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# Revisiting the Economic Case for Fiscal Union in the Euro Area

*Helge Berger, Giovanni Dell’Ariccia,  
and Maurice Obstfeld*

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## Abstract

The paper makes an analytical contribution to the revived discussion about the euro area's institutional setup. After significant progress during the euro crisis, the drive to complete Europe's Economic and Monetary Union (EMU) had stalled, and the way forward will benefit from an in-depth look at the conceptual issues raised by the evolution and architecture of Europe, and the tradeoffs involved. A thorough look at the underlying economic issues suggests that in the long run, EMU will benefit from progressing along three mutually supporting tracks: introduce more fiscal risk sharing, helping to make the sovereign "no bailout" rule credible; complementary financial sector reforms to delink sovereigns and banks; and more effective rules to discourage moral hazard. This evolution would ensure that financial markets provide incentives for fiscal discipline. Introducing more fiscal union comes with myriad legal, technical, operational, and political problems, raising questions well beyond the remit of economics. But without decisive progress to foster fiscal risk sharing, EMU will continue to face existential risks.

## Acknowledgments

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## Overview

This paper contributes to the debate about the euro area’s architecture through an in-depth look at its underlying conceptual issues and alternative policy solutions. The firming macroeconomic outlook is an opportunity for policymakers to take stock both of current policies and of institutional arrangements and consider the economic case for a more resilient euro area—both at the national and the central levels (see also Thomsen 2017). At the national level, policymakers should press ahead with structural reforms (which tend to be more potent and easier to implement when growth is already high) and add to fiscal buffers where fiscal space is scarce. At the central level, it is a good time to consider narrowing the remaining gaps in the institutional setup of the Economic and Monetary Union (EMU). While this is hardly a new topic, there is now a window of opportunity to move the discussion forward (European Commission 2017).<sup>1</sup>

The question of how to complete EMU’s architecture remains urgent. Even though the euro area’s institutions evolved rapidly under the pressure of the debt crisis—adding conditional lending facilities, enhanced surveillance, and key elements of a banking union—the promise of continued progress toward “more Europe,” including in the fiscal domain, stalled as the crisis ebbed. There was a sense that what had been achieved was the most that was politically feasible. Although aspects of this discussion go well beyond the sphere of economics, it is also true that accepting political constraints as unchangeable will leave Europe ill-equipped to mitigate the harsh economic reality of a modern-day currency union operating in an environment of volatile international financial markets. Today’s favorable economic circumstances will not last forever, and the chance to strengthen the euro area should not be missed. When economic conditions become more challenging, the single currency’s architecture may well be tested again.

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<sup>1</sup>See also Bénassy-Quéré and others 2017, 2018; and the contributions in Bénassy-Quéré and Giavazzi 2017.



EMU's lack of fiscal union preserves a vulnerability that is bound to resurface under pressure. As the euro area debt crisis demonstrated, current arrangements provide a dangerous mix bound to return once the current upswing has run its course: hard constraints on economic adjustment under the common currency; a pervasive lack of fiscal discipline; and the speed and force with which shocks—amplified by a still-tight sovereign-banking embrace—travel through the euro area's financial system. Without some degree of fiscal union, this vulnerability presents an existential risk that policymakers should not ignore—especially with macroeconomic policy space much lower than before the recent crises.

More is required than completing the banking union. The need for a Single Supervisory Mechanism (SSM) and a Single Resolution Mechanism (SRM) along with functioning common deposit insurance and a common fiscal backstop is by now well understood.<sup>2</sup> The latter already includes elements of fiscal union. But the banking union, however vital, is not enough. Essential in addition is progress along several complementary dimensions to strengthen EMU's fiscal framework, including the following:

- Adequate EMU fiscal risk sharing, beyond what private capital markets can provide—which can reduce the incentive for governments to provide ad hoc support in crisis situations, thereby helping make the sovereign “no bailout” pledge more credible;
- Stronger rules and market discipline to discourage moral hazard;
- Coordinated system-wide fiscal policy to help counter common shocks when monetary policy is constrained by the effective lower bound.

Economic considerations suggest that EMU will function most smoothly if its institutional framework evolves along all these dimensions—but as a practical matter, some sequencing will be necessary. A realistic sequence may include completing the banking union first and tackling legacy issues, improving governance to build trust, and gradually introducing more elements of a central fiscal capacity, starting with those that support the banking union.

### **A Strong and Sustainable EMU Ultimately Needs Fiscal Union**

In a perfect world, households could purchase insurance against any undesirable state of the economy, guaranteeing a first-best, efficient outcome. But the world is far from perfect. Financial friction and externalities prevent risk-averse individuals from buying optimal levels of insurance. Welfare can

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<sup>2</sup>See Thomsen 2017; IMF 2017; and Goyal and others 2013.

rise if sovereigns step in with a variety of policies to enhance risk sharing and intertemporal consumption smoothing.

Monetary policy and exchange rate flexibility typically play a critical role in countering country-level shocks. Flexible exchange rates serve as a buffer, helping shift aggregate demand to countries facing a shortfall and away from those whose economies are overheating (Friedman 1953; Mundell 1961). However, within a currency union—where the common monetary policy focuses on the currency union aggregate—and given insufficient private sector risk mitigation, fiscal policy needs to play a greater role in absorbing country-level shocks.

Against this backdrop, there is a structural, efficiency-based argument for fiscal union. In a world where sovereign debt repayment was assured and sovereigns were not subject to borrowing limits more binding than their intertemporal budget constraints, national fiscal policy would be able to smooth out most transitory shocks (for example, through deficit-financed increases in spending). But even in such a hypothetical world, higher deficits today must be repaid through higher primary budget surpluses later, so purely national fiscal responses are less effective in countering more persistent shocks than a system of intergovernmental transfers (Kenen 1969). That said, the advantage of fiscal risk sharing can be larger or smaller depending on the type of shock and economic circumstances.<sup>3</sup> Traditional public finance arguments provide one more rationale for fiscal union, as they suggest that certain government functions, such as the provision of public goods benefiting all, should be centrally provided (Oates 1968). And such public goods need financing.

A second, more situational argument is that highly indebted countries may be constrained by market default fears in conducting anticyclical fiscal policy.<sup>4</sup> Under these circumstances—which are especially relevant for the euro area—cross-country fiscal risk sharing offers a critical tool to smooth out shocks at the national level. And its benefits relative to the current framework can be very large, for the country's partners as well as for the country itself. Specifically, as elaborated below, a sovereign's inability to deal with the consequences of a systemic banking crisis may even challenge the integrity of the single currency.

A powerful sovereign-bank nexus in EMU magnifies problems that the lack of fiscal risk sharing causes. The health of banks and sovereigns is linked by multiple interacting channels: banks' sovereign bond holdings; a safety net that still depends largely on the domestic sovereign for fiscal support,

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<sup>3</sup>As Farhi and Werning (2017) show, the benefit could be limited for typical shocks at the business cycle frequency—see the additional discussion below.

<sup>4</sup>See Draghi (2014).

even under the European Union's Bank Recovery and Resolution Directive (BRRD); and limited cross-border portfolio diversification, which makes banks' health highly dependent on national economies (Acharya, Drechsler, and Schnabl 2014; Dell'Ariccia and others, forthcoming; Farhi and Tirole 2016).

These linkages, present in every country, become a greater concern in the context of a currency union, where monetary policy cannot react to individual country shocks. The bank-centered nature of the euro area financial system adds vulnerability, with the crisis showing how some banking systems are now large enough to threaten government solvency (Obstfeld 2013; Navaretti and others 2016). Nevertheless, despite notable progress with the financing of the Single Resolution Fund (SRF) to support the SRM, EMU's financial stability framework still operates without an adequate joint fiscal backstop, leaving it incomplete in vital dimensions.

In addition, the amount of risk sharing provided by markets remains generally inadequate. EMU's financial markets are still more debt-based and less equity-based than other currency areas, and the crisis has brought more fragmentation, further limiting the amount of market-based risk sharing (for example, Allard and others 2013; ECB 2016). Moreover, financial markets tend to provide not more but less risk sharing in times of crisis, when it is most needed (Furceri and Zdzienicka 2015). Alcidi, D'Imperio, and Thirion (2017) show that capital markets in the euro area are a less powerful tool for risk sharing than in the United States. Finally, cross-country labor mobility remains significantly below what is observed in other common currency areas (for example, Arpaia and others 2015).

The institutional framework has evolved under the pressure of the crisis, but fiscal risk sharing in EMU is still very limited.

- The *European Stability Mechanism* (ESM) added a conditional sovereign lending facility available to all members. Even though there is no doubt that emergency lending to sovereigns has proved a critical function in the context of the euro area, ESM risk sharing is currently predominantly in the form of subsidized lending to stressed countries subject to strict conditionality. While ESM credit is typically extended when market access is in doubt and sovereign lending rates are high, it ultimately must be repaid. This limits its macroeconomic impact relative to other, more targeted, fiscal risk sharing—for example, automatic payouts from a rainy day fund organized at the euro area level.<sup>5</sup> In addition, while other risk sharing approaches will provide support before a shock has turned into a full funding crisis, the ESM is typically approached as a last resort and only after a

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<sup>5</sup>See the discussion below of the pros and cons of various potential risk-sharing mechanisms.

costly crisis has already taken hold (Allard and others 2013). In addition, as a last resort measure and in accordance with the BRRD, since 2014 the ESM also has the option to directly recapitalize “systemic and viable” euro area financial institutions. More recent proposals consider an expansion of the ESM’s role, including to backstop banking resolution and to perform macroeconomic surveillance for the euro area.

- In principle, the *EU budget* could help with risk sharing, but, given its small size, its potential impact is tiny. At about 1 percent of GDP, it remains an order of magnitude smaller than central budgets even in the most decentralized federations. For example, the federal budgets in Canada, Switzerland, and the United States represent about half of general government final spending, or 15–20 percent of GDP (Escolano and others 2015).

The current constellation of large national banking systems and highly indebted sovereigns therefore makes for internal inconsistency in EMU’s existing set of rules and safeguards against taxpayer-funded bailouts. In the absence of sufficient fiscal risk sharing, idiosyncratic shocks tend to cut deeper, implying higher potential costs for other EMU members and thereby making a bailout more likely (Allard and others 2013). Consistent with this concern, euro area sovereign obligations now carry collective action clauses, but triggering a sovereign default process would hit the domestic economy hard, especially through a banking system more exposed to the sovereign due to the absence of a complete euro area banking union. Thus, sovereign debt markets may wait too long before punishing profligate borrowers with higher spreads, effectively setting the stage for a more severe future crisis.<sup>6</sup> This mechanism, in turn, may reduce a government’s incentive to keep debt levels low in the first place. One way to edge the no bailout rule closer to time consistency is through introducing more fiscal risk sharing, including funding of a full banking union, thereby limiting the economic fallout from a government default and enhancing the credibility of no bailout pledges.

## What Should the Next Steps Be?

Whatever the political challenges, the economic case for completing EMU could not be clearer. Without adding some degree of fiscal risk sharing to economic and monetary union, EMU will remain highly vulnerable to shocks and mired in battles over vastly insufficient second-best policies. Specifically, EMU needs more fiscal risk sharing to help reduce the need for ad hoc crisis interventions, make no bailout more credible, and enlist financial

<sup>6</sup>Similarly, Cœuré (2016) concludes that “a degree of fiscal risk sharing” underpinned by “a set of rules at euro area level, mutually agreed and enforced by common institutions” may be required for sovereign debt markets to effectively indicate sovereign risk.

markets to strengthen governments' incentives against excessive fiscal deficits. This task also requires complementary financial sector reforms, including the completion of the banking union and fostering a capital market union.

In addition, as the level of fiscal risk sharing reaches meaningful levels, EMU should introduce more effective rules and institutions, at the EMU and/or national level, to reduce moral hazard. While there are good arguments for risk sharing, distinguishing between the provision of insurance against idiosyncratic risks and redistribution can be difficult in practice. In this context, it will be critical that all countries have similarly strong incentives to reform and to reduce structural impediments to economic growth and convergence. This balance will ensure that all benefit from tackling risks together without some countries becoming systematically and predictably givers or takers.

These three tracks are fully complementary. Financial market discipline better aligns incentives and presupposes the possibility of private sector bail-in, but it also limits sovereigns' fiscal room to maneuver, making risk sharing among member states more valuable. Financial sector reform can enhance private markets' contribution to risk sharing while loosening the bank-sovereign nexus, thereby making sovereign default a viable option in times of stress and sovereigns less vulnerable to domestic shocks. At the same time, several factors point to the need to limit moral hazard:

- Even in the best case, spillovers from sovereign default will remain, possibly motivating bailouts.<sup>7</sup>
- The strength of EMU's collective financial sector backstop depends on the strength of its individual members, opening the door to free riding.
- Efficiency and sustainability of any risk sharing system among sovereign states requires that none exploits (or is seen to exploit) the system.

Better fiscal risk sharing and a stronger banking union, in turn, may make it easier for member states to embrace and adhere to more effective rules.

A broad-based approach will ultimately be needed. Efforts must include completing the banking union with a centralized fiscal backstop, but should also involve elements of fiscal sharing—with proposals ranging from the introduction of a dedicated rainy day fund to the installation of a small central budget to provide EMU-wide public goods (with a dedicated tax source and some limited ability to issue joint and several Eurobonds) or area-wide basic unemployment insurance. In addition—and commensurate with the introduction of fiscal risk sharing—EMU members should take steps to

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<sup>7</sup>Indeed, due to some costs being external, sovereign defaults may occur too frequently (from the community-welfare perspective) relative to politically difficult domestic adjustment measures. For a discussion of US municipal default from this perspective, see Gillette 2012.

strengthen governance meaningfully and advance financial sector reform to foster fiscal discipline and policy coordination.

That said, practical concerns may well call for sequencing. Given the political environment, a pragmatic approach could start by completing the banking union, along with addressing legacy issues (such as existing stocks of nonperforming loans in the banking system) and better governance to strengthen trust among euro area members. Gradual introduction of fiscal risk sharing should follow, first in support of the banking union and then more broadly to provide cross-country insurance against macroeconomic risks. Some forms of risk sharing—such as the provision of a broader range of area-wide public goods—must await eventual further progress toward political union.

The rest of this paper takes a closer look at the economic case for fiscal union, the implications for EMU, and the road ahead.



## CHAPTER

# 1

## A Closer Look at the Economic Case for Fiscal Union

The economic case for fiscal union is urgent. Progress will require difficult political decisions that involve not only compromises between vastly different approaches to economic policymaking (Brunnermeier, James, and Landau 2016a), but eventually more delegation of sovereignty from the national to the central level. However, the analysis of the economic forces at work suggests that at least some elements of fiscal union are critical to sustain EMU over time.

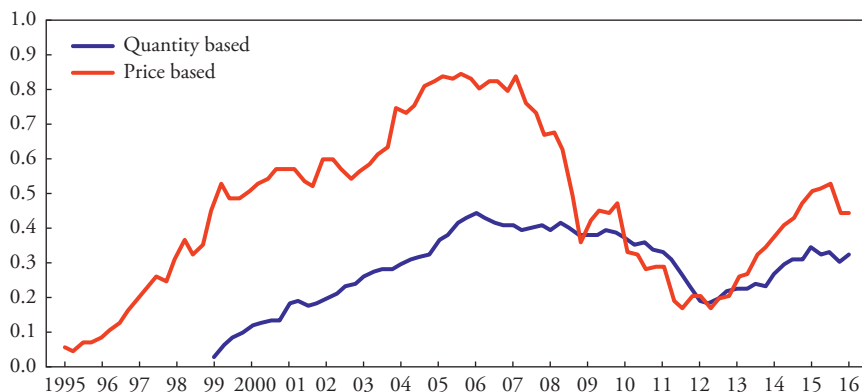
### EMU's Adjustment Problem

For all its benefits, the euro's introduction complicated the adjustment to shocks. The single currency represents the culmination of an intense economic harmonization process toward a complete internal market for goods, services, capital, and labor. This has greatly facilitated intra-European trade flows (Baldwin and others 2008; Berger and Nitsch 2008). Stable exchange rates can reduce uncertainty in trade and prevent asset markets from driving swings in competitiveness, which thereby promotes efficient allocation of resources. At the same time, however, with prices and wages rigid in the short term, the absence of a flexible exchange rate may severely complicate adjustment to idiosyncratic shocks.

Absent exchange rate flexibility, asymmetric shocks cause more severe internal and external imbalances. In standard open economy models, adjustment to an asymmetric real shock requires a change in the equilibrium real exchange rate. When the nominal exchange rate can adjust, it largely neutralizes domestic nominal rigidities. When it cannot, domestic prices and wages need to change. And if they do so only slowly, quantities move instead, which in the case of adverse shocks, leads to persistent excessive unemployment and negative output gaps (Obstfeld and Rogoff 1995). These predictions are



**Figure 1. Indicators of Financial Integration in the Euro Area**  
(Index; 1 = full integration, 0 = full fragmentation)



Source: European Central Bank.

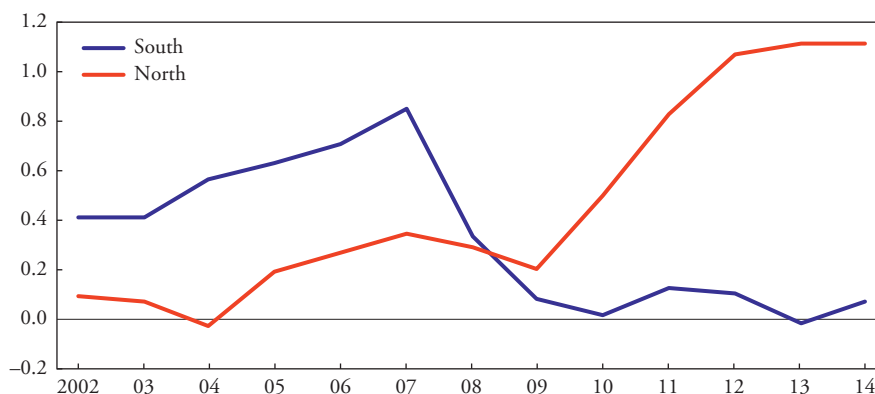
Note: The composite indicators measure the average degree of financial integration across the euro area and are constructed by aggregating various sub indicators across money, bond, equity, and banking markets.

broadly supported by empirical work (for example, Edwards and Levy Yeyati 2005; Berger and Nitsch 2014).

Financial markets have offered unreliable aid in cushioning the adjustment to asymmetric shocks. Cross-border equity holdings within EMU have grown, but financial integration is still biased toward debt financing, which tends to be more procyclical than equity financing (Beck and others 2016). This bias helps explain why market-provided risk sharing within EMU has been unstable and collapsed during the crisis (Kalemli-Ozcan, Luttini, and Sorensen 2014; Beck and others 2016; Furceri and Zdzienicka 2015). And while financial market integration shows some signs of recovery since the substantial fragmentation during the crisis, price- and quantity-based measures point to a persistent setback and continued sensitivity to episodes of financial stress (Figure 1).

Intra-EMU labor mobility has remained low. Labor movements can help to offset asymmetric country-level labor demand shocks. But hard-to-overcome differences in culture and language and regulatory impediments limit labor mobility (Aiyar and others 2016). Although intra-European labor mobility contributes to long-term adjustment much the way it does in the United States, the process takes about twice as long in Europe (Beyer and Smets 2015). This remains true even though intra-European labor mobility increased significantly under the pressure of the crisis and interstate migration in the United States has dropped (Molloy, Smith, and Wozniak 2011; Dao, Furceri, and Loungani 2017) (Figure 2).

**Figure 2. Intra-Euro Area Net Migration Rate, by Group of Host Countries**  
(Crude rate per 1,000 inhabitants in host country)



Sources: Organization for Economic Co-operation and Development International Migration Database; and IMF staff calculations.

Note: South = {ITA, ESP, PRT}; North = {AUT, BEL, DEU, FIN, NLD} Abbreviations are International Organization for Standardization (ISO) country codes.

## Strengthening Sovereign Bond Markets

### The Absence of a Monetary Backstop for Solvent but Illiquid Sovereigns

When the crisis began, market perception of a central bank bound by rigid rules when facing a spike in sovereign borrowing costs gave rise to multiple equilibria. The European Central Bank (ECB) monetary framework, designed with the good intention of protecting EMU from fiscal dominance, may have had a significant unintended consequence. The prohibition against monetary financing (Article 123, Treaty on the Functioning of the European Union [TFEU]) was interpreted as preventing the ECB from acting as a monetary backstop or lender of last resort for solvent but potentially illiquid sovereigns. This feature contrasted with the situation in unitary monetary areas, where markets believe that the government, in extremis, could print money to redeem its debt at face value.

For this reason, liquidity runs in the euro area could more easily turn into self-fulfilling threats to solvency. A sovereign could be considered solvent at low borrowing spreads, but at risk of insolvency if spreads were to jump; and in both cases, the outcome might confirm investors' expectations. Without a central bank liquidity backstop for government debt, spreads can vary more widely and rapidly, without significant changes in underlying fundamentals, as markets switch between equilibria. The sovereign-spread behavior of countries such as Spain and Italy over 2010–14 is consistent with this scenario.<sup>1</sup>

<sup>1</sup>Bocola and Dovis (2016) discuss the case of Italy in a model of sovereign borrowing.

As the crisis escalated, however, the ECB adopted new tools and a rhetoric that greatly mitigated these concerns. Since August 2012, the Outright Monetary Transactions program (yet to be tested) in principle allows the ECB to purchase sovereign bonds on secondary markets if necessary to safeguard the monetary policy transmission mechanism. Further, mechanisms in support of financial intermediaries, such as various long-term lending facilities, indirectly also supported liquidity in national sovereign bond markets. Finally, and perhaps most critically, ECB President Mario Draghi's 2012 "whatever it takes" speech signaled the ECB's willingness to act decisively against liquidity runs.

The danger of multiple equilibria limited governments' fiscal room to maneuver during the euro crisis. As Draghi (2014) put it: "[S]ince 2010 the euro area has suffered from fiscal policy being less available and effective, especially compared with other large advanced economies. This is not so much a consequence of high initial debt ratios—public debt is in aggregate not higher in the euro area than in the U.S. or Japan. It reflects the fact that the central bank in those countries could act and has acted as a backstop for government funding. This is an important reason why markets spared their fiscal authorities the loss of confidence that constrained many euro area governments' market access. This has in turn allowed fiscal consolidation in the U.S. and Japan to be more backloaded."

### **Market Discipline and the Failure of the No Bailout Clause**

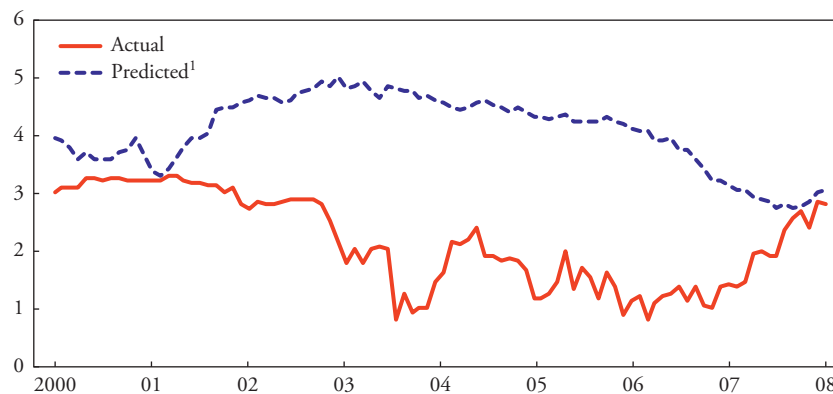
While prone to multiple equilibria in turbulent times, financial markets in tranquil times have paid limited attention to fundamentals when pricing national sovereign risks. Risk pricing remains imperfect today, but sovereign bond markets' sensitivity to differences in national economic and fiscal developments has likely increased since the crisis. For example, a simple standard model linking euro area member countries' sovereign-bond spreads over Germany to fiscal and macroeconomic developments estimated during 2008–15 suggests spreads significantly higher than observed in 2000–07 (Figure 3).<sup>2</sup> This confirms earlier findings in the literature, including Obstfeld's (2013) comparison of intra-EMU and intra-Canadian spreads.

A key impediment to more informative bond pricing is the absence of a time-consistent and therefore credible threat of sovereign bankruptcy. TFEU Article 125 explicitly forbids member states to assume liability for the debts of others. However, as far as markets are concerned, the no bailout promise

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<sup>2</sup>See also, for example, the recent analysis in Afonso, Arghyrou, and Kontonikas 2015; Delatte, Fouquau, and Portes 2016; and Ehrmann and Fratzscher 2017. Among other things, these findings suggest that the introduction of fiscal risk sharing through ESM lending, usually at below-market rates, has not prevented an increase in the responsiveness of spreads to fiscal measures.

**Figure 3. Sovereign Bond Spreads, Actual versus Predicted by Fundamentals**  
(Logs)



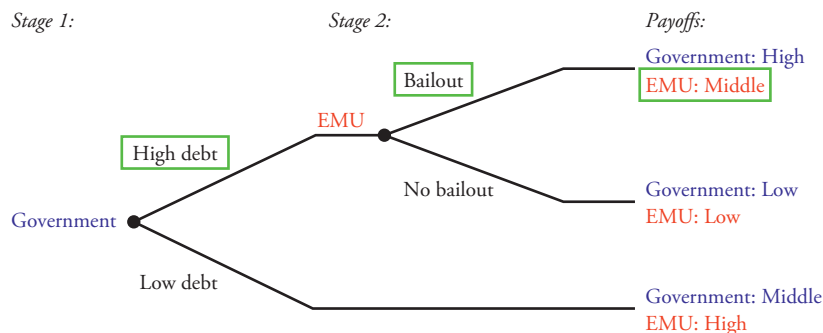
Source: IMF staff estimates.

<sup>1</sup>Predicted from a panel regression of 2008–15 bond spreads on country fundamentals (e.g., debt, fiscal balance, growth, inflation), including Europe-wide variables (policy rate, high bond yield index) and country fixed effects. Dashed line shows out-of-sample predictions for 2000–07.

is credible only if it can be expected to stand the test of a crisis. Indeed, once the debt of a currency union member becomes unsustainable and a crisis ensues, bailout can be policymakers' best choice, making it unlikely that the rule will be followed. This is what happens when, from policymakers' perspective, the overall cost of a sovereign default is higher than that of a bailout (Figure 4). Depending on the country, the cost of sovereign default can be high, including both the economic and social consequences to the stricken country and the repercussions across the currency area through economic, financial, migration, and political spillovers—and in extreme cases, even exit from the euro area. These prospective costs can make the fiscal resources needed for a bailout look comparatively small. Thus, if markets expect the cost of a sovereign default to be relatively high, they will question the no bailout clause and fail to impose the discipline that averts moral hazard and keeps debt low in the first place.<sup>3</sup>

The weak credibility of the no bailout rule stems from a time-consistency problem that fiscal risk sharing may ameliorate. Ex ante, the promise to avoid bailouts—if credible—is optimal. It increases fiscal prudence by raising a

<sup>3</sup>See, among others, Bordo, Markiewicz, and Jonung 2011 for a discussion of the historical US experience with sovereign (state) bankruptcy. Andritzky and others (2016) propose to link ESM programs to a sovereign debt maturity extension followed by a possible restructuring if debt proves unsustainable. According to Bénassy-Quéré, Ragot, and Wolff (2016), the main issue does not concern so much the introduction of a debt restructuring mechanism as it does ensuring that it is feasible—including through banking sector resilience and the introduction of better economic stabilization tools. Bénassy-Quéré and others (2018) emphasize that credible debt restructuring also requires legal mechanisms that protect sovereigns from holdout creditors and procedures to strengthen the no bailout commitment on the institutional side.

**Figure 4. A Stylized Example of a Time-Inconsistent “No Bailout” Rule**


Note: At stage 1, a government selects low debt or high debt. At stage 2, if debt is high, the rest of EMU can bail the government out or force a sovereign bankruptcy. If, given a high debt level, EMU's payoff is higher under a bailout (e.g., because of the high economic and financial cost of the resulting crisis across the currency area) and the government prefers high over low debt, the recursive equilibrium of this strategic interaction (marked by the green frames in the figure) is high debt followed by a bailout. See Allard and others, 2013. EMU = Economic and Monetary Union.

country's cost of default and simultaneously forces private creditors to internalize sovereign risk and thus price it correctly. In practice, however, governments cannot commit to steering clear of bailouts, and under the conditions discussed above, a bailout may become optimal ex post, since its immediate benefits may vastly exceed its immediate costs. This possibility undermines the credibility of the promise. Bulow and Rogoff (1988), for example, show that when a creditor-country government cannot commit to allowing private creditors and debtors to work out debt problems on their own, it can be gamed ex post into making side payments to those private parties. In general, containing the fallout from sovereign debt problems reduces creditor governments' incentives to get involved in bargaining games between debtors and creditors, and the introduction of some fiscal risk sharing, by limiting the expected EMU-wide costs of idiosyncratic country shocks, will therefore likely ameliorate the time-inconsistency problem and lend credibility to the no bailout rule.<sup>4</sup> (This is akin to what happens with rules governing the use of public funds in the resolution of banking crises. In a world without deposit insurance and bail-in-able securities, the economic and social consequences of bank failures may mean that bailouts are unavoidable. The introduction of deposit insurance reduces the externalities from bank failure and makes bail-ins more credible.) We elaborate on this point in what follows:

<sup>4</sup>Several factors are at work. Risk sharing might affect bargaining between debtors and creditors, tilting bargaining power toward the latter and making creditor governments more eager to bail out their lenders by orchestrating an EMU bailout of the sovereign. A more direct likelihood, however, is that by shielding the debtor economy in the case of an idiosyncratic shock, risk sharing would reduce lender losses conditional on no bailout, which would, in turn, enhance the credibility of a no bailout promise.

- Consider the case of a government default with significant consequences unacceptable to the rest of the euro area membership (for instance, a deep banking crisis and recession, with large spillovers to others). Under these conditions, market participants would see the no bailout clause as time-inconsistent and would just assume that if the need emerged, it would be violated and the other members would do whatever it took to end the crisis. Then, the presence of a formal arrangement to share some fiscal risk (for example, in the form of a common fiscal backstop for bank resolution and deposit insurance and fiscal transfers linked to the recession) that limited the negative consequences of a default could make default acceptable from an economic and political standpoint.
- This reasoning suggests that, under certain conditions, moral hazard will first decrease and then increase in the amount of formal fiscal risk sharing (see the annex for a formal illustration). Assume that a bailout will cover all costs of a crisis-struck country and that, in the absence of a formal risk-sharing arrangement, the bailout arrives with certainty. Then, as just discussed, introducing even a small amount of formal risk sharing can lower the probability of receiving the full bailout. If that is the case, the expected overall amount of support a country would receive in case of a crisis—coming through the combination of bailout and formal risk sharing—drops. Therefore, the incentives to choose prudent policies that prevent crises improve, and moral hazard falls. However, as the amount of risk sharing provided through formal arrangements rises closer to the level provided under a full bailout, this effect reverses and moral hazard rises.<sup>5</sup>
- In addition, by mitigating the fiscal consequences of economic shocks to individual countries, the introduction of formal risk-sharing arrangements will help stabilize the affected economies and prevent potentially more harmful crises. This benefit, in turn, will likely reduce the need for bailouts in the first place.
- Last but not least, since a well-designed formal fiscal risk-sharing mechanism coupled with market discipline on sovereign borrowing will generally provide less financial support than a bailout during a full-blown crisis, it is likely to entail less moral hazard than a no bailout regime without risk sharing that lacks credibility. That said, as with any insurance, the larger the degree of fiscal risk sharing expected to arrive through formal mechanisms, the more important it will be also to enforce more stringent gov-

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<sup>5</sup>The presence of spillovers will matter in this context. The positive relationship between formal risk sharing and moral hazard is likely to be stronger if the support agreed to benefit only the crisis country—such as improving a country's payoff under financial autarky in models of sovereign debtor/creditor negotiations (for example, Eaton and Gersovitz 1981). However, in a closely integrated currency area, crisis costs are likely to be shared (for example, through trade and financial channels), giving rise to an initially negative effect of higher formal risk sharing on moral hazard.

ernance rules to keep moral hazard in check.<sup>6</sup> The following section will provide a fuller treatment of governance issues.

There are many ways to share fiscal risk. For example, if essential government functions and area-wide public goods—from unemployment, pensions, and health insurance to deposit insurance, bank restructuring, and security services—are provided at the aggregate level, a country’s sovereign bankruptcy is far less likely to threaten the basic functioning of government (Allard and others 2013; Demertzis and Wolff 2016; Dolls and others 2016).<sup>7</sup> Aggregate revenue obligations to the center could be made procyclical (for example, social insurance payments and income tax payments would move along with a member country’s GDP growth), bringing about a measure of fiscal risk sharing. Such arrangements are beyond the limit of EMU’s current institutional and political framework—for example, even though the European Union has a common budget and democratic accountability, the budget is small, and it supports the entire European Union, not just the euro area. However, it is important to observe that the common currency itself, along with the ECB and new institutions such as the ESM, SSM, and SRM, exemplify how the provision of public goods can be gradually expanded.

In the absence of such mechanisms, more targeted approaches will be useful. For example, crisis-struck euro area countries could have access to centrally managed dedicated rainy day funds or EMU-level funds backstopping national unemployment programs (see next section). These resources would help contain the overall economic, financial, and fiscal fallout of a government’s default, thereby likely reducing bailout expectations and strengthening the markets’ incentives to price sovereign risk more accurately in the first place.

When sovereign default is credible, markets can play a constructive role in disciplining sovereigns, but the possibility of default also opens the door to self-fulfilling runs on their debt. To resolve this tension, the ECB should remain ready to address liquidity concerns affecting monetary policy transmission. More fundamentally, however, sovereigns must carefully manage fiscal vulnerabilities, in terms of both the size and structure of their debt stocks, paying prompt attention to market signals. At least equally important in determining fiscal vulnerability, however, is the government’s exposure to problems in its domestic financial system. This topic is taken up next.

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<sup>6</sup>Addressing this need will be aided by the fact that risk sharing shifts part of the task of stabilizing state-level business cycles to the central level, which should make it easier to implement credible deficit limits at the state level.

<sup>7</sup>This would be the case even if these government functions were located at the EU level.

## **The Role of Financial Regulation and Policies**

Closely intertwined sovereign and bank balance sheets make idiosyncratic national shocks (and their spillovers) more potent and heighten public balance sheet exposure. As in other jurisdictions, the financial health of banks is linked to that of sovereigns through multiple interacting channels: banks' holdings of sovereign bonds, implicit and explicit government guarantees for the banking system, and the impact of bank or sovereign distress on the economy at large. The precrisis financial architecture of the euro area amplified the strength of this connection, however, opening the door to powerful doom loops (Acharya, Drechsler, and Schnabl 2014; Farhi and Tirole 2016) and generating inconsistencies with the no bailout rule.

### **EMU's Strong Sovereign-Bank Nexus**

Even within a unitary monetary and fiscal jurisdiction, regional monetary conditions can become procyclical during distressed times. A negative regional shock reduces borrowers' creditworthiness. Banks with portfolios concentrated in the region become riskier, and their cost of funds increases. The resulting higher lending rates further hinder real activity, and so on. But in a single-country setting, in contrast to the euro area, two elements intervene to stop or at least contain this spiral. A nationwide financial safety net reduces concern for regional bank stability, and, if the crisis is broader than regional and has the potential to bring the public sector into the spiral, monetary policy can intervene with liquidity for the sovereign and banks and can control interest rate conditions. This capacity limits vicious real-sector/bank/government spirals, or doom loops.

In the euro area, the incomplete precrisis financial architecture strengthened the sovereign-bank nexus and increased the likelihood of vicious spirals. Several factors were at work:

- The national concentration of bank assets—linked, in part, to the absence of a ubiquitous area-wide safe asset—made collateral shortages more likely, which threatened to deepen regional shocks (see below).
- The absence of a centrally funded financial sector safety net implied an immediate bilateral link between the health of banks and sovereigns.
- As noted earlier, the ECB is much more constrained than other central banks in its ability to act as a monetary backstop for solvent sovereigns (Draghi 2014; Véron 2016), leaving euro area sovereign bond markets more vulnerable to self-fulfilling liquidity crises (Cœuré 2016).



Together, these factors tightened the link between bank and sovereign health and imply that—absent fiscal transfers or a bailout package—distressed conditions in sovereign bond markets may threaten a country’s participation in the payment system and the integrity of the single currency.

These tensions became painfully evident during the sovereign debt crisis. In fiscally weak countries, the soundness of nationally based fiscal bank backstops came into question. Banks were increasingly perceived as vulnerable, which led to rising bank funding costs and lending rates. This hurt real activity, further damaging public finances. In countries with large banking systems, bank distress overwhelmed national fiscal resources directly, because of explicit and implicit public guarantees, and indirectly, through its effect on real activity. Fiscal stress, in turn, cast doubt on the continuing effectiveness of government guarantees, aggravating financial stress.

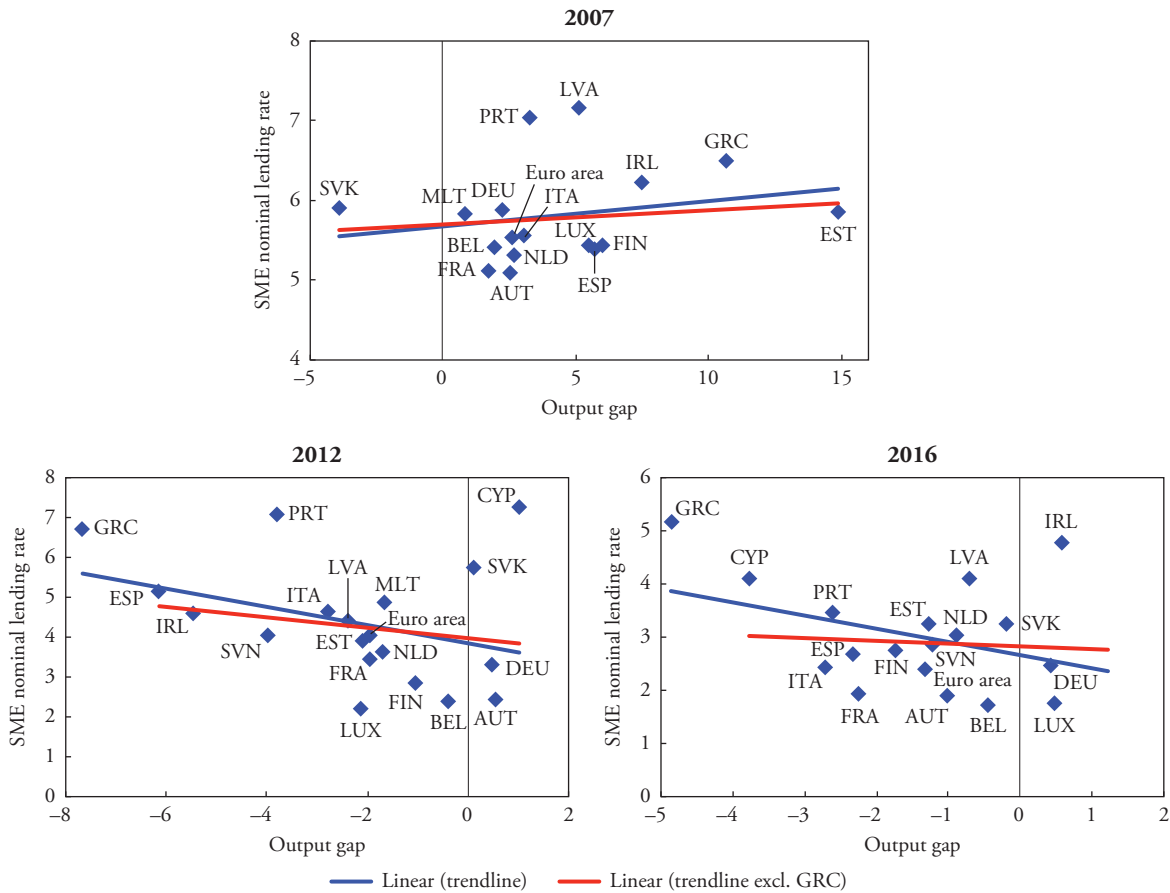
Thus, market yields that had not previously been synchronized started moving together. Yields of bank and sovereign bonds became highly correlated (Mody and Sandri 2012; Navaretti, Calzolari, and Pozzolo 2016). At the peak of the crisis, bank deposit rates moved together with sovereign credit default swap (CDS) spreads, illustrating that a weak fiscal position meant a weak safety net.

A weak cross-border resolution framework promoted segmentation along national lines. Absent functioning area-wide resolution institutions, the cumbersome process of dealing with multinational banks in distress ultimately resulted in breakups along national lines, a setback for financial integration and the European Single Market. At the same time, market and regulatory pressures led to a retrenchment of bank portfolios within domestic borders.

The sovereign-bank nexus also impeded the smooth functioning of the monetary policy transmission mechanism. Notwithstanding the ECB’s initial policy easing, monetary conditions in distressed economies such as Italy and Spain remained relatively tight (and at times tightened further). At the peak of distress, the inability to control local monetary conditions led to a perverse relationship between lending rates and output gaps, exacerbating the crisis (Figure 5).

Despite intervening reforms of the euro area’s framework for bank regulation and resolution, the data indicate that the threat of direct financial contagion between sovereigns and banks remains strong well after the crisis. As the ECB (2016) reports, EMU banks quickly scaled down the share of nondomestic EMU sovereign bonds in their asset portfolios—from 18 percent in early 2010 to 10 percent at the beginning of 2012 (Figure 6). At the same time, however, their holdings of domestic sovereign bonds rose, strengthening

**Figure 5. Output Gap and Small and Medium Enterprise Nominal Lending Rate**  
(In percent)



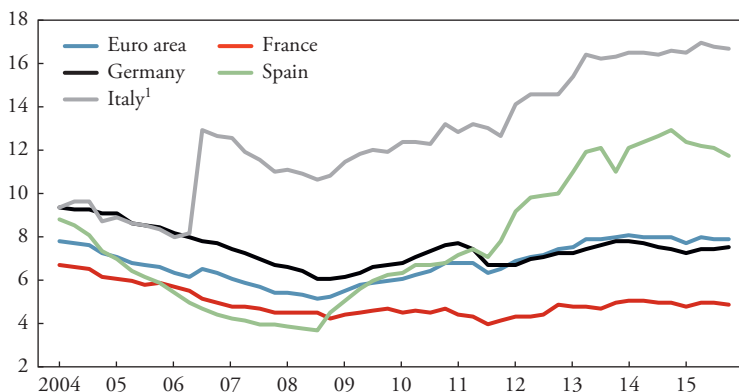
Source: IMF staff calculations.

Note: Data labels in the figures use International Organization for Standardization (ISO) country codes. SME = small and medium enterprises.

the link between governments and banks at the national level (Acharya and Steffen 2015).

Sovereign and financial sector risk are still highly correlated. Altavilla and others (2016) find that in countries particularly exposed to stress during the crisis, a 1 percentage point increase in the domestic sovereign CDS premium raised CDS premiums for banks with a median exposure to their sovereigns by about 30 basis points, with negative repercussions for loan growth. This effect worked both ways: when sovereign bonds lost value during the crisis, banks suffered equity losses, which increased default risk and funding costs and triggered a slowdown in lending activity. Then, after the ECB announced the Outright Monetary Transactions program, the mechanism went into reverse, allowing banks to expand lending again. There is also evidence

**Figure 6. Bank Holdings of Domestic Government Debt**  
(Percent of total assets)



Sources: Arslanalp and Tsuda (2012, updated to 2014); European Central Bank; and IMF staff calculations.

<sup>1</sup>The kink in Italy's series is due to inclusion of a large public financial institution in 2006.

of comovement between nonfinancial corporate bonds and sovereign risk (Horny, Manganelli, and Mojon 2016).

### Is the Current Framework Consistent with the No Bailout Clause?

Prudential regulation and other incentives encourage banks to hold sovereign bonds. As in other jurisdictions, the zero risk weights the EU Capital Requirement Directive sets for banks' sovereign-bond holdings favor such assets over others with similar risk characteristics but higher capital charges. Before the crisis, the uniform treatment of different euro area sovereign bonds by the ECB likely contributed to banks' demand for government securities (Obstfeld 2013). In addition, especially in times of bond market duress, the absence of a lender of last resort for sovereigns can amplify the temptation for sovereigns to use moral suasion to motivate banks to accumulate sovereign bonds—in Coeur's (2016) words, domestic banks may "act ex post as a contingency liquidity buffer to their sovereigns" to reduce their vulnerability to multiple equilibria (see also Altavilla, Pagano, and Simonelli 2016).

Recent regulatory reforms have reduced the likelihood of vicious sovereign-bank spirals. In the wake of the crisis, strengthened financial supervision, higher loss absorption buffers (especially for systemically important financial institutions), and new bail-in requirements have likely lowered the expected fiscal needs associated with bank distress. Some have argued that the introduction of positive risk weights on sovereign bonds and a more risk-sensitive collateral policy by the ECB would both likely weaken the bond-holding channel (Obstfeld 2013; Brunnermeier and others 2016b;

Dolls and others 2016).<sup>8</sup> At the same time, this change could introduce an undesired element of cyclicity in capital regulation, as banks would be forced to raise capital when sovereigns are downgraded, which typically occurs during recessions. Further, it may complicate liquidity management during crises. Government financing would also be affected (Cœuré 2016). This is why there is still no consensus on the introduction of positive risk weights for sovereigns.

Furthermore, the complex and multidimensional nature of the sovereign-bank nexus implies that these measures would weaken but not sever it. Stronger sovereign and bank balance sheets reduce the risk of crises, and tighter rules on bank bond holdings reduce direct exposure. But these measures leave most of the fundamental links between banks and sovereigns, which operate through the implicit and explicit safety net and the macroeconomy, intact. Thus, the nexus can be broken only through genuine completion of the banking union, including mutualized deposit insurance and resolution funds supported by an adequately sized and reliable common fiscal backstop (Goyal and others 2013).

It follows that, absent a full banking union, sovereign distress will inevitably remain a threat to countries' bank stability and the payments system, undermining the credibility of the no bailout clause. As illustrated again in Greece during the spring and summer of 2015, a sovereign debt crisis can easily escalate into a full-fledged bank run with immediate consequences for a country's links with the euro area payment system, even putting membership in the euro area at risk. Under these conditions, the no bailout pledge could be repeatedly tested.

In contrast, a full banking union would—in principle—allow sovereign debt restructuring to take place without impairment of credit and payments. A mutualized safety net anchored by a mutually guaranteed fiscal backstop would sever the direct link between national sovereign and bank distress. A sovereign crisis would still affect domestic banks through its effect on local activity, but as for regional crises in a single-country setting, public guarantees and liquidity support from the center would do much to contain vicious spirals. Puerto Rico's debt crisis, for example, has neither sparked a run on its banks nor imperiled its status in the US currency union.

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<sup>8</sup>At the peak the crisis, the EBA imposed capital buffers based on “prudent valuation” of sovereign debt held to maturity. This exercise had a forward-looking element resembling positive risk weights on sovereign bonds. However, a more systematic and fully ex ante approach would provide a better incentive structure for the banking system. (See: [https://www.eba.europa.eu/documents/10180/26923/Sovereign-capital-shortfall\\_Methodology-FINAL.pdf](https://www.eba.europa.eu/documents/10180/26923/Sovereign-capital-shortfall_Methodology-FINAL.pdf).)

## Policy Coordination and Governance

When policies entail cross-border externalities, lack of international coordination can lead to inefficiencies. The key issue here is not spillovers per se, but whether policymakers make decisions that focus solely on the domestic consequences of their actions or instead internalize the effects on other countries and shared objectives (Aguiar and others 2015). For example, in typical times, the stabilization of area-wide macroeconomic shocks falls under the purview of the ECB. However, when monetary policy operates at the effective lower bound, there can be a role for fiscal policy to contribute to the smoothing of aggregate shocks. In the absence of a central fiscal capacity, this calls for the coordination of economic policies so that all countries contribute (Gaspar and others 2016). At the same time, expansionary or contractionary fiscal policy in one country can lead to unwanted overheating or cooling elsewhere—and these spillovers seem to be larger during recessions, when monetary policy is operating at or close to the effective lower bound and exchange rates cannot adjust (Blagrove and others 2017). Local bank supervision and macroprudential policies can generate unwanted financial spillovers across a currency area. Unaccomplished structural reforms can lower domestic resilience to idiosyncratic shocks, in turn affecting others.

The underlying problem is difficult to solve in the absence of binding contracts or a central authority that conducts policies based on common goals. In game-theoretic terms, the externalities produce cooperation problems that are difficult to overcome, because individual players are motivated to deviate from the agreed coordinated strategy. To be sure, as Eichengreen and Wyplosz (2017) argue, absent strong cross-country macroeconomic spillovers, a return of fiscal responsibility to national governments and, among other things, stronger domestic fiscal institutions could solve some of these problems without adding constraints at the euro area level. However, macroeconomic spillovers do occur—and as noted above, they are not the only spillover problem. This fact suggests, ultimately, that the solution likely requires a better approximation to binding, verifiable agreements or—if these are out of reach—the delegation of policy competence to a supranational third party.<sup>9</sup>

The SSM marks significant progress on the financial policy front. The SSM aims to bring uniform supervisory treatment to the single market. It strengthens the credibility of supervisory action by imposing greater discipline on national regulators. Further, it aims to reduce national distortions (for instance, the preferential treatment of “national champions”) and better account for cross-border impacts (for example, internalizing the cross-border

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<sup>9</sup>See, for example, Uhlig 2003; Beetsma, Debrun and Klaassen 2001, Beetsma and Debrun 2004; Chari and Kehoe 2008; Beetsma and Giuliodori 2010; and Aguiar and others 2015. Oates (2006) discusses the problems of decentralization from a public finance perspective.

spillovers of regulatory actions). Finally, the SSM is likely to reduce regulatory capture, as banks that are large at the national level will likely have less clout at the euro area level.<sup>10</sup>

The second leg of the banking union, the SRM, is also a major step in the right direction. It applies to all banks supervised by the SSM and aims at “ensuring the orderly resolution of failing banks without recourse to taxpayers’ money.” Under its rules, resolution should in principle entail bail-in of creditors as well as shareholders, in line with the EU BRRD. That said, the way this new arrangement is working in practice is still being tested. Moreover, although the SRM will be backed by the Single Resolution Fund, funded by contributions from credit institutions under the SSM jurisdiction and targeted at 1 percent of the system’s covered deposits, the fund still lacks a robust joint fiscal backstop to cover systemic events—for example, if multiple large banks require capital injections or there is a significant threat of contagion.<sup>11</sup> And there has been limited progress to build a common deposit insurance system across national jurisdictions; the proposed European Deposit Insurance Scheme faces significant political pushback.

In contrast, on the fiscal front, EMU governance is generally seen as lacking power. There is consensus in the literature that EMU’s self-imposed structural reform commitments (for example, the Lisbon strategy) and fiscal rules lost much of their effectiveness once the so-called Maastricht criteria for joining the euro were no longer binding (Bénétrix and Lane 2013; Ioannou and Stracca 2014). It is still mostly the smaller countries that obey the rules of the Stability and Growth Pact (SGP), perhaps because larger countries are less likely to be sanctioned under the existing SGP framework.<sup>12</sup>

There is little evidence that the wave of new rules and surveillance procedures introduced since the start of the crisis has made a difference. Most observers agree that neither the “Six Pack,” “Two Pack,” and “Fiscal Compact”—meant to reinforce the SGP, including by more granular surveillance and the operationalization of the debt rule—nor the “European Semester” and “Macroeconomic Imbalance Procedure”—aimed at improving economic governance

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<sup>10</sup>Agarwal and others (2014) study the relative behavior of state versus federal supervisors in the United States.

<sup>11</sup>In Europe as well as at the global level, recent initiatives have sought to increase private sector bail-in and limited taxpayer liability in cases of bank insolvency. As Avgouleas and Goodhart (2016) argue, however, bail-in regimes will not remove the need for public support for resolution unless the risk is idiosyncratic. Similarly, Gros and de Groen (2015) conclude that, while the BRRD bail-in requirement, in principle, reduces the need for public recapitalization, no resolution fund can deal with a major systemic crisis without a fiscal backstop.

<sup>12</sup>See, for example, the analyses and discussions in de Haan, Berger, and Jansen 2004; Beetsma, Giuliodori, and Wierdsma 2009; Carlino and Inman 2013; Gros and Alcidi 2015; Eyraud and others 2017; and Bénassy-Quéré and others 2018.

and policy coordination more broadly—have made a notable difference.<sup>13</sup> Eyraud, Gaspar, and Poghosyan (2017) point out the potential importance of the changed majority requirements for certain decisions in enforcing the SGP. But they conclude that, overall, these reforms failed to change underlying political incentives. This stasis is not helped by the lower transparency inherent in the proliferation of rules (Andrle and others 2015), reinforced by the general overlap of EMU- and EU-based governance procedures.

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<sup>13</sup>See, for example, Hallerberg 2016 and Demertzis and Wolff 2016. On the European Semester, the analysis of Gros and Alcidi (2015) and Darvas and Leandro (2015) suggests that implementation of recommendations was poor from the start in 2011 and continued to decline over time.

## Completing EMU: The Way Forward

A complete EMU needs more fiscal union. Despite recent progress, EMU remains vulnerable to shocks and subject to the corrosive force of uncoordinated national policies in critical areas (Table 1). Specifically, given the limited borrowing room of several sovereigns and large banking systems with continued pockets of fragility, there is an urgent need for more extensive fiscal risk sharing facilities, both to cushion local shocks and to underpin a complete banking union. These changes would add credibility to the no bailout principle and strengthen fiscal discipline with the help of financial markets. Improving governance is critical to align national policies with common goals.

Progress is urgent along two critical dimensions. First, in the near term, the completion of the banking union is key to removing a potentially explosive sovereign-bank nexus that could still threaten the integrity of the single currency. Second, over the longer term, more extensive fiscal risk sharing would contribute to the smooth functioning of the euro area.

### Completing the Banking Union

Completing the banking union remains a priority. As discussed, the SSM was a major step forward in ensuring uniform supervisory standards across the euro area, eliminating favoritism toward national champions and reducing the risk of regulatory capture. Yet, despite progress toward common resolution policies with the SRM and BRRD, the banking union remains incomplete. Specifically, the lack of a truly common financial safety net leaves the sovereign-bank nexus essentially intact.

The establishment of a common fiscal backstop for bank resolution and deposit insurance would greatly weaken the country-level sovereign-bank



**Table 1. Completing EMU: Steps toward a Functioning Fiscal Union**

Principal Requirements	Progress since the Crisis	What More Is Needed
<b>(1) Fiscal risk sharing</b> <ul style="list-style-type: none"> <li>• Macroeconomy</li> <li>• Banking union backstop</li> </ul>	<ul style="list-style-type: none"> <li>• Small-scale centralized investment initiative</li> <li>• Conditional liquidity provision, usually at below- market rates (European Stability Mechanism)</li> <li>• Single resolution fund (Single Resolution Mechanism)</li> </ul>	<ul style="list-style-type: none"> <li>• Macroeconomic risk sharing of relevant size</li> <li>• Common deposit insurance</li> <li>• Robust jointly financed bank resolution fund</li> </ul>
<b>(2) Governance</b> <ul style="list-style-type: none"> <li>• Policy coordination</li> <li>• Rules</li> </ul>	<ul style="list-style-type: none"> <li>• Various increasingly complex fiscal governance reforms</li> <li>• Single Supervisory Mechanism</li> </ul>	<ul style="list-style-type: none"> <li>• Effective coordination</li> <li>• Simpler but more effective rules to reduce moral hazard</li> </ul>
<b>(3) Markets</b> <ul style="list-style-type: none"> <li>• Factor market integration</li> <li>• Incentivizing fiscal and financial institution discipline</li> <li>• Reducing the risk of adverse self-fulfilling equilibria in sovereign debt markets</li> </ul>	<ul style="list-style-type: none"> <li>• Stronger supervision, higher loss-absorption buffers, and bail-in requirements</li> <li>• Financial market integration not fully recovered from the crisis</li> <li>• Collective action clauses introduced</li> </ul>	<ul style="list-style-type: none"> <li>• Fully unified supervision, regulation, deposit insurance, and resolution to defuse the country-level sovereign-bank nexus</li> <li>• Full capital market union</li> <li>• Credible limitations on taxpayer-funded bailouts, supported by a minimum of risk sharing</li> </ul>

nexus. It would prevent a systemic banking crisis from jeopardizing a country's fiscal stability and implicitly threatening euro membership. It would prevent stress in a sovereign's bond markets from undermining confidence in local banks. It would lend credibility to the no bailout clause by allowing sovereign debt to be restructured without threatening local banking systems. And by reducing the sovereign's direct dependence on the health of its banking sector, it would make borrowing spreads more likely to reflect fiscal fundamentals than self-fulfilling expectations.

In the context of the centralization of the financial safety net, the question of the preferential treatment of sovereign bonds on bank balance sheets is relevant. There is a trade-off between making sovereign holdings more risk sensitive and limiting regulatory cyclicality. Depending on their design, binding exposure limits or risk-sensitive capital weights could increase capital requirements during sovereign distress, encouraging banks to curb or reduce their exposures. Therefore, the currently observed debt-stabilizing behavior of banks, which tend to increase holdings of sovereign paper during distress, could be significantly reduced. This reduction could have negative repercussions, as banks' responses to procyclical regulatory shifts amplify the effects of events that raise sovereign spreads. Against this backdrop, some have advocated positive but not highly risk-sensitive risk weights, while others have stressed the advantages of imposing concentration charges (for example,

Véron 2017, Bénassy-Quéré and others 2018). Any such reform would have to be introduced carefully not to give rise to instability in the financial system or debt markets.

Facilitating intra-euro-area capital flows through a “Capital Markets Union” (CMU) would also be beneficial. The recent action plan by the European Commission presents two sets of arguments in favor of deeper and more integrated capital markets in Europe. The first is cyclical. The lack of growth during the post-crisis period has in part been attributed to banks’ distress and the associated inability or unwillingness to lend. In that context, the CMU is portrayed as an alternative source of external financing for small and medium enterprises. The second set of arguments is structural. Deeper and more efficient capital markets would reduce the system’s vulnerability to future crises. Should banks again fall into distress, stronger capital markets could prevent or at least weaken the vicious bank/real-sector/sovereign spirals that played a critical role during the recent crisis. The CMU is also seen as a complement to the banking union that would further the introduction of uniform standards, including for securitization and collateral. Finally, more efficient capital markets are an obvious precondition to reduce the centrality of debt as a source of external funding, which, among other advantages, would promote risk sharing through private markets.<sup>1</sup>

Details matter. The CMU proposal rightly highlights the importance of efficient “plumbing” (the proper design and implementation of several microlevel elements of the reform) to ensure that transaction costs do not overwhelm the gains from more extensive and integrated capital markets. A partial list of these elements includes more harmonized tax and resolution regimes, more uniform securitization standards, credit bureaus to facilitate access, a “European passport” for financial assets to ensure equal treatment, and venture capital support (for example, though more favorable tax treatment).

There is an ongoing discussion about the need for safe assets. The fragmentation in the supply of safe assets stemming from EMU’s unique combination of one money and many treasuries has frequently been cited as a vulnerability.<sup>2</sup> Absent a central budget that can issue its own euro area bonds backed by a dedicated area-wide revenue source, sovereign-bond-backed securities combining and tranching liabilities of multiple euro area sovereigns (also known as European safe bonds or ESBIEs; see Brunnermeier and others 2017) are currently being studied by European and euro area institutions. These bonds

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<sup>1</sup>The CMU could potentially also facilitate more visionary schemes by sovereigns to diversify their idiosyncratic risks, for example, through GDP-linked securities (Obstfeld and Peri, 1998; Borensztein and Mauro, 2004; Benford, Ostry, and Shiller, forthcoming).

<sup>2</sup>See, for example, Brunnermeier and others (2016b) for a recent, more comprehensive discussion.

could help—especially if introduced in conjunction with the described financial framework reform.<sup>3</sup> However, if they are to be accepted by markets in the absence of regulatory measures that ensure demand, ESBIEs might require some form of centralized guarantee or backing (for example, by a central budget or another entity such as the ESM). This need will likely be most urgent for lower tranches, but may emerge even for the upper tranche in times of crisis.

That said, in the longer term, EMU will require fiscal risk sharing capacities beyond the needs of an effective banking resolution backstop—even a full banking union, while a big improvement, would not fulfill all needs. Even a full banking union cannot completely solve the issues implied by sovereigns' current inability to provide cyclical smoothing. Removing the most explosive risk associated with the lack of fiscal risk sharing would provide time for sovereigns slowly to increase their fiscal space. But, short of debt restructuring, this adjustment process would take a long time, leaving countries exposed to adverse risks in the interim and with little ability to manage their economic cycles.

### Fiscal Union for the Euro Area

To function well, currency unions need to deal effectively with moral hazard while providing fiscal risk sharing. Moral hazard is difficult to avoid when the degree of follow-through on jointly agreed policy action cannot always be observed. This informational asymmetry can have costly consequences—for example, when the absence of effective structural reforms or failure to adhere to fiscal rules increases the probability that a country will fall into crisis, with potentially costly spillovers to other EMU members. There are strong arguments suggesting that fiscal risk sharing is essential to the functioning of EMU, but it could aggravate EMU's existing moral hazard problem further by reducing the incentives to avoid certain risks in the first place. The case for fiscal risk sharing and the issue of moral hazard are discussed in turn.

#### The Argument for Fiscal Risk Sharing and How to Implement It

The need for fiscal risk sharing to help take the edge off idiosyncratic macro-economic shocks is fundamental to the currency union.

- This is an old insight, of course. Since Kenen 1969 and the 1977 Mac-

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<sup>3</sup>There are various other proposals for such bonds, including, for example, bonds issued by a potential “European Redemption Fund” discussed earlier or jointly guaranteed “stability bonds” that would replace national sovereign bonds up to an agreed-on level of debt measured as a fraction of GDP (Ubidé 2015).

Dougall Report, the literature has stressed the *mutual insurance character* of centrally provided stabilization of idiosyncratic national shocks, arguing that it is more effective because the associated fiscal stabilizers come with smaller expected increases in domestic sovereign debt and associated future tax liabilities for households and firms (see also, for example, Bayoumi and Masson 1998).

- In addition, more recent research emphasizes the *inefficiency of market-based cross-country risk sharing* when financial markets are incomplete, or even when they are complete—because households do not fully consider macroeconomic externalities when insuring against country-specific shocks within a currency union (Farhi and Werning 2017). Those externalities call for sovereign or government-supported fiscal risk sharing based on state-contingent transfers. Conceptually, such transfers can take any number of forms so long as they are final. As a rule, the mutual gains from risk-sharing mechanisms are largest when shocks are very persistent and prices adjust only slowly, as well as when country-level shocks are less correlated (Fidrmuc 2015). Beyond these classic arguments—as just discussed—the need to provide a minimal fiscal backstop to a genuine banking union provides a further rationale.
- Moreover, as discussed earlier, a minimum of fiscal risk sharing is needed to *ensure the time consistency of the no bailout rule* in EMU by limiting the cost of macroeconomic shocks at the member level.

The debate about the best institutional solution continues (see, for example, Eyraud, Gaspar, and Poghosyan 2017). The principal options include microeconomic approaches—which introduce improved cross-border risk sharing at the individual or household level—and macroeconomic mechanisms, or a combination of both. The euro is of course not a political union, but comparisons with unitary currency areas still provide a useful benchmark of comparison. Empirically, net fiscal transfers help smooth about 10–15 percent of idiosyncratic income shocks at the state level in the United States and about 20 percent at the Land level in Germany, with a significant role played by cyclically sensitive revenue and spending functions at the federal level (Poghosyan, Senhadji, and Cottarelli 2015). Such offsets are even more important for EMU. While market-provided risk sharing (that is, risk sharing through private financial transactions) smooths about 55 to 70 percent of regional income shocks within federations such as Canada, the United States, and post-1990 Germany, the number is significantly lower in the euro area (Allard and others 2013). Cross-country credit flows—EMU’s only significant source of market-based risk sharing—have been smoothing only about 35 percent of national shocks in normal times, a number that drops to 17 and 11 percent, respectively, during severe or very severe economic downturns (Furceri and Zdzienicka 2015).

Microeconomic risk-sharing mechanisms, which build on existing social insurance programs, are promising. The underlying principle is to stabilize directly household incomes by integrating some existing tax-transfer mechanisms across currency union member countries (Dolls and others 2016). Such transfers can be designed to be automatic, elastic to the cycle, and endowed with high fiscal multipliers as they directly relax the household budget constraint. In addition to helping smooth incomes in the face of adverse shocks, providing social insurance at the level of EMU will foster the mobility of labor across the region, which further aids risk sharing.

Unemployment insurance, whose benefits and contributions both move with the business cycle, is a natural starting point for such considerations.<sup>4</sup> For example, Dullien (2014a) suggests a basic EMU-wide unemployment insurance fund to provide a minimum level of insurance that national programs could top up. An EMU-level fund would receive a share of the wage contributions collected by national authorities in return for paying benefits in case of unemployment. Fiscal risk sharing would occur because a country's aggregate payments into the system would drop during an economic downturn, while benefits would increase, funded by the contributions of other countries—with the opposite happening during an upswing. The replacement rate of the EMU-wide program would be harmonized across countries, and payouts would be time-limited and conditional on previous work, preserving existing differences in generosity across countries, if so desired, and reducing the risk of permanent cross-country transfers. Finally, to deal with EMU-wide shocks, the fund would be allowed to build reserves and, if needed, borrow from capital markets.

The approach could contribute significantly to EMU fiscal risk sharing. Calculations by Dullien (2014b) suggest that during the 2007–09 recession, a common unemployment insurance program with a replacement rate of 50 percent could have reduced the shortfall in Spanish GDP by about 20 percent. Model-based simulations show that under certain conditions, supranational unemployment insurance can buffer country-level risk without increasing unemployment levels (Moyen, Stähler, and Winkler 2016).<sup>5</sup>

Several authors have analyzed macroeconomic mechanisms that could offer similar benefits—all designed to operate in a nondiscretionary manner to provide short-term transfers. Among the proposals are the following:

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<sup>4</sup>However, Balassone and others (2014) argue that the introduction of an EMU-wide, notional defined-contribution pension plan would provide actuarially fair benefits while offering cross-border fiscal risk sharing, because contributions would be a function of incomes and, thus, of the business cycle.

<sup>5</sup>Among the conditions is that benefits and contribution levels can differ across countries and fluctuate with country-specific shocks. See Moyen, Stähler, and Winkler 2016 for details.

- *Rainy day fund:* A dedicated macroeconomic stabilization mechanism would collect permanent contributions from EMU members in exchange for transfers linked to the occurrence of country-level shocks (Allard and others, 2013; Furceri and Zdzienicka 2015; Bénassy-Quéré and others, 2018). As discussed earlier, even the introduction of limited formal risk-sharing arrangements may make a difference. Moreover, a more complete banking union and further progress toward the development and integration of euro area capital markets could strengthen market-provided risk sharing. If a rainy day mechanism could borrow with joint and several liability, it could also help counter EMU-wide shocks.
- *Centralized budget:* An EMU-based fiscal capacity could provide area-wide public goods or long-term public investment (IMF 2016b) financed by government contributions, taxes, or a combination of both. To the degree that the revenue collected to fund it would vary with country-specific macroeconomic shocks, whereas spending on public goods would continue, it would generate fiscal risk sharing for EMU members, stabilizing consumption fluctuations (Evers 2015). If the central budget could borrow with joint and several liabilities, that could, in addition, help automatically counter EMU-wide shocks—which would matter most when the ECB operates at the effective lower-interest-rate bound or when monetary policy is otherwise overburdened (Corsetti and others 2016). Moreover, it could be easier to realize economies of scale and increase spending efficiency (Escolano and others 2015).
- *Common borrowing schemes:* A central entity could borrow at market rates and onlend to national budgets or the private sector in EMU member countries (De Grauwe and Ji 2016; IMF 2016b). The introduction of Eurobonds—that is, national treasuries’ access to jointly guaranteed borrowing—would have similar effects. As with the short-term liquidity provided through the ESM, fiscal risk sharing would occur through the funding-cost differences.

### Dealing with Moral Hazard

Distinguishing between risk sharing, redistribution, and legacy issues is a difficulty for both micro- and macroeconomic approaches.<sup>6</sup> In principle, risk sharing should include any type of shock—whether transitory, persistent, or permanent—provided the underlying risk is indeed random and has the potential to affect all EMU members. At the same time, it can be difficult to determine the underlying nature of observed differences in income or other economic variables in real time. For example, based on microdata simulations

<sup>6</sup>Avoiding permanent transfers is among the principles for fiscal risk sharing set out by the “Five Presidents Report” (Juncker 2015).

of an EU-wide tax and benefit system, Bargain and others (2013) argue that microeconomic approaches are likely to have both risk-sharing and redistributive qualities. Legacy issues, such as existing nonperforming loans (NPLs) on bank balance sheets, pose even more challenging issues unless specific tools are available to deal with them outside of risk-sharing mechanisms. Moreover, legacies are a key barrier to moving forward on mechanisms to share future risks, whether transitory or not.

Moral hazard is a major concern. As discussed earlier, the introduction of an enhanced degree of risk sharing will help increase the credibility of the no bailout rule for sovereigns. When no bailout is credible, financial markets are more likely to enforce fiscal discipline on member states and fewer area-wide rules may suffice to induce prudent behavior by national policymakers. However, not all relevant policy action can be observed, which can aggravate moral hazard problems once fiscal risk sharing has reached meaningful levels. Among others, Hebous and Weichenrieder (2016) warn that greater fiscal risk sharing could weaken incentives for structural reforms aimed at increasing resilience in the face of adverse shocks. Similar arguments can be made for national efforts to collect and efficiently administer tax and other revenues.

Careful design of fiscal risk sharing can reduce these problems. Among the proposals discussed in the literature, for example, Dolls and others (2015, 2016) suggest a slightly amended unemployment insurance setup that would have an EMU-level fund provide support only when national downturns exceed certain levels. They suggest such a design would be less prone to local manipulation and less likely to generate permanent transfers. To that end, the transfers would be conditioned on the presence of truly asymmetric and unusually large shocks (for example, an increase in unemployment above the EMU average) exceeding a predetermined high threshold. Arguably, this would be broadly comparable to Unemployment Insurance Extended Benefits in the United States, which offer federal support to workers having exhausted regular state-level benefits in times of high (local) unemployment. Another remedy that has been discussed is conditioning participation in fiscal risk-sharing programs on previous structural reforms (Brunnermeier and others 2016b). Bénassy-Quéré and others (2018) discuss a design that would condition access on having implemented good policies and in which risk sharing remains partial to ensure that borrowing countries retain some skin in the game.

Microeconomic and macroeconomic approaches alike have their advantages and disadvantages. On the one hand, cross-country risk sharing through social insurance systems can be based on objective criteria linked to observable characteristics of households or individuals. Arguably, this makes these systems less likely to be politicized by governments (Brunnermeier and

others 2016b). On the other hand, societal preferences for providing social security vary widely across EMU members (Dolls and others 2016), which complicates the introduction of area-wide plans that will likely require at least some harmonization of labor market institutions. In addition, although some macroeconomic programs face problems of real-time data observability (for example, in the case of GDP—see Balassone and others 2014), they could be more transparent and easier to monitor than microeconomic approaches. Microeconomic approaches rely on complex, interlinked social security systems—involving taxes; transfers; and pension, health, and unemployment benefits—that differ widely across countries in terms of generosity and composition.

Legacy issues will need to be tackled outside risk-sharing mechanisms. By design, risk sharing is meant to address new risks, suggesting that legacy issues such as the large stock of NPLs in Europe’s banking system require a dedicated separate effort. For example, an earlier suggestion by the German Council of Economic Advisors (2011) introduced the idea of a “European Redemption Fund” that would, over time, purchase the stock of EMU national sovereign debt exceeding the SGP threshold of 60 percent of GDP at the time of its introduction.<sup>7</sup> Recent proposals by the European Banking Authority for a European-level “bad bank” to purchase existing NPLs at their real market value as determined by due diligence (Enria 2017) would harmonize the approach across countries but stops short of providing a joint EMU-wide guarantee for its financing. Disposing of legacies is a thorny problem, to say the least; for one thing, they condition, and in general worsen, the national and EMU-wide effects of new adverse shocks. Precisely for this reason, however, legacies should not be allowed to stand in the way of necessary institutional innovations. But those innovations will be impossible to advance unless the path to greatly reducing legacies is clearly delineated and credible.

### **What Constraints on Government Behavior?**

In the presence of moral hazard, EMU needs rules that bind national policymakers. As discussed, the need for rules depends, in part, on the availability of fiscal risk sharing (see also the discussion in the annex). While there are, from an efficiency perspective, very good arguments for making sure that economic risks are being insured, the presence of insurance may reduce the incentives for risk prevention. Thus, the more fiscal risk sharing is put in place and the greater the concern for moral hazard, the more rel-

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<sup>7</sup>The fund would finance its purchases by jointly guaranteed debt and be repaid by governments, which (subject to various safeguards) would commit to adjusting their deficits to keep their remaining national debt below the Maastricht threshold.



evant rules enforced by the center will become. Externalities that national policies can inflict on other currency union members provide another reason for such rules.

International experience strongly supports this conclusion. Across individual countries, the constraints applied to regional governments' policies tend to be tighter when the level of fiscal risk sharing is higher, often with rules enforced by the center.

- In general, more unitary regimes like those of France and the United Kingdom, where fiscal risk sharing is relatively intensive, tend to impose stricter governance on subnational governments than those of more federalist countries like Canada and Switzerland, which provide relatively less risk sharing (Allard and others 2013). Rule enforcement often involves some form of delegation of sovereign powers to higher levels of government—even in federalist states. For example, in a sample of 13 federalist countries, Eyraud and Sirera (2015) find about half of these rules were imposed by the center. All countries have rules that can mandate sanctions and/or corrective actions, and no country relies on market discipline alone.
- Where rules are not directly imposed by the center, they tend to be either negotiated between government levels or self-imposed (Eyraud and Sirera 2015). For example, the United States combines intermediate levels of risk sharing with relatively strong self-imposed governance at the state level. This arrangement arguably reflects the credibility of sovereign bankruptcy—both historically (Bordo, Markiewicz, and Jonung 2011) and economically. The credibility of the federal no bailout commitment and the ability of states to adhere to balanced-budget rules depend, at least in part, on the presence of a minimum of fiscal risk sharing, including a full banking union (Henning and Kessler 2012). That said, as the analyses in Kirkegaard and Posen (2018) show, the path towards today's level of U.S. integration was neither particularly rapid nor linear.

This evidence suggests that EMU's existing fiscal framework needs significant strengthening and simplification. Although adding provisions that account for meaningful contingencies can increase rules' resilience, built-in flexibility often undermines enforcement and introduces complexities that defeat the purpose of a clear and predictable anchor to fiscal policy (Eyraud and others, forthcoming). Andrieu and others (2015) argue that a better fiscal governance framework could begin with simplification (by merging the preventive and corrective arms of the SGP or making them more consistent) and the introduction of a single fiscal anchor with a single operational rule (for example, combining a debt target with an expenditure rule). However, these initiatives will mean little unless they come with much stricter enforcement. Among the reform options considered by Andrieu and others (2015) are (1) better

monitoring (by coordinating the European Commission and national fiscal councils); (2) more credible sanctions (for example, through deployment of nonmonetary sanctions in bad times); and (3) more automatic enforcement through gradually stepped-up monitoring and constraints once countries are found to be noncompliant with the rules.

Ultimately, however, some more migration of sovereignty to the center may be needed. This delegation could involve, for example, allowing a veto right over national budgetary decisions or outright delegation of fiscal (and other) policy responsibilities to a central authority representing jointly accepted goals. Such evolution would, of course, raise the need for more democratic accountability at the center.

Improving the coordination of other economic policies is also important. For example, the absence of structural reforms in any one EMU country affects others by lowering growth and potentially reducing resilience. Given the poor track record of the existing coordination mechanisms, additional steps are needed. As IMF 2016a argues, the incentive for structural reforms will require stronger enforcement of the current framework, including better coordination of the recommendations in the European Semester and Macroeconomic Imbalance Procedure (MIP), and linking them to ambitious outcome-based benchmarks (Banerji and others 2015). Repeated offenders under the MIP should be subjected to enhanced surveillance (that is, the “Excessive Imbalance Procedure”). Where macroeconomic demand is still weak and the impact of reforms can benefit from fiscal support, flexibility under the SGP for structural reforms and public investment, as well as targeted use of existing EU-level resources would be helpful (IMF 2016c; Banerji and others 2017).



## Which Steps Are Needed, and When?

Completing EMU's institutional architecture will be a complicated journey. There are myriad legal, technical, and operational problems to overcome, including those stemming from the euro area's unique institutional setup, which combines EU legal norms and processes with EMU-specific intergovernmental frameworks. Even more critically, because many of the necessary steps require fundamental changes to the TFEU and national law, the lack of political union and ideological differences will be a critical obstacle for EMU completion (Brunnermeier, James, and Landau 2016a). As the European Commission (2017, p. 27) concludes, for the currency union to become stronger, one way or the other, member states will have to "accept to share more competences and decisions on euro area matters, within a common legal framework."

Advancing fiscal risk sharing at both the microeconomic and macroeconomic levels is key. It not only promises efficiency gains compared with stabilization that relies solely on national policy tools, it will also help establish the credibility of EMU's no bailout clause. Several proposals—on their own or in combination—could be steps in the right direction. These include establishing small central fiscal capacity with an automatic macroeconomic stabilization function or a budget to contribute to the provision of prospective EMU-wide public goods, such as defense, border control, and common infrastructure programs (for example, as in the Juncker plan). Either facility could be supported by a dedicated euro-area-wide tax source and could feature some limited ability to draw additional resources—for example, from member countries or from the issuance of jointly guaranteed Eurobonds. At the same time, steps could be taken to introduce harmonized basic unemployment insurance at the EMU level, with a common backstop, possibly provided by the central budget.

To make no bailout credible, it is critical to complete the banking union blueprint as originally conceived. This step requires an adequate fiscal backstop for both common deposit insurance and the SRM. In combination, these resources would eventually have to be similar in size to those of other currency areas to sever the bank-sovereign nexus fully, but initial moves in the right direction would send an important signal to markets and are an urgent priority given how quickly markets can react to possible economic setbacks.

Complementary financial sector reforms are also needed. While advancing fiscal risk sharing and completing the banking union will clearly raise the credibility of the no bailout clause, complementary financial sector reforms would go even further to enlist financial markets in strengthening incentives against excessive fiscal deficits. Still, any such reform would have to carefully balance the trade-off between increasing the sensitivity of sovereign bond holdings to risk and generating unwanted regulatory cyclicality. The introduction of ESBIes could play a supporting role in ensuring adequate safe assets for the financial system, provided the safety of the senior tranches held by financial institutions can be ensured. Legacy NPLs in banking systems must be addressed.

Along with the introduction of more fiscal risk sharing, EMU needs more effective macroeconomic governance. Immediate measures would include the simplification of the existing SGP framework and ensuring tighter monitoring, including by fiscal councils. At the same time, a process should be set in motion to strengthen the enforcement of simplified rules by making sanctions more credible and embedding them in a more automatic, gradual process. Eventually, as fiscal risk sharing is scaled up beyond the minimum required to ensure the credibility of the no bailout clause, some delegation of sovereignty to the center will likely be needed, requiring commensurate movement toward enhanced democratic accountability.

EMU must also find more effective ways to coordinate other national economic policies in pursuit of common goals. Structural reforms, or their absence, can cause EMU-wide spillovers just as fiscal policy can. This interdependence suggests a need to improve on current policy coordination systems.

Sequencing these reforms may have advantages from a pragmatic point of view. The banking union is relatively advanced, and completing it would largely weaken the sovereign-bank nexus and the associated crisis-amplifying mechanism. In contrast, the introduction of meaningful levels of fiscal risk sharing will require creating a new institutional framework. Models of risk sharing that play an important role elsewhere—especially, large common budgets that support the provision of public goods at the central level—will be difficult to implement until there is fuller political union. This reality puts additional emphasis on building trust and overcoming moral hazard to ensure

participation by all members. Against this backdrop, pragmatic sequencing of reforms could yield benefits: completion of the banking union, addressing legacy issues, and strengthening governance—followed by the introduction of an initially small, targeted fiscal risk sharing instrument, such as a central fiscal capacity.

Progress in all directions, however demanding, is an economic necessity. The steps set out here to equip EMU with the beginnings of full fiscal union involve complicated institutional decisions, reallocation of sovereign power, and questions of democratic accountability. These are issues that call for thorough public debate at a time when even the goal of European integration is no longer shared by all, and decisions that are not based on broad public support have the potential to backfire. Economic reality has a way of asserting itself, however, whatever the prevailing political tides. Ultimately, without more tangible elements of a fiscal union, EMU will remain fundamentally vulnerable to shocks. By the same token, the promise of a more complete EMU tomorrow will add to its resilience today.



## Annex 1. Optimal Risk Sharing and Delegation: A Simple Illustration

The model illustrates that a regional union will find it optimal to combine a positive but less-than-full level of formal fiscal risk sharing with some delegation of regional decision-making powers to the center. This follows from the assumption that the introduction of formal risk-sharing arrangements increases the credibility of the commitment to avoid full bailouts, and it is consistent with the notion that, without some form of formalized risk sharing, the cost of withholding a bailout during a crisis is too high to be politically acceptable. Therefore, when some formal but partial risk sharing is introduced, the amount of expected (or de facto) overall fiscal risk sharing drops, and the associated level of moral hazard falls. Delegation to the center can further limit moral hazard, but full delegation is not optimal if it comes with a cost, such as a lack of consideration for regional preferences. In general, both the optimal degree of formal risk sharing and the optimal level of delegation to the center are higher if bailouts become costlier—for example, because they come even later, after an economic shock has escalated into a crisis.

### Setup

Consider a social planner facing a principal-agent problem between a “center” interested in the welfare benefits stemming from risk sharing among multiple “regions” (for example, through a rainy day fund) and their sovereign governments, which can potentially free ride on the fiscal insurance provided by the center. In what follows, we approach the planner’s problem in reduced form, but the equations in this simplified model could easily be microfounded with standard behavioral premises.

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With thanks to Roberto Piazza for insightful comments and help with the numerical solutions.



Our model is predicated on four basic and relatively uncontroversial assumptions:

- Fiscal risk sharing entails welfare benefits by allowing regions to smooth local shocks.
- As with most other insurance policies, the expectation of fiscal risk sharing will flatten incentives for fiscal prudence at the regional level. Absent corrective actions, this effect will entail a moral hazard problem that is increasing in the degree of expected risk sharing.
- Expected risk sharing is a function of formal risk sharing formulas (whatever is agreed on ex ante among sovereigns) and the credibility of rules, excluding the provision of ad hoc support, in which the latter is assumed to increase with the degree of risk sharing through formal arrangements.
- Delegation of power to the center (or to another credible commitment technology) reduces moral hazard. But it entails costs—for example, in terms of administrative efficiency, political buy-in, or the ability for regional sovereigns to stabilize smaller shocks not triggering risk sharing.

In what follows, we formalize these assumptions in specific functional forms. Assume risk sharing can come in two forms: through formal arrangements that range between zero and a maximum amount of risk sharing normalized to 1, denoted by  $s \in [0,1]$ , and some form of ad hoc support delivered by the center. Ad hoc support will likely come at an additional welfare cost—for example, because it occurs (too) late, when a regional crisis has already deepened (see below). For simplicity, assume that the latter support, when it occurs, provides the same degree of risk sharing as the maximum amount of formal risk sharing ( $s = 1$ ). The probability of ad hoc support,  $p_B$ , should be falling in the level of formal risk sharing because a higher degree of formal risk sharing lessens the domestic distress from an adverse shock and the potential spillovers to partner regions:  $\partial p_B / \partial s \leq 0$ . Under the assumed functional form  $p_B = 1 - s$ , if one or the other form of risk sharing gets triggered by economic circumstances in the region, the *expected level of risk sharing*,  $\hat{s}$ , can be written

$$\begin{aligned}\hat{s}(s) &= p_B + (1 - p_B)s \\ &= 1 - s + s^2.\end{aligned}$$

Note that the expression is convex in  $s$  with a minimum at  $s = 1/2$ . At either  $s = 0$  or  $s = 1$  insurance is effectively maximal—one way or the other. Moving  $s$  to the interior  $(0,1)$  can only reduce the level of insurance, as it will result in a first-order reduction in either the probability of ad hoc support (if  $s = 0$ ) or of maximal formal risk sharing (if  $s = 1$ ).

Now consider *moral hazard* by individual regional sovereigns. As discussed, we assume that moral hazard,  $m$ , is an increasing function of expected risk sharing  $\hat{s}$ . Essentially, this formulation is a reduced form for the diminished market discipline associated with risk sharing and the expectation of ad hoc support. For simplicity, we assume that  $m$  is a linear function of the expected degree of risk sharing and the degree of power delegation to the center,  $d \in [0,1]$ , with the property that there is no moral hazard at the regional level if all decisions are delegated to the center ( $d = 1$ ):

$$\begin{aligned} m(s, d) &= (1 - d)\hat{s} \\ &= (1 - d)(1 - s + s^2). \end{aligned}$$

As  $\hat{s}$ ,  $m$  is convex in  $s$  with a minimum at  $s = 1/2$ .

As discussed, one difference between formal risk sharing and risk sharing through ad hoc support is that the latter comes with an additional welfare cost. Assuming these costs, denoted  $b$ , are linear, their expected value can be written as

$$b(1 - s),$$

with  $b > 0$ . As discussed, delegation will be costly as well, including because decisions taken at the center will pay less attention to regional preferences. If these costs increase exponentially with the level of delegation, a functional representation is

$$c \frac{d^2}{2},$$

with  $c > 0$ .

### Optimal Choice

The planner's expected welfare function can thus be defined as

$$\begin{aligned} W &= \hat{s}(1 - m) - b(1 - s) - c \frac{d^2}{2} \\ &= (1 - s + s^2)(1 - (1 - d)(1 - s + s^2)) - b(1 - s) - c \frac{d^2}{2}, \end{aligned}$$

in which the first term represents the net benefit of risk sharing, taking into account moral hazard, and the second and third terms represent the costs just discussed. In what follows, we focus our discussion on interior solutions by assuming that the cost of delegation exceeds a certain minimum level:  $c \geq c_0 > 0$ .

The first-order conditions with respect to  $s$  and  $d$  will give us the optimal degree of delegation  $d^*$  and optimal degree of formal risk sharing  $s^*$ . For  $d$  we have

$$\frac{\partial W}{\partial d} = (1 - s + s^2)^2 - cd = 0.$$

This implies that optimal delegation will fulfill

$$d^* = \frac{(1 - s + s^2)^2}{c}.$$

We note the following:

- As Figure A1 illustrates,  $d^*$  is a convex quadratic function in  $s$  with a positive minimum at  $s = 1/2$ , suggesting that the optimal degree of delegation is first decreasing and then increasing in the level of formal risk sharing:  $\partial d^*/\partial s < 0$  when  $s < 1/2$ , but  $\partial d^*/\partial s > 0$  when  $s > 1/2$ .<sup>1</sup> This reflects the convexity of expected risk sharing and the associated moral hazard discussed earlier: because the level of moral hazard is the highest at very low and very high levels of formal risk sharing, this is also where the planner will require the highest levels of delegation.
- The optimal degree of delegation is strictly decreasing in the cost of delegation,  $\partial d^*/\partial c < 0$ , with  $d^* = 1/c$  for  $s \in \{0,1\}$ .

But which optimal level of formal risk sharing  $s^*$  will the planner set? The first-order condition for  $s$  is

$$\frac{\partial W}{\partial s} = (2s - 1)(1 - 2(1 - d)\hat{s}) + b = 0,$$

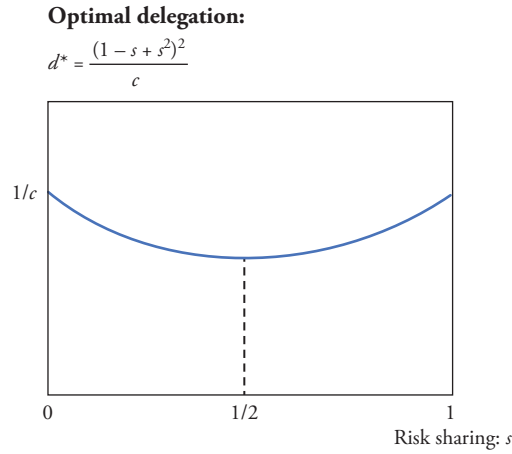
which depends not only on  $d$  but also on the cost of bailout  $b$ . We note the following:

- The planner will find it optimal to select a positive amount of formal risk sharing even when the cost for ad hoc risk sharing  $b$  is very low. Assuming that  $b$  is positive but close zero, then the first-order condition for  $d$  implies that the planner sets  $s^*$  close to  $1/2$ . This is because, for lower starting levels of  $s$ , increasing  $s$  reduces the probability of ad hoc support and the associated welfare loss from moral hazard by more than it lowers the expected level of risk sharing  $\hat{s}$ , until  $s = 1/2$ , where moral hazard is minimal. From the first-order condition for  $d$ ,  $s^* = 1/2$  means the planner will reduce optimal formal risk sharing to its minimum level.
- At  $s = 1/2$ , if the cost  $b$  of ad hoc risk sharing increases, the planner should move to offset some of these costs and select a higher level of formal risk sharing. Indeed, substituting  $d^*$  into the first-order condition for  $s$ , we find that  $\partial s^*/\partial b > 0$ , suggesting that  $s^* > 1/2$ . Since  $\partial d^*/\partial s > 0$  when  $s > 1/2$ ,  $d^*$  will increase along with  $s^*$ .

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<sup>1</sup>At  $s > 1/2$ ,  $d^* = (3/4)^2/c$ . This is positive for finite positive  $c$ .

Figure A1. Optimal Formal Risk Sharing



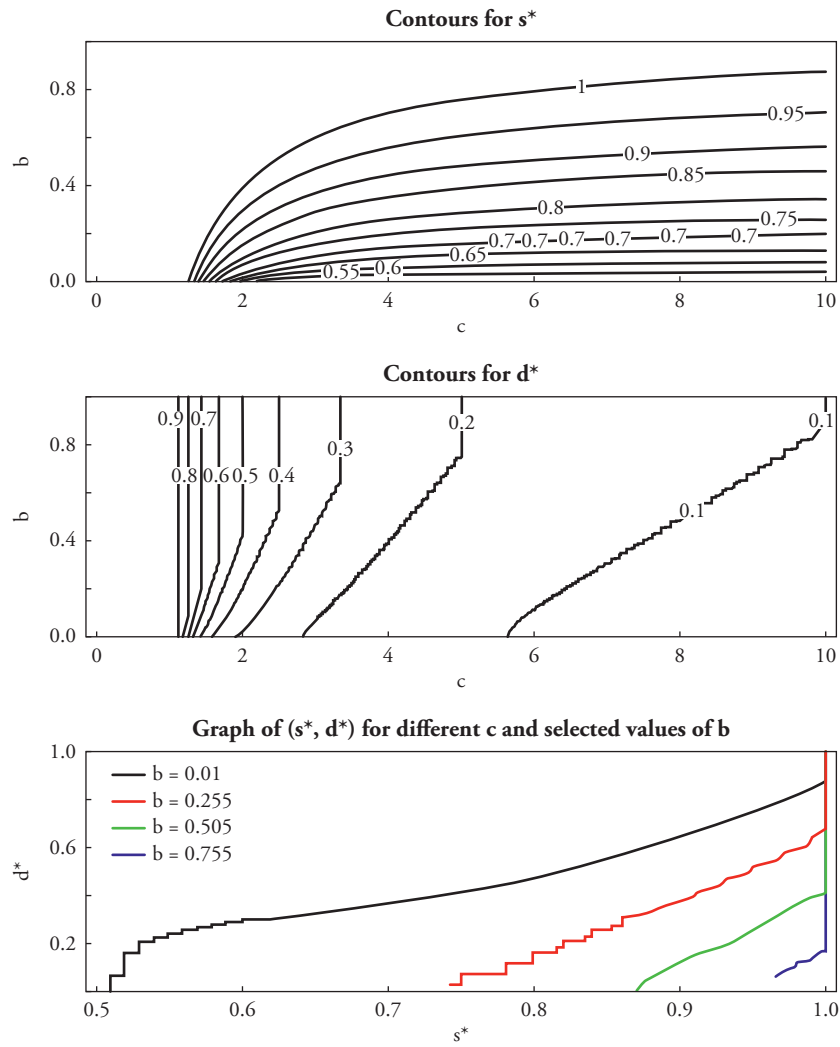
Source: IMF staff calculations.

- Finally, if the cost of delegation  $c$  increases, the planner will delegate less (as  $\partial d^* / \partial c < 0$ ) and—because this will increase moral hazard for a given level of  $s$ —the formal level of risk sharing will also be lower:  $\partial s^* / \partial c < 0$ .

The model thus shows that the planner for the regional union will, for plausible parameters, choose a combination of some formal risk sharing and some delegation to the center. Moreover,  $s^*$  and  $d^*$  generally move in the same direction as parameters change. As just discussed, an increase in the cost of delegation will lead the planner to lower  $s^*$  along with  $d^*$ . Similarly, a reduction in the cost of ad hoc bailouts relative to formal risk-sharing arrangements will prompt the planner to raise both  $s^*$  and  $d^*$ .

The precise level of formal risk sharing and delegation selected depends on the parameters assumed. Figure A2 provides numerical examples. The first two panels show the level of  $s^*$  and  $d^*$ , respectively, for different values of  $c$  and  $b$ . For example, setting  $c = 4$  and  $b = 0.2$  will imply ( $s^* = 0.77$ ,  $d^* = 0.17$ ), while for  $c = 4$  and  $b$  approaching zero we have ( $s^* = 0.5$ ,  $d^* = 0.14$ ). The third panel illustrates how  $s^*$  and  $d^*$  vary together with changing values of  $c$  (which is decreasing along each upward sloping location ( $s^*$ ,  $d^*$ )) for a given constant level of  $b$ .

Figure A2. Numerical Examples



Source: IMF staff calculations.

## References

- Acharya, V., I. Drechsler, and P. Schnabl. 2014. “A Pyrrhic Victory? Bank Bailouts and Sovereign Credit Risk.” *Journal of Finance* 69 (6): 2689–739.
- Acharya, V., and S. Steffen. 2015. “The ‘Greatest’ Carry Trade Ever? Understanding Eurozone Bank Risks.” *Journal of Financial Economics* 115 (2): 215–36.
- Afonso, Antonio, Michael G. Arghyrou, and Alexandros Kotonikas. 2015. “The Determinants of Sovereign Bond Yield Spreads in the EMU.” Working Paper Series 1781, European Central Bank.
- Agarwal, Sumit, David Lucca, Amit Seru, and Francesco Trebbi. 2014. “Inconsistent Regulators: Evidence from Banking.” *Quarterly Journal of Economics* 129 (2): 889–938.
- Aguiar, M., M. Amador, E. Farhi, and G. Gopinath. 2015. “Coordination and Crisis in Monetary Unions.” *Quarterly Journal of Economics* 130 (4): 1727–79.
- Aiyar, Shekhar, Bergljot Barkbu, Nicoletta Batini, Helge Berger, Enrica Detragiache, Allan Dizioli, Christian Ebeke, Huidan Lin, Linda Kaltani, Sebastian Sosa, Antonio Spilimbergo, and Petia Topalova. 2016. “The Refugee Surge in Europe.” IMF Staff Discussion Note SDN/16/02, International Monetary Fund, Washington, DC.
- Alcidi, Cinzia, Paolo D’Imperio, and Gilles Thirion. 2017. “Risk-sharing and Consumption-Smoothing Patterns in the US and the Euro Area: A comprehensive comparison.” CEPS Working Document 2017/04, May.
- Allard, Céline, Petya Koeva Brooks, John C. Bluedorn, Fabian Bornhorst, Katharine Christopherson, Franziska Ohnsorge, Tigran Poghosyan, and an IMF Staff Team. 2013. “Toward a Fiscal Union for the Euro Area.” IMF Staff Discussion Note SDN/13/09, International Monetary Fund,

- Washington, DC.
- Altavilla, C., M. Pagano, and S. Simonelli. 2016. “Bank Exposures and Sovereign Stress Transmission.” Working Paper 11, European Systemic Risk Board.
- Andritzky, Jochen, Désirée I. Christofzik, Lars P. Feld, and Uwe Scheuring. 2016. “A Mechanism to Regulate Sovereign Debt Restructuring in the Euro Area.” German Council of Economic Experts Working Paper 04/2016.
- Andrle, Michal, John Bluedorn, Luc Eyraud, Tidiane Kinda, Petya Koeva-Brooks, Gerd Schwartz, and Anke Weber. 2015. “Reforming Fiscal Governance in the European Union,” IMF Staff Discussion Note SDN/15/09, International Monetary Fund, Washington, DC.
- Arpaia, Alfonso, Aron Kiss, Balazs Palvolgyi, and Alessandro Turrini. 2015. “Labour Mobility and Labour Market Adjustment in the EU.” IZA Policy Paper 106, August.
- Arslanalp, Serkan and Takahiro Tsuda, 2012, “Tracking Global Demand for Advanced Economy Sovereign Debt,” IMF Working Paper 12/284.
- Avgouleas, Emilios, and Charles Goodhart. 2016. “An Anatomy of Bank Bail-ins—Why the Eurozone Needs a Fiscal Backstop for the Banking Sector.” *European Economy* 2016 (2): 75–90.
- Balassone, Fabrizio, Sandro Momigliano, Marzia Romanelli, and Pietro Tommasino. 2014. “Just Round the Corner? Pros, Cons, and Implementation Issues of a Fiscal Union for the Euro Area.” Bank of Italy Occasional Paper 245, Rome.
- Baldwin, Richard, Virginia DiNino, Lionel Fontagné, Roberto A. De Santis, and Daria Taglioni. 2008. “Study on the Impact of the Euro on Trade and Foreign Direct Investment.” European Economy Economic Papers 321, April.
- Banerji, Angana, Bergljot Barkbu, James John, Tidiane Kinda, Sergejs Saksonovs, Hanni Schoelermann, and Tao Wu. 2015. “Building a Better Union: Incentivizing Structural Reforms in the Euro Area.” IMF Working Paper WP/15/201, International Monetary Fund, Washington, DC.
- Banerji, Angana, Valerio Crispolti, Era Dabla-Norris, Romain Duval, Christian Ebeke, Davide Furceri, Takuji Komatsuzaki, and Tigran Poghosyan. 2017. “Labor and Product Market Reforms in Advanced Economies: Fiscal Costs, Gains, and Support.” IMF Staff Discussion Note 17/02, International Monetary Fund, Washington, DC.
- Bargain, Olivier, Mathias Dolls, Clemens Fuest, Dirk Neumann, Andreas Peichl, Nico Pestel, and Sebastian Sieglösch. 2013. “Fiscal Union in Europe?”

- Redistributive and Stabilizing Effects of a European Tax-Benefit System and Fiscal Equalization Mechanism.” *Economic Policy* 28 (75): 375–422.
- Bayoumi, Tamim, and Paul R. Masson. 1998. “Liability-Creating Versus Non-liability-Creating Fiscal Stabilisation Policies: Ricardian Equivalence, Fiscal Stabilisation, and EMU.” *Economic Journal* 108 (449): 1026–1045.
- Beck, R., L. Dedola, A. Giovannini, and A. Popov. 2016. “Special Feature A: Financial Integration and Risk sharing in a Monetary Union.” In *Financial Integration in Europe* (April): 80–98.
- Beetsma, Roel, Xavier Debrun, and Franc Klaassen. 2001. “Is Fiscal Policy Coordination in EMU Desirable?” *Swedish Economic Policy Review* 8: 57–98.
- Beetsma, Roel, and Xavier Debrun. 2004. “Reconciling Stability and Growth: Smart Pacts and Structural Reforms.” *IMF Staff Papers* 51 (3): 431–56.
- Beetsma, Roel, and Massimo Giuliodori. 2004. “What Are the Spill-overs from Fiscal Shocks in Europe. An Empirical Analysis.” ECB Working Paper 325.
- Beetsma, Roel, Massimo Giuliodori, and P. Wierds. 2009. “Planning to Cheat: EU Fiscal Policy in Real Time.” *Economic Policy* 24 (60): 753–04.
- Beetsma, Roel, and Massimo Giuliodori. 2010. “The Macroeconomic Costs and Benefits of the EMU and Other Monetary Unions: An Overview of Recent Research.” *Journal of Economic Literature* 48 (3): 603–41.
- Bénassy-Quéré, Agnès, Markus K. Brunnermeier, Henrik Enderlein, Emmanuel Farhi, Marcel Fratzscher, Clemens Fuest, Pierre-Olivier Gourinchas, Philippe Martin, Jean Pisani-Ferry, Hélène Rey, Isabel Schnabel, Nicolas Véron, Beatrice Weder di Mauro, and Jeromin Zettelmeyer. 2018. *Reconciling Risk Sharing with Market Discipline, A Constructive Approach to Euro Area Reform*. CEPR Policy Insight 91, London.
- Bénassy-Quéré, Agnès, and Francesco Giavazzi (eds.). 2017. *Europe’s Political Spring, Fixing the Eurozone and Beyond*. VoxEU.org. London: CEPR Press.
- Bénassy-Quéré, Agnès, Michael Hüther, Phillippe Martin, and Guntram Wolff. 2017. “Europe Must Seize this Moment of Opportunity, Opinion, Bruegel.” <http://bruegel.org/2017/08/europe-must-seize-this-moment-of-opportunity>.
- Bénassy-Quéré, Agnès, Xavier Ragot, and Guntram B. Wolff. 2016. “Which Fiscal Union for the Euro Area?” *Bruegel Policy Contribution* 2016/05 (February).
- Bénétrix, Agustín S., and Philip R. Lane. 2013. “Fiscal Cyclicity and EMU.” *Journal of International Money and Finance* 34 (April): 164–76.



- Benford, James, Jonathan D. Ostry, and Robert J. Shiller (eds.). Forthcoming. *Sovereign GDP-Linked Bonds: Rationale and Design*. London: CEPR Press.
- Berger, Helge, and Volker Nitsch. 2008. "Zooming Out: The Trade Effect of the Euro in Historical Perspective." *Journal of International Money and Finance* 27 (8): 1244–60.
- . 2014. "Wearing Corset, Losing Shape: The Euro's Effect on Trade Imbalances." *Journal of Policy Modeling* 36 (1): 136–55.
- Beyer, Robert, and Frank Smets. 2015. "Labour Market Adjustment in Europe and the US: How Different?" ECB Working Paper 1767, March.
- Blagrove, Patrick, Giang Ho, Ksenia Koloskova, and Esteban Vesperoni. 2017. "Cross-Border Impact of Fiscal Policy: Still Relevant?" *World Economic Outlook*, International Monetary Fund, Washington, DC, October, 185–215.
- Bocola, Luigi, and Alessandro Dovis. 2016. "Self-Fulfilling Debt Crises: A Quantitative Analysis." NBER Working Paper 22694, National Bureau of Economic Research, Cambridge, MA.
- Bordo, Michael D., Agnieszka Markiewicz, and Lars Jonung. 2011. "A Fiscal Union for the Euro: Some Lessons from History." NBER Working Paper 17380, National Bureau of Economic Research, Cambridge, MA.
- Borensztein, Eduardo, and Paolo Mauro. 2004. "The Case for GDP-Indexed Bonds." *Economic Policy* 19 (38): 165–216.
- Brunnermeier, Markus, Harold James, and Jean-Pierre Landau. 2016a. *The Euro and the Battle of Ideas*. Princeton: Princeton University Press.
- Brunnermeier, Markus K., Luis Garicano, Philip Lane, Marco Pagano, Ricardo Reis, Tano Santos, David Thesmar, Stijn Van Nieuwerburgh, and Dimitri Vayanos. 2016b. "The Sovereign-Bank Diabolic Loop and Esbies." NBER Working Paper 21993, National Bureau of Economic Research, Cambridge, MA.
- Brunnermeier, Markus K., Sam Langfield, Marco Pagano, Ricardo Reis, Stijn Van Nieuwerburgh, and Dimitri Vayanos. 2017. "ESBies: Safety in the Tranches." *Economic Policy* 32 (90): 175–219.
- Bulow, Jeremy, and Kenneth Rogoff. 1988. "Multilateral Negotiations for Rescheduling Developing Country Debt: A Bargaining-Theoretic Framework." *IMF Staff Papers* 35 (December): 644–57.
- Carlino, Gerald, and Robert Inman. 2013. "Spillovers: Why Macro-fiscal Policy Should be Coordinated in Economic Unions." VoxEU, June 24. <http://voxeu.org/article/spillovers-why-macro-fiscal-policy-should-be-coordinated-economic-unions>.

- Chari, V. V., and Patrick J. Kehoe. 2008. "Time Inconsistency and Free-Riding in a Monetary Union." *Federal Reserve Bank of Minneapolis, Research Department Staff Report* 308.
- Cœuré, Benoît. 2016. "Sovereign Debt in the Euro Area: Too Safe or Too Risky?" Keynote Address, Europe on Credit Series, Harvard University, November 3. <https://www.ecb.europa.eu/press/key/date/2016/html/sp161103.en.html>.
- Corsetti, Giancarlo, Luca Dedola, Marek Jarociński, Bartosz Maćkowiak, and Sebastian Schmidt. 2016. "Macroeconomic Stabilization, Monetary-Fiscal Interactions, and Europe's Monetary Union." ECB Working Paper 1988.
- Dao, Mai, Davide Furceri, and Prakash Loungani. 2017. "Regional Labor Market Adjustment in the United States: Trend and Cycle." *Review of Economics and Statistics* 99 (2): 243–57.
- Darvas, Zsolt, and Alvaro Leandro. 2015. "The Limitations of Policy Coordination in the Euro Area under the European Semester." *Bruegel Policy Contribution*, 19.
- De Grauwe, Paul, and Yuemei Ji. 2016. "How to Reboot the Eurozone and Ensure Its Long-term Survival." In *How to Fix Europe's Monetary Union: Views of Leading Economists*, edited by Richard Baldwin and Francesco Giavazzi. London: CEPR, 137–50. <http://voxeu.org/content/how-fix-europe-s-monetary-union-views-leading-economists>.
- de Haan, Jakob, Helge Berger, and David-Jan Jansen. 2004. "Why Has the Stability and Growth Pact Failed?" *International Finance* 7 (2): 235–60.
- Dell'Ariccia, Giovanni, Maria Soledad Martinez Peria, Deniz Igan, Elsie Addo Awadzi, Marc Dobler, and Damiano Sandri. Forthcoming. "Trade-offs in Bank Resolution."
- Delatte, Anne-Laure, Julien Fouquau, and Richard Portes. 2016. "Regime-Dependent Sovereign Risk Pricing During the Euro Crisis." ESRB Working Paper Series 9, May.
- Demertzis, Maria, and Guntram B. Wolff. 2016. "What Are the Prerequisites for a Euro-Area Fiscal Capacity?" *Policy Contribution Issue 2016/14*. <http://bruegel.org/2016/09/what-are-the-prerequisites-for-a-euro-area-fiscal-capacity>.
- Dolls, Mathias, Clemens Fuest, Dirk Neumann, and Andreas Peichl. 2015. "An Unemployment Insurance Scheme for the Euro Area? A Comparison of Different Alternatives Using Micro Data." CESifo Working Paper 5581.
- Dolls, Mathias, Clemens Fuest, Friedrich Heinemann, and Andreas Peichl. 2016. "Reconciling Insurance with Market Discipline: A Blueprint for a European Fiscal Union." *CESifo Economic Studies*, 62 (2): 210–31.

- Draghi, Mario. 2014. “Unemployment in the Euro Area.” Speech to the Annual Jackson Hole Central Bank Symposium, August 22.
- Dullien, Sebastian. 2014a. “A European Unemployment Benefit Scheme: How to Provide for More Stability in the Euro Zone.” Bertelsmann-Stiftung, Guetersloh.
- . 2014b. “The Macroeconomic Stabilisation Impact of a European Basic Unemployment Insurance Scheme.” *Intereconomics* 49 (4): 189–93.
- Eaton, Jonathan, and Mark Gersovitz. 1981. “Debt with Potential Repudiation: Theoretical and Empirical Analysis.” *Review of Economic Studies* 48 (2): 289–309.
- Edwards, Sebastian, and Eduardo Levy Yeyati. 2005. “Flexible Exchange Rates as Shock Absorbers.” *European Economic Review* 49:2079–105.
- Ehrmann, Michael, and Marcel Fratzscher. 2017. “Euro Area Government Bonds—Fragmentation and Contagion During the Sovereign Debt Crisis.” *Journal of International Money and Finance* 70 (February): 26–44.
- Eichengreen, Barry, and Charles Wyplosz. 2017. “Europe’s Fiscal Conundrum.” In *Europe’s Political Spring, Fixing the Eurozone and Beyond*, edited by Agnès Bénassy-Quéré and Francesco Giavazzi. VoxEU.org. London: CEPR Press, 61–67.
- Enria, Andrea. 2017. “The EU Banking Sector—Risks and Recovery. A Single Market Perspective.” Presentation, EBA. [https://www.esm.europa.eu/sites/default/files/2017\\_01\\_30\\_\\_esm\\_risk\\_and\\_adjustment\\_at\\_eu\\_banks\\_0.pdf](https://www.esm.europa.eu/sites/default/files/2017_01_30__esm_risk_and_adjustment_at_eu_banks_0.pdf).
- Escolano, Julio, Dora Benedek, Hui Lin, Carlos Mulas Granados, Masahiro Nozaki, Joana Pereira, Gregoire Rota Graziosi, Laura Sinn, and Jose Torres. 2015. “Distribution of Fiscal Responsibilities in Federations.” In *Designing a European Fiscal Union*, edited by Carlo Cottarelli and Martine Guerguil. London and New York: Routledge, 13–59.
- European Central Bank (ECB). 2016. *Financial Integration in Europe*, April.
- European Commission. 2017. “The Deepening of the Economic and Monetary Union.” Reflection Paper, Brussels.
- Evers, Michael P. 2015. “Fiscal Federalism and Monetary Unions: A Quantitative Assessment.” *Journal of International Economics* 97 (1): 59–75.
- Eyraud, Luc, Xavier Debrun, Andrew Hodge, Victor Lledó, and Catherine Pattillo. Forthcoming. “Second Generation Fiscal Rules: Balancing Credibility, Flexibility and Simplicity.” IMF Staff Discussion Note, International Monetary Fund, Washington, DC.
- Eyraud, Luc, Vitor Gaspar, and Tigran Poghosyan. 2017. “Fiscal Politics in

- the Euro Area.” In *Fiscal Politics*, edited by Vitor Gaspar, Sanjeev Gupta, and Carlos Mulas-Granados. Washington, DC: International Monetary Fund, 439–76.
- Eyraud, Luc, and Raquel Gomez Sirera. 2015. “Constraints on Subnational Fiscal Policy.” In *Designing a European Fiscal Union*, edited by Carlo Cottarelli and Martine Guerguil. London and New York: Routledge, 90–132.
- Farhi, Emmanuel, and Jean Tirole. 2016. “Deadly Embrace: Sovereign and Financial Balance Sheet Doom Loops.” NBER Working Paper 21843, National Bureau of Economic Research, Cambridge, MA.
- Farhi, Emmanuel, and Iván Werning. 2017. “Fiscal Unions.” NBER Working Paper 18280, National Bureau of Economic Research, Cambridge, MA, revised.
- Fidrmuc, Jan. 2015. “Political Economy of Fiscal Unions.” *European Journal of Political Economy* 40 (December): 147–57.
- Friedman, Milton. 1953. “The Case for Flexible Exchange Rates.” In *Essays in Positive Economics*. Chicago: University of Chicago Press, 157–203.
- Furceri, Davide, and Aleksandra Zdzienicka. 2015. “The Euro Area Crisis: Need for a Supranational Fiscal Risk Sharing Mechanism?” *Open Economies Review* 26 (4): 683–710.
- Gaspar, Vitor, Maurice Obstfeld, Ratna Sahay, and an IMF Staff Team. 2016. “Macroeconomic Management When Policy Space Is Constrained: A Comprehensive, Consistent, and Coordinated Approach to Economic Policy.” IMF Staff Discussion Note SDN/16/09, International Monetary Fund, Washington, DC.
- German Council of Economic Advisors. 2011. *Annual Economic Report 2011/2012*, Wiesbaden.
- Gillette, Clayton P. 2012. “Fiscal Federalism, Political Will, and the Strategic Use of Municipal Bankruptcy.” *University of Chicago Law Review* 79: 281–330.
- Goyal, Rishi, Petya Koeva Brooks, Mahmood Pradhan, Thierry Tresselt, Giovanni Dell’Ariccia, Ross Leckow, Ceyla Pazarbasioglu, and an IMF Staff Team. 2013. “A Banking Union for the Euro Area.” IMF Staff Discussion Note SDN/13/01, International Monetary Fund, Washington, DC.
- Gros, Daniel, and Cinzia Alcidi. 2015. “Economic Policy Coordination in the Euro Area under the European Semester.” CEPS Special Report 123.
- Gros, Daniel, and Willem Pieter de Groen. 2015. “The Single Resolution Fund.” VoxEU. <http://voxeu.org/article/size-single-resolution-fund>.
- Hallerberg, Mark. 2016. “Fiscal Governance and Fiscal Outcomes under

- EMU before and after the Crisis.” In *Political and Economic Dynamics of the Eurozone Crisis*, edited by James A. Caporaso and Martin Rhodes, 145–66.
- Hebous, Shafik, and Alfons Weichenrieder. 2016. “Toward a Mutualization of European Unemployment Insurance? On Limiting the Downsides of a Fiscal Transfer System for the Eurozone.” *CESifo Economic Studies* 62 (2): 376–95.
- Henning, C. Randall, and Martin Kessler. 2012. “Fiscal Federalism: US History for Architects of Europe’s Fiscal Union.” Bruegel Essay and Lecture Series.
- Horny, Guillaume, Simone Manganelli, and Benoît Mojon. 2016. “Measuring Financial Fragmentation in the Euro Area Corporate Bond Market.” *Banque de France Working Paper* 582, February.
- International Monetary Fund (IMF). 2016a. “Euro Area Policies, Article IV Consultation.” IMF Country Report 16/219, Washington, DC.
- . 2016b. “Euro Area Policies, Selected Issues.” IMF Country Report 16/220, Washington, DC.
- . 2016c. “Time for a Supply-Side Boost? Macroeconomic Effects of Labor and Product Market Reforms in Advanced Economies.” *World Economic Outlook*, April, Chapter 3, 101–42.
- . 2017. “Euro Area Policies, Article IV Consultation.” IMF Country Report 17/235, Washington, DC.
- Ioannou, Demosthenes, and Livio Stracca. 2014. “Have the Euro Area and EU Governance Worked? Just the Facts.” *European Journal of Political Economy* 34 (June): 1–17.
- Juncker, Jean-Claude (in close cooperation with Donald Tusk, Jeroen Dijsselbloem, Mario Draghi, and Martin Schulz). 2015. “The Five Presidents’ Report: Completing Europe’s Economic and Monetary Union.” European Commission, Brussels.
- Kalemli-Ozcan, Sebnem, Emiliano Luttini, and Bent Sorensen. 2014. “Debt Crises and Risk Sharing: The Role of Markets Versus Sovereigns.” NBER Working Paper 19914, National Bureau of Economic Research, Cambridge, MA.
- Kenen, Peter. 1969. “The Theory of Optimum Currency Areas: An Eclectic View.” In *Monetary Problems of the International Economy*, edited by R. A. Mundell and A. K. Swoboda. Chicago: University of Chicago Press, 41–60.
- Kirkegaard, Jakob Funk, and Adam S. Posen (eds.) 2018. *Lessons for EU Integration from US History*, Peterson Institute for International Economics, Washington. [https://piiie.com/system/files/documents/kirkegaard-posen\\_ec-report2018-01.pdf](https://piiie.com/system/files/documents/kirkegaard-posen_ec-report2018-01.pdf).

- MacDougall Report. 1977. "Report of the Study Group on the Role of Public Finance in European Integration." European Commission, Brussels. [http://ec.europa.eu/archives/emu\\_history/documentation/chapter8/19770401en73macdougallrepvol1.pdf](http://ec.europa.eu/archives/emu_history/documentation/chapter8/19770401en73macdougallrepvol1.pdf).
- Mody, Ashoka, and Damiano Sandri. 2012. "The Eurozone Crisis: How Banks and Sovereigns Came to Be Joined at the Hip." *Economic Policy* 27 (70): 199–230.
- Molloy, Raven, Christopher L. Smith, and Abigail Wozniak. 2011. "Internal Migration in the United States." *Journal of Economic Perspectives* 25 (3): 173–96.
- Moyen, Stéphane, Nikolai Stähler, and Fabian Winkler. 2016. "Optimal Unemployment Insurance and International Risk Sharing." *Deutsche Bundesbank Discussion Paper* 33/2016.
- Mundell, Robert A. 1961. "A Theory of Optimum Currency Areas." *American Economic Review* 51 (4): 657–65.
- Navaretti, Giorgio Barba, Giacomo Calzolari, and Alberto Franco Pozzolo. 2016. "Diabolic Loop or Incomplete Union? Sovereign and Banking Risk." *European Economy* 1, 9–28.
- Oates, Wallace. 1968. "The Theory of Public Finance in a Federal System." *Canadian Journal of Economics* 1 (1): 37–54.
- . 2006. "On Theory and Practice of Fiscal Decentralization." IFIR Working Paper Series 2006–05, Institute for Federalism and Intergovernmental Relations, Lexington, KY.
- Obstfeld, Maurice. 2013. "Finance at Center Stage: Some Lessons of the Euro Crisis." European Commission Economic Papers 493, Brussels. [http://ec.europa.eu/economy\\_finance/publications/economic\\_paper/2013/ecp493\\_en.htm](http://ec.europa.eu/economy_finance/publications/economic_paper/2013/ecp493_en.htm).
- , and Giovanni Peri. 1998. "Regional Non-Adjustment and Fiscal Policy." *Economic Policy* 13 (26): 205–59.
- Obstfeld, Maurice, and Kenneth Rogoff. 1995. "Exchange Rate Dynamics Redux." *Journal of Political Economy* 103 (3): 624–60.
- Poghosyan, Tigran, Abdelhak Senhadji, and Carlo Cottarelli. 2015. "The Role of Fiscal Transfers in Smoothing Regional Shocks." In *Designing a European Fiscal Union*, edited by Carlo Cottarelli and Martine Guerguil. London and New York: Routledge, 60–89.
- Thomsen, Poul. 2017. "The Euro Zone: What's Next." Speech at the Financial Times Investment Management Summit, London, September 28. <http://www.imf.org/en/News/Articles/2017/09/28/sp092817-the-euro-zone-whats-next>.

Ubide, Angel. 2015. "Stability Bonds for the Euro Area." Peterson Institute Policy Brief PB15–19.

Uhlig, Harald. 2003. "One Money, but Many Fiscal Policies in Europe: What are the Consequences?" In *Monetary and Fiscal Policies in EMU*, edited by Marco Buti. Cambridge, United Kingdom: Cambridge University Press, 29–56.

Véron, Nicolas, 2016, "Breaking the Vicious Cycle," *Financial World*, 7, October/November.

Véron, Nicolas. 2017. "Sovereign Concentration Charges: A New Regime for Banks' Sovereign Exposures." European Parliament, November.