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Banking on Bonds: The New Links Between States and Markets*

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Abstract

This article examines a neglected structural transformation in European finance: the growing importance of government debt as collateral for Europe's repo markets, where banks borrow cash against collateral. Seduced by the promises of repo market-driven financial integration, the EU institutions and Member States encouraged private finance to generate its own architecture for the European repo market in the early years of the euro, sidelining known problems about systemic fragilities. These fragilities materialized after Lehman Brothers' collapse and were exacerbated by the ECB's collateral policies. The European sovereign debt crisis shows that governments, just like private asset issuers, can rapidly become vulnerable to repo pro-cyclicality and collateral crises.

Keywords: repo markets; collateral; ECB; crisis; shadow banking; government bonds

Introduction

Since 2008, regulators have become increasingly concerned with two markets of systemic importance for shadow banking: securitization and repo markets (FSB, 2012; Commission, 2012; ECB, 2013a). After Lehman Brothers' collapse triggered a run on the repo market (Gorton and Metrick, 2012; Constâncio, 2012), central banks across the world expressed their surprise that such shadow markets had become systemic (see FSB, 2012; ECB, 2013a). For the ECB (2013a), the build-up of leverage in European finance could be traced to 'the growth of markets that are relatively "hidden" from regulators', including the European repo market where financial institutions borrow against collateral.

The European repo market has become structurally important for European private and public finance. First, it tripled in volume between 2001 and 2008 to €6 trillion, reaching the size of the US repo market (Hördahl and King, 2008; Constâncio, 2012). Second, while dominated by large European banks, repo markets also involve cash-rich, non-bank financial institutions (pension funds, insurance companies). In 2011, large European banks were still funding 66 per cent of their assets in wholesale funding markets, twice the level of US or Asian banks (Le Lesle, 2012). Third, the European repo market is structurally intertwined with European government bond markets. Around 75 per cent of repo transactions use government bonds as collateral (Hördahl and King, 2008). Fourth, the quiet rise of repo markets has created new systemic actors (Constâncio, 2012). In 2012, LCH Clearnet – a clearing house (or CCP) that stands between the two repo parties to guarantee the exchange of collateral and cash – intermediated around €11 trillion of repos

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with government bonds monthly. By 2013, the ECB had put it on the list of financial institutions to be supervised at the European level. Finally, central banks implement monetary policy – including the ECB's medium and long-term refinancing operations (LTROs) – through repo operations, lending to banks against collateral (see ECB, 2015a).

Despite its systemic importance, the European repo market has attracted little scholarly attention. With few exceptions, financial economists deal almost exclusively with the US repo market (see Mancini *et al*., 2013; Boissel *et al*., 2014). The notable exception in international political economy, Hardie and colleagues (2013) question the conventional dichotomy between (US) market and (Europe) bank-based financial systems and call for more work on banks' activities in money and capital markets. To this end, they focus on repo markets as a crucial dimension of market-based banking on both sides of the Atlantic.

This article builds on and extends the contributions of Hardie and colleagues to show not only that the European repo market has deeply altered European financial capitalism, but also *how* it did this and *who* facilitated its deepening. We first show that EU institutions and Member States actively supported the growth of European repo markets and then trace the impact on European finance in times of crisis. We thus argue that the launch of the euro was accompanied in European policy circles by growing support for a pan-European repo market able to integrate the 15 national repo markets in place at the time. Although EU policy-makers had grown aware of the systemic risks posed by repo markets (ECB, 2002a; also BIS, 1999; Praet and Herzberg, 2008), they nevertheless pushed this process through. The 2002 Financial Collateral Directive committed Member States to removing constraints on European banks' cross-border use of repos, embedding the (collateral) rules designed by market participants.

The idea of a European repo market fit well with the Commission's integrationist political strategy that envisaged a single financial space (Jabko, 2006; Mügge, 2010; Grossman and Leblond, 2011). It promised to solve the new liquidity challenges confronting Member States in a euro government bond market that threatened to become a de facto German bund zone. It also offered the ECB a solution to pressing questions of the effectiveness of its monetary policy, on which its success and legitimacy as a European institution rested (Enderlein and Verdun, 2009; Jones, 2009). For the ECB, the European repo market could connect and integrate EMU securities markets, creating the single financial space crucial for the transmission of interest rate decisions.

The ECB was uniquely positioned to energize the repo-driven financial integration because it creates euro liquidity through repo loans (ECB, 2015a). The ECB used its collateral framework – the terms on which it lends to banks – to encourage repo market participants to Europeanize sovereign collateral – that is, to treat all EMU sovereign bonds as identical collateral. The ECB deflected criticism that it was granting preferential treatment to 'periphery' governments by adopting market practices for managing collateral. Thus, it could argue that its collateral policies accommodated, rather than influenced, market views of (government) creditworthiness (Issing, 2005). In doing so, the ECB introduced collateral practices that EMU national central banks had not used before, in full knowledge that these could sharpen financial instability. After Lehman's collapse, these practices exacerbated the European sovereign bond crisis, until Draghi promised to provide liquidity to EMU government bond markets directly rather than through European banks (see Buiter and Rahbari, 2012; de Grauwe and Ji, 2012).

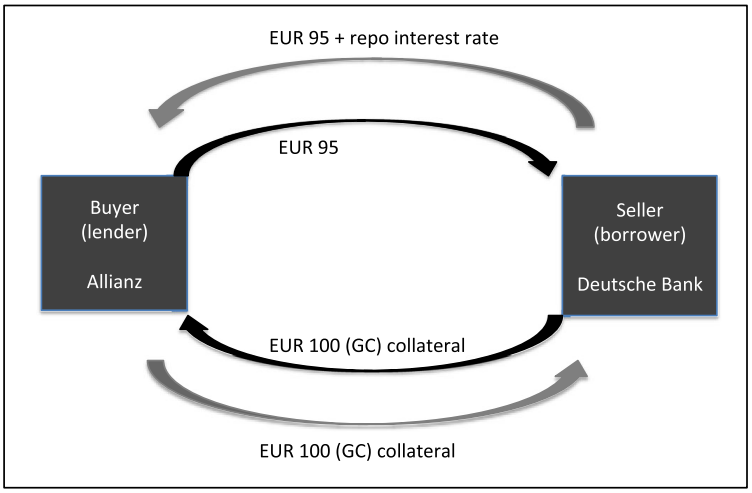
This article is organized as follows: first, we explain how repo markets work and trace the fragilities underpinning collateral practices. Next, we explain how and why the European Commission, the ECB and Member States made the growth of the European repo market possible. Finally, we examine the consequences of these decisions during the European sovereign debt crisis and propose future avenues for research.

I. How Repos Work

The 'repurchase agreement' (often referred to as 'repo') has become a key financial device for contemporary capitalism. Though the legal and formal definitions of a repo transaction can make it sound quite complex, it most simply can be thought of as a (usually short-term) secured loan. In a repo transaction one institution (the lender) agrees to buy an asset from another institution (the borrower) and sell the asset back to the borrower at a pre-agreed price on a pre-agreed future date (a day, a week or more). The lender takes a fee (repo interest rate payment) for 'buying' the asset in question and can sell the asset in the case that the borrower does not live up to the promise to repurchase it. The fundamental purpose of this circular transaction is to lend and borrow funds (and, in some cases, securities). While financial institutions use it to raise finance, central banks use it in monetary policy.

To illustrate, suppose Deutsche Bank (DB), acting as a borrower, sells assets to a buyer (Allianz), acting as a lender, and commits to repurchasing those assets later (see Figure 1). Allianz becomes the temporary owner of the assets, which also serve as collateral, and Deutsche Bank has temporary access to cash funding. DB and Allianz also agree that the purchase price is less than the market value of collateral (€100) – in this case a 5 per cent difference, known as a *haircut*. This provides a buffer against market fluctuations and incentivizes borrowers to adhere to their promise to buy securities back. In our example, DB provides €100 worth of collateral to 'insure' a loan of €95. When the repurchase takes place, DB pays €95 plus a 'fee' or interest payment in exchange for the assets it had sold.

Figure 1: How General Collateral Repos Work



For DB, the repo is an SFT (securities financing transaction). DB uses its portfolio of marketable securities to raise short-term market funding without giving up the returns on those assets. Because repos are structured legally as sales/repurchase (of collateral) agreements and in economic terms as cash loans,[1] Allianz does not assume the risks and returns on the assets it owns temporarily, but rather has to send all returns on those assets to DB. Financial institutions like to use repos to raise finance because the use of collateral makes them at once less costly and less risky than borrowing from unsecured money markets.

The presence of collateral also enables cash-rich non-bank institutions such as insurance companies, pension funds and non-financial corporations to participate in money markets (Pozsar, 2014). In our example, Allianz can use the repo to increase returns on its cash; further, it can also reuse the collateral ('repo it out') if it needs cash before the repurchase with DB is executed.

It should be noted that there are different kinds of repo agreements and the kind we have just described is known as a GC ('General Collateral') repo. This is a funding-driven repo. What makes GC repos distinctive is that the parties to the repo transaction agree what kind of securities can be considered equivalent as collateral and accept any or all those securities. In other words, any security that belongs to a certain agreed-upon category will do. We visualize this in Figure 1: assuming the agreed-upon GC basket above includes AA-rated Belgian and AAA German bonds, Allianz would accept €100 of German bonds, or €100 of Belgian bonds, or any combination of the two. A typical repo contract would allow DB to replace some or all of the bonds in the GC portfolio on any day of the repo contract, as long as they are of equivalent value, as determined by the so-called 'mark-to-market' technique, which requires that the value of collateral portfolio be constantly updated according to market fluctuations.

Using mark-to-market is meant to protect lenders like Allianz from the failure of counterparties like DB. In effect, through the repo contract Allianz becomes the legal owner of collateral so that it can sell the collateral and recover the cash. For this system to work without disruption, Allianz needs to ensure that the market value of its collateral portfolio remains equal to the cash loan. This typically leads to a preference for high-quality collateral, such as investment-grade government bonds. These trade in liquid markets and generally experience less price volatility, therefore making the repo funding cheaper. Indeed, before the global financial crisis, market haircuts on government collateral were typically zero (see CGFS, 2010). Additionally, repos collateralized with government bonds also enjoy preferential regulatory capital treatment (ECB, 2002a). In the event that the market value of the collateral falls before the day of the repurchase, the legal right to make a *margin call* protects Allianz. In other words, Allianz requires DB to provide more collateral to make up for the shortfall in value. Conversely, if collateral increases in price, Allianz returns the difference back to DB, allowing it to raise further funding and increase leverage (Adrian and Shin, 2010).

Repo transactions have also altered the policy toolbox of contemporary central banks. Repos have overtaken the traditional outright sale and purchase of assets as monetary

[1] For legal differences between European and US repo markets, see «http://www.icmagroup.org/Regulatory-Policy-and-Market-Practice/short-term-markets/Repo-Markets/frequently-asked-questions-on-repo/9-is-repo-in-europe-the-same-as-repo-in-the-us/»

policy instruments (see ECB, 2013b). Central banks use repos to meet banks' demand for reserves and thus influence interest rates on unsecured inter-bank money markets where they implement monetary policy. Of critical importance, the central bank's collateral framework – the terms on which it lends to banks, including the potential use of haircuts, collateral acceptability and margining practices – is not exogenous to how repo markets work. Indeed, the following sections show that it can have systemic, if poorly understood, effects on how repo markets treat and manage collateral, on liquidity in collateral markets and on banks' ability to preserve access to (repo) market funding in crisis (Whelan, 2014; CGFS, 2015).

Repo Practices and Financial Instability: Collateral in Times of Stress

Central banks began to worry about repo markets after the 1997 Asian crisis. The CGFS (Committee on the Global Financial System) set up a Working Group on Collateral, whose members included central banks from Europe, North America and Asia. Its research explored how collateral practices – mark-to-market, margin calls, haircuts – had exacerbated systemic tensions (BIS, 1999; Domanski and Neumann, 2001). At the core of repo fragilities, policy-makers discovered, was the 'illusion' of liquidity that lured banks into believing that they could continuously create, and have access to, abundant liquidity via repo markets.

During good times, repo markets 'lubricate' liquidity in the securities markets that provide collateral. The more banks rely on repos for funding and leverage, the more collateral is necessary (Adrian and Shin, 2010). The repo-driven demand for securities (collateral) increases trading and liquidity in those securities markets. Yet in times of crisis, this liquidity dynamic can rapidly turn out fragile.

To illustrate, suppose that the highly leveraged DB, funded with short-term repos, is suddenly unable to repurchase collateral from Allianz. Allianz, and other institutions that lent to DB via repos, have no choice but to sell collateral. This in turn pushes collateral prices down and reduces collateral market liquidity, triggering further margin calls on repo funding, and further asset sales. A funding liquidity problem (for DB) turns into a (collateral) market liquidity problem, eroding confidence in asset valuations. As uncertainty proliferates, cash lenders change the terms of repo loans, only accepting high-quality collateral and/or imposing substantially higher haircuts. Thus, tightening collateral conditions (higher haircuts, narrower range of acceptable collateral) may lead to a liquidity spiral: lower liquidity in collateral markets, more margin calls, more funding problems, more asset sales, lower liquidity (Brunnermeier and Pedersen, 2009; also BIS, 1999).

Thus, collateral practices simultaneously affect financial institutions reliant on repos *and* the issuers of assets used as collateral. Rather than issuers' credibility, collateral liquidity depends on 'whether vulnerable counterparts have substantial positions that need liquidating' (Praet and Herzberg, 2008, p. 23). Funding difficulties for leveraged (shadow) banks can generate sudden stops in collateral markets.

As early as 2002, the ECB recognized the relevance of fragile collateral practices for European finance. It pointed to large European banks – headquartered in the UK, France and Germany – that were leaving behind the close, informational-intensive relationships with retail customers and turning instead to market-based activities (ECB, 2002a; also

Hardie *et al*., 2013). The increasing reliance on risk-sensitive market funding, the ECB warned, meant that European banks would run on each other in repo markets.

Paradoxically, however, the analysis did not translate into policy actions. Central banks did not ask how to 'design out' collateral fragilities, or how a financial system increasingly organized around market liquidity mattered for central banks' crisis interventions, traditionally designed to address banks' funding liquidity problems via lender of last resort (see Mehrling, 2012). Rather, the ECB threw its weight behind the European Commission's Financial Collateral directive that gave market participants free rein in designing collateral rules.

Dominated by large European banks (who together generated around 80 per cent of repo volumes), the European repo market grew rapidly under such auspicious conditions. Outstanding stocks tripled between 2001 and 2008 (Figure 2). In cumulative (flow) terms, the ECB (2015b) survey showed, repo transactions reached €25 trillion annually by 2008 – almost double the volumes in the unsecured money market segment where banks traditionally lend to each other (and where the ECB implements interest rate decisions). Such differences between stock and flow volumes highlight the short-term nature of repo markets.

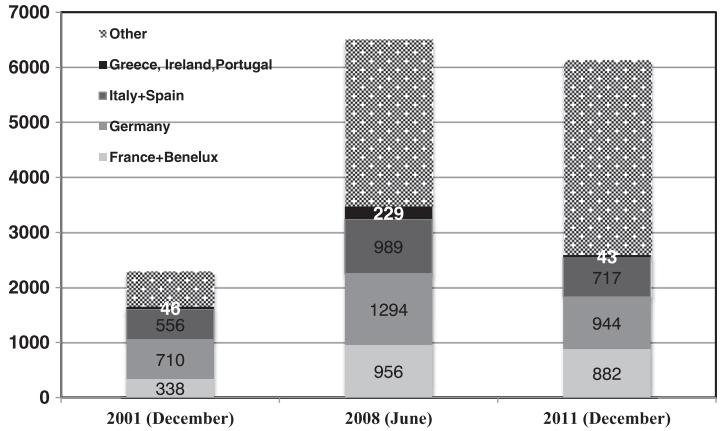
In contrast to the US, European repo market participants could draw on a broad range of sovereign debt: Ireland, Italy, Greece, Portugal and Spain together supplied around 25 per cent of sovereign European collateral by June 2008 (see Figure 2). Italy alone, with one of the world's largest sovereign debt markets, accounted for around 11 per cent of collateral in European repos.

The next sections explore how the large European banks dominating the repo market were able to mobilize broad political support from the EU institutions and Member States.

II. The European Commission: Market-based Governance and the Deepening of European Economic Integration

The European integration scholarship highlights the Commission's crucial role in the liberalization of capital flows and EMU. Since the 1980s, the Commission had successfully

Figure 2: Government-issued Collateral in European Repo Markets, EUR Billions.
Source: ICMA statistics



enlisted broad support for a rapid, profound transformation of European financial markets and the institutional structures governing them (Jabko, 2006). European banks with international ambitions were important allies, exerting pressure on their governments to overcome domestic opposition from financial institutions that stood to lose market share (Mügge, 2010).

The repo market fit perfectly this political strategy that invoked the appealing vision of a single financial space, further cementing the alliance between the Commission, European banks and technocracies. Regarding the repo market, this alliance became visible in 1996, when the Commission summoned a group of financial market experts to give advice on financial market integration. Chaired by Alberto Giovannini, the group included private financial institutions, influential expert groups such as the European Financial Market Lawyers' Group or the International Swaps and Derivatives Association (Keijser, 2006, p. 62) and representatives from the European Commission and ECB. Critical for our discussion, the group's 1999 report concluded that:

> There are many areas where the introduction of the single currency alone cannot be sufficient to induce the degree of integration and efficiency of financial markets that is needed for the development of the European economy. […] In an area characterized by a single currency, old rules and market architectures may be unsuited to the task and become instead the main obstacles to the attainment of a higher degree of efficiency. The repo market is a perfect illustration of this problem. (The Giovaninni Group, 1999, p. 1)

In line with this diagnosis, the report proposed the vision of a Europe where banks would freely move collateral and cash across borders and where market practices for managing collateral risk and legal and fiscal frameworks would be harmonized. Crucially, the report promised that an integrated repo market would maintain the momentum for financial integration that EMU had created, but could not deliver on its own. The interactions between repo and collateral markets would increase liquidity in securities markets used as collateral, paving the way for the genuine integration of EU capital markets.

The Commission quickly turned the report's main recommendations into institutional reality. The 2002 Collateral Directive provided a unified legal framework for the cross-border use of collateral which steamrolled the domestic institutions that governed national repo markets, while refraining from EU-level regulatory interventions or supervisory oversight. By stressing that market practices would strengthen financial stability, the Commission effectively institutionalized pure market-based governance in this area. Member States lend support to this market-based integrationist strategy for reasons that we turn to below.

EMU Member States and the Europeanization of Sovereign Collateral

The introduction of the euro was expected to create a euro government bond market that would challenge the US Treasuries' status as international benchmark (Galati and Tsatsaronis, 2003). The convergence in borrowing costs for EMU governments and the increasing presence of investors from outside Europe (see Andritzky, 2012) lent plausibility to such ambitions. In parallel, however, EMU governments found themselves competing with each other as they lost the privilege of issuing risk-free in their currency' (Galati and Tsatsaronis, 2003). This became a competition for liquidity, a challenge for small

Member States who saw investors, no longer concerned about exchange rate and inflation risk, turn to liquid bond markets of large Member States (see ECB, 2000, 2006).

It is important to recall that Member States had bought into the Commission's promise that EMU would counterbalance the asymmetries of the European Monetary System and diffuse the threat, often materialized, of currency crises (Jabko, 2006). Having left behind the threat of a de facto deutsche mark zone, governments worried that the Euro government bond market would become a German bund zone. As Bunds were increasingly used to price other EMU government bonds, investor preference for highly liquid German bonds would erode the liquidity of their bonds and raise borrowing costs (see Trampusch, 2015).[2] With EMU, Germany did not only fashion the ECB after the Bundesbank but quietly became the de facto EMU *safe asset* issuer, a country whose 'paper sells itself'.[3]

Furthermore, during the political tensions accompanying the 2005 French vote on the European Constitution, Member States understood that investors would quickly exploit these asymmetries. In 'spread widening' or 'euro-break up' trades, leveraged investors sold low-rated government bonds (Greece) and bought high-rated government bonds (Germany).[4] Although investors did not take positions large enough to reverse the yield convergence in Euro government bond markets, the euro-break up trade provided early warnings that Member States with weaker finances may come under speculative pressure in times of crisis, and that such pressure could only be addressed by the ECB. Thus, the *Financial Times* warned that 'positioning against weak euro governments would be a one way bet' for hedge funds and macro-traders unless the ECB intervened to buy those government bonds and 'crush short-sellers' (Dizard, 2005).

An integrated European repo market could address such liquidity predicaments. To understand why Member States bought into this promise, it is important to recall how GC repos function. The mechanics of a GC repo – where market participants agree on a set of securities that are equivalent as collateral – would help with the further integration of European government bond markets if banks agreed to create GC baskets that included *all* EMU government debt. Lower-rated governments would also benefit from rapid repo growth, as large banks looked for collateral beyond their home government. In doing so, banks would Europeanize sovereign collateral, creating a 'synthetic' eurozone high-quality collateral asset that included all European sovereigns.

The alliance between the Commission and European banks thus sold the European repo market as the solution to the liquidity challenges that EMU was creating for European governments. This solidified the broader political strategy to push for more market-based governance at European level (see Jabko, 2006). Furthermore, banks used governments' liquidity concerns to relax the constraints on their expansion strategies. A European repo market would reduce dependence on the fiscal strategies of home governments. Indeed, a common concern among bankers in the early 2000s was that fiscally conservative governments were not creating enough highly rated debt to be used as collateral, a tendency potentially sharper in EMU if the Stability and Growth Pact was to prove successful. A European repo market would effectively manufacture high-quality

[2] 'Two minutes that shook Europe's bond markets', *Financial Times*, 9 September 2004.
[3] 'Schleif to leave Germany's Finance Agency', *Financial Times*, 1 March 2005.
[4] 'Playing spread poker with Europe's bonds', *Financial Times*, 2 May 2005.

collateral out of previously illiquid and/or lower-rated EMU government debt *on the same funding terms* with German debt, without additional regulatory burden.

By 2008, this promise had come true. Large repo market participants (LCH Clearnet, Eurex) introduced euro GC collateral baskets that included *all* eurozone sovereigns (see Hördahl and King, 2008; also BIS, 2011). Banks could raise cross-border funding on equal terms against A-rated Greek or AAA German government bond collateral. Even repo actors in the same jurisdiction increasingly used foreign government collateral (see Table 1). Thus, the share of 'home' collateral declined from 63 per cent in 2001 to 31 per cent in 2008, while cross-border repos increased their share from 36 per cent to 48 per cent in the same period.

The country breakdown in banks' portfolios of government debt captures the distinctive portfolio strategies of large 'core' and 'periphery' banks (see Figure 3), closely reflecting their business models (see Liikanen Report, 2012). Banks in Greece, Spain, Italy and Portugal, who typically traded with each other inside national borders to support traditional lending or had foreign subsidiaries reliant on their hosts' funding markets, remained 'loyal' to home governments. In contrast, market-based banks in 'core' countries emerged as cross-border creators of liquidity by increasingly holding, and using as collateral, foreign government debt.

Italy and other 'periphery' governments benefited from increased demand from European banks, which built geographically diversified portfolios of government debt that could be used in GC portfolios to fund their global expansion strategy. In turn, banks in 'periphery' countries diversified less, since they could use the debt of the home sovereign as collateral to borrow from, say, German banks.

While governments were oblivious to the emerging sovereign bank interdependencies and the attending systemic risks, the ECB's (2006) work on fiscal policy noted that investors created perverse incentives for governments to increase public debt in order to enjoy the EMU liquidity premium. Nevertheless, the ECB did not connect this 'perverse' liquidity effect to repo markets, for reasons that we explore next.

III. The ECB: Mandate Politics and Struggles Over Legitimacy

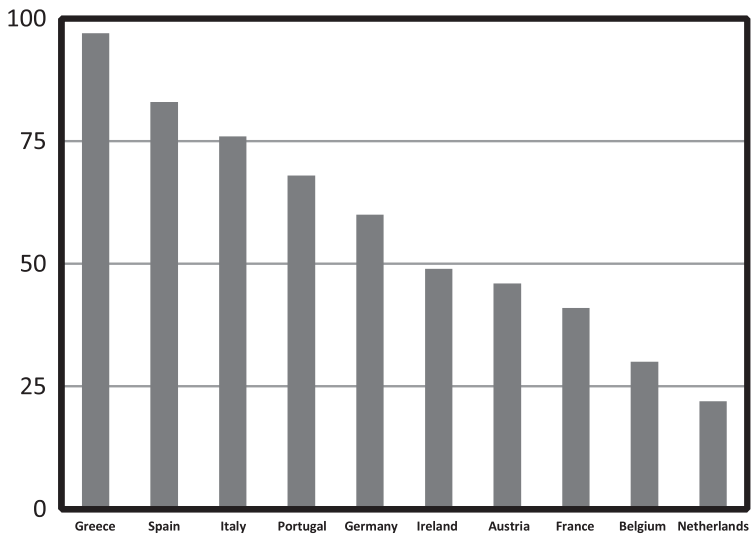
The ECB saw the European repo integration as an opportunity to improve the conditions under which it could fulfil its price stability mandate. Its political legitimacy in concentrating monetary powers at European level rested on its ability to deliver price stability, an 'output legitimacy' (Jones, 2009). The economics of its mandate required a well-functioning transmission mechanism, where banks and financial markets across Eurozone respond in a similar fashion to interest rate decisions (ECB, 2002b, 2006). Thus, the ECB

Table 1: Repo Collateral and Counterparty, Europe, (share of total)

		2001	*2008*	*2009*
Collateral	National	63	31	36
	Cross-border (from euroarea)	27	65	59
Counterparty	National	43	31	32
	Cross-border (from euroarea)	36	48	44

Source: compiled from the ECB's Euro Money Market Surveys

Figure 3: Share of Home Sovereign in Banks' Sovereign Bond Portfolios, 2010.
Source: European Banking Authority.



viewed the single European financial space as fundamental to its success as a European institution. The integrated repo market, 'indifferent to the location of securities and counterparties' (ECB, 2002b, p. 64), could accelerate its creation.

Due to its role as creator of euro liquidity via repo operations, the ECB was in a unique position to support the European repo market. Since its inception, the ECB had accepted a broader range of collateral than other central banks, which typically focused on government debt to protect themselves against credit risk (CGFS, 2015). This is usually explained as a consequence of historical, institutional and structural differences in a monetary union. The broad range of acceptable private and public assets would ensure that the ECB's collateral framework preserved market neutrality, that is, that the ECB's loans against collateral would not have a substantive influence on the markets where collateral trade (see ECB, 2013b; ECB, 2015a).

Yet in practice, the ECB was well aware that its collateral framework could influence the way that private repo markets treated EMU government bonds and securities in general. Moreover, it was prepared to use its collateral policies to influence repo market participants, and thus change liquidity conditions in EMU government bond markets:

> … the way market participants perceive the different national characteristics of securities accepted as collateral in repo transactions constitutes one aspect of the fragmentation of the euro area repo market. For instance, given the different credit ratings of euro area governments, there might be differences in the terms of repo transactions (i.e. repo rate, haircut) with government securities as collateral, depending on the country. The same applies to the differences in the liquidity of government securities. Market integration would benefit from the extension of a euro GC approach, enabling participants to put securities with similar, although not the same, characteristics in the same basket. Eurosystem collateralised operations are an example of this approach. (ECB, 2002b, p. 68)

Thus, the ECB played an important role in the Europeanization of sovereign collateral. It created a euro GC basket that included all EMU government bonds in the same liquidity category, encouraging private repo actors to follow suit. By 2008, several large CCPs (Eurex, LCH Clearnet) had done so. Paradoxically, although the ECB (2006) complained that investors were losing their disciplining function in government bond markets due to their obsession with liquidity, its financial integration agenda saw it nurturing that obsession.

The ECB breathed life into the European repo market, yet it did not achieve this without trade-offs. Member States had agreed to renounce their currencies if the independent ECB would 'maximize collective utility' by conducting, in a depoliticized fashion, monetary policy (Enderlein and Verdun, 2009, p. 11). Yet its collateral policy was subject to political contestation that questioned its independence. Indeed, Buiter and Sibert (2005) pointed out that the politics of monetary policy in EMU resided not in interest rate decisions, but in the ECB's collateral policies. In their view, these policies encouraged private finance to treat AAA-rated Germany and A-rated Greece as sovereign issuers of similar creditworthiness, an implicit 'subsidy' to lower-rated Member States that weakened fiscal discipline.

The ECB had prepared for such objections by adopting the risk practices of repo market participants: daily mark-to-market, margin calls and haircuts (Issing, 2005). In doing so, the ECB could argue that its collateral policies had no substantive impact on government bond markets for two reasons. First, banks had little incentive to use government bonds to borrow from the central bank, since its repos carried higher haircuts than private repo transactions (where haircuts were zero for government debt) and ECB-held collateral could not be re-used in the repo market. Second, the ECB stressed that its collateral policies accommodated market views of credit quality. If markets distrusted Germany, its bonds would fall in market value. Like any repo market participant, the ECB would mark German collateral to market and make margin calls. Rather than disrupt, the ECB argued that its collateral policies reinforced private market discipline.

By trying to strike a delicate balance between its financial integration priorities and its independence, the ECB made a radical departure from how central banks in EMU countries had previously managed lending operations (see Table 2). These central banks rarely marked to market and never made margin calls when lending to banks (except the Dutch central bank), and few used initial haircuts.

It is plausible to suggest that the ECB simply converged with the practice of large central banks, such as the Bank of England or the Federal Reserve (Whelan, 2014). However, as argued above, the ECB fully understood that the private risk rules it adopted had repeatedly destabilized financial markets throughout the late 1990s. Furthermore, the ECB's (2015a) arguments for adopting market risk practices – as protection against credit, market and liquidity risk (ECB, 2015a) – are debatable. Richard Comotto, of the repo industry association, reminds us that repo market participants mark collateral to market, impose haircuts and make margin calls to ensure urgent access to liquidity.[5] A central bank is not subject to the same liquidity pressures since it is the only institution that can create official liquidity. If the borrower defaults, it does not need to sell collateral.

[5] See https://icmacentre.wordpress.com/2014/10/07/asking-the-unthinkable-do-central-banks-really-need-to-take-haircuts-when-lending/

Table 2: Collateral Practices, Central Banks, Before and Since the Euro.

Margining practices	*Belgium*	*France*	*Germany*	*Italy*	*Holland*	*ECB*	*UK*	*US*
Mark to market	No	No	No	No	Weekly	Daily	Daily	Daily
Margin call	No	No	No	No	Rare	Yes	Yes	Yes
Initial haircut	Yes	Yes	No	No	Yes	Yes	Yes	Yes

Source: compiled from BIS (1999) and central bank websites.
Note: Data for eurozone countries is for June 1998, for the others June 2015.

If it did, it would trigger fire sales and sharpen instability – as the ECB (2015a) acknowledges. Rather, the central bank can afford to wait until collateral matures, earning interest and eventually receiving the cash back from issuers. Otherwise, the central bank acts like a shadow bank (see FSB, 2012), replicating the 'cyclical behavior of private sector margin and haircuts' (CGFS, 2010, p. 21), and thus sharpening the systemic fragilities that it is meant to contain in the first place.

In sum, the ECB's decision to adopt market practices for managing collateral was a political decision aimed to shield its independence from the problematic politics of its collateral framework. The crisis would come to test this decision.

Collateral Damage in the European Sovereign Debt Crisis

> The financial crisis which erupted in 2007 has fragmented the GC repo market in Eurozone government bonds … There is consequently a German GC market, a French GC market and so on, but there is no longer a eurozone GC market, except for one-day repos, where credit risk is minimal. (European Repo Council, 2013)

While US scholars and policy-makers have dedicated close attention to the run on US repo markets following Lehman Brothers' collapse (Gorton and Metrick, 2012; Krishnamurthy et al., 2014) and the FSB (2012) put repo markets on its shadow banking agenda, scholarship on the systemic fragilities in European repo markets is in its infancy. Although the crisis reversed the Europeanization of sovereign collateral, as suggested in the quote above, the few studies dealing with European repo markets (Mancini *et al*., 2013; Boissel *et al*., 2014) do not engage with the impact on collateral markets.

The paucity of research on this topic is striking considering that by 2012, Portugal, Greece and Ireland provided 0.1 per cent of total repo collateral, sharply down from the 3.5 per cent share in 2008 (see Figure 2), and that Eurex (a large CCP) eliminated GIP government bonds from its GC Pooling basket (Mancini *et al*., 2013). Repo participants also reduced the use of German government bonds, for the opposite reason: in times of uncertainty, investors become reluctant to part with highly liquid assets.

Thus, the insight from the US-based literature on repo markets that government bonds preserve their high-quality collateral status in crisis, when repo lenders stop accepting privately issued securities, does not apply to Europe (Pozsar, 2014). The eurozone crisis shows that governments are also vulnerable to repo market tensions because the private rules that govern collateral and the incentives of systemic repo market participants are inherently destabilizing.

In the eurozone crisis, Member States faced not only destabilizing repo market dynamics, but also a central bank whose collateral policies were pro-cyclical at critical junctures.

This clashes with the conventional description of the ECB's crisis interventions, which emphasizes that its measures helped stabilize repo and collateral markets (ECB, 2010; Drudi *et al*., 2012; BIS, 2011). The narrative goes like this: throughout 2008 and 2009, the ECB acted counter-cyclically by extending the pool of eligible collateral (lowering the credit rating threshold from A− to BBB−), a measure meant to help leveraged European banks facing severe funding problems (ECB, 2015a). This allowed banks to take 'bad' collateral to the ECB's long-term lending facilities and use high-quality collateral in private repos. Policy action contained potential runs in periphery collateral markets, restoring confidence in the collateral qualities of GIIPs government debt. The several LTROs enabled banks to fund government debt portfolios, increasing demand and therefore liquidity in those markets. The OMT finally dealt with unfounded fears of a eurozone break-up in 2012.

A repo lens complicates this account. When examined through collateral practices, the ECB's crisis interventions were often pro-cyclical. At critical moments, the central bank made margin calls, raised haircuts and tightened collateral standards. Indeed, in those moments the ECB behaved just like a private repo market participant – a 'shadow bank' – that disregards the systemic implications of its collateral practices.

Thus, in April 2010, shortly after Standard and Poor's downgraded Greece below investment grade status, the ECB announced that it would introduce graduated haircuts on lower-quality assets starting from January 2011 (see Table 3), a necessary step towards 'normalizing' monetary policy (Gabor, 2014). While the new haircut rules initially appeared to exempt government bonds, in the August 2010 communication, the ECB indicated that sovereign collateral rated BBB+ and lower would also incur higher haircuts. This decision dealt a heavy blow to low-rated governments, increasing the cost of using their government bonds as collateral.

Afterwards, the ECB exercised the 'power to threaten the banking system' (Whelan, 2014, p. 17) and periphery governments by changing the acceptability criteria and haircuts on lower-rated government collateral (Greek, Irish, Portuguese) at its discretion, without revealing the haircuts it applied on these bonds, or the potential negative effects this would have on banks and liquidity more general.

Paradoxically, at that time, the ECB (2011) and the Commission were advocating a move away from policies based on credit ratings. The EU institutions worried about

Table 3: Haircut Schedule on Category I Assets (Debt Instruments Issued by Governments and Central Banks).

Residual maturity (years)	*AAA to A−*		*BBB+ to BBB−*		
	before July 2013	*since July 2013*	*before Jan 2011*	*Jan 2011–July 2013*	*since July 2013*
0–1	0.5	*0.5*	5	5.5	*6*
1–3	1.5	*1*	5	6.5	*7*
3–5	2.5	*1.5*	5	7.5	*9*
5–7	3	*2*	5	8	*10*
7–10	4	*3*	5	9	*11.5*
>10	5.5	*5*	5	10.5	*13*

Source: ECB. Data for fixed coupon assets.

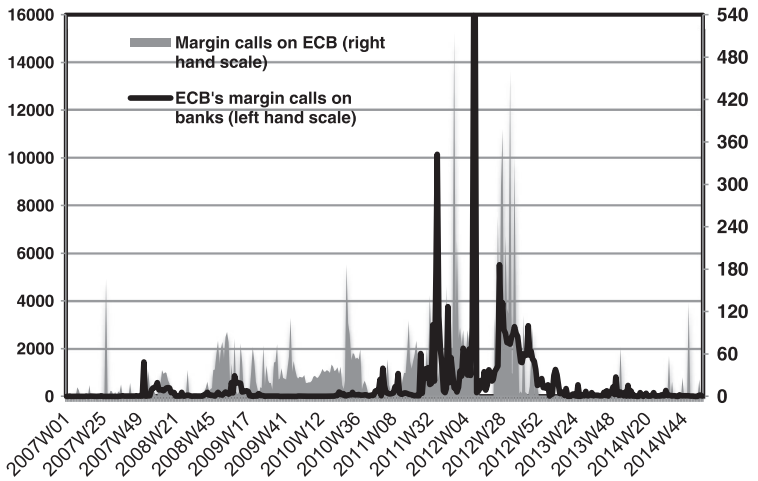
'cliff-effects', a well-documented phenomenon whereby ratings downgrades trigger fire sales. Fire sales of collateral may quickly mutate into further funding problems for banks reliant on private repo funding (Brunnermeier and Pedersen, 2009). This is why the FSB's (2010, p. 3) stressed that 'central bank policies should avoid mechanistic approaches that could lead to unnecessarily abrupt and large changes in the eligibility of financial instruments and the level of haircuts that may exacerbate cliff effects'. Its minimum haircut proposals explicitly reject the use of credit ratings (see FSB, 2012).

Yet it is these mechanistic approaches that the ECB relied on in 2010. The timing could not have been worse, as uncertainty about collateral liquidity threatened to spread beyond Greece. The haircut decisions thus tightened collateral standards in a pro-cyclical fashion, just as repo market participants do during periods of market stress (Domanski and Neumann, 2001; CGFS, 2010; Gorton and Metrick, 2012). Indeed, Whelan (2014, p. 4) argues that the ECB was 'generally more aggressive in its risk control measures than any other major central banks'.

However, this is not only a story about pro-cyclical haircut adjustments. The difficulties faced by 'periphery' sovereigns and banks were further magnified by the use of mark-to-market and margin calls in the ECB's LTROs. Consider the implications for Greek and Spanish banks. Both had highly concentrated portfolios of home government bonds, a strategy sanctioned by the ECB's earlier efforts to Europeanize collateral. As tensions eased in 2009, the ECB's mark-to-market and daily margin calls created incentives for banks to use LTROs in order to buy (home) government bonds, push up prices and make margin calls on ECB repos (see Figure 4). By June 2009, the two banking systems were funding 8 per cent and 2 per cent, respectively, of total assets with ECB's LTRO repo loans, some against home sovereign collateral.

Yet market tensions in 2010–12, underpinned by the ECB's tightening of collateral standards, increased the costs of using lower rated sovereign bonds as collateral. The ensuing fall in market price of those government bonds meant that banks had to find additional collateral to meet the ECB's margin calls. Indeed, throughout 2011 and early 2012,

Figure 4: Margin Calls, ECB Repos (Including LTROs, Millions of EUR).
Source: www.ecb.int



the ECB's margin calls increased in magnitude (see Figure 4). Paradoxically, at the time, Vitor Constâncio (2012, p. 2), the ECB vice-president, noted that 'the decline in collateral values translates in additional collateral calls possibly compounded with higher haircuts and margins requirements. A system in which financial institutions rely substantially on secured lending tends to be more pro-cyclical than otherwise'. Yet he failed to notice that his concerns also applied to the ECB's repo loans.

Confronted with margin calls from the ECB and market participants, banks needed to raise funding in private repo markets against high-quality collateral such as German bunds, or sell lower-rated government bonds. Indeed, in an attempt to pre-empt double exposure to the counterparty and to collateral, repo participants often refused to lend against collateral issued by governments where borrowers were headquartered: 'an Irish bank pledging Italian debt as collateral is less desirable from a credit perspective than an Irish bank pledging AAA-rated security with no correlation to the European debt crisis. Where firms are declining PIIGS debt, collateral pledgers are sometimes faced with having to offer higher quality collateral' (SLT, 2011, p. 12).

Systemic repo actors, alongside the ECB, also helped create a perfect storm for 'periphery' governments between 2010 and 2012. Consider the example of LCH Clearnet. As the ECB promised to 'get tough' on periphery sovereign collateral and 'zombie' banks addicted to its liquidity, LCH announced a new sovereign risk framework for its repo operations in October 2010. It introduced a trigger that measured the spread between the yield on a ten-year government bond and a benchmark basket of AAA-rated sovereign bonds. LCH would hike haircuts when that spread went above 450 basis points for five consecutive days, disregarding the destabilizing effects that its arbitrary spread could inflict on lower-rated EMU governments. When LCH Clearnet raised haircuts on a lower-rated sovereign bond, demand would shift to AAA sovereigns that benefit from 'safe-asset' status (Germany). This lowered yields on AAA sovereign debt and increased spreads against lower-rated government bonds. Thus, LCH Clearnet's collateral practices and the speculative 'euro break-up trade' described earlier would reinforce each other to the detriment of periphery government bonds, and the benefit of German bunds.

LCH Clearnet first applied that framework to Irish government bonds in November 2010. Irish yields had been rising, although the government had no immediate refinancing needs, and enjoyed investment-grade rating. However, the ECB had been pressing the Irish government to reduce Irish banks' dependency on its emergency liquidity, viewed as an obstacle to the exit strategy (Brown and Atkins, 2010). As LCH repeatedly increased haircuts on Irish sovereign collateral from 0 to 45 per cent over three weeks, a German bank could only get €55 of funding for every €100 of Irish collateral. Faced with lower liquidity in its sovereign debt market, Ireland had no choice but to ask for IMF support. Portugal went through the same process in early 2011, when LCH increased haircuts to 80 per cent (see Bank of England, 2011). By December 2011, LCH no longer accepted Irish and Portuguese government bonds as collateral. The repo industry association stressed that such haircut policies propagated stress in the GIIPS sovereign bond markets in 2011 and 2012.[6]

[6] According to ICMA: 'Strict haircutting by CCPs arguably had such an effect on Greece, Ireland, Italy, Portugal and Spain in 2011' see http://www.icmagroup.org/Regulatory-Policy-and-Market-Practice/short-term-markets/Repo-Markets/frequently-asked-questions-on-repo/27-what-does-a-ccp-do-what-are-the-pros-and-cons/

From a collateral angle, the ECB's OMT was a game-changer precisely because it put an end to uncertainty about the collateral qualities of EMU sovereign debt. The timing of the OMT also becomes clearer. Early in 2012, repo market participants became increasingly concerned about the collateral qualities of Italian government bonds, the second largest supplier of collateral for European repo markets. An Italian default would have obliterated the European repo market, European banking and the euro with it. It is at this juncture that the ECB finally decided to act in a decisively counter-cyclical fashion. While the LTROs were inherently pro-cyclical through the collateral policies attached, the OMT programme committed to preserve liquidity in government bond markets through direct market interventions.

Conclusion

This paper advances scholarship on how finance constrains state sovereignty during crises (Streeck, 2014) and on the importance of repo markets for market-based banking (Hardie *et al*., 2013). It highlights the critical importance of an understudied shift in state–financial market relations in Europe: the linkages between repo and sovereign bond markets. As a result, the standing of a sovereign in financial markets now hinges on the collateral quality of its debt, which in turn depends on (shadow) banks' expansion strategies, their vulnerability to short-term funding shocks, the portfolio decisions of resident and non-resident bondholders, the collateral policies of private repo actors and central banks. In this new environment, European sovereigns' access to finance moves with the cyclical rhythms of (shadow) banking.

Specific policy decisions of the European Commission and the ECB that led to the organic links between repo and sovereign bond markets reflected not only their ideas about European integration or the politics of their mandates (Jabko, 2006; Grossman and Leblond, 2011; Enderlein and Verdun, 2009; Jones, 2009), but also the dynamics of policy coalitions forged between EU institutions and expert networks clustered around private finance (Mügge, 2010; Woll, 2013; Tsingou and Moschella, 2013).

Our insights open several avenues for future research. First, scholars should re-examine common wisdoms about (fiscal) policy agency in a world where collateral becomes increasingly important. Indeed, a survey undertaken by the Italian Treasury suggests that Member States have become concerned about the implications of pro-cyclical repo markets for public debt management (Canatta, 2012), and potentially more aware of the underlying asymmetries in the European repo–sovereign debt nexus that benefit high-rated Member States. The rapid transformation in public debt management (see Trampusch, 2015) should be explicitly considered in relationship to repo markets, with close analytical attention paid to the changing relationship between debt managers, Treasuries and central banks. Furthermore, it would be interesting to explore how/whether this re-think will shape the Juncker Commission's Capital Markets Union plans to transform shadow banking – including repo markets – into market-based finance.

Second, future research should engage with questions of output legitimacy in a market-based banking system (see Jones, 2009). The neglected politics of the ECB's collateral framework played an important role in the European crisis, while the OMT promised liquidity backstops to government bond markets, but conditional on structural reforms. Furthermore, research could explore, in a comparative fashion, how large central banks

may be able to solve the trade-off between protecting their balance sheet and the financial (in)stability implications of their collateral policies.

Finally, research should explore the strategies of repo market participants in regulatory struggles at national, regional and international levels. While early in the crisis regulators agreed that it was imperative to reform market practices for managing collateral (see FSB, 2012), we know little about why the FSB dropped government bond collateral from its repo regulation by 2013. Political economists have also left unexplained the contrast between the US and Europe: while the US Treasury has proposed measures to delink the collateral function of government bonds from leveraged activities, EU governments have abandoned their plans to include repos in the Financial Transactions Tax. This should invite more work on the political processes through which repo lobbies have been successful in rolling back initiatives to regulate repo markets.

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References

Adrian, T. and Shin, H.S. (2010) 'Liquidity and Leverage'. *Journal of Financial Intermediation*, Vol. 19, No. 3, pp. 418–37.

Bank for International Settlements (1999) 'Implications of Repo Markets for Central Banks'. CGFS Paper No 10.

Bank for International Settlements (2011) 'The Impact of Sovereign Credit Risk on Bank Funding Conditions'. CGFS Paper No 43.

Bank of England (2011) Financial Stability Report. December 2011.

Boissel, C., Derrien, F., Örs, E. and Thesmar, D. (2014) 'Sovereign Crises and Bank Financing: Evidence from the European Repo Market'. Available at «https://studies2.hec.fr/jahia/webdav/site/hec/shared/sites/thesmar/acces_anonyme/home/working%20papers/Repo_paper_09Apr2014_FD.pdf».

Brown, J.M. and Atkins, R. (2010) 'Dublin warned over ECB liquidity'. Available at http://www.ft.com/cms/s/0/d1841b72-f0ef-11df-bf4b-00144feab49a.html#axzz3l5ZEip7r.

Brunnermeier, M., and Pedersen, L. (2009) 'Market Liquidity and Funding Liquidity'. *Review of Financial Studies*, Vol. 22, No. 6, pp. 2201–38.

Buiter, W. and Sibert, A. (2005) 'How the Eurosystem's Treatment of Collateral in its Open Market Operations Weakens Fiscal Discipline in the Eurozone (and What to Do About It)'. Available at «http://papers.ssrn.com/sol3/papers.cfm?abstract_id=887541».

Buiter, W. and Rahbari, E. (2012) 'The European Central Bank as Lender of Last Resort for Sovereigns in the Eurozone'. *JCMS*, Vol. 50, No. 2, pp. 6–35.

Canatta, M. (2012) 'The Role of Debt Management Offices on the Repo Market'. Available at «http://www.publicdebtnet.org/public/CORE-TOPIC/Repo-Marke/resourceDetail.jsp?id=20121121172945&tab=RES_POWERPOINT».

Committee on the Global Financial System (2010) 'The Role of Margin Requirements and Haircuts in Procyclicality'. CGFS Papers No. 36.

Committee on the Global Financial System (2015) 'Central Bank Operating Frameworks and Collateral Markets'. CGFS Papers No. 53.
De Grauwe, P., and Ji, Y. (2012) 'Mispricing of Sovereign Risk and Macroeconomic Stability in the Eurozone'. *JCMS*, Vol. 50, No. 6, pp. 866–80.
Dizard, J. (2005) 'Playing Spread Poker with Europe's Bonds'. *Financial Times*, 2 May.
Domanski, D., and Neumann, U. (2001) 'Collateral in Wholesale Financial Markets'. *BIS Quarterly Review*, pp. 57–64.
Drudi, F., Durré, A. and Mongelli, F.P. (2012) 'The Interplay of Economic Reforms and Monetary Policy: The Case of the Eurozone'. *JCMS*, Vol. 50, No. 6, pp. 881–98.
ECB (2000) 'The Euro Area One Year After the Introduction of the Euro: Key Characteristics and Changes in the Financial Structure'. Monthly Bulletin, January, pp. 35–51.
ECB (2002a) 'Developments in Banks' Liquidity Profile and Management'. Available at «https://www.ecb.europa.eu/pub/pdf/other/banksliquidityprofile02en.pdf».
ECB (2002b) 'Main Features of the Repo Market in the Euro Area'. Monthly Bulletin, October, pp. 45–67.
ECB (2006) 'Fiscal Policy and Financial Markets'. Monthly Bulletin, February, pp. 71–85.
ECB (2010) 'The ECB's response to the financial crisis'. ECB Monthly Bulletin, October, pp. 59–74.
ECB (2013a) 'Enhancing the Monitoring of the Shadow Banking System'. Monthly Bulletin, October, pp. 71–98.
ECB (2013b) 'The Eurosystem Collateral Framework through the Crisis'. ECB Monthly Bulletin, July, pp. 71–86.
ECB (2015a) 'The Financial Risk Management of the Eurosystem's Monetary Policy Operations'. Available at «https://www.ecb.europa.eu/pub/pdf/other/financial_risk_management_of_eurosystem_monetary_policy_operations_201507.en.pdf».
ECB (2015b) 'Financial Integration in Europe, 2015'. Available at «https://www.ecb.europa.eu/pub/pdf/other/financialintegrationineurope201504.en.pdf».
European Commission (2012) 'Green paper shadow banking'. *COM*(2012) 102, 12 April.
European Repo Council (2013) 'What is General Collateral Repo?' Available at «http://www.icmagroup.org/Regulatory-Policy-and-Market-Practice/short-term-markets/Repo-Markets/frequently-asked-questions-on-repo/11-what-is-general-collateral-gc-repo/».
Enderlein, H. and Verdun, A. (2009) 'EMU's Teenage Challenge: What Have We Learned and Can We Predict from Political Science?'. *Journal of European Public Policy*, Vol. 16, No. 4, pp. 490–507.
Financial Stability Board (FSB) (2010) 'Principles for Reducing Reliance on CRA ratings'. October.
FSB (2012) 'Strengthening Oversight and Regulation of Shadow Banking: A Policy Framework for Addressing Shadow Banking Risks in Securities Lending and Repos'. June.
Gabor, D. (2014) 'Learning from Japan: the European Central Bank and the European Sovereign Debt Crisis'. *Review of Political Economy* (ahead of print), pp. 1–20.
Galati, G. and Tsatsaronis, K. (2003) 'The Impact of the Euro on Europe's Financial Markets'. *Financial Markets, Institutions & Instruments*, Vol. 12, No. 3, pp. 165–222.
Gorton, G. and Metrick, A. (2012) 'Securitized Banking and the Run on Repo'. *Journal of Financial Economics*, Vol. 104, No. 3, pp. 425–51.
Grossman, E. and Leblond, P. (2011) 'European Financial Integration: Finally the Great Leap Forward?'. *JCMS*, Vol. 49, No. 2, pp. 413–35.
Hardie, I., Howarth, D., Maxfield, S. and Verdun, A. (2013) 'Banks and the False Dichotomy in the Comparative Political Economy of Finance'. *World Politics*, Vol. 65, No. 4, pp. 691–728.
Hördahl, P. and King, M. (2008) 'Developments in Repo Markets During the Financial Turmoil'. BIS Quarterly, December.
International Capital Markets Association (ICMA) 'European repo market survey', 2001, 2008, 2012, available at www.icma-group.org.

Issing, O. (2005) 'One Size Fits All! A Single Monetary Policy for the Euro Area'. Speech at the International Research Forum, Frankfurt am Main, 20 May 2005. Available at «http://www.ecb.int/press/key/date/2005/html/sp050520.en.html».

Jabko, N. (2006) *Playing the Market: A Political Strategy for Uniting Europe, 1985–2005* (Cornell University Press).

Jones, E. (2009) 'Output Legitimacy and the Global Financial Crisis: Perceptions Matter'. *JCMS*, Vol. 47, No. 5, pp. 1085–1105.

Keijser, T. (2006) *Financial Collateral Arrangements*: *The European Collateral Directive*, *Law and Finance* (Vol. 9) (Kluwer).

Krishnamurthy, A., Nagel, S. and Orlov, D. (2014) 'Sizing Up Repo'. *The Journal of Finance*. DOI:10.1111/jofi.12168.

Liikanen Report (2012) 'High-Level Expert Group on Reforming the Structure of the EU Banking Sector'. Final Report. Available at «http://ec.europa.eu/internal_market/bank/docs/high-level_expert_group/report_en.pdf».

Mancini, L., Ranaldo, A. and Wrampelmeyer, J. (2013) '*The Euro Interbank Repo Market*'. No. 1316.

Mehrling, P. (2012) 'Three Principles for Market-Based Credit Regulation'. *The American Economic Review*, Vol. 102, No. 3, pp. 107–112.

Mügge, D. (2010) *Widen the Market, Narrow the Competition: Banker Interests and the Making of a European Capital Market* (ECPR Press).

Pozsar, Z. (2014) *Shadow Banking: The Money View* (Office for Financial Research, US Treasury).

Praet, P. and Herzberg, V. (2008) 'Market Liquidity and Banking Liquidity: Linkages, Vulnerabilities and the Role of Disclosure'. *Banque de France Financial Stability Review*, pp. 95–109.

Streeck, W. (2014) 'The Politics of Public Debt: Neoliberalism, Capitalist Development and the Restructuring of the State'. *German Economic Review*, Vol. 15, No 1, pp. 143–65.

The Giovaninni Group (1999) *EU Repo Markets: Opportunities for Change* (European Commission: Directorate-General for Economic and Financial Affairs).

Trampusch, C. (2015). 'The Financialisation of Sovereign Debt: An Institutional Analysis of the Reforms in German Public Debt Management'. *German Politics*, Vol. 24, No. 2, pp. 119–36.

Whelan, K. (2014) 'The ECB's Collateral Policy and Its Future as Lender of Last Resort'. Report for the European Parliament.

Woll, C. (2013) 'Lobbying under Pressure: The Effect of Salience on European Union Hedge Fund Regulation'. *JCMS*, Vol. 51, No. 3, pp. 555–72.