past to absorb the liquidity stemming from purchases under the SMP and the funds that banks place in the Eurosystem's overnight deposit facility (see Figure 4).



Source: ECB. Authors' calculations. Assets are represented above the x-axis while liabilities are represented below the axis.

Figure 4: Evolution of the Eurosystem balance sheet | 1999-2021

4.2. Banco de Portugal balance sheet

The evolution of the Banco de Portugal balance sheet mimics the path observed at the Eurosystem level, since the onset of a single monetary policy across the countries that constitute the euro area. However, there are some idiosyncrasies worth noting, mostly explained by the market fragmentation occurred over the period.

Prior to the global financial crisis, Banco de Portugal total assets amounted to around 34 billion euros (around 19% of the Portuguese GDP). By the end of December 2021, total assets reached more than 200 billion euros, roughly the same as the Portuguese GDP.[19]

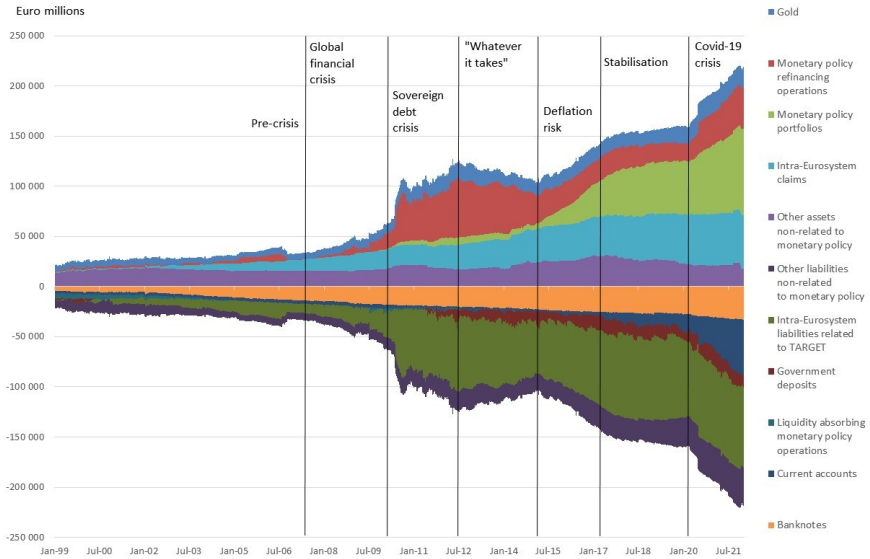
The Banco de Portugal balance sheet has been increasing significantly over the years, although this increase was not always driven by the same balance sheet aggregates. On the asset side, monetary policy refinancing operations, monetary policy portfolios and intra-Eurosystem claims were the main aggregates contributing to the increase of the balance sheet. Monetary policy refinancing operations increased since the beginning of the period under review, although this increase was stronger during the crises periods (sovereign debt crisis and Covid-19 pandemic), as the ECB resorted to longer-term refinancing operations (both targeted and not-targeted) to provide liquidity to the banking system and, ultimately, to the real economy. Monetary policy portfolios, on the other side, started to appear in the balance sheet only after the global financial crisis, with the introduction of various asset purchase programmes (i.e. the CBPP1 and the SMP). However, the increasing path in the monetary policy portfolios was mainly due to the PSPP, which started in March 2015 and, since the onset of the Covid-19 pandemic, to both the PSPP and the PEPP.

The corresponding increase on the liability side of the balance sheet was mainly explained by the increase in TARGET liability, as banks transferred a significant amount of funds from the monetary policy liquidity providing operations abroad. The increase in liabilities is also explained by the increase in government deposits since mid-2011, in part reflecting the inflows from the 3-year Portugal's financial assistance programme from the EU and the IMF between 2011 and mid-2014 and the Treasury's policy of hoarding a significant cash buffer for precautionary reasons.[20] Current accounts also increased during the period under analysis, motivated by the amounts of liquidity injected via asset purchase programmes, TLTRO and, especially, after the introduction of the two-tier system[21] in October 2019. Banknotes grew at a relatively constant rate, as well as the liabilities non-related to monetary policy (see Figure 5).

19. (Banco de Portugal 2022).

20. See Strauch *et al.* (2016).

21. The two-tier system exempts part of credit institutions' excess reserve holdings (i.e. reserve holdings in excess of minimum reserve requirements) from the negative remuneration applicable on the deposit facility in this period.



Source: Banco de Portugal. Authors' calculations. Assets are represented above the x-axis while liabilities are represented below the axis.

Figure 5: Evolution of the Banco de Portugal balance sheet | 1999-2021

5. The evolution of Banco de Portugal balance sheet

5.1. Pre-crisis period (2000-2007)

Before the global financial crisis, the size of Banco de Portugal balance sheet remained very limited.

The pre-crisis period covers the period between the beginning of stage III of the EMU until the end of July 2007, just before the first signs of the global financial crisis started to materialise (see Figure 6).[22]

The first years following the introduction of the euro were characterised by a continued economic expansion with inflation at levels slightly above 2%. Before the financial crisis (i.e. during 1999-2007), real GDP in the euro area grew by 2.5% per year on average.[23] Inflation expectations were stable, despite some upward pressure on prices, monetary policy followed a corridor system with a structural liquidity deficit and the policy rate was the MRO interest rate. During this period, the size of the Eurosystem balance sheet was relatively small (around 1 trillion, in

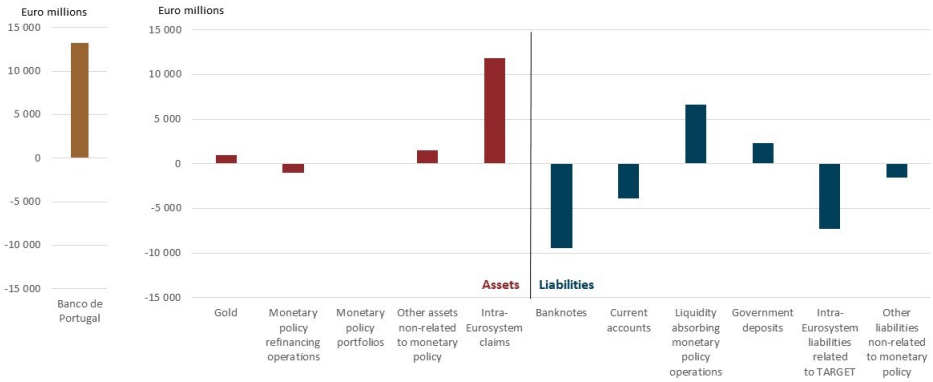
22. We consider the first major sign to be the decision of BNP Paribas to suspend three of its money market funds on 9 August 2007, as problems in the U.S. subprime mortgage sector were preventing the institution from calculating their value.

23. Source: Eurostat.

line with the Federal Reserve and Bank of Japan balance sheets' size), and so was the balance sheet of Banco de Portugal (below 50 billion euros), which increased by around 13 billion euros throughout this 7-year period.

On the asset side, the major increase was observed in the intra-Eurosystem claims (by 11.8 billion euros), related to tourism cash inflows.[24] In addition, other assets non-related to monetary policy increased by 1.5 billion euros, while monetary policy refinancing operations decreased by 1 billion euros.

On the liability side, banknotes increased by almost 10 billion euros, as a reflection of the increase in global circulation at the Eurosystem level (Banco de Portugal 2008). Also, the TARGET balance increased by around 7.3 billion euros, due to net cross-border payments, representing a liability vis-a-vis the ECB. On the other hand, liquidity absorbing monetary policy operations decreased by 6.7 billion euros and government deposits decreased by 2.3 billion euros. The reduction in liquidity absorbing monetary policy operations reflects the reimbursement of pre-euro liquidity-absorbing instruments, implemented before the adoption of the euro in a context of excess liquidity, created by several factors, such as the monetary financing of government deficits in the 1970s.[25]



Source: Banco de Portugal. Authors' calculations. The chart presents the evolution of each balance sheet aggregate. Aggregates in red are accounted on the asset side of the balance sheet and aggregates in blue represent the liability side of the balance sheet. Asset aggregates above the x-axis represent an increase on the asset side of the balance sheet and liability aggregates below the x-axis correspond to an increase on the liability side of the balance sheet.

Figure 6: Change in balance sheet aggregates during the pre-crisis period | 1999-2007

24. Banknotes received from tourism are deposited in Banco de Portugal and therefore contribute to an increase in current accounts on the liability side, which raised by almost 4 billion euros during this period.

25. For more details, please see Abreu (2005) and Amaral (2022).

5.2. Global Financial Crisis period (2007-2010)

The composition of Banco de Portugal balance sheet changed and its size increased substantially as a consequence of the non-standard measures adopted by the Eurosystem in response to the global financial crisis.

The global financial crisis period covers the period between the beginning of August 2007 and the end of the first quarter of 2010. In this period, the Banco de Portugal balance sheet almost doubled.

Following the United States subprime mortgage crisis in 2007, euro area banks started to face uncertainty regarding the creditworthiness of their counterparties in the interbank market. Transaction volumes dropped, particularly in the unsecured money market segment with longer-term maturities. Unsecured rates and repo rates secured by stressed sovereign collateral jumped to higher levels. This resulted in a shortage of liquidity and a collapse of activity in many financial market segments.

To accommodate banks' increased demand for liquidity, the ECB decided to implement a fixed interest rate with full allotment (FRFA)[26] procedure after the collapse of Lehman Brothers, in September 2008, in both MRO and LTRO tenders. From October 2008 onwards, banks had unlimited access to liquidity from the ECB at a pre-specified interest rate set by the ECB, as long as they could provide eligible collateral. The ECB also made adjustments to the collateral requirements and risk control framework for its liquidity providing operations.[27] At the same time, the ECB lowered substantially its key interest rates. The MRO rate was cut by a total of 350 basis points to 1 per cent between October 2008 and May 2009.

The ECB has also stimulated liquidity demand from the banking sector by extending the maximum maturity of the LTRO. Whereas in the pre-crisis period, the ECB only offered operations with a maturity up to three months, the maximum maturity was extended to six months in March 2008 and then to 12 months in June 2009.

These conditions raised banks' demand for liquidity, which implied a significant expansion of the Banco de Portugal balance sheet. Central bank refinancing operations increased by 15.2 billion euros, mostly concentrated in 12-month LTRO. On the liability side, this was linked to the increase of TARGET liability by 19.1 billion euros, as cross-border capital outflows to more resilient countries prevailed in this period.

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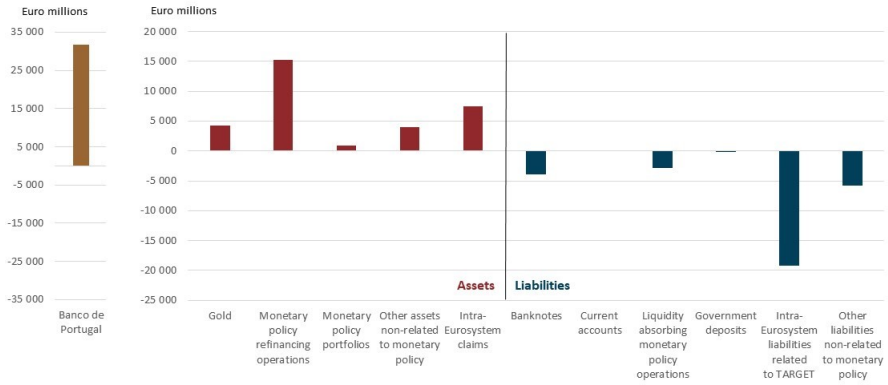
26. The FRFA procedure has remained in place since the global financial crisis for all liquidity providing operations, although it has been suspended temporarily for LTRO in the spring of 2010.

27. The list of eligible collateral accepted in the refinancing operations was first extended in October 2008, allowing banks to refinance themselves mobilizing less liquid assets.

As a result, in the period between the end of 2007 and mid-2009, the Banco de Portugal balance sheet increased by 31.7 billion euros, representing an expansion of almost 40% (see Figure 7).



Source: Banco de Portugal. Authors' calculations.

Figure 7: Change in balance sheet aggregates during the global financial crisis period | 2007-2010

5.3. Sovereign debt crisis period (2010-2012)

Long-term refinancing operations and bonds purchased by the Eurosystem lengthen Banco de Portugal balance sheet during the sovereign debt crisis.

The sovereign debt crisis is considered to have hit Portugal in the second quarter of 2010. Therefore, the range defined for this period goes from the second quarter of 2010 until the end of July 2012. During this period, the Banco de Portugal balance sheet more than quadrupled compared with the beginning of the global financial crisis period.

After having increased interest rates in April[28] and July 2011, to 1.25% and to 1.5% respectively, amid accelerating inflation concerns, in November and December 2011, the ECB Governing Council cut interest rates, again in two steps of 25 basis points. These rate cuts were deemed necessary in view of the worsened economic forecasts which indicated an increased recession risk.

As a reaction to the ongoing credit crisis in the euro area, the ECB launched a first round of 3-year LTRO in December 2011 and a second round in March 2012 to provide liquidity to its counterparties and alleviate pressure on the refinancing rates of some peripheral euro area governments.

28. The first rate hike in April 2011 came just after Portugal's financial assistance request from the EU and the IMF.

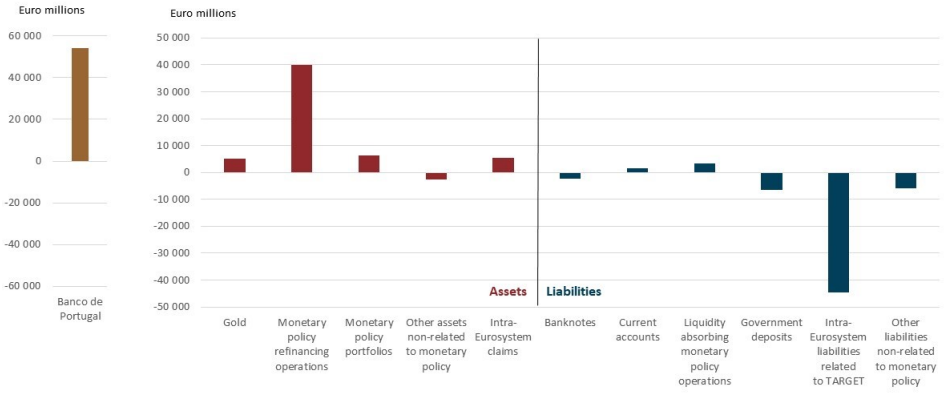
At the same time, to support the new refinancing operations the Governing Council, in its December 2011 meeting, also decided, among other measures, to extend again the list of eligible collateral and to reduce the required reserves ratio from two to one per cent.

Against this background, monetary policy refinancing operations increased by 40 billion euros, reaching its highest level in Portugal during this period (61 billion euros), with the LTRO accounting for almost 90% of total refinancing.

The ECB also made use of outright asset purchases during the crisis, which influenced the size of the Portuguese central bank balance sheet. Concretely, the ECB conducted CBPP1 and CBPP2 between June 2009 and October 2012, as the covered bond market had virtually dried up in terms of liquidity and issuance. The aim of the programmes was to revive the covered bond market, which is a very important financial market in Europe and a primary source of funding for banks. Covered bonds held by Banco de Portugal reached 1.5 billion euros by mid-2012.

In addition, between May 2010 and the summer of 2012, the ECB intervened, with the SMP, in the secondary markets of some euro area government bonds in order to ensure depth and liquidity and "restore an appropriate monetary policy transmission mechanism". After a first wave of interventions, the programme was re-activated in August 2011, in response to renewed tensions. The SMP was terminated with the introduction of the Outright Monetary Transactions (OMT) programme in August 2012. The existing securities in the SMP portfolio were to be held to maturity. The Banco de Portugal's SMP holdings of government bonds amounted to 5.7 billion euros by mid-2012.

During this period, the IGCP received funds from the EU and the IMF, in the context of the economic adjustment programme implemented in Portugal (from May 2011 until July 2012 Portugal received EU and the IMF funds in the amount of almost 56.5 billion euros). Since then, the Treasury maintained a significant cash buffer deposited at Banco de Portugal, which implied an increase in Government deposits by almost 6.5 billion euros during this period. Furthermore, Portuguese banks resorted to Eurosystem refinancing operations and used the Eurosystem funding to repay their foreign borrowings, which, associated with the outright purchases programmes, resulted in an increase in Banco de Portugal's TARGET liability by almost 45 billion euros (see Figure 8).



Source: Banco de Portugal. Authors' calculations.

Figure 8: Change in balance sheet aggregates during the sovereign debt crisis period | 2010-2012

5.4. "Whatever it takes" period (2012-2015)

Repayments and maturities of longer-term operations actually lead to a reduction of the Banco de Portugal balance sheet, while the Eurosystem reaffirmed its commitments to intervene in financial markets by launching the OMT.

The "whatever it takes" period ranges from the beginning of August 2012 to the end of February 2015, i.e. before the start of the PSPP. The beginning of the period is marked by the ECB President Mario Draghi's speech, delivered at the Global Investment Conference in London, stating the ECB's readiness to do whatever it takes within its mandate to preserve the euro. A week later, the ECB announced that OMT could be undertaken, with the aim of safeguarding an appropriate monetary policy transmission and the singleness of the monetary policy.[29] These events have substantially contributed to restore financial confidence and reduce tensions in financial markets (Brunnermeier *et al.* 2016). During the period under review, the euro area observed an economic recession in 2012, followed by a 2-year period of weak economic recovery, with increasing fears of deflation, which led the ECB to reinforce its accommodative monetary policy stance between mid-2014 and early 2015, namely by introducing new asset purchase programmes and TLTRO.

29. A necessary condition for OMT is strict and effective conditionality attached to an appropriate European Financial Stability Facility/European Stability Mechanism (EFSF/ESM) programme. Transactions were intended to focus on the shorter end of the yield curve, and in particular on sovereign bonds with a maturity of between one and three years. Importantly, no *ex-ante* quantitative limits were set on the size of OMTs and these transactions were to be fully sterilised.

During this period, the evolution of Banco de Portugal balance sheet was marked by a significant decrease in monetary policy refinancing operations, as their total amount outstanding halved, from 56 billion euros in August 2012 to 28 billion euros in February 2015, reflecting a gradual deleveraging process experienced by the Portuguese banking system.[30] This reduction was determined by partial reimbursements made by banks and the expiry of the two 3-year LTRO that were conducted in late 2011 and early 2012. This reduction was only partially compensated by an increase in the amount of TLTRO at the time when these new operations initiated, in September 2014, and during the course of 2015, when an increased participation by banks was observed.

On the other hand, monetary policy portfolios remained relatively stable. Despite the ECB decision to introduce OMT, in August 2012, these purchases were never activated[31] and therefore did not have any balance sheet effect. The small reduction observed in this aggregate during this period mainly reflected the maturity of securities held under the CBPP (terminated in June 2010), SMP and CBPP2 (terminated in September and October 2012, respectively). This reduction was only slightly compensated by the introduction of the CBPP3 in the last quarter of 2014.[32]

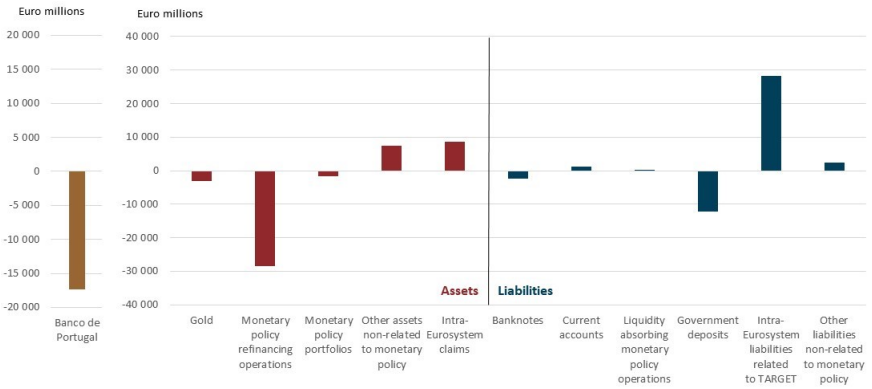
Government deposits increased 12 billion euros during this period, albeit this mainly reflects a high intra-annual volatile pattern, mostly related with the Treasury's financing programme.

On the liability side, the TARGET liability declined by 28.3 billion euros, mainly reflecting the decrease in refinancing operations, mostly due to the early repayments of the 3-year LTRO as of January 2013, as well as the increase in government deposits, as previously described (see Figure 9).

30. The Financial and Economic Assistance Programme for Portugal required the strengthening of financial institutions' solvency ratios. Banks had to comply with core Tier I capital ratios of at least 9 per cent until December 2011 and of at least 10 per cent by 31 December 2012.

31. The sole announcement of the programme had a significant impact on euro area sovereign bond yields and no country deemed necessary to activate this programme.

32. The ABSPP was also introduced in the same period, but purchases conducted under this programme are not the direct responsibility of Banco de Portugal and therefore are not reflected in its balance sheet.



Source: Banco de Portugal. Authors' calculations.

Figure 9: Change in balance sheet aggregates during the "whatever it takes" period | 2012-2015

5.5. Deflation risk period (2015-2017)

Previous commitments to act turn into decisive action to face the deflation risk, with the introduction of the public sector purchase programme (PSPP), which resulted in a further expansion of the Banco de Portugal balance sheet.

The deflation risk period can be defined as spanning from March 2015 until the end of March 2017. This period was characterized by an environment of subdued economic growth, weak money and credit creation, low inflation (the annual HICP in the euro area decreased from 2.7% in 2011 to 0.4% in 2014) and an increased probability of deflation. Against this background, the ECB announced the PSPP in the beginning of 2015, adding the purchase of sovereign bonds to the existing private sector asset purchase programmes (ABSPP and CBPP3). A year later, to counter a deterioration in economic and financial conditions, uncertain global prospects and geopolitical risks, the ECB announced further monetary policy stimulus, including an expansion of monthly net purchases under the APP, from 60 billion euros to 80 billion euros, and the introduction of a new private sector asset purchase programme, the CSPP.

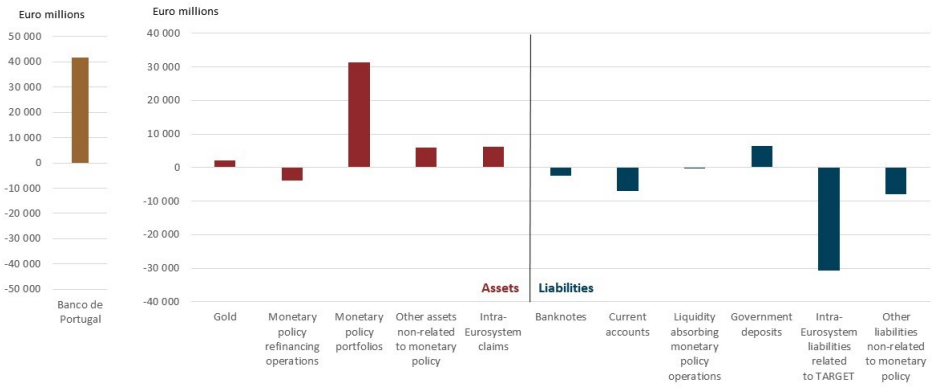
In this context, the balance sheet of Banco de Portugal increased by 42 billion euros, driven by monetary policy portfolios, which expanded substantially, from 5.4 billion euros in March 2015, to 36.8 billion euros in the end of March 2017.

Also, between 2015 and 2016, fixed rate tender procedures with full allotment were prolonged, interest rates on the deposit facility and on the MRO were reduced and a second series of TLTRO was launched (TLTRO II). However, during this period, the impact of these measures is not visible in the evolution of balance sheet aggregates, namely on monetary policy refinancing operations. In fact, this asset

aggregate reduced by 3.8 billion euros in this period, reflecting a strong decrease in outstanding MRO, which was only partially compensated by an increase of banks' exposure to longer-term refinancing operations.

On the asset side, other assets non-related to monetary policy increased by around 6 billion euros, mostly explained by the increase in the foreign currency portfolio. The expansion of assets in foreign currency is associated with collateralised loan operations that were performed during this period, without the associated exchange rate risk, which temporarily impact the currency composition.

On the liability side, the TARGET liability increased by an amount similar to the monetary policy portfolios (30.8 billion euros). These developments mainly reflect the fact that APP purchases are typically performed with foreign counterparties (see Figure 10).



Source: Banco de Portugal. Authors' calculations.

Figure 10: Change in balance sheet aggregates during the deflation risk period | 2015-2017

5.6. Stabilisation period (2017-2020)

The economic recovery started in 2017 contributed to a relative stabilisation of Banco de Portugal balance sheet.

The stabilisation period ranges from the second quarter of 2017 to the start of the Covid-19 pandemic, in March 2020. In 2017, the economic recovery that had started in 2013 resulted in a solid and broad-based economic expansion. Against this background of a gradual strengthening of the economic activity in the euro area but still persistent subdued levels of underlying inflation, the ECB preserved a substantial degree of monetary accommodation and decided to extend the APP for a longer period with gradual reductions in monthly net purchases and the conclusion of net purchases at the end of 2018.

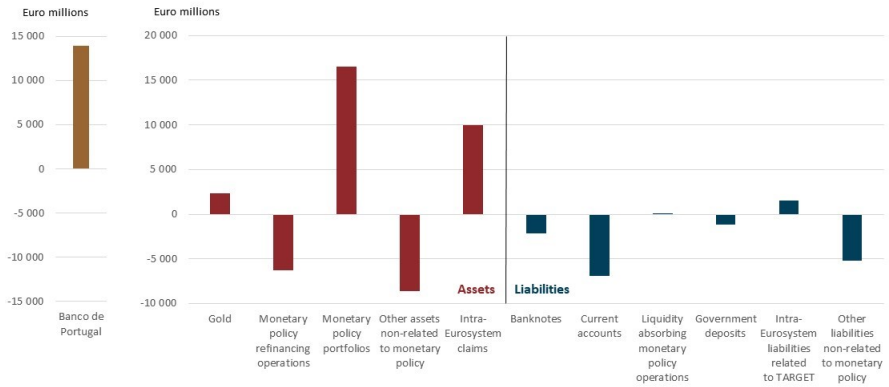
The Governing Council ensured that APP reinvestments would be maintained for an extended period after the date on which the ECB would start raising official interest rates. The ECB intended to maintain a broad accommodative monetary policy, in any case, as long as necessary to maintain favourable financing conditions. Furthermore, throughout 2018, the ECB raised the expectation of a gradual increase in policy rates from the summer of 2019 onwards, always with a commitment to maintain a broadly accommodative monetary policy.

In 2019, the euro area faced a moderation in the pace of the economic expansion in an environment of reduced inflation and lower inflation expectations over the long-term. At an international level, 2019 was also marked by uncertainty due to a weakening of trade and industrial activity, a slowdown in advanced economies and idiosyncrasies of some emerging market economies.

During this period, the balance sheet of Banco de Portugal increased by around 14 billion euros. On the asset side, monetary policy portfolios increased by around 16.5 billion euros, due to the restart of the APP purchases in November 2019, while monetary policy refinancing operations decreased by 6.2 billion euros, explained by the early repayments of the TLTRO II occurred since June 2018. Furthermore, intra-Eurosystem claims increased by almost 10 billion euros, due to the large tourism inflow that Portugal faced during this period, which contributed to a significant inflow of banknotes from abroad. However, other assets non-related to monetary policy decreased by 8.7 billion euros, mostly due to the reduction in the foreign currency portfolio of Banco de Portugal. This reduction was mostly explained by the maturity of the collateralised loan operations that were performed during the deflation risk period.

On the liability side, the main counterparts were the banknotes (2.1 billion euros), other liabilities non-related to monetary policy (5.2 billion euros) and current accounts (6.9 billion euros). The significant increase in intra-Eurosystem claims due to the inflow of banknotes from tourism is reflected in the increase of banks' current accounts in the Banco de Portugal balance sheet. Moreover, in addition to the effects from APP liquidity injections, the increase in current accounts may also be explained by the announcement of the two-tier system in September 2019, to exempt part of the excess reserves from the DFR negative remuneration.[33] The two-tier system aimed at mitigating the adverse effects of a prolonged negative interest rate period (NIRP), as the Governing Council also announced the reduction in the DFR from -0.4% to -0.5%. In order to take full advantage of the two-tier system and therefore fulfil the exempted allowance, equal to six times the minimum reserve requirement, Portuguese banks adopted several strategies, such as intra-group transfers, asset sales and cross-border money market transactions, especially in the repo market (see Figure 11).

33. At the euro area level, we observe a substitution from the deposit facility to current account holdings during this period, as the two-tier system only applies to funds on the current accounts.



Source: Banco de Portugal. Authors' calculations.

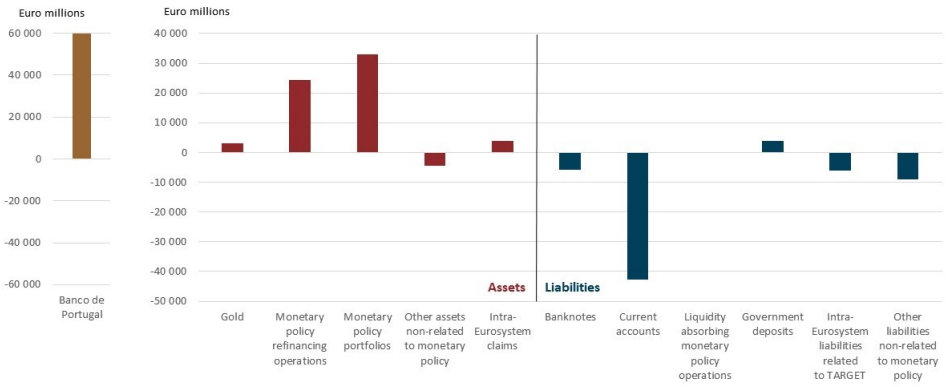
Figure 11: Change in balance sheet aggregates during the stabilisation period | 2017-2020

5.7. Covid-19 crisis period (2020-2021)

Monetary policy measures implemented to face the Covid-19 crisis, namely the TLTRO III and PEPP, contributed to a very significant increase of Banco de Portugal balance sheet.

The last period, the Covid-19 crisis period, ranges between 1 March 2020 and 31 December 2021. Since March 2020, as a result of the Covid-19 pandemic, economic activity in the euro area decreased severely and the euro area experienced the worst recession ever recorded. In order to limit the economic impact of the pandemic, ensure the normal functioning of financial markets and promote accommodative monetary and financial conditions, the Governing Council introduced in March and April 2020 a new package of unconventional monetary policy measures. During this period, the balance sheet of Banco de Portugal increased by around 60 billion euros. On the asset side, the major increase was observed in monetary policy portfolios, which increased by almost 33 billion euros with the introduction of PEPP and the increase in APP net purchases. Furthermore, monetary policy refinancing operations increased by around 24 billion euros, due to the launch of pandemic emergency longer-term refinancing operations (PELTRO) and especially to the recalibration of the TLTRO III, accompanied by an easing of the collateral framework for Eurosystem credit operations, namely an increase in the Eurosystem's risk tolerance level. While the PELTRO aimed to ensure enough liquidity during the pandemic, the recalibration of the TLTRO III provided a higher borrowing allowance at a very favourable interest rate and the collateral framework easing ensured banks had enough collateral to participate in the refinancing operations. On the liability side, current accounts increased by around 43 billion euros, albeit the liquidity injected through the monetary policy operations amounted to around 57 billion euros. Thus, the remaining liquidity injected by the ECB was transferred to banks

outside of Portugal, contributing to an increase in the TARGET liability. However, other inflows, such as the funds received from the recovery plan adopted by the European Union or the purchases of public debt from foreign investors, partially compensate this increase, resulting in a positive change of 5.9 billion euros (see Figure 12).



Source: Banco de Portugal. Authors' calculations.

Figure 12: Change in balance sheet aggregates during the COVID-19 crisis period | 2020-2021

6. Conclusions

The balance sheet of Banco de Portugal expanded significantly since the global financial crisis, following a trend similar to the one observed at the Eurosystem level. Between 1999 and mid-2007, both balance sheets increased by more than 60%. From the beginning of the financial crisis to the end of 2021, Banco de Portugal and Eurosystem balance sheets expanded even more, with total assets reaching a value more than six times higher than the levels observed in mid-2007. Unconventional monetary policy measures, in particular the QE, were the main drivers of these evolutions.

The analysis of the evolution of Banco de Portugal balance sheet by subperiods shows that the balance sheet expanded consistently throughout time, as it increased in all but one subperiod, the "whatever it takes" period, between mid-2012 and early 2015, which reflected the reduction in the exposure of Portuguese banks to Eurosystem funding due to a deleveraging process experienced in the context of the implementation of Portugal's financial assistance programme.

After the global financial crisis, the growth in Banco de Portugal balance sheet was initially driven by an increase in liabilities, i.e. demand by banks for central bank reserves increased due to a significant impairment on the interbank market. Central

bank refinancing operations played an important role during this period. Since 2015, broader monetary policy decisions regarding the asset side of the balance, i.e. asset purchases, designed to support economic growth and bring inflation back to the 2% target, gained relevance being now factored in the updated ECB's monetary policy strategy.

Globally, between 1999 and 2021, the balance sheet expansion was, on the asset side, mostly driven by the conduction of purchases of securities for monetary policy purposes and significant increases in central bank funding to banks and in intra-Eurosystem claims, the latter aggregate being explained by the inflow of banknotes related to the tourism activity in Portugal. In fact, 91% of the expansion observed in total assets since 1999 is explained by these three aggregates. On the liability side, intra-Eurosystem liabilities related to TARGET and current accounts explain 69% of the expansion in total liabilities, reflecting the liquidity provided through monetary policy operations, which was either deposited in the central bank or transferred to euro area banks outside of Portugal.

Given the high degree of uncertainty arising from the current geopolitical context, it is not possible to confidently anticipate how the Eurosystem and Banco de Portugal balance sheets will evolve in the coming years. However, the rich experience gained over the last two decades, in which important structural changes have taken place, with significant implications for the effectiveness of the monetary policy transmission mechanism, constitutes an important background to take into account both in the management of future crises and in the much-desired normalisation of monetary policy (Bernanke 2017; Constâncio 2018). It is, therefore, paramount to continue monitoring the evolution of the Banco de Portugal balance sheet in order to draw further "lessons" in view of the important challenges ahead.

References

Abreu, Marta (2005). "Inflation and Monetary Policy in Portugal before the Euro." *Notes*, Spring, 73–87.

Altavilla, Carlo, Lorenzo Burlon, Mariassunta Giannetti, and Sarah Holton (2022). "Is there a zero lower bound? The effects of negative policy rates on banks and firms." *Journal of Financial Economics*, 144(3), 885–907.

Amaral, Luciano (2022). *Economia Portuguesa: últimas décadas*. Fundação Francisco Manuel dos Santos.

Bailey, Andrew John, Jonathan Bridges, Richard Harrison, Josh Jones, and Aakash Mankodi (2020). "The central bank balance sheet as a policy tool: past, present and future."

Banco de Portugal (2008). "Relatório do Conselho de Administração – Atividade e Contas 2007."

Banco de Portugal (2022). "Relatório do Conselho de Administração – Atividade e Contas 2021."

Bernanke, Ben S (2017). "Monetary policy in a new era." *Evolution or Revolution?: Rethinking Macroeconomic Policy after the Great Recession*, pp. 3–48.

Bindseil, Ulrich (2004). *Monetary policy implementation: Theory, past, and present*. OUP Oxford.

Bindseil, Ulrich (2014). *Monetary policy operations and the financial system*. OUP Oxford.

Bindseil, Ulrich and Alessio Fotia (2021). *Introduction to central banking*. Springer Nature.

Blinder, Alan S (1998). "Central Banking in Theory and Practice (Cambridge, Massachusetts)."

Boeckx, Jef, Maarten Dossche, and Gert Peersman (2014). "Effectiveness and transmission of the ECB's balance sheet policies. National Bank of Belgium Working Paper No. 275, December 2014."

Brunnermeier, Markus K, Harold James, and Jean-Pierre Landau (2016). "The Euro and the battle of ideas." In *The Euro and the Battle of Ideas*. Princeton University Press.

Constâncio, Vitor (2017). "The future of monetary policy frameworks." *lecture at the Instituto Superior de Economia e Gestão, Lisbon*, 25.

Constâncio, Vıtor (2018). "Past and future of the ECB monetary policy." *Rede*.

Cour-Thimann, Philippine (2013). "CESifo Forum Special Issue April 2013: Target Balances and the Crisis in the Euro Area." In *CESifo forum*, vol. 14, pp. 5–50.

De Fiore, Fiorella and Oreste Tristani (2019). "(Un) conventional policy and the effective lower bound."

European Central Bank (2011). *The monetary policy of the ECB*. European Central Bank.

European Central Bank (2015). "The role of the central bank balance sheet in monetary policy." *ECB Economic Bulletin*, (4).

Gambacorta, Leonardo, Boris Hofmann, and Gert Peersman (2014). "The effectiveness of unconventional monetary policy at the zero lower bound: A cross-country analysis." *Journal of Money, Credit and Banking*, 46(4), 615–642.

Rule, Garreth *et al.* (2015). "Understanding the central bank balance sheet." *Handbooks*.

Soares, Rita Isabel, Joana Sousa-Leite, João Filipe, and Nuno Nóbrega (2020). "Banco de Portugal TARGET balance: evolution and main drivers." *Banco de Portugal Occasional Papers*.

Strauch, Rolf, Juan A Rojas, Frank O'Connor, Cristina Casalinho, Pablo de Ramon-Laca Clausen, Phaedon Kalozois, *et al.* (2016). *Accessing Sovereign Markets: the Recent Experiences of Ireland, Portugal, Spain, and Cyprus*. Publications Office of the European Union.

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