
“The diabolic loop between sovereign and banking risk in the euro area”

Marta Gómez-Puig and Simón Sosvilla-Rivero

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Abstract

Multiple interconnected channels link banks and governments: the sovereign-exposure channel (banks hold significant amounts of sovereign debt), the safety net channel (government guarantees protect banks), and the macroeconomic channel (bank and government health affect and is affected by economic activity). However, the sovereign-bank nexus in euro-area countries is particularly worrying since its member states issue debt in a currency they do not directly control and cannot ensure nominal repayment to bondholders. In this work, we summarise the main theoretical and empirical contributions that analyse this phenomenon and the legislative and institutional initiatives to reduce sovereign exposures in the banking sector.

JEL classification: G21, G33, H63.

Keywords: Bank risk, Euro area, Interdependency, Sovereign risk, Sovereign-bank nexus.

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1. Introduction

After the European sovereign debt crisis in late 2009, as bank holdings of sovereign debt expanded, advanced and developing market countries paid more attention to the relationship between governments and the banks that lend to them as they played a crucial part in the 2010–2012 European debt crisis. Many banks in euro-area peripheral countries changed the composition of their portfolios at the beginning of the 2010 decade from corporate lending to holdings of sovereign debt. By 2010, Greece, Ireland, and Portugal had trouble refinancing their debt; Italy and Spain followed in 2011.

Some academics contend that moral pressure from domestic authorities was the cause of this (Acharya *et al.*, 2018); however, others argue that it was the product of weak banks' free decision to increase their holdings of riskier, high-yielding government bonds (Angelini *et al.*, 2014). Capponi *et al.* (2021) present a model that demonstrates how the "doom loop" exacerbates the banking industry's problem – "too interconnected to fail" – as banks highly central in the network can strategically exploit exposure to their own government to raise the probability of receiving a bailout.

Multiple interconnected channels link banks and governments, including the sovereign-exposure channel (banks hold significant amounts of sovereign debt), the safety net channel (government guarantees protect banks), and the macroeconomic channel (bank and government health affect and is affected by economic activity). Dell'Ariccia *et al.* (2018) offer a detailed account of the numerous pathways that result in a "sovereign-bank nexus", where the financial well-being of banks and sovereigns is intertwined. The concern over the emergence of a vicious cycle in which sovereign fragility would endanger the asset side of the banks' balance sheet was one cause for this increasing interconnectedness. In turn, bank distress would boost sovereigns' explicit and implicit bail-out costs, imperil public budgets, and cast doubt on the sustainability of their debt (see, for instance, Alter and Schuler, 2012).

We examine the sovereign-bank nexus in the euro area, which, according to De Grauwe (2012), is particularly worrying since its member states issue debt in a currency they do not directly control and cannot ensure nominal repayment to bondholders, possibly leading to a self-fulfilling debt crisis (Obstfeld, 2013). Some scholars (see, for example, Shambaugh, 2012) underline that euro-area countries experienced three interconnected crises – banking, sovereign debt, and economic growth crises – that threatened the continued viability of the monetary union. We will now concentrate on the interactions between the banking crisis and the sovereign debt crisis in the euro area, even if this literature investigates the links between the three crises (see Brunnermeier *et al.*, 2016).

2. Quantifying the sovereign-bank nexus in the euro area

The sovereign-bank nexus has been typically examined using traditional banking and sovereign risk indicators based on the secondary market (sovereign yield spreads and banking sector equities returns) and the derivatives market (banking sector credit default swap (CDS) spreads and sovereign CDS spreads). For example, Yu (2017) uses CDS spreads for 11 European countries and 26 commercial banks between 2006 and 2012 to investigate the two-way relationship between banking and sovereign debt crises. She finds that the co-movement between the bank and sovereign CDS spreads at the country level was minimal before the financial crisis, increased significantly after the onset of the subprime crisis, and decreased significantly until the Greek debt crisis. In addition, the price dynamics analysis demonstrates that sovereign CDS spreads gradually led bank CDS spreads throughout the euro area debt crisis. In contrast, the opposite occurred prior to the bankruptcy of Lehman Brothers.

An interesting case study in the literature has been Italy. In order to determine how the sovereign risk in Italian government bonds may impact the sovereign and credit risk of non-stressed nations, Capasso

et al. (2022) examine the transmission of bank-sovereign risk among euro area members. They use a Global Vector Autoregressive (GVAR) method to calculate the cross-country "distance" in the debt-to-GDP ratio and apply that value to calculate spatial closeness. Their findings support the theory of a sovereign-bank loop, in which a shock in one country's CDS spreads spills over to other CDS and bank indices, making the repercussions more substantial in more fragile financial systems. Furthermore, Sabatini (2022) measures the effect of a decline in the value of banks' government bond portfolios on their supply of loans (direct channels) using the unexpected rise in sovereign yields in Italy in May 2018, separating the impact of a decline in bank capitalization (balance sheet channel) from the influence of a decrease in the ability to raise money using government bond holdings as collateral (liquidity channel). She finds that banks with significant government bond portfolios lowered their lending more than other banks. Due in part to the large amount of Eurosystem funds held by available banks, the liquidity channel was not activated. More recently, Pietrovito and Pozzolo (2023) examine a large sample of individual loan data issued by over 100 Italian small banks and demonstrate that a rise in the risk-premium demanded by banks on corporate lending is consistent with a concurrent rise in banks' total assets and a portfolio readjustment from loans to government bonds.

Based on a comprehensive dataset from German banks, Acharya *et al.* (2022) document the use of sovereign credit default swaps (CDS) during the European sovereign debt crisis to extend, rather than hedge, their long exposures to sovereign risk throughout the 2008–2013 period.

While CDS clearly indicate a country's default risk, they do not reflect investor sentiment towards credit risk. Instead, they reflect a combination of default risk expectations and anticipated rescue measures. This is the reason why Gómez-Puig *et al.* (2019) assess the sovereign-bank risk interconnection using alternative indicators ("The distance-to-default, DtD") based on the contingent claims analysis (CCA) methodology (Merton, 1974) and the standard option pricing model (Black and Scholes, 1973), using data for Greece, Ireland, Italy, Portugal and Spain over the 2004-2013 period.

Concretely, Gómez-Puig *et al.* (2019), instead of directly calculating the value of an issuer's assets (bank or sovereign), use the information on the liabilities side of its balance sheet and market perception to infer their implied value and volatility. To do so, they define a single priority structure of debt holders based on the seniority of creditors. This structure is incorporated into a theoretical model to obtain alternative estimates of the credit risk of banks and sovereign issuers in euro-area countries. Specifically, based on knowledge of the value and volatility of non-preferred creditor claims and considering the value of preferred creditor claims as a default barrier, they calculate the value and volatility of assets using an inverse formulation of the Black-Scholes equation (Singh *et al.*, 2015 and 2021). Their findings point to a strong relationship between banking and sovereign risk for these distressed countries during the sample, with market participants' risk appetite serving as the primary channel of risk transmission between sovereigns and banks. Their bi-directional Granger causal analysis by country suggests the development of a bank-sovereign doom loop only in Spain during the European sovereign debt crisis period.

On the other hand, Gibson *et al.* (2017) explore a panel of five stressed euro area nations within a three-equation simultaneous system where sovereign spreads, sovereign ratings, and bank ratings are endogenous to examine the possibility of feedback loops. First, the authors use a generalized method of moments (GMM) estimation, enabling them to compute multiplier and persistence impacts. Second, they use a new, bias-free estimate-generating system time-varying parameter technique. Their findings support strong doom-loop effects by demonstrating the close relationships between sovereign ratings, sovereign spreads, and bank ratings during the euro crisis.

Ongena *et al.* (2019) demonstrate that domestic banks in fiscally troubled countries (Greece, Ireland, Italy, Portugal, and Spain) were much more likely than foreign banks to increase their holdings of

domestic sovereign bonds during the European sovereign debt crisis, particularly during months when the government needed to roll over a sizable amount of maturing debt. Risk transfer, carry trading, or regulatory compliance cannot account for this outcome. Domestic banks that were tiny, had weaker balance sheets, or had received government assistance were particularly vulnerable to "moral suasion", while bank governance was less of a factor. Their results suggest that a bank is more ready to purchase sovereign debt if it believes that governmental instability threatens its viability more than the risky debt does, being a risk that could pay off when bond yields are high.

Besides, Tavlas *et al.* (2020) support the idea that the lack of a central bank safety net in the markets for sovereign bonds intensified feedback loops, and Albertazzi *et al.* (2021) document that foreign lenders stabilise lending, reducing the doom loop. Bonfim *et al.* (2022) demonstrate how the negative feedback loop between sovereigns and banks can be exacerbated by banks' lending exposure to businesses with government contracts.

Finally, one effect induced by the European sovereign debt crisis was the divergence registered in the evolution of credit in the euro area. In this respect, Faccia and Corbisiero (2020) examine the impact of bank and corporate weakness on the observed credit crunch in the euro area during the sovereign debt crisis using a unique data set of credit lapses encountered by businesses in the region. Their findings imply that it was challenging for businesses to secure external finance in distressed euro area countries due to weak banks.

3. Policy responses to reducing sovereign exposures in the banking sector

In the literature, there has also been significant interest in the policy responses aiming at eliminating or mitigating the sovereign-bank nexus. While the direct (financial) channel has seen tremendous improvement recently, its indirect (real) mechanisms have generally held steady (Bellia *et al.*, 2020).

Seoane (2020) examines how the feedback effects between banks and sovereigns resulting from sovereign debt holdings in domestic banks changed throughout the European debt crisis and how it reacted to the European Central Bank (ECB)'s adoption of monetary policy based on open market operations and marginal lending facilities. He documents indications of carry trade activity by banks and some weak evidence that the liquidity provision regulations may have helped to increase this channel.

Bechtel *et al.* (2021) demonstrate that quantitative easing can successfully mitigate the sovereign-bank nexus. Their findings suggest that ECB's public sector purchase programme (PSPP) significantly decreased the co-movement of sovereign and bank credit risk by over 80%, being the euro area periphery the driving force behind the mitigation.

Acharya *et al.* (2021) examine the factors that led to government involvement in the euro area banking sector during the 2008–2009 financial crisis and their long-term effects. According to their results, forbearance led undercapitalized banks to engage in zombie lending and shift their assets from loans to risky sovereign debt. This, in turn, led to decreased credit supply, increased banking sector risk, and a greater reliance on liquidity support from the ECB.

Lastly, Hristov *et al.* (2021) investigate how the ECB's unconventional monetary policy affects the banks' sovereign debt holdings. Their findings imply that after innovations connected to unconventional monetary policy, banks in Italy, Spain, and Portugal increased their exposure to domestic government debt. Furthermore, these authors contend that a home bias was evident in restructuring the government debt portfolio.

4. Macroprudential measures to reduce the sovereign-bank nexus

However, the global financial crisis and the crisis surrounding sovereign debt made clear the necessity to move more quickly toward completing the European Economic and Monetary Union and reduce the probability of triggering new episodes of the sovereign-bank doom loop.

Indeed, right during the European sovereign debt crisis, some authors (Schoenmaker, 2011) note that countries in the euro area faced the "financial trilemma", which implied having to choose between two of the three following objectives: (i) financial stability, (ii) cross-border financial activity, and (iii) domestic financial policies. In other words, governments had to give up national financial policies and hand over control to national institutions to maintain financial stability and cross-border financial activity. In a similar vein, Pisani-Ferry (2012) point out that the euro was conceptualized at the end of the 1990s in response to what came to be known as the "Mundell trilemma", which states that no country can simultaneously benefit from exchange rate stability, monetary autonomy, and capital mobility. Therefore, the decision to forego monetary sovereignty and choose exchange rate stability within a framework of unrestricted capital movement was made with the establishment of the single currency. This author claimed that 20 years later, the euro area encountered a new "trilemma" arising from the three fundamental tenets of monetary union (the absence of co-responsibility for public debt, the strict rule of non-monetization rule, and the national character of the banking systems), whose coexistence favours the euro area's vulnerability. Therefore, just as in the late 1990s, the question is to choose which principle to renounce. The problem is that this implies that the euro area must be transformed into a "real" economic and monetary union, including a "real" fiscal, banking and political union.

Following this view, different macroprudential measures have been articulated at the euro area level to increase the financial system's resilience in the face of disturbances, address possible systemic risks, foster a timely policy response and reduce fragmentation across national borders, all aimed at weakening the sovereign-bank nexus. Additionally, the European Commission is developing a roadmap for the gradual establishment of the European Banking Union (EBU), creating a single supervisory mechanism (SSM) and a single resolution mechanism (SRM) for banks for deeper integration of the euro area banking system. Moreover, the European Banking Authority (EBA) guarantees efficient and uniform prudential regulation and supervision throughout the European banking industry, maintaining financial stability and safeguarding the banking sector's integrity, efficiency and orderly functioning.

In this respect, Alogoskoufis and Langfield (2018) simulate portfolio reallocations by euro-area banks under scenarios for regulatory reform to inform policy deliberations. Their simulations show a conflict between concentration and credit risk in regulatory design: by enlarging the portfolio opportunity set, a region-wide low-risk asset produced by pooling and tranching cross-border portfolios of government debt instruments would ease this tension. Therefore, these authors contend that banks could reinvest in a security with a low concentration and credit risk.

Craig and Giuzio (2019) examine the potential impacts of diversification requirements for sovereign bond portfolios of European banks and propose to reduce the adverse effects of the sovereign-bank nexus on risk and portfolio diversification in the sovereign bond portfolios of the major European banks, arguing that while requiring banks to change their holdings in order to increase portfolio diversification may mitigate fire-sale externalities, it may be ineffective at lowering overall portfolio risk, including tail risk.

Hristov *et al.* (2021) argue that tightening macroprudential regulation based on unsystematic capital increases banks' exposure to domestic sovereign bonds in peripheral nations, deepening the

sovereign-bank nexus. Instead of modifying their domestic sovereign bond holdings in response to the shock, banks in the core countries increase their loan portfolios.

Bales (2022) demonstrates that, following the establishment of the EBU in 2014, the network connectedness and the strength of interdependence are much reduced. The network connectivity only declines in the short and medium term, while the strength effect is noticeable over all time horizons. This study shows that the new regulatory system encourages financial stability but works best in the short and medium term.

Gulija *et al.* (2023) focus on the COVID-19 stress impact in 2020, and the results are reported for the SSM significant banks and various EBU member states. They contend that the crisis' containment introduced a significant uncertainty, namely a potential insolvency lag, once the advantages of the public assistance fade and insolvencies begin to materialize. This uncertainty is linked to non-financial corporations, the stability of SSM significant banks, and sovereign debt sustainability, creating a new "doom loop". To increase understanding of those uncertainties and ensure financial stability, the authors propose the establishment of a "transition phase" as a mechanism of accountability.

Finally, Lamers *et al.* (2023) study how well the Bank Recovery and Resolution Directive (BRRD) works to reduce the link between banks and sovereigns in the euro area. Using CDS spreads to assess bank and sovereign credit risk and a dynamic conditional correlation mixed data sampling model to account for long-term interconnectedness between banks and sovereigns, they show that since the BRRD was implemented, the dynamic correlation between banks and sovereigns has declined in euro area countries. According to their panel data research, the banks' capital sufficiency, size, or ownership of domestic sovereign securities are not the main causes of the fall in interconnectedness.

5. Conclusion

Banks and sovereign risks interact during crises to endogenously generate more risk and create a "doom loop". This relationship is particularly worrying in euro-area countries since its member states issue debt in a currency they do not directly control and cannot ensure nominal repayment to bondholders. Indeed, this led to a self-fulfilling crisis during the sovereign debt crisis of 2009-12. This phenomenon has unleashed a series of theoretical and empirical contributions to analyse it and legislative and institutional initiatives to reduce sovereign exposures in the banking sector. Both have been summarised in the present work.

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