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Article

Institutional constraints, liquidity provision, and endogenous money in the Eurozone core and periphery before and after crises: A preliminary comparison of the Eurozone Crisis and the Coronavirus Pandemic

NINA EICHACKER*

Abstract:

This paper compares the Eurosystem's response to the Global Financial Crisis with the Coronavirus Pandemic in 2020, and argues that the European Central Bank (ECB) embraced more accommodative monetary policies within the Eurozone after 2011. Using cross-sectoral balance sheet data, it shows that ECB decisions to constrain or enable liquidity provision across the Eurozone changed between the 2008 GFC and the Coronavirus Crisis. These changes reflect Post-Keynesian theories of liquidity preference and endogenous money. Though the Eurosystem has returned to inflation targeting at the time of writing, the ECB's willingness to extend novel monetary support during past crises creates precedent for similar responses to future crises.

University of Rhode Island, USA,
email: nina_eichacker@uri.edu

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After the Global Financial Crisis (GFC) of 2008, financial crises evolved into sovereign debt crises for many peripheral members of the Eurozone but not for core members (Tooze, 2018). By contrast, early financial crises in Europe's experience of the Coronavirus Pandemic did not evolve into sovereign debt crises, despite European governments having incurred trillions of euros worth of debt while responding to the pandemic (Alderman, 2021). This paper investigates why peripheral economies in Europe were more likely to endure sovereign debt crises following the GFC, despite their banks having less direct involvement in the subprime mortgage crisis, and why the governments of peripheral economies in Europe have avoided sovereign debt crises since the financial turmoil of the pandemic began.

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Private creditors' perception of the relative volatility of different governments' sovereign debt affected the space in which governments have been able to respond to economic crises of the 21st century (Prates, 2020). This is particularly important, since governments in Europe, the US, and beyond have bailed out banks alongside national central banks (NCBs) in recent crises, and since sovereign debt has grown to be a large component of collateral for bank and NCB liquidity operations. Changes in the relative valuation and credit rating of these assets has disproportionately hurt Eurozone economies, and peripheral economies worldwide, that lack exorbitant privilege (Ban and Gabor, 2016). Though peripheral European economies have avoided sovereign debt crises since 2020, developing economies lacking access to liquidity services such as those provided by the ECB have not been so lucky (Lustgarten, 2022).

When the ECB has delegated responsibility for financial recovery to member economies and has been unwilling to target spreads in sovereign debt between peripheral and core members, it has limited endogenous money creation by peripheral economies' NCBs. These problems were compounded after the GFC by the ECB Governing Council's decision to block emergency liquidity assistance (ELA) to peripheral Economic and Monetary Union (EMU) NCBs, which increased government burdens in those economies' recoveries. Since 2012, however, the ECB has shown more willingness to act as a dealer of last resort by using Eurosystem institutions to purchase sovereign debt issued by peripheral members, which has allowed spreads to narrow and endogenous money creation to proceed smoothly. Though early forms of novel support after the GFC were typically conditional on governments' commitment to austerity, measures after 2020 like the Pandemic Emergency Purchasing Programme (PEPP) were paired with a suspension of the ECB's Stability and Growth Pact, allowing governments to increase deficit and debt to GDP ratios to the degree needed to navigate the pandemic's physical costs.

The paper supports these arguments with balance sheet analysis of a sample of EMU countries' banks, NCBs, and governments before and after 2008. It also shows that peripheral economies bore larger fiscal burdens for recovery from the GFC and subsequently maintained larger shares of reserve assets, even after the worst of the Eurozone Crisis had passed. When the ECB issued new liquidity facilities in 2020, NCBs and banks could more freely deploy expansionary policies, which decreased their shares of reserve assets among total assets until late in 2021. The ECB's increased willingness to allow NCBs to target spreads decreased the costs for governments, assisting NCBs' responses to the crisis, and it prevented sovereign debt crises that characterized the Eurozone Crisis. Preliminary evidence indicates that banks and NCBs in the Eurozone have only begun shifting towards holding larger concentrations of liquid assets as of September 2021, as the Federal Reserve and ECB pivoted toward contractionary policies.

Several Post-Keynesian theories about money help explain these changes. The structuralist approach to the Post-Keynesian theory of endogenous money helps explain how banks' and monetary authorities' relative preference for liquidity or willingness to extend liquidity services may change over time in response to structural changes. The willingness of the Governing Council of the ECB to change borrowing costs for NCBs in the Eurosystem through its determination of the Eurosystem Collateral Framework (ESCF) can raise or lower barriers that NCBs face in exercising monetary operations for their domestic economies. The predominance of European sovereign debt in collateral for private repurchase agreements and monetary operations in the Eurosystem has increased European banks' and governments' vulnerability to changes in perceptions of their creditworthiness, with implications for what

collateral NCBs accept for domestic liquidity operations. Countries vulnerable to private creditors' perceptions of their sovereign bonds' relative volatility have experienced widening bond spreads as those creditors have fled toward more liquid sovereign bonds issued by Eurozone members with exorbitant privilege. When the Eurosystem has actively supported particular countries by targeting sovereign bond rates in crises, as in 2012 and 2015 when the ECB respectively announced outright market transactions (OMT) and later implemented the Public Sector Purchasing Program (PSPP), and in 2020 when the ECB created PEPP, the ECB has shown it can prevent liquidity crises from worsening and constraining fiscal space. Time will tell whether the ECB may attempt structural transformation through monetary accommodation to more sustainably hedge against crises, or whether it will reserve these measures for larger crises caused by extra-European shocks.

This paper contributes to Post-Keynesian analyses of monetary policy in several ways. It extends analyses of novel monetary responses to financial crises, such as those by Febrero et al. (2015) and Fiebiger and Lavoie (2021), from the GFC and the Eurozone Crisis to encompass the Coronavirus Pandemic. The ECB's response to the Coronavirus Pandemic in 2020 resembled the Federal Reserve's response to the subprime mortgage crisis in its willingness to act as a dealer of last resort and improve confidence in international bond markets. It expands upon work by Chick and Dow (2012) and Prates (2020) on the effects of currency hierarchy, liquidity preference, and the relative willingness or ability of central banks to act as dealers of last resort when responding to economic crises. Private creditors' perceptions of the value of foreign currencies and sovereign bonds may limit the policy space that governments and NCBs have to maneuver during a financial or economic crisis (Prates, 2020). While the ECB declined to use its policy space to accommodate endogenous money creation in peripheral members of the Eurozone following the GFC, its willingness to intervene as a dealer of last resort for sovereign bonds issued by peripheral members' governments in 2020 assuaged volatility in secondary markets for those assets. These measures are particularly important as banks and NCBs across the Eurozone have increasingly come to use sovereign debt as collateral for liquidity operations in shadow banking systems and as collateral for repurchase agreements in Eurosystem monetary policy (Ban and Gabor, 2016; Gabor, 2021).

The next section of this paper briefly discusses the design of Eurosystem monetary policy and elaborates particularly on the increased importance of sovereign debt in Eurozone monetary policy from 2000 to 2008 and beyond; the following section is an analysis of bank, NCB, and government balance sheets within a sample of Eurosystem economies; the penultimate section elaborates on how the structuralist approach to endogenous money helps explain the changes observed over time; the final section concludes.

1. Eurozone monetary structures, sovereign debt, and liquidity provision

This section describes key features of the Eurosystem liquidity provision. It describes the ECB Governing Council's discretionary power in determining collateral for monetary operations within the EMU through the standards of the ESCF, as well as its power to grant or deny emergency liquidity assistance to member NCBs. It highlights the increased importance of sovereign debt issued by member states' governments as collateral for monetary operations, as well as the potential liquidity implications of rising bond rates, especially when governments are increasingly likely to aid NCBs in bailing out banks during financial crises, as

they have since the GFC. It notes the limits of the Eurosystem's TARGET2 system, a cross-border settlement system that functions as an overdraft system, in practice, subject to the discretion of the ECB Governing Council. Throughout, it considers factors that may constrain or limit liquidity provision for banks and NCBs within the Eurosystem.

The Eurosystem includes the ECB and the network of Eurozone members' NCBs. The ECB Governing Council includes the six members of the ECB's executive council, and the governors of member NCBs; it wields discretion in guiding ECB policy with cross border implications for members of the Eurosystem. The Governing Council may approve or veto proposed policy actions by member NCBs; it also shapes collateral standards within the Eurosystem through the design of the ESCF, which can be modified to include or reject different collateral from Eurosystem liquidity operations. The Governing Council has routinely adapted the ESCF to include new forms of collateral, such as corporate bonds, or to limit the use of other collateral, such as sovereign bonds issued by peripheral economies of the EMU (Bindseil et al., 2017; ECB, 2020b; Whelan, 2016).

The ECB's primary assets are repo loans to banks.[1] In the lead-up to the GFC in 2008, Eurozone bank holdings of sovereign bonds, and the use of those bonds as collateral for repo transactions with private creditors and monetary authorities, expanded to approximately 75% (Ban and Gabor, 2016). Collateral provided for repo transactions are marked to market, so changes in popular valuation of assets like sovereign bonds matter for NCBs and banks using those assets as general collateral. The ECB Governing Council may also implement or increase haircuts, the difference between the value of collateral and the repo payment, which can increase borrowers' liquidity service costs. NCBs make their own decisions about the levels of reserves to maintain with the ECB, whether to maintain excess reserves or change the volume of capital buffers, and what amount and combination of other reserve assets to retain (Gros and Bini Smaghi, 2000). The Eurosystem's cross-border settlement system, TARGET2, allows banks within the Eurozone to borrow reserves from NCBs in order to transfer liquid assets to banks elsewhere in the Eurosystem. (Lavoie, 2014). As long as the NCB can create reserves with expansionary policy, TARGET liabilities can increase; TARGET claims can increase without the counterpart NCB engaging in expansionary policy. Since NCBs are constrained by the volume of reserve asset creation the ECB Governing Council is willing to approve, TARGET liability expansion cannot be infinite in practice (Whelan, 2014). When the Governing Council declines to authorize reserve-creating actions or it increases the cost for NCBs to do so, such as by reducing the types of collateral banks may offer for refinancing or increasing the cost of these operations by implementing haircuts, then monetary expansion may be curtailed and TARGET liabilities will not increase.

Though the ECB does not officially allow monetary financing of government debt, its policies regarding the use of sovereign debt as collateral for monetary operations indirectly affect the cost of government liquidity. This is especially important during crises, when governments may lend directly to banks alongside NCBs (Maurer and Grussenmeyer, 2015). Governments may bail out domestic credit institutions anticipating NCBs' support; this short-term relief may assuage the fears of creditors for domestic credit institutions and may likewise improve depositors' and borrowers' confidence during crises. Governments typically fund this

[1] Repurchase agreements, also known as repos, are short-term contracts for borrowers to sell an array of assets (collateral bundles) to a counterparty, or prime dealer, with a contractual obligation for the borrower to repurchase the collateral at a set time in the future. In the Eurozone, repo monetary operations involve short-term repo agreements between banks and NCBs and the ECB.

support with debt, which is likely to increase debt-to-GDP ratios. If sovereign bondholders worry about the sustainability of this debt, their decisions to hold or sell sovereign bonds may affect domestic financial institutions and economies at large. Changing the credit ratings of sovereign debt may also negatively affect banks' and NCBs' ability to use those assets as collateral.

Outside of monetary operations, NCBs in the Eurosystem may engage in ELA, liquidity provision with collateral outside the ESCF. NCBs must present information to the ECB about the institution receiving ELA, the value, volume, and maturity of ELA to be provided, the currency in which the assistance will be provided, the collateral used for the ELA transaction, interest rates paid by all counterparties to the ELA, rationale for providing ELA, risk assessments of the counterparties, assets, and potential cross-border effects of the ELA operation (ECB, 2013). The ECB Governing Council can veto ELA operations if two-thirds of the Governing Council disagrees, based on any of the above criteria (ECB, 2013). Thus, the Governing Council acts as a gatekeeper for ELA, which may increase or decrease funding costs for Eurosystem NCBs, banks, and governments (Whelan, 2016). The ability of the ECB to restrict these operations structurally mitigates European NCBs' ability to provide liquidity to financial institutions in their economies. While the ECB provides ample data on Eurosystem monetary operations to the public, it does not share data on ELA operations.

When collateral for refinancing operations is no longer considered acceptable by the ESCF, banks in the Eurozone and NCBs can sell assets that are less liquid (Whelan, 2014). NCBs hold securities, typically domestic government bonds, loans to domestic commercial banks, and foreign exchange reserves, including sovereign bonds like US Treasuries and gold, which can be used for exchange rate interventions (Cecchetti and Schoenholtz, 2015). NCBs may also hold special drawing rights (SDRs), international reserve assets issued by the IMF under the Bretton Woods fixed exchange rate system, which are claims on "freely usable currencies of IMF members" (IMF, 2022). Smaller economies that do not issue vehicle currencies maintain demand for foreign exchange reserves (Obstfeld et al., 2010; Bonizzi and Kaltenbrunner, 2020). Banks within the Eurosystem often demonstrate home bias and hold high concentrations of domestic sovereign assets; downgrading sovereign bonds can disproportionately constrain liquidity provision in those economies (Whelan, 2016). The relative openness of the ESCF to particular assets can have spillover effects throughout the Eurosystem (Ban and Gabor, 2016).

The next section uses balance sheet analysis to demonstrate that banks and NCBs in the Eurozone have increased their precautionary asset holdings in the wake of crises and the inconsistent monetary relief granted within the Eurozone. It also considers differences in the reserve holding and lending behavior of banks and NCBs in the core and periphery, and it presents preliminary evidence of shifts in the ECB's policies between the GFC and the pandemic.

2. Sectoral balance sheet trends for the Eurosystem: a comparison of two crises

This section presents trends in monetary policy and bank practice from 2000 through 2022 in a sample of Eurosystem member countries: two core economies, Germany and France; four economies that received bailouts from the Troika,[2] Greece, Ireland, Portugal and Spain; and Italy. It contrasts core and peripheral bank, NCB, and government balance sheets over that

[2] The European Commission, the European Central Bank, and the IMF.

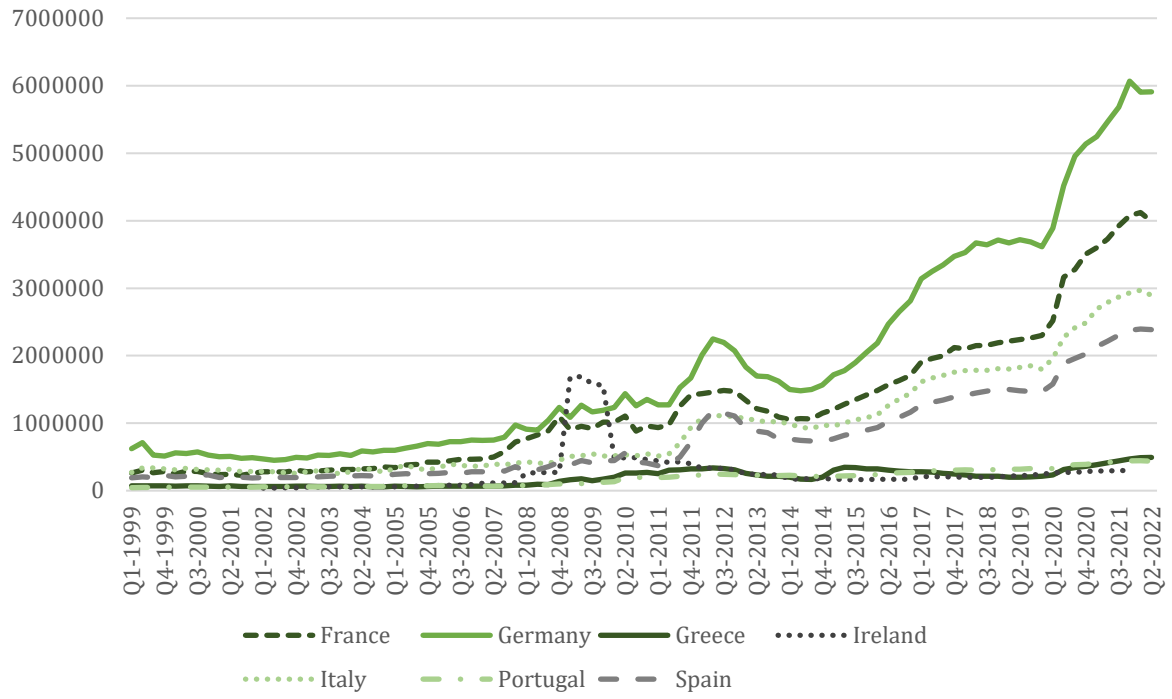
period. It compares the effects of the Eurozone Crisis and the onset of the pandemic, and it shows that NCBs have accommodated more liquidity provision in peripheral economies since the pandemic, allowing banks to resume lending more quickly since the pandemic than at the onset of the GFC. This section shows the effects of peripheral economies' vulnerability to private liquidity and sovereign debt crises after 2008, and it compares the more restrictive monetary policies pursued after 2008 with the more permissive monetary policies implemented between March 2020 and December 2021. It considers how increased uncertainty about the fate of larger Eurosystem programs in 2022 and beyond may affect future economic outcomes.

2.1. Global Financial Crisis

Figures 1 and 2 show the change in aggregate balance sheets maintained by NCBs and other monetary and financial institutions across the sample from 2000 until 2022. Financial practices across what would become the EMU converged between 1990 and 2005 (Eichacker, 2017). Before 2008, banks lent more, and repo transactions by NCBs and shadow banks enabled more expansion of the money supply across the Eurosystem (Ban and Gabor, 2016). Holdings of sovereign debt by NCBs and other monetary and financial institutions (MFIs) increased, as those assets were accepted as collateral for repo transactions (Ban and Gabor, 2016). After 2008, fallout from the US subprime mortgage crisis spread to European financial intermediaries and global financial markets; capital flight ensued from the Eurozone periphery, and creditors in core EMU economies stopped rolling over repurchase agreements from banks in peripheral economies (Ban and Gabor, 2016; Tooze, 2018). Monetary and financial practices by NCBs and banks in Ireland, Greece, and Portugal gradually diverged from the rest of the sample in this period. While the balance sheets of Irish, Greek, and Portuguese banks and NCBs shrank,[3] NCBs elsewhere continued to increase gross assets and liabilities, as banks in those countries maintained roughly constant absolute asset and liability levels. These breaks indicate a structural divide within the Eurozone that facilitated liquidity and money provision in some economies, while slowing or reversing the process elsewhere.

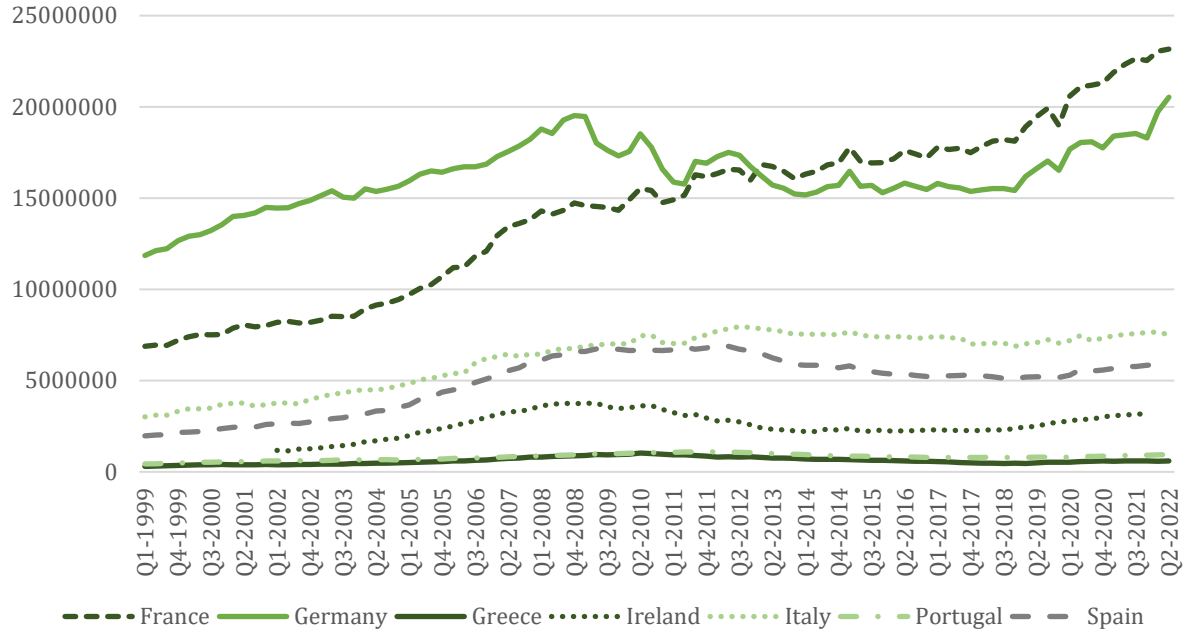
[3] Figure 1 shows a brief spike in the Bank of Ireland's aggregate balance sheet after it implemented a massive ELA program to relieve the failing Anglo-Irish Bank; in subsequent years, the aggregate balance sheet of Ireland's central bank shrank to mirror those of other peripheral EMU members, as Irish banks paid back their loans (Whelan, 2012).

Figure 1 – *Aggregate balance sheets, NCBs, millions of euros*



Source: OECD Statistics (2022), National Account Data, Nonconsolidated Balance Sheets by sector.

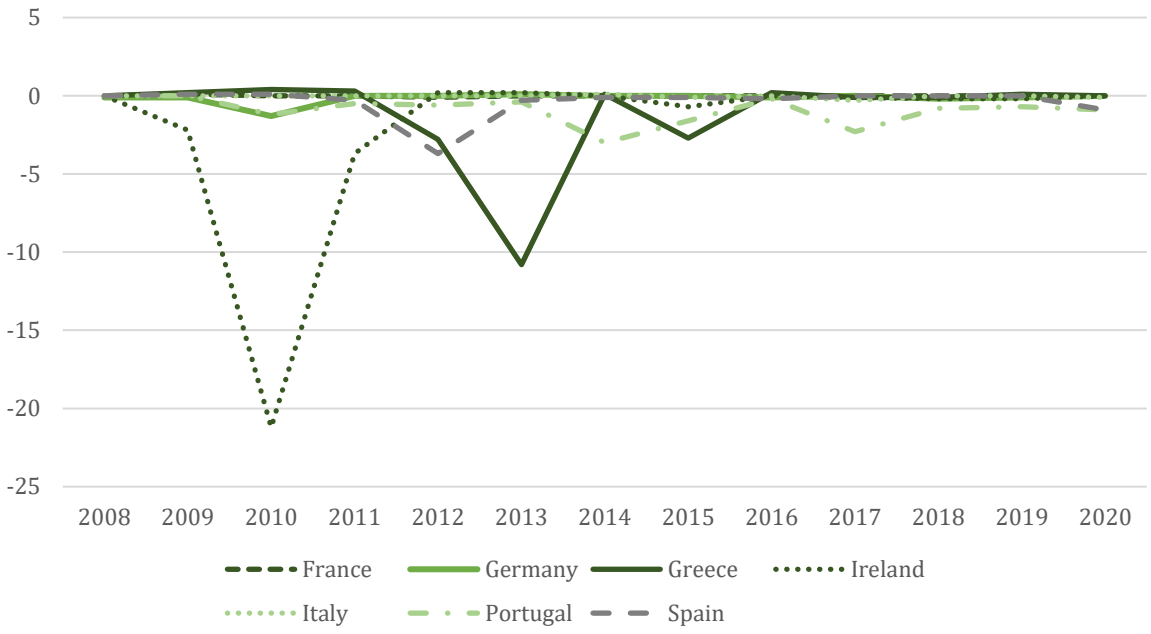
Figure 2 – *Aggregate balance sheets, non-central bank MFIs, millions of euros*



Source: OECD Statistics (2022), National Account Data, Nonconsolidated Balance Sheets by Sector.

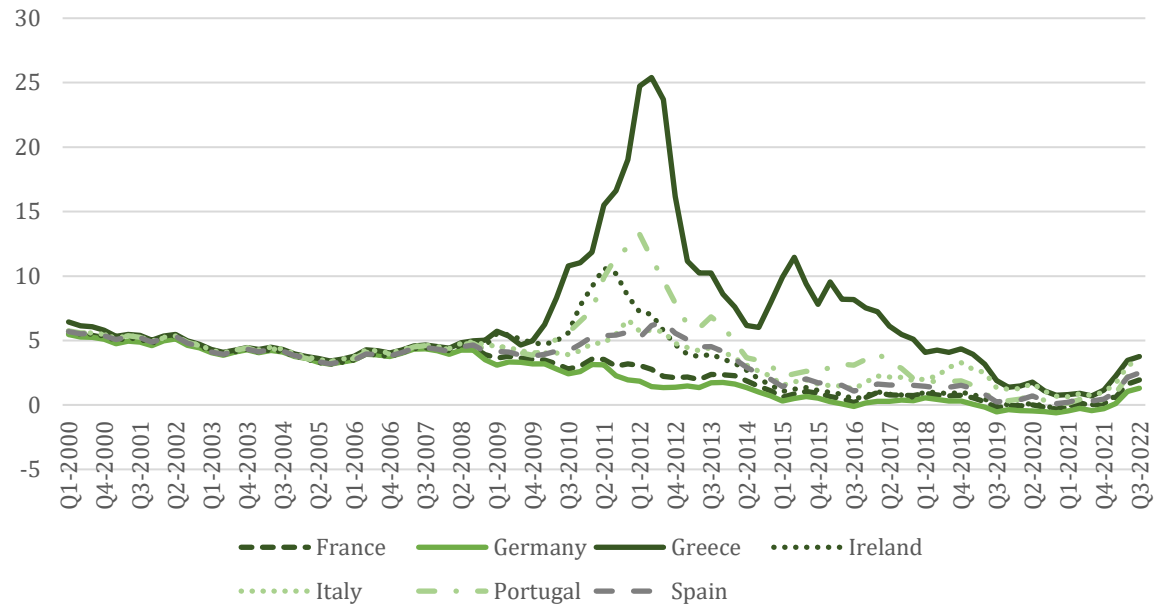
What explains the divergence in central banks' responses between the GFC and the onset of the Global Pandemic? In the first months of the GFC, French and German government officials rejected the notion of a collective European response to GFC, delegating the responsibility of restoring domestic financial systems to governments and NCBs (Ban and Gabor, 2016; Tooze, 2018). Also, banks in the Eurozone with branches and subsidiaries in the US qualified for liquidity support from the Federal Reserve. Banks in peripheral EMU economies, including Greece, Ireland, Italy, Portugal, and Spain, were less likely to engage in international activity and depended more on the ECB, which had itself received liquidity support from the Federal Reserve in the form of dollar swap lines (Tooze, 2018). Thus, aggregate NCB balance sheet data in figure 1 likely understate the liquidity support that German and French banks received relative to their counterparts in the rest of the sample; given the importance of Fed liquidity support, these banks could have shown large spikes similar to those in the Irish case, given the billions of USD worth of liquidity assistance they received from multiple Federal Reserve facilities (Tooze, 2018).

Figure 3 – *Net government deficits resulting from financial sector support, through 2020: net financial debits (lending and payments) by governments to banks as a ratio to GDP*



Source: ECB Data (July, 2022) Government Deficit Data.

Figure 4 – *Quarterly long-term interest rates on sovereign debt, through September 2022*



Source: OECD Statistics (2022), Financial Data, Monthly Long-Term Interest Rates.

After the onset of the GFC, governments across the Eurozone incurred deficits to support and bail out domestic MFIs (Maurer and Grussenmeyer, 2015). Figure 3 shows the subsequent increase in government deficits across the sample.[4] Since banks in Germany and France were more likely to receive liquidity support from the Federal Reserve, their governments required less deficit expenditure to shore up domestic liquidity needs. By contrast, the governments of peripheral European economies in the sample devoted proportionally more to bailing out domestic financial systems. While private creditors purchased German sovereign bonds soon after the GFC, rapid increases in government debt to GDP ratios disproportionately affected private creditors' perceptions of peripheral EMU economies' sovereign debt. Credit rating agencies progressively downgraded the peripheral sovereign debt, and bond spreads widened between core and peripheral economies, depicted in figure 4 (Eichengreen, 2015). This dynamic compounded funding problems for peripheral EMU financial institutions and governments, which had not received liquidity support from the Federal Reserve (Tooze, 2018).

Though the ECB increased the scope of collateral it accepted for liquidity operations early in the GFC, wide-spread downgrades of peripheral economies' sovereign debt complicated liquidity operations for those economies' NCBs. In 2008, the ECB lowered the minimum rating for non-asset-backed securities from A to BBB; if sovereign bond ratings of member states dropped below BBB, the bonds could no longer be used as collateral. As the ESCF expanded the range of assets accepted as collateral for monetary transactions, it also increased the costs for

[4] The ECB maintains a database of statistics that show governments' assistance to domestic financial sectors, including contingent liabilities, guarantees, asset swaps, and other payments directly from governments to banks. See https://sdw.ecb.europa.eu/browse.do?node=9691263

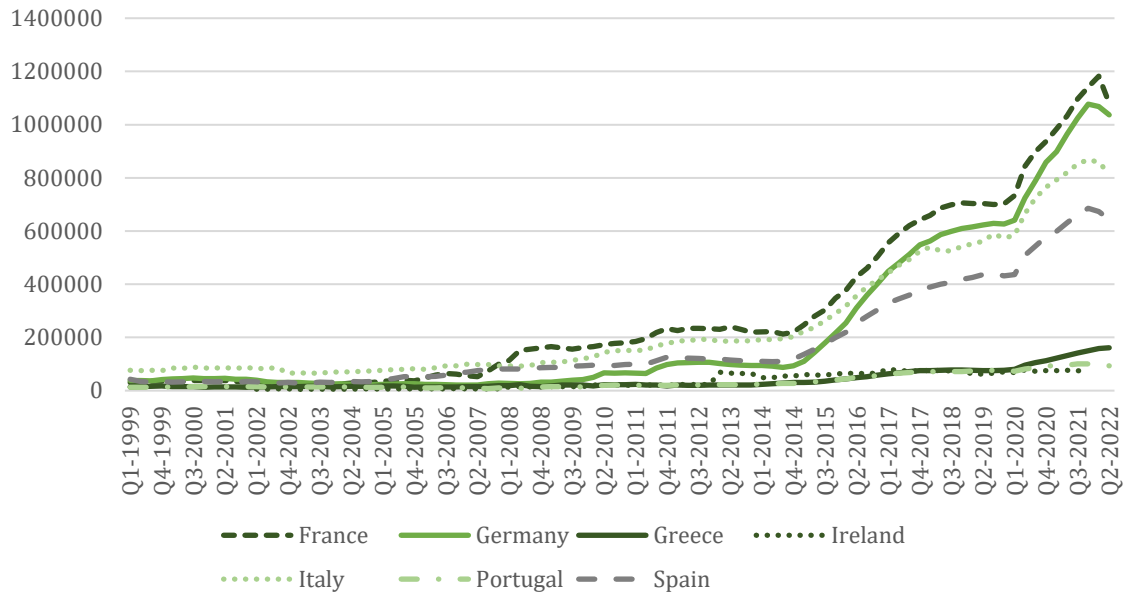
NCBs and banks offering riskier collateral. In 2010, the ESCF was revised to apply haircuts on collateral rated below A (Eberl and Weber, 2014). As private creditors sold off peripheral EMU sovereign bonds, and private yields on that debt rose, peripheral members incurred increased liquidity costs (Eichengreen, 2015). These changes particularly increased peripheral EMU members' vulnerability to crisis, since sovereign debt issued by EMU governments had grown to be a substantial component of collateral for private credit operations as well as for monetary operations (Ban and Gabor, 2016). Cesaratto contrasts 'ostracized' banks in the EMU periphery, which could not access lower-cost European overnight index (Eonia) rates, with 'non-ostracized' banks in the EMU core, which were able to access extremely low rates on interbank lending, despite the greater propensity of banks in the core to have engaged in high-risk activity before the GFC (Cesaratto, 2022, p. 12).

As the Eurozone Crisis progressed, NCBs in peripheral member states that were at risk of defaulting on obligations initiated ELA procedures. In three cases – Ireland, Cyprus[5] and Greece – the ECB Governing Council made clear to the NCBs and financial ministers of the respective states' governments that its approval of ELA required those governments to commit to austerity measures. The Governing Council also required that governments and NCBs assume further liability for the costs of ELA (Whelan, 2016). When the Irish government applied for ELA, the then-head of the ECB, Jean-Claude Trichet, threatened to withhold ELA if the Irish government failed to publicly guarantee repayment of ELA in addition to implementing austerity and economic restructuring measures (*The Irish Times*, 2014). The ECB deferred the responsibility of liquidity provision to the Irish government, further entrenching the Irish government's commitment to honoring those banks' liabilities and to increasing its sovereign debt funding costs in private markets (Whelan, 2014).

Whelan (2016) has also written about how the Eurosystem's repeated threats to exclude Greek sovereign debt from the ESCF procyclically undermined private sector confidence in Greek sovereign debt. After a 2014 stress test of Greek banks revealed that the restructuring measures those banks were committed to implementing would dramatically reduce their likelihood of default, the ECB announced that it could retroactively reject the Bank of Greece's proposed ELA measures (ECB, 2015). Capital flight from Greek banks ensued, further exacerbating funding crises in the Greek financial system, while the ECB Governing Council announced that any further approval for ELA would require Greek commitment to ongoing negotiations over bailouts for Greek banks. These moves by the ECB locked the Greek government into onerous liabilities as the Troika finalized the terms of the Greek government's liability to the European Commission (Whelan, 2016).

[5] Cyprus is not included in the data analysis for this article. Belgium appears to have also received ELA support on the basis of reporting 'Other claims on euro-area credit institutions denominated in euro' (Wolff, 2014, p. 7).

Figure 5 – *Debt security holdings by NCBs, millions of euros*



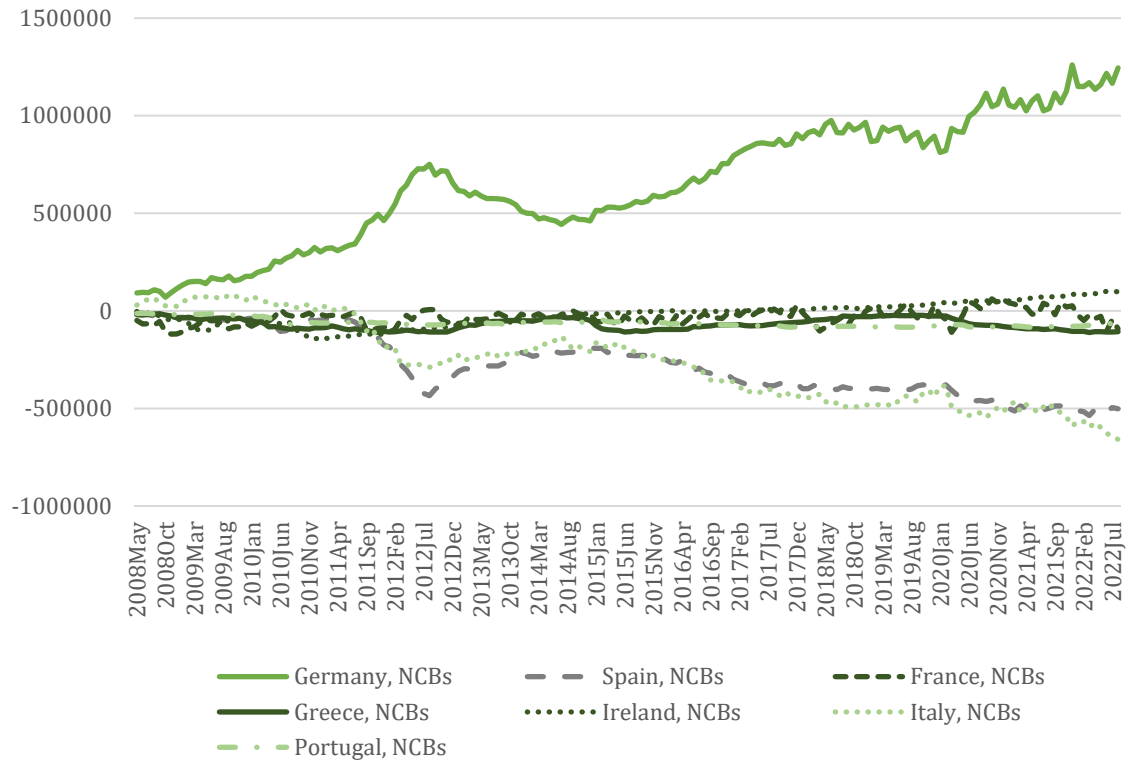
Source: OECD Statistics (2022), National Account Data, Nonconsolidated Balance Sheets by Sector.

The effects of these restraints on Eurosystem monetary operations and ELA are apparent in balance sheet analyses of NCBs across the sample. Figure 5 shows that, while most NCBs in the Eurozone steadily acquired more debt securities, the primary form of monetary expansion in the Eurozone, between 2009 and 2013 the NCBs of Ireland, Greece, and Portugal did not. These dynamics help explain the movement of TARGET balances shown in figure 6, as peripheral economies experienced capital flight from MFIs to safer financial havens in the Eurozone core. As a consequence, the NCBs of Ireland, Greece, and Portugal had little growth in their TARGET liabilities, while the TARGET liabilities of Italy and Spain's NCBs increased. In Germany, the Bundesbank engaged in expansionary monetary policy even as capital flowed into German banks; its TARGET claims rose in tandem with its NCB's balance sheet overall.

The ECB eventually allowed more liquidity provision by peripheral NCBs, after Ireland and Portugal had committed to austerity measures while paying down their obligations to the ECB. First, the ECB eventually approved the creation of the European Financial Stability Facility (EFSF), a special-purpose vehicle (SPV) designed to purchase sovereign bonds issued by peripheral Eurozone economies to relieve liquidity pressure; however, it took months for the SPV to be created and start purchasing peripheral sovereign debt (Tooze, 2018). By August 2011, the ECB resumed buying Irish and Portuguese bonds, which stabilized their prices and yields and relieved liquidity pressure for those financial systems and NCBs (Tooze, 2018). In 2012, the ECB introduced OMT, whereby NCBs purchased EMU government bonds on secondary markets at the behest of the Governing Council, on the condition that those governments adopt austerity measures. Though the ECB has never deployed OMT, it remains an option for member states in the Eurosystem. It also introduced the Public Sector Purchase Programme (PSPP) in 2014, whereby NCBs in the Eurosystem would purchase government

issued debt, which could effectively minimize volatility in markets for public debt in times of crisis (ECB, 2022a; Grad et al., 2011).

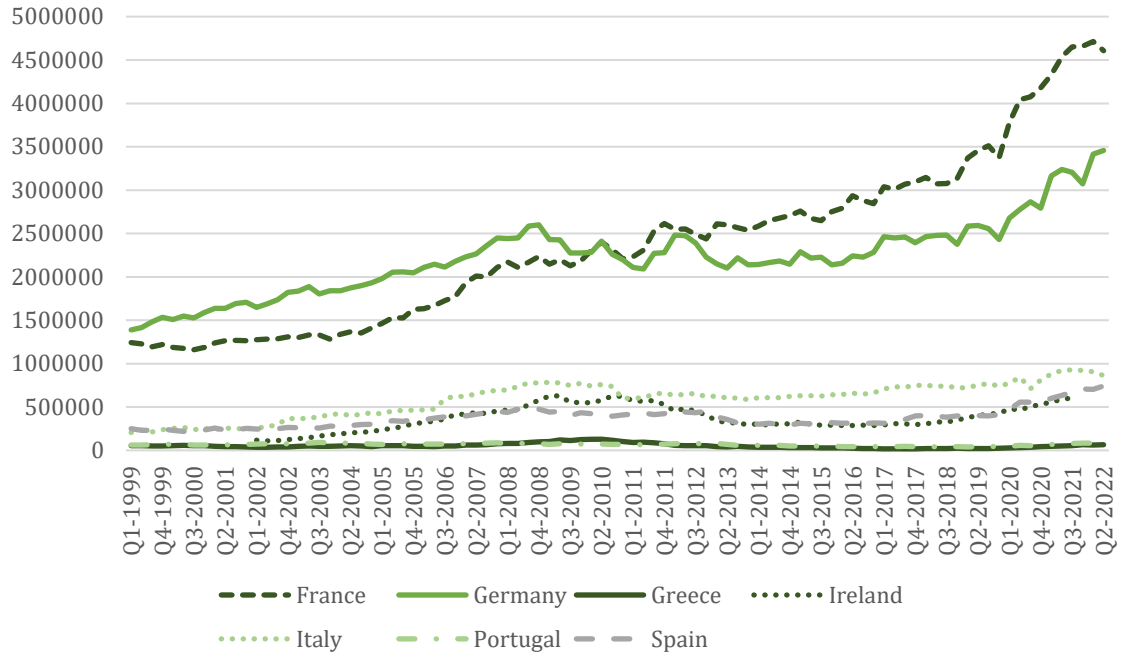
Figure 6 – *TARGET2 balances, end of month, millions of euros*



Source: ECB Data (July, 2022) TARGET Balance Data.

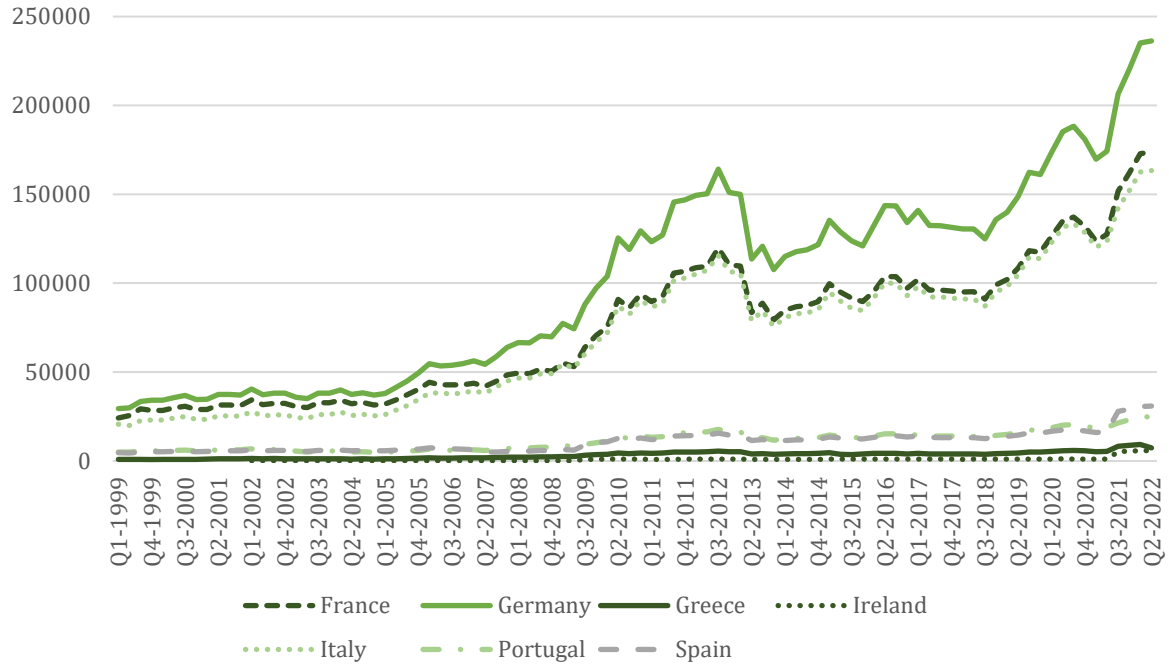
In this context, we can interpret the greater willingness of NCBs and MFIs, excluding central banks, to hold reserve assets (cash and deposits at central banks) since 2015. At the outset of the GFC, banks and NCBs increased their aggregate holdings of reserve assets in pursuit of liquidity. Figure 7 shows that MFIs (excluding central banks) gradually increased their holdings of cash and reserve deposits after 2008, while figure 8 shows that most NCBs in the sample increased their absolute holdings of monetary gold and foreign exchange receivables soon after 2008. Because MFIs, excluding central banks, were generally lending less, and because their portfolios of other assets, like derivatives, debt securities, and loans, were likely to have depreciated early in the GFC, these dynamics increased the concentration of reserve assets relative to MFIs' total assets after 2008. NCBs across the sample and MFIs in aggregate appear to have maintained larger levels and shares of these liquid assets since 2015, indicating a structural shift in favor of more liquid assets across these economies after the GFC and the Eurozone Crisis.

Figure 7 – *Absolute currency and deposits held and maintained by MFIs, excluding central banks; millions of euros*



Source: OECD Statistics (2022), National Account Data, Nonconsolidated Balance Sheets by Sector.

Figure 8 – *Monetary gold and SDRs held by central banks, billions of euros*



Source: OECD Statistics (2022), National Account Data, Nonconsolidated Balance Sheets by Sector.

2.2. Coronavirus Pandemic

In the early months of the pandemic, the ECB appeared more willing to accommodate monetary creation and financial activity and to minimize governments' vulnerability to volatile demand for sovereign debt, in contrast with its more constrained response to the GFC. Early in March 2020, before the global scope of the pandemic was fully understood, private creditors started to sell off Italian debt, in an early response to the Italian government's increased deficits as it responded to the pandemic's domestic effects (Arnold and Stubbington, 2020). Yield spreads grew between Italian sovereign debt and German sovereign debt, and Lagarde stated that the ECB would not intervene to limit spreads. Private creditors responded to this announcement by selling more Italian sovereign debt, which induced more rapid increases of the interest rate on Italian government bonds. Lagarde then reversed her position: the ECB would once again do 'whatever it takes' to support the Eurozone, including purchasing debt associated with pandemic related spending, through the Pandemic Emergency Purchasing Programme (PEPP) (Arnold and Stubbington, 2020). The ECB included Greek debt as eligible collateral for these operations, and the European Commission suspended the Stability and Growth Pact, so that governments could spend without worrying about deficit and debt to GDP ratios (ECB, 2020b; Valero, 2022, Nikas, 2022).

After the onset of the global Coronavirus Pandemic in 2020, as figure 1 shows, NCBs in Europe's core have increased their aggregate balance sheets, though the relative scope of how much they have increased is smaller than what is apparent in those of core members of this sample like Germany and France. These trends appear to have begun to reverse since early 2022, as central banks, including the Federal Reserve and the ECB, have shifted to increasing interest rates. Figure 2 shows that, while German and French MFIs, excluding central banks, have also increased their aggregate balance sheets since the onset of the Coronavirus Pandemic, MFIs in Greece, Ireland, Italy, Portugal, and Spain have proceeded more cautiously. Lending by MFIs in those countries has plateaued since 2015, though it has increased in absolute terms and relative to total assets for MFIs in France and Germany in the same period. This likely reflects the ECB's more proactive and supranational response to the pandemic. By initiating PEPP, the ECB empowered NCBs to backstop domestic government responses to the physical consequences of the pandemic. These measures ensured that Eurozone governments would not be vulnerable to sovereign bond market volatility, by allowing NCBs attempts to provide liquidity for government borrowing in a moment of global uncertainty.

The ECB's rapid actions have minimized the burden that governments have played in relieving domestic banks. Figure 3 shows that, since 2020, most governments have not increased deficit-to-GDP ratios as a consequence of aiding domestic banks through loan guarantees, asset swaps, or other fiscal commitments. Though government deficits have grown in Europe since the onset of the pandemic, figure 4 shows that long-term interest rates on sovereign debt have converged across the sample, thanks to purchases in the billions of euros of sovereign debt under both PEPP and the PSPP (Alderman, 2021; ECB, 2022a). However, since the ECB has begun increasing interest rates since early 2022, long-term interest rates on sovereign debt have begun to diverge within the Eurozone. The monetary mechanism by which this has been ensured is visible in figure 5; debt security holdings have increased across NCBs in the sample. The wide accommodations of the ESCF have facilitated monetary operations in peripheral and core EMU economies; figure 6 shows that TARGET2 surpluses and deficits have increased in Germany, Ireland, France, Greece, Spain, and Italy in ways that demonstrate the

effects of accommodative monetary policy. The Bank of Portugal's TARGET2 balances have held relatively constant since 2020. At present, there is no data on whether any NCBs within the Eurosystem have deployed ELA, but it seems that, from March 2020 through December of 2021, it has not been necessary.

PEPP, which fostered NCB purchases of hundreds of billions of euros worth of corporate and sovereign bonds across the Eurosystem, may have cushioned governments across the Eurosystem from funding pressures, but MFIs and NCBs still seem to exercise caution about the makeup of their assets. Figure 7 shows that MFIs, excluding central banks, have increased their holdings of currency and deposits at central banks, and figure 8 shows that, since the third quarter of 2021, NCBs have increased their holdings of monetary gold and SDRs. Banks wary of future rate hikes may be retrenching to more liquid assets in anticipation of future liquidity problems, while NCBs worried about the effect of rising sovereign debt yield spreads may be ensuring that they have suitable collateral for future monetary operations. As interest rates rise in Europe and beyond, the future of monetary operations in the Eurozone remains to be determined.

The chain of monetary events described in this section shows a contrast between the Eurosystem's responses to the GFC and the Coronavirus Pandemic. During and after the GFC, the ECB's resistance to act as a dealer of last resort by purchasing peripheral governments' sovereign bonds curtailed the funding options available to the Greek, Irish, and Portuguese governments, setting them up for further vulnerability to crisis and to the punishing conditionality of the bailouts of the Eurozone Crisis. By contrast, the German government was never at risk of insolvency because of persistent international demand for its debt, despite large German banks' risky financial activity in the US subprime mortgage-backed securities markets, development of SIVs to engage in repurchases of subprime mortgage-backed securities, and widespread lending to the Eurozone's periphery (Thompson, 2015).

The ECB's response to the Coronavirus Pandemic contrasts with its reluctance to backstop European government spending after 2008. After initially claiming that the ECB would not target spreads between yields on government debt issued by the ECB's periphery and core, Lagarde pivoted to expansive accommodative measures. The ECB's relative willingness to accommodate non-core European economies shapes the reserve-holding and liquidity preference of member states' banks and NCBs. When the ECB has demonstrated greater reticence to expansively provide liquidity, banks and NCBs have shifted asset balances in order to hold greater concentrations of liquid assets, including cash, foreign exchange reserves, and gold. In contrast with the onset of the GFC, there was no corresponding rush by Eurosystem NCBs to shift toward gold and other reserve assets in the early months of the pandemic.

Some of these trends have begun to reverse since late 2021. Figure 1 shows that NCBs' aggregate balance sheets are starting to shrink in the Eurozone, and figure 5 shows that debt security holdings by NCBs have begun to decline in the Eurozone, as the Federal Reserve and the ECB have shifted toward raising interest rates. Figure 4 shows that interest rates have risen throughout the Eurozone since late 2021; country rates have also begun to diverge. Though low, rates in peripheral economies like Greece, Italy, and Spain hover around 3% as of the third quarter of 2022, compared to rates of 1.3 and 1.9 in Germany and France. Figure 8 shows that, since September 2021 and continuing through 2022, NCBs have started accruing more reserve assets across the sample. Future research should track these trends and ascertain whether these dynamics persist, or whether the threat of future crises halts these rate hikes and balance sheet patterns.

These preliminary findings illustrate the potential for Eurosystem monetary policy to become even more broadly accommodating. If governments provide liquidity support to banks early in crises, expansive liquidity provision can cushion their economies from private creditors' potential fears of default. These measures relieve funding pressures for economies that may lack exorbitant privilege in global bond markets, and facilitate more fiscal expenditure to deal with the consequences of crises like a pandemic. When debates about when to relieve accommodative measures resume, bond spreads increase, generating more uncertainty for governments, banks, and NCBs. These events leave durable marks: most economies in this sample, periphery and core alike, maintained larger capital buffers and larger stocks of reserve assets between 2014 and 2020 than they did before the expansion linked to the subprime mortgage boom. Movements by NCBs at the time of writing to increase their holdings of monetary gold and foreign exchange receivables hint at more conservative practices, which may potentially constrain financial activity that architects of the EMU hoped the union would promote (Gros and Bini Smaghi, 2000).

The next section of this paper relates these policy shifts with the Post-Keynesian theory of endogenous money. It analyzes the ECB's structural power to dictate liquidity conditions for banks and NCBs in core and peripheral members of the Eurosystem through the lens of the structuralist approach to endogenous money in Post-Keynesian economic theory. By comparing the ECB's approaches after 2008 and after 2020, it maps a trajectory along which the ECB has become more willing to accommodate liquidity provision by peripheral members following major financial crises.

3. Explaining the evolution of ECB policy with Post-Keynesian theories of money, liquidity provision, and currency hierarchies

Post-Keynesian theories of endogenous money, currency hierarchies, and liquidity preference help explain many of the phenomena described in the preceding section. This section uses insights from Chick and Dow (2002), Prates (2020) and others to explain how an institution like the ECB might change its approach to liquidity provision over time to structurally constrain or facilitate economic recoveries after financial crises. While the ECB's response to the GFC in 2008 and 2009 paved the way for divergence within the Eurozone between core and peripheral members' abilities to respond to the financial crisis, Mario Draghi's actions in 2012 and Lagarde's actions in 2020 were more accommodative of domestic financial systems through their direct targeting of sovereign bond spreads between core and peripheral members of the Euro area. This gradual transformation of the Eurosystem's approach to monetary policy in times of crisis and stability may not be permanent, yet it demonstrates the importance of political economic factors that may affect member NCBs' and governments' abilities to address economic downturns.

Post-Keynesian theories of endogenous money rebut monetarist positions that central banks are sole providers of money in any given economy and that there is a predetermined and unvarying relationship between the money put into circulation and the broader demand for money in any given economy (Kaldor, 1985; Dow, 2006). In an endogenous monetary system, banks' assets like loans generate deposits at the micro level (Mehrling, 2020; Chick and Dow, 2002). Banks' willingness to lend and purchase assets facilitates transactions between other actors within an economy to deposit income elsewhere in the banking system; the ease with

which NCBs facilitate the smooth operation of the financial system and with which governments may engage in transactions likewise foster economic activity and the contingent creation of money in an endogenous money system (Mehrling, 2020). Funding practices may change over time, and the relative importance of private and non-bank financial institutions may ease or constrict liquidity conditions. These interlinkages present points for rupture in crises, when access to liquidity may determine the solvency of particular actors and institutions.

The structuralist approach to endogenous money notes that, though borrowers' demand for credit is a major determinant of the money supply, banks and other financial and monetary institutions still play central roles in creating and circulating money (Chick and Dow, 2002). Institutional structures, history, and expectations of the relative willingness and ability of central banks to accommodate banks' and other borrowers' demand for different assets may determine relative liquidity demand, which in turn affects how much money circulates (Dow, 2006). If authorities can influence the money supply through a more active setting of interest rates and other fees to encourage or discourage reserve borrowing by banks or other borrowers based on interpretations of how creditworthy they are, endogenous money and liquidity preference can reinforce one another, particularly in periods of financial instability, and may vary over time and space (Dow, 2006, pp. 37-38). Banks' decisions about what constitutes creditworthiness are determined by economic, social, and historic context, and they must be considered in a given economy's execution of monetary policy. Changes in the perceived value and liquidity of assets, such as sovereign debt used as collateral for monetary operations, can affect banks' operations overall. Over time, different assets may be accepted in return for different transactions, at different values relative to par; these assets may take more or less time to exchange, depending on relative demand (Minsky, 1980). Though banks may be able to access liquidity from central banks as long as they can pay the price for it, banks expecting liquidity service volatility may rationally maintain precautionary stores of liquid assets (Culham, 2020).

Before 2008, sovereign debt issued by all members of the Eurozone grew to be an important form of collateral exchanged in repurchase agreements between banks and NCBs for monetary operations (Ban and Gabor, 2016). The ECB's deference to domestic NCBs and governments in responding to European spillovers from the GFC and the failure of major private intermediaries like Lehman Brothers increased the importance governments played in bailing out domestic financial systems (Tooze, 2018; Maurer and Grussenmeyer, 2015). However, while governments in core economies like Germany and France, where banks had been heavily involved in the sub-prime mortgage crisis, implicitly benefited from the Federal Reserve's early extension of liquidity support, banks in Ireland, Spain, and Greece, which had primarily engaged in domestic activity before 2008, relied to a greater degree on government assistance (Tooze, 2018). When private creditors sold off peripheral EMU members' sovereign bonds, and credit rating agencies downgraded sovereign debt issued by Ireland, Greece, and Portugal, credit ratings on those governments' bonds fell below the limits mandated by the ESCF. As a result, domestic NCBs could no longer rely on those assets for monetary operations. When governments bear outsize burdens in responding to financial crises, volatility in sovereign debt markets that increases their interest rates serves to constrain monetary supply. European NCBs moved away from holding the sovereign debt of peripheral Eurozone members after the ECB's rejection of that debt as collateral, which worsened fiscal burdens for those governments. Since the GFC and Eurozone Crisis, most European banks and NCBs have

increased their holdings of cash, monetary gold, and foreign currencies. This flight toward more liquid assets aligns with the structuralist approach to endogenous money – the prospect of crisis and lack of liquidity have prompted a more precautionary accumulation of reserve assets.

Because government debt was a key element of collateral, and because demand for some governments' bonds outpaced demand for others', peripheral members of the Eurozone were at a structural disadvantage in their ability to use expansionary monetary policy to resolve pervasive financial problems (Prates, 2020). By contrast, governments of economies that had engaged more explicitly in the subprime mortgage asset bubble that preceded the financial crisis of 2008 were able to access liquidity services from the Federal Reserve, and private creditors continued to acquire their governments' sovereign debt. The ECB Governing Council exacerbated this disparity when it blocked peripheral members' NCBs' attempts to deploy ELA for domestic banks. The Governing Council's rejection of ELA for banks in Greece, Ireland, and Portugal increased the cost of liquidity provision for governments and forced governments to absorb the costs of crisis. The Eurozone Crisis thus revealed a currency hierarchy within the Eurozone, despite members' common currency (Prates, 2020).

The ECB's about-face in 2020 further demonstrates the salience of the structuralist approach. Lagarde's quick turnabout from arguing that the ECB would not target spreads to authorizing PEPP, which quickly forced sovereign bond rates to converge, illustrated a structural willingness to accommodate Eurozone monetary needs. Why would the ECB, which had allowed the costs of liquidity provision to increase to unmanageable levels for peripheral members in 2008, suddenly authorize low- to no-cost liquidity provision in 2020? The fundamental creditworthiness of Greek, Irish, Italian, Portuguese, and Spanish banks could not have changed so dramatically between the end of the Eurozone Crisis and the onset of the pandemic to plausibly argue for decreasing the cost of providing liquidity to banks in need in those peripheral members. If the ECB could readily accommodate monetary demand by banks and NCBs in 2020, there is little reason to believe it could not have accommodated those needs in 2008, if not for a different set of political and economic priorities.

Just as the ECB has shown that it can reassess the relative creditworthiness of Eurozone members, its leadership may determine that, once the Eurozone no longer faces the risks of crisis, it no longer merits such monetary accommodation. The ECB's language about when PEPP will expire is ambiguous; in a December 2020 press release, the ECB announced that collateral easing payments would continue through the end of calendar year 2022 but also that it would maintain the program as long as economic fallout from the pandemic was evident (ECB, 2020a). Yet, we may already see the evidence of a changed willingness to use monetary measures to backstop debt as the Eurosystem's leadership debates implementing the Transmission Protection Instrument (TPI), which would authorize NCBs in the Eurosystem to purchase public securities in order to prevent fragmentation between Eurozone members if bond rates begin to diverge (ECB, 2020b). Regardless of whether the ECB applies its willingness to promote convergence during the pandemic to non-crisis times, the ECB's willingness in 2020 and 2021 to engage in wide accommodative measures for core and peripheral members alike, as well as a willingness to backstop sovereign debt, whether it is issued to support domestic financial systems or to provide other supports for domestic economies, presents a break with the past.

4. Conclusion

This paper has illustrated how the ECB's structural willingness to foster or inhibit endogenous money creation in the Eurosystem changed in the decades since 2000. Shortly after the implementation of EMU, banks across the Eurozone engaged in greater cross-border activity, increased their scope of money creation, and shifted concentrations of assets and liabilities towards less liquid assets. These changes were apparent in monetary policy by NCBs across the Eurosystem as their balance sheets increased. After 2008, these dynamics reversed; by 2015 the terrain of the European financial and monetary landscape resembled practices in the pre-EMU period. Banks and NCBs retrenched to holding larger shares of reserve assets and maintaining larger capital buffers, in both core and peripheral economies. Since the onset of the global recession linked with the Coronavirus Pandemic in March 2020, the ECB has again shown a structurally greater willingness to use expansive liquidity measures to enable financial activity, monetary policy, and government spending within the Eurozone. These changes imply the sustained importance of historical and political structures within the Eurozone, which have sometimes hindered liquidity provision and endogenous money creation and at other times enabled those processes.

Banks in core EMU economies accessed generous monetary support from the Federal Reserve early in the GFC, which sheltered their NCBs and governments from higher bailout costs. By contrast, peripheral economies in the Eurozone that absorbed spillover effects from the GFC had greater fiscal liabilities related to bailouts (Maurer and Grussenmeyer, 2015). These dynamics procyclically worsened private creditors' perceptions of their banks' and their governments' sovereign debt. Though NCBs initially attempted to accommodate banks' increased demand for liquidity through the rapid purchase of general collateral from banks, the ECB's reluctance to act as a dealer of last resort and its increasing stringency in providing lender of last resort services worsened procyclical crises in the periphery. When Eurozone NCBs used up eligible collateral for monetary operations, the ECB Governing Council increased the cost of using peripheral collateral for monetary operations, and the ECB attached austerity conditions and labor market reforms as prerequisites for ELA (Whelan, 2014). These actions structurally limited monetary expansion in peripheral EMU economies through the mechanism of higher cost operations, as well as outright limits on spending as a prerequisite for ELA.

However, the ECB has shown that political commitment to a more accommodative monetary policy can minimize structural constraints on liquidity provision in the peripheral economies of the Eurozone. The creation of the PSPP in 2014 and the PEPP in 2020 both reduced the costs of borrowing for Eurozone governments and increased the scope of assets that NCBs could use as collateral for operations (Tooze, 2018; Tooze, 2021). In both cases, officials within the Eurosystem changed their minds about what assets could be used to conduct monetary policy, which decreased funding costs for Eurozone members that lacked exorbitant privilege in global credit markets. These measures and their effects are consistent with the structuralist approach to endogenous money: at different points in its history, the Eurosystem has accommodated or constrained monetary operations between members on an apparently discretionary basis.

European monetary policy can accommodate liquidity demand during crises. The ECB has successfully empowered NCBs to facilitate liquidity provision to banks and endogenous money creation. Eurozone monetary policymakers' desire to accommodate financial activity in Italy and Spain during the Eurozone Crisis because of the potential risk of their financial systems

collapsing implies that policymakers could have extended liquidity services to Irish, Greek, and Portuguese banks much earlier in the Eurozone Crisis. The power to determine which banks receive aid and what conditional terms attend bailouts links Eurozone monetary policy to disparate economic outcomes. Preliminary analysis of monetary operations and balance sheets since March 2020 confirm this story.

The ECB's retrenchment toward increasing interest rates is not inconsistent with the previous trends discussed. Though spreads are beginning to widen between rates on sovereign debt issued by the Eurozone's periphery and core, the ECB's actions are consistent with the structural approach to endogenous money. While the ECB demonstrated an increased willingness to target spreads in the immediate aftermath of the Coronavirus Crisis, its subsequent return to inflation targeting and its contractionary policies fit with the structuralist approach's premise that central banks may change their relative willingness to accommodate money creation over time, or in response to political and economic changes. Future research should analyze how the ECB responds to future crises that may arise due to its commitment at the time of writing toward raising rates, especially if peripheral members of the Eurozone suffer disproportionately

The economic costs of the Eurozone Crisis were great. Peripheral economies suffered austerity, unemployment, and welfare crises as governments slashed budgets to accommodate their conditional bailouts (Tooze, 2018). These could have been avoided through rapid provision of liquidity that addressed the sources of the funding crises throughout the Eurosystem, even as regulators could have targeted the worst financial excesses that determined European losses in the GFC. The importance of maintaining liquidity for economies in crisis is in sharp focus at the time of writing, as central banks around the world attempt to mitigate the economic consequences of the Coronavirus Pandemic. Western governments have again provided bailout services for banks, increasing those governments' potential vulnerability to private credit market dynamics that increase their debt servicing costs to unsustainable levels (Tooze, 2021). The European Commission's early decision to suspend the Growth and Stability Fund's required ratios and the willingness of the ECB to fund Eurozone-wide pandemic spending with PEPP indicates that policymakers have learned from the last time. Though the ECB has currently suspended PSPP, and though the fate of PEPP is ambiguous, its willingness to create new programs like the TPI may indicate a more structural change in the Eurosystem's approach to regional development and recovery. Time will tell.

References

Alderman L. (2021), "Europe's Pandemic Debt is Dizzying. Who Will Pay?", *The New York Times*, 17 February, updated 30 April. Available at: https://www.nytimes.com/2021/02/17/business/europe-pandemic-debt.html

Arnold M. and Stubbington T. (2020), "Lagarde Triggers Investor Jitters as ECB Launches Virus Response", *Financial Times*, 12 March. Available at: https://www.ft.com/content/11ab8f84-6452-11ea-b3f3-fe4680ea68b5

Ban C. and Gabor D. (2016), "Banking on Bonds: The New Links Between States and Markets", *Journal of Common Market Studies*, 54 (3), pp. 617-635.

Bindseil U., Corsi M., Sahel B. and Visser A. (2017), "The Eurosystem Collateral Framework Explained", *ECB Occasional Paper*, n. 189, Frankfurt (Germany): European Central Bank. Available at: https://www.econstor.eu/bitstream/10419/175731/1/ecb-op189-en.pdf

Bonizzi B. and Kaltenbrunner A. (2020), "Critical Macro-Finance, Post Keynesian Monetary Theory and Emerging Economies", *Finance and Society*, 6 (1), pp. 76-86.

Cecchetti S. and Schoenholtz K. (2015), *Money, Banking, and Financial Markets*, New York: McGraw-Hill.

Cesaratto S. (2022), "An ECB's Staff Narrative of Two Decades of European Central Banking: A Critical Review", *Quaderni del Dipartemento di Economia Politica e Statistica della Universita di Siena*, n. 866. Available at: https://www.deps.unisi.it/sites/st02/files/allegatiparagrafo/23-03-2022/866.pdf

Chick V. and Dow S. (2002), "Monetary Policy with Endogenous Money and Liquidity Preference: A Nondualistic Treatment", *Journal of Post Keynesian Economics*, 24 (4), pp. 587-607.

Chick V. and Dow S. (2012), "On Causes and Outcomes of the European Crisis: Ideas, Institutions, and Reality", *Contributions to Political Economy*, 31 (1), pp. 51-66.

Culham J. (2020), "Revisiting the Concept of Liquidity in Liquidity Preference", *Cambridge Journal of Economics*, 44 (3), pp. 491-505.

Dow S. (2006), "Endogenous Money: Structuralist", in Arestis P. and Sawyer M. (eds.), *A Handbook of Alternative Monetary Economics* (pp. 35-51), Cheltenham (UK) and Northampton (MA): Edward Elgar Publishing.

Eberl J. and Weber C. (2014), "ECB Collateral Criteria: A Narrative Database 2001-2013", *IFO Working Paper*, n. 174, Leibniz Institute for Economic Research at the University of Munich, IFO Institute. Available at: https://www.cesifo.org/DocDL/IfoWorkingPaper-174.pdf

ECB – European Central Bank (2013), "ELA Procedures", European Central Bank. Available at: https://www.ecb.europa.eu/pub/pdf/other/elaprocedures.en.pdf

ECB – European Central Bank (2015) "ELA to Greek Banks Maintained at Its Current Level", European Central Bank. Available at: https://www.ecb.europa.eu/press/pr/date/2015/html/pr150628.en.html

ECB – European Central Bank (2020a), "Monetary Policy Decisions", press release, European Central Bank. Available at: https://www.ecb.europa.eu/press/pr/date/2020/html/ecb.mp201210~8c2778b843.en.html

ECB – European Central Bank (2020b), "Pandemic Emergency Purchase Programme", European Central Bank. Available at: https://www.ecb.europa.eu/mopo/implement/pepp/html/index.en.html

ECB – European Central Bank (2022a), "Public Sector Purchase Programme (PSPP) – Q&A", European Central Bank. Available at: https://www.ecb.europa.eu/mopo/implement/app/html/pspp-qa.en.html

ECB – European Central Bank (2022b), "The Transmission Protection Instrument", press release, European Central Bank. Available at: https://www.ecb.europa.eu/press/pr/date/2022/html/ecb.pr220721~973e6e7273.en.html

ECB – European Central Bank (July, 2022), *Statistical Data Warehouse*. Available at: https://sdw.ecb.europa.eu/

Eichacker N. (2017), *Financial Underpinnings of Europe's Financial Crisis: Liberalization, Integration, and Asymmetric State Power*, Cheltenham (UK) and Northampton (MA): Edward Elgar Publishing.

Eichengreen B. (2015), "The Irish Crisis and the EU from a Distance", *IMF Working Paper* [preprint], Washington: International Monetary Fund. Available at: https://www.imf.org/external/np/seminars/eng/2014/ireland/pdf/Eichengreen_IrishCrisisEU.pdf

Febrero E., Uxó J. and Dejuán Ó. (2015), "The ECB During the Financial Crisis: Not So Unconventional!", *Metroeconomica*, 66 (4), pp. 715-739.

Fiebiger B. and Lavoie M. (2021), "Central Bankers and the Rationale for Unconventional Monetary Policies: Reasserting, Renouncing or Recasting Monetarism?", *Cambridge Journal of Economics*, 45 (1), pp. 37-59.

Gabor D. (2021), "Revolution without Revolutionaries: Interrogating the Return of Monetary Financing", *Transformative Responses to the Crisis*, Berlin, Germany: Finanzwende and Heinrich-Böll-Foundation. Available at: https://transformative-responses.org/wp-content/uploads/2021/01/TR_Report_Gabor_FINAL.pdf

Grad D., Mehrling P. and Neilson D. (2011), "The Evolution of Last-Resort Operations in the Global Credit Crisis", *SSRN Working Paper*, n. 2232348.

Gros D. and Bini Smaghi L. (2000), *Open Issues in European Central Banking*, New York: St. Martin's Press.

IMF – International Monetary Fund (2022), "Special Drawing Rights (SDR)", fact sheet, International Monetary Fund. Available at: https://www.imf.org/en/About/Factsheets/Sheets/2016/08/01/14/51/Special-Drawing-Right-SDR

Kaldor N. (1985), "How Monetarism Failed", *Challenge*, 28 (2), pp. 4-13.

Lavoie M. (2014), *Post Keynesian Economics: New Foundations* (pp. 17-34), Cheltenham, UK and Northampton, MA: Edward Elgar Publishing.

Lustgarten A. 2022, "The Barbardos Rebellion", *The New York Times*, 27 July. Available at: https://www.nytimes.com/interactive/2022/07/27/magazine/barbados-climate-debt-mia-mottley.html

Maurer H. and Grussenmeyer P. (2015), "Financial Assistance Measures in the Euro Area from 2008 to 2013: Statistical Framework and Fiscal Impact", *Statistics Paper Series,* n. 7 [preprint]. Available at: https://www.ecb.europa.eu/pub/pdf/scpsps/ecbsp7.en.pdf#%5B%7B%22num%22%3A55%2C%22gen%22%3A0%7D%2C%7B%22name%22%3A%22XYZ%22%7D%2C83%2C757%2C0%5D

Mehrling P. (2020), "Payment vs. Funding: The Law of Reflux for Today", *Working Papers*, n. 113, New York, NY: Institute for New Economic Thinking. Available at: https://www.ineteconomics.org/uploads/papers/WP_113-Mehrling-Payment-vs-Funding.pdf

Minsky H. (1980), "Capitalist Financial Processes and the Instability of Capitalism", *Journal of Economic Issues*, 14 (2), pp. 505-523.

Nikas S. (2022), "ECB Weighs Plan to Extend Greek Debt Collateral Status to 2024", *Bloomberg*, 16 February. Available at: https://www.bloomberg.com/news/articles/2022-02-16/ecb-weighs-plan-to-extend-greek-debt-collateral-status-to-2024?sref=QQ2zZ4RD

Obstfeld M., Shambaugh, J. and Taylor, A. (2010), "Financial Stability, the Trilemma, and International Reserves", *American Economic Journal: Macroeconomics*, 2 (2), pp. 57-94.

OECD – Organization for Economic Co-operation and Development (2022), *Statistics*. Available at: https://stats.oecd.org/

Prates D. (2020), "Beyond Modern Monetary Theory: A Post-Keynesian Approach to the Currency Hierarchy, Monetary Sovereignty, and Policy Space", *Review of Keynesian Economics*, 8 (4), pp. 494-511.

The Irish Times (2014), "Jean Claude Trichet Letter to Brian Lenihan", *The Irish Times*, November 6. Available at: https://www.irishtimes.com/business/economy/jean-claude-trichet-letter-to-brian-lenihan-1.1989801

Thompson H. (2015), "Germany and the Euro-Zone Crisis: The European Reformation of the German Banking Crisis and the Future of the Euro", *New Political Economy*, 20 (6), pp. 851-870.

Tooze A. (2018), *Crashed: How a Decade of Financial Crises Changed the World*, New York: Viking.

Tooze A. (2021), *Shutdown: How Covid Shook the World's Economy*, New York: Viking.

Valero J. (2022), "Dutch Finance Chief Backs Postponing Return of EU's Debt Limits", *Bloomberg News*, 4 April. Available at: https://www.bloomberg.com/news/articles/2022-04-04/dutch-finance-chief-backs-postponing-return-of-eu-s-debt-limits?sref=QQ2zZ4RD

Whelan K. (2012), "ELA, Promissory Notes and All That: The Fiscal Costs of Anglo Irish Bank", *The Economic and Social Review*, 43 (4), pp. 653-673.

Whelan K. (2014), "TARGET2 and Central Bank Balance Sheets", *Economic Policy*, 29 (77), pp. 79-137.

Whelan K. (2016), "Banking Union and the ECB as Lender of Last Resort", *UCD Centre for Economic Research Working Paper Series*, n. WP16/09, Dublin, IE: UCD School of Economics, University College Dublin. Available at: https://www.econstor.eu/bitstream/10419/175468/1/WP16_09.pdf

Wolff G. (2014), "Eurosystem Collateral Policy and Framework: Was It Unduly Changed?", *Breugel Policy Contribution*, issue 2014/14. Available at: https://www.bruegel.org/sites/default/files/wp-content/uploads/imported/publications/pc_2014_14.pdf