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TARGET balances: still a cause for concern?

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Abstract

The Eurosystem's decentralised framework generates a number of intra-Eurosystem claims and liabilities among its participating National Central Banks, the most important of which being related to the Eurosystem's centralised large-value payment system, TARGET/TARGET2.

Throughout the first years of the common currency, TARGET imbalances were generally low. However, after the 2007 global financial crisis, they have started to exhibit a growth pattern that has been aggravated by every episode of turmoil occurred ever since – the European sovereign debt crisis, the deflationary pressures of the mid-2010s and, more recently, the COVID-19 outbreak.

The mechanics and meaning of these balances have been thoroughly discussed. However, although their causes are well identified, a significant disagreement regarding their risks and consequences for the future of the Euro Area still persists.

This dissertation contributes to the debate. Its goal is three-fold: (1) to present the TARGET system and explain the dynamics behind the accumulation of TARGET balances in a detailed manner, (2) to present a chronological evolution of TARGET balances, complete with an analysis of its main drivers, and (3) to compare the views of those who state that TARGET imbalances are a problem and those who claim otherwise.

JEL codes: E42, E44, E52, E58, F33, F34, F36.

Keywords: TARGET2, TARGET Balances, Euro, Monetary Policy, Economic and Monetary Union, Global Financial Crisis, European Sovereign Debt Crisis, Asset Purchase Programme.

Resumo

A estrutura descentralizada do Eurosistema gera uma série de ativos e passivos entre os seus Bancos Centrais Nacionais, sendo o mais importante deles relacionado com o sistema centralizado de pagamentos de grande-escala do Eurosistema, denominado por TARGET/TARGET2.

Ao longo dos primeiros anos da moeda comum, os desequilíbrios do TARGET mantiveram-se relativamente baixos. No entanto, após a crise financeira global de 2007, começaram a exibir um padrão de crescimento que foi agravado por todos os episódios de turbulência ocorridos desde então – a crise da dívida soberana europeia, as pressões deflacionárias de meados da década de 2010 e, mais recentemente, a crise provocada pelo surto de COVID-19.

As mecânicas e o significado desses equilíbrios foram já amplamente discutidos. No entanto, embora as suas causas estejam bem identificadas, um desacordo significativo quanto aos seus riscos e consequências para o futuro da Área do Euro ainda persiste.

Esta dissertação contribui para o debate. O seu objetivo é triplo: (1) apresentar o sistema TARGET e explicar, de forma detalhada, a dinâmica por detrás da acumulação de saldos TARGET, (2) apresentar uma evolução cronológica dos saldos TARGET, completa com uma análise dos seus principais fatores impulsionadores, e (3) comparar os pontos de vista daqueles que afirmam que os desequilíbrios do TARGET são um problema e daqueles que afirmam o contrário.

Códigos JEL: E42, E44, E52, E58, F33, F34, F36.

Palavras-chave: TARGET2, Saldos TARGET, Euro, Política Monetária, União Económica e Monetária, Crise Financeira Global, Crise da Dívida Soberana Europeia, Programa de Compra de Ativos.

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1 Introduction

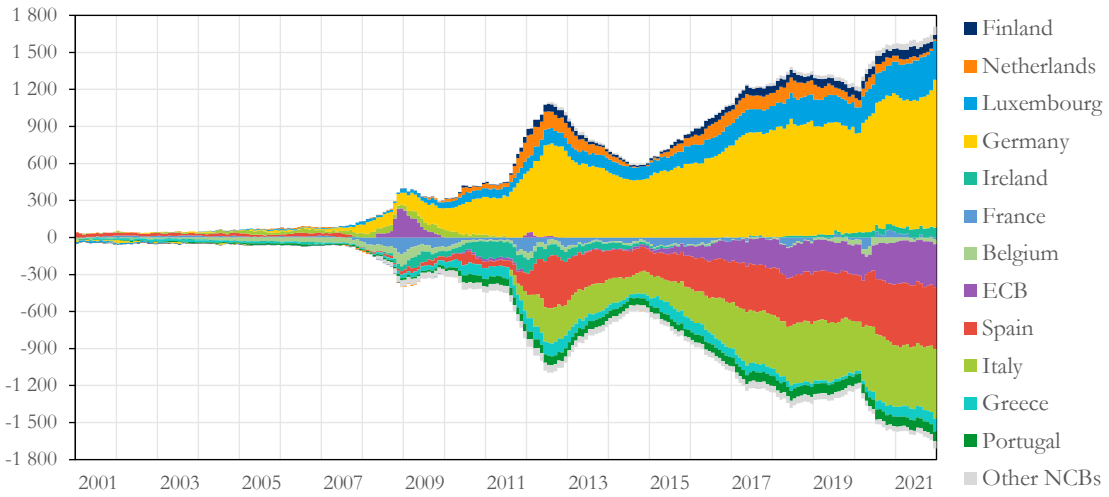
A safe and efficient payment infrastructure is crucial for a well-functioning economy. Such an infrastructure is usually composed of multiple payment systems, working alongside each other to serve a myriad of different needs but being interconnected in some form. In the most common arrangement, all systems operating in an economy are connected to a centralised system, operated by the central bank. The centralised system ensures all payments, performed either directly through it or via the ancillary systems, are appropriately reflected as credit or debit movements in the reserve accounts credit institutions hold at the central bank.

The Euro Area's centralised payment system is named TARGET. It was launched alongside the Euro to increase the efficiency of cross-border payments within the Eurozone, as well as to assist with the implementation of the Eurosystem's single monetary policy and contribute to the integration of European markets (ECB, 2001). Given its importance, it can be considered the "backbone" of the Euro (Bindseil & König, 2012).

One of the Eurosystem's most distinct characteristics is its high degree of decentralisation, reflected in various regards. Chief among them is the fact that commercial bank reserves are not held by a central entity but are, instead, distributed amongst the Eurosystem's National Central Banks (NCBs). As a result of the decentralisation of central bank accounts, cross-border transactions need to be reflected as claims and liabilities between the Eurosystem's NCBs. Said positions are called TARGET balances.

Throughout the first years of the common currency, TARGET imbalances were generally low, representing little more than residual values in NCBs' balance sheets. By mid-2007, however, the situation started to change. As signs of an impending financial crisis began to appear, the once low, stable and relatively homogeneous balances started to grow in different directions. As depicted in Figure 1.1, after the financial crisis, divergences in TARGET positions have further expanded in three additional episodes. The first, from mid-2011 until mid-2012, corresponded with the intensification of the European sovereign debt crisis. The second, in early-2015, concerns the introduction of the Eurosystem's quantitative easing measures. Lastly, the third, occurred in early-2020, pertains to the intensification of asset purchases by the Eurosystem after the COVID-19 outbreak.

Figure 1.1 · TARGET balances of selected NCBs, January 2001 – December 2021 (10^9 euros)



Source: ECB Data Warehouse (sdw.ecb.europa.eu/browse.do?node=9691112).

The data points refer to the average values in each month.[1] Data for the ECB and some of the "Other NCBs" is represented only after May 2008, as data referring to previous periods is unavailable.

The increase in TARGET balances started to attract the attention of some economists by early-2011. A heated debate about the mechanics and meaning of said balances soon emerged. Although there was a solid consensus on their causes – high stress levels in financial markets –, a significant disagreement arose regarding their consequences. On the one hand, authors such as Hans-Werner Sinn, which is credited for starting the debate, argued that TARGET balances constituted a stealth bailout mechanism, whereby the Eurosystem was assisting struggling economies – such as Greece, Portugal or Spain – and, as such, helping them sustain high current account deficits for longer than necessary (Sinn, 2011a, 2011b, 2011e; Sinn & Wollmershäuser, 2012; Wolf, 2011). On the other hand, an equally large – if not larger – body of literature argued that TARGET balances were a mere side effect of the liquidity shortage being felt by struggling economies, which crated a need for increased intervention in markets by the Eurosystem (Bindseil & König, 2012; Cecioni & Ferrero, 2012; Jobst, 2011; Storbeck, 2011; Whelan, 2014).

The initial debate eventually cooled down as the European sovereign debt crisis came to an end. However, the increase in TARGET claims associated with the start of quantitative

[1] As Jobst (2011) explains, many items in central bank balance sheets register strong daily fluctuations, with TARGET balances being no exception. Therefore, period averages tend to depict a more accurate picture of reality than end-of-period positions.

easing has reignited worries about the meaning of these balances, and views do not seem to be getting any closer (Perotti, 2020). Are TARGET imbalances a normal by-product of the system, or are they a sign of trouble? Which risks do they entail? This dissertation aims to respond to those questions. Its goal is three-fold: (1) to present the TARGET system and explain the dynamics behind the accumulation of TARGET balances in a detailed manner, (2) to present a chronological evolution of TARGET balances, complete with an analysis of its main drivers, and (3) to compare the views of those who state that TARGET imbalances are a problem and those who claim otherwise.

The remainder of the dissertation is organised as follows. Chapter 2 introduces the TARGET system, describing its history and importance for the European monetary union, as well as its relationship with other systems operating in the Euro Area. Chapter 3 explains the dynamics behind the creation and accumulation of TARGET balances from the perspective of central bank balance sheets. Chapter 4 provides a detailed analysis of the behaviour of TARGET balances over time, exploring their main driving forces. Chapter 5 discusses the implications that the accumulation of balances can have for the Euro Area, comparing the two opposite views found in the literature. Chapter 6 concludes.

2 The TARGET system and its role in the European monetary union

In every economy, countless transactions take place every day. As a result, payments flow almost continuously amongst a wide range of economic agents. Today, cashless payments make up the bulk of payments by value, as cash (banknotes and coins) is primarily used in low-value transactions (Füssel & Kokkola, 2010). Consequently, a safe and efficient payment infrastructure is crucial for a well-functioning economy.

2.1 The basics of a payment system

For a cashless payment (or another financial transaction) to be successful, multiple parties must be involved. Firstly, payment instructions need to be sent to (and processed at) the bank(s) of both the payer and the payee. Assuming they hold accounts with different institutions, both banks must, in turn, communicate between themselves to register the payment. Once that is done, the payment must be settled. If the payer and the payee use the same bank, the payment can be settled within the institution's own books. If, however, the two parties hold accounts at different banks, the money will need to be transferred from one to the other. The transfer of funds between banks is called an interbank payment.

Interbank payments can be settled via two arrangements: correspondent banking agreements or payment systems.[2] In the first case, a payment between two banks is settled by a third one (called "correspondent"). The banks participating in the transaction must have accounts at said correspondent, which simply credits/debits said accounts to settle the transaction.[3] Correspondent banking arrangements are often governed by longer-term contracts (meaning they concern a multitude of payments in a predefined period). By contrast, payment systems consist of structures with common rules and standardised procedures where banks can route payments to one another. One key difference between the two settlement forms is the so-called settlement agent, i.e., the institution in whose books settlement takes place. As can be inferred, in correspondent banking agreements, the settling agent is the correspondent bank.

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[2] A combination of both is also possible. For example, a correspondent bank may execute a transaction via a payment system on behalf of another bank that does not have access to it (Füssel & Kokkola, 2010).

[3] This is a general case. However, the settlement may involve additional intermediaries or, by contrast, none (for instance, if the payment concerns a bank and its correspondent). Correspondent banks usually provide their services to various financial institutions, under contracts made separately for each of them.

On payment systems, however, this role is performed by either the system's operator or another designated institution. Nowadays, payment systems are the most used arrangement for interbank payments (Füssel & Kokkola, 2010).

Depending on the predominant type of transaction they process, payment systems can be classified as either large-value or retail. Large-value payment systems are mainly geared towards large or time-critical payments performed between financial institutions. In contrast, retail payment systems tend to be designed to handle large volumes of relatively low-value payments, such as card payments.

Multiple payment systems tend to co-exist within a country or monetary union, serving different needs but being interconnected in some form. In the most common arrangement, various systems (predominantly retail) are connected to a centralised large-value system. The former, called ancillary systems, process transactions but do not settle them; instead, they delegate the settlement of the underlying monetary obligations to the centralised system, called settlement system (Füssel & Kokkola, 2010).

Most, if not all, settlement systems are real-time gross settlement (RTGS). In such systems, payments are settled continuously and individually. This means debit and credit entries are created for every payment instruction settled, and each transaction has an immediate effect on the accounts of financial institutions. As such, the bank at the receiving end of the payment is free to use said funds to make other payments within a very short period (ECB, 2013). By contrast, on most ancillary systems, settlement is delegated at pre-defined moments (usually only a few per day), and payment instructions are netted in some way, depending on the system's *modus operandi* (Füssel & Kokkola, 2010).

As a result of the described inter-system interoperability, on a typical day, most transactions performed in an economy are processed via retail systems. These transactions are not settled immediately in the settlement system, but at the end of each day or once every few hours, in net terms, together with a myriad of other transactions that occurred in the same ancillary system during that period. By contrast, interbank operations (including those independent from ancillary systems, such as borrowing operations) are typically performed directly on the centralised system or, alternatively, on other interbank systems more catered to operations of that kind.

RTGS systems are usually run by central banks, for two main reasons. Firstly, credit institutions are critically mandated to have accounts at the central bank. These accounts are

used, *inter alia*, to receive liquidity from the central bank in monetary policy operations and, in the jurisdictions that demand it, to fulfil minimum reserve requirements. As a result, the central bank is the ideal settlement agent for the economy at large, as it can credit or debit the reserve accounts of most, if not all, credit institutions in the economy to settle transactions between them (Whelan, 2014).

Secondly, RTGS systems are strongly linked to two of central banks' essential functions: implementing monetary policy and safeguarding the financial system's stability (Hanssens, 2010). The reasoning is quite intuitive: central banks tend to conduct monetary policy operations with a limited group of entities. For monetary policy to be effective, it is, therefore, crucial that the effects of such operations be propagated to other financial institutions and the rest of the economy. Such dissemination is performed via the money market, which relies heavily on the smooth functioning of payment infrastructure. Accordingly, disruptions in such systems can cause significant effects on market activity and asset prices, thus both destabilising the financial system and impairing the transmission of monetary policy impulses (Hanssens, 2010). Consequently, RTGS systems are crucial to ensure financial stability, implement monetary policy adequately and, as a result, preserve public confidence in money (Bank for International Settlements, 2003), the ultimate goal of any central bank.

2.2 The TARGET system

In the Euro Area, the importance of RTGS systems was recognised quite early on. As a result, multiple of these systems were already in place years before the introduction of the Euro. Back then, however, each member-state's central bank operated its own structure, developed to meet local requirements and with exclusive support for domestic transactions (Carlá et al., 2010). As a result, financially, Europe was considerably more fragmented before the single currency than today. For instance, correspondent banking was the most common way of making cross-border payments between European countries (Füssel et al., 2010), and money markets were split along national borders.

Clearly, the existing RTGS systems were suboptimal to be used in the monetary union. Improvements regarding harmonisation, consolidation and efficiency were needed to ensure the monetary union would succeed in its most foundational objectives, such as the smooth conduction of a single monetary policy and the establishment of a unified Euro money market (Carlá et al., 2010).

To achieve said goals, the European Union developed a unified RTGS system to be used across all countries in the Euro Area. In 1995, nearly four years before the launch of the Euro, preparation began for such a system, eventually named TARGET (Trans-European Automated Real-time Gross Settlement Express Transfer). Being the RTGS system for the Euro, it was launched alongside the new currency, in 1999, to (a) assist with the implementation of the Eurosystem's single monetary policy, (b) increase the efficiency of cross-border payments within the Eurozone and (c) contribute to the integration of the Euro money market (ECB, 2001).

Eight years after TARGET's debut, an updated system, TARGET2, was introduced. Initially, TARGET had been launched as a decentralised structure. At the time, a completely new system would take too long to develop and implement, so TARGET was built by linking the existing member-states' systems. However, this decentralised nature did not work in its favour, as it resulted in some inefficiencies. By contrast, TARGET2 is a more unified system, built on a single platform designed to overcome its predecessor's drawbacks. The new system was launched in November 2007 and entirely superseded the first-generation system by May 2008 (Carlá et al., 2010). For simplification, hereafter, the TARGET acronym is used to refer to both generations of the system unless the distinction between them is relevant.

As a sidenote, the Eurosystem is currently working on a further revision to TARGET2's infrastructure, scheduled to go live in November 2022. The reworking seeks to consolidate TARGET2 with its sibling, TARGET2-Securities (T2S), launched in 2015 to facilitate the cross-border transaction of securities in Europe.[4] The consolidation project also seeks to replace TARGET2 with an updated RTGS system, called T2. While changes are not as profound as in the first large revision, one development stands out: the addition of multi-currency capabilities. The system will be able to facilitate payments in other currencies, if doing so is of interest to their respective central banks (ECB, 2022b).

TARGET routinely settles a myriad of individual payments, as well as positions in a broad array of ancillary systems. Its use is mandatory in a few cases, namely the settlement of

[4] Before T2S, these assets were held on multiple platforms. As a result, cross-border transfers of securities were as cumbersome as cross-border payments were before TARGET. T2S was developed to articulate with TARGET2 and allow banks to hold both securities accounts and central bank money accounts on the same platform, thus making the transaction of securities safer and more efficient (Carlá et al., 2010).

payments involving the Eurosystem (i.e., the group formed by the Euro Area NCBs and the ECB) and of positions of other net large-value systems operating in Euro. Otherwise, by and large, participants are free to settle payments via alternative systems or other types of arrangements. Nonetheless, TARGET has been the preferred choice for large-value operations (Carlá et al., 2010), a fact that highlights the system's appeal regarding reach, reliability, safety and pricing.

As previously mentioned, commercial banks are mandated to hold accounts at their central bank, and those accounts are used to settle payments in the central bank's centralised settlement system. This principle is no different in the Eurosystem, but the *modus operandi* is slightly different. One of the Eurosystem's most distinct characteristics is its high degree of decentralisation, reflected in various regards. Each National Central Bank (NCB) maintains its own legal identity, as well as a certain level of autonomy in some areas of activity. Accordingly, each NCB (in addition to the ECB itself) keeps its own balance sheet. Given this degree of decentralisation, by the time the Eurosystem was being designed, it was agreed that the accounts commercial banks held with their home NCBs would not be transferred to a centralised entity but instead continue to reside in each NCB's balance sheet. As a result, the Eurosystem's commercial bank reserves are spread amongst the Eurosystem's NCBs and, typically, credit institutions access TARGET via their home NCB. The ECB, in turn, does not hold any bank reserves nor cannot accept credit institutions as TARGET customers (Eisenschmidt et al., 2017).

The decentralisation of reserves constitutes another reason TARGET is an integral part of the monetary union. The system acts as the guarantor that banks' central bank accounts are fully fungible across Euro countries (Eisenschmidt et al., 2017). As a result of its operation, especially given that the system has no upper limit on transaction values, cross-border intra-Eurosystem payments are processed equally as smoothly as domestic ones (Bank for International Settlements, 2003).

As with most other large-value payment systems (Füssel & Kokkola, 2010), TARGET settles transactions in central bank money. This should come as no surprise, as the system is so intimately connected to central banks' balance sheets. "Central bank money", also known as "monetary base", "base money", or M0, is the narrowest of money aggregates and corresponds to the money registered on central banks' balance sheets. In the Euro Area, this aggregate includes only two items: the deposits financial institutions hold at their respective NCBs and

the value of banknotes in circulation.[5] Naturally, banknotes do not flow through TARGET; the system is reserved for the portion of central bank money held in electronic (or cashless) form.[6]

Since TARGET works with central bank money as opposed to commercial bank money, and taking into account the discussion on the interoperability across systems provided in the previous section, individual customer-grade transactions (even if of a substantial value, such as real-estate transactions) are rarely noticeable on TARGET. In fact, the amounts transferred via TARGET seldom correspond to the value of such transactions themselves, but instead to the corresponding central bank reserves belonging to the banks involved, after netting such transactions with a myriad of others. As a result, one cannot, as a rule, expect one transaction to exert an important effect on TARGET. However, taken together, multiple individual transactions can become relevant, particularly when they are biased in one direction. For example, that is the case of a deposit leakage between two Euro Area countries, or chronic current account deficits, two situations that are discussed in this dissertation at a later stage.

2.3 TARGET balances

Every day, as a result of all cross-border payments executed within that day on TARGET, each participating NCB registers either a net inflow or outflow of funds. Intuitively, a net inflow occurs when, in aggregate terms, the reserve accounts that NCB holds for credit institutions receive more money from other Euro Area countries as compared to what they send out. A net outflow corresponds to the opposite situation, i.e., credit institutions send out more money than they receive.[7]

At the close of each business day, the daily inflow/outflow (or net position) is aggregated into the accumulated net positions registered in the past. The sum of all these positions can result in a positive balance (i.e., a TARGET claim) or, by contrast, in a negative one (i.e., a TARGET liability). These balances are carried indefinitely, as they are not settled (Garber, 2010). Settlement would involve the transfer of assets between Euro Area NCBs; it can

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[5] Coins are not part of central bank money, as their issuance is a responsibility of the member-states' national governments. Nonetheless, the issuance of coins is subject to a few restrictions, namely in terms of value: the total value of coins to be put into circulation each year must be approved in advance by the ECB (ECB, 2007b).

[6] Despite that, a discussion on the flow of banknotes within the Eurosystem can be found in section 3.2.3.

[7] Naturally, levelled positions can also occur, but they are very rare.

occur, but not for this purpose. Moreover, these positions exist since the very first day the system operated and were not impacted by the transition from TARGET to TARGET2. As a result, a single name is used to denominate them, regardless of the system's version: "TARGET balances" (Eisenschmidt et al., 2017).

In essence, TARGET balances represent accounting relationships between the Eurosystem's NCBs. As a result, studying these balances from the perspective of NCBs' balance sheets makes it considerably easier to understand their mechanics. The next chapter aims to do precisely that, while providing a detailed explanation of these balances' main drivers and the Eurosystem's *modus operandi*.

3 TARGET balances: a balance sheet phenomenon

To better understand the behaviour of TARGET balances, it is necessary to take a step back and comprehend a few basic principles behind central bank balance sheets.

3.1 The basics of central bank balance sheets

Reducing a regular central bank's balance sheet into its simplest form, it takes the structure presented in Table 3.1.[8]

Table 3.1 · Stylised central bank balance sheet

Assets	**Liabilities**
Foreign assets (net)	Banknotes
Central bank operations (net)	Commercial bank reserves
Other items	Other items
	Equity
	Capital and reserves

A central bank's main liability is the money it issues. Whether in the form of banknotes or commercial bank reserves, this liability must be backed by assets, such as government bonds. The assets used as a counterpart to the money generated, as well as a few other items necessary for the central bank's activity, are found on the assets side of the balance sheet.

For simplicity, all items are presented on a net basis. However, it is worth noting that, in a real-world balance sheet, the elements shown above on the assets side can encapsulate items of both natures. Below is a more detailed look into each balance sheet item displayed in the table, which aims to clarify this observation.

Starting with the items on the **assets** side:

- **Foreign assets (and liabilities)** represent assets and liabilities denominated in other currencies. On the assets side, this item's main constituent is foreign exchange reserves.

[8] The exact balance sheet composition varies across different central banks, with some items adopting different nomenclature and/or different degrees of disaggregation. Still, most central bank balance sheets can be summarized into the form presented in the table (Rule, 2015).

- **Central bank operations** refer to the mechanisms through which the central bank controls the availability of reserves to the banking system and, consequently, the amount of liquidity in the market. Operations that provide liquidity show up as assets, while those that absorb liquidity constitute liabilities.

Regarding **liabilities**:

- **Banknotes** cover, as the name implies, the banknotes "in circulation", that is, either being held by the general population or by commercial banks (for example, in vaults or ATMs).[9]
- **Commercial bank reserves** correspond to the accounts credit institutions hold at the central bank. Often mandatory, they are similar in spirit to the deposits families constitute at commercial banks.

As for **equity**, the item is a trace of the fact that, in legal and accounting terms, a central bank has many similarities with a private company (Rule, 2015). As such, central bank balance sheets include own funds, which, among other purposes, can be used to absorb losses.

Lastly, "**other items**" represent all elements not included in the abovementioned items. For instance, properties detained by the central bank (registered on the asset side) or accounts the central bank may hold for other institutions, such as governments or foreign central banks (registered on the liabilities side).

Rule (2015) presents a very detailed discussion on the composition and importance of each of the above categories, with a special focus on central banks' liabilities.

3.2 The Eurosystem's balance sheet framework and TARGET (im)balances

Due to the Eurosystem's decentralised framework discussed in section 2.2, in the Euro Area, the balance sheet framework is a bit more complex than the one described above. This has multiple implications, which are discussed hereafter.

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[9] Banknotes that have either been produced but are still in the hands of the central bank, or that have been returned to the institution (for example, due to damage) are not included in this item. Coins are not included, as, in many economies (including the Euro Area), they are not issued by the central bank. The issuance of Euro banknotes is discussed with greater detail in section 3.2.3.

3.2.1 Cross-border transactions

As a result of the intra-Eurosystem decentralisation of reserves, a transaction between, for instance, Banco Santander, S.A. (registered in Spain) and Deutsche Bank AG (registered in Germany) cannot be settled on the same central bank, as these banks' reserve accounts are constituted in different NCBs. Banco Santander's reserve account is held at Banco de España (Bank of Spain), whereas Deutsche Bank's is held at Deutsche Bundesbank (Bank of Germany). Hence, the transfer of reserves between Banco Santander and Deutsche Bank cannot occur in one step. An intermediary step is required; this is where the TARGET system comes into play.

Before discussing how TARGET would solve this issue, let us observe how a similar transaction is settled when both banks are registered in the same country (or, in other words, hold reserve accounts at the same NCB). Let us consider, for example, a large-scale transaction between two Austrian commercial banks. Besides impacting the balance sheets of the banks involved, such a transaction would only produce changes in the balance sheet of the Austrian central bank (Oesterreichische Nationalbank). In that NCB's books, one would observe a mere change in the composition of commercial bank reserves, with one of the commercial banks having its reserves diminished and the other enlarged.

Table 3.2 · Impact of a transaction between two Austrian banks on Oesterreichische Nationalbank's balance sheet

Assets	**Liabilities**	
Foreign assets (net)	Banknotes	
Central bank operations (net)	Commercial bank reserves	=
Other items	Austrian Bank A	↓
	Austrian Bank B	↑
	Other items	
	Equity	
	Capital and reserves	

Going back to the previous example, would the transfer of deposits be performed in the same way – that is, directly from Banco Santander's reserve account at Banco de España to Deutsche Bank's reserve account at the Bundesbank –, both central banks' balance sheets would be left unbalanced.

To keep both balance sheets balanced, each NCB needs to offset the variation in central bank reserves that occurs in its books. This is done by registering either a claim or a liability vis-à-vis the other NCB. Since this operation is being executed via TARGET, these central banks must report a TARGET claim on, or a liability with, one another. In this case, Banco de España must register a TARGET liability, which the Bundesbank shall match with a TARGET claim on its side. The resulting balance sheet composition is shown in Table 3.3.

Table 3.3 · Impact of a large-scale transaction between Spain and Germany on the balance sheets of Banco de España and Bundesbank

Banco de España

Assets	**Liabilities**	
Foreign assets	Banknotes	
Central bank operations	Bank reserves	↓
Other items	TARGET liabilities	↑
	Other items	
	Equity	
	Capital and reserves	

Bundesbank

Assets	**Liabilities**	
Foreign assets	Banknotes	
Central bank operations	Bank reserves	↑
TARGET claims	↑ Other items	
Other items		
	Equity	
	Capital and reserves	

Notice how the Eurosystem's decentralised framework – notably, the rule that commercial banks hold their reserve accounts with their respective NCB rather than with a centralised entity – results in the fact that, although the accounting identity (Assets = Liabilities + Equity) holds at the aggregate Eurosystem level, it rarely does so for each NCB if intra-Eurosystem claims and liabilities are excluded (Jobst, 2011). Ultimately, the existence of TARGET balances (and other intra-Eurosystem balances) is a direct consequence of the decentralised organisation of payments in the Euro Area (Jobst, Handig, & Holzfeind, 2012).

The previous paragraph mentions "other intra-Eurosystem balances". Indeed, it is worth noting that not all intra-Eurosystem claims/liabilities are TARGET balances. Although these are the most important, other intra-Eurosystem accounting positions populate NCB's balance sheets. Chief among them is a position related to the adjustment of banknotes, which is discussed in section 3.2.3.

To facilitate accounting, on each NCB's books, TARGET balances, claims and liabilities regarding the allocation of banknotes, and other intra-Eurosystem balances are each registered

only once, in a single position vis-à-vis the ECB, which acts as a central clearing house (Jobst, Handig, & Holzfeind, 2012). As has been described for TARGET balances, at the end of each day, each of these positions is netted into a single asset or liability item (depending on the predominant transaction nature), and these balances are then carried forward to the next day. In other words, NCBs' claims and liabilities vis-à-vis the Eurosystem are never settled.

By design, the sum of all TARGET balances equates to zero – the sum of all positive balances equals the sum of all negative ones. Essentially, TARGET positions simply represent cross-border liquidity flows within a closed system. So, taken together, the assets and liabilities of all NCBs cancel each other out exactly (Jobst, Handig, & Holzfeind, 2012). The same applies to other intra-Eurosystem positions and is the reason none of these appears in the Eurosystem's consolidated financial statement (Krsnakova & Oberleithner, 2012).

3.2.2 Monetary policy operations

Having observed that TARGET balances result from intra-Eurosystem cross-border transactions, this section aims to explain how monetary policy operations can generate such transactions and, as a result, influence these balances.

The Euro Area has a single monetary policy in place. As such, decisions on monetary policy are made centrally (by the ECB's Governing Council, which is formed by the members of the Executive Board of the ECB and the governors of the Euro Area NCBs) and executed under a uniform set of terms and conditions in all member states. Nonetheless, the implementation of said monetary policy – in other words, the actual provision or absorption of liquidity – is generally[10] conducted in a decentralised manner, by each NCB.

Regarding its implementation, the Eurosystem's framework encompasses various types of operations, designed for different needs. They can be arranged into two major groups: (1) open market operations and (2) standing facilities (*The Implementation of the Eurosystem Monetary Policy Framework*, EU Guideline 2015/510). The former is aimed at managing liquidity levels and interest rates in the Euro Area. In contrast, the latter is mainly aimed at managing overnight liquidity in the Eurosystem. Below is a brief description of each of these groups.

[10] A few exceptions do exist. They are discussed in greater detail ahead.

Starting with open market operations, these include four instruments: (1) main refinancing operations (MROs), (2) longer-term refinancing operations (LTROs), (3) fine-tuning operations and (4) structural operations. Besides fulfilling different objectives, they primarily differ in regularity and proceedings.

In short, MROs and LTROs are performed regularly to provide temporary liquidity to financial institutions. As a rule, MROs are conducted every week and have a weekly maturity, whereas LTROs are conducted every month and have a three-month maturity. Both are conducted using reverse transactions, meaning an NCB either buys assets from financial institutions under repurchase agreements (which oblige the sellers to repurchase the assets, or equivalent ones, from the NCB at the end of the contract) or provides them with credit in the form of collateralised loans (that is, loans guaranteed by financial assets).[11]

By contrast, fine-tuning and structural operations are not performed under a regular calendar. Fine-tuning operations are performed on an *ad hoc* basis to deal with unexpected liquidity fluctuations in the market. In contrast, structural operations are carried out whenever the ECB Governing Council identifies the need to adjust the Eurosystem's structural position vis-à-vis the financial sector on a more permanent basis.

Regarding standing facilities, these serve to manage the overnight liquidity in the Eurosystem. Unlike open market operations, which are initiated by the ECB, standing facilities are available for financial institutions to use on their initiative. Credit institutions can use the marginal lending facility to obtain overnight liquidity and the deposit facility to place overnight deposits with the Eurosystem through their respective home NCB.

Since the onset of the financial crisis, the Eurosystem's regular monetary policy operations have been complemented by a set of other liquidity-providing initiatives which aim to alleviate financial institutions from the liquidity constraints that have been registered ever since. New measures include extraordinary LTROs with maturities of up to 48 months and, most importantly, several outright asset purchase programmes (APPs).[12]

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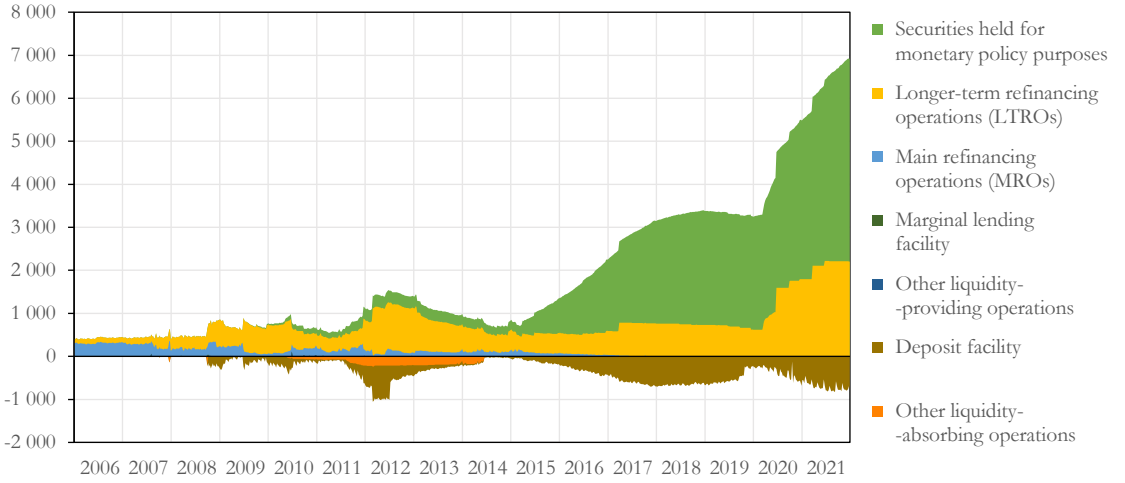
[11] In both cases, assets must fulfil certain eligibility requirements, defined in the Eurosystem credit assessment framework (ECAF), a unified framework that applies to the entire Eurosystem.

[12] Chapter 4 presents a more detailed view on the Eurosystem's response to the 2008 global financial crisis and subsequent crises (e.g., sovereign debt crisis).

Figure 3.1 · Decomposition of the Eurosystem consolidated balance sheet (items related to monetary policy, weekly, 10^9 euros)



Source: ECB Data Warehouse (sdw.ecb.europa.eu/browse.do?node=bbn24).

Data points refer to end-of-week positions.

Figure 3.1 shows the aforementioned components' relative importance to monetary policy over the years. One observation immediately stands out from the figure: the vast increase in liquidity that started to develop in 2015, gradually slowed down from 2017 onwards and was further catapulted in 2020. This behaviour, largely attributable to the Eurosystem's quantitative easing programme, is analysed in this dissertation at a later stage. For now, two remarks can be made: on the one hand, how seldom fine-tuning operations, structural operations, and the marginal lending facility have been used and, on the other hand, how the importance of each liquidity-providing monetary policy instrument has changed over time, as conditions in the European financial system changed.

Regarding the last observation, before the financial crisis, MROs were the Eurosystem's main liquidity-providing monetary policy instrument. In August 2007, as the first signs of financial turmoil started to appear and liquidity began to dry up, the ECB decided to intensify its intervention to increase market liquidity. One of the measures it implemented was a considerable expansion of LTROs, via both an increase in the amounts made available in regular monthly operations and the introduction of supplementary LTROs with longer maturities (Trichet, 2010). Accordingly, these operations started to represent a more significant proportion of the funds provided in the context of monetary policy.

Despite the change in composition, refinancing operations remained the main liquidity-providing monetary policy instrument until 2015, when they were superseded by asset purchases for monetary policy purposes.

The Eurosystem started purchasing assets in the context of monetary policy in 2009. However, until 2014, it had done so infrequently – on just three occasions – and in relatively short amounts – pre-2014 asset purchases totalled 278 billion euros (ECB, 2010a; Ghysels et al., 2017). By the end of 2014, however, the situation started to change. Confronted with deflationary pressures, the ECB re-enacted asset purchases and, not long after, announced a fully-fledged quantitative easing programme, through which the Eurosystem would acquire assets worth 60 billion euros each month until at least September 2016. Asset purchases ended up perduring until December 2018, with monthly totals of 60 billion euros or more being registered every month until December 2017. This led to an unprecedented expansion of the Eurosystem's balance sheet, as shown in Figure 3.1.

More recently, as COVID-19 struck, the ECB announced additional asset purchases and yet another reinforcement of LTROs. This further catapulted the Eurosystem consolidated balance sheet, whose total already surpassed 8.5 trillion euros by the end of 2021. Monetary policy alone contributed to nearly 7 trillion euros, over 80% of that amount.

The ECB's incisive intervention on markets had a substantial effect on TARGET balances, so much so that the chart above closely mimics the behaviour of TARGET balances during the same period. However, not all monetary policy operations produce the same effects on TARGET balances, as said effects are highly dependent on these operations' characteristics. Moreover, monetary policy operations can have direct and indirect effects on TARGET (Deutsche Bundesbank, 2016).

Looking into direct effects first, they are highly dependent on whether a monetary policy operation involves a cross-border transaction or not. Credit operations, such as MROs and LTROs, generally do not. This stands from the fact that, as previously mentioned, liquidity is created and destroyed at the NCB level, and each NCB interacts exclusively with counterparties domiciled in its jurisdiction.

As an illustration, suppose the Eurosystem has conducted a regular LTRO. On its balance sheet, the newly created liquidity is registered under "central bank operations", on the assets

side.[13] Correspondingly, on the liabilities side, an equivalent amount is credited to the reserve account(s) of the bank(s) that participated in the LTRO. This means that, in this type of operation, corresponding assets and liabilities are registered at the very same NCB. Table 3.4 illustrates the outcome of an LTRO in which one bank (Bank A) obtained liquidity and another one (Bank B) did not.

Table 3.4 · Impact of a liquidity-providing credit operation on an NCB's balance sheet

Assets		**Liabilities**	
Foreign assets (net)		Banknotes	
Central bank operations (net)	↑	Commercial bank reserves	↑
Other items		Bank A	↑
		Bank B	
		Other items	
		Equity	
		Capital and reserves	

Unlike credit operations, asset purchase programmes (APPs) can have a direct effect on TARGET balances, as they can originate substantial cross-border flows of reserves in the settlement process itself, i.e., when securities are exchanged for payment (Eisenschmidt et al., 2017). This may occur for two main reasons.

On the one hand, unlike credit operations, not all asset purchases are performed in a decentralised form. Although APP implementation has been predominantly decentralised, the ECB has participated directly in APP implementation on some occasions. In such interventions, assets are registered on the ECB's books, but liabilities cannot be, as credit institutions cannot open TARGET2 accounts at the ECB. Therefore, the corresponding liabilities are spread among the counterparties' NCBs, consequently impacting TARGET balances. Table 3.5 illustrates how a centralised asset purchase operation is registered on the books of the ECB and of one NCB, for instance, the Bundesbank.

[13] In real world balance sheets, the wording is likely to differ, mainly due to the usage of finer disaggregation levels.

Table 3.5 · Impact of a centralised asset purchase

European Central Bank

Assets		**Liabilities**	
Foreign assets		Banknotes	
Central bank operations	↑	TARGET liabilities	↑
Other items		Other items	
		Equity	
		Capital and reserves	

Bundesbank

Assets		**Liabilities**	
Foreign assets		Banknotes	
Central bank operations		Bank reserves	↑
TARGET claims	↑	Other items	
Other items			
		Equity	
		Capital and reserves	

On the other hand, even if APPs are implemented at the local level, the Euro Area's financial market integration is such that, more often than not, the assets purchased by NCBs are sourced from counterparties located outside their jurisdictions (Eisenschmidt et al., 2017). Cross-border transactions are therefore implied, thus, once again, directly impacting TARGET balances. Cross-border APP purchases stem from a key difference between the rules that apply to asset purchase programmes and to credit operations. In the latter, NCBs must interact exclusively with counterparties established in their jurisdictions, whereas, in the former, central banks are authorised to purchase assets from foreign counterparties.

Soares et al. (2020), which study Portugal's TARGET balance, provide an enlightening example on how diffuse cross-border APP purchases are. They state that most primary dealers of Portuguese sovereign debt are foreign institutions[14] and that, accordingly, most APP purchases performed by the Bank of Portugal were sourced from abroad. This, however, does not happen only in Portugal, quite the opposite. During the APP's first years, about 80% of all assets purchased (by value) were obtained from non-domestic counterparties and roughly 50% from outside the Euro Area, predominantly from the United Kingdom (ECB, 2017).

When performing asset purchases, NCBs must create reserves in order to pay for said assets. In the stylised representation, this causes an increase in the item "central bank operations". Let us take the example of Banco de Portugal. If the institution purchases assets from a domestic counterparty, the increase in "central bank operations" is matched in the counterparty's reserve account, which sits on the liabilities side of the NCB's balance sheet.

[14] The list is available at www.igcp.pt/en/1-4-399/market-participants/oevt-and-omp.

On the other hand, if Banco de Portugal acquires assets from a counterparty that accesses the TARGET system via the Bundesbank, the changes on both balance sheets must be intermediated by TARGET balances. As such, Banco de Portugal shall report a TARGET liability, whereas the Bundesbank shall pencil a TARGET claim. Table 3.6 shows how such a transaction would be registered.

Table 3.6 · Impact of a decentralised cross-border asset purchase between the Banco de Portugal and the Bundesbank

Banco de Portugal

Assets		**Liabilities**	
Foreign assets		Banknotes	
Central bank operations	↑	Bank reserves	
Other items		TARGET liabilities	↑
		Other items	
		Equity	
		Capital and reserves	

Bundesbank

Assets		**Liabilities**	
Foreign assets		Banknotes	
Central bank operations		Bank reserves	↑
TARGET claims	↑	Other items	
Other items			
		Equity	
		Capital and reserves	

As a result, APP purchases greatly contribute to the increase in TARGET balances across the Euro Area. But that is not all: the APP's effects on TARGET balances are strongly influenced by the counterparties' locations, and these exhibit an intriguing pattern. This pattern is mostly influenced by two rules of TARGET access.

Firstly, TARGET participation is allowed for banks from outside the Euro Area. As noted before, banks located in the Euro Area participate in TARGET via their respective NCBs. As for banks from outside, they can access the system directly via a branch or subsidiary located within the Euro Area or, alternatively, by making an agreement with an existing direct participant so that it processes payments on its behalf (in essence, acting as a correspondent bank with respect to TARGET).[15] In either case, these banks benefit from a higher degree of freedom when choosing the location/NCB from which to participate in the system.

[15] ECB (2020) offers a portrait of the correspondent banking business in the Euro Area.

Generally, the "TARGET accessways" of non-Euro Area financial institutions tend to be concentrated in a small set of locations, which coincide with major financial areas.[16]

Secondly, an arrangement called "multi-addressee access", introduced with TARGET2, allows banking groups to route the TARGET transactions of all their branches located within the European Economic Area through a single TARGET account, normally corresponding to its head office (ECB, 2022a), usually located in a financial centre.

Due to the high percentage of securities being obtained from outside the Euro Area, as well as the importance of major financial groups in securities markets, the locations chosen by non-Euro Area banks and large groups to access TARGET (either directly or indirectly) strongly influence how asset purchases affect TARGET balances.

As a result, APP purchases tend to result in persistent payment flows towards a small group of locations, namely Germany and the Netherlands, which have attracted large TARGET inflows since the APP's start. Other important TARGET gateways are Luxembourg, due to its significant fund management industry, and Finland, due to its close ties to Nordic banks (Eisenschmidt et al., 2017).[17]

Having discussed monetary policy operations' direct effects on TARGET, it is worth to note that the liquidity generated by them can be a crucial contributor to the propagation of TARGET imbalances. This impact is the indirect effect of monetary policy operations and corresponds to a crucial piece of the TARGET puzzle.

As the central bank creates liquidity, the claim it registers against financial institutions is expected to remain on its balance sheet until the maturity of the operation (in the case of a regular LTRO, three months). However, the counterparty may transfer its newly received

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[16] Major financial areas have a few relative advantages over other locations. For those accessing TARGET via a branch, these locations tend to grant them various efficiency gains such as better access to trained human resources. For those accessing via correspondent banks, such banks usually have a global reach and tend to be based in major financial centres (Eisenschmidt et al., 2017).

[17] Until 2008, London played a significant role as an access door to the Euro Area. However, the Bank of England's decision not to participate in TARGET2 (even though it had been connected to TARGET until its closure) forced UK institutions wishing to access the system to do so via other NCBs. Their preferred options have also been Deutsche Bundesbank and De Nederlandsche Bank, although the latter to a lesser extent (ECB, 2017; Eisenschmidt et al., 2017).

liquidity abroad almost immediately. So, while the assets related to the operation remain in the books of the NCB that performed it, the corresponding liquidity (in the form of bank reserves) may migrate to another NCB's books, being transformed in a TARGET liability on the NCB that created it (Jobst, Handig, & Holzfeind, 2012). As a result, even if the monetary policy operation initially had no direct effect on TARGET balances, the liquidity it generates can expand them if said liquidity (or part of it) leaves the country. The more liquidity there is in the banking system, the more significant the effect can be (Soares et al., 2020).

3.2.3 Banknotes

Although banknotes do not flow through TARGET, they occupy a significant part of the monetary base and can indirectly affect TARGET balances (Jobst, Handig, & Schneeberger, 2012). Moreover, the intra-Eurosystem flows of banknotes themselves make for an interesting discussion. This section aims to address the mechanics of banknotes within the Eurosystem and, as such, contribute to a better understanding of TARGET balances.

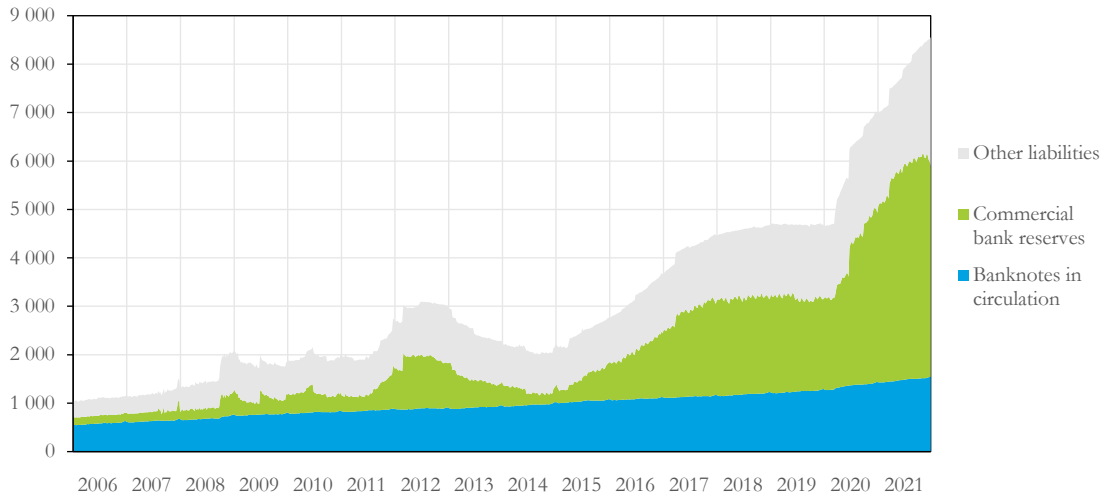
Figure 3.2 presents the weight of the monetary base (and each of its components) in the Eurosystem's liabilities. The importance of banknotes is undeniable. Until 2015, they made up the bulk of base money, representing 60% to 80% of it. In the last few years, however, the large asset purchases under the Eurosystem's quantitative easing programme, which resulted in an expansion of financial institutions' current accounts at the central bank, changed the weights significantly. At the end of 2019, banknotes represented a little over 40% of the monetary base, dropping further during the pandemic to roughly 26% by the end of 2021. Nonetheless, banknotes still represent a considerable part of M0, and their value, in absolute terms, has been increasing steadily over the years.

As with commercial bank reserves, banknotes are spread among the balance sheets of Euro Area NCBs. Similarly to the conduction of monetary policy, the issuing and withdrawal of banknotes are organised in a decentralised fashion. Ergo, although coordinated centrally, these activities fall under the responsibility of each NCB.[18]

In the Eurosystem, banknotes enter circulation mainly through commercial banks; NCBs supply banknotes on demand to them, in exchange for the reserves they hold at the central

[18] The ECB also has the right to issue and withdraw Euro banknotes. Nevertheless, in practice, the institution does not exercise this right, as it does not handle physical cash (ECB, 2020b).

Figure 3.2 · Decomposition of the Eurosystem consolidated balance sheet (liabilities, weekly, 10^9 euros)



Source: ECB Data Warehouse (sdw.ecb.europa.eu/browse.do?node=bbn24).
Data points refer to end-of-week positions.

bank's books. Symmetrically, commercial banks can also return banknotes to central banks in exchange for reserves.

Banknotes circulate freely among member states. As such, they can be returned to any NCB, regardless of which one issued them at first. This is an important consideration, as cross-border flows of physical cash can assume significant magnitudes – tangible evidence of this phenomenon is how common it is for Europeans to come across coins from multiple member-states on a daily basis.[19]

The free circulation of banknotes originates some interesting observations. Namely, some intra-Eurozone dynamics induce somewhat persistent flows. As a result, in some NCBs,

[19] Although they do not constitute central bank money, coins are the most visible example of the cross-border flows of cash. The average citizen can easily identify a coin's issuing country, as it is stated prominently on one of its sides (the so-called "national side"), via a distinctive motif which features the country's name or an abbreviation of it. As for banknotes, such identification is not possible. Information regarding the banknote's origin is bound to the first character of its serial number, but it does not indicate its issuing country. Instead, said character identifies the NCB which commissioned its printing (on banknotes from the first series), which may not correspond to the one which first issued it (Jobst, Handig, & Schneeberger, 2012), or the printing works responsible for its production (on banknotes from the second series) (ECB, 2021).

since the Euro entered circulation, the value of banknotes returned to them has surpassed the value of banknotes they have put into circulation. This is the case for Austria and Portugal, for example (Jobst, Handig, & Schneeberger, 2012; Soares et al., 2020).

Due to the aforementioned inequality in the distribution of banknotes, it has been decided that the value of banknotes registered on an NCB's balance sheet should not reflect the net balance of banknotes physically it has put into and withdrawn from circulation (Handig & Holzfeind, 2007). Instead, it reflects a fixed portion of the total value of Euro banknotes in circulation. Said portion is based on the NCB's participation in the ECB's capital.

The ECB's capital is distributed among all NCBs belonging to the European System of Central Banks (ESCB) – i.e., the NCBs of all EU member-states. All of them, and solely them, own a portion of the ECB's capital, defined according to a key that reflects, in equal parts, their country's share in the population and GDP of the EU.[20] Banknote allocation is performed under a special version of the capital key, which does not include non-Euro Area countries and designates a share of 8% of the total value of banknotes to the ECB itself.

To retain, banknotes are registered in a markedly different way from the remaining liquidity in the system (commercial bank reserves). The differentiated treatment has a very practical reasoning. If banknotes were distributed in the same way reserves are – i.e., according to the amount of liquidity created and destroyed by each NCB –, countries such as Portugal and Austria would observe a substantial erosion of their balance sheets over time (Scheller, 2004). That is because commercial bank reserves are subject to a crucial restriction which does not apply to banknotes: minimum reserve requirements. Financial institutions are obliged to constitute reserve accounts at their local NCB, and such reserves must contain a minimum amount of funds (even if said amount is calculated as an average over a predefined period). As a result, commercial bank reserves essentially have a lower limit. By contrast, banknotes do not. As a result, "net banknote receivers" such as Portugal and Austria would have seen the value of banknotes gradually decline on their balance sheets, surpassing zero and walking

[20] The capital key was fixed for the first time in 1998, upon the establishment of the ECB. Since then, it has been readjusted eight times, either following predefined five-year intervals or in response to changes in the European Union's composition. An overview of its most recent revision can be consulted at www.ecb.europa.eu/ecb/orga/capital/html/index.en.html.

into negative territory, dragging the total of their balance sheets with it. Over time, the situation would become increasingly unsustainable.

As a sidenote, the provision of money, in either form, constitutes an income-generating activity for the Eurosystem. The proceeds of such activity, called monetary income, are shared amongst Euro Area NCBs in the same way for both banknotes and reserves. In both cases, the distribution of monetary income is performed according to their shares in the ECB's capital key (Scheller, 2004).[21] As such, the distribution of monetary income is unrelated to the way central bank money is registered on NCBs' balance sheets.

The aforementioned arrangement created the need for another intra-Eurosystem claim/liability item to be added to NCBs' balance sheets. This item, "net claims/liabilities related to the allocation of Euro banknotes within the Eurosystem", represents the difference between an NCB's share of the total value of banknotes in circulation (which, as stated above, is the value that appears on its balance sheet) and the value of the banknotes said NCB has put into circulation (in net terms, i.e., the value of banknotes put in circulation subtracted by the value withdrawn from circulation). If the net balance of banknotes the NCB has put in circulation is higher than the value given by the allocation key, a "net liability related to the allocation of Euro banknotes within the Eurosystem" appears on the liabilities side of its balance sheet. In the opposite case, a net claim on the Eurosystem must be registered on its assets side.

Two interesting remarks can be withdrawn from the observation made above. Firstly, as with TARGET balances, these positions are registered vis-à-vis the Eurosystem as a whole, not individual NCBs. Secondly, claims and liabilities resulting from the allocation of banknotes are different from those related to the TARGET system. So, both items co-exist in an NCB's balance sheet, either on the same or on opposite sides of the table.

As Jobst, Handig, & Schneeberger (2012) mention, as a rule, TARGET and banknote-related balances are essentially independent of each other. However, the authors mention the two items could be correlated, even if loosely, in the case of countries whose net inflows or outflows of banknotes are substantial as compared to the size of their economies.

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[21] The allocation of monetary income applies exclusively to Euro Area NCBs, as only these take part in the single monetary policy.

4 The historical record of TARGET balances

Having observed TARGET balances' main drivers, this chapter aims to describe their behaviour since the introduction of the Euro. Their evolution has been inconstant, having registered different growth patterns, motivated by specific events. As such, it can be divided into the following six distinct phases:

1 The pre-crisis period (January 1999 – August 2007),
2 The global financial crisis period (August 2007 – May 2010),
3 The sovereign debt crisis period (May 2010 – July 2012),
4 The period following Draghi's "whatever it takes" speech (July 2012 – October 2014),
5 The Asset Purchase Programme period (October 2014 – March 2020), and
6 The COVID-19 period (March 2020 – December 2021).[22]

4.1 The pre-crisis period

The Euro's launch, on 1 January 1999, marked the realisation of an old dream for the EU. The single currency was the last piece in the Union's ambitions of a single market and reflected the ultimate proof of intra-European cooperation. Its relevance was indisputable for Europe and the rest of the world, as joining such a large and diverse set of developed countries under a single currency was an unprecedented experience. It was, as expected, an enormous challenge, constituting the Union's most ambitious project to date. Still, the years spent in preparatory work paid off, and the Euro had a successful launch.

Along with the Euro came the TARGET system and TARGET balances. Throughout the first years of the common currency and until the onset of the global financial turmoil of 2007, these imbalances remained very low, representing practically irrelevant values in NCBs' balance sheets. Despite that, significant developments took place during the Euro's planning phase and first few years, that later played a crucial role in the evolution of TARGET balances. This section aims to present and analyse such developments.

The preparatory work for the Euro started in the early-1990s and involved not only setting up the appropriate institutional and legislative arrangements (e.g., the creation of the ECB)

[22] This dissertation's period of analysis ends in December 2021.

but also aligning the monetary policies of European member-states, in an effort to make the transition to the new currency as smooth as possible and to assure its strength.

The monetary policy alignment played a crucial role in the run-up to the Euro. The new currency would engulf a diverse set of economies which, despite the geographical proximity, were still considerably heterogeneous in critical aspects. One of the most notable was inflation. On one side of the picture stood Germany, whose central bank, renowned for its commitment to price stability, served as a model in the design of the European Central Bank (Afxentiou, 2000). On the other side stood southern-European countries such as Italy and Spain, which had to make remarkable efforts to control inflation in order to be admitted into the Euro (Feldstein, 1997).

Together with the convergence in inflation came the alignment of interest rates. All Euro countries would be governed by a single monetary policy, which implied the same reference rates would apply to the whole union. In southern European countries, which traditionally had higher interest rates than central European ones, this resulted in a significant reduction of rates, a stimulus for their economies.

As a result, in the mid-1990s and in the first years of the Euro, these economies experienced remarkable economic vigour. The growth was, however, "tainted by a strong inflationary component" (Sinn, 2011e, para. 13), with wages and prices increasing across the board. Higher prices severely hampered these countries' exporting competitiveness, while higher wages increased their purchasing power with regard to imported goods. As a result, their imports vastly outgrew their exports, throwing their current accounts into negative territory.

Recalling the impact cross-border transactions exert on TARGET, as explained in section 3.2.1, one would expect these countries' TARGET balances to increase significantly during this period, especially considering that most of these countries' imports originated from other European countries, given Europe's increasingly integrated goods and services market. However, such an increase did not occur. Once the Euro and the TARGET system were launched, TARGET claims and liabilities were well under control until the onset of the financial crisis. That is because, at the aggregate country level, payment outflows were being compensated by substantial funding inflows, originating primarily (although not exclusively) from central Europe (Sinn, 2011e). Using balance of payments terms, these countries' large

current account deficits were being offset by exceptional surpluses in their financial accounts. As a result, their TARGET positions tended to be broadly balanced (Soares et al., 2020).

During this period, peripherical countries became very appealing for foreign investment, as they were registering a considerably higher growth performance when compared to their central European counterparts. Furthermore, southern countries' government bonds were now rated as safe, which meant banks were no longer demanded to hold equity capital against them. Moreover, despite the interest rate convergence, these countries' public debt instruments still provided a slightly better remuneration than those of their central-European counterparts, making them comparably more attractive (Sinn, 2011e). More importantly, within these countries' borders, credit was cheaper and more abundant than ever before. The interest rate convergence offered these countries record-low interest rates, while the integrated interbank and financial markets allowed banks to finance themselves easily in other European countries (Soares et al., 2020). As such, in these countries, bank lending became increasingly based on credit these banks obtained from abroad.

The dynamics described above meant the mechanics presented in section 3.2.1 were essentially operating in both directions, with payment outflows being consistently compensated by inflows of similar magnitude, producing an almost perfect equilibrium. Said equilibrium, however, would be brought to an end, after years of market tensions that started to be felt around 2007. As a result, these countries' financial reality and TARGET balances would change irreversibly.

4.2 The financial crisis period

By mid-2006, the United States was experiencing a housing bubble about to burst. Real estate prices had been on a consistent and ever-accelerating rise since the mid- to late-1990s, but the euphoria surrounding the market was starting to fade away. As a result, prices began to stabilise and, not long after, to drop. The inversion of the decade-long upward trend shook the market and triggered a series of events that led to the most severe financial crisis since the Great Depression of 1929. On the opposite side of the Atlantic, the episode marked the beginning of an unprecedented expansion in TARGET balances which persists to this day.

Like an aviation accident, a crisis should never be attributed to a single factor, but to an unfortunate chain of events instead. The 2007 financial crisis is no exception, but the literature seems to agree, for the most part, on a major catalyst of both the boom and the

bust: securitisation. Usually performed by a credit institution, securitisation consists in pooling several assets and issuing a security that is backed by them. As investors acquire these securities, the payments originating from such assets (in the case of a mortgage, the principal and interest payments) are routed to them as if they owned the assets directly.

Securitisation surged in popularity during the 1990s and early-2000s, expanding into not only an increasing number of home mortgages but also other income-producing assets such as car loans, equipment leases and credit card debt (Financial Crisis Inquiry Commission, 2011). For good reason. Loans, especially mortgages, are intrinsically illiquid (Peicuti, 2013). They tendentially have long maturities and non-uniform characteristics, which make them hard to market. As a result, they used to reside in banks' balance sheets until maturity. Securitisation allowed credit institutions to change this reality, transforming these loans into marketable securities. By passing these loans along to investors,[23] credit institutions could refinance themselves more quickly, as they obtained liquidity that could be used to grant more credit. Moreover, since the underlying loans left their balance sheets, banks not only got rid of the risk associated with the credits they underwrote but also gained a valuable tool to help them circumvent restrictions on capital requirements, if necessary. On mortgage-backed securities, the ever-increasing real estate prices provided an additional cushion in case of default.

Accordingly, as securitisation became more prominent, those who granted credit were increasingly disconnected from those who were exposed to its risk (Peicuti, 2013). This weakened banks' risk sensitivity. Over time, lending standards gradually collapsed, credit access was facilitated, and increasingly riskier loans started to pollute the market (Financial Crisis Inquiry Commission, 2011). By the mid-2000s, securitisation had become so widespread that it played a crucial role in maintaining liquidity in the financial system (Peicuti, 2013). In 2007, roughly 60% of U.S. outstanding mortgages (by dollar amount) were securitised, and the securitisation rate on new mortgages was close to 90% (Levitin & Wachter, 2012). In Europe, similar developments were taking place. Banks' primary source of liquidity was no longer the collection of deposits but rather the sale of securities.

As some borrowers started to have more difficulty paying their mortgages, namely (but not exclusively) due to the steady increase in interest rates implemented by the Federal Reserve since 2004, delinquency levels increased. At the same time, housing supply had managed to

[23] This is a simplification of the process, as securitisation usually involves intermediaries.

follow the increasing demand in some areas, stabilising prices. Not long after, in mid-2006, house prices began falling across the country, and liquidity problems started to emerge.

As a result of the aforementioned developments, the financial system started to show increasing signs of fragility (Cecchetti & Schoenholtz, 2017). Nonetheless, it was not until roughly a year later, on 9 August 2007, that it was significantly disturbed. On that day, French bank BNP Paribas announced it would temporarily close three investment funds since "the complete evaporation of liquidity in certain market segments of the US securitisation market has made it impossible to value certain assets fairly regardless of their quality or credit rating" (BNP Paribas, 2007, para. 1).

This announcement sent shockwaves around the world. On the one hand, it revealed just how exposed the financial system was to the risk from low-quality securities. On the other hand, it showed large risk exposures constituted a global problem, with major European banks being as exposed to risk as U.S. ones. A crisis of confidence emerged among market participants, which started to develop more profound doubts about each other's financial health. Consequently, market agents adopted a wait-and-see attitude (Peicuti, 2013), which put global interbank markets in a situation of tension. Trading volumes declined rapidly, and interest rates on interbank transactions surged, deviating significantly from benchmark rates. As a result, liquidity flows began to dry up, creating a significant liquidity squeeze that, if left unaddressed, could have caused severe damage to the financial system (Trichet, 2010).

The ECB was the first central bank to react to the newfound turmoil in financial markets. A few hours after BNP's announcement, the institution conducted an extraordinary operation, through which commercial banks were allowed to withdraw as much liquidity as they needed (against the delivery of appropriate collateral, as discussed in chapter 3), with overnight maturity, at a predefined interest rate (the minimum bid rate on main refinancing operations). In total, 49 banks submitted bids, drawing 94.8 billion euros, demonstrating the shock's severity (ECB, 2007a, 2010c). Over the following days, the ECB conducted three additional operations, which lent a further 116.5 billion euros. Unlike the first one, however, these followed the then-prevailing standard procedure (ECB, 2007a).[24]

[24] Under said procedure, liquidity allotment is performed by means of a competitive auction. Each bank must bid not only how much liquidity it desires but also the price (interest rate) it is willing to pay for it. The total amount of liquidity to be provided is defined in advance by the ECB, which satisfies the bids with the highest rates first.

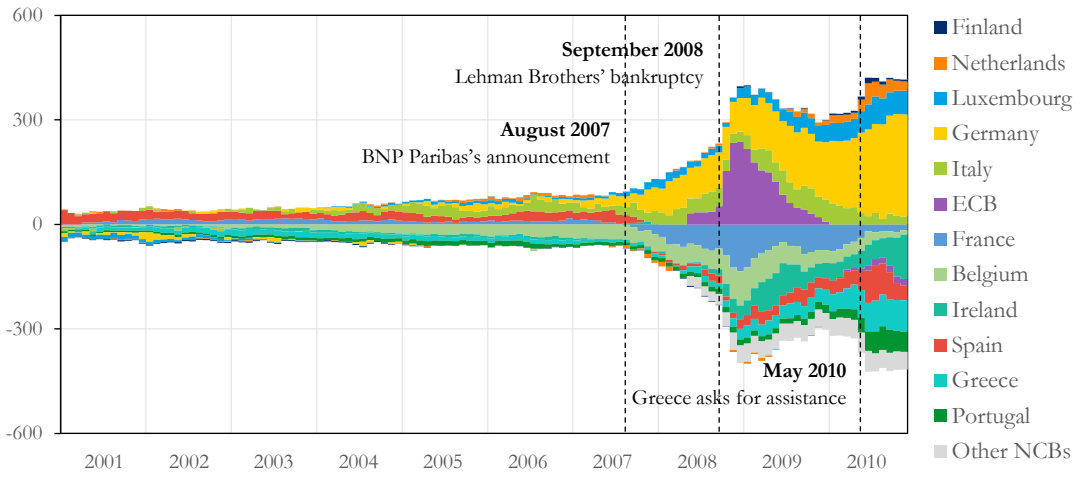
This series of operations marked the beginning of a period of increased market intervention by the Eurosystem. In the months that followed, fine-tuning operations were more frequent, MROs were adjusted to help banks maintain adequate levels of liquidity, and supplementary LTROs with maturities of three and six months were conducted. The outstanding amount of LTROs increased from circa 150 billion euros, in mid-2007, to over 600 billion euros by the end of 2008, increasing the average maturity of ECB's liquidity-providing operations (Trichet, 2010). The Eurosystem also began to provide liquidity in U.S. dollar against euro-denominated collateral, by means of a swap agreement with the Federal Reserve (ECB, 2010c; Trichet, 2010). Through this intervention, the Eurosystem sought to provide the banking system with additional liquidity, so that banks could continue to provide adequate credit to the economy. By doing so, the Eurosystem effectively acted as an intermediary between banks with excess liquidity and banks in need of it, *de facto* replacing the interbank market (Mojon, 2010).

The Eurosystem's intervention impacted most Euro Area countries' TARGET balances, but that impact has been marginal on all cases but that of France, which suffered a profound change. As observed in Figure 4.1, the country, which, before the announcement, had registered predominantly positive (yet low) TARGET balances, saw its balance move into negative territory, consistently growing over the course of the following months.

The deterioration of France's TARGET balance is, by and large, explained by the fact that, over this period, French banks became significantly more active in the Eurosystem's open market operations. This likely stems from the fact BNP Paribas is a French bank. In December 2007, Banque de France's loans related to monetary policy operations amounted to 71 billion euros, an increase of over 400% when compared to the 13.7 billion registered at the end of the previous year (Banque de France, 2008). In December 2008, this amount had almost doubled to a total of 133 billion euros (Banque de France, 2009). The increased participation in monetary policy operations meant that a larger part of French banks' funding corresponded to money being created internally. As such, France's payment inflows were reduced and now sat below its payment outflows, generating a gradual deterioration of the country's TARGET balances.

Also observed in Figure 4.1 is the vast increase in Germany's balance, after years of low balances that frequently oscillated between positive and negative territory. By December 2007, the country's claim on the Eurosystem had more than doubled, from 26 billion euros registered

Figure 4.1 · TARGET balances of selected NCBs, January 2001 – December 2010 (10^9 euros)



Source: ECB Data Warehouse (sdw.ecb.europa.eu/browse.do?node=9691112).

The data points refer to the average values in each month. Data for the ECB and some of the "Other NCBs" is represented only after May 2008, as data referring to previous periods is unavailable.

in July to around 69 billion euros. Germany's improvement, however, is mostly explained by its current account, which registered a surplus of roughly 7.5% of the country's GDP (Deutsche Bundesbank, 2008b). German banks' participation in the Eurosystem's open market operations increased too, but only slightly (Deutsche Bundesbank, 2008a, 2009).

One year later, despite continuous central bank intervention – not only in the Euro Area but in many other economies – money market tensions were still severe. Although central banks' swift intervention restrained the liquidity shortage's effects, money market rates continued to behave abnormally, remaining more volatile than before and registering peculiarly larger spreads at longer maturities. The return to normality still seemed far-fetched (Trichet, 2010).

On 15 September 2008, Lehman Brothers – at the time, the United States' fourth largest investment bank – succumbed to market pressures and filed for bankruptcy. Consequently, tensions escalated to unprecedented heights, transforming the turmoil into a true financial crisis (ECB, 2010b; Trichet, 2010). The growing uncertainty among market participants became overwhelmingly large, and markets seized up. These issues were accompanied by a deterioration in global trade and a remarkable slowdown in economic activity in most developed economies.

In response to the aforementioned developments, in early-October, the ECB, along with five other central banks,[25] announced a key interest rate reduction of 50 basis points (Trichet, 2010), in an effort to stimulate the economy. Over the following months, as the economic downturn lingered on and the situation in global markets showed very little signs of improvement, further cuts were done, bringing most central banks' key rates to historical minima. Between October 2008 and May 2009, the ECB's key rates – (1) the interest rate on the marginal lending facility, (2) the minimum bid rate on the main refinancing operations, and (3) the interest rate on the deposit facility –, were cut from 5.25%, 4.25% and 3.25% (respectively) to 1.75%, 1.00% and 0.25%. Such low rates had not been observed in Euro Area countries since at least World War II (ECB, 2010b).

Interest rate cuts were not enough. The crisis of confidence felt on interbank markets meant credit institutions were lending to each other at rates far above key levels. Had monetary policy been restricted to interest rate cuts, the transmission of said rates to the real economy would be severely hindered. As such, various central banks felt the need to tap into "non-standard" monetary policy measures.

In the case of the ECB, the non-standard measures were included in a policy package named "enhanced credit support", announced in October with the aim to improve the flow of credit to individuals and corporations. One of the package's key measures was the change in procedures for refinancing operations, which would now operate under a "fixed rate full allotment" tender procedure, i.e., similarly to the extraordinary operation of 9 August 2007 described above. In addition, the ECB broadened the list of assets accepted as collateral and reinforced its LTROs, extending their maximum maturity to six months. In May 2009, in an additional effort to drive the Euro Area's economy into a sustained path of recovery, the ECB further lengthened LTROs' maturity to one year and announced the Covered Bond Purchase Programme (CBPP), through which it would perform outright purchases of 60 billion euros worth of euro-denominated covered bonds until June of the following year (ECB, 2010c; Trichet, 2010).

After the shock, TARGET balances suffered a considerable increase. The main driver of said increase was, undoubtedly, the Eurosystem's intervention on markets. As observed in Figure 4.1, the ECB's own TARGET balance registered a vast increase, which is mirrored in a

[25] Bank of Canada, Bank of England, Federal Reserve, Sveriges Riksbank and Swiss National Bank.

generalised way across the NCBs' TARGET balances. This may seem counter-intuitive, considering the previous discussion on the decentralised nature of the Eurosystem's monetary policy. There is, however, good reason for this. The increase is related to the ECB's swap agreement with the Federal Reserve to provide liquidity in U.S. dollar in the Euro Area, which, although available before Lehman's bankruptcy, the swap line saw most of its utilisation after the shock. Its peculiar impact on TARGET balances results from the fact that, in simple terms, the swap line is split into two parts: one established between the ECB and the Federal Reserve, and a group of other swap lines established between the ECB and each NCB (ECB, 2009).

All the non-standard measures mentioned above were thought of as temporary. Indeed, by late-2009, as conditions in financial markets showed signs of stabilisation and the monetary policy transmission mechanism gradually became more reliable, the ECB started to slowly phase them out (ECB, 2010c). Throughout 2009, banks had gradually become more active in the money market, thus becoming less dependent on the Eurosystem for financing. This is mostly noticeable in LTROs, which started to be performed less frequently. The liquidity the Eurosystem provided to the banking sector was still above pre-crisis levels but was gradually being reduced (ECB, 2010b). As activity in markets slowly resumed, TARGET balances started to recede slowly.

It seemed that the worst was over (Trichet, 2010). However, severe tensions would soon start to develop in the European sovereign debt market, bringing another downturn to the European economy, further exacerbating TARGET balances, and going as far as to threaten the Euro's existence.

4.3 The sovereign debt crisis period

Despite the unfortunate developments in global markets, throughout the financial crisis' first couple of years, Euro Area sovereign debt markets remained relatively undisturbed (Lane, 2012). However, by late-2009, the situation started to take a turn for the worse. At this point, the financial crisis had already taken a significant toll in economic activity. The increased expenditure in countercyclical fiscal measures, along with the decline in tax revenue, had, predictably, deteriorated member-states' finances. The worsening of public finances was more worrying in periphery countries, whose economies had suffered harder from the crisis. Moreover, it was becoming clearer that the scale of the damage had exceeded most

expectations, with countries such as Spain and Ireland reporting larger-than-expected structural deficits. Concomitantly, the weak banking sector, which could trigger the need for government bailouts, continued to pose a remarkable threat to the solvability of many countries' public finances (Lane, 2012).

Adding to this environment of high government structural deficits and accelerating debt levels, in October, the then-newly-elected Greek government made an alarming announcement. The executive would be revising its projection on the 2009 fiscal deficit from 6% to a staggering 12.7% of the country's GDP (Lachman, 2010; Lane, 2012). To make matters worse, it was revealed that the country had been masking the true extent of its structural deficits, namely using derivative instruments that circumvented EU's reporting rules. Later in the same month, the government admitted the country had been misreporting budget data for years, even before it had joined the Euro, in order to meet convergence criteria (Lachman, 2010).

Due to the above-stated developments, investors' confidence in the sovereign debt bonds of peripherical countries started to erode. Yields on their sovereign bonds started to creep up, and an increasing spread between them and the remaining Euro Area countries' yields started to appear. Before the crisis, this difference was minute. Since sovereign debt bonds of Euro Area countries are denominated in a common currency, differences in the expected yield mainly represent disparities on perceived credit risks and volatility (Lane, 2012). By early-2010, the Greek yield started to diverge more decisively from the remaining peripheric countries, as the country's public debt situation became increasingly unsustainable.

Not long after, in May 2010, Greece's increasing debt problems led the country to ask for financial assistance. The news was not taken kindly by market agents, for whom Greece became associated with considerably higher risk premia. Moreover, there was a widespread fear that other highly indebted European countries could be in a similarly unsustainable situation. As a result, some secondary markets for government bonds started to dry up, with buy orders vastly decreasing and yields quickly expanding, reaching unprecedented levels (Cour-Thimann & Winkler, 2013).

To reduce tensions in said markets, which are important for the transmission of monetary policy, the ECB announced it would start purchasing Euro Area government bonds on the

secondary market,[26] under a programme called Securities Market Programme (SMP). It was later revealed that the intervention had involved Greek, Irish and Portuguese titles (Ghysels et al., 2017). The intervention was effective, stabilising sovereign debt markets and bringing sovereign bond yields to a more manageable level (Cour-Thimann & Winkler, 2013). Still, although stabilised, these markets were not operating under normal conditions. Risk aversion was still considerably higher than before the crisis and, despite the Eurosystem's intervention, it reflected on yields; only not so vehemently. Tough markets, coupled with unsustainable debt levels, eventually brought two other countries to ask for official assistance: Ireland, in November 2010, and Portugal, in April 2011.

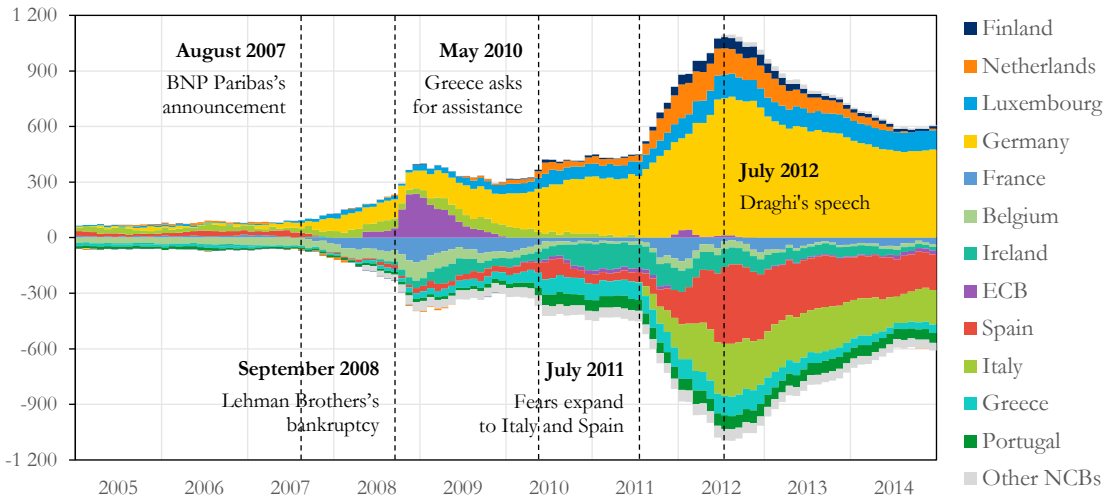
On account of these events, banks in Greece, Ireland and Portugal were now virtually cut from the European interbank market, having to resort to the Eurosystem for the vast majority of their financing needs. Foreign investors, faced with increased risks, refrained from rolling-over their investments and even domestic investors started to have a more marked preference for safer investments in other countries (Baldo et al., 2017). Put more simply, these countries experienced a sudden stop in capital flows. In Greece and Ireland, this situation was aggravated by a deposit flee towards countries seen as safer, such as Germany (Storbeck, 2011).

As a result, the equilibrium described in section 4.1 no longer existed. Peripheric countries continued to experience significant payment outflows, despite the slowdown in economic activity, but the financial inflows were drastically reduced. Since payment inflows fell short of payment outflows, these countries gradually started to accumulate TARGET balances.

As can be observed in Figure 4.2, Greece and Portugal's TARGET balances have a high degree of co-movement, both increasing as Greece asked for assistance – even though Portugal's request would only come almost a year later – and stabilising at roughly the same time. Ireland's, by contrast, started to increase later, roughly two months before the country asked for assistance, and grew for longer, becoming the Eurosystem's TARGET liability by the end of 2010. Spain's case is also worth of note, as the country registered a larger-than-usual TARGET balance during the summer of 2010, but it reduced again during the autumn. On

[26] The ECB is prohibited from buying government bonds on the primary market, as that would constitute monetary financing. In addition, these purchases were sterilised through liquidity-absorbing operations, so as to not increase the liquidity available in the economy.

Figure 4.2 · TARGET balances of selected NCBs, January 2005 – December 2014 (10^9 euros)



Source: ECB Data Warehouse (sdw.ecb.europa.eu/browse.do?node=9691112).

The data points refer to the average values in each month. Data for the ECB and some of the "Other NCBs" is represented only after May 2008, as data referring to previous periods is unavailable.

positive terrain, Germany solidified its place as the system's largest creditor, while Luxembourg and the Netherlands registered slowly-increasing, albeit considerably smaller, TARGET claims.

By early- to mid-2011, TARGET balances were at record levels for the time, but seemed to have stabilised. However, since April, three Euro Area countries were under assistance programmes. This meant the fears of Greek contamination had become real. As such, said fears started to spread to other countries: "which would be next?". This put the Italian and Spanish bond markets under significant pressure, as they too were struggling with their public debt situation, although not to the same extent as the other three member-states.

The spread of solvability fears to Italy and Spain was very worrying. Greece, Ireland and Portugal represent a very small portion of the Euro Area's population. At the time, Greece and Portugal were home to roughly 10 million people each, and Ireland to about 4.6 million (Eurostat, 2011). Consequently, the countries' contribution to the Euro Area's total public debt was low. Italy and Spain, by contrast, were the third and fourth largest Euro Area countries by population size (respectively), and, together, represented roughly one third of the Euro Area's total population and public debt (Eurostat, 2012) at the time.

As fears over Italian and Spanish bonds arose, these countries' financial institutions started to face funding problems similar to those of Greece, Ireland and Portugal, although not to as much of a severe degree. As a result, their TARGET balances vastly expanded. By the end

of the year, both countries had surpassed Ireland, becoming the system's largest debtors with liabilities of circa 150 billion (Spain) and 160 billion euros (Italy).

In essence, fears of sovereign defaults were not only impairing interbank markets but also segmenting them along member-states' borders (Eser et al., 2012). This meant banks were reluctant to lend to each other, but even more so to foreign ones. In addition, central European banks were especially distrusting of those situated in the periphery. As a result, on the one hand, banks in the countries most hardly affected by the crises were living through a constant liquidity shortage, finding it very hard to finance themselves if not via the Eurosystem's liquidity-providing operations. On the other hand, banks in central European countries frequently had excess liquidity but, instead of lending it to other credit institutions, often opted to keep it, creating a liquidity buffer. During this time, the use of the Eurosystem's deposit facility increased significantly, as can be observed in Figure 3.1 (section 3.2.2).

All things considered, the Euro's existence was at stake, and the ECB needed to act swiftly and decisively to stop these fears from spreading. It did, and its intervention is the reason Italy's and Spain's TARGET balances grew so rapidly. In early-August, the institution decided to reactivate the SMP, intervening mainly in the Italian and Spanish bond markets, but also in the Irish and Portuguese ones, as these too were under pressure after both countries asked for official assistance. In total, SMP purchases totalled 218 billion euros (Ghysels et al., 2017). In addition, the Eurosystem launched a second Covered Bond Purchase Programme (CBPP2) and reinforced LTROs once again, with maturities of up to one year (Eser et al., 2012). This further increased the average maturity of ECB's liquidity-providing operations.

The strong financial market tensions continued to dampen economic activity in the Euro Area, and the economic outlook was bleak. As a result, by the end of 2011, key interest rates, which had been raised slightly in early-2011, were reduced back to 2009 levels. In addition, the ECB announced an additional set of measures aimed at fostering credit to households and corporations, which were observing a substantial credit crunch. The measures included, *inter alia*, the allotment of two LTROs with 36-month maturity, to be performed on 21 December 2011 and 24 February 2012, and the reduction of minimum reserve requirements from 2% to 1% (Eser et al., 2012).

The Eurosystem's intervention was playing a key role in guaranteeing stability in the short- to medium-term. However, the Euro was going through the toughest period in its history, and there were crippling fears that the single currency would survive to this crisis. A breakup of the Euro seemed more imminent than ever.

4.4 The period following Draghi's "whatever it takes" speech

As tensions kept escalating, on 26 July 2012, one day before the opening of London's Olympic Games, Mario Draghi is invited to deliver a speech at the "Global Investment Conference", a business summit occurring in the same city, organised by the UK government to strengthen its international business relations (Wanke, 2017). On that day, Draghi would be representing the ECB alongside figures such as the governor of the Bank of England, the OECD Secretary-General and the IMF's Managing Director – which, coincidentally, was Christine Lagarde, who would come to succeed him in the ECB's presidency years later – (UK Foreign & Commonwealth Office, 2012).

Knowing all too well about the tensions, as well as this conference's global reach and media coverage, Draghi seized the opportunity to make an impactful speech that would hopefully help bringing some calm to markets. He chose to highlight the Euro's strengths, stating the Euro Area was "much stronger than people [acknowledged]" (Draghi, 2012, para. 3) and drawing an analogy between it and a bumblebee, an insect whose wings are very small for the size of its body but still allow it to fly. Moreover, he emphasized the effort being made at the time to not only circumvent the crisis but also make the common currency more resistant to future ones, hinting at a multitude of structural reforms about to be presented, which would "graduate the bumblebee into a real bee" (Draghi, 2012, para. 5). Towards the end of the speech, he stated the ECB were convinced the Euro was irreversible and finally uttered the famous expression – "Within our mandate, the ECB is ready to do whatever it takes to preserve the Euro. And believe me, it will be enough" (Draghi, 2012, para. 19) –, implicitly promising unlimited support to Euro Area banks, markets and countries (Alcaraz et al., 2019). He ended the speech by acknowledging the Euro's biggest challenge at the time was the financial fragmentation discussed in the previous section.

Financial markets responded very positively to Draghi's words, which seemed to have gone a long way towards alleviating tensions. The effect was felt almost immediately: in the days that followed, spreads on peripherical countries' sovereign debt yields dropped considerably,

continuing their downward trend during the following weeks and months (Wanke, 2017). This was helped by the fact that, in the following month, the ECB announced the introduction of Outright Monetary Transactions (OMT), a program through which the institution would acquire Euro Area sovereign bonds with maturities between one and three years on the secondary market. As with the SMP, OMTs would be fully sterilised. The program was, however, never activated (Alvarez et al., 2017).

Calm in the markets made banks feel less and less the need to resort to the Eurosystem as a lender of last resort. A large degree of financial market segmentation persisted, but slowly went down. As a result, the Eurosystem's intervention on markets gradually declined, and so did TARGET balances. During the next couple of years, intra-Eurosystem balances would slowly decline in a generalised manner. As evidenced by Figure 4.2, the decrease in TARGET balances was generalised, affecting all countries in a relatively similar manner.

Over the course of 2013 and 2014, the economic outlook for the Euro Area was slowly showing signs of improvement. Concomitantly, financing conditions improved substantially across the whole Euro Area, with periphery countries' sovereign bond yields continuing to decline. This was further helped by the ECB's decision to start providing forward guidance on key interest rates, in order to better manage agents' expectations, and to announce it would continue to provide liquidity under the fixed rate full allotment procedure for as long as necessary in all refinancing operations (Alvarez et al., 2017).

4.5 The Asset Purchase Programme period

By mid-2014, the European post-crisis recovery was starting to lose momentum, causing inflation, which remained low, to decline even further. Concomitantly, the improvements in credit conditions brought by previous monetary policy decisions were not being successfully translated into easier credit conditions for households and firms, especially in peripherical countries (Alvarez et al., 2017). As a response to such developments, the ECB announced a set of measures that would change the landscape of its monetary policy framework and, simultaneously, mark a new phase in the development of TARGET balances.

The ECB's policy adjustment happened in two phases. Initially, in June 2014, the ECB announced an interest rate cut and the introduction of a series of eight targeted long-term refinancing operations (TLTROs). Both measures were historical. On the one hand, the interest rate cut, although small, marked the first time one of the ECB's key rates dipped

below zero.[27] On the other hand, the TLTROs, which would be conducted at quarterly intervals from September 2014 to June 2016, had a record-long maturity of four years and one crucial distinguishing factor: their "targeted" nature. Unlike regular LTROs, the amount banks could borrow under these operations was positively linked to the loans they granted to households and non-financial corporations.

In September, the ECB announced a further interest rate cut and, most importantly, a return to outright asset purchases, via two new private sector purchase programmes: the Covered Bond Purchase Programme 3 (CBPP3), whose purchases started in October, and the Asset-Backed Securities Purchase Programme (ABSPP), whose purchases started in November. The CBPP3 had similar objectives to its predecessors, while the ABSPP was mostly aimed at providing Euro Area financial institutions with incentives to issue simple, transparent and robust asset-backed securities, thus fostering the sound development of the Euro securitisation market (Alvarez et al., 2017).

The measures had the intended effect on the economy, with market rates falling significantly and real economy credit conditions improving. However, by early-2015, inflation was still weak, with indicators of expected inflation falling to historical lows (Alvarez et al., 2017). There was a high risk that a long period of consistently low inflation laid ahead.

Against this background, in January 2015, the ECB announced the implementation of an additional asset purchase programme, dubbed Public Sector Purchase Programme (PSPP), through which it would purchase bonds issued by Euro Area governments and agencies, as well as a few international or supranational institutions (ECB, 2022c). Moreover, the three programmes would now start to be taken together, seen as members of an "umbrella" policy package which is simply referred to as the Asset Purchase Programme (APP).

The APP marked a vast expansion of the Eurosystem's asset purchases. Combined, its three programmes were set to perform purchases worth 60 billion euros each month, at least until September 2016 (ECB, 2015). Of the three, PSPP has been the APP's largest contributor by far, consistently representing roughly 80% of APP's monthly purchases. The PSPP contributed to such a large portion of total purchases that, in its first month (March 2015), PSPP's purchases were worth almost as much as all the purchases the other two programmes

[27] The rate on the deposit facility, which stood at 0% since July 2012, was reduced to –0.10%. The rates on the main refinancing operations and the marginal lending facility were reduced, respectively, to 0.15% and 0.40%.

had performed until that point. As such, the APP, and particularly the PSPP, marked the beginning of a fully-fledged quantitative easing programme for the Euro Area.

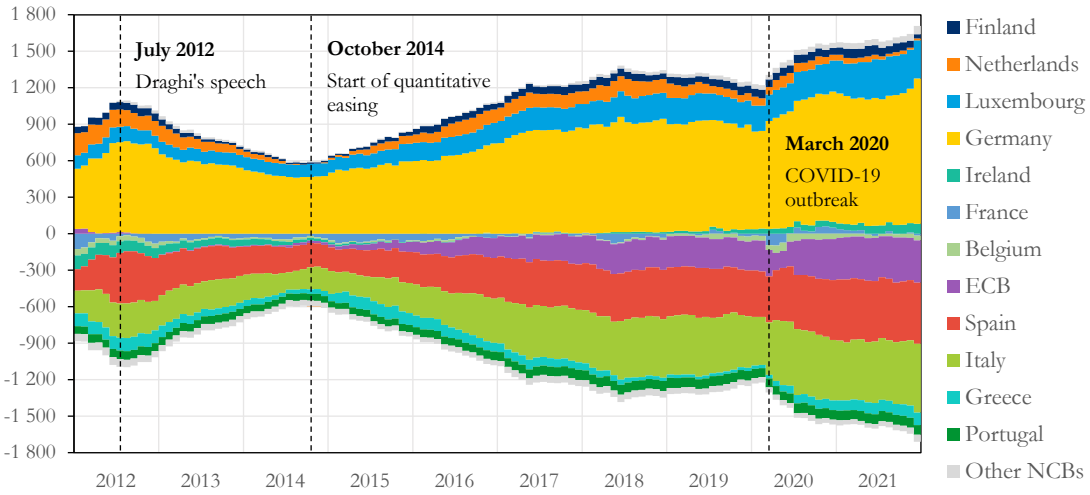
By the end of the year, with inflation still far below target, the ECB performed two additional rate cuts, in December 2015 and March 2016, which brought key interest rates to 0.25%, 0.00% and –0.40%. In addition, the institution decided to increase asset purchases to 80 billion euros per month starting in April 2016, as well as to broaden the APP's reach into Euro-denominated bonds issued by non-bank corporations, by launching a fourth asset purchase programme, called Corporate Sector Purchase Programme (CSPP) (Alvarez et al., 2017). Over the following months, the programme would contribute to 10% to 15% of APP's monthly purchases. Finally, a new series of TLTROs (TLTRO II) was introduced, containing four operations with similar characteristics to the first ones.

As the inflation outlook gradually started to improve, the Eurosystem began to slowly phase out the APP. In March 2017, monthly purchases were reduced to 60 billion euros per month, in January 2018, to 30 billion and, in September 2018, halved once again, situating at 15 billion until December of the same year. By January 2019, APP purchases had ceased to expand, with the ECB's mandate being only to maintain the size of its cumulative purchases, performing a reinvestment of funds as its assets reached maturity. By October, the ECB decided to reactivate APP's active purchases, by increasing its portfolio of assets by 20 million euros each month. The reactivation was due to a further decline in inflation (ECB, 2022c).

As a result of the Eurosystem's intervention during this period, but particularly the PSPP, the Eurosystem's balance sheet registered an unprecedented expansion (as can be observed in Figure 3.1, situated in section 3.2.2). TARGET balances, in turn, grew substantially. As Figure 4.3 depicts, the growth in TARGET balances was, once again, generalised, affecting all countries in a very similar manner. Moreover, it loosely accompanied the intensity of APP's new purchases, increasing rapidly during 2015 and 2016, slowing down in mid-2017 and stabilising (albeit with a slight decreasing trend) in 2018. Worth of note is Germany's TARGET position – which reached new heights, standing close to 900 billion euros by the end of 2019 –, as well as the ECB's – which, as a result of the institution's partial participation in the purchase of assets, grew from a balanced position, by early-2015, to exhibit a liability of circa 250 billion euros by the end of 2019.

In this period, the dynamics behind the evolution of TARGET balances had changed. They were no longer being driven by the strains in the financial system, which got particularly

Figure 4.3 · TARGET balances of selected NCBs, January 2012 – December 2021 (10^9 euros)



Source: ECB Data Warehouse (sdw.ecb.europa.eu/browse.do?node=9691112).

The data points refer to the average values in each month.

acute by the time of the sovereign debt crisis. Instead, the increase in TARGET balances was now primarily being caused by the increasing amount of liquidity present in the banking system, as described by the end of section 3.2.2. With minimum reserve requirements still at 1% and the Eurosystem providing banks with immense amounts of liquidity in order to stimulate inflation, the room for Euro Area banks to make cross-border transactions with the liquidity received from the Eurosystem became more ample. As such, TARGET balances vastly increased, even in the absence of liquidity strains.

4.6 The COVID-19 period

The COVID-19 outbreak has prompted an unprecedented health and economic crisis at the global scale. Detected for the first time in China in late-2019, the virus quickly spread around the world. In Europe, the first case was reported in France, in late-January 2020. Thereafter, contagion occurred at an increasing pace. By early-March, the number of cases registered in Europe was already in the thousands, with the vast majority of countries reporting at least one case within their territories (Spiteri et al., 2020).

A large outbreak was soon identified in Northern Italy, which became the first European country to declare a nation-wide lockdown, on 9 March 2020. The objective was to reduce the risk of contamination and prevent health services from being overloaded. Other

countries followed suit and, a little over a week later, on 18 March 2020, lockdowns already affected over 250 million EU citizens. (Henley & Oltermann, 2020).

The wave of lockdowns spreading across Europe had enormous economic repercussions. The crisis brought economic activity to a halt in many economic sectors and caused a wide array of supply chain issues. As Lagarde (2020) states, the economic shutdown resulted in an unusual recession, which took a larger toll on sectors that tend to be less sensitive to the economic cycle, such as services, while exerting a considerable lighter impact on typically fragile sectors, such as manufacturing and construction. As lockdowns lasted through time, their effects got progressively worse, and the gradual return to normality, with its vast set of restrictions, did not help the situation. As a result, the shock had a strong deflationary component. As it hit the Euro Area at a time when inflation was already low – much lower than the ECB's target of 2% *per annum* – the danger of deflation was considerably larger.

The ECB reacted swiftly to the developments. With its monetary policy toolkit still limited by the scenario of historically low interest rates, the institution, once again, resorted to unconventional monetary policy instruments, reinforcing the provision of liquidity. Its first measures were announced in mid-March. Besides measures such as the conduction of additional LTROs and the easing of conditions for TLTRO III (conducted in June), the ECB's response included a further expansion of the APP, via the so-called Pandemic Emergency Purchase Programme (PEPP). Initially, the programme was designed to provide 750 billion euros in liquidity until the end of the year. However, as the pandemic continued to weigh on economic activity well into mid- and late-2020, the program was eventually expanded twice – by 600 billion euros, in June, and a further 500 billion, in December –, reaching a total of 1.85 trillion euros. All the while, the remaining asset purchase programmes continued to operate, registering 20 billion euros of net purchases each month, plus a 120 billion euro added from March to December 2020, also as a response to the pandemic (Aguilar et al., 2020; Banco de España, 2020).

The vast increase in asset purchases during this period had, yet again, an enormous impact on TARGET balances, whose grand total catapulted from roughly 1,200 billion euros (in February 2020) to roughly 1,800 billion euros by the end of 2021. As growth dynamics are the same as described in the previous section and, once again, the increase was well distributed across Euro Area countries, this is further evidence on just how much impact asset purchases can exert on TARGET balances.

5 The implications of TARGET balances

The increase in TARGET balances described in chapter 4 started to attract the attention of some economists by early-2011, as the Euro Area was going through the sovereign debt crisis. At the time, Greece and Ireland had already asked for official assistance, and Portugal would do so not too long after, in April 2011. A lively discussion on the mechanics and meaning of said balances soon emerged. The discussion, eventually called "TARGET debate" played a major role in shaping the perceptions economists have today about these imbalances' implications.

The debate was triggered in late-February 2011, when the renowned German economist Hans-Werner Sinn started expressing his concerns over what the increasing imbalances meant for the Eurosystem, but particularly for Germany. As stated in Chapter 4, as European peripheral countries started to be starved of private inflows of money, they started to resort to the Eurosystem's liquidity-providing operations more intensely. As a result, the amount these countries obtained in monetary policy operations outweighed their NCBs' participation in the ECB's capital. Sinn called this a bailout (Sinn, 2011a, 2011b, 2011c, 2011d), arguing it allowed countries such as Greece or Portugal to keep sustaining high current account deficits even with the loss of capital inflows or, as he put more bluntly, "made it possible for them to continue living beyond their means" (Sinn, 2011c, sec. 'The size of the problem').

Sinn's critics stated that his views constitute an oversimplification of reality (Bindseil & König, 2012; Jobst, 2011; Storbeck, 2011), denying that the Eurosystem's intervention constituted a bailout. In addition, they argued that, although there was a correlation between current account deficits and TARGET balances, the relationship between them and TARGET balances was nuanced, as has been discussed in chapter 4.

Garber (2010) had already identified that, in the event of such a capital flight from a Euro country, the Eurosystem's institutional arrangements are such that the rest of the Eurozone would automatically finance such capital flight. Banks established in struggling member-states would become more active in open market operations, in turn making the Eurosystem assume the role of lender of last resort. This shall happen – he added – for as long as the banks in that country have collateral to offer and that collateral is accepted by the ECB.

As mentioned in chapter 4, since the onset of the financial crisis, the Eurosystem had reinforced its liquidity provision vastly, while lowering standards for collateral. In other words, the Eurosystem had made it possible for the situation Garber describes to perdure for much longer, allowing TARGET balances to acquire a considerably larger magnitude.

Returning to Sinn's vision, the author was worried the increased liquidity provision and lower collateral standards would make the situation perdure for too long. He was well-aware of the risks involved. The Eurosystem was financing banks with increasing signs of fragility, whose sovereigns might not afford to rescue them in case of default, all while accepting lower-quality assets as collateral, which included those countries' own sovereign debt.

Risks were high, and Sinn (2011a, 2011d, 2011e) recognised that a substantial part of them would be borne by Germany. Not because of the size of its TARGET claim, as the risks are not related to that. As explained by Deutsche Bundesbank (2011), each NCB's share of the risk is based on the ECB's capital key, just like its share of the Eurosystem's profits. Indeed, Germany has the largest portion of the ECB's capital; however, that is due to the country's size and economic power. As discussed in section 3.2.3, the capital key reflects, in equal parts, a country's share in the population and GDP of the EU. Ergo, even in case of dramatic defaults, German taxpayers would not be paying considerably more or less than any other European taxpayer. Still, German taxpayers would be paying for other countries' responsibilities.

In addition, Sinn feared that the fact that a larger portion of monetary creation was now being done in peripheric countries could induce liquidity shortages on banks located within TARGET creditor countries' borders, hampering their credit granting activity. Indeed, periphery countries started to obtain a disproportionately large fraction of the refinancing credit (reaching as high as 70%), with German banks, traditionally the largest borrowers in refinancing operations, reaching percentages as low as 5% (Bindseil & König, 2012). However, as stated by ECB (2011), a positive TARGET balance does not create credit constraints, as TARGET-creditor countries are natural recipients of cross-border payment flows from other Euro Area countries. Moreover, the fixed rate full allotment regime introduced by the Eurosystem meant the banking system was being provided with all the liquidity it sought for, which further degrades Sinn's argument.

Despite Sinn's alarmism, TARGET balances were, indeed, a very worrying topic at the time, as they were rooted on severe and asymmetrical liquidity strains in the banking system, coupled with structural disequilibria in peripherical countries' current account deficits and public finances under strain.

Nowadays, the situation is vastly different. TARGET balances are now being primordially caused by the enormous amounts of liquidity that are free to move throughout the financial system, as described in the later part of section 3.2.3. They are no longer a sign of a deep liquidity strain affecting the Euro Area's financial system unevenly, nor the sign of a crisis of confidence that split Euro markets along member-state borders. However, they still entail some crucial risks, which are discussed in the next section.

6 Conclusion

Having studied the past of TARGET balances, observed their dynamics, seen how they have evolved, and assessed the risks they entailed, it is now crucial to look ahead, towards their future, and the challenges it will certainly bring along.

TARGET balances are now over 50% bigger as they were at the height of the sovereign debt crisis, and over twice the size as when the TARGET debate started. As has been stated, they are no longer a sign of a financial system on the verge of collapse, increasingly unsustainable sovereign debt levels or vast balance of payments disequilibria.

However, these balances still entail important risks. Not because they represent risky credit to fragile banks, or to sovereigns whose debt levels are becoming too unbearable, but instead, because the Euro itself is still in a fragile situation.

The Euro is a project in construction. It is an unprecedented experience from which both participating countries and external (observer) countries have been learning a lot, and adjusting accordingly. The global financial crisis and the sovereign debt crisis have demonstrated just that, highlighting key points of failure in the currency union that the European Union had to correct. The European Union has responded decisively, with reforms that, adapting Draghi's words, are graduating the bumblebee into a real bee. Great examples of which are the Banking Union and the reform to the Stability and Growth Pact.

Nevertheless, the Euro is still not a real bee, and there are a few problems laying under the horizon which can shake its foundations. For instance, the increasing rise in inflation intensified by the war in Ukraine or the subsequent rise in interest rates, which can put European sovereigns – which maintain fairly high debt values – under stress once again. Or even, on a different note, a rise in populist movements across Europe, which may end the project by popular vote.

With all these challenges in mind and with the great uncertainty the future always entails, it is safe to say that, yes, TARGET balances are still a cause for concern, but mostly because the Euro itself also is.

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