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European Monetary Unification through Novation: The Political Economy of the TARGET System

Steffen Murau* and Matteo Giordano†

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When Economic and Monetary Union became effective in January 1999, it remained unclear what accounting treatment to choose for claims and obligations that the Eurosystem's National Central Banks (NCBs) incur against each other in the 'Trans-European Automated Real-Time Gross Express Transfer' (TARGET) system. The Governing Council of the European Central Bank (ECB) decided only later in 1999 that they should be shifted to the ECB as an intermediating balance sheet—a process called 'novation'. This decision has decisively shaped the countenance of the monetary union and its fate throughout the subsequent two decades but so far escaped the scrutiny of scholarship in International Political Economy (IPE). This paper adopts the perspective of critical macro-finance, which approaches the monetary system as a hierarchical web of interlocking balance sheets, to study the political-economic role of the TARGET system and its successor, the TARGET2 system. We theorize on monetary unification and show that novation of claims and obligations to a third-party balance sheet is not the only possible solution to 'stitch together' separate monetary systems at their apex, but likely was the only one politically feasible. Drawing on historical TARGET and TARGET2 data, we explain how the novation method at the top of the hierarchy has repeatedly served to defend the integrity of the monetary union, both monetarily and politically. It has also enabled the evolution of the ECB balance sheet as an idiosyncratic tool that the Eurosystem could use to tackle multiple problems, in particular setting up swap lines and introducing unconventional monetary policy.

Keywords: Critical macro-finance; payment system; European Central Bank; Eurocrisis; unconventional monetary policy; swap lines

* Boston University, Global Development Policy Center, smurau@bu.edu
† University of London, School of Oriental and African Studies, Department of Economics, 638454@soas.ac.uk

1. Introduction

In 1999, the Governing Council of the European Central Bank (ECB) took a wide-ranging but barely communicated decision about how to handle claims and obligations that National Central Banks (NCBs) of the European System of Central Banks (ESCB) incur against each other in the TARGET system. TARGET stands for 'Trans-European Automated Real-Time Gross Express Transfer' system and was introduced in January 1999 when the Economic and Monetary Union became effective. Monetary unification was a key component of the European integration project, partly in reaction to problems of the European Monetary System (EMS) and its Exchange Rate Mechanism (ERM). When it came live, however, many details were left open and had to be figured out along the way. One of them was how to handle open claims and obligations of NCBs against each other, an issue that is masked when the Eurosystem balance sheet is consolidated and that arises with the deepening of regional financial integration. This question ended up on the table of the ECB's Governing Council, which comprises both the six permanent members of the Executive Board and the governors of the NCBs. The council decided that at the end of each business day, NCBs' bilateral claims and obligations against each other should be first netted out, and then all remaining claims and obligations should no longer be directed against each other but shifted to the ECB as an intermediated balance sheet which would thus effectively function as a central counterparty (CCP) for NCBs—a process that is called *novation.*

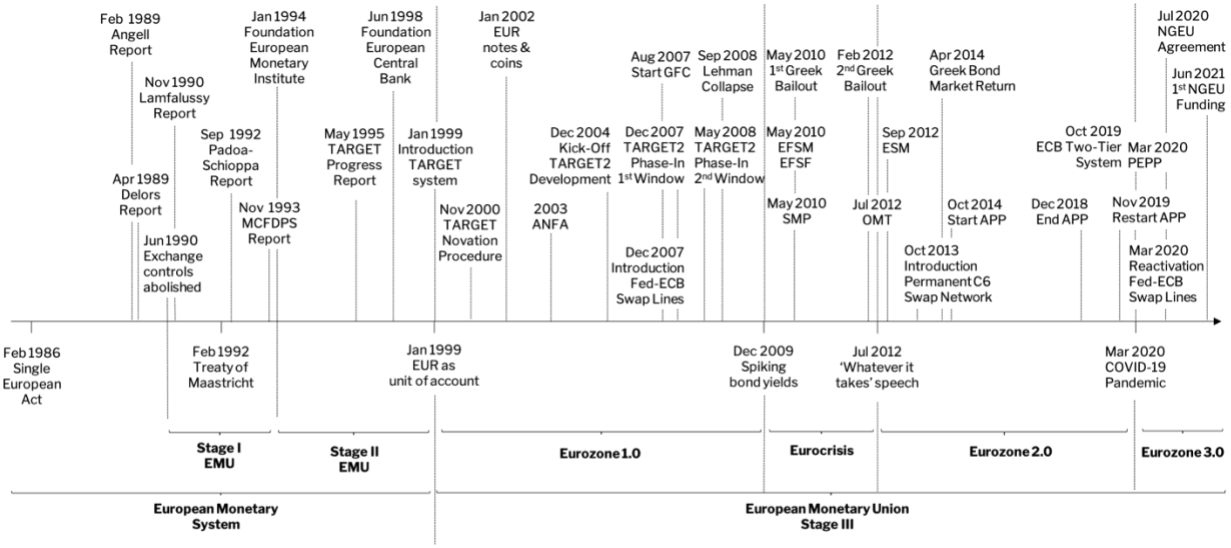
The decision to shift mutual claims and obligations of NCBs to the ECB via novation has decisively shaped the countenance of the European Monetary Union (EMU), the real-world monetary arrangement that was created at the result of the Economic and Monetary Union project. It has crafted the mechanism how the monetary union is held together at its apex and granted an idiosyncratic role for the ECB balance sheet in the Eurosystem. It completed a process that got formally initiated with the Treaty of Maastricht but had long been in the making before (cf. timeline in Figure 1).

European monetary unification, in a metaphorical sense, was a surgical operation to stitch together different separate European monetary systems at the apex of their domestic monetary hierarchies, the level of central banks, with an automatic payment system that is unlimited in volume and can fund cross-border payment imbalances. What was to hold them together—"irrevocably", as it is stated in the public language—was the TARGET system. It was planned and developed by the European Monetary Institute (EMI), the predecessor of the ECB which existed from 1994 to 1998. Fighting against a tough schedule, the ECB established TARGET as a minimum viable product just in time for Stage III of EMU to start in January 1999. As apparently not all details had been clarified at that point, it was left for the Governing Council to decide only after the start of operations how the apex of the Eurosystem's monetary hierarchy should work and how the 'surgical stitches' were supposed to hold the patient together, for everything that was yet to come. Its solution—the novation procedure—became effective in November 2000 (Banca d'Italia 2000, 266). Today, it is codified in Article 6 of the *ECB TARGET Guideline* (ECB/2012/27).

We know little about how the decision of the Governing Council to use novation came about: when exactly it was made, how the decision-making process looked that led to it, or if any alternatives lay on the table. The council meets behind closed doors and keeps its decisions notoriously secret. Among publicly available sources, only indirect reference is occasionally made to the decision, for instance in Banca d'Italia (2000) or Cour-Thimann (2013). The decision follows a series of reports,

published by committees at the Bank for International Settlements (BIS), on payment systems and interbank netting schemes. Chief among them are the Angell Report (BIS 1989) and the Lamfalussy Report (BIS 1990). These informed the activities of the Working Group on EU Payment Systems, established by EU central banks, which from 1994 were continued under the auspices of the EMI. As its milestones, the Working Group published the Padoa-Schioppa Report of September 1992 and the *Minimum Common Features for Domestic Payment Systems* report of November 1993 (Giovanoli 1997, 536; ECB 1999a). In these reports, novation features as the preferred technique for multilateral netting that would bring least credit and counterparty risk, provided that the CCP has a strong liquidity position (BIS 1989). Novation was notably absent, however, in the EMI's main progress reports on the development of the TARGET system (EMI 1995a; 1995b; 1996). It appears that as the development of the EMU project progressed, the question of how to handle open claims and obligations at the top of the monetary hierarchy was either absent or kept confidential.

Figure 1—Timeline of European monetary integration and the TARGET and TARGET2 systems



Abbreviations: APP: Asset Purchase Programme; ANFA: Agreement on Net Financial Assets; EFSF: European Financial Stability Facility; EFSM: European Financial Stability Mechanism; EMU: European Monetary Union; ESM: European Stability Mechanism; EUR: Euro; GFC: Global Financial Crisis; MCFDPS: Minimum Common Features for Domestic Payment Systems; NGEU: Next Generation EU; OMT: Outright Monetary Transactions; PEPP: Pandemic Emergency Purchases Programme; SMP: Securities Markets Programme; QE: Quantitative Easing; TARGET: Trans-European Automated Real-Time Gross Settlement Express Transfer System

The importance and the consequences of the novation decision have so far not been recognized by scholars of International Political Economy (IPE) or neighbouring disciplines. In fact, the paramount significance of the TARGET system in general is widely overlooked, just as the role of payment systems in the US Federal Reserve System have remained poorly studied for decades (Rossi 2007; Wolman 2013). Payment systems are a notoriously dry and technical topic to study. The politics and strategic choices that come with payment system design often remain beyond the attention of IPE scholars and students. As it is difficult to find an appropriate conceptual approach to the issue, they are usually treated as a merely 'technical' issue and remain depoliticized.

Only during the Eurocrisis did the payment system between the ECB and the NCBs receive some academic scrutiny—then in the form of the TARGET2 system, the successor of the original TARGET system, which was introduced in the course of 2007 and completely replaced TARGET in May 2008. The discussion was started by Sinn and Wollmershäuser (2012) who interpreted the TARGET2

system as mirroring the balance of payments and argued that it allows illegitimate current account financing while opening up a way for crisis-ridden countries with a negative TARGET2 balance to incur perpetual debts on the surplus countries. Drawing on an older paper by Peter Garber (1998a), they expressed the worry that Germany as the largest TARGET2 surplus country lends money to the Eurozone periphery and would lose billions or trillions of Euros in case of an EMU break-up. Some authors agree with them (Westermann 2014; Blake 2018), and they have later doubled down on their points (Sinn 2014; 2018). These arguments, revolving around the 'current account' explanation of TARGET2 imbalances, also gave rise to a streak of populist literature, outright vilifying the EMU institutions, the TARGET2 system, and the profligate peripheral countries.

There were many critical responses to Sinn and Wollmershäuser that tried to clarify things. Among the first respondents were Whelan (2011) as well as Cecchetti, McCauley, and McGuire (2012). The big issue was how to normatively interpret the TARGET balances. Do they matter or are they just 'statistical' features? Are they connected to the balance of payments or not? Maybe the two best and most detailed ones—written by ECB staff who defend their employer against Sinn—are Cour-Thimann (2013) and the working paper of Bindseil and König (2011), which was published in a modified form as a journal article in *Credit and Capital Markets* (Bindseil and König 2012). Additionally, the idea of a 'monetary policy' explanation of TARGET imbalances rather than Sinn's 'current account' one was put forward by Cecioni and Ferrero (2012) who also outline the fact that rising TARGET imbalances do not cause changes in the net external position of member countries as they substitute *official* for *private* flows. Other responses involve De Grauwe and Ji (2012a) who argue that TARGET claims could be made void without suffering losses because the value of central bank money as 'fiat money' is independent of central banks' assets. Another frequent topic is comparing the TARGET2 system and its balances with the settlement practices within the Federal Reserve System (Lubik and Rhodes 2012; Eichengreen et al. 2015).

The literature on TARGET2 has continued to evolve in a number of ways, especially with the advent of the Eurosystem's Asset Purchases Programmes (APPs) in 2014. There are econometric studies of how to interpret TARGET2 balances (Abad et al. 2013; Auer 2014; Eisenschmidt et al. 2017; Chmielewski and Sławiński 2019; Cheung, Steinkamp, and Westermann 2020), technical analyses considering how NCBs can exit the TARGET2 system (Papadia 2014; Malinen et al. 2016), scholars analysing the TARGET2 system in relation to the 1944 Keynes Plan for an International Clearing Union (Lavoie 2015; Amato et al. 2016; Barredo-Zuriarrain, Molero-Simarro, and Quesada-Solana 2016; Rossi 2016; Mazier and Valdecantos 2019; Kregel 2019), the TARGET2 system as a risk-sharing mechanism (Schelkle 2017), as well as sociological studies focusing on the conceptual ambiguities of the TARGET2 system and how individuals deal with it (Krarup 2016; 2019; Sahr 2019). However, we still lack a proper political economy account of the role that the TARGET and TARGET2 systems play for European monetary unification that includes the politics connected to their introduction, the institutional reality they have created, and the process of institutional transformation they have triggered.

To fill this gap of an institutionalist IPE account of the TARGET and TARGET2 system, we adopt the lens of critical macro-finance (Gabor and Vestergaard 2018; Gabor 2020). We understand the monetary and financial system as a hierarchical web of balance sheets which interlocks through different financial instruments that on some balance sheets exist as assets and others as liabilities (Mehrling 2011; Tooze 2018; Guter-Sandu and Murau 2022). Money is defined as a specific subset

of credit instruments that exist within this web of interlocking balance sheets and that hierarchically higher institutions issue as liabilities for hierarchically lower institutions that hold them as assets. Liabilities of central banks, notably reserves and notes, are the hierarchically highest forms of money within their jurisdictions; liabilities of commercial banks, notably deposits, are located one layer below (Murau and Pforr 2020). The TARGET system is the institutional structure located at the apex of the Eurozone's monetary hierarchy to connect previously autonomous NCBs and the ECB, thus connecting the national monetary jurisdictions of the individual member states. As Bindseil and König stress (2012), a balance sheet view is the only possible methodological account that can analytically do justice to the TARGET and the TARGET2 system. Analyzing the hierarchical tiering and the way in which different balance sheets are stitched together allows to coherently unveil the structures and mechanisms that underpin the EMU.

Our analysis makes clear that stitching together the NCB balance sheets with TARGET as a real-time gross settlement (RTGS) system and shifting mutual claims and obligations of NCBs to the ECB balance sheet via novation was by no means the only possible and not necessarily the most elegant way to achieve monetary unification but likely the only one politically feasible. It neither required that any of the EMU member states had to take the symbolically difficult step to give up their domestic central bank, nor was any central bank singled out to implement monetary policy for the monetary union as a whole. Rather, all NCBs remained in charge of implementing monetary policy in what previously was 'their' domestic monetary system, and the ECB balance sheet was added. While novation was a logical final step to deal with claims and obligations of NCBs against each other in the TARGET system, it is not surprising that it could only be introduced *post factum* in Stage III, when TARGET was already up and running. Novation shaped a monetary union in a form that had not been seen before, with an apex—the ECB—that provides elasticity space in an automatic fashion and without any quantitative limits. Since 1999, novation has played a key part in holding the monetary union together. It has helped provide elasticity space to maintain par between EUR-denominated instruments in all EMU member states, allowed a fundamental transformation of the ECB into an autonomous 'firefighting' balance sheet, and created 'sufficient' obstacles to prevent EMU member states from the leaving the monetary union.

We connect our critical macro-finance analysis with data provided by the Eurosystem Statistical Data Warehouse and through the reports on Statistical and Account Balance sheets of the Eurosystem. The data available for TARGET balances is inherently limited because it comes only in a *net* and highly aggregated format, which prevents analysis of gross flows across jurisdictions (cf. Borio and Disyatat 2011). Not only does this represent a major methodological challenge that has not been solved in the literature on TARGET balances, it also prevents a correct understanding of the specific drivers of such balances. These are residuals of payment flows that originated from participants in the system, which are strictly confidential and are not shared by the ECB even upon request. Our analysis, however, is not affected by these limitations as we seek to provide an understanding of the significance of both the TARGET system and TARGET balances for the process of monetary unification. While refraining from simplistically interpreting TARGET balances as 'stealth bailouts' or signs of financial instability, we draw balance sheets and balance sheet mechanisms, which we seek to reconcile with available TARGET data, taking into account its *ex post* nature as a residual that is difficult to interpret.

As a result, we provide a macro-financial approach to monetary unification from a payment system perspective that contributes to the burgeoning IPE literature on the politics of central banking in

Europe. This literature has addressed important topics such as market neutrality (van 't Klooster and Fontan 2020), securitization and repo markets (Gabor and Vestergaard 2018; Braun 2020), risk management (van 't Klooster 2022), unconventional monetary policy (van Doorslaer and Vermeiren 2021), communication (Diessner and Lisi 2020; Moschella and Diodati 2020; Moschella, Pinto, and Diodati 2020), democratic accountability (Collignon and Diessner 2016), and the costs of exiting the Euro (Lapavitsas 2018; Durand and Villemot 2020). Ultimately, our focus on the monetary plumbing offers a new dimension for the study of regional fiscal and investment policies (Mertens and Thiemann 2018; 2019), both carried out through the payment system outlined here. Our account adds a take on the politics involved with payment system questions and the political economy of choosing different strategies of monetary unification connected to various techniques for stitching together previously independent monetary systems at their apex.

The remainder of this article is organized as follows. Section 2 looks at the organization of cross-border payments in Europe prior to monetary unification and the associated problems. Section 3 compares three different scenarios for stitching together the previously independent monetary systems at their apex and shows that monetary unification through novation was primarily chosen for political reasons. Section 4 uses historical TARGET and TARGET2 data to explain how the novation method at the top of the hierarchy has repeatedly served to defend the integrity of the monetary union and enabled the evolution of the ECB into a discretionary 'firefighting' balance sheet. Section 5 concludes.

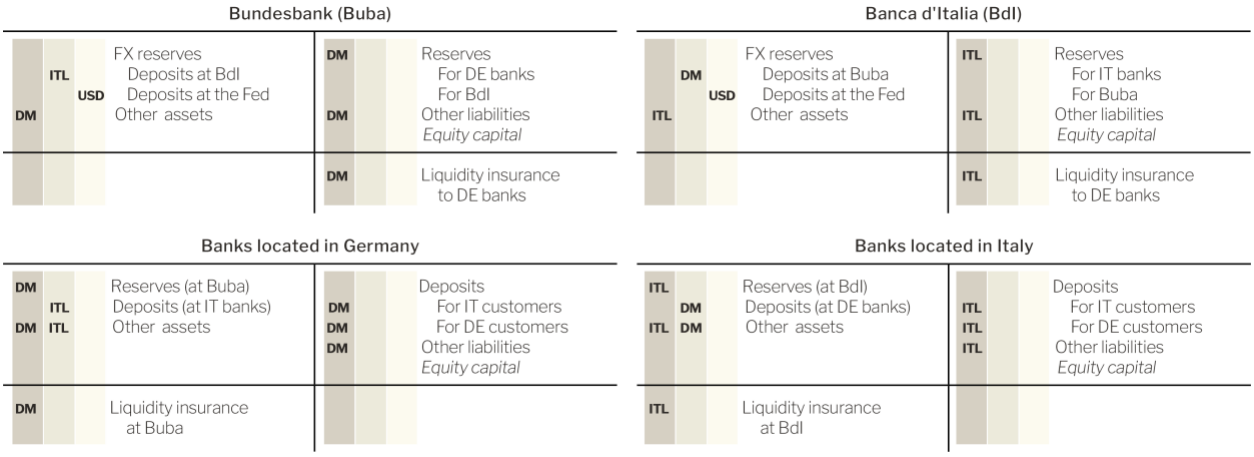
2. The European Monetary System prior to Monetary Unification

The challenge of monetary unification, from a critical macro-finance perspective, is how to stitch together previously separate monetary systems, understood as a web of interlocking balance sheets with a domestic hierarchy of central banks and commercial banks. Such challenge arises especially with the monetary unification of advanced capitalist countries with developed financial systems whose legacy monetary systems need to be integrated with one another despite their differences. EMU is a project that attempted precisely this. It must be seen in the context of European political and economic integration after the Second World War and the desire to complete the single market (Jabko 1999; 2006). After the 1956 Treaty of Rome, EMU had been on the agenda at least since the early 1960s, also in order to establish a European single currency as a counterweight to the international role of the US dollar (USD) (Szász 1999, 12, 20). It received its first big push in the context of the Werner Report (1970).

2.1 Cross-border payment and funding in the correspondent banking system

To sketch the initial position for the EMU project, Figure 2 depicts the national monetary systems of Germany and Italy before monetary unification as a simple model of hierarchical balance sheets. Following Murau (2020), this notation style places assets on the left-hand side and liabilities on the right-hand side of each balance sheet, and connects them with one or more units of account that the instruments can be denominated in. Moreover, the methodology distinguishes *actual* from *contingent* assets and liabilities. Actual assets and liabilities are placed in the upper part of each balance sheet. These are instruments that can in principle be observed on each balance sheet; the difference between both determines an institution's solvency position, expressed via its equity capital. Contingent instruments, placed in the lower part of each balance sheet, are implicit or explicit guarantees or insurances that hierarchically higher institutions grant to hierarchically lower institutions and that only become actual instruments in the moment of a crisis. While not observable during 'normal' times, contingent instruments are of paramount importance for the 'elasticity space' of a balance sheet—its ability to expand and avoid illiquidity or insolvency in the moment of a crisis.

Figure 2—German and Italian monetary jurisdiction without monetary union

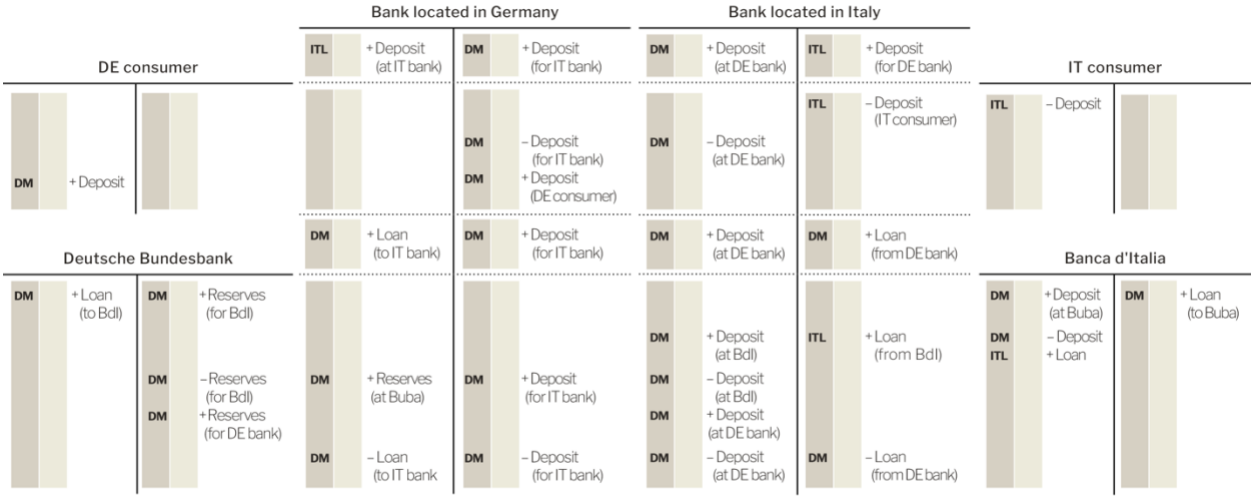


Both the German and the Italian monetary jurisdiction have their own unit of account, the Deutsche Mark (DM) and the Italian lira (ITL). Its central banks—the Bundesbank and the Banca d'Italia—form the apex of the domestic hierarchy of money, commercial banks are situated hierarchically below them. The commercial banks issue deposits as liabilities both to domestic and international customers. As assets, they hold the reserves of their central banks and deposits at correspondent banks, next to various other loans and securities. The central banks issue reserves and other instruments such as notes as liabilities. Their assets, next to various loans and securities, comprise foreign exchange (FX) reserves, which include deposits that they hold with each other as well as the international reserve currency, here the US dollar (USD). Central banks also provide liquidity insurance as contingent liabilities to banks in their monetary jurisdiction, for whom they are contingent assets.

Figure 3—proceeding in four steps that are separated with dotted lines—shows how cross-border payment flows are carried out in such a setting via correspondent banking relationships between German and Italian banks (cf. Giovanoli 1997; ECB 1999a) and how the funding of cross-border payment imbalances can be organized (Mehrling 2020). We assume in our example that an Italian consumer wants to transfer deposits held in ITL to a German consumer held in DM and that this transfer is the only net cross-currency payment flow, which makes Germany structurally a 'surplus country' and Italy a 'deficit country'.

The first step shows how a correspondent banking relationship is established: the German and the Italian bank grant deposits to each other in their respective currencies. The German bank issues a DM-denominated deposit as its liability, which the Italian bank holds as its asset. Vice versa, the Italian bank issues an ITL-denominated deposit as its liability, which the German bank holds as its assets.

Figure 3— Cross-border payment and funding without monetary union



The second step displays how the cross-currency transaction takes place. To transfer the deposit of the Italian consumer, the Italian bank symmetrically reduces the ITL deposits it has issued as liabilities and the DM deposits it holds as assets, while the German bank substitutes its DM deposit for the Italian bank with a deposit for the German consumer. This is the cross-currency leg of the transaction, which takes into account the prevailing exchange rate between both currencies.

This example is simplified insofar as we assume that the banks of the German and the Italian consumers both act as correspondent banks for each other. This case may apply if both consumers hold accounts at one of the large banks in the monetary jurisdictions. A more complex chain of payments would involve that the Italian consumer's bank is a small peripheral bank which has to make a domestic transfer to a larger Italian bank, which in turn organizes the cross-border leg with a large German bank. Subsequently, the large German bank passes on the transfer to a smaller German bank at which the German consumer holds their account. Under such circumstances, it would become necessary that the small and the large banks in both countries settle with each other with central bank reserves (not depicted here). The cross-border structure of the transaction, however, remains fundamentally the same.

The structural payment imbalance endangers the fixed exchange rate system as it creates a pressure on the DM as surplus currency to appreciate vis-à-vis the ITL, unless a surplus balance sheet is willing to use its elasticity space to fund the imbalance. Accordingly, the third step depicts how this funding of the structural payment imbalance occurs via private balance sheets on the interbank market when the German bank grants a loan to the Italian deficit bank. This operation could also happen before the cross-border payment, but we show it as ex-post funding to emphasize the structural nature of funding the imbalance. The German bank charges the respective interbank rate as interest, which reflects market sentiments on the payment imbalance and would increase with worsening deficits. This allows that the payment imbalance does not immediately appear in the spot exchange rate, which would break the peg, but rather in the forward exchange rate, which is implied in the interest rate differential.

Should the German banks no longer be willing to lend to Italian banks, it is possible to substitute the private with public cross-border funding through central banks. This happens in the fourth step. Banca d'Italia takes a DM loan from Bundesbank and lends the DM instruments on to the Italian commercial bank. When the DM instrument becomes the asset of the Italian bank, the Bundesbank has to shift its reserves from BdI's account to a German banks' account which grants a loan to the Italian bank as it cannot have a liability at Bundesbank. Finally, the Italian bank uses the deposit acquired to pay off the private loan to the German bank. This demonstrates how central bank balance sheets are the last resort to fund payment imbalances and defend fixed exchange rates on the forward market before they can show up in the spot price.

This balance sheet example, while idealized, explains the structural challenge European policymakers have been grappling with in their attempts to stabilize exchange rates and build the single market. It demonstrates how private interbank markets are the first resort and central banks the last resort balance sheets to fund imbalances and stabilize the peg. The political conflict line was between surplus central banks, foremost the Bundesbank, which was unwilling to fund excessive imbalances and could insist on occasional settlement of the loans either with DM or USD, and deficit central banks, which had to accumulate increasing foreign indebtedness, pay interest, and eventually repay the loan, while mimicking the surplus countries' monetary policy decisions. Compromises between surplus and deficit countries included repeated exchange rate adjustments, which reduced the need to fund imbalances but distorted economic integration and invited speculative attacks of large hedge fund investors against the fixed exchange rate regimes (McNamara 1998).

2.2 The European Monetary Cooperation Fund

In 1973, as a measure to stabilize the exchange rate peg and improve cross-border funding, the central banks of what then was the European Economic Community (EEC) established the European Monetary Cooperation Fund (EMCF)—effectively a predecessor of the ECB balance sheet

The Werner Plan of 1970 had suggested the introduction of a 'European Reserve Fund' (ERF) used for pooling FX reserves of EEC central banks. The EMCF had the somewhat lesser ambition to help stabilize the 'Snake in the Tunnel' by reducing exchange rate fluctuations. To this end, it offered the Very Short-Term Financing Facility (VSTFF) as a means for deficit central banks in the EMS to replenish their FX reserves (European Communities – Commission 1984; Bordo and Schwartz 1987; De Grauwe and Peeters 1989; Louw [1987] 1987). Due to conflicts between central banks and the Commission, however, it remained largely unused in the first years of its operation (Szász 1999, 46–49). In 1978, the ESCF received a major makeover when the EMS was established and the European Currency Unit (ECU) was introduced as a new unit of account. Even though the French proposal to convert the EMCF into a 'European Monetary Fund' with the ability to autonomously hand out short and medium-term loans to central banks did not materialize (Szász 1999, 51–60), the EMCF did receive the authority to receive reserves from EEC central banks and issue ECU-denominated instruments in return (cf. Article 1, Council Regulation (EEC) No 3181/78 of 18 December 1978).

Figure 4 depicts this setting on-balance-sheet. As actual assets, the EMCF holds reserves of the Bundesbank and Banca d'Italia denominated in their national currencies. More specifically, at the inception of the EMS, EEC central banks deposited 20 percent of their gold reserves and 20 percent of their USD reserves at the EMCF, even though not outright but in the form of three-month revolving swaps (European Communities – Commission 1984, 18). In turn, these central banks receive ECU-denominated reserves from the ECMF, which they hold in their FX reserves. The VSTFF features as a contingent instrument on the balance sheets. It effectively increases their elasticity space as it allows EEC central banks to borrow reserves from each other. The denomination of the contingent instruments in ECU offers a mechanism to determine the respective exchange rate for those transactions.

Figure 4—The European Monetary Cooperation Fund in the European Monetary System

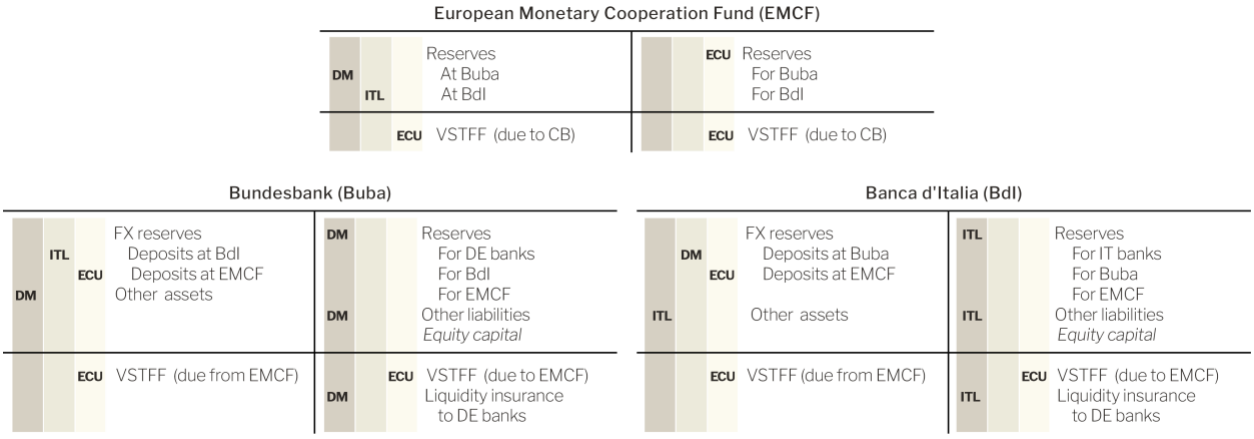
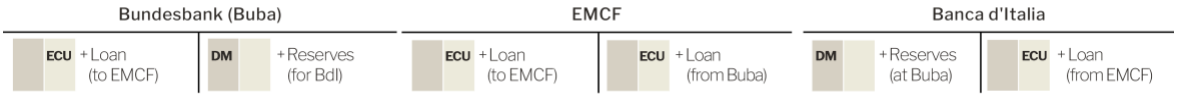


Figure 5 shows the balance sheet mechanics associated to borrowing via the VSTFF. Following the logic of our example, the BdI is in need of DM reserves to operate in the FX market. For the sake of our example, private transactions matter only in so far as they create pressure on the Lira-DM peg, forcing the central banks to intervene in the foreign exchange market. In normal times central banks would be able to operate bilaterally. However, when central bank reserves become limited and the pressure on the exchange rate mounts, the VSTFF comes into play by coordinating not the intervention in FX markets by the two central banks but the funding of the deficit central bank for unilateral intervention in FX market. In our case, the BdI intervenes by purchasing Lira in exchange for DM, acquired by incurring a liability in ECU against the VSTFF (Vaubel 1980; Garber 1998b). The VSTFF acts as the linchpin for this transaction.

Figure 5—Borrowing via the Very Short-Term Financing Facility



Failure by the central bank of the strong currency country to be ready to provide liquidity in its own currency would translate in the mechanism of matching liabilities and assets to break down. This failure occurred for instance in the ERM crisis of 1992, which saw Germany unwilling to provide unrestrained short-term supply of DM to Italy, which was driven off the peg. Such unwillingness is primarily driven by two consequences of the VSTFF mechanism: the acquisition of exposure to market risk of the Bundesbank by accepting ECUs since a devaluation of the DM would entail a loss for the Bundesbank, and the effects of DM-denominated credit to be injected in the foreign exchange market on the German monetary base, which then would need to be sterilised to avoid interferences with Bundesbank's monetary policy.

Speculative attacks on pegged exchange rates were one of the reasons for European policymakers to foster plans for monetary unification in the 1980s. The primary argument, however, was that the completion of the single market project required the permanent and credible removal of exchange rate fluctuations for the undistorted flow of goods and a simplification of cross-border payments. Moreover, there was a desire to improve monetary policy operations in Europe. In the EMS, the Bundesbank was the lead central bank whose monetary policy decisions had to be mimicked by all other EMS central banks in order to defend the peg. Monetary unification was meant to provide a truly European monetary policy which would take into account the economic and financial conditions in all member states on an equal footing. European unification had been advocated in technocratic circles for decades. For example, the Werner Report and the Delors Report played an important role.

However, the breakthrough towards monetary union only happened in the context of the fall of the Iron Curtain. In a 'grand bargain', French President François Mitterrand offered his agreement to German reunification to Chancellor Helmut Kohl against his commitment to give up the DM and introduce a single currency. This compromise had already been on the horizon since the time of Willy Brandt and Georges Pompidou in the late 1960s (Szász 1999, 28). In the early 1990s, concrete steps were taken to bring the EMU project to completion.

3. European monetary unification through novation

The Delors Report explains that EMU "would imply complete freedom of movement for persons, goods, services and capital, as well as irrevocably fixed exchange rates between national currencies and, finally, a single currency", which "in turn, would imply a common monetary policy" (Delors 1989, 13). However, as our critical macro-finance framework shows, the more specific additional challenge for monetary unification is to find an alternative mechanism to the correspondent banking structure of private banks and the flow of FX reserves in between central banks in case there are net imbalances between the different commercial banks. This is an additional payment system dimension of monetary unification (Bindseil and König 2012), the political economy of which has so far received insufficient academic scrutiny.

In fact, there are multiple possibilities for connecting the payment systems of previously independent monetary systems, all consistent with introducing a single currency—i.e. irrevocably fixing the exchange rates of national currencies with the ECU, which then is renamed into EUR—and setting up a single monetary policy. We can imagine at least three different scenarios for achieving monetary unification, each of which represents a different approach of 'stitching together' the balance sheets at the apex of the new monetary union and comes with different advantages and disadvantages. We will compare those scenarios along four separate but connected dimensions. First, as concerns *financial institutions*, we ask what arrangement of hierarchical balance sheets to choose. Second, with regard to the dimension of *financial instruments*, we wonder how those balance sheets in the monetary union should be connected for cross-border payments. Third, we look at how *monetary policy* should be organized within the web of interlocking balance sheets. And fourth, from a *political economy* perspective, we discuss what political process could, if at all, lead to an agreement of all parties involved to such a design for monetary union.

3.1 Scenario 1: Monetary unification with a Single Central Bank

As a first scenario, let us imagine that instead of two central banks, there will be only one central bank put in charge of both domestic banking systems who would then, for all intent and purposes, become one banking system and one monetary jurisdiction.

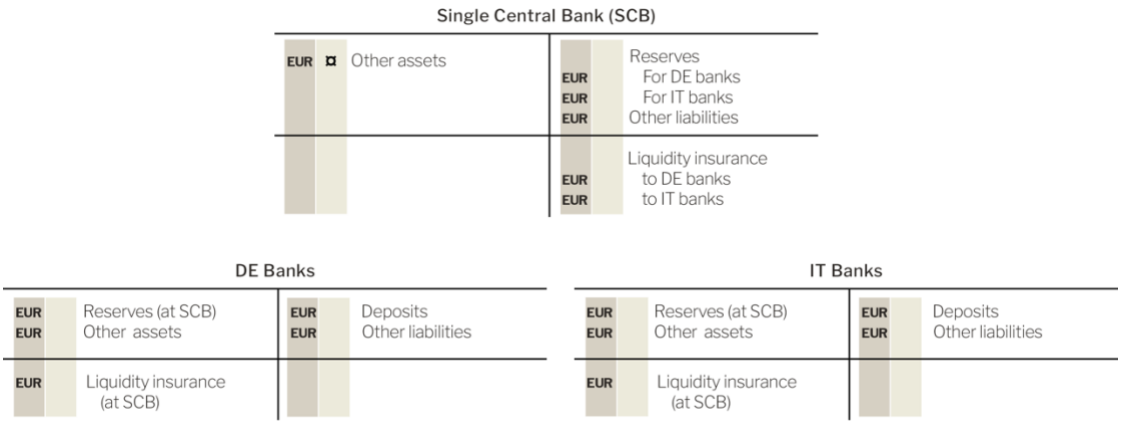
Figure 6 visualizes this system with a Single Central Bank (SCB). This outcome could be achieved if simply one of the two central banks takes over and replaces the other central bank. For instance, this is what happened in the German monetary unification after the reunification of 1990. Alternatively, a new central bank could be created that replaces the previous ones. In both cases, there will be only one type of reserves issued by the SCB denominated in the EUR as the single unit of account. All commercial banks are connected to the SCB in the same way and are subject to the same types of liquidity insurance. The problem of cross-border payments would become obsolete as both domestic monetary systems are fully merged. All correspondent banking structures would disappear, just as the need for cross-border shifting of FX reserves between deficit and surplus central banks or a cross-border emergency liquidity mechanism such as the VSTFF.

Monetary policy would work exactly as in any national monetary system. The SCB determines the interest rate and hence the conditions under which commercial banks can borrow reserves via the

liquidity insurance mechanisms or deposit reserves at the SCB. Moreover, the SCB can autonomously carry out open market purchases or sales of securities to expand or contract its balance sheet. Any monetary policy operation, whether conventional or not, would expand or contract the SCB balance sheet and the reserve accounts of the commercial banks within the monetary union, regardless of their location. If needed, for example, both Italian and German banks have the same access to the SCB balance sheet if they possess the collateral meeting the requirements and can thus expand their reserves account. The SCB does not discriminate against the banks' origins and would cover the role of a central bank with all the sovereign governments.

The relationships between government financing and the SCB remain of speculative nature but it is highly unlikely that a system with a SCB could coexist with incomplete political, fiscal, and banking union. For instance, problems could arise if the quality of debt securities issued by one of the monetary union's member states was lowered below the collateral threshold, as happened during the Eurozone crisis. In a non-federal Europe, the links between national governments that issue their own debt securities for most of their funding while federal fiscal transfers are absent and the domestic banking sectors are strong and still constrained by national boundaries. Similarly, the SCB would have to also centralise the non-monetary policy operations that were previously carried out by the national central banks for their own governments.

Figure 6—Scenario 1: Monetary unification with a Single Central Bank



While an elegant solution on-balance-sheet, it is hard to imagine how such a scenario could have been politically feasible in the context of European monetary unification (cf. Szász 1999, Ch. 14). It can be taken for granted that France or Italy likely would not have accepted that the Bundesbank, which was the leading central bank in the EMS, takes over the role of a European SCB and replaces the Banque de France and the Banca d'Italia. Vice versa, it can be ruled out that Germany would have accepted giving up the Bundesbank entirely and submit to the monetary authority of France or Italy. Moreover, for smaller member states such as the Netherlands, membership in the monetary union was not supposed to imply entirely submitting to one of their bigger neighbours but rather to enhance their own effective monetary sovereignty (Murau and van 't Klooster 2022). Hence, although the elevation of the ECB as entirely supranational bank with its own set of liabilities and acting as settlement institution has been proposed as a solution to the inconsistencies arisen with the Eurozone crisis (Rossi 2016), it seems obvious that such solution did not get adopted. There was no political decision-making process that could have led to it as an outcome.

3.2 Scenario 2: Monetary unification with an Interdistrict Settlement Account

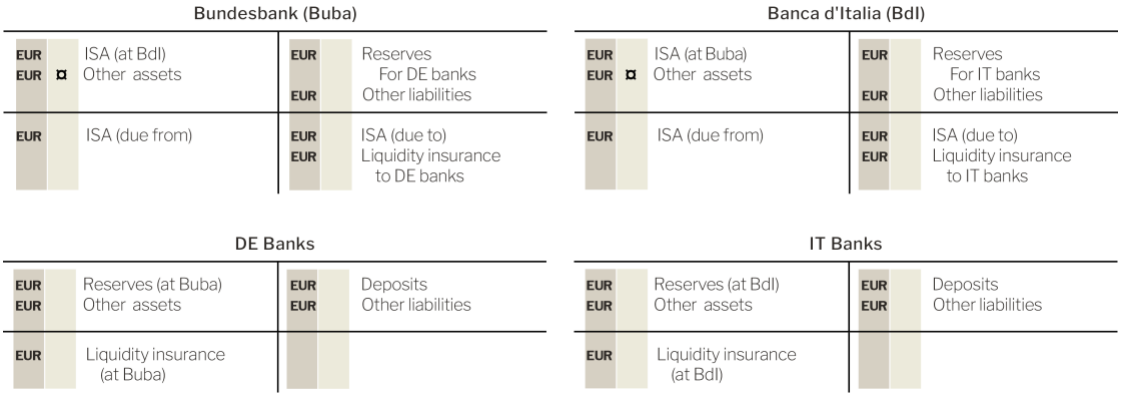
A second scenario for monetary unification, which does not involve the integration of monetary jurisdictions into a single one with one SCB, would be to choose a similar institutional solution as the US Federal Reserve System. This would entail setting up a new clearing and settlement system between both central banks within which claims and obligations of both central banks against each other can emerge and be recorded.

Along those lines, Figure 7 shows the integration of payment systems across districts and thus from one District Central Bank (DCB) to the other. The commercial banks have reserve accounts with the respective central bank districts (BuBa and BdI) and receive different types of liquidity insurance from them. The payment systems are integrated and the liabilities of the two central banks are valued at par and with the same unit of account. The important difference compared to the SCB model is that cross-districts payments are channelled through the central banks district balance sheet: the reserve account of the commercial banks that initiate the transfers decreases while the reserve account of the commercial banks receiving the transfers increases. No correspondent bank is needed because there are no payment systems to bridge.

As payments from one district to another must not be limited to maintain the par value of different DCBs' liabilities, there can be net inflows or outflows of liquidity from one district to the other. To bridge the balance sheets of the different DCBs, a linking system needs to appear as a rebalancing item on the central bank districts balance sheets: the Interdistrict Settlement Account (ISA). We have adopted the name 'ISA' from the Federal Reserve System and record it—in line with the Financial Accounting Manual methodology of the Fed (Federal Reserve System 2022)—only as assets of the DCBs.

ISA balances are bilateral claims between DCBs that arise with the changing reserve accounts. This accounting style seeks to make sure that an increase of the reserve account liabilities at a DCB caused by an inflow of liquidity is met with an increase of the assets shown on the DCB balance sheet, in this case interdistrict claims. We think of the possibility that the ISA increases ('due from') or decreases ('due to') as contingent assets and liabilities that expand the elasticity space of the DCBs. The need for such an unlimited elasticity space between both DCBs arises precisely because there is no SCB.

Figure 7—Scenario 2: Monetary unification with an Interdistrict Settlement Account



For the implementation of a single, coherent monetary policy across the monetary union, one of the DCBs must take the lead over the others—just as the New York Fed does in the US system. This DCB carrying out the monetary policy operations then *de facto* adopts the role of the apex in the interdistrict settlement system. For banks across the monetary union, access to the apex balance sheet becomes paramount because it is the only way to receive emergency liquidity in the form of final means of payments. Hence, the hierarchy among the DCBs in this scenario does not depend on the technical unification of the payment systems but on the operationalisation of the DCB balance sheets for monetary policy purposes, which inevitably spills over into the inter-district payment system.

In this scenario, there is not a single operational balance sheet for the system of DCBs. Instead, the size of system's balance sheet is a consolidation of the DCB balance sheets, netted for the inter-district balances. It follows the model of the Federal Reserve System which has itself a system of settlement for ISA that has been refined throughout the century but still required tweaking during the global financial crisis (Koning 2012). To avoid the build-up of interdistrict imbalances, the ISA are settled on a yearly basis in April of every year based on the average yearly balance. The assets used to settle these balances have changed throughout time, notably from gold certificates to the reallocation of SOMA domestic and foreign portfolios in 1975 (Wolman 2013; Eichengreen et al. 2015). The Gold Settlement Account—the original form of the ISA—limited the elasticity space of the ISA as it reduced the permanent overdraft and relied on settlements in gold amongst DCBs. In the context of EMU, such interdistrict settlement of ISA balances would have led to the problem that Europe lacks a sizable market for EMU debt securities. Therefore, it would have been necessary to use national government securities for settling ISA balances. This is a suboptimal institutional setting, for instance as it grants major advantages to the issuers of 'safe' sovereign bonds.

For European monetary unification, the introduction of an interdistrict settlement system with a Federal-Reserve-style ISA might have been more politically feasible than the introduction of an SCB because no EMU country would have had to give up their central bank. At the same time, using one of the DCB balance sheets as the institutional apex to carry out monetary policy operations would not have offered a discernible improvement compared to the EMS in which only the Bundesbank had monetary policy autonomy—an institutional setting that countries such as France and Italy wanted to alter with the EMU project. A situation in which French and Italian banks depend solely on the Bundesbank's balance sheet for liquidity support would have been unacceptable for their governments. Unsurprisingly, the political process towards EMU led to a third option.

3.3 Scenario 3: Monetary unification with an interbank real-time gross settlement system

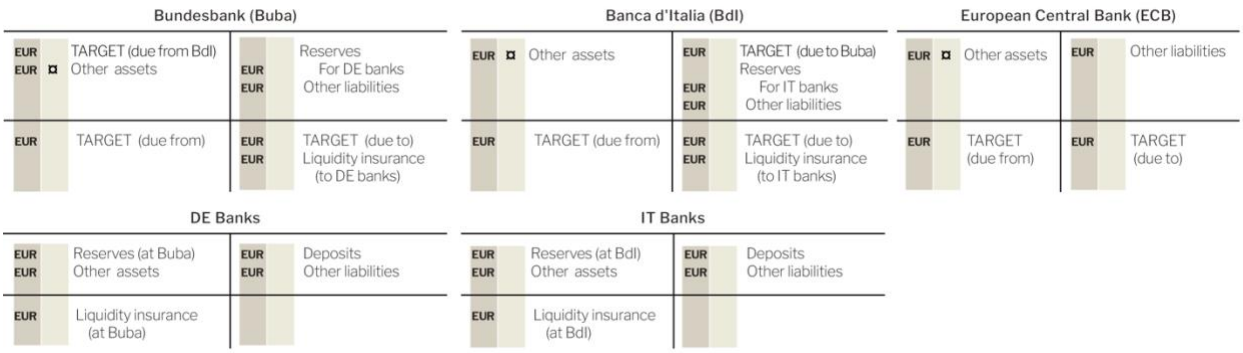
With the first two scenarios politically unfeasible to bring the EMU project to fruition, the solution found was to introduce not only a clearing and settlement system between the central banks but also an additional balance sheet hierarchically above them—the ECB—against which the claims and obligations of the central banks can be shifted by novation.

This form of monetary unification required, as a first step, that each central banking balance sheet destined to become part of the monetary union had to run its own RTGS system. Some smaller NCBs had to introduce a new RTGS systems, most other NCBs already operated an RTGS system and could keep it but had to align it to minimum standards for the purpose of harmonization. In addition, the

ECB had to introduce its own RTGS system called 'European Payment Mechanism' (EPM) for its own central banking 'jurisdiction', which comprised primarily EU institutions with ECB reserve accounts. As a second step, the individual RTGS systems of the NCBs and the ECB had to be 'interlinked' to allow inter-district payments. This interlinking infrastructure coupled with the national RTGS allowed the processing of large-value payments across the EU and thus were the defining feature of the TARGET system.[1] TARGET effectively replaced previously existing *private* correspondent banking system with a *public* payment infrastructure within the Eurosystem, in which NCBs remained in charge of their individual RTGS. Planning for the TARGET system started in 1994 at the EMI. As it wasn't clear which of the EU member states would become part of the monetary union, all of them were integrated into the TARGET system. When the TARGET system got live in 1999, all 15 EU NCB balance sheets and the ECB balance sheet became a part of it (EMI 1995b; ECB 1999b; 2000a).

Figure 8 shows this system at work as it became operational in January 1999. To process a payment between banks in different districts, the reserve account of the bank that initiates the transfer decreases, whilst the reserve account of the bank that receives the transfer increases. The national payment systems are integrated and the liabilities of one district central bank (Bundesbank) are maintained at par with the liabilities of another district central bank (Banca d'Italia). If a payment imbalance remains, TARGET assets appear on the balance sheet of the surplus NCB as its reserve liabilities increase, and similarly TARGET liabilities are recorded on the balance sheet of the deficit NCB when its reserves liabilities decrease. The ECB balance sheet is not affected as long as there is no liquidity inflow or outflow from the ECB 'jurisdiction'.

Figure 8—Scenario 3: Monetary unification with TARGET as an RTGS (before novation)



Regarding the implementation of monetary policy, the TARGET system foresaw a decentralized approach that would not make use of the ECB balance sheet (ECB 1998). The ECB Governing Council would define the common monetary policy, drawing on open market operations, standing facilities, and minimum reserves as its three monetary policy instruments (ECB 2000b). These would subsequently be implemented by the different NCBs in their respective districts in accordance with the ECB capital key (Bindseil 2014). This left role of the ECB in the TARGET system ambiguous. It was not operationalized in any way: it did not have accounts of commercial

[1] The official documents state that "'interlinking' shall mean the technical infrastructures, design features and procedures which are put in place within, or constitute adaptations of, each national RTGS system and the ECB payment mechanism for the purpose of processing cross-border payments within Target," (ECB 2001, L 140/72).

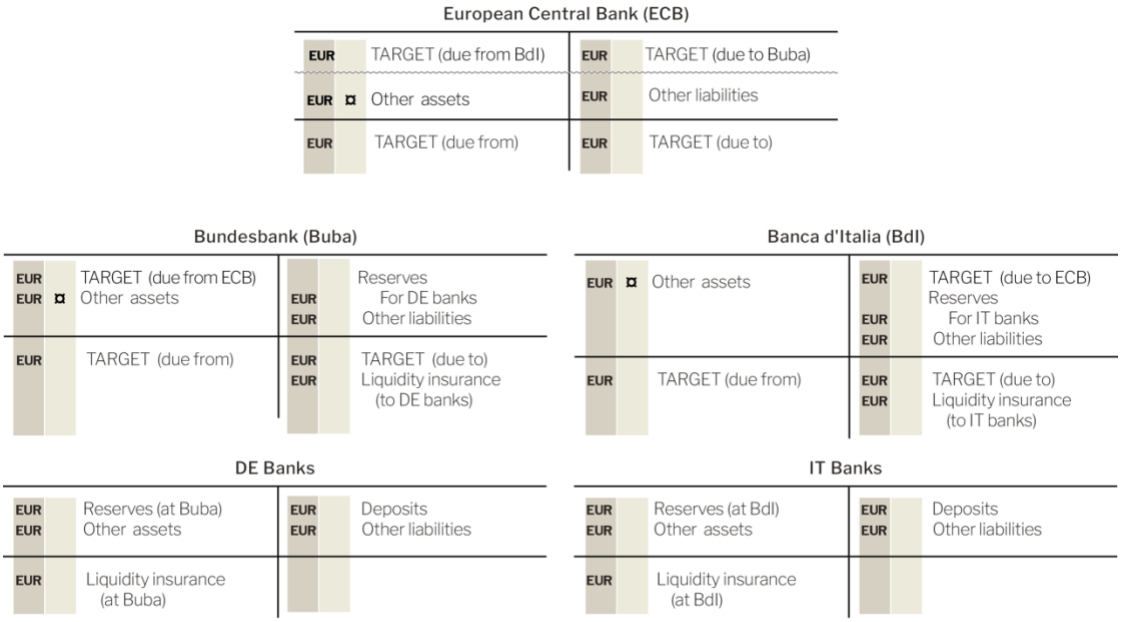
banks, it did not carry out monetary policy, and its balance vis-à-vis the other districts depends only on its role as correspondent banking service to a restricted group of ECB customers. At the same time, however, the ECB covered some roles as a pivot of the system: For instance, 'Euro 1'—the large-value net settlement system operated by the EBA Clearing Company (EBA)—was settled through the ECB balance sheet, and it hosted the Central Accounting System (CAS) for the settlement of payments.

From a political feasibility perspective, this solution was easier to sell than the previous ones. On the one hand, it allowed that all EMU member states could keep their domestic central banks, could keep a portion of their NCB balance sheet under their control, and could keep operating their own payment systems—de facto maintaining a technical exit rout form the monetary integration. The concession was that a supranational institution, not a leading NCB, was put in charge of deciding the single and common monetary policy. In other words, the NCBs were gauged to believe that they would keep some form of autonomy. On the other hand, this solution left an important and uncomfortable question ambiguous: when TARGET went live, there was no official information on what should be done with the open claims and obligations that NCBs would accumulate against each other. Decades of monetary troubles within Europe had essentially fought over how deficit and surplus central banks should deal with claims against one other. The long-lasting concerned the question of who would carry the burden of adjustment (Keynes [1942] 1969). The original development of TARGET did not solve this issue. It did not even try to impose a mechanism for rebalancing. This kept it vague if it would rather benefit the surplus or the deficit central banks, entailing that project acquired a higher degree of political feasibility. Indeed, the biggest advantage of the TARGET system was the ambiguity and lack of formal decisions about open claims and obligation, thus avoiding direct opposition by either the net debtors or net creditors. Deficit countries could assume that it would remove the need of short-term adjustments. Surplus countries, by contrast, could assume that TARGET would only be a minor part of the monetary union, thus entailing the shift of adjustment from monetary channels to domestic ones—alignments in the real exchange rates needed be achieved through internal devaluation, still on part of the deficit countries.

Against this backdrop, it may not be surprising that the unavoidable decision about the—actually highly political—question of how to deal with open TARGET claims and obligations was only taken after TARGET had become live. Referring back to G-10 Financial Stability reports, the ECB Governing Council decided that NCBs' open claims and obligations against each other should be shifted against the ECB at the end of each business day. This way, they *de facto* redefined the ECB balance sheet as a CCP for all NCB districts whose balance sheet will expand in line with the rise of cross-border imbalances—very much turning upside down how the ECB balance sheet was originally designed during the planning stage at the EMI.

Figure 9 demonstrates how the novation technique plays out on-balance-sheet when the payment imbalance between the Bundesbank and the Banca d'Italia is shifted to the ECB at the end of a business day. The Bundesbank receives a TARGET claim against the ECB balance sheet as an asset, the Banca d'Italia at TARGET obligation as a liability. The actual instruments of the ECB balance sheet receives a new 'compartment'—separated with a wavy line—where it acts as CCP and holds matching TARGET assets and liabilities. This mechanism bears many similarities to the EMCF, which mediated the funding between central banks via the VSTFF, but is automatic and unlimited.

Figure 9—Scenario 3: Monetary unification with TARGET as an RTGS (after novation)



In effect, novation positioned the ECB balance sheet at the apex of the TARGET system and made it the 'central bank for the NCBs' against which they hold TARGET claims and obligations. This turned the EMI's original design for the Eurozone upside down and in some respects created a design of the Eurosystem much closer to Scenario 1 than could have been politically feasible ex ante.

4. Defending monetary union through novation, 1999-2022

The European Monetary Union has withered 23 turbulent years despite multiple strains. Against many odds, monetary unification through novation has fulfilled its intended purpose. The stitches at the top of the hierarchy held the balance sheets together at the apex, defending the monetary union's integrity.

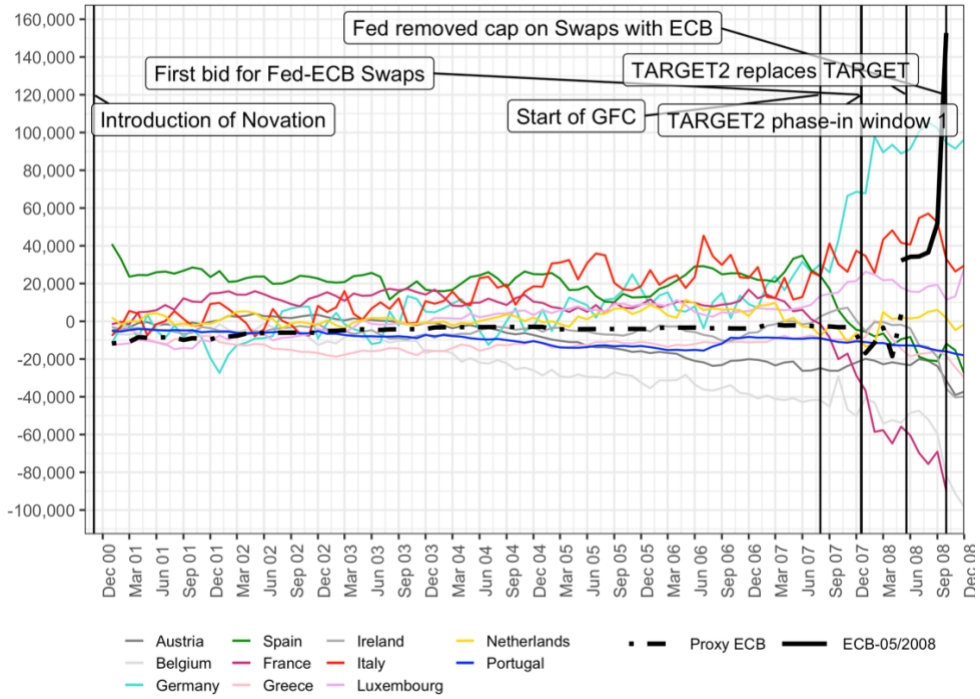
The monetary union's institutional setting functioned broadly as envisioned during its first decade of relatively smooth sailing—we refer to it as the 'Eurozone 1.0'. Cross-border payments increased and the single monetary policy became operational, even though the Stability and Growth Pact never functioned as intended, chiefly because Germany and France refused to obey by their own rules only a few years into the start of the monetary union. Things started to change in 2007 with the advent of the Global Financial Crisis (GFC) which led to the establishment of emergency swap lines between the Fed and the ECB. Spill-overs in 2009 gave rise to the 'Eurocrisis' that affected both the Eurozone's banking system and sovereign debt market. Numerous emergency measures followed in 2010: the introduction of the European Financial Stability Mechanism (EFSM) and the European Financial Stability Facility (EFSF), which was later replaced by the European Stability Mechanism (ESM); several bailouts for Greece; as well as the inception of the ECB's Securities Markets Programme (SMP). The strains could only be tamed with the famous 'Whatever it takes' speech by ECB President Mario Draghi in July 2012, which was flanked by the introduction of the Outright Monetary Transactions (OMT) programme (Copelovitch, Frieden and Walter 2016).

In the ensuing phase of the 'Eurozone 2.0', the EU's Banking Union and Capital Market Union projects sought to address what had been identified as the main shortcomings of the EMU's original design. In the meantime, interest rates converged to the zero-lower bound and the ECB sought to steer the monetary union with the help of unconventional monetary policy, organized around its asset purchase programmes. The COVID-19 pandemic, which started to hit Europe in March 2020, has started a new transformation, associated for instance with the ECB's Pandemic Emergency Purchase Programme (PEPP) and the setting up of Next Generation EU (NGEU), a scheme that for the first time allows the EU to issue genuine European debt. Arguably, these changes introduced a new phase of the monetary union—that of the 'Eurozone 3.0' (Guter-Sandu and Murau 2022).

This turbulent history is reflected in the data on the TARGET system. TARGET balances of the NCBs and the ECB remained low during the 'Eurozone 1.0' (see Figure 10). The situation changed with the GFC and the Eurocrisis, which coincided with the long-planned phase-in of the TARGET2 system. Structural and systematic TARGET2 balances arose with the Eurocrisis and have not abandoned EMU members ever since, despite moments of convergence in 2013 (see Figure 11). While the ever-increasing TARGET2 surplus of Germany and the structural deficit positions of Italy and others have received profound scrutiny, hardly any attention has been paid to the ECB's changing positions in the TARGET2 system. As the black line in both figures shows, the ECB's TARGET2 balance spiked in the positive in the second half of 2008, deteriorated since, and has become structurally negative from 2014 in the 'Eurozone 2.0', even though briefly approaching zero at the advent of the 'Eurozone 3.0'.

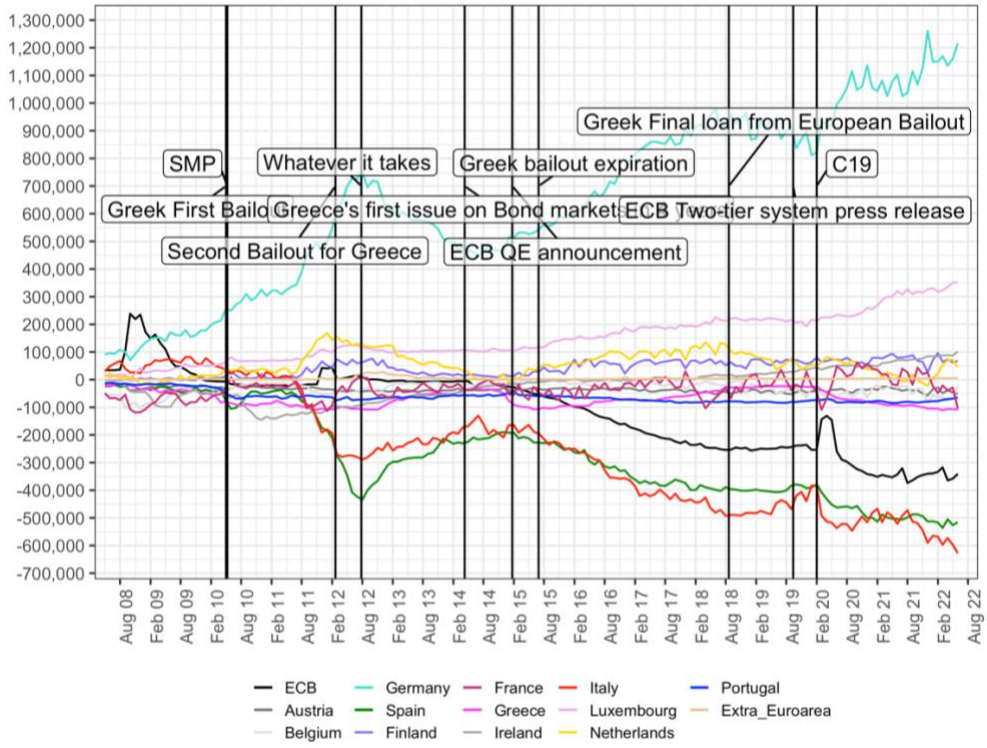
Drawing on this data, we argue that the design of the TARGET2 system, based on novation, has played a key part in holding the monetary union together. As we show below, novation has helped provide elasticity space to maintain par between EUR-denominated instruments in all EMU member states; it allowed a transformation of the ECB into a 'firefighting' balance sheet; and it created 'sufficient' obstacles to prevent EMU member states from the leaving the monetary union.

Figure 10—TARGET balances for selected NCBs and the ECB (Jan 2001–May 2008)



Source: ECB SDW 2022. Average of observations data, in million Euro. The Average of Observation data is available from Jan 2001. Until May 2008, the official data on the ECB's TARGET position in not available. As a proxy, we indicate the residual of all NCB balances, which must reflect both the TARGET balances of the ECB and of extra-Euro area central banks, the latter being historically stable and close to a balanced position.

Figure 11—TARGET2 balances for selected NCBs and the ECB (Mar 2008–Feb 2020)



Source: ECB SDW 2022. End of period, in million Euro. The End of the Period data is only available from May 2008 onwards.

4.1 How novation helped provide elasticity space to maintain par inside the Eurozone

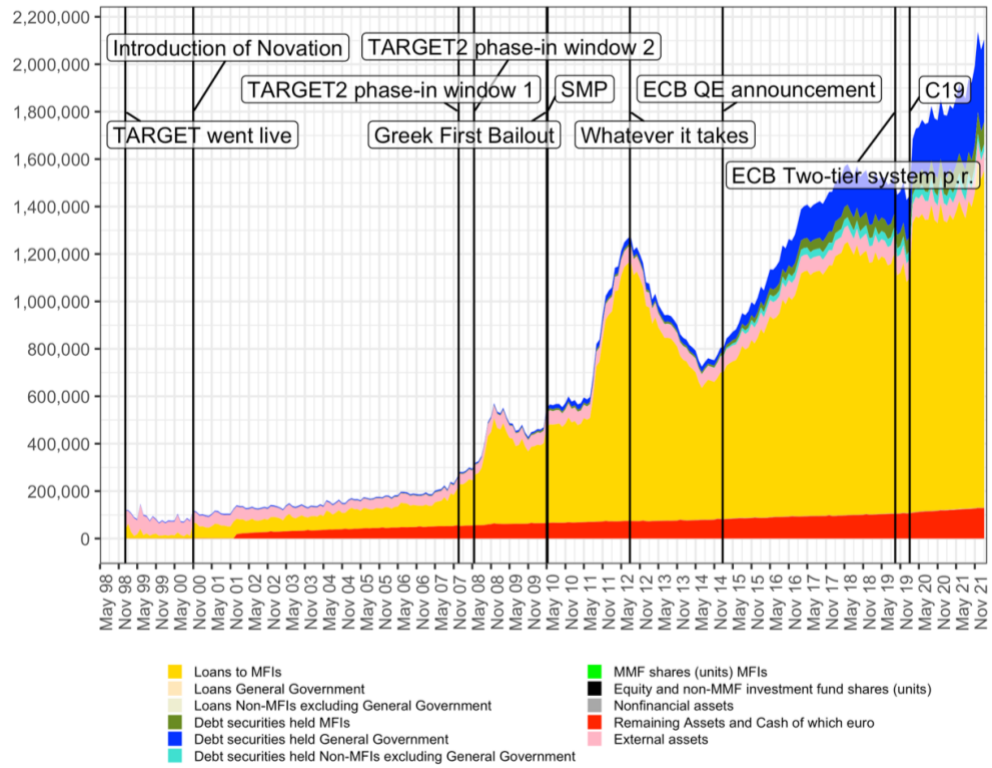
A first factor through which novation helped defend the integrity of the monetary union is that it enabled the TARGET2 system to provide the elasticity necessary to compensate for various crisis dynamics since 2008. Due to the novation technique, there is no defined limit to NCBs' balance sheet expansion to compensate for payment imbalances within the TARGET2 system. Therefore, when interbank lending by banks froze up and a capital flight from deficit to surplus EMU members set in (De Grauwe and Ji 2012b; Auer 2014), the substantial TARGET2 positions visible in Figures 10 and 11 were able to emerge on the NCB balance sheets. This was crucial to maintain par between EUR-denominated instruments between both EMU surplus and deficit countries.

As a consequence of the novation technique, the TARGET2 system offers a mechanism to finance cross-border positions on public balance sheets which, under different circumstances, would be held by private institutions (Auer 2014). This is true even though TARGET2 balances are not legally speaking debt instruments. This way, the TARGET2 system introduced what we call *elasticity space* in between central bank balance sheets to an infinite amount. Given that TARGET balances do not have a maturity date, the balances do not need to be settled, and they represent by nature a form of official funding that does not result in 'official' debt ratios as it appears only when the Eurozone balance sheet is disaggregated. It simply allows funding the imbalance and forces away the need to equilibrate them. Somewhat paradoxically, the TARGET2 system allows real-time settlement for participating central banks that want to do a cross-border payment but relies on the complete absence of settlement at the apex. As novation is an *automatic* process of netting and transferring of the bilateral TARGET positions, it cannot be constrained by policy decisions.

To visualize the degree of elasticity provided, Figures 12 and 13 present the assets and liabilities recorded on the ECB's Accounting Balance Sheet from the *Breakdown of Eurosystem aggregated balance sheet* (ECB 2022). It is 'disaggregated' as it does not net out intra-Eurosystem claims. When intra-EMU claims and liabilities are not netted, the ECB balance sheet becomes the second largest balance sheet of the Eurosystem, second only to the Bundesbank.[2] The Accounting Balance Sheet helps us gauge the actual elasticity provided by the TARGET2 system, in the form of claims and obligations that surplus and deficit NCBs have shifted against the ECB as CCP. These are reflected in the yellow area in Figure 12 and the complementary blue area in Figure 13. The yellow area depicts the ECB's loans (assets) to Monetary and Financial Institutions (MFIs) by the ECB, the blue area the deposit liabilities of MFIs at the ECB. Both began rising as the GFC spilled over into the Eurozone and increased as the Eurocrisis worsened. The peak in summer 2012 emphasizes the paramount importance of Mario Draghi's 'Whatever it takes' speech and its impact on market sentiments. It put an end to the sharply rising use of ECB contingent assets and liabilities, closely associated with capital flight from deficit countries to Germany.

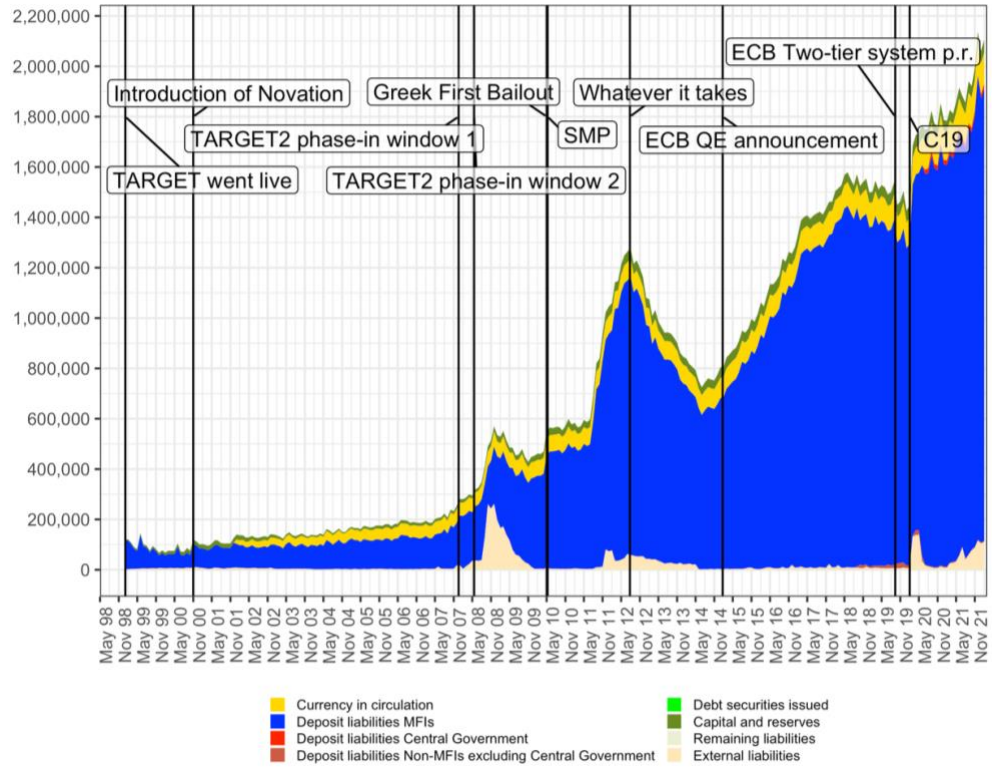
[2] The data on the breakdown of Eurosystem aggregated balance sheet—known as the "Statistical Balance Sheet", does not net the intra-NCBs positions, and differs substantially from the disaggregated financial statement of the Eurosystem, known as the "Accounting Balance Sheet", or the contributions to the annual consolidated balance sheet of the Eurosystem. This allows us to define the access to the ECB balance sheet and thus make the case for the ECB as the apex of the EMU monetary hierarchy.
For more references on the difference between Statistical and Accounting Balance Sheet, see: Explanatory Note (https://www.ecb.europa.eu/press/pr/wfs/shared/pdf/disaggregated_explanatory_note.en.pdf) and Bridging tables (https://www.ecb.europa.eu/pub/pdf/other/bridgingtables201607.en.pdf).

Figure 12—Assets on the ECB Accounting Balance Sheet (1999–2022)



Source: Own elaborations on ECB SDW 2022. In million Euro.

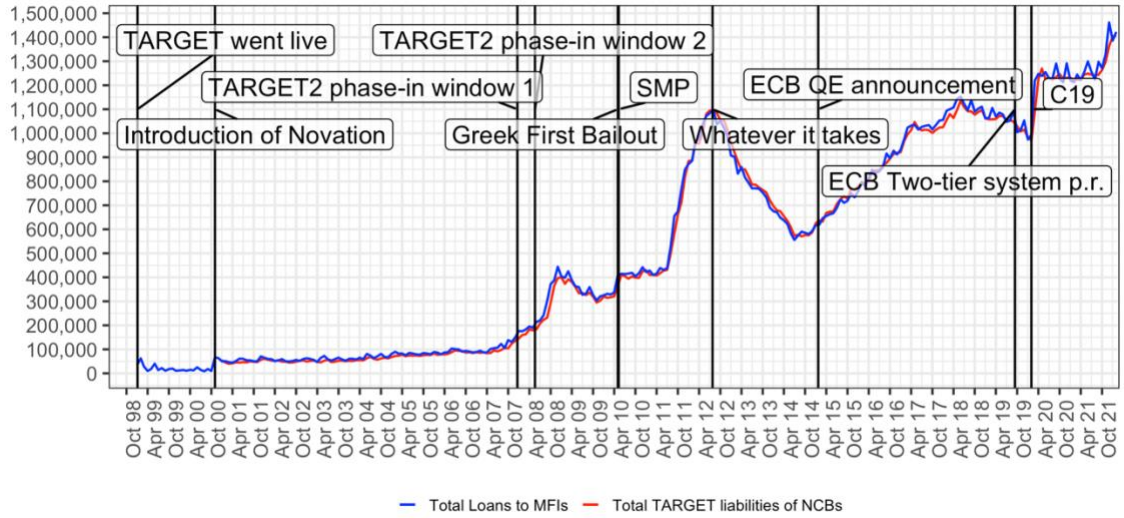
Figure 13—Liabilities on the ECB Accounting Balance Sheet (1999–2022)



Source: Own elaborations on ECB SDW 2022. In million Euro.

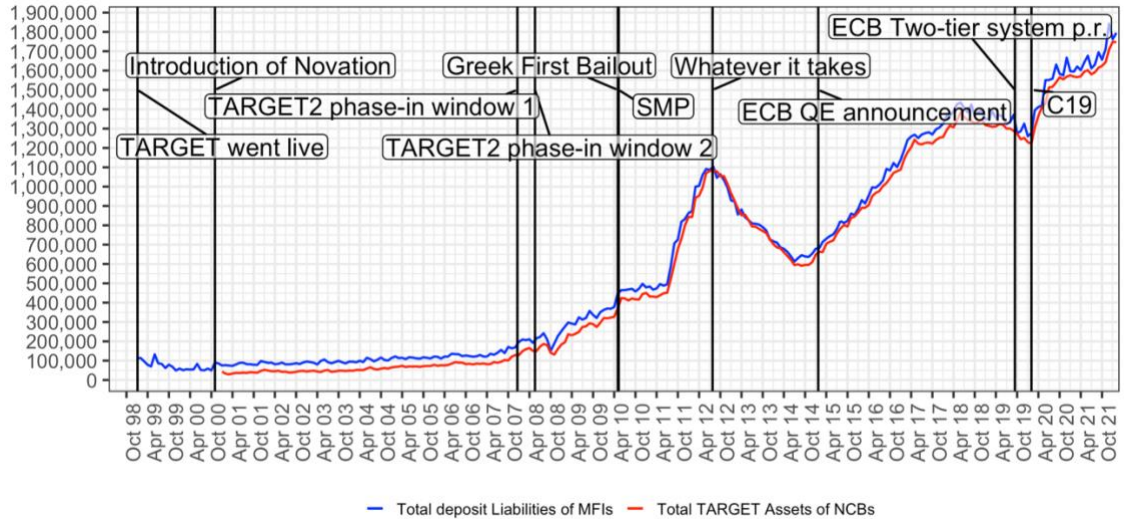
To substantiate our claims, Figures 14 and 15 provide a complete understanding of the elasticity space shown in figure 11 and 12. While the category "Monetary and Financial Institutions" is composed not only of the NCBs but also other deposit-taking corporations (except ECB and NCBs) and money market funds (ECB 2021), Figures 13 and 14 demonstrate that the loans and deposit liabilities of the MFIs at the ECB consist almost entirely of the TARGET2 claims and liabilities of the NCBs.

Figure 14—ECB Loans to Euroarea MFIs and total NCB TARGET liabilities (1999-2022)



Source: Own elaborations on ECB SDW 2022. In million Euro. TARGET data available from Jan 2001.

Figure 15—ECB Deposit Liabilities to Euroarea MFIs and total NCB TARGET assets (1999-2022)



Source: Own elaborations on ECB SDW 2022. In million Euro. TARGET data available from Jan 2001.

During the Eurocrisis, the TARGET2 system's unlimited elasticity space prevented that crisis countries broke par—a situation in which 1 EUR held on a bank account in Germany would no

longer be equivalent in value to 1 EUR held on a bank account in Italy, which would represent a *de facto* end of monetary union. The absence of such elasticity space would imply a boundary on the cross-border payments carried out within the EMU. Unlimited elasticity space eliminates the constraint faced by countries undergoing a balance of payment crisis: NCBs can continue to process payment because they cannot run out of TARGET balances, which in this regard operate in a similar way as FX reserves. BdI's EUR-denominated liabilities—i.e., the EUR reserves in the Italian banking sector—can be exchanged for other NCBs' liabilities automatically and without limit through the TARGET2 system, thus entailing that the nominal par between, for example, BdI's liabilities and BuBa's liabilities cannot be broken. Such par would be invalidated in the presence of any constraint on the movement of capital, which could be imposed either through capital controls—as in the case of Greece during the Eurocrisis—or simply by imposing a limit on the TARGET2 elasticity space, which in turn would force a country to impose capital controls when such limit is reached.

4.2 How novation helped transform the ECB into a centralized 'firefighting' balance sheet

A second factor through which novation contributed to keeping the monetary union together is that it helped transform the ECB into an autonomous balance sheet capable of centrally supplying elasticity to the Eurosystem when needed. This function of a discretionary 'firefighter' stands in stark contrast to the original design of the Eurosystem foreseen by the preparatory work of the EMI, which was based on the premise that monetary policy would be carried out by the NCBs with TARGET participants in their country, using their national RTGS systems. The ECB, in this original design, was conceptualized as a passive balance sheet, on which no sizable TARGET balances would emerge (EMI 1995b).

As visualized in Figure 10, the ECB balance sheet played this attributed role for most of the time in the Eurozone 1.0. There is no clear information about the ECB's TARGET balances in the early years of the monetary union, as the ECB's positions have only been officially published from May 2008, the beginning of the second TARGET2 phase-in window. Nevertheless, it is possible to treat the residual of all NCB balances as proxy, which reflects both the TARGET balances of the ECB and of extra-Euro area central banks, the latter being historically stable and close to a balanced position. We see that this proxy never deviates much from zero.

Already in 2003, however, an important preliminary step was taken to enhance the autonomy of the ECB balance sheet in the Eurosystem—the Agreement on Net Financial Asset (ANFA), made between the ECB and the NCBs. Much like the decision to introduce novation, it was taken by the Governing Council and remained essentially secret until 2016, when the ECB was forced to release it (ECB 2019). When the TARGET system went live, only parts of NCBs' balance sheets related to monetary policy operations were integrated and limited by the ECB's capital key and monetary policy decisions, while the rest—the Net Financial Assets (NFA) carried from the legacy central banks—were left unrestrained, following the principle of subsidiarity. With ANFA, the ECB sought to move beyond subsidiarity and to impose limits on the independent and nationally regulated operations of the NCBs. It had realized that NCBs' NFA portfolios, which are administered independently from the ECB, affect the amount of EUR-liquidity in circulation and thus may hamper the working of the common monetary policy (Hansen and Meyer 2017).

The ECB's use of its balance sheet for autonomous firefighting occurred for the first time in December 2007 when it set up reciprocal emergency swap lines with the Federal Reserve Bank of New York (FRBNY) to backstop offshore USD deposits in the Eurozone (Murau, Pape and Pforr 2021). Swap line drawings led to the sharp positive spikes in the ECB's TARGET2 position in Q3 and Q4 of 2008, as well as in March and April 2020, that are visible in Figures 10 and 11. When swap lines are used and the Eurosystem borrows USD-denominated instruments from the FRBNY, the ECB balance sheet is used as a conduit between the Euroarea NCBs in need for emergency USD liquidity and the FRBNY. As the FRBNY is not part of the TARGET2 system, the EUR leg of the transaction creates TARGET2 imbalances. Figure 16 depicts this process on-balance-sheet. The Bundesbank and the Banca d'Italia are assumed to be in acute need of emergency USD liquidity to pass it on to their domestic banking systems and ask the ECB for an activation of the swap lines. The ECB balance sheet serves as the entry-point of the FRBNY's USD liquidity to the Euroarea and exchanges EUR-denominated against USD-denominated reserves. These the ECB then passes on the USD reserves to the NCB balance sheets. In this specific example, the Bundesbank has net TARGET claims against the ECB as starting point and sees a decrease in its TARGET2 balance, whereas the Banca d'Italia starts with net TARGET2 obligations against the ECB and sees them increase further. The reverse transactions would occur at the maturity date, typically three months later, when the ECB would return the EUR-liquidity to the NCBs and thus record a decrease in its TARGET claims or an increase in its TARGET liabilities. In the meantime, while the USD loan for this international lender of last resort operation is outstanding, the ECB's TARGET2 account deviates significantly from its originally passive role.

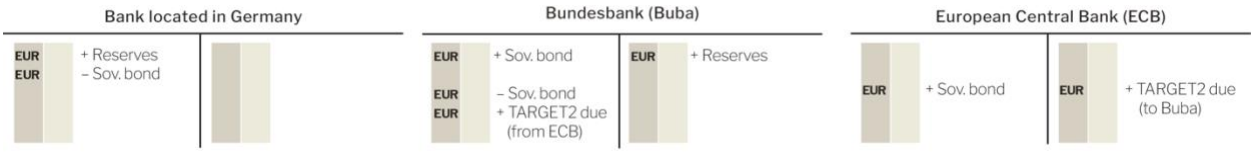
Figure 16— Impact of swap line drawing on the ECB's TARGET2 balance (first leg of the Swap)

The second case of an autonomous firefighting role of the ECB's balance sheet, which causes a decrease of the ECB's TARGET2 positions, are the Eurosystem's asset purchase programmes. At the advent of unconventional monetary policy, there had been strict regulations about the allowed on-balance-sheet activities for NCBs. The large-scale asset purchases were organized in a way that NCBs bought assets from domestic institutions, at times playing the role of counterparty for foreign investors offloading securities. As a consequence, the asset purchases of the NCBs came with de facto cross-jurisdiction flows of liquidity, which are reflected in the widening of the NCBs' TARGET balances (Cecioni and Ferrero 2012; Della Corte, Federico, and Tosti 2018; Febrero, Uxó, and Álvarez 2019),. However, the various APPs placed strict limitations on the volume of asset that NCBs could purchase.[3] The ECB balance sheet, by contrast, was *de facto* unregulated.

[3] The different programmes are carried out by different NCBs according to the guidelines of the ECB: the PSPP sees NCBs buying their respective government debt, the CSPP is carried out by six NCBs, the ABSPP are executed through six NCBs exclusively, and for the CBPPP NCBs purchase according to the ECB's capital key.

Therefore, the ECB itself began carrying out purchases through its balance sheet. Figure 17 visualizes the mechanism that explains why asset purchases lead to a deteriorating TARGET2 position of the ECB, as we can see in Figure 11 from 2014 onwards. The ECB's rising negative TARGET2 balance suggest liquidity outflows in exchange for the securities populating its balance sheet now. Such *operationalisation* of the ECB balance sheet was possible due to the legal provision that let the ECB would carry some of the book values of the marketable securities purchased—for example, 10 percent of the securities bought under the PSPP, see (ECB 2020)—due to the mechanical use of TARGET2 elasticity by the NCBs to carry out the monetary policy.

Figure 17—Impact of asset purchases on the ECB's TARGET2 balance



Novation was the first step that triggered the domino of institutional change through the 'fait accompli' characteristic of the ECB. With novation the ECB starts acquiring a central role both for lender of last resort and monetary policy operations that it was not supposed to have in the original plan, and that was complemented with a series of other decisions occurred behind the doors of the Governing Council. If APP and the implementation of swap lines are examples of operationalization of the ECB balance sheet, ANFA and the ECB's market-based approach to collateral complement the tendency of the ECB to resort to "technocratic depoliticization" as an answer to the shortcomings of the process of monetary unification (van 't Klooster 2022, 16). In a macro-financial sense, TARGET with novation provided the infrastructure and the path to make it possible for the ECB to attain a central and superior role vis-à-vis the other NCBs. This process is in line with the central banks' modus operandi of depoliticization for the sake of legitimacy recognised in the security purchasing programmes carried out by the ECB and the SNB (van 't Klooster and Fontan 2020). The transformation of the ECB towards a discretionary balance sheet put the Eurosystem on a path towards what we had described as the first scenarios of monetary unification that had not been politically feasible twenty years ago.

4.3 How novation prevents countries from leaving the monetary union

A third factor how monetary integration through novation contributed to maintaining the integrity of the European Monetary Union is that shifting claims and obligations against the ECB balance sheet makes it substantially more difficult for EMU member states to leave. On the one hand, there is the possibility that in surplus countries such as Germany or the Netherlands parties are elected to government that subscribe to a 'current account' explanation of TARGET2 and wish to exit the monetary union. On the other hand, there are several examples of deficit country governments—for instance in Cyprus, Greece, and Italy—that have adopted serious steps in this direction. Among the reasons why none of these governments was able execute their plans is that novation against the ECB balance sheet creates too many technical obstacles, financial stability risks, and legal uncertainties to make exiting the monetary union a reasonable option.

First, from a technical perspective, the TARGET2 system has increased the technical difficulties of leaving the monetary union than with the original TARGET system, in which the NCBs still operated their own RTGS systems and could have had a fallback infrastructure to use for processing domestic payments. Under the original TARGET system, exiting the regional payment infrastructure could have been more easily achieved given that the system sought in integrate separate RTGSs, whilst the move to TARGET2 comes with the Single Shared Platform in which the national RTGS have been consolidated into one region-wide payment system. In that regard, the TARGET2 system does what it has been designed for: it deepens the level of financial and infrastructural unification in order to reduce barriers to cross-border transactions. At the same time, however, novation as a technique to keep the apex together was apparently a way of stitching together that is implicitly sufficiently difficult to disentangle to discourage both government critical of EMU and speculators.

Second, from a financial stability perspective, there is a profound lack of clarity about whether TARGET2 balances have to be honored by an exiting country or not. In letters and discussions with Italian and German members of Parliament, then ECB President Mario Draghi highlighted implicitly that a potential exit from the EMU would require the repayment of the TARGET2 liabilities accumulated by the deficit member country (Draghi 2018). This, however, remains the only—informal—statement on the topic. Novation muddies the waters for the repayment of open positions because the bilateral origins of claims and obligations, once shifted against the ECB balance sheet, can no longer be tracked. Defaults on TARGET positions would entail losses on the Eurosystem, which are mutualized by the ECB, which itself would need to be recapitalized by the remaining NCBs—the ECB's shareholders—whose capitalization is granted by the national treasuries. While this process is not automatic, and the decisions of the single NCBs on how to proceed would take a political dimension, especially within national borders, it entails profound financial stability risks along the way.

Third, there are profound legal uncertainties about how to handle TARGET2 balance in case of an EMU break-up. While the repayment of TARGET2 liabilities in the case of a breakup has not been questioned per se, the potential losses accrued on the Eurozone by the exit of a deficit country have been gauged in different ways (Sinn and Wollmershäuser 2012; Whelan 2014; Guglielmi et al. 2017). There is widespread legal ambiguity on whether TARGET2 balances would remain denominated in EUR or could be redenominated in the new currency of the exiting member (Lapavitsas 2018). The issue boils down to the contradiction of the legal jurisdiction over the TARGET2 system: TARGET2 jurisdictions and the operational modules of the SSP are owned by their respective NCBs and remain legally separated and under the national law of their geographical location. At the same time, however, a legal assessment of the ECB states that "[t]he bilateral relationship between the ECB and participants in TARGET2-ECB shall be governed by the law of the Federal Republic of Germany" (ECB 2007, L 237/89). Given the explanation of novation and of its operations, this final statement in the ECB's Guidelines acquires a bigger role than it may seem. Novation, by making TARGET2 balances a bilateral transaction between the ECB and every single NCB, mechanically shifts the legal jurisdictions of TARGET2 balances to Frankfurt am Main, regardless of whether their TARGET2 balances are accrued vis-à-vis Germany. The payment system and the decision of novation lock in all member states of the EMU by changing the legal jurisdiction of significant claims and liabilities positions as a result of technical process left unexamined for twenty years whilst countries accumulated sizeable accounts. If push comes to shove and there are indeed legal fights about the consequences over a break-up of the monetary union, this may play out as an important advantage for Germany as the EMU member state with more than €1 trillion in TARGET2 claims.

5. Conclusion

This paper has proposed a critical macro-financial approach to the payment system dimension of European monetary unification, which we understand as the stitching together of previously independent monetary systems at their apex. We offered three scenarios for monetary unification, highlighting how only one of these three could be deemed politically feasible, namely the unification through the TARGET system. We then proceeded to assess the monetary and payment infrastructure entailed by TARGET and its successor, TARGET2, explaining how they required a rebalancing mechanism on balance sheets for funding imbalances between NCBs. A flow of reserves from one NCB to another, *ceteris paribus*, entails the decrease in liabilities on the original NCB and an increase in liabilities of the receiving NCB. To balance the books, TARGET balances of the same quantity as the flow in reserves are recorded as liabilities in the former and assets in the latter NCB. The true innovation came with the decision to use novation for netting out these balances with the ECB as a CCP. In consequence, deficit NCBs received liabilities vis-à-vis the ECB, whilst the TARGET assets of surplus NCBs were claims against the ECB. Hence, TARGET and TARGET balances are not just a technical side issue, but the very heart of the monetary unification project.

Monetary unification through novation is not only remarkable due its on-balance-sheet dimension but also due to the *ex post* decision-making process of the ECB Governing Council. Such a technocratic decision is in line with the ECB's *modus operandi* that aims at depoliticizing the process of monetary integration and played a crucial role in centralizing the ECB balance sheet as the CCP of the Eurosystem. Automatic and unlimited access to the ECB balance sheet through TARGET balances can be understood as the provision of *elasticity space* required to maintain the monetary union. The crucial political move was to establish a higher-ranking balance sheet above the NCBs that provides elasticity space and allows financing surpluses and deficits. This is a technique for institution building that has not properly been acknowledged in the IPE literature. At the same time, the novation technique is key for the "irreversibility" of EMU by locking in member countries both technically and legally. The financial plumbing matters, especially when the process of monetary unification is constrained by the political decisions of the member states. It is neither helpful to pretend that the European Monetary Union is only a slightly more advanced version of a fixed exchange rate system, nor that it is an incomplete or poorly executed version of the US monetary system. It is a *sui generis* monetary system that has found a unique way of designing the top of the hierarchy—by monetary unification through novation.

Our analysis opens avenues for future research on the political economy of payment systems and infrastructures. First, there are significant questions on the determinants and consequences of the monetary and payment infrastructures of monetary unions. For instance, the drivers of monetary unification processes could be studied from a comparative perspective. Second, significant voids remain regarding the interpretation of TARGET2 imbalances and their impact on shifting volume and risk from private to public balance sheets. We do not know what policy measures would be able to address the diverging TARGET2 balances, if it is possible to incorporate measures to avoid the public derisking of cross-border positions, and how intra-jurisdiction TARGET2 balances are catalysts for asymmetric economic developments. Finally, the implementation of Next Generation EU will likely cause significant changes in the TARGET2 balances of the NCBs and of the ECB, requiring a study of the consequences of EU fiscal policy on the monetary infrastructure that carries out the ECB monetary policy.

References

Abad, José, Axel Löffler, Gunther Schnabl, and Holger Zemanek. 2013. "Fiscal Divergence, Current Account Divergence and TARGET2 Imbalances in the EMU." *Intereconomics* 48 (1): 51–58.

Amato, Massimo, Luca Fantacci, Dimitri Papadimitiou, and Gennaro Zezza. 2016. "Going Forward from B to A? Proposals for the Eurozone Crisis." Working Paper No. 866. Levy Economics Institute.

Auer, Raphael. 2014. "What Drives TARGET2 Balances? Evidence from a Panel Analysis." *Economic Policy* 29 (77): 141–97.

Banca d'Italia. 2000. "Ordinary General Meeting of Shareholder. Held in Rome on 31 May 2001." Report. Rome: Banca d'Italia.

Barredo-Zuriarrain, Juan, Ricardo Molero-Simarro, and Alejandro Quesada-Solana. 2016. "Euro-Dependence—A Peripheral Look beyond the Monetary Union. A Proposal of Reform of the TARGET2." *Review of Radical Political Economics* 49 (3): 375–93.

Bindseil, Ulrich. 2014. *Monetary Policy Operations and the Financial System*. Oxford and New York: Oxford University Press.

Bindseil, Ulrich, and Philip König. 2012. "TARGET2 and the European Debt Crisis." *Credit and Capital Markets - Kredit Und Kapital* 45 (2): 135–72.

Bindseil, Ulrich, and Philipp Johann König. 2011. "The Economics of TARGET2 Balances." SFB 649 Discussion Paper 2011–035. Humboldt Universität zu Berlin.

BIS. 1989. "Report on Netting Schemes. Prepared by the Group of Experts on Payment Systems of the Central Banks of the Group of Ten Countries." February 1989. Basel: Bank for International Settlements.

———. 1990. "Report of the Committee on Interbank Netting Schemes of the Central Banks of the Group of Ten Countries." Basel: Bank for International Settlements.

Blake, David. 2018. "Target2: The Silent Bailout System That Keeps the Euro Afloat." https://doi.org/10.13140/RG.2.2.15790.82248.

Board of Governors of the Federal Reserve System. 2022. "Financial Accounting Manual for Federal Reserve Banks." https://www.federalreserve.gov/aboutthefed/financial-accounting-manual-for-federal-reserve-banks.htm.

Bordo, Michael D., and Anna J. Schwartz. 1987. "The ECU - an Imaginary or Embryonic Form of Money: What Can We Learn from History?" NBER Working Paper w2345.

Borio, Claudio, and Piti Disyatat. 2011. "Global Imbalances and the Financial Crisis. Link or No Link?" BIS Working Papers No 346. Basel: Bank for International Settlements.

Braun, Benjamin. 2020. "Central Banking and the Infrastructural Power of Finance: The Case of ECB Support for Repo and Securitization Markets." *Socio-Economic Review* 18 (2): 395–418. https://doi.org/10.1093/ser/mwy008.

Cecchetti, Stephen, Robert McCauley, and Patrick McGuire. 2012. "Interpreting TARGET2 Balances." BIS Working Paper No 393. Bank for International Settlements.

Cecioni, Martina, and Giuseppe Ferrero. 2012. "Determinants of TARGET2 Imbalances." Questioni di Economia e Finanza (Occasional Papers) 136. Banca d'Italia.

Cheung, Yin-Wong, Sven Steinkamp, and Frank Westermann. 2020. "Capital Flight to Germany. Two Alternative Measures." *Journal of International Money and Finance* 102: 1–21.

Chmielewski, Tomasz, and Andrzej Sławiński. 2019. "Lessons from TARGET2 Imbalances. The Case for the ECB Being a Lender of Last Resort." *Economics and Business Review* 5 (19): 48–63.

Collignon, Stefan, and Sebastian Diessner. 2016. "The ECB's Monetary Dialogue with the European Parliament: Efficiency and Accountability during the Euro Crisis?" *JCMS: Journal of Common Market Studies* 54 (6): 1296–1312. https://doi.org/10.1111/jcms.12426.

Cour-Thimann, Philippine. 2013. "Target Balances and the Crisis in the Euro Area." CESifo Forum April 2013. München.

De Grauwe, Paul, and Yuemei Ji. 2012a. “What Germany Should Fear Most Is Its Own Fear. An Analysis of TARGET2 and Current Account Imbalances.” CEPS Working Document No. 368. Center for European Policy Studies (CEPS).
———. 2012b. “What Germany Should Fear Most Is Its Own Fear. An Analysis of TARGET2 and Current Account Imbalances.” CEPS Working Document No. 368. Center for European Policy Studies (CEPS).
De Grauwe, Paul, and Theo Peeters, eds. 1989. *The ECU and European Monetary Integration*. London: Palgrave Macmillan UK. https://doi.org/10.1007/978-1-349-19518-3.
Della Corte, Valerio, Stefano Federico, and Enrico Tosti. 2018. “Unwinding External Stock Imbalances? The Case of Italy’s Net International Investment Position.” Questioni di Economia e Finanza (Occasional Papers) 446. Banca d’Italia.
Delors, Jacques. 1989. “Report on Economic and Monetary Union in the European Community.” Report to the European Council 17 April 1989. Committe for the Study of Economic and Monetary Union.
Diessner, Sebastian, and Giulio Lisi. 2020. “Masters of the ‘Masters of the Universe’? Monetary, Fiscal and Financial Dominance in the Eurozone.” *Socio-Economic Review* 18 (2): 315–35.
Doorslaer, Hielke van, and Mattias Vermeiren. 2021. “Pushing on a String. Monetary Policy, Growth Models and the Persistence of Low Inflation in Advanced Capitalism.” *New Political Economy* 26 (5): 797–816.
Draghi, Mario. 2018. “Monetary Dialogue at the Committee on Economic and Monetary Affairs.” Transcript. 24 September 2018. Brussels: European Central Bank. https://www.ecb.europa.eu/pub/pdf/annex/ecb.sp180924_2_transcript.en.pdf.
Durand, Cédric, and Sébastien Villemot. 2020. “Balance Sheets after the EMU: An Assessment of the Redenomination Risk.” *Socio-Economic Review* 18 (2): 367–94. https://doi.org/10.1093/ser/mwy004.
ECB. 1998. “Excerpts of Guideline of the European Central Bank of 16 November 1998 on a Trans-European Automated Real-Time Gross Settlement Express Transfer System (‘TARGET’).” ECB/1998/NP13. Frankfurt am Main: European Central Bank.
———. 1999a. “TARGET and Payments in Euro.” *ECB Monthly Bulletin* November 1999: 41–51.
———. 1999b. “Monthly Bulletin.” Monthly Bulletin November 1999. Frankfurt am Main: European Central Bank.
———, ed. 2000a. *EPM: The ECB Payment Mechanism*. Frankfurt am Main: European Central Bank.
———. 2000b. “The Single Monetary Policy in Stage Three.” General Documentation on Eurosystem Monetary Policy Instruments and Procedures November 2000. Frank: European Central Bank.
———. 2001. *GUIDELINE OF THE EUROPEAN CENTRAL BANK of 26 April 2001 on a Trans-European Automated Real-Time Gross Settlement Express Transfer System (Target) (ECB/2001/3)*. *Guideline (ECB/2001/3)*. https://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX:32001O0003.
———. 2007. *DECISION OF THE EUROPEAN CENTRAL BANK of 24 July 2007 Concerning the Terms and Conditions of TARGET2-ECB (ECB/2007/7)*. *ECB/2007/7*. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32007D0007.
———. 2019. *AGREEMENT of 25 October 2019 on Net Financial Assets*. Vol. AGR/2019/10251. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELLAR:c24994d9-9129-11ea-aac4-01aa75ed71a1.
———. 2020. *DECISION 2020/188 OF THE EUROPEAN CENTRAL BANK of 3 February 2020 on a Secondary Markets Public Sector Asset Purchase Programme (ECB/2020/9)*. *Decision ECB/2020/9*. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32020D0188&qid=1598887522263&home=ecb.
———. 2021. *REGULATION (EU) 2021/379 OF THE EUROPEAN CENTRAL BANK*. *Regulation ECB/2021/2*. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32021R0379.
———. 2022. “ECB Statistical Data Warehouse.” https://sdw.ecb.europa.eu.

Eichengreen, Barry, Arnaud Mehl, Livia Chiţu, and Gary Richardson. 2015. “Mutual Assistance between Federal Reserve Banks. 1913-1960 as Prolegomena to the TARGET2 Debate.” *The Journal of Economic History* 75 (3): 621–59.

Eisenschmidt, Jens, Danielle Kedan, Martin Schmitz, Ramón Adalid, and Patrick Papsdorf. 2017. “The Eurosystem’s Asset Purchase Programme and TARGET Balances.” Occasional Paper Series No 196. Frankfurt am Main: European Central Bank.

EMI. 1995a. “Preparation of Stage Three of EMU and Decision-Making Powers of the EMI.” Legal Division 7 February 1995. Frankfurt am Main: European Monetary Institute.

———. 1995b. “Report to the Council of the European Monetary Institute on the TARGET System.” Frankfurt am Main: European Monetary Institute.

———. 1996. “Report on Accounting Principles for the ESCB/ECB.” Working Group on Accounting Issues 25 October 1996. Frankfurt am Main: European Monetary Institute.

European Communities – Commission. 1984. *The ECU*. Luxemburg: for Official Publications of the European Communities.

Febrero, Eladio, Jorge Uxó, and Ignacio Álvarez. 2019. “Target2 Imbalances and the ECB’s Asset Purchase Programme. An Alternative Account.” *Panoeconomicus* Advanced Online Publication: 1–21. https://doi.org/10.2298/PAN180627008F.

Gabor, Daniela. 2020. “Critical Macro-Finance. A Theoretical Lens.” *Finance and Society* 6 (1): 45–55.

Gabor, Daniela, and Jakob Vestergaard. 2018. “Chasing Unicorns. The European Single Safe Asset Project.” *Competition and Change* 22 (1): 139–64.

Garber, Peter. 1998a. “Notes on the Role of TARGET in a Stage III Crisis.” NBER Working Paper No. 6619. Cambridge, MA: National Bureau of Economic Research.

———. 1998b. “Notes on the Role of TARGET in a Stage III Crisis.” NBER Working Paper No. 6619. Cambridge, MA: National Bureau of Economic Research.

Giovanoli, Mario. 1997. “Legal Issues Regarding Payment and Netting Systems.” In *Current Legal Issues Affecting Central Banks, Volume IV*, edited by Robert C. Effros, 517–40. Washington, DC: International Monetary Fund.

Guglielmi, Antonio, Javier Suárez, Carlo Signani, and Marcello Minenna. 2017. “Re-Denomination Risk down as Time Goes By.” Country Update: Italy. Mediobanca Securities. Mediobanca.

Guter-Sandu, Andrei, and Steffen Murau. 2022. “The Transformation of Eurozone Fiscal Governance. Mitigating Fiscal Discipline through a Proliferation of Off-Balance-Sheet Fiscal Agencies.” *New Political Economy* 27 (1): 62–80. https://doi.org/10.1080/13563467.2021.1910648.

Hansen, Arne, and Dirk Meyer. 2017. “ANFA — National Money Creation as an Existential Threat to the Currency Union?” *Intereconomics* 52 (4): 230–37. https://doi.org/10.1007/s10272-017-0680-9.

Jabko, Nicolas. 1999. “In the Name of the Market: How the European Commission Paved the Way for Monetary Union.” *Journal of European Public Policy* 6 (3): 475–95. https://doi.org/10.1080/135017699343630.

———. 2006. *Playing the Market. A Political Strategy for Uniting Europe, 1985-2005*. Ithaca and London: Cornell University Press.

Keynes, John Maynard. (1942) 1969. “Proposal for an International Currency (or Clearing) Union.” In *The International Monetary Fund 1945-1965: Twenty Years of International Monetary Cooperation*, edited by J. Keith Horsefield, III:3–37. Washington D.C.: IMF.

Klooster, Jens van ’t. 2022. “The Politics of the ECB’s Market-Based Approach to Government Debt.” *Socio-Economic Review*, March, mwac014. https://doi.org/10.1093/ser/mwac014.

Klooster, Jens van ’t, and Clément Fontan. 2020. “The Myth of Market Neutrality: A Comparative Study of the European Central Bank’s and the Swiss National Bank’s Corporate Security Purchases.” *New Political Economy* 25 (6): 865–79. https://doi.org/10.1080/13563467.2019.1657077.

Koning, John Paul. 2012. “The Idiot’s Guide to the Federal Reserve Interdistrict Settlement Account.” *Moneyness* (blog). May 2, 2012. http://jpkoning.blogspot.com/2012/02/idiots-guide-to-federal-reserve.html.

Krarup, Troels. 2016. “Economic Discourse and European Market Integration. The Problem of Financial Market Infrastructures.” PhD thesis, Paris: Institut d’Études Politiques de Paris.
———. 2019. “The Collateral Liquidity Problem in Contemporary Finance and the Resurrection of Quantity Theory.” *Competition and Change* 23 (3): 245–65.
Kregel, Jan. 2019. “Globalization, Nationalism, and Clearing Systems.” Public Policy Brief No. 147. Annandale-on-Hudson: Levy Economics Institute.
Lapavitsas, Costas. 2018. “The Redenomination Risk of Exiting the Eurozone: An Estimation Based on the Greek Case.” *European Law Journal* 24 (2–3): 226–43. https://doi.org/10.1111/eulj.12276.
Lavoie, Marc. 2015. “The Eurozone. Similitudes and Differences with Keynes’s Plan.” Working Paper. Macroeconomic Policy Institute.
Louw, André. (1987) 1987. “The ECU: Facts and Prospects.” *Revue de l’euro*, no. 51.
Lubik, Thomas A., and Karl Rhodes. 2012. “TARGET2. Symptom, Not Cause, of Eurozone Woes.” Economic Brief EB12-08. Federal Reserve Bank of Richmond.
Malinen, Tuomas, Peter Nyberg, Heikki Koskenkylä, Elina Berghäll, Ilkka Mellin, Sami Miettinen, Jukka Ala-Peijari, and Stefan Törnqvist. 2016. “How to Leave the Eurozone. The Case of Finland.” Discussion Paper. University of Helsinki.
Mazier, Jacques, and Sebastian Valdecantos. 2019. “From the European Monetary Union to a Euro-Bancor. A Stock-Flow Consistent Assessment.” *European Journal of Economics and Economic Policies: Intervention* 16 (1): 8–26.
Mehrling, Perry. 2011. *The New Lombard Street. How the Fed Became the Dealer of Last Resort*. Princeton and Oxford: Princeton University Press.
Mertens, Daniel, and Matthias Thiemann. 2018. “Market-Based but State-Led: The Role of Public Development Banks in Shaping Market-Based Finance in the European Union.” *Competition & Change* 22 (2): 184–204. https://doi.org/10.1177/1024529418758479.
———. 2019. “Building a Hidden Investment State? The European Investment Bank, National Development Banks and European Economic Governance.” *Journal of European Public Policy* 26 (1): 23–43. https://doi.org/10.1080/13501763.2017.1382556.
Moschella, Manuela, and Nicola M Diodati. 2020. “Does Politics Drive Conflict in Central Banks’ Committees? Lifting the Veil on the European Central Bank Consensus.” *European Union Politics* 21 (2): 183–203. https://doi.org/10.1177/1465116519890412.
Moschella, Manuela, Luca Pinto, and Nicola M Diodati. 2020. “Let’s Speak More? How the ECB Responds to Public Contestation.” *Journal of European Public Policy* 27 (3): 400–418. https://doi.org/10.1080/13501763.2020.1712457.
Murau, Steffen. 2020. “A Macro-Financial Model of the Eurozone Architecture Embedded in the Global Offshore US-Dollar System.” GEGI Study July 2020. Boston, MA: Global Development Policy Center, Global Economic Governance Initiative (GEGI), Boston University. https://doi.org/10.2312/iass.2020.041.
Murau, Steffen, and Jens van ’t Klooster. 2022. “Rethinking Monetary Sovereignty. The Global Credit Money System and the State.” *Perspectives on Politics* https://doi.org/10.31235/osf.io/k9qm8. https://doi.org/10.31235/osf.io/k9qm8.
Murau, Steffen, and Tobias Pforr. 2020. “What Is Money in a Critical Macro-Finance Framework?” *Finance and Society* 6 (1): 56–66.
Papadia, Francesco. 2014. “Operational Aspects of a Hypothetical Demise of the Euro.” *Journal of Common Market Studies* 52 (5): 1090–1102.
Rossi, Sergio. 2007. *Money and Payments in Theory and Practice*. Abingdon and New York: Routledge.
———. 2016. “The Euro Must Be Abandoned to Achieve European Monetary Integration.” *International Journal of Political Economy* 45 (1): 72–84.
Sahr, Aaron. 2019. “Zwischen Pflichten Und Fiktionen. Zur Politischen Dimension Des Euros Aus Der Perspektive Einer Beziehungstheoretischen Geldsoziologie.” *Zeitschrift Für Soziologie* 48 (3): 209–25.

Schelkle, Waltraud. 2017. *The Political Economy of Monetary Solidarity. Understanding the Euro Experiment*. Oxford and New York: Oxford University Press.
Sinn, Hans-Werner. 2014. *The Euro Trap. On Bursting Bubbles, Budget, and Beliefs*. Oxford: Oxford University Press.
———. 2018. "Fast 1000 Milliarden Target-Forderungen Der Bundesbank. Was Steckt Dahinter?" Discussion Paper. München: Ludwig-Maximilians-Universität und CESifo.
Sinn, Hans-Werner, and Timo Wollmershäuser. 2012. "Target Loans, Current Account Balances and Capital Flows. The ECB's Rescue Facility." *International Tax and Public Finance* 19 (4): 468–508.
Szász, André. 1999. *The Road to European Monetary Union*. Houndsmill: Macmillan.
Tooze, Adam. 2018. *Crashed. How a Decade of Financial Crises Changed the World*. New York: Viking.
Vaubel, Roland. 1980. "The Return to the New European Monetary System." *Carnegie-Rochester Conference Series on Public Policy* 13 (January): 173–221. https://doi.org/10.1016/0167-2231(80)90044-5.
Werner, Pierre. 1970. "Report to the Council and the Commission on the Realization by Stages of Economic and Monetary Union in the Community." Luxemburg: Council - Commission of the European Communities.
Westermann, Frank. 2014. "Discussion of 'TARGET2 and Central Bank Balance Sheets.'" Working Paper 99. Osnabrück: Institute of Empirical Economic Research, Osnabrück University.
Whelan, Karl. 2011. "Professor Sinn Misses the Target." VoxEU. University College Dublin. https://voxeu.org/article/there-hidden-eurozone-bailout.
———. 2014. "TARGET2 and Central Bank Balance Sheets." *Economic Policy* 29 (77): 79–137.
Wolman, Alexander L. 2013. "Federal Reserve Interdistrict Settlement." *FRB Economic Quarterly* 99 (2): 117–41.

About the authors

Steffen Murau is a postdoctoral fellow at the Global Development Policy (GDP) Center of Boston University, a research fellow in the Monetary and Economic Department at the Bank for International Settlements (BIS) in Basel, and a senior researcher at the Global Climate Forum (GCF) in Berlin. His research interests include monetary theory, shadow banking, the international monetary system and the European Monetary Union. Among others, he has published in the Journal of Institutional Economics, the Review of International Political Economy, New Political Economy, Perspectives on Politics, and the Journal of Common Market Studies.

ORCID-ID: https://orcid.org/0000-0002-3460-0026

Matteo Giordano is a doctoral student and teaching assistant in the Department of Economics at the School of Oriental and African Studies (SOAS) University of London and a member of the European Research Network on Social and Economic Policy (RNeNSEP). His main areas of interest are European Political Economy, financialisation, international and monetary macroeconomics, and history of economic thought.

ORCID-ID: https://orcid.org/0000-0002-1588-6735