The European Sovereign Debt Crisis

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April 23rd 2012

Abstract

to be written.

1 Introduction

The global financial crisis that began in Summer 2007 has had several phases and has affected individual countries and regions with varying degrees of intensity. Although the United States was clearly the epicenter of the first stage of the crisis, the European crisis that subsequently took hold has been quite different in nature and has posed major problems for policymakers, with wrenching economic and political costs.

Our aim is to address the sovereign debt crisis in the euro area, even if other European countries have also experienced major shocks during the crisis (a partial list includes the international losses of global banks operating out of Switzerland and the United Kingdom; the collapse of the Icelandic banking system; and the sudden stop in capital flows to Central and Eastern Europe). While, as will be clear from the analysis in this paper, the sovereign debt crisis cannot easily be disentangled from the macroeconomic imbalances and banking crisis that also afflict the euro area , it is beyond the scope of this article to provide a full-scale treatment of these other elements. Rather, our primary focus is on understanding how these other problems feed into the fiscal crisis.[1]

The tension between a common currency and independent national fiscal policies was identified from the beginning as a fundamental challenge for the success of the euro. First, the elimination of national currencies meant that the stabilization role of national fiscal policies took on additional importance upon the creation of the monetary union. Relative to the dollar monetary union of the United States, the macroeconomic stabilization role of national fiscal policies (vis-a-vis national macroeconomic shocks) is especially important for the euro area in view of the absence of a significant common area-wide federal budget and the weakness of other adjustment mechanisms such as cross-border labor mobility. To fulfill a national stabilization role, it would be important that fiscal policies should be allowed to vary over the cycle and deployed in a discretionary manner to address country-specific macroeconomic imbalances.

Second, running in the other direction, the ability of national governments to borrow poses obvious free-rider problems for a currency union (see, amongst many others, Buiter et al 1993, Beetsma and Uhlig 1999, Uhlig 2003, Wyplosz 2006). In particular, each member country may not internalize the full negative impact on the other member countries from excessive borrowing and excessive debt levels. The original design of EMU dealt with

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[1]Shambaugh (2012) provides an accessible overview of the euro crisis.

this incentive problem in two ways. First, the Stability and Growth Pact specified limits on the size of annual budget deficits and the stock of public debt, at 3 percent and 60 percent respectively. Second, the European Treaty included a "no bailout" clause, with the implication that a sovereign default would occur if a national government failed to meet its debt obligations.

Third, banking regulation remained a national responsibility after the formation of EMU. Banking crises involve direct fiscal costs (if governments end up recapitalising banks or providing other forms of fiscal support) but also are associated with indirect fiscal costs, since GDP and tax revenues tend to remain low for a sustained period in the aftermath of a banking crisis (Honohan and Klingebiel 2003, Reinhart and Rogoff 2009). Accordingly, national governments carried crisis-related fiscal risks, even if such contingencies were not explicit in fiscal accounting systems (Lane 1998, IMF 2008).

Given these features, the potential for a fiscal crisis under EMU was well flagged in the debate prior to the launch of the euro and remained a background concern during the first decade of the euro.[2] Moreover, Europe had experienced several major crises during the late 1980s and 1990s (the Scandinavian banking crisis, the EMS currency crisis) while also been an observer of major crises elsewhere in the world (such as the 1997/1998 Asian crisis), such that crisis management had long been a major policy concern of European policymakers. However, it would take nearly a decade before the euro area's capacity to manage a crisis would be tested.

The structure of the rest of the paper is as follows. In Section 2, we describe the evolution of fiscal positions in the euro area and highlight the factors behind the growth in sovereign debt. We analyze the contribution of monetary union to the sovereign debt crisis in Section 3. Section 4 outlines some reforms that can help improve the resilience of the euro area to future fiscla shocks. Finally, Section 5 concludes.

2   The Evolution of Public Debt

The gross level of public debt provides an incomplete picture of the overall sovereign financial balance sheet (Losjch et al 2011 provide a comprehensive review). A government can hold financial assets, so that net public debt can be lower than gross public debt. It also has an implicit asset in the form of the present value of future tax revenues. However,

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[2]Feldstein (1997) provided an especially provocative analysis. See also Lane (2006).

on the other side, it may have contingent liabilities, such as formal or informal guarantees provided to private-sector debt (banks, corporates, households). In addition, it has implicit liabilities such as unfunded public pension commitments. While the distinction between gross government debt and the government's overall financial position will be raised in some contexts in the ensuing discussion, it is beyond the scope of this paper to fully incorporate these factors into the analysis below.

As a benchmark, Figure 1 plots the ratio of sovereign debt to GDP for the aggregate euro area and the United States over 1970 to 2010. We see that the European debt ratio surpassed the US debt ratio in 1995 but that both ratios were quite stable during the 2002-2007 pre-crisis period at 70 percent and 60 percent respectively. These debt ratios have climbed during the crisis, with the US debt level rising more quickly than the European debt level. To gain further insight, Figure 2 shows the annual fiscal balances over 1995-2012. Europe both ran smaller aggregate deficits than the United States during the pre-crisis period and also had a smaller aggregate expansion in the scale of deficits during the crisis.

However, the aggregate European data masks the variation at individual country level. Figure 3 shows the evolution of debt ratios for seven key euro area member countries over 1982-2011.[3] One message from Figure 3 is that these countries have quite different debt histories. In one group, both Italy and Greece have had debt ratios above 90 percent since the early 1990s. Ireland, Portugal and Spain all achieved significant declines in debt ratios during the 1990s. While the Portuguese debt ratio began to climb from 2000 onwards, Ireland and Spain saw continuing declines in debt ratios until 2007. Finally, until the onset of the crisis, France and Germany had stable debt ratios at around 60 percent for over a decade; these debt ratios were far above the corresponding values for Ireland and Spain during 2002-2007.

Following Escolano (2010), equation 1 provides a useful decomposition of the change in the debt-output ratio between any two periods $N - t$ and N

$$d_N - d_{N-t} = \sum_{s=N-t}^{N-1} \frac{i_{s+1}}{1 - \gamma_{s+1}} d_s - \sum_{s=N-t}^{N-1} \frac{\gamma_{s+1}}{1 - \gamma_{s+1}} d_s + \sum_{s=N-t+1}^{N} prim_s + \sum_{s=N-t+1}^{N} sfa_s \quad (1)$$

where d is the debt-GDP ratio, i is the average nominal interest rate paid on the debt, γ

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[3]We focus on these seven countries, since Germany, France, Italy and Spain are the four largest member countries, while the fiscal crisis so far has been most severe in Greece, Ireland and Portugal. (Of course, Italy and Spain are also the main problem countries in terms of potential fiscal vulnerabilities.)

is the growth rate of nominal GDP, $prim$ is the ratio of the primary (non-interest) deficit to GDP and sfa is the stock-flow adjustment term.

The first two terms show the dependence of debt dynamics on the outstanding stock of debt: all else equal, a higher interest rate is associated with more rapid debt accumulation, while a faster rate of nominal GDP growth is associated with an improvement in the debt-GDP ratio by increasing the denominator in this ratio. In a given period, the net impact of these two terms depends on the sign of $(i_{s+1} - \gamma_{s+1})$: if the interest rate is higher than the growth rate, there is upward pressure on the debt ratio; conversely, if the interest rate is below the growth rate, there is downward pressure on the debt ratio.

Importantly, the relevant interest rate is the average yield paid out on the stock of public debt, which depends on the mix of debt maturities and the split between market-based funding and other types of funding (for example, state-sponsored savings accounts). For instance, a country that has mainly issued government bonds at long maturities will face only a minor short-term change in its debt servicing payments if there is a shift in short-term interest rates, whereas the impact would be much greater for a country that has more heavily relied on short-term issuance.

The third term shows the impact of the gap between non-interest expenditure and revenues as a source of debt dynamics. Since interest payments are largely predetermined by the stock of accumulated debt (interacted with the average interest rate on the debt), the primary balance is the key variable that is controllable by the government.

Finally, the "stock-flow" adjustment term reflects valuation effects and transactions that affect the level of gross public debt but do not affect the budget balance. The importance of this term for debt dynamics is highlighted by IMF(2008), Abbas et al (2011) and Weber (2012). An important contributor under this heading is the acquisition of financial assets - for instance, a government might issue debt in order to purchase shares in a bank that requires recapitalisation. Since these shares have a financial value, the net financial position of the government is unchanged by such a transaction (even if its risk profile is considerably altered). In the other direction, a government's gross debt can fall if it receives a financial gain, such as obtaining the proceeds from privatising a state-owned enterprise. (Again, a full assessment of the state's overall balance sheet should take into account the sacrifice of future dividend payments if a firm is privatised.)

In Table 1, we employ equation 1 to provide a more detailed analysis of debt dynamics for these countries over 1992-2011. We divide this period into four phases: the run up to

EMU (1992-1998); the early years of EMU (1998-2002); the pre-crisis period (2002-2007); and the crisis (2007-2011). After the signing of the Maastricht Treaty in 1992, a number of European countries undertook significant fiscal adjustments in order to qualify for EMU membership (Gali and Perotti 2003, Fatas and Mihov 2010, Benetrix and Lane 2012). In particular, Greece, Ireland and Italy ran sizeable primary surpluses even if the burden of servicing the existing debt meant that debt ratios did not decline for Greece and Italy.[4]

The early years of EMU were associated with a major reduction in debt servicing costs for Greece, Italy and Potugal, while rapid growth in Ireland and Spain contributed to sizeable reductions in debt-output ratios. For the latter pair, strong growth during 2002-2007 saw further reductions in debt ratios, even if the primary surplus declined markedly for Ireland (as it did for Italy). However, there was a sizeable reversal in the primary balance for Greece, which ran primary deficits during this period, despite its high outstanding debt burden. The primary deficit also climbed in Portugal during this period, contributing to a large increase in its public debt ratio from 53.9 percent in 2002 to 68.3 percent in 2007.

All countries experienced sizeable increases in debt ratios during the 2007-2011 crisis period. To further highlight the components of this adverse shift, Table 2 reports the change in debt dynamics between the pre-crisis 2002-2007 period and the crisis period 2007-2011. The scale of the recession is an important factor, with the nominal growth term declining in magnitude for all countries and even turning positive for Greece and Ireland. With the exception of Germany, there was substantial deterioration in primary balances, even if Italy still maintained a small primary surplus. In fact, the cost of debt interest payments was lower during the crisis period for most countries, in line with the decline in short- and medium-term interest rates for most of this period. The stock-flow adjustment term was not a significant contributor to the adverse shift in debt dynamics, with the exceptions of Ireland and Germany.[5]

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[4] The stock-flow adjustment was also an adverse factor for Greece. Greece's entry into EMU was delayed until 2001. Ireland's extraordinary output growth during this period contributed to a large decline in the debt-output ratio.

[5] The fiscal cost of public recapitalisation of the Irish banking system in part shows up in the stock-flow adjustment term, since some of the capital injections could be interpreted as acquiring a valuable financial asset in terms of share ownership of viable banks. However, the capital injections into the disaster banks were more accurately classified as capital transfers and showed up in the extrordinary-large primary deficit in 2010. The large stock-flow adjustment term for Germany relates to its decision to set up a "bad bank" to relieve some banks of impaired assets, with these asset purchases funded through the issuance of extra

The 2007-2011 period really consists of two distinct stages. During 2007-2009, the global crisis and global recession saw a deterioration in fiscal positions in many countries. This was mainly due to a sharp decline in tax revenues, with stimulus programs only playing a minor role (Benetrix and Lane 2010). As will be covered in Section 3, sustained concerns about debt sustainability only took hold in 2010 and 2011, with the launch of austerity programs and EU/IMF rescue packages for Greece, Ireland and Portugal.

Accordingly, as is shown in Table 3, it is helpful to also examine the year-by-year debt dynamics within the 2007-2011 crisis period. Table 3 shows that the primary deficit peaked in 2009 for all countries (with the exception of Germany), with an average cumulative reduction of 5.5 percent of GDP in the primary deficit between 2009 and 2011 for Ireland, Portugal and Spain and an extraordinary reduction of nearly 10 percent of GDP for Greece.[6] However, weak or negative nominal growth and the impact of the increase in the level of outstanding debt on interest payments meant that debt ratios continued to climb during 2010 and 2011.

Tables 1 - 3 are backward-looking and describe the actual evolution of public debt until 2011. While the accumulation of high debt and deficit levels are important contributors, the European crisis is as much to do with projections about future debt dynamics. In particular, these countries face considerable fiscal adjustment challenges over the next twenty years in order to bring debt levels back down to "normal" levels. As an illustration, International Monetary Fund (2011) calculated the required improvement in cyclically-adjusted primary balances between 2010 and 2020 if the debt-GDP ratio is to converge to 60 percent of GDP by 2030.[7] The results are shown in Table 4: the scale of the required adjustment is large for each for the euro periphery countries; indeed, it is also considerable for France.

Moreover, these calculations are based on "normal" values for output growth and interest rates and do not take into account possible step increases in public debt associated

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government debt. See also Eurostat (2011) on the proper accounting treatment of "fiscal defeasance structures."

[6]The record-breaking Irish primary deficit of 28.2 percent of GDP in 2010 consisted of an X percent 'regular' deficit and capital transfers of X percent into the banking system.

[7]These calculations are based on 'normal' values for interest rates and growth rates. The primary balance is assumed to be maintained at its 2020 value until 2030. As noted by the IMF, the required fiscal adjustment is even greater if the trend increase in ageing-related public spending is taken into account. (The IMF calculations also indicate that the United States and Japan face major fiscal adjustments over this period.)

with future bailouts of banks, corporations or households. The fiscal sustainability debate also extends to concerns about the risks of future adverse movements in the values for output growth and interest rates, plus the spectre of contingent debt liabilities. In turn, the existential nature of the euro crisis can be linked to concerns that the nature of monetary union increases these fiscal risks. We turn to these issues in the next section.

3   The Euro and Fiscal Risk

There are three phases in the inter-relation between the euro and the sovereign debt crisis. First, the nature of monetary union arguably increased fiscal risks during the pre-crisis period. Second, once the crisis occurred, the nature of monetary union influenced the playing out of crisis dynamics through multiple channels. Third, the restrictions imposed by monetary union shape the duration and tempo of the anticipated post-crisis recovery period (which, of course, also feeds back into the crisis dynamics through the behavior of forward-looking agents). In each phase, it is important to bear in mind the distinction between the intrinsic nature of a monetary union versus how the euro area has actually operated. In particular, it is possible to imagine alternative versions of the euro area with different sets of countervailing policies and institutions that can mitigate some of the adverse dynamics that we will discuss in this section.

3.1   Pre-Crisis Risk Factors

During the first decade of EMU, a number of factors increased the fragility of fiscal positions in some member countries.

First, as is shown in Figure 4, the dispersion in current account balances across the euro area increased significantly and these imbalances were persistent. Table 5 xx

To the extent that current account imbalances accelerated income convergence by reallocating resources from capital-abundant high-income countries to capital-scarce low-income countries, this in part represented a positive gain from monetary union (Blanchard and Giavazzi 2002). In related fashion, current account deficits might also have facilitated consumption smoothing by the catch-up countries to the extent that current income levels were perceived to be below future income levels.

However, if capital inflows rather fuelled investment in non-productive capital (such

as housing) and delayed adjustment to structural shocks (such as increasing competition from Central and Eastern Europe and emerging Asia in the production of low-margin goods), then the accumulation of external imbalances posed significant macroeconomic risks (Blanchard 2007a, Blanchard 2007b, Lane 2010, Giavazzi and Spaventa 2011, Chan et al 2011).

For countries running large and sustained external deficits, Blanchard (2007a) identifies several risk factors. In terms of medium-term growth performance, a current account deficit can be harmful if increased expenditure on nontradables squeezes the tradables sector by bidding up wages and drawing resources away from industries that might have more scope for productivity growth. This might be especially risky inside a currency union if nominal rigidities mean that the downward wage adjustment required once the deficit episode is over can only be gradually achieved through a persistent increase in unemployment.

In addition, a large current account deficit poses short-term risks, if there is a sudden stop in funding markets such that the deficit must be narrowed quickly. The historical evidence is that large and sudden capital flow reversals are costly in terms of output contractions, rising unemployment and asset price declines (see, amongst many others, Freund and Warnock 2007).[8] A reversal in capital flows is also associated with a greater risk of a banking crisis, especially if capital flows have been intermediated through the domestic banking system.

As pointed out by Summers (1988) and Blanchard (2007a), excessive current account surpluses can also be costly if various distortions mean that there is domestic over-saving or productive domestic investment opportunities are overlooked and the balance of economic activities between the export sector and domestic-facing sectors is skewed too far in favour of the former. However, there is a fundamental asymmetry between surplus countries and deficit countries, in that surplus countries are not subject to the same risk of outward capital flight during downturns.

As noted above, capital flow reversals can be associated with a banking crisis. More generally, a key predictor of a banking crisis is the scale of the preceding domestic credit boom. Table ?? shows the evolution of credit-GDP ratios. The European periphery experienced a strong credit boom. In part, this can be directly related to the formation of EMU, since the elimination of currency risk was associated with a rapid increase in cross-

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[8]A simple analytical model is provided by Obstfeld and Rogoff (2002), while Mendoza (2010) provides a more elaborate quantitative model.

border inter-bank lending and a convergence in lending rates. On the credit demand side, the drop in interest rates and easier availability of credit (relative to the pre-EMU period) stimulated consumption-related and property-related borrowing (Fagan and Gaspar 2007).

However, it is important to appreciate that the most intense phase of the credit boom and current account deficits did not occur at the onset of EMU in 1999. Rather, as is also evident in Figure 4 and Table 5, Lane and Pels (2012) show that there a discrete increase in the dispersion of current account imbalances during 2002-2007, while Table **??** show that credit growth was especially dramatic during 2002-2007 for the two countries that experienced the biggest construction booms (Ireland and Spain).[9]

A complete explanation for this second phase of current account deficits and credit booms has not been provided. That said, the simultaneous timing with the securitisation boom in international financial markets, the US sub-prime episode and the decline in financial risk indices suggest that the answer may be found in the underlying dynamics of the global financial system and the unusually-low long-term interest rates prevailing during this period.

Figure 5 shows the differences across countries in terms of the distribution of net financial flows across sectors.[10] For Ireland and Spain, the government was not a net borrower during the 2002-2007. Rather, households were the primary borrowers in Ireland and corporates in Spain. In Portugal and Greece, the government and corporates were both significant borrowers but these negative flows were partly offset through significant net accumulation of financial assets by the household sector in these countries.

As was covered in Section 2, the main fiscal indicators did not flash warning signs during 1999-2007. For most countries, public debt ratios were either stable or decreasing. The main exception was Portugal, which saw a gradual increase in its ratio albeit from a below-average initial value. Famously, France and Germany had more negative fiscal deficit numbers than Spain and Ireland during this period, with both France and Germany exceeding the 3 percent limit in the early 2000s.

Below the surface, however, fiscal risks were increasing in the peripheral countries. As

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[9]For partly-exogenous reasons, these countries also experienced major immigration surges during this period, which further amplified the boom conditions. See also Lane (2011) and Gavilan et al (2011).

[10]The aggregate net financial flow (the acquisition of financial assets minus the acquisition of financial liabilities) corresponds to net international capital flows, since the economy as a whole can only run an imbalance vis-a-vis the rest of the world. In turn, the aggregate net financial flow is the sum of net financial flows across households, corporates and the government.

documented by Benetrix and Lane (2012), fiscal policy became less counter-cyclical after the formation of EMU, undoing an improvement in cyclical performance that had been evident in the 1990s (Gali and Perotti 2003, Fatas and Mihov 2010). The reduction in debt servicing costs associated with the low level of real interest rates did not pass through into more positive overall fiscal balances, since the savings were used to boost non-interest spending or finance tax cuts. In related fashion, the benign macroeconomic environment was not exploited by those countries (Greece and Italy, amongst others) with very high outstanding debt ratios as an opportunity to reduce these ratios.

From a risk management perspective, the failure to substantially tighten fiscal policy was a missed opportunity, especially during a period in which the private-sector was taking on more risk, in line with the rapid expansion in the debt levels of banks, corporates and households, in varying proportions in different countries. In some countries (Ireland and Spain), the credit and housing booms directly generated extra tax revenues, since rising asset prices, high construction activity and capital inflows boosted the tax take from capital gains taxes, asset transaction taxes and expenditure taxes. Faster-growing member countries also had inflation rates above the euro area average (since real exchange rate appreciation takes the form of a positive inflation differential inside a currency union), which also boosted tax revenues through the non-indexation of many tax categories. These large-scale revenue windfalls were only partially used to improve fiscal positions, with the balance paid out in terms of extra public spending or tax cuts.

A contributory factor in the failure to tighten fiscal policy was the poor performance of the analytical framework used to assess the sustainability of fiscal positions. In evaluating the cyclical conduct of fiscal policy, domestic authorities and international organisations such as the IMF, OECD and European Commission primarily focused on point estimates of the output gap in order to estimate the "cyclically-adjusted" budget balance, without taking into account the distribution of macroeconomic and fiscal risks associated with the expansion in external imbalances, credit growth, sectoral debt levels and housing prices.

To illustrate this point, Table 7 shows two sets of IMF estimates for the output gap and the structural budget balance - the contemporaneous "real time" estimates reported in 2007 and the latest estimates constructed in 2011 with the benefit of hindsight. Although the latest estimates now report sizeable output gaps and structural deficits in 2007, this was not the case for the real-time estimates. More importantly, the assessment process did not include adequate formal mechanisms to incorporate the distribution of macroeconomic and

fiscal risks, beyond ritualistic nods to "potential" risk factors if macroeconomic outcomes should turn out to come in below forecasted values.[11]

In summary, 1999-2007 was a period in which good growth performance and a benign financial environment masked the accumulation of an array of macroeconomic, financial and fiscal vulnerabilities. Such risk factors are not very helpful in predicting turning-points or forecasting whether the inevitable correction would ultimately take the form of a "soft landing" or a "hard landing." However, a prudential and forward-looking approach to risk management would have suggested more aggressive actions to lean against the wind and to accumulate buffers that might help in the event that "this time was not different" with the boom ending in a sudden and disruptive fashion.

Importantly, as emphasised by Blanchard (2007a), the Portuguese experience provided an early warning indicator of what might happen if optimistic growth projections failed to be realised. Portugal had experienced a temporary productivity surge in the late 1990s which, together with the improvement in the financial environment associated with EMU entry, prompted an investment and consumption boom, funded by sizeable capital inflows. The growth surge was over by 2001, with Portugal recording very slow growth during 2002-2007 despite the boom in the rest of the European periphery. The Portuguese experience showed the difficulty of adjusting to the end of a boom, with considerable resistance to the downward wage adjustments needed to undo the real appreciation that occurred during the growth phase. However, there was no sharp recession in Portugal during this period, with a large current account deficit continuing to facilitate domestic private and public spending despite the growth slowdown.

Rather, it would take the 2008 global financial crisis to trigger the reversal in private-sector capital flows to the euro periphery. In turn, the combined impact of domestic recessions, banking-sector distress and the decline in risk appetite among international investors would fuel the conditions for a sovereign debt crisis. However, the crisis-amplifying mechanisms innate in currency union membership would also play a central role in the unfolding of the crisis, as would the failure to have in place European-level crisis management institutions and the chaotic political response as the crisis developed.

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[11]Similar points apply in relation to the role played by national or international Financial Stability Reports in the pre-crisis period.

3.2 The Crisis

August 2007 marked the start of the first phase of the global financial crisis, with the initiation of liquidity operations by the ECB in response to concerns about prospective losses by some major European banks. The high exposure of major European banks to losses in the US ABS market has been well documented, as has the dependence of these banks on US money markets as a source of dollar finance (McGuire and von Peter 2009, Acharya and Schnabl 2010, Bertaut et al 2010, Shin 2011). The global crisis entered a more acute phase in September 2009 with the collapse of Lehman Brothers and the severe global financial crisis in late 2009 and early 2010 shook Europe as much as the United States.

Still, the ECB was placed to address the common element of the financial shock. In tandem with the other major central banks, it slashed short-term interest rates, provided extensive euro-denominated liquidity and entered into currency swap arrangements to facilitate access by European banks to dollar-denominated liquidity.

However, the global shock also had asymmetric effects across the euro area. Cross-border financial flows dried up in late 2008, with investors repatriating funds to home markets and re-assessing international exposure levels (Milesi-Ferretti and Tille 2010). This disproportionately affected those countries with the greatest reliance on external funding, especially international short-term debt markets. Inside the euro area, Ireland was the most striking example - the high dependence of its banking system on international short-term funding prompted its government at the end of September 2008 to provide an extensive two-year liability guarantee to its banks.[12]

More generally, the global crisis was a trigger event that prompted a re-assessment of asset prices and growth prospects, especially for those countries that displayed macroeconomic imbalances. For instance, Lane and Milesi-Ferretti (2011) show that the pre-crisis current account deficit and rate of domestic credit expansion are significant correlates of the scale of the decline in output and expenditure between 2007 and 2009, while Lane and Milesi-Ferretti (2012) show that "above-normal" current account deficits during 2005-2008 were associated with sharp current account reversals and expenditure reductions between 2008-2010. The cessation of the credit boom was especially troubling for Ireland and Spain,

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[12]See also Honohan (2010) and Lane (2011). Of course, the collapse of the Icelandic banking system in Autumn 2008 was even more dramatic.

since the construction sectors in these countries had grown rapidly. The decline in construction was a major shock to domestic economic activity, while abandoned projects and falling property prices indicated large prospective losses for banks that had made too many property-backed loans.

Still, it is noteworthy that sovereign debt markets remained relatively calm during 2008 and most of 2009. During this period, the main focus was on stability of the area-wide banking system, with country-specific risks remaining in the background. Furthermore, the relatively low pre-crisis public debt ratios of Ireland and Spain gave some comfort that these countries could absorb the likely fiscal costs associated with a medium-size banking crisis. Demand for sovereign debt was also propped up by banks that valued sovereign bonds as highly-rated collateral in obtaining ECB liquidity.

It was only in late 2009 that the sovereign debt crisis entered a more intense phase. As news about the full-year budget out-turns for 2009 dripped out, the fiscal impact of the recession on the European periphery was more fully appreciated. Large deficit/GDP ratios were recorded for 2009 in many countries. For Ireland and Spain, fiscal revenues fell much more quickly than GDP, in view of the excess sensitivity of tax revenues to construction activity and asset prices.

But the most shocking news originated in Greece — after the election in October 2009, the new government reported that previously-announced fiscal estimates had been severely distorted. In relation to 2009, it announced a revised budget forecast of 12.7 percent of GDP, which was more than double the previous 6.0 percent estimate.[13] In addition, the historical accounts for previous years were also revised to show significantly-larger deficits. In addition, the scale of the recession and rising estimates of prospective banking-sector losses on bad loans also had a negative indirect impact on sovereign bond values, since investors recognised that a deteriorating banking sector posed fiscal risks (see, amongst many others, Mody and Sandri 2012).

Figure 7 shows the annual average spread in ten-year bond yields between the E5 group (Italy, Spain, Portugal, Ireland, Greece) and Germany over 1999 to 2011. The spread was close to zero during 2003-2007 and only showed a modest increase during 2008-2009. Rather, the gap only grew truly large during 2010 and expanded yet further in 2011.

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[13]See also Gibson et al (2012). These authors also point out that the Greek announcement was coincidentally soon followed by the surprise request from Dubai World for a debt moratorium, such that the climate in international debt markets markedly deteriorated in October/November 2009.

Figure 8 provides a more granular look at the behaviour of country-level bond yields for the E7 group from October 2009 through March 2012. The graph shows that there were really three problematic groups. First, the Greek yield began to sharply diverge in early 2010, with the gap secularly increasing thereafter. Second, there was high comovement between the Irish and Portuguese yield during 2010 and the first half of 2011 (with a sharp reversal in Irish yield in the second half of 2011). Third, the yields on Italy and Spain have moved together, with these spreads at an intermediate level between the bailed-out countries and the anchor countries of Germany and France. For Italy and Spain, the spread against Germany rose above 300 basis points in July 2011 and remained at elevated levels thereafter.[14]

Greece was the first country to be shut out of the bond market in April/May 2010, with Ireland following in November 2010 and Portugal in April 2011. In each case, joint EU/IMF programs were established under which three-year official funding would be provided, on condition that the recipient countries implemented fiscal austerity packages, structural reforms to boost growth (especially important in Greece and Portugal) and recapitalised and deleveraged over-extended banking systems (especially important in Ireland). The scale of required funding far exceeded normal IMF lending levels, so the European Union was the major provider of official funding. Since no European bailout fund was in place in May 2010, the European component of the first Greek package was financed by bilateral loans from the other member governments. At that time, it was also decided to set up a temporary European Financial Stabilisation Fund (EFSF) that could raise funds on the basis of guarantees from the member states in order to provide official funding in any future crises.[15]

At one level, the European bailouts were in the spirit of traditional IMF programs. A temporary period of official funding can provide an opportunity for a government to take the typically-unpopular measures necessary to put the public finances on a trajectory that converges on a sustainable medium-term path, while also implementing the types of structural reforms that can boost the level of potential output. In this way, the debtor can

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[14]At a finer level, 2011 saw a visible spread emerging between the French and German yields. The greater relative vulnerability of France is not pursued in this paper.

[15]In addition, the pre-existing European Financial Stability Mechanism (EFSM) that had previously only been used for balance-of-payments foreign-currency support for non-euro member countries was adapted to also provide funding for euro member countries.

avoid the costs associated with sovereign default and the immediate closing of the fiscal deficit, while the holders of the outstanding sovereign debt continue to receive the payments of interest and principal.

For the other member countries, the avoidance of default benefits their creditor institutions (especially banks with significant holdings of peripheral-country sovereign bonds or claims on peripheral-country banks), while also guarding against the possible negative international spillovers from a default event. weak banks. int systemic (european; global).

However, some standard features of IMF programs seemed inappropriate in the context of EMU. Given the inability of individual member countries to engineer a currency devaluation and the scale of macroeconomic and fiscal imbalances, the plausible time scale for macroeconomic adjustment was longer than the standard three-year term of such deals. The slow pace of adjustment was sure to be further augmented by the pro-cyclical behaviour of national price level inside a currency union, since fiscal austerity would be a deflationary force in addition to driving down real GDP, making it more difficult for the government and private-sector debtors to service debt burdens that were fixed in nominal terms. In related fashion, the recessionary impact of an excessive pace of fiscal consolidation could pass through to a deterioration in private-sector balance sheets, which was especially troubling for highly-indebted Irish households. In turn, this could increase overall fiscal risk, in view of the myriad sovereign exposures to banking-sector losses (Honohan and Klingebiel 2003).

At a more general level, the fiscal adjustment targets under the three EU/IMF country programs were fixed on a country-by-country basis and were specified at the date of the initial agreement in each case. In particular, the fiscal targets were not conditional on the state of the wider European economy. In view of the subsequent deterioration in aggregate European growth projections, such non-contingent targets appear sub-optimal in terms of program design.

The financial conditions in the original bailout deals also largely copied standard IMF practices. In particular, there was a sizeable 300 basis points penalty premium built into the interest rate charged on the EU-sourced loans. A penalty rate has the logic of discouraging moral hazard and also provides compensation to the funders for the non-trivial default risk. However, an extra 300 basis points in the interest rate has a sizeable adverse impact on debt dynamics, especially for highly-indebted countries. In addition, this penalty rate caused political difficulties, since it appeared that the creditor EU countries were profiting at the

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expense of the bailed-out countries. In the end, this penalty premium on the European component of the official loans was eliminated at the July 2011 European summit; in addition, the repayment period on the official debt was doubled from 7.5 years to 15 years, which further helped debt dynamics.[16]

An important feature of the bailouts has been the use of funds to recapitalize banking systems, rather than just to cover the 'regular' fiscal deficits. So far, this element has been most important in the Irish bailout, where the initial design of the bailout allowed for funding of up to 22 percent of GDP to be deployed for recapitalization.[17] However, it is also a feature of the Greek and Portuguese bailouts, while it is the most-cited risk factor in relation to the Spanish crisis. Indeed, the July 2011 European Summit announced that the EFSF could make special loans purely to fund bank recapitalisations in cases where a country might be able to retain market access in relation to its normal fiscal needs.

In all of these countries, the deep and prolonged recession was associated with growing estimates of potential loan losses for banking systems. In Ireland and Spain, the losses on property-based lending were especially severe, in view of the scale of the property boom-bust cycle in these countries. For Greek banks, the high losses on their large holdings of Greek sovereign debt meant that recapitalization would be required.

The use of sovereign funding for bank recapitalizations encounters some fundamental risks (see also Acharya et al 2010, Brunnermeier et al 2011). While publicly-funded recapitalization of troubled banks can accelerate recovery from a banking crisis, this strategy is problematic if the scale of publicly-funded recapitalization increases sovereign debt to a level associated with significant default risk. Moreover, an excessive level of sovereign debt means that the banking crisis is unlikely to be resolved, in view of the myriad exposures of domestic banking systems to domestic sovereign risk. In addition to their direct holdings of domestic sovereign bonds, domestic banks are also exposed via the private-sector loan losses that are likely to be associated with the extra fiscal austerity associated with a higher

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[16]The interest rate on the IMF-sourced component of the funds continued to follow the standard IMF rules, which includes a penalty premium on large-scale loans.

[17]This was in addition to the already-large volume of public funding that had been committed to previous recapitalization rounds from 2008 onwards. By Summer 2011, it turned out that only about 13 percent of GDP of additional public funding was required, since rigorous stress tests indicated that upper-bound prior estimates of potential loan losses might be too pessimistic, while the Irish banks were also able to improve capital positions through aggressive debt exchanges with subordinated bond holders and, in one case, new private-sector equity investment.

level of sovereign debt. The value of domestic banks will also be compromised by the risks of higher taxes on the banking system and the greater likelihood of financial-repression measures from a highly-indebted government (Reinhart and Sbrancia 2011).

The sovereign backing of national banking systems faces additional complications inside a multiple-country monetary union. The banks in the euro periphery were especially heavy drawers on the standard liquidity facilities of the ECB, since these banks had lost access to market funding of their non-deposit liabilities and had also experienced substantial deposit outflows. In addition, these banks (especially in Ireland) obtained extra central bank funding by presenting non-standard collateral to their national central banks under the "emergency liquidity assistance" (ELA) mechanism.[18]

This large-scale and peristent dependence on official liquidity was a source of concern for the ECB. From the ECB viewpoint, sovereign recapitalizations of the banks offered several benefits. First, well-capitalized banks should be better able to obtain market funding. Second, well-capitalized banks would be better credit risks in relation to liquidity operations. Third, well-capitalized banks could more easily absorb the losses associated with rapid deleveraging; by quickly shrinking their balance sheets, these banks could reduce their dependence on official liquidity.[19]

However, from the perspective of a debtor country, this strategy offers fewer benefits. As already noted, the cost of making the banks safer may be to make the sovereign riskier. In addition, if sovereign-funded bank recapitalisation ultimately serves to reduce the level of liquidity inflows into the banking system, the net impact is to replace low-interest official bank liquidity with higher-interest official sovereign debt. In turn, this can amplify debt sustainability concerns.

Given these problems with publicly-funded bank recapitalizations, a natural response is to seek alternative methods of raising capital. While raising fresh equity or convertible bonds from private investors can play a role, such funding is scarce and expensive during crises. If shareholder equity is virtually wiped out by losses, banks can also seek to

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[18]The primary difference between standard ECB liquidity and ELA liquidity is that any losses on the posted collateral (in the event that the funding is not repaid) are jointly shared by the member countries in the former case but fall upon the national central bank in the latter case. See XXX for a more complete explanation.

[19]For instance, high-speed deleveraging can involve the firesale of bundles of loans at steeply-discounted values.

exchange subordinated debt on favourable terms.[20]However, under the European system, senior bank bonds are legally treated as having equal status to depositors - so far, no senior bonds have been written down by euro area banks.

While Ireland initially included senior bonds in its September 2008 bank liability guarantee scheme, this guarantee expired at the end of September 2010. Given the dire state of the Irish banking system (Anglo-Irish Bank had made losses equal to eight times its pre-crisis level of capital), it was proposed by the Irish government (with the apparent backing of the IMF) that there should be a substantial writedown on the value of the outstanding senior bank bonds, at least in relation to the very worst banks that would no longer be deposit-taking institutions.[21] However, this was resisted by the ECB and other member state governments, for fear that this would be a disruptive shock to the already-fragile European bank funding model.[22] In this sense, then, part of the recapitalization-related increase in Irish sovereign debt can be attributed to pan-European financial stability concerns.

Given this shared interest in financial stability across the euro area, a risk-sharing approach by which the costs of bank rescues are partly absorbed by other member states might be more efficient and equitable. However, no such risk-sharing mechanism has been put in place and the only type of European funding for bank rescues remains plain-vanilla official loans to the national sovereign, with fixed repayment terms. Under this approach, the fates of national sovereigns and national banking systems remain closely intertwined.

Traditionally, in cases where the initial sovereign debt level was assessed to be unsustainably high, the provision of IMF funding was conditional on private-sector creditors agreeing to take a voluntary reduction in the present value of the debt owed to them. However, under the joint EU-IMF programs, such "private-sector involvement" (PSI) was not deemed necessary in the first wave of bailouts.

However, the prospect of PSI in future bailouts began to spook the markets in Autumn 2010. In the initial discussions about the design of the European Stability Mechanism (ESM) that would replace the EFSF in 2013, the Franco-German Deauville declaration on 18th October 2010 seemed to indicate that PSI would be an automatic feature in any ESM-

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[20]Irish banks obtained extra capital of about 10 percent of GDP through subordinated debt exchanges.

[21]Expert legal opinion indicated that the equality of treatment between senior bank bond holders and depositors could be broken in exceptional circumstances, especially if extraordinary levels of public funding were necessary to keep a bank alive.

[22]Media reports indicate that is was also opposed by the US Treasury, fearing contagion from the European senior bank bond market to the US senior bank bond market.

funded bailout.[23] The enhanced risk faced by private-sector investors that was triggered by this announcement immediately led to a clear increase in spreads for Greece, Ireland and Portugal in particular and Ireland's efforts to avoid a bailout came to a halt soon thereafter in early November 2010. It also contributed to the funding difficulties faced by European banks (especially the local banks in the troubled periphery), in view of the large portfolios of sovereign bonds held by these banking systems.

The PSI debate further developed in July 2011 when it was accepted that Greece would need a second bailout package but that this time private-sector creditors would have to accept a voluntary haircut. While the indicated haircut at that time was relatively small at 21 percent (on one basis of calculating net present values), it would eventually turn out to be more sizeable at 50 percent in the final March 2012 agreement. This €100 billion debt writeoff corresponds to 47 percent of Greek GDP.[24]

Still, the invoking of the PSI option in July 2011 was certainly a contributory factor to the sharp widening of the spreads on Spanish and Italian debt over Summer 2011. Furthermore, the widening of the crisis to include these larger economies was associated with a broadening of the debate about the nature of the euro crisis and appropriate set of crisis management tools.

In terms of averting future crises, the logic of setting up the EFSF (and its successor, the ESM) is that the reserve availability of official funding should be a calming influence in the sovereign bond market. In particular, a heated debate concerns the possibile existence of multiple equilibria in the sovereign debt market (Calvo 1998, De Grauwe 2011). A country with a high debt level is vulnerable to increases in the interest rate it pays on its debt, since high debt servicing costs imply an increase in the debt-stabilising level of the primary surplus. This can give rise to self-fulfilling speculative attacks, since an increase in default risk perceptions induce investors to demand higher yields which, in turn, makes default more likely. In contrast, default risk would remain low in the absence of any speculative attack.

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[23]Since the EFSF was established on a temporary basis, it was agreed that it should be succeeded by a permanent institution (the European Stability Mechanism - ESM) from 2013 onwards. Since the funding of the ESM would include paid-in capital contributions from the member states, it would take time to set up and require an amendment to the European Treaty.

[24]The second bailout package is officially projected to lead to a Greek debt-GDP ratio of 120 percent by 2020, which is a shade above the debt ratios of the some of the other troubled euro member countries. See also Ardagna and Caselli (2012) for an account of the Greek crisis.

This multiple equilibria narrative has greater force in the context of a multi-country currency union than for countries with their own currencies since the underlying demand for the euro-denominated sovereign debt of any individual country is quite elastic, in view of the availability of close substitutes (the euro-denominated sovereign debt issued by other membr countries). In this environment, a small adverse shift in the fundamentals of an individual country can trigger a large decline in investor demand, since it is tempting to "run for the exit."

A firewall fund can reduce the risk of the 'bad' equilibrium arising, since investors need not fear that a country will be pushed into involuntary default by an inability to rollover its debt. However, while the initial scale of the EFSF was sufficient to deal with the three smaller peripheral economies, it was not enough to also fully finance Spain and/or Italy in the event that these countries should require some level of official financing. While the size of EFSF/ESM has been raised, it is far from the size that would be sufficient to comprehensively refinance Spain and Italian debt.

There are several barriers to increasing the size of the EFSF/ESM. First, some fear the moral hazard that the availability of official funding might tempt politicians in at-risk countries to avoid the tough fiscal decisions that might be required to maintain access to market funding. Second, the risk of taking losses on official loans to troubled partner countries is a deterrent for non-crisis countries that wish to preserve a high credit rating. Third, establishing a crisis resolution institution in the middle of a crisis is politically unpopular in low-risk countries, even if these electorates under a 'veil of ignorance' might have more strongly supported such an institution if it had been set up before the crisis.

As a complement to the fiscal support provided by the EFSF/ESM, the ECB has also been involved in efforts to stabilize the sovereign bond market. The securities markets program (SMP) was initiated by the ECB in May 2010 under which it began to purchase sovereign bonds in the secondary market. There have been two main waves of SMP purchases. Between May 2010 and October 2010, about €65 billion of bonds were bought by the ECB; a further €125 billion was committed during the market turmoil between August 2011 and November 2011, such that the cumulative bond holdings under the SMP grew to over €200 billion (about 2 percent of euro area GDP).

The SMP was rationalised by the ECB in terms of ensuring stability in the monetary policy transmission mechanism through the provision of liquidity and depth to troubled markets for sovereign debt market. Moreover, the ECB has taken pains to emphasise that

the SMP does not represent debt monetisation, since bonds are only purchased on the secondary market and the liquidity created is cancelled out through offsetting sterilization operations.

There is a close analogy between the design of the SMP and currency-market interventions by modern central banks. In both cases, the intention is not to set a floor to asset values but rather to disrupt destabilising momentum dynamics by which a carcity of willing buyers means that small incremental increases in asset sales can have a disproportionate price impact. Under these conditions, limited intervention by a central bank can be temporarily stabilising by breaking the momentum dynamics. However, in some quarters, the SMP was interpreted as exceeding the price-stability mandate of the ECB and this intervention ultimately prompted the resignation of two German members of the ECB's governing council (Bundesbank President Axel Weber and ECB Executive Board member Juergen Stark).

In view of the limits to expanding the capacity of the EFSF/ESM, there have also been calls for the ECB to take further steps to stabilize the sovereign debt market (see, for example, De Grauwe 2011). For instance, going beyond the current perceived consensus as to the limits of its mandate, it could more aggressively exploit its balance sheet capacity by announcing a ceiling to the interest rate it would tolerate on the sovereign debt of countries that meet certain fiscal criteria (such as taking credible steps to ensure debt declines to a safe level over the medium term). Indeed, if this commitment was accepted by market participants, it would not need to actually engage in large-scale bond purchases to enforce the ceiling, since the threat would be sufficient to ensure market rates stayed below the ceiling.

Going yet further, if private-sector investors remained unwilling to fund the sovereign debt, fiscal dynamics were not converging on a sustainable path and sufficient fiscal transfers from other member states were not politically feasible, debt monetization might be viewed in some quarters as preferable to outright defaults by large European countries. Since debt monetization is expressly forbidden by the European Treaty, an institutional change to the ECB's mandate would be required. Whether such an amendment would be supported by all member countries is difficult to envisage but this debate might heat up if a more acute and severe phase of the crisis were to take hold. After all, the debt monetization option lies behind the market belief that large countries (such as the United States) can always honor their domestic-currency debt obligations by "printing money," even if this required

a major overhaul in the mandates of notionally-independent central banks.

3.3 Prospects for Post-Crisis Recovery

The legacy of the crisis is that a number of countries will have dangerously-elevated public debt ratios, while many others will have debt levels that are lower by comparison but still high relative to long-term normal values. Even if current austerity programs are sufficient to stabilize debt ratios, there remains the post-crisis adjustment challenge of gradually reducing debt to safer levels.

This medium-term challenge is viewed with trepidation in European circles, since the underlying fundamentals do not look promising. First, in relation to the denominator, it is not likely that nominal output growth will be very strong. In relation to real output growth, there is nothing to suggest that real growth rates for advanced economies should exceed the 2 percent long-term average achieved. (This is one reason why debt ratios are stickier in high-income countries than in emerging economies, since the scope for rapid output growth is larger for the latter group of catching-up countries.)

In addition, the long-term level of real GDP may have been damaged by the boom-bust cycle and the aftermath of the crisis. As argued by De Long and Summers (2012) and embedded in the European Commission's model of potential output, the surge in unemployment during the crisis has hysteresis effects by eroding human capital and altering labor market dynamics; moreover, long-term unemployment is especially hard to reduce in a setting of low inflation and downward nominal wage rigidity. Furthermore, if fiscal adjustment takes the form of excessively increasing tax rates and cutting productive public investment, the level of potential output can fall through the adverse supply-side impact of excessively-high tax rates and an inadequate stock of public capital. For those countries also enduring banking crises, the empirical evidence that output growth is compromised for a decade provides a further reason to be sceptical about medium-term growth prospects (Reinhart and Rogoff 2010).

In relation to the GDP deflator, the 2 percent area-wide inflation target for the ECB means that the most indebted member countries are likely to have average inflation substantially below that level, in view of the correlation between domestic demand and the price level of nontradables. Sustained low inflation is especially likely for those countries that also have a high stock of net external debt, in view of the role played by real exchange

rate depreciation in shifting from running trade deficits to running trade surpluses (Lane and Milesi-Ferretti 2004).

Second, the high outstanding stock of debt and the scarring effect of the crisis means that risk premia are likely remain non-trivial for most indebted member countries. The large losses experienced by private-sector investors in Greek sovereign debt underline that the sovereign debt of euro area member countries cannot be categorised as risk-free investments, with the credibility of protestations that the Greek episode is a "one off" will only be earned over a long time period of accompanying measures to rule out other sovereign defaults. The long-term presence of sovereign risk premia means that the scale of non-interest primary surpluses required to reduce debt levels is all the larger.

Third, the political economy of long-term fiscal austerity is likely to be challenging. It is well established in the sovereign debt literature that "willingness to pay" is as important as "ability to pay" in determining the outcome to sovereign debt crises. Slow nominal output growth and high debt levels suggest that the highly-indebted countries are set for a long period of large primary surpluses - the debt tolerance of the populations in these countries will be repeatedly tested in the coming years, especially in view of the electoral risks facing governments that must impose spending cuts and tax increases with no short-term prospect of fiscal relaxation.

Fourth, Reinhart and Sbrancia (2011) highlight that financial repression has been central to debt-reduction strategies in the past. Financial repression can take many forms, with the common element of reducing the de-facto real interest rate paid on the sovereign debt. While the crisis has already revealed that member governments are capable of identifying many such opportunities, it remains the case that the founding principle of open capital markets across the European Union means that there is only very limited scope for financial repression in comparison to what was possible under historical conditions of binding capital controls and tightly-regulated domestic financial institutions.

Put together, this list of negative factors serves to indicate the scale of the challenge facing the euro area. In the next section, we outline the possible reforms that might help to alleviate the situation.

4 Euro Reform

The severity of the crisis has prompted much discussion of reform of EMU. Most immediately, the initial focus in Spring 2010 was on setting up financial rescue funds and crisis management mechanisms, as was covered above.

In addition, the importance of generating robust output growth has strengthened calls for structural reforms that might increase levels of income per capita and improve resilience to macroeconomic and financial shocks. The renewed interest in supply-side reforms has several drivers - the high level of unemployment that arose during the crisis, the impossibility of demand drivers such as fiscal stimulus or capital inflows and the importance of high output growth for debt sustainability (both sovereign debt and various forms of private-sector debt). timing of reforms (Gali).

The high outstanding sovereign debt levels and the importance of avoiding future fiscal crises has also induced reforms to the European fiscal governance system, through the 2011 adoption of the "six pack" set of regulations and the 2012 launch of the capstone Fiscal Compact Treaty. The principles behind the fiscal governance reforms are twofold: first, high public debt levels pose a threat to fiscal stability and, second, the fiscal balance should be close to zero "over the cycle."

While similar principles were also embedded in the 1992 Maastricht Treaty and the 1997 Stability and Growth Pact, there are some critical differences. First, under the new system, there is a specified time frame for reducing public debt below a "safe" ceiling (set at 60 percent of GDP) - the excess above the ceiling has to be eliminated at an average rate of "one twentieth" each year.[25] Second, in relation to the fiscal balance, the previous system focused on the overall budget balance, with a maximum deficit set at 3 percent of GDP. This had two main defects - it did not adequately allow for cyclical variation in budget positions and it did not provide much discipline for countries inside the limit. In contrast, the new system focuses on the structural budget balance that strips out cyclical effects and one-off items. This avoids the perverse pattern by which a country in a cyclical downturn would be compelled to engage in fiscal austerity to attain a target value for the deficit-GDP ratio, while an overheating economy could pro-cyclically cut taxes and raise

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[25]If debt in year t is 120 percent of GDP, the debt reduction target for year t+1 is 3 percent of GDP, since (1/20)*(120-60)=3. Strictly speaking, the rule is expressed as a moving average: $d_t^* = 0.95 * (d_{t-1} - 60) + (0.95)^2 * (d_{t-2} - 60)$
$+(.95)^3 * (d_{t-3} - 60)$

spending while still balancing the overall budget. In contrast, a structural balance target encourages a government to bank cyclical revenue gains during upturns in exchange for a greater slippage in the overall budget balance during recessions.

It is obvious that a fiscal framework that focuses on the structural balance faces knotty measurement problems, in view of the limited capability of macroeconomic forecasters to accurately differentiate between cyclical fluctuations and trend fluctuations in output, especially in real time. For this reason, the Fiscal Compact requires the establishment of an automatic correction mechanism, by which a government has to make ex-post adjustments if the forecast errors for the structural budget cumulate over several years to a significant level. For instance, in the German fiscal law, a cumulative overshoot above 1.5 percent of GDP requires a gradual correction by running tighter structural budgets until the excess is eliminated.[26]

In terms of implementation, another major difference relative to the old-style Stability and Growth Pact is that the primary source of fiscal discipline is intended to be local in nature. The Fiscal Compact requires that the fiscal rules are written into domestic legislation with constitutional-level backing. It also requires the creation of national independent fiscal councils to monitor the compliance with the specified fiscal rules. Under this approach, the cross-national monitoring (with the underlying threat of sanctions) by the European Commission and the other member countries is only a "second line of defence." This new emphasis on national-level fiscal frameworks recognises that local monitoring is most likely to be effective, both in view of the greater democratic legitimacy and the impracticality of remote monitoring of very different national fiscal systems.

The six-pack governance reforms are designed to go beyond narrow fiscal governance by encompassing a wider perspective on excessive imbalances that pose a threat to macroeconomic stability (and ultimately financial and fiscal stability). The "excessive imbalances" process is designed to monitor a scorecard of indicators, including the current account balance, the net international investment position, credit growth, house price indices and competitiveness (inflation, real exchange rate, export market share), with the intention that a country experiencing severe imbalances should undertake policy interventions to mitigate such imbalances. In this regard, there is growing interest in the potential role of national-level macroprudential policies that might help lean against the wind in relation to excessive capital inflows and excessive credit growth. In addition, there is also growing

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[26]See Bundesbank (2011).

interest in the potential role of fiscal instruments in addressing external imbalances (Lane 2010). For instance, a "fiscal devaluation" that combines combination a revenue-neutral reduction in payroll taxes and an increase in VAT can replicate the reallocative impact of a currency devaluation (Farhi et al 2011).

However, it is evident that a more extensive set of reforms can help improve the stability of the eurosystem, even if progress on these reforms has been much slower. The list includes: enhanced coordination of national fiscal policies; the "federalisation" of the banking sector; the launch of common area-wide bonds; and deeper levels of fiscal union.

As it stands, the primary emphasis in the Fiscal Compact Treaty is on ensuring fiscal discipline at the national level. While the importance of policy coordination is acknowledged in the text of the treaty, there is no well-developed mechanism by which the collective fiscal position of the euro area is optimised in relation to the prevailing macroeconomic conditions. This has given rise to concerns that the aggregate scale of fiscal austerity is inefficiently large, since the spillover effects on other member countries are not factored into the adjustment plans of each individual country. While the absence of a "collective view" on fiscal policy might not be a major problem during normal times, it may have especially adverse effects during periods when the ECB has fixed the interest rate at a lower bound. (The voluminous recent literature on the effectiveness of fiscal policy when interest policy hits the zero bound is relevant here.)

In relation to the banking sector, the diabolic loop linking national fiscal risk and national banking risk was described above. This link can be broken by moving responsibility for the resolution of banking crises to the European level, just as it is a federal responsibility in the United States. A European-level banking system would involve European-level regulatory responsibility, European-level deposit insurance, European-level bank resolution policies and a European-level fiscal backstop in the event that fiscal resources were deemed necessary to stabilise the banking system (Allen et al 2011, Brunnermeier et al 2011). As calculated by Marzinotto, Sapir and Wolff (2011), the scale of shared fiscal resources that would be required to credibly stand behind such a European-level banking system could be around two percent of area-wide GDP, such that it represents a very limited scale of fiscal union compared to the size of the federal budget in the United States.

The observed instability in the sovereign bond market since 2010 has reinforced calls for the issuance of common area-wide bonds. As surveyed by Favero and Missale (2012), the traditional justification for a common bond was to improve liquidity relative to a

non-integrated bond market in which individual euro-denominated bonds are issued by each member state. However, the liquidity effect appears minor relative to the observed disruptive impact of destabilising speculative attacks on national sovereign debt markets inside the euro area.

Furthermore, Favero and Missale (2012) point out that there are self-interested reasons why fiscally-stronger member states might be willing to entertain the launch of common bonds. First, these authors estimate significant contagion during the crisis, with the spreads on stronger member states adversely affected by the speads on weaker member states. Second, if common bonds reduce default risk for the weaker member states, this may prove cheaper than alternative rescue vehicles such as the deployment of bailout funds.

Most of the debate has focused on eurobonds that would be issued on the basis of "joint and several" liability of the member states. The virtue of eurobonds is that the backing by the strongest member states would provide cheaper funding for weaker member states, while also insulating the euro area from the contagious speculation observed in the last couple of years. However, beyond requiring significant changes to the European Treaty, eurobonds face the classic moral hazard problem by which irresponsible member states might over-borrow in the knowledge that other member states had committed to meet the debt payments.

This basic problem has motivated several proposals for limited-type eurobonds. Delpla and Von Weizsacker (2011) propose that each country is only able to obtain eurobond funding for its sovereign debt up to 60 percent of GDP, with the excess still requiring funding through the issuance of national bonds. Philippon and Hellwig (2011) propose that short-maturity eurobonds (eurobills) would limit moral hazard since mis-behaving countries could be quickly excluded from debt rollovers. Muellbauer (2011) advocates "conditional" eurobonds by which access to eurobond funding is only permitted if a country satisfies a range of criteria to underpin good macroeconomic and fiscal fundamentals.

In fact, Brunnermeier et al (2011) point out that many of the advantages of eurobonds can be obtained through the issuance of common bonds that do not require the mutualisation of fiscal risk. Under this proposal, a European Debt Agency (EDA) would buy up national sovereign bonds (up to a limit of 60 percent of GDP in each case) but servicing national debts would remain a domestic responsbility. The EDA would be funded by the issuance of two tranches of bonds – European Safe Bonds (ESBies) and European Junior Bonds (EJBies) – with the latter having the primary exposure in the event of defaults

on the underlying portfolio of national sovereign bonds. Accordingly, the ESBies should be super-safe assets, which in turn should make them preferred collateral for central bank liquidity operations. In this way, European banks that primarily held ESBies rather than national domestic sovereign bonds would be less exposed in the event of a domestic sovereign debt crisis - indeed, this property of ESBies should receive favorable regulatory and collateral treatment relative to national sovereign bonds.[27] By providing a stable source of demand for national sovereign bonds, the average yields paid by most national governments would fall. Moreover, the availability of the two tranches of European-level bonds would allow "flight to safety" episodes to take the form of a shift in the relative demand between ESBies and EJBies, rather than the destabilising cross-border capital flight from weaker member states to stronger member states.

As with the creation of any new type of large-scale financial instrument, each of these proposals faces considerable implementation and logistical difficulties, especially in terms of the transition from the current situation to a new equilibrium. The introduction of new instruments during a crisis is especially problematic, especially to the extent that the superior characteristics of the new types of bonds imply a loss in value for at least some types of existing bonds.

In contrasting the euro area with the long-standing dollar currency union that is the United States, it is also possible to point to a deeper level of fiscal union as a mechanism to improve area-wide stability . A larger area-wide shared tax stream (that would be allocated to member states according to a specified acyclical formula) would enhance fiscal stability by allowing some components of tax revenue to be delinked from fluctuations in national-level output. Similarly, European-level spending programmes (even if confined to cyclically-sensitive components such as unemployment benefit payments) would improve fiscal stability by not requiring an increase in the domestic financing of cyclically-sensitive spending downturns. More generally, a European-level rainy day fund could provide general bloc grants to troubled economies. However, the scale of fiscal union that would be required to envisage such European-level risk-sharing mechanisms seems far advanced relative to the current level of political integration (see also Henning and Kessler 2012).

In terms of sequencing, the Fiscal Compact Treaty may be considered as a gateway to more ambitious levels of reform. In particular, by mitigating moral hazard, national-level

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[27]See also Buiter and Sibert (2006) on the collateral policies of the ECB vis-a-vis national sovereign bonds.

fiscal discipline increases the political feasibility of European-level risk-sharing mechanisms (a European banking system, eurobonds, deeper fiscal union). However, the momentum for the more extensive reforms may dissipate if the euro area manages to scrape along without being engulfed by a more acute, all-encompassing crisis.

5   Conclusions

The origin and propagation of the European sovereign debt crisis reflect a sequence of major policy failures. The absence of effective crisis management institutions was a major flaw in the initial design of the euro. The inherent messiness involved in proposing and implementing multi-country crisis management responses 'on the fly' has been an important destabilising factor throughout the crisis. Moreover, as was predicted by Feldstein (1997), it has led to a sharp increase in political tensions between European member states, which are further reinforced by the contrasting crisis narratives prevailing among the electorates of creditor and debtor countries.

The most benign perspective on its long-term impact is that the crisis provides a one-time opportunity for Europe to implement a set of necessary reforms that would not have been politically feasible in its absence. Even under this interpretation, it is not clear whether the unfolding reform process will achieve all that is needed for a stable monetary union or will rather just deliver a monetary union that can survive but still vulnerable to recurring crises. The alternative scenario by which the single currency implodes is no longer unthinkable, even if it would unleash the "mother of all financial crises" (Eichengreen 2010a, 2010b). The stakes are high.

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Table 1: Debt Dynamics: 1992 to 2011

1992-1998	d_{1992}	$prim$	$i*d$	$\gamma*d$	sfa	d_{1998}
Greece	79.0	-17.4	63.4	-57.4	27.6	95.4
Ireland	91.4	-26.4	29.6	-50.6	8.8	53.1
Portugal	50.0	0.5	30.5	-23.2	-7.5	50.4
Spain	63.3	-1.6	14.1	-12.0	0.2	64.2
Italy	105.2	-25.3	64.6	-35.0	5.7	114.9
Germany	42.0	3.1	20.1	-8.5	3.7	60.5
France	39.7	7.0	20.3	-9.2	1.6	59.5
1998-2002	d_{1998}	$prim$	$i*d$	$\gamma*d$	sfa	d_{2002}
Greece	95.4	-10.8	27.1	-27.0	18.0	102.6
Ireland	53.1	-15.1	7.2	-21.0	7.8	31.9
Portugal	50.4	1.4	11.5	-11.7	2.4	53.9
Spain	64.2	-9.5	12.5	-17.6	3.1	52.5
Italy	114.9	-15.6	24.9	-19.2	0.4	105.1
Germany	60.5	-5.0	12.4	-5.0	-2.1	60.7
France	59.5	-3.6	11.8	-8.9	0.1	59.0
2002-2007	d_{2002}	$prim$	$i*d$	$\gamma*d$	sfa	d_{2007}
Greece	102.6	7.7	24.1	-35.5	9.3	107.4
Ireland	31.9	-11.9	5.5	-10.2	9.6	24.9
Portugal	53.9	6.3	13.3	-11.1	6.0	68.3
Spain	52.5	-14.5	9.5	-16.3	5.1	36.2
Italy	105.1	-7.4	24.2	-18.2	-0.5	103.1
Germany	60.7	-1.7	14.4	-8.6	0.4	65.2
France	59.0	2.2	13.6	-12.6	2.1	64.2
2007-2011	d_{2007}	$prim$	$i*d$	$\gamma*d$	sfa	d_{2011}
Greece	107.4	22.6	22.8	4.7	5.6	162.8
Ireland	24.9	53.0	10.1	8.6	11.5	108.1
Portugal	68.3	16.2	13.3	-1.1	5.0	101.5
Spain	36.2	24.2	7.5	-1.1	2.9	69.6
Italy	103.1	-2.4	18.8	-2.4	3.1	120.5
Germany	65.2	-1.5	10.4	-4.4	12.1	81.8
France	64.2	13.4	10.5	-4.0	1.4	85.4

Note: d is the ratio of public debt to GDP, $prim$ is the primary deficit (as a ratio to GDP), $i*d$ is the level of interest payments, $\gamma*d$ is the growth term and sfa is the stock-flow adjustment. Author's calculations based on AMECO data.

Table 2: Shift in Debt Dynamics from 1992/1997 to 1997/2011

	$\Delta PBAL$	$\Delta i * D$	$-\Delta g * D$	ΔSFA
Greece	14.9	-1.3	40.2	-3.7
Ireland	64.9	4.6	18.8	1.8
Portugal	9.9	-0.1	10.0	-0.9
Spain	38.7	-2.0	15.2	-2.2
Italy	5.0	-5.3	15.8	3.6
Germany	0.3	-4.0	4.2	11.8
France	11.2	-3.1	8.6	-0.7

Note: Δd is the change in ratio of public debt to GDP between 2002-2007 and 2007-2011, $\Delta prim$ is the change in the primary deficit (as a ratio to GDP), $\Delta i * d$ is the change in the level of interest payments, $\Delta \gamma * d$ is the change in the growth term and Δsfa is the change in the stock-flow adjustment. Author's calculations based on AMECO data.

Table 3: Debt Dynamics in Detail: 2008 to 2011.

2008	d_{2007}	$prim$	$i*d$	$\gamma*d$	sfa	d_{2008}
Greece	107.4	4.8	5.1	-4.7	0.4	113.0
Ireland	24.9	6.0	1.4	1.4	10.7	44.3
Portugal	68.3	0.6	3.1	-1.1	0.7	71.6
Spain	36.2	2.9	1.6	-1.2	0.5	40.1
Italy	103.1	-2.5	5.1	-1.4	1.4	105.8
Germany	65.2	-2.7	2.8	-1.2	2.6	66.7
France	64.2	0.4	2.9	-1.5	2.2	68.2
2009	d_{2008}	$prim$	$i*d$	$\gamma*d$	sfa	d_{2009}
Greece	113.0	10.6	5.1	0.6	-0.1	129.3
Ireland	44.3	12.1	2.0	5.4	1.3	65.2
Portugal	71.6	7.3	2.9	1.4	-0.2	83.0
Spain	40.1	9.4	1.8	1.5	1.0	53.8
Italy	105.8	0.8	4.5	3.4	0.9	115.5
Germany	66.7	0.5	2.7	2.8	1.8	74.4
France	68.2	5.1	2.4	1.6	1.7	79.0
2010	d_{2009}	$prim$	$i*d$	$\gamma*d$	sfa	d_{2010}
Greece	129.3	5.0	5.8	2.5	2.5	144.9
Ireland	65.2	28.2	3.1	1.9	-3.6	94.9
Portugal	83.0	6.8	3.0	-2.0	2.6	93.3
Spain	53.8	7.4	1.9	-0.2	-1.9	61.0
Italy	115.5	0.1	4.4	-2.2	0.5	118.4
Germany	74.4	1.8	2.5	-3.1	7.6	83.2
France	79.0	4.6	2.4	-1.8	-2.0	82.3
2011	d_{2010}	$prim$	$i*d$	$\gamma*d$	sfa	d_{2011}
Greece	144.9	2.2	6.7	6.3	2.7	162.8
Ireland	94.9	6.7	3.6	-0.1	3.0	108.1
Portugal	93.3	1.6	4.2	0.5	1.9	101.5
Spain	61.0	4.5	2.2	-1.3	3.2	69.6
Italy	118.4	-0.9	4.8	-2.3	0.3	120.5
Germany	83.2	-1.1	2.4	-2.9	0.1	81.8
France	82.3	3.2	2.6	-2.3	-0.5	85.4

Note: d is the ratio of public debt to GDP, $prim$ is the primary deficit (as a ratio to GDP), $i*d$ is the level of interest payments, $\gamma*d$ is the growth term and sfa is the stock-flow adjustment. Author's calculations based on AMECO data.

Table 4: Required Shift in Primary Fiscal Balance, 2010 to 2020. Note: Based on calculations reported in IMF *Fiscal Monitor* (September 2011).

Greece	15.5
Ireland	12
Portugal	9.6
Spain	8.3
Italy	3.1
France	6.3
Germany	2.3

Note: Required shift in cyclically-adjusted primary fiscal balance (expressed as a ratio to GDP) between 2010 and 2010, if debt is to converge to 60 percent of GDP by 2030. Source: IMF Fiscal Monitor (September 2011).

Table 5: Current Account Balances

	1993 -1997	1998 -2002	2003 -2007	2008 -2011
Greece	-2.0	-5.9	-9.1	-11.1
Ireland	3.4	-0.2	-2.6	-1.6
Italy	2.1	0.2	-1.8	-2.9
Portugal	-2.4	-9.0	-9.2	-10.5
Spain	-0.6	-3.1	-7.0	-5.8
France	1.1	2.0	-0.2	-1.9
Germany	-0.9	-0.3	5.1	5.7

Note: Current account balances (expressed as a ratio to GDP). Source: International Monetary Fund's World Economic Outlook database.

Table 6: Private Credit Dynamics

	1998	2002	2007
Greece	31.8	56.5	84.4
Ireland	81.2	104.4	184.3
Portugal	92.1	136.5	159.8
Spain	80.8	100.1	168.5
Italy	55.7	77.3	96.5
Germany	112.2	116.7	105.1
France	81.0	85.6	99.3

Note: Loans to private sector from domestic banks and other credit institutions. Source: World Bank Financial Database.

Table 7: 2007 Data — Original and Revised Estimates

		Original	Latest
Greece	Output Gap	1.3	3.4
	Structural Balance	-3.4	-7.9
Ireland	Output Gap	-0.7	3.7
	Structural Balance	1.2	-1.4
Portugal	Output Gap	-1.7	0.6
	Structural Balance	-2.2	-3.4
Spain	Output Gap	-0.5	2.1
	Structural Balance	2.0	1.0
Italy	Output Gap	-0.8	2.8
	Structural Balance	-1.9	-3.0

Note: European Commission estimates of output gap and cyclically-adjusted budget balance for 2007. Original denotes values from 2007 Autumn Report; Latest denotes values from 2011 Autumn Report.
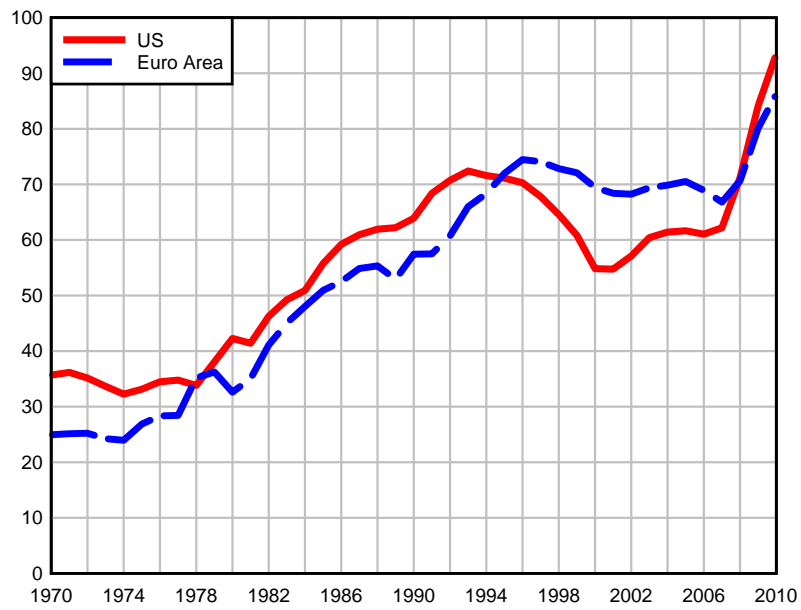
Figure 1: Public Debt Ratios: Euro Area and United States, 1970 to 2010. Source: Author's calculations, based on IMF Public Debt Database.
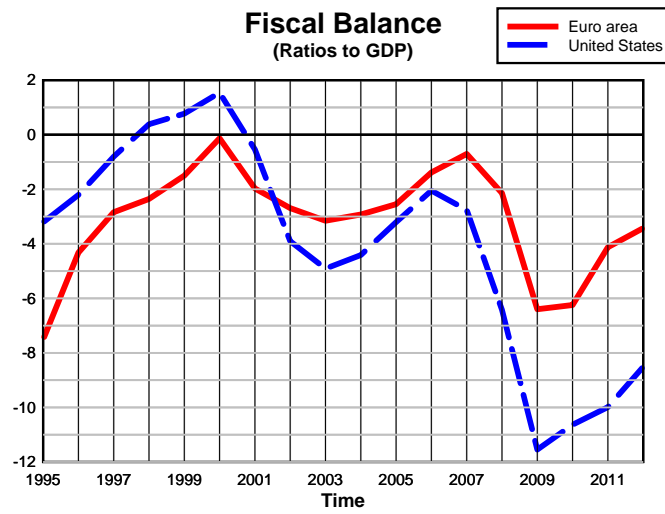
Figure 2: Fiscal Balances (Ratios to GDP). Source: Author's calculations based on AMECO data.
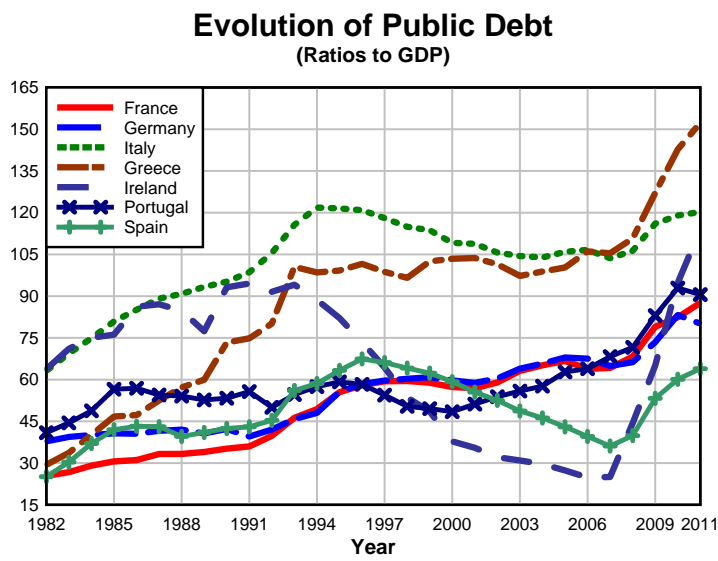
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Evolution of Public Debt
(Ratios to GDP)

Legend: France, Germany, Italy, Greece, Ireland, Portugal, Spain

Figure 3: Public Debt Dynamics 1982-2011. Note: Gross government debt (expressed as a ratio to GDP). Source: IMF Public Debt Database.

Current Account Balances: Surplus Countries and Deficit Countries
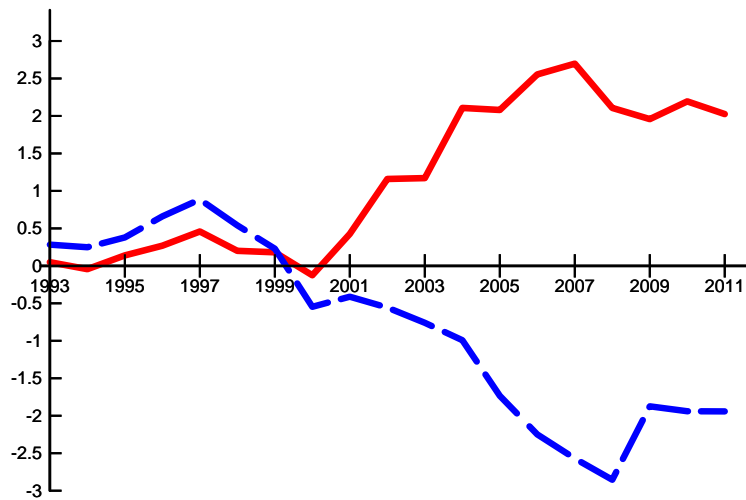
Figure 4: Current Account Balances: Euro Area Split Between "Surplus" Group and "Deficit" Group. Source: Author's calculations based on data from World Economic Outlook. Current account balances expressed as ratios to aggregate GDP of the euro area.
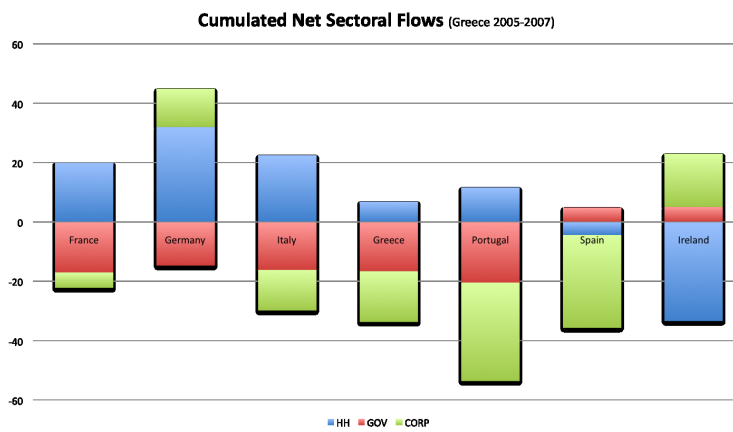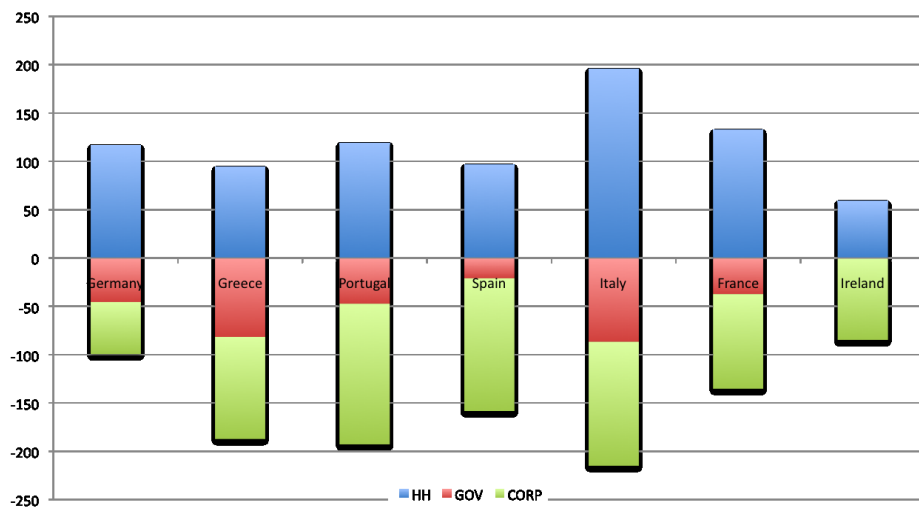
Figure 5: Sectoral Distribution of Net Financial Flows, 2002-2007. Source: Author's calculations, based on sectoral financial accounts data from Eurostat and Central Statistics Office of Ireland.

Figure 6: Sectoral Distribution of Net Financial Assets, 2002-2007. Source: Author's calculations, based on sectoral financial balance sheet data from Eurostat and Central Statistics Office of Ireland.
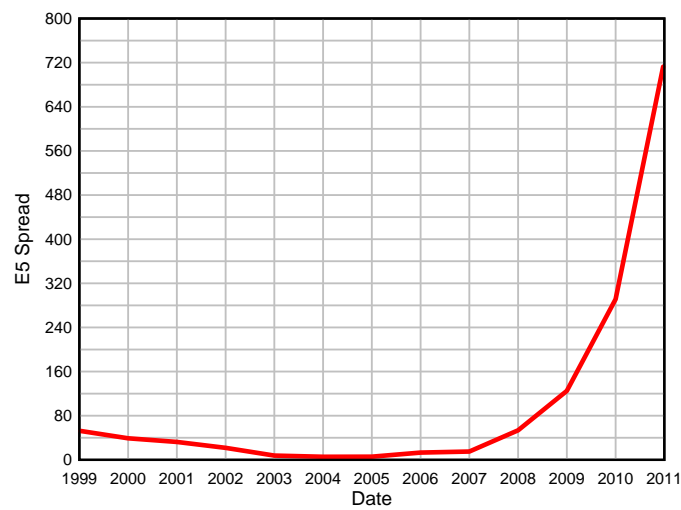
Figure 7: Spread in 10-Year Bond Yields: E5 minus Germany. Note: Unweighted average of bond yields for E5 group (Italy, Spain, Portugal, Ireland, Greece) minus bond yield for Germany. Source: Author's calculations based on Datastream data.
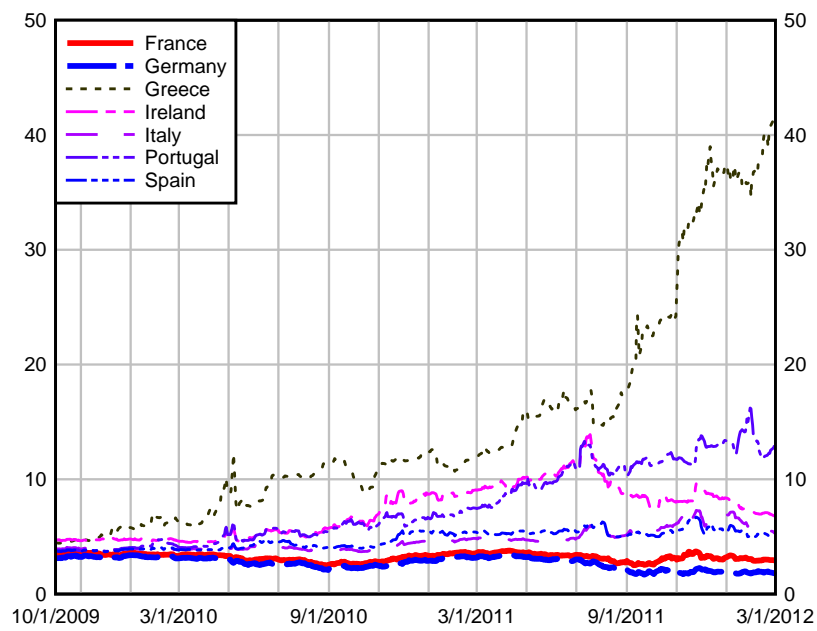
Figure 8: 10-Year Bond Yields, October 2009 to March 2012. Source: Author's calculations based on Datastream data.