July 2012
IMF Country Report No. 12/182

Euro Area Policies: 2012 Article IV Consultation—Selected Issues Paper

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EURO AREA POLICIES

Selected Issues

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Approved by the European Department

July 3, 2012

Contents

I. THE EUROZONE CRISIS AND THE SOVEREIGN-BANK NEXUS: THE CASE FOR A EUROZONE BANKING UNION[1]

This paper argues that the creation of a common Eurozone financial stability architecture is an immediate priority to restore the viability of the Economic and Monetary Union. A Banking Union will prevent further financial fragmentation of the euro area, and will help end the adverse downward spirals between sovereigns, banks and the real economy at play in periphery countries. The Banking Union should have three main elements: a eurozone deposit guarantee scheme, a eurozone resolution authority and a eurozone supervisory authority. Many European authorities have called for the establishment of a "Banking Union" to help restore financial stability and restart growth in the eurozone. The June 29 agreement of the EU Summit to present proposals for a single supervisory mechanism and, contingent on its implementation, allow direct recapitalization of banks by the ESM represents an important step forward towards a Banking Union.

A. Introduction

1. **The euro area crisis has revealed the weaknesses of a framework where responsibility for financial stability remains national.** Faced by two related shocks after the Summer of 2011 (a funding shock affecting large euro area banks; and stress affecting weak sovereigns), the eurozone financial system has fragmented away from being area-wide to being re-focused on national markets. The intra-euro area capital flight has created de-integrating forces in sovereign bond markets, interbank markets and lending and deposit markets, thereby reversing the long-standing process of European financial integration that was stimulated by the creation of the euro. This reversal has contributed to impair the transmission of monetary policy in the eurozone. Meanwhile, downward spirals between sovereigns, banks and the real economy are stronger than ever in the periphery. As a result, national-based policies are increasingly precluded and collective solutions are becoming necessary.

2. **The creation of a "Banking Union" is critical for the viability of the Economic and Monetary Union.** It will help break the adverse feed-back loops between sovereigns, banks and the real economy by creating an institutional framework that provides common backstops to restructure failed banks and enhance confidence in safety nets. Taking steps towards a Banking Union will contribute in ending the ongoing financial fragmentation of the euro area by reducing incentives to cut cross-border exposures. In the medium-term, it will help minimize the probability of bank failures and the cost of resolution borne by tax-payers.

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[1] Prepared by Thierry Tressel (EURAE). We are grateful to the ECB and the EU Commission DG ECFIN for useful comments during the seminars held respectively on May 30th in Frankfurt and on June 1st in Brussels.

3. **The IMF has long argued that the EU needs a centralized financial stability architecture.** It was predicated on the need to keep pace with the rapid increase in the size of European banks and with the integration of financial markets in Europe where cross-border contagion can be substantial.[2] It was also seen as a way to effectively address the coordination and burden sharing issues arising when dealing with cross-border banks. This centralized framework was envisaged to encompass a common resolution authority with a common backstop, a common deposit guarantee scheme and a common supervisory authority. Establishing such an architecture is even more important for the euro area where (i) economic and financial integration is deeper than in the broader EU; (ii) downward spirals between sovereigns and banks are stronger than elsewhere; and where (iii) monetary policy is impaired by financial fragmentation.

4. **After the 2008 crisis, the EU took significant steps towards developing a supra-national supervisory structure, but ultimate responsibility remained at the national level.** Following the recommendations of the de Larosiere Report, the EU introduced elements of an EU supervisory structure by establishing the European Supervisory Authorities – the European Banking Authority, the European Securities and Markets Authority, and the European Insurance and Occupational Pensions Authority –, and the European Systemic Risk Board as the EU macroprudential oversight body.[3] However, the new agencies have limited powers and resources, which implies that ultimate competence remains at the national level. The recent roadmap outlined by the European Council addresses these shortcomings by calling for the establishment of a full EU Banking Union. The outcome of the June 29 EU Summit is an important step forward by announcing an agreement on proposals for the establishment of a single supervisory mechanism and, when this mechanism is in place, on allowing the ESM to directly recapitalize banks.[4]

5. **The paper is organized as follows.** Section B presents a narrative of the various stages of the banking and sovereign crisis since the Summer of 2011. Section C characterizes the downward spirals at play in periphery euro area countries. Section D describes the process of financial de-integration within the euro area. Section E outlines the main elements of a Banking Union that would help break the adverse sovereign-bank feed-back loops and would end the financial de-integration of the eurozone. Section F concludes.

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[2] See for instance Fonteyne, W., Bossu, W., Cortavarria-Checkley, L., Giustiniani, A., Gullo, A., Hardy, D., and S. Kerr, 2010, "Crisis Management and Resolution for a European Banking System", IMF WP 10/70.

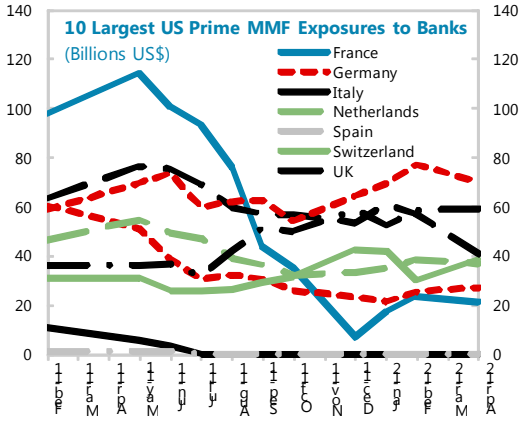
[3] De Larosiere, Jacques and co-authors (2009), "Report of the High-Level Group on Financial Supervision in the EU", European Commission.

[4] "Towards a Genuine Economic and Monetary Union" – Report by President of the European Council June 26, 2012. And: "Euro Area Summit Statement", June 29, 2012.

B. The Eurozone Crisis (July 2011–June 2012)

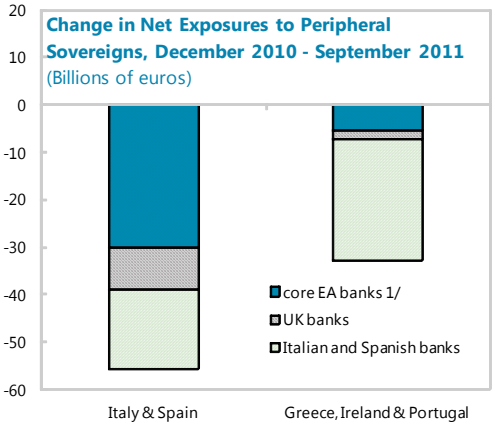
Stages of the crisis

6. **Initial shock: the eurozone crisis escalated in the Summer of 2011 when wholesale funding markets for European banks began to freeze, and sovereign borrowing costs of Italy and Spain began to rise significantly**. The Euribor-OIS spread an indicator of counterparty risk in unsecured interbank markets, rose sharply in August and remained at high levels, reaching about half the level following the collapse of Lehman Brothers. It only fell substantially after the reopening of the US$ swap line and the first allotment of the 3 year LTRO by the ECB. From June 2011 onwards, US investors started to reassess exposures to large euro area banks, causing a sharp increase in the cost of US$-euro basis swaps. The US$ funding shock was particularly large for the French banks which lost about US$ 100 billion of funding from the 10 largest US MMF between June and December of 2011 (Figure 1 and text figure).



Source: Fitch ratings

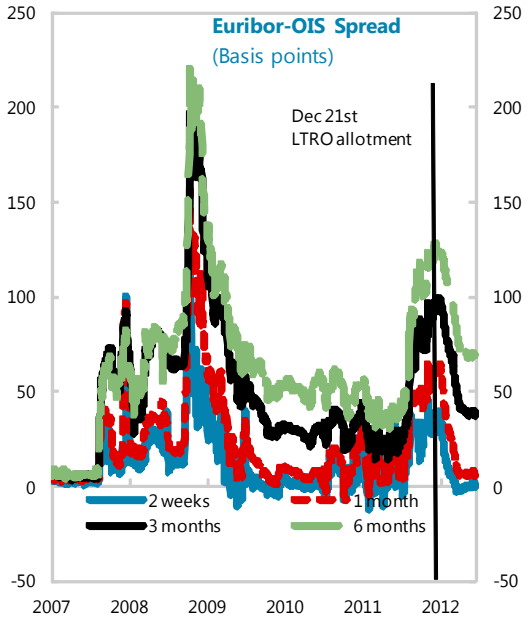
7. **Contagion across markets: good collateral became scarce as funding demand focused on secured markets.** Large European banks highly dependent on wholesale funding substituted short-term secured borrowing (repos) for unsecured borrowing, raising the demand for good quality collateral. At the same time, the worsening sovereign crisis eroded the value of the collateral posted in private transactions as government bond yields rose, while margin requirements increased following ratings downgrades. Through these channels, sovereign stress affected the ability of banks to access secured funding markets. The ECB unconventional liquidity provision alleviated funding stress in secured markets and reduced net demand for private sector funding, but collateral used for repo financing still remains significantly more expensive in June 2012 than it was in July of 2011 (Figure 1).



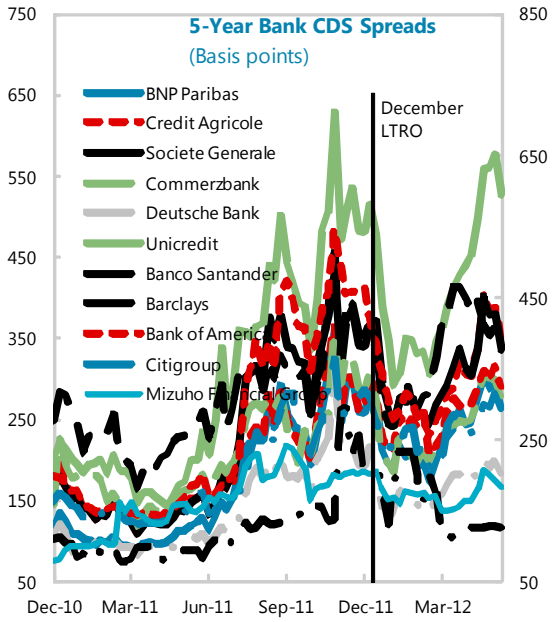
Sources: EBA July 2011 stress tests ; and EBA recapitalization exercise.
1/ "Core EA" includes Austria, Belgium, France, Germany and the Netherlands.

Figure 1. Banking and Sovereign Stress

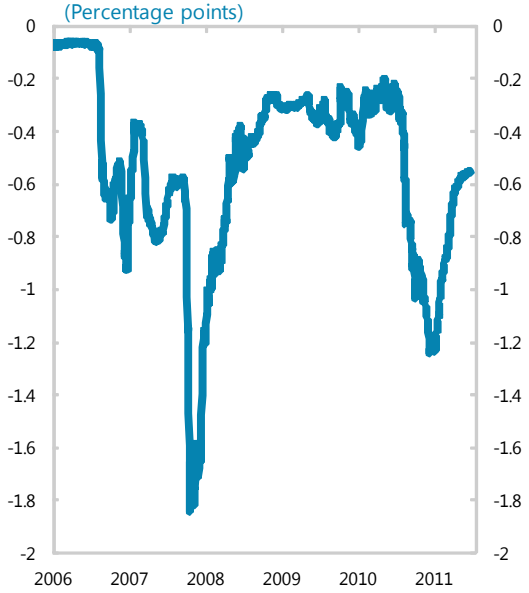
Counterparty risk increased in interbank market...



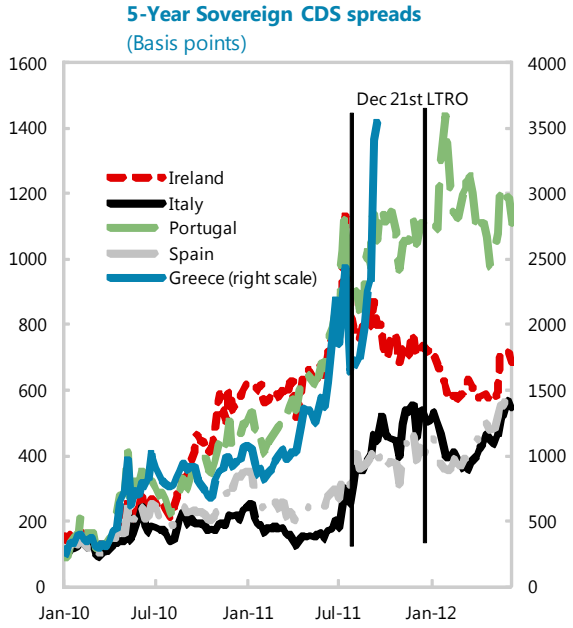
causing funding stress...



spreading to secured repo markets...

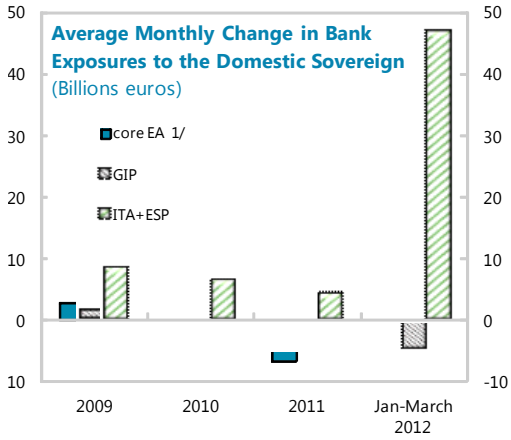


while Italian and Spanish sovereign stress increased.



Sources: Datastream; Bloomberg L.P.; and IMF staff calculations.

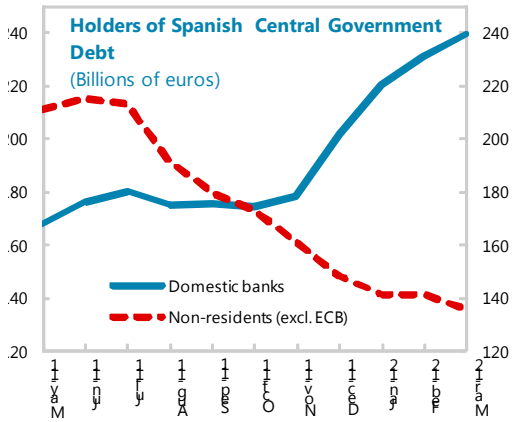
8. **Deleveraging: European banks reassessed their exposures to the Italian and Spanish sovereigns**. According to EBA data, large European banks sold off more than €80 billion of bonds of periphery sovereigns during January-September 2011.[5] In the EBA sample, core euro area banks were the largest sellers of Italian and Spanish sovereign bonds while Italian and Spanish banks were the largest sellers of sovereign bonds of the program countries.



Source: IMF, International Financial Statistics database.
1/ Core EA includes Austria, Belgium, Finland, France, Germany, and Netherlands

9. **ECB intervention: the long-term refinancing operations of the ECB and the US$ swap lines stabilized funding markets.** They also contributed to temporarily reducing sovereign stress. However, the stabilization of bond yields was achieved by increasing the sovereign exposures of Spanish and Italian banks, setting the stage for stronger adverse loops between weak sovereigns and domestic banks.

10. **Sovereign-bank nexus intensifying in Spain.** Two series of events have taken place. First, the government announcement on March 02 that the previously agreed SGP fiscal targets were not attainable, and downgrades of the sovereign took place in April 23, June 07 and 13. Second, the take-over and bailout of Bankia raised uncertainties about the extent of real estate losses and concerns about the impact on the sovereign balance sheet. Meanwhile, a group of banks were downgraded.



Source: Bank of Spain.

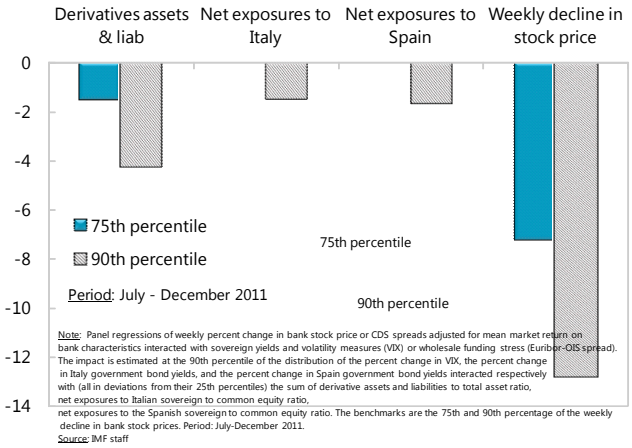
Impact of ECB interventions: determinants of banking stress before and after the LTROs

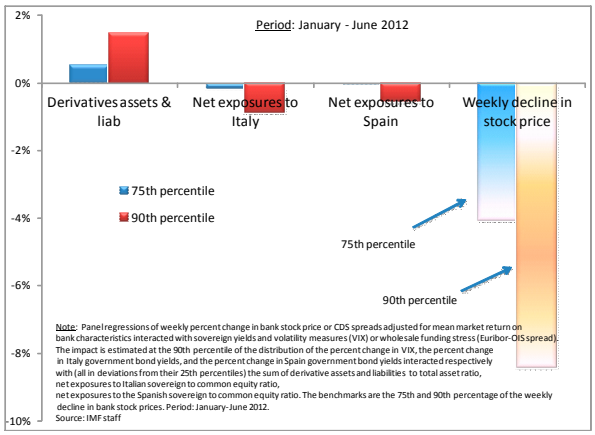
11. **Before the first LTRO, bank-specific stress was mainly explained by: (i) sovereign exposures to Italy or Spain, or (ii) dependence on wholesale funding and large activities in derivatives markets.** Empirical analysis shows that, before the first LTRO, banking stress –measured either by stock price returns or CDS spreads adjusted for market movements—moved positively with stress affecting the Italian and Spanish sovereigns in proportion to exposures to each sovereign. This co-movement was economically significant for the very exposed banks, which were mostly domestic banks. When market uncertainty and volatility increased, banking stress was also high for banks that are very active in

[5] EBA July 2011 stress tests and EBA recapitalization exercise (November 2011).

derivatives' markets or more reliant on wholesale funding – all mostly core euro area banks, (Box 1).

12. **After the first LTRO, Spanish and Italian banks with larger exposures to their sovereign underperformed their peers, independently of sovereign bond yields or CDS spreads movements.** Reliance on wholesale funding or activities in derivatives' markets were no longer significant causes of banking stress. This suggests that the provision of long-term liquidity by the ECB and significant purchases of sovereign bonds by domestic banks has only moderately reduced the link between sovereign and bank performance in Spain and Italy, and that concerns about banks in these two countries has not abated.[6]





C. Downward Spirals at the National Level

13. **Because many European banks are large but remain the responsibility of the home authority, this contingent liability can jeopardize the sovereign balance sheet.**[7] The Irish and Spanish crises are examples of bank bailouts that turned out to be "Pyrrhic victories" for their sovereigns. These two countries extended large financial support and the impact on public debt has so far amounted to more than 40 percent and about 20 percent of GDP respectively since 2008. In addition to the direct impact of financial support on public debt, banking crisis also substantially raise the borrowing costs of the sovereign. Acharya et al. (2012) show that higher bank CDS spreads before a bailout resulted in higher government CDS

Financial Sector Support 2008-11
(percent of 2011 GDP)

Belgium	7.0
Ireland	41.2
Germany	12.2
Greece	6.1
Netherlands	14.1
Spain [1/]	19.5
United Kingdom	6.8
United States	5.3

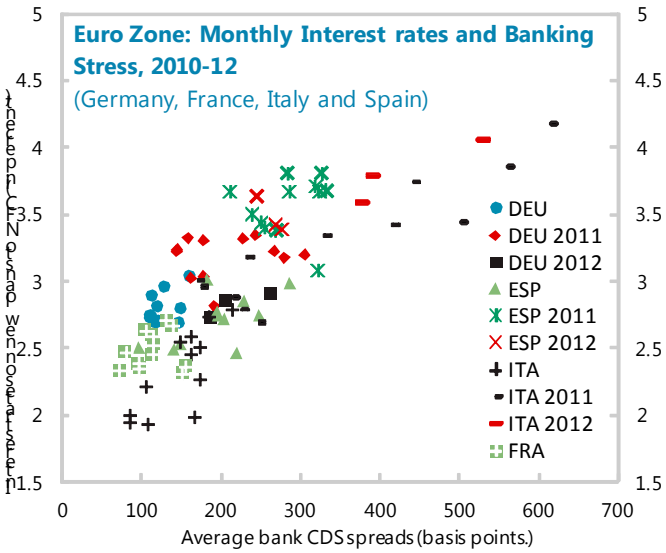
Sources: Fiscal Monitor; Spain FSAP; and IMF staff estimates.
1/ Includes actual use of debt guarantees, asset purchases and capital support from the FROB as of March 2012 and the ESM/EFSF loan announced on June 9th.

[6] The second period includes the announcements that Spain would not meet the previously agreed EU fiscal targets (March 02, 2012) and the take-over and bailout of Bankia-BFA (May-June 2012).
[7] See *2012 Spillover Report: Financial Spillovers from Euro Area and UK Globally Systemically Important Banks*.

spreads after the announcement of the bailouts.[8] An event study of the Bankia bailout suggests that such dynamics are currently at play in Spain: announcements related to the take-over and recapitalization of Bankia by the Spanish government suggest a likely link with the increase in the borrowing costs of the sovereign around each event (Box 2).

14. **Weak sovereigns also damage the balance sheet of domestic banks.** Three main channels are at play. First, as a result of home bias in portfolio decisions, domestic banks usually have large exposures to domestic sovereign debt. Hence, sovereign risks directly impact the market value of bank assets.[9] Second, weak sovereigns can lose their ability to honor their financial safety net obligations. This can adversely impact domestic banks through: (i) the loss of the implicit (or explicit) sovereign guarantee;[10] (ii) reduced deposit confidence as domestic guarantee schemes (which are usually not pre-funded)) become less credible. Third, the decline in the collateral value of sovereign bonds (as yields increase or as higher margin requirements are applied after ratings downgrades) reduces the ability of domestic banks to access secured funding or euro-system liquidity.[11]

15. **Banking stress adversely damages the real economy by raising the cost of credit.** Banks under stress may curtail credit supply and raise lending rates to strengthen capital buffers and increase internally generated funds. Similarly, weak economic performance and fragile balance sheets of non-bank sectors of the economy also affect bank profitability as demand for new loans falls, non-performing loans rise, and deposit growth slows-down. To estimate the relative importance of



Sources: Europoean Central Bank; Bloomberg L.P.; and IMF staff calculations.

[8] Acharya, V., Drechsler, I., and P. Schnabl, 2012, "A Tale of Two Overhangs: The Nexus of Financial Sector and Sovereign Credit Risk", Banque de France Financial Stability Review, April 2012. See also Gerlach, S., Schulz, A., and G. Wolff, 2010, "Banking and Sovereign Risk in the Euro Area", CEPR Discussion Paper 7833.

[9] The impact on the balance sheet may exceed the decline in the market value of government bonds, as restoring market confidence may require banks to build higher buffers against total exposures. For this reason, the EBA recapitalization exercise requested that European banks hold buffers against marked-to-market, available for sale and held to maturity exposures to weak sovereigns.

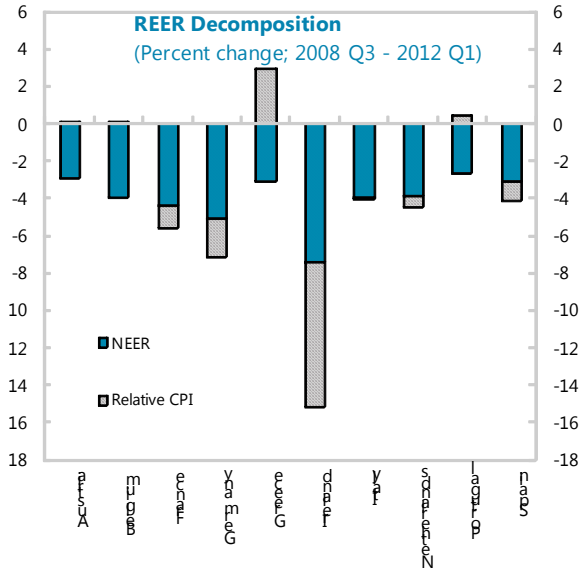
[10] For instance, the May 18th 2012 downgrade of 16 Spanish banks (including the 3 largest banks) by Moody's cited the deteriorating Spanish economy and the reduced creditworthiness of the government as motivation for the downgrade.

[11] Acharya and al. (2012) also show that higher government CDS was associated with higher bank CDS for given bank ratings, and cite the example of Santander which experienced higher borrowing costs as the value of the sovereign implicit guarantee deteriorated in 2010.

these factors, we run a panel regression of monthly lending rates in the four largest euro area countries on average monthly bank CDS spreads (averaged by country), consensus forecasts of real GDP growth (to account for general macroeconomic factors) and country fixed effects, covering the period between 2010 and March 2012.[12] The estimate suggests that a 150 bps increase in bank CDS spreads is associated with an increase in lending rates of 0.6 percentage points and 0.4 percentage points respectively for loans to non-financial corporations and mortgage loans.[13] This econometric association suggests that bank funding stress can have substantial effects on loan pricing and credit supply.

16. **Weak sovereigns and a deteriorating macroeconomic outlook tend to reinforce each other.** In absence of fiscal risk sharing, a weak sovereign cannot implement countercyclical fiscal policies when the economy is slowing down and may have to consolidate in a downturn to restore confidence and lower debt levels. [14] In the process, economic growth may be further weakened by the resulting compression of domestic demand. Ambiguity of financial investors' beliefs about the link between growth and fiscal consolidation could make adjustment even more arduous.[15]

17. **Adverse feedback loops are stronger in a monetary union than elsewhere.** These adverse feed-back loops are amplified by the absence of a domestic exchange rate that could buffer the impact of intra-euro area sudden stops on the borrowing costs of sovereigns, and that would help compensate the adverse impact of fiscal efforts on domestic demand compression by an exchange rate depreciation stimulating exports. Moreover, sovereign borrowing costs can rapidly spiral out if market anticipations turn out pessimistic, making fiscal adjustment more difficult to achieve unless the monetary authority signals the possibility of future loosening.[16]

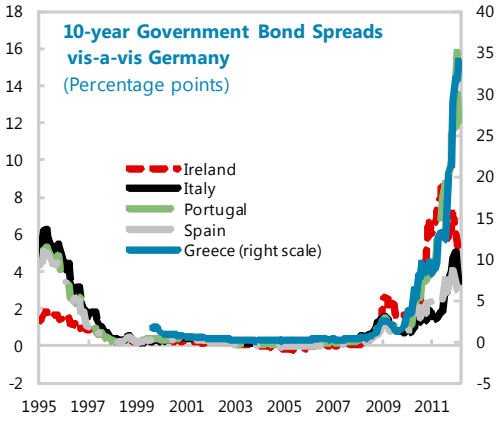


Source: IMF, Information Notice System database.

[12] Consensus forecasts are measured for the current year.
[13] As a comparison during 2010, bank CDS spreads in Spain and Italy rose by between 150 and 200 bps while lending rates to non-financial corporations increased by respectively 0.5 and 0.8 percentage points.
[14] See "Fiscal Consolidation Under the SGP: Some Illustrative Simulations", *2012 Selected Issues Paper.*
[15] "2011 in Review: Four Hard Truths", Olivier Blanchard, IMF direct, Dec. 21 2011.
[16] Jeanne, O., 2012, "Fiscal Challenges to Monetary Dominance in the Euro Area: A Theoretical Perspective", Banque de France, Financial Stability Review April 2012.

D. Financial Fragmentation of the EMU

18. **Before the start of the crisis, the eurozone had achieved a very high degree of financial integration.** The clearest evidence is the strong compression of sovereign bond yields observed at that time. Between 01/2002 and 12/2007, the spread between Greek sovereign bonds and German bunds oscillated between 8 and 37 bps. Meanwhile, before the crisis, the current account deficits of peripheral countries were almost entirely financed by private capital flows originating from within the eurozone, thus allowing net foreign liabilities to accumulate.[17]

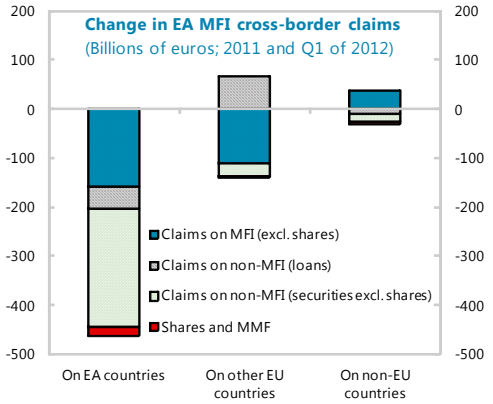


Sources: Bloomberg L.P.; and IMF staff calculations.

19. **Before the crisis, sovereign risks of periphery country were *de facto* shared between core euro area and domestic investors.** In peripheral euro area countries, other euro area residents were the main holders of public debt together with domestic residents, thus creating *de facto* some risk sharing of sovereign risk within the EMU. For example, at the end of 2010, more than 75 percent of the foreign-held Spanish sovereign debt was still held by euro area residents.

Source: IMF, Coordinated Portfolio Investment Survey.

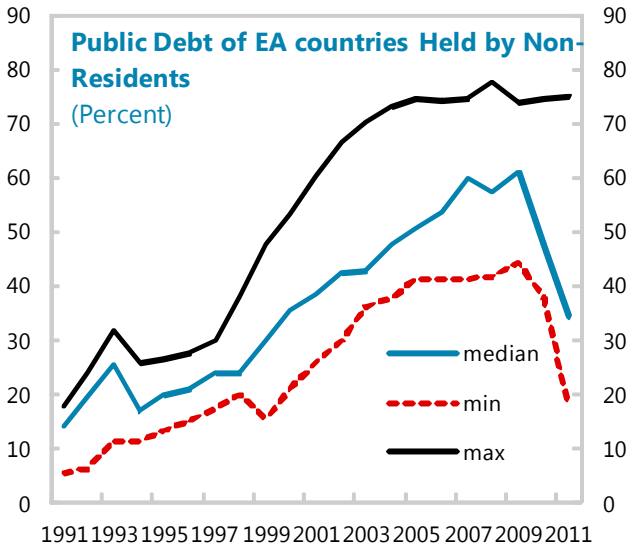
20. **During the crisis, sovereign bond markets were the most deeply affected by the withdrawals of intra-euro area cross-border capital flows.** As a result sovereign cross- border risk sharing diminished while the divergence of sovereign yields impeded the interest rate channel of monetary policy. In 2011 and in Q1 of 2012, bond markets experienced a withdrawal of intra-euro area cross-border capital of €240 billion, a 24 percent reduction since end 2010), closely followed by intra-euro area interbank markets (where a sharp reduction of cross-border claims of €190 billion occurred in Q4 of 2011 and Q1 of 2012). The historical rise of non-residents holdings of euro area sovereign debt was, therefore,



Source: ECB, cross-border positions of EA MFI, excl ESCB.
Note: Changes in cross-border claims not adjusted for potential valuation effects.

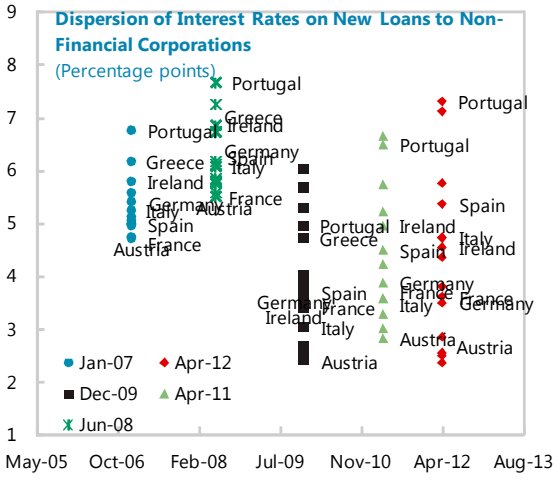
[17] See evidence reported in Chen, R., G.M. Milesi-Ferretti and T. Tressel (2012), "External Imbalances in the Euro Area", forthcoming IMF WP.

sharply reversed. For example, at the end of 2011, non-residents held respectively 34 percent and 33 percent of the sovereign debt of Italy and Spain, down from 44 percent and 48 percent at the end of 2009.



Sources: IMF, World Economic Outlook database; and International Investment Position statistics.

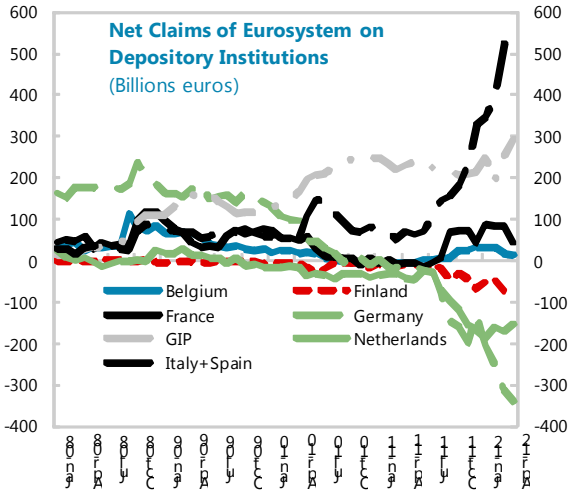
21. **The increased cross-country dispersion of lending rates has weakened the allocation of capital at the eurozone level and has disrupted the bank lending channel of monetary policy.** The dispersion of lending rates has increased substantially since the start of the financial crisis in 2008. For example, the spread on lending rates to non-financial corporations between Spain and Germany increased from 6 bps in August 2008 to 43 bps in January 2011 and to 187 bps in April 2012. As a result, firms face increasingly different credit supply conditions across countries irrespective of their own profitability. The bank lending channel of monetary policy also operates less well in countries under stress. While the lowest lending rates responded to changes in the policy rate, the highest lending rates moved in opposite direction while tracking banking stress relatively well (as documented in section C).



Source: European Central Bank.

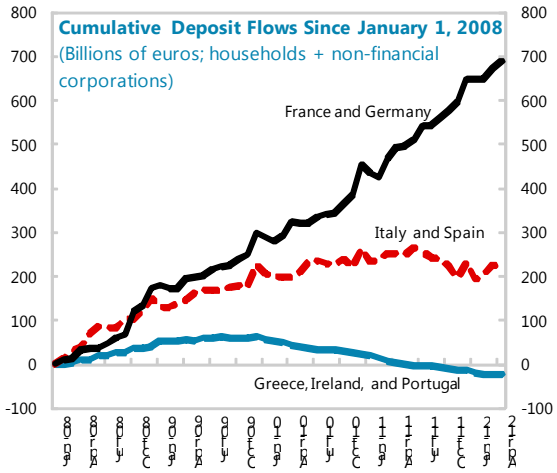
22. **The de-integration of interbank markets is further disrupting monetary policy.** Overnight EONIA volumes have steadily declined since the start of the euro area crisis at the time of the first Greece bailout in May 2010. EONIA average daily volumes are down to €20 billion at the end of May 2012 from €40 billion at the end of 2010 indicating continued strains in unsecured markets. In the meantime, overnight bank deposits at the ECB have risen

to about €750 billion from less than €200 billion in June 2011. Interbank markets have become increasingly segmented along national borders and the ECB is intermediating capital across national borders. While net borrowing from the eurosystem has remained high for the 3 program countries and has sharply increased for Italian and Spanish banks, Dutch and German banks continued to accumulate large net claims on the eurosystem. Hence, private markets have been replaced by fixed rate full allotment of liquidity by the ECB.



Source: IMF, International Financial Statistics database.

23. **Insured deposits are declining in several periphery countries, which adds to instability concerns.** Since end-2009, the cumulative decline in the stock of insured deposits has reached €86 billion in the three program countries. In Spain, Between July 2011 and April 2012, insured deposits (households and non-financial corporations) declined by €55 billion.



Source: European Central Bank.

E. Main Elements of a Eurozone Banking Union

24. **Establishing a banking union will strengthen the viability of the EMU by delinking financial intermediation from the strength of the sovereign and by ending financial fragmentation.** It will help ensure financial stability by severing the feed-back loops at play between sovereigns and their domestic banks. A banking union will also create strong incentives to restore financial integration within the monetary union. Solid cross-border banking activities would help re-start growth by ensuring that healthy eurozone firms can obtain credit from financial institutions, regardless of the strength of their sovereign. Last but not least, a banking union, by stabilizing financial systems, will help ensure a smoother transmission of monetary policy in weak countries.

25. **A common deposit insurance scheme with collective and credible backing by all member countries should be established.** Deposits are flowing out of Greece, but there are concerns that deposit outflows could occur in other peripheral countries. The purpose is to help delink banks and sovereigns where the latter cannot honor their safety net obligations.

Since national DGS are not pre-funded, weak sovereigns cannot credibly insure non-bank private deposits. Moreover, national DGS, even if they were pre-funded, cannot reassure agents that their savings are protected in euros.

26. **The European DGS could work as follows.** The announcement should include a clear timetable for the establishment of the DGS. The deposit insurance should apply to all financial institutions, as restricting membership to only a subset of banks could risk accelerating deposit withdrawals or shifts of deposits across banks. Ultimately, the scheme should be partially pre-funded by a levy on the industry. But to be effective immediately, it should have access to additional funding such as a credit line from the euro-system (similar to the lines of credit of the FDIC with the Federal Reserve), or be backstopped by a common pool of government resources – such as the ESM/EFSF or the possibility to issue a limited amount of joint and several guaranty bills. The deposit insurance scheme should be consistent with the best practices laid out in the 2010 EU Commission proposal to harmonize national deposit guarantee schemes in the EU, including in term of coverage ratio, payout speed, financing and cooperation and cross-lending with other EU deposit insurance, and with the recently released Directive for an EU framework for the recovery and resolution of credit institutions.[18]

27. **A centralized bank resolution agency with common financing would urgently help achieve more efficient bank restructuring without threatening the sovereign balance sheet.** As observed in Ireland and Spain, weak sovereigns may not have the ability to backstop their financial system on their own, which may affect ability to achieve cost-effective wind-down of banks. Such detrimental feed-back loops must be broken. When common resources are relied-upon, a central authority should be in charge of the restructuring. A centralized solution would also help achieve efficient cross-border cooperation when cross-border banks fail, by encouraging ex ante rather than ex post burden sharing arrangements. As with the deposit insurance scheme, the resolution authority should be backed by a common fund financed by an industry levy, and should have recourse to a common pool of government-provided resources or a liquidity backstop from the ECB. In this regard, to delink sovereign debt from bank restructuring costs, the EFSF/ESM facilities should urgently be empowered with sufficient flexibility to directly recapitalize banks of member states. To facilitate orderly wind-down of failing institutions, the powers of the resolution authority should be consistent with the EC framework establishing strong and harmonized resolution regime for credit institutions in the EU, including powers to bail-in unsecured creditors to achieve burden sharing and powers emphasizing preparedness and prevention.

[18] Proposal for a Directive of the European Parliament and of the Council establishing a framework for the recovery and resolution of credit institutions and investment firms (June 6th, 2012).

28. **A supra-national supervisory regime for large banks should support the establishment of common backstops.** A general principle for institutional design is that financing and monitoring responsibilities should be aligned. [19] Having a common supervisor would help align incentives with the common good rather than with the objectives of "national champions". Because of concerns about ring-fencing, different national priorities, or a desire to protect home champions, national authorities have had incentives to refrain from sharing information and cooperate in time of crisis. A supra-national approach would help solve these coordination problems within the monetary union and the broader EU. This would foster financial stability and help forestall further financial fragmentation. The European Commission will present proposals for a single supervisory mechanism later in the year. Several models can be envisaged.[20] The ECB could play the role of eurozone supervisory authority for all banks, balancing concerns related to its LOLR role and the need to maintain monetary policy independence, and with some delegation of tasks to national entities. An alternative model is a two-tier system in which the ECB or another body would supervise large or systemic European banks while smaller, local banks would remain under the oversight of national authorities.

29. **While other EU countries should be able to join, the banking union is urgent for the euro area.** Capital flight has dramatic consequences in a monetary union. Deposits move easily with a currency area, and a Deposit Guarantee Scheme covering all euro area depository institutions would help reassure retail depositors that their savings are safe across the EMU. Along similar lines, a euro area bank resolution authority would help prevent the strong bank-sovereign feedback loops to take hold within the currency union. The ECB could play the role of common supervisor, and could be given explicit responsibility for financial stability and full lender of last resort functions, thereby aligning these roles and eliminating bank-sovereign linkages also present in the ECB's current Emergency Liquidity Assistance (ELA) scheme. The framework of the Banking Union should allow other EU countries to opt-in and be consistent with the elements of a financial stability framework and regulations established at the EU level.

F. Conclusions

30. **The eurozone architecture must be completed by creating a Banking Union.** A Banking Union would help delink sovereigns from their banks and would provide incentives to various players to end the financial fragmentation of the eurozone. The Banking Union has three main elements: a deposit guarantee scheme backstopped by common resources, a resolution authority with access to a common fund and a supervisory authority. While a

[19] Tirole, Jean, "The euro crisis: some reflexions on institutional reforms", Financial Stability Review, Banque de France, April 2012.
[20] See for instance Pisani-Ferry, J., Sapir, A., Veron, N., and G. Wolff, 2012, "What Kind of European Banking Union?", June 2012, Bruegel Institute.

Banking Union could operate without fiscal union, it will perform more effectively when elements of a fiscal union providing a clearer framework for fiscal transfers are also in place. The banking union is first and foremost a necessity for the euro area, but should be opened to other EU countries.

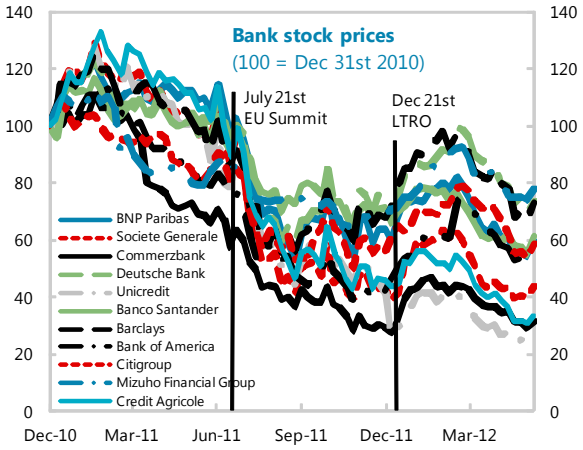
31. **On June 29, the European authorities took important steps forward by agreeing to pursue a key element of a Banking Union and changes in the use of the EFSF/ESM resources.** The European Commission will present proposals for the establishment of a single supervisory mechanism that would involve the ECB, and, contingent on the the single supervisor being in place, allowing the ESM to directly recapitalize banks. However, as the EU Council is asked only to consider the proposals of the EU Commission by the end of 2012, the timing and speed of implementation of these proposals are yet to be clarified.

32. **Although the main elements the Banking Union are well identified, many key details and the path towards the new architecture remain to be clarified.** First, the pros and cons of various possible models of a Banking Union must be weighted carefully to ensure convergence on the most effective financial stability architecture. Second, a clear roadmap towards the full institutional set-up must be prepared, with a clear understanding of transitional and sequencing issues. In this respect, a fast implementation of EU Directives and regulations (such as the bank resolution Directive and the CRDIV/CRR) would provide the initial building block of the new framework, while the ESM/EFSF should urgently be made flexible enough to allow direct equity injections into banks. Third, the path towards the Banking Union cannot be dissociated from the current crisis response; choices in term of banking stability are not independent from other dimensions, including those related to a fiscal union. Fourth, it is essential to identify the aspects of the reform process that will have the largest impact on market sentiment in the short-term. Fifth, the EU dimension remains critical and any steps at the euro area level must be consistent with EU directives and regulations and will require interacting with or reinforcing existing EU institutions (the ESAs, the ESRB). Sixth, while the Banking Union will centralize powers and financing responsibility, the subsidiarity principle will apply to determine the future role of national authorities and their interaction with the supra-national institutions.

Box 1. Sources of Banking Stress July 2011 –June 2012

A panel regression analysis sheds light on the co-movements between bank and sovereign stress since July 2011. The sample contains weekly stock prices and CDS spreads of 58 banks between July 2011 and June 8th 2012, and is split in pre and post-LTRO. The sample of banks contains listed European banks which participated in the 2011 EBA stress tests, while exposures are from the EBA recapitalization exercise. The main econometric specification is as follows: $y_{it} = \beta \cdot X_{it} + \alpha \cdot Exp_{iS} + \mu \cdot Exp_{iS} \cdot p_{St} + \eta \cdot Z_i \cdot q_t + \varepsilon_{it}$, where y_{it} is the weekly stock return or percent change in CDS spreads for bank i during week t net of the average market return, X_{it} is a vector of bank characteristics, Exp_{iS} is exposure of bank i to sovereign S in percent of common equity, p_{St} is the weekly percent change in 10 year government bond yield or 5 year CDS spread, Z_i is either the wholesale funding ratio of total derivative assets and liabilities in percent of total assets, and q_t is either the percent change in the VIX or in the 3 month euribor-OIS spread.

Before the LTRO, CDS spreads and equity returns of European banks co-moved positively with the stress experienced by the Italian and Spanish sovereigns, in proportion of their exposures. Banks more exposed to the Italian and Spanish sovereigns experienced higher declines in stock prices (respectively higher increase in CDS spreads) when bond yields (respectively sovereign CDS spreads) soared. This co-movement was economically significant mostly for domestic banks with very large exposures to their sovereign. Whereas weekly stock price declined by 2 percentage point between July and end December on average, the impact of the median weekly increase in Italian bond yields on weekly stock prices was economically significant (about 1 percentage points weekly) only for the top 10 percent banks with the largest exposures to the Italian sovereign. Similar conclusions hold for exposures to the Spanish sovereign.



Source: Bloomberg L.P.

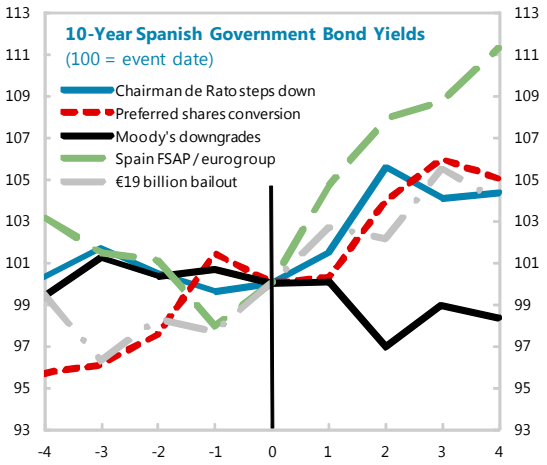
Before the LTRO, banking stress also appeared higher for core EA banks very active in derivative markets. Banks with higher derivative assets and liabilities experienced significantly higher stress in equity markets when volatility soared between July and the end of 2011. The top 10 percent banks with the largest activities in derivative markets experienced, at the mean change in the VIX, higher declines in weekly stock price of about 2 percent on average before the LTRO. After the LTRO, as funding and derivative market stabilized, these dimensions had insignificant impact on banking stress.

After the first LTRO, large exposures to the Italian and Spanish sovereign became indicators of bank stress, irrespective of yields of CDS spreads movements for their sovereigns. Banks with the top 10 percent largest exposures to the Italian and Spanish sovereigns (e.g. domestic banks) underperformed their peers in equity markets by 3-4 percentage points weekly. Portuguese bank equity prices also started to commove with domestic government bond yields. Surprisingly, equity market stress of banks with larger exposures to the Spanish (or Greek) sovereign started to commove negatively with stress in government bond markets, perhaps because higher initial exposures reflected higher losses through the PSI (Greece) or increased purchased of Spanish government bonds by domestic banks already highly exposed. Higher activity in derivative markets or higher reliance on wholesale funding was no longer a source of stress.

Box 2. Event Study: Bankia and Spanish Sovereign Borrowing Costs

The take-over of Bankia by the Spanish government provides a unique opportunity to assess the link from bank to sovereign balance sheet. Bankia was established in December 2010 by the merger of seven savings banks, and was initially owned by the holding company Banco Financiero y de Ahorros (BFA). In July 2011, Bankia went public through an IPO of about €4 billion of shares. As of end 2011, BFA-Bankia was the fourth largest banks in Spain with total assets of about 30 percent of GDP and the largest holder of real estate assets. On May 7th 2012, Bankia Chairman Rodrigo de Rato stepped down while the government announced the take-over of Bankia. On May 10th, the government converted its €4.5 billion of preferred shares in Bankia's parent BFA into voting shares, thus obtaining a controlling stake in Bankia. On May 25th, it was reported that Bankia had negotiated a further €19 billion injection. Spain had become the new focal point of the euro area banking-sovereign crisis.[21] Following the publication of the FSAP of the Spanish financial system, the Eurogroup announced on June 9th its willingness to commit financial support to the Spanish government through an EFSF/ESM loan of up to €100 billion for the recapitalization of financial institutions.

The event study suggests that the Bankia episode had a clear negative impact on the Spanish sovereign borrowing costs. Focusing on windows of ±4 days before and after each of the four events above-mentioned, we find that sovereign borrowing costs (on 10 year government bonds) rose on average by 40 bps, while spreads on 5 year sovereign CDS contracts rose by 37 bps on average.[22] This evidence suggests that concerns about the fiscal cost of bailing-out a large financial institution adversely affected the borrowing costs of the Spanish government, possibly because of the anticipated impact on the debt dynamics.



Sources: Bloomberg L.P.; and IMF staff calculations.

An alternative hypothesis for the increase in the sovereign borrowing costs *during these events* does not appear to be supported by the data.[23] A deteriorating macroeconomic outlook could explain the increase in sovereign borrowing costs. Such a slower moving concern could affect the sovereign directly (through the primary fiscal balance) and indirectly through banks' health. Two pieces of evidence provide limited support that the outlook explained the increase in yields or CDS spreads during these events. First, during the month of April before the need to support Bankia became headlines, the average increase of the sovereign yields (respectively CDS spreads) during similar windows of 9 days was "only" of 10 bps (respectively 15 bps). Second, on May 18th, Moody's announced the downgrade of the 3 largest Spanish banks (Santander, BBVA and La Caixa) by three-notches, and argued it was justified by the deteriorating Spanish economy and the reduced creditworthiness of the government. The downgrade had no visible impact on sovereign yields or on sovereign CDS spreads within 4 days of the announcement.

[21] See for instance Christopher Bjork (25 May 2012). "Spain to Inject €19 Billion into Bankia, Troubled Lender Says". *The Wall Street Journal*.

[22] There was however no increase in CDS spreads following the announcement of the Eurogroup loan. This could be expected since the loan by itself does not worsen the debt dynamics.

[23] Other events during the period considered included various press reports of deposit flights, rumors of the audits of Bankia, sovereign downgrades in April and June, and financial sector reforms announced on May 11. The study does not control for concerns about elections in Greece.

II. FISCAL INTEGRATION IN THE EURO AREA[1]

More fiscal integration with stronger governance and more risk sharing can reduce the threat that economic shocks in one country endanger the euro area as a whole. The example of other currency areas suggests that transfers, centralized provision of public goods, or common financial stability backstops can be effective tools to mitigate regional shocks. But risk sharing needs to be anchored in a powerful governance framework that provides for better coordination of fiscal policies and limits moral hazard. The starting point of the euro area is unique, but a clear roadmap towards a fuller fiscal and financial union could anchor expectations. A limited and scalable introduction of common debt with appropriate governance safeguards could support the creation of a banking union and signal a strong intermediate commitment to a fuller fiscal union.

A. The Case for Fiscal Integration in the Euro Area

Adjustment under a common currency

1. **In a common currency area, the burden of adjustment to idiosyncratic shocks falls on factor mobility, price flexibility, and supporting financial and fiscal policies.** The literature (e.g., Mundell 1961, Kenen 1969) identifies labor and capital mobility, as well as price and wage flexibility as key characteristics for an optimal currency area. Absent exchange rate adjustments, internal flexibility is necessary to absorb economic shocks.

2. **Sharing fiscal risks and protecting against negative fiscal externalities are valuable where economic adjustment to country-specific shocks is less than perfect**. Where labor mobility is low, intra-area capital flows are volatile, and structural rigidities are impeding price adjustment and reallocation of resources, fiscal and financial policies will have to take on some of the adjustment burden. Risk sharing[2] tools can limit the impact of regional shocks and help prevent contagion, and, if accompanied with appropriate governance arrangements, can also safeguard against excessive debt taking of regions.

Where does the euro area stand?

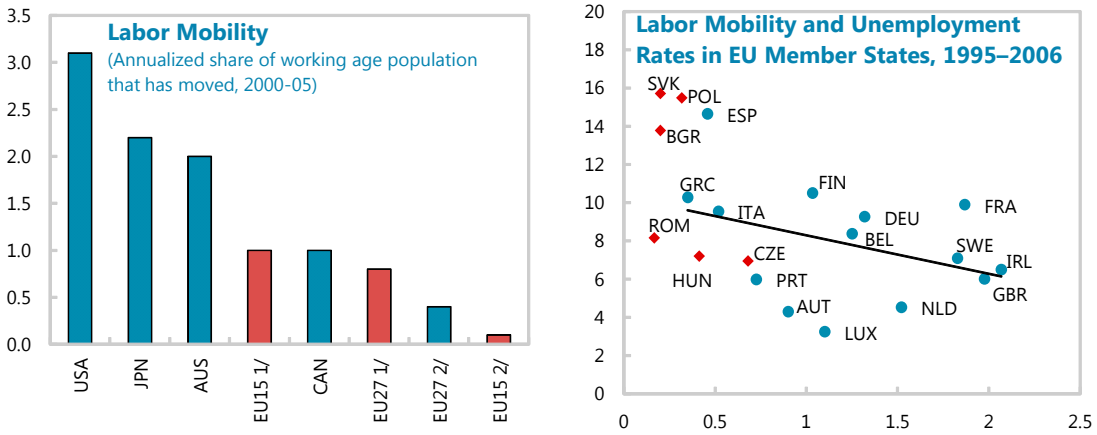
3. **Limited labor mobility in the euro area impedes adjustment to idiosyncratic shocks.** If workers move in response to differences in wages and job opportunities, they reduce disparities in unemployment rates and real wages across regions (see, e.g., World Bank 2010; Sharpe et al., 2007). However, while there is some evidence that labor mobility in the euro area has increased in response to the crisis, it remains fairly limited. Only about 1

[1] Prepared by Helge Berger (EUR), Fabian Bornhorst (EUR), Esther Perez-Ruiz (EUR), Jimmy McHugh (FAD), and Tigran Poghosyan (FAD).

[2] In this context, risk sharing broadly includes those risks stemming from short term idiosyncratic real and financial shocks as well as those associated with financial instability and slow structural adjustment.

percent of the working age population changes residence within their country in a given year, and even less move between euro area countries. This compares to about 3 percent in the US, 2 percent in Australia, and slightly less than 2 percent in Canada (Figure 1). Obstacles to labor mobility within the euro area include cultural and language barriers, distortions in housing markets, limits to the portability of pensions, and, more generally, the absence of a cross country social safety net.

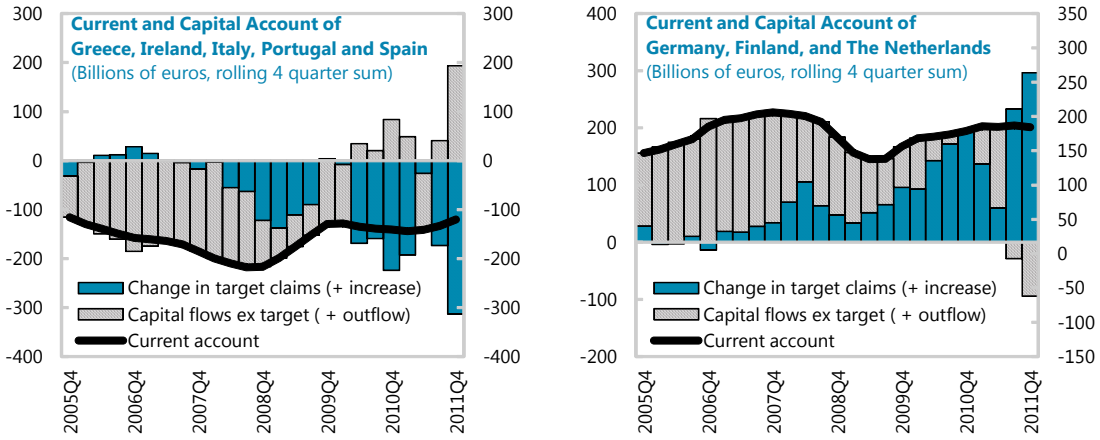
Figure 1. Labor Mobility in the Euro Area Is Low



Sources: WEO; European Commission; Bonin et al. 2008; and Staff estimates.
1/ Mobility within countries.
2/ Mobility between countries.

4. **Capital moves freely across the euro area, but is susceptible to sudden swings that challenge financial stability.** Free flowing capital can facilitate real convergence in a common monetary area, and promotes the deepening of financial markets. At the inception of the Economic and Monetary Union (EMU), the perceived absence of sovereign risk contributed to rapid financial integration. Cross border credit increased rapidly with capital flowing mainly from the core to the periphery. It was widely considered that the common currency increased integration of financial markets, which would help smooth asymmetrical shocks. But the vulnerabilities that rapid financial integration could harbor were overlooked, as hopes of a "stronger and fitter" banking sector (ECB, 1999) did not materialize. By 2008, however, financial integration reversed its course. Cross border investment positions unwound quickly, core countries became recipients of net private capital flows (Figure 2), and the cross border interbank market became impaired, posing challenges for financial stability.

Figure 2. Private Capital Flows Have Reversed



Sources: Haver Analytics; IFS; and IMF staff calculations.

5. **The lack of a common backstop for financial system stability generates adverse feedback loops between the financial sector and sovereigns and fuels contagion**.[3] Absent strong common regulation, supervision, resolution powers, and deposit insurance, all supported by sufficient supra-national backstops, the integrated financial market makes banking problems hard to prevent and contain. Given the size of national banking systems, the resulting problems can overwhelm the fiscal capacity of individual sovereigns. At the same time, banks have significant exposures to their sovereigns. Consequently, the sharp rise in some sovereign risk premia, often coming on top of rapidly deteriorating macroeconomic conditions, further fuels contagion.

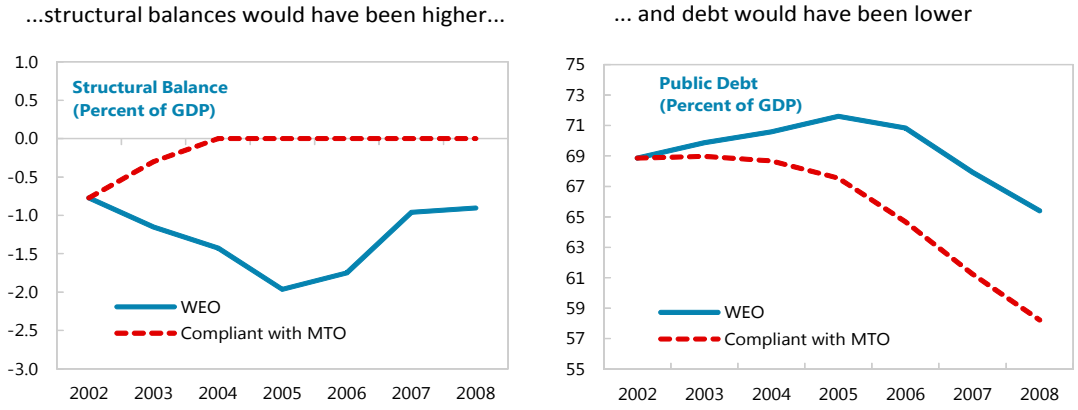
6. **Wage and price flexibility in the euro area is limited, slowing the correction of macroeconomic imbalances.** Such flexibility is important to guide the reallocation of resources in the event of idiosyncratic shocks. The euro area saw rapid convergence in nominal interest rates since the mid-1990s, but price levels in the periphery picked up more rapidly than in the core. This kept real interest rates at very low levels and fuelled demand in periphery countries. Meanwhile, real convergence lagged behind as wage increases outpaced productivity gains, contributing to large competitiveness gaps and growing current account imbalances (see, among others, Mongelli and Wyplosz, 2009). Even after the crisis began, with few exceptions (e.g., Ireland), prices and wages have not responded strongly to deteriorating macroeconomic conditions, often because of prevalent labor market rigidities (Jaumotte and Morsy, 2012 and Lebrun and Perez, 2011), contributing to a lengthy and costly adjustment process.

[3] See *The Eurozone Crisis and the Sovereign-Bank Nexus: The Case for a Eurozone Banking Union*, Euro Area 2012 Article IV Consultation: Selected Issues.

Insufficient risk sharing and governance

7. **With market adjustment slow or incomplete, weak fiscal governance and lack of fiscal risk sharing are particularly costly.** The EU budget is small and was not designed as a risk sharing tool. As a consequence, it provided little help to crisis-hit countries.[4] At the same time, the Stability and Growth Pact (SGP) failed to encourage the creation of sufficient fiscal space.[5] Estimates suggest that strict adherence to structural targets during 2000-07 would have reduced debt by about 7 percent of GDP by 2007, all other things being equal (Figure 3). As a result, with neither sufficient national buffers nor common backstops available, shocks hitting any one member country could grow into a problem affecting all of the area.

Figure 3. Had Countries Complied with the Medium Term Objectives (MTO)... 1/



Sources: WEO; and IMF staff calculations.
1/ Medium Term Objectives are country specific objectives set under the preventive arm of the Stability and Growth Pact (SGP).

8. **In sum, the euro area can be characterized as an area with incomplete internal adjustment mechanisms and insufficient policy coordination.** In particular, the absence of common fiscal and financial policy tools could not compensate for low factor mobility, high nominal rigidity and poor fiscal coordination. And while the crisis brought the introduction of ex-post risk sharing facilities, resort to EFSM/EFSF/ESM is an economically and politically costly way of mutualizing risks after their realization that so far has failed to deliver lasting improvements in confidence and financial conditions.

[4] The EU budget collects contributions from and allocates funds to member states according to rules, for example, the EU common agriculture and cohesion policies (from the expenditure side) and the current system of contributions based on the VAT and GNI resources (on the revenue side). The allocation principles in the common EU budget reflect primarily regional and redistribute concerns, not necessarily fiscal risk sharing.
[5] Much of this was recognized early on. See Bornhorst and others (2012) for a review of the early literature on the euro area. For example, Bordo and Jonung (1999) review the formation of currency areas and conclude that, more often than not, political considerations explain the introduction of common currencies before the economic criteria for an optimal currency area fulfilled.

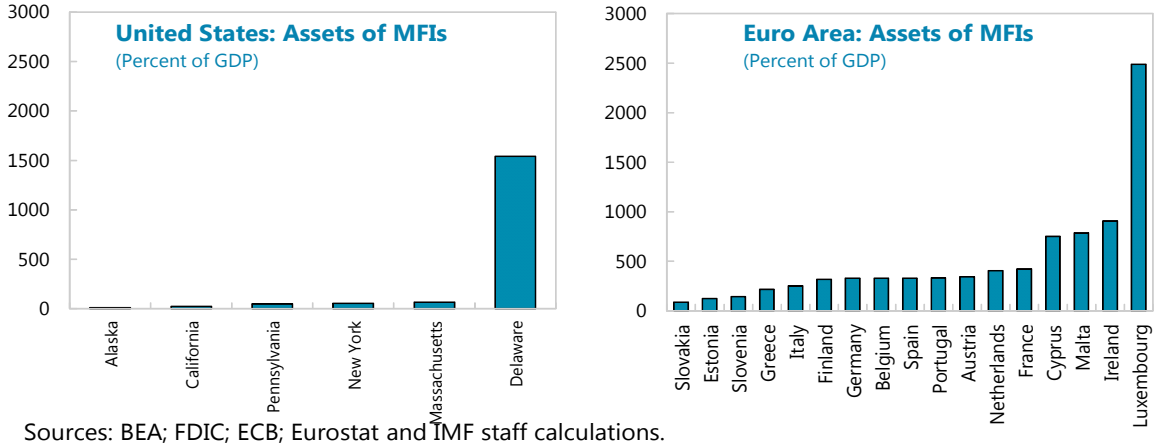
B. What Makes Currency Areas Viable?

9. **Among all the preconditions for a viable currency union, which ones have proved most critical elsewhere?** Existing currency areas feature a high degree of fiscal and financial integration, often with strong governance requirements and formalized mechanisms of ex-ante insurance against fiscal and financial risks that prevent contagion. The question is which are essential institutional features that would be worth examining from an euro area perspective.[6]

Fiscal risk sharing

10. **Common backstops for the financial system enhance financial stability.** Such frameworks usually include area-wide supervision as well as deposit insurance and resolution frameworks with a common backstop. Besides multiplying the strength of regional backstops, centralized backstops also prevent the emergence of (negative) links between banks and sovereigns. In the U.S., for example, the banking sector is distributed heterogeneously across states, but the Federal Deposit Insurance Corporation (FDIC) insures deposits regardless of the state of registration, and acts to resolve banks countrywide (Figure 4).

Figure 4. Euro Area Banks Are as Large as Their US Counterparts, but Lack a Common Financial Sector Backstop



Sources: BEA; FDIC; ECB; Eurostat and IMF staff calculations.

11. **Risk sharing mechanisms help smooth the impact of macroeconomic shocks**. These mechanisms typically include tax sharing arrangements and transfers from the central to regional government, and feature in unitary as well as federal states.

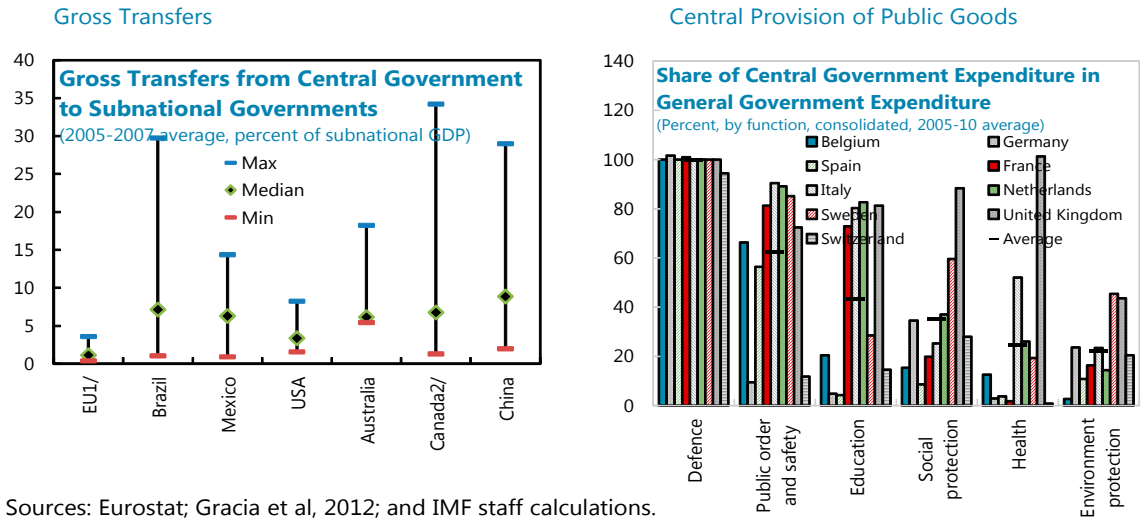
- While the institutional arrangements can differ, these transfers typically respond to cyclical developments at the regional level, providing insurance against idiosyncratic shocks as well as to income differences across regions (Figure 5).

[6] For related discussions see, among others, Bordo et al. (2011) and Henning and Kessler (2012).

- Staff analysis finds that, on average, a 1 percent increase in a region's output gap can lead to an increase in central government transfers offsetting between 5 and 20 percent of the income shock (Box 1). This is consistent with past findings that risk sharing could smooth about 10 to 20 percent of regional income shocks (Melitz and Zumer, 2002; von Hagen, 2007).
- Such risk sharing can occur at different frequencies. Indeed, transfer for risk sharing purposes might be difficult to disentangle from "redistributive" transfers aimed at mitigating income differentials: what may look like an attempt to equalize incomes across regions could be the sharing of fiscal risks resulting from slow-moving technological and structural change or gradual shifts in the global environment.[7]

12. **In many currency areas, centrally provided goods and services act as an additional insurance against risks**. In addition to potential economies of scale, the central provision and financing of public goods and services also entails an element of fiscal risk sharing. This is because during a downturn a region's relative tax contribution to finance a centrally provided public good or service will fall, while the benefits from these goods and services remain unchanged. Even though the degree of centralization varies reflecting differences in preferences or historical and political developments (Figure 5), central government spending is a significant share of general government in a number of countries.

Figure 5. Elements of Fiscal Integration



Sources: Eurostat; Gracia et al, 2012; and IMF staff calculations.
Note: Excludes tax sharing arrangements.
1/ For EU, spending of EU budget, data for 2008.
2/ Excludes region of Nunavut which receives 77 percent of GDP in gross transfers.

[7] For example, within Germany's fiscal equalization scheme some *Länder* have been net beneficiaries for many decades before becoming net contributors and vice versa, reflecting for the most part structural change.

Box 1. Risk Sharing and Redistribution

To assess the potential importance of fiscal risk-sharing through transfers within existing currency areas, this analysis examines the extent to which central government transfers in large federations act as a regional stabilization mechanism. The approach adopts the empirical framework by Rodden and Wibbels (2010) and focuses on gross transfers from the central government. It excludes tax sharing arrangements or other tools of risk sharing such as the central provision of public goods or services.

A panel regression is estimated for a sample of six federations, namely Australia, Brazil, Canada, China, Mexico and the United States. The dependent variable is transfers from the central government to sub-national or regional budgets, expressed as a ratio of state GDP. Two explanatory variables are considered:

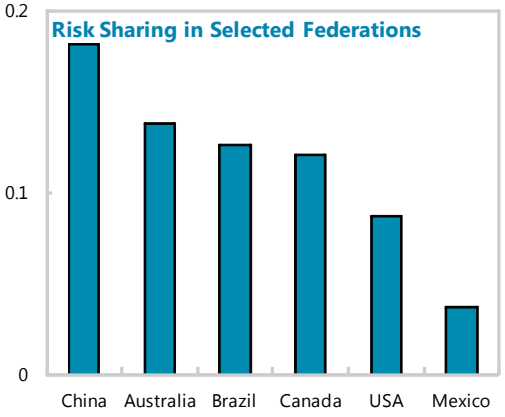
$$\left(\frac{CGtransfers}{GDP}\right)_{it} = \beta_1 * GDPpc_{it} + \beta_2 * GDPgap_{it} + \alpha_i + \varepsilon_{it}$$

where i and t indices denote regions and time, respectively, *GDPpc* is real per capita GDP, *GDPgap* is the output gap, α are regional fixed effects, and ε is an error term. Negative and significant coefficients for β_1 and β_2 quantify the relative weight of each of the factors driving fiscal policy decisions.

In all countries, transfers respond significantly to a variation in the regional output gap, offsetting between 5 and 20 percent of cyclical fluctuations. The hypothesis that gross transfers respond to the level of per capita income in regions is, however, only supported in a couple of federations.

Figure B1. Regression Results

	Australia	Brazil	Canada	China	Mexico	USA
Real per capita GDP	0.18	-2.04	-2.74	6.91***	-0.02	3.83***
	(0.02)	(-1.16)	(-0.51)	(8.44)	(-0.03)	(3.53)
Output gap	-0.14***	-0.13***	-0.12**	-0.18***	-0.04**	-0.09***
	(-5.06)	(-7.79)	(-3.02)	(-4.33)	(-2.51)	(-7.12)
Constant	9.00**	-23.45	4.00	-51.32***	7.13	-7.85**
	(2.86)	(-0.83)	(0.23)	(-7.41)	(0.67)	(-2.42)
Obs	98	390	192	419	248	672
R-squared	0.34	0.24	0.02	0.44	0.02	0.21
States	8	26	13	30	31	48



Source: Gracia et al. (2012).

Notes: The estimations are performed using the fixed effects estimator. *, **, and *** denote significance at the 10, 5, and 1 percent levels, respectively. The chart shows the percentage change in federal transfers to state GDP in response to a 1 percentage point decline in a state's output gap.

Strong governance

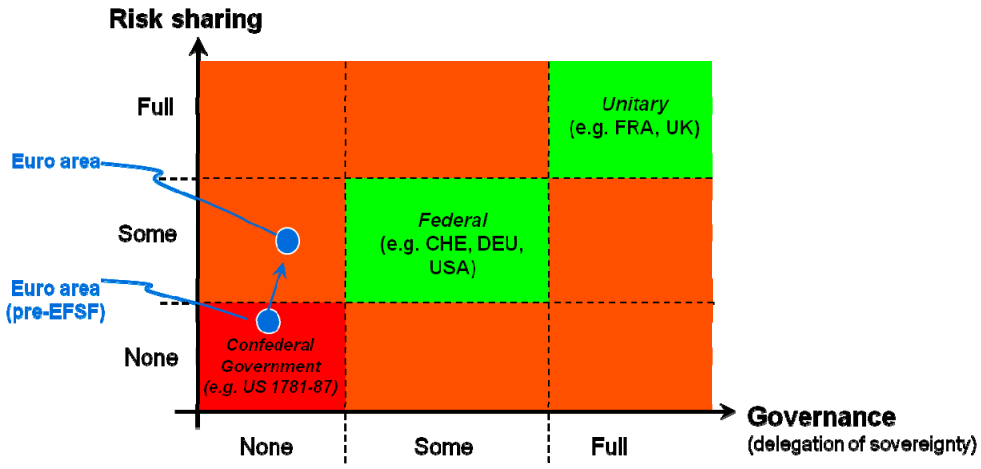
13. **Strong governance helps other currency areas overcome moral hazard.** Risk pooling naturally involves moral hazard and many currency areas complement fiscal risk sharing with governance frameworks that limit regional fiscal sovereignty and encourage fiscal behavior in accordance with commonly agreed standards.

- A common element of fiscal integration is a center with area-wide tax authority. For example, where public goods are provided centrally, the center usually has some national tax authority over all regions.
- Where transfers are a significant part of regional income, the center often has the right to intervene more directly in the regions' public finances.
- Many federations use legally enforceable fiscal rules to ensure that regional fiscal positions are sustainable (e.g., balanced budget rules for states in U.S., the debt brake rule for Germany's *Länder*).

14. **Risk sharing does not presume no-bailout.** Bailout arrangements for subnational or regional entities differ widely across currency areas: they can be formalized, occur ad-hoc, or be explicitly banned (e.g., no-bailout clauses). Where bailout arrangements exist, their deployment combines a loss of regional fiscal sovereignty in return for resources from the center. In other settings, bailout mechanisms are absent. But where no-bailout clauses exist, they are enforced against a background of effective risk sharing that ensures regional risks are mitigated (e.g., through transfers and a common financial sector backstop) and a minimum provision of (centrally provided) public goods and services.

15. **In sum, fiscal integration in other currency areas tends to combine risk sharing and governance.** Federal and unitary states take different positions along these two dimensions. In unitary states (e.g., France, U.K.) revenue and expenditure policies are determined mostly centrally for the entire territory and, as a consequence, a high degree of fiscal risk is shared. Thus, for regions, external governance is high (or fiscal sovereignty is low). By contrast, federation states (e.g., Germany, Switzerland, and the U.S.) are characterized by a somewhat lower degree of both risk sharing and delegation to the central government. Even lower degrees of risk sharing and external governance exist among confederations where the currency is not common, such as European Union or the Commonwealth of Independent States (see Figure 6 for a stylized illustration).

Figure 6. Dimensions of Fiscal Integration



C. What Are the Options for the Euro Area?

General considerations

16. **There are various approaches to designing fiscal integration.** One approach would follow the subsidiary principle and allocate all fiscal functions to the central level for which the benefits in terms of economies of scale and positive externalities outweigh the costs. This would have to be matched by adequate financing and democratic accountability.

- **Functions:** A key central function would involve preserving economic stability following idiosyncratic shocks, primarily by insuring regions against fiscal risks, and providing a common backstop of the financial system.
- **Financing:** A sufficiently sized central budget could match specific expenditure programs with centrally controlled sources of taxation or other revenue. Extra-budgetary solutions could be used to finance specific central functions, for example in the financial sector. Common borrowing could be used to support any of these functions but could also offer ways of horizontal risk sharing between regions.
- **Accountability and governance:** With fiscal devolution to the center, democratic accountability would ensure that taxpayers have leverage on policy decisions. At the same time, with moral hazard being part of any insurance or risk-sharing mechanism, strong governance safeguards are needed at the regional level.

17. **Making EMU a more viable currency will require more integration, even if convergence towards long term solutions can only happen with time**. The starting point of the euro area is unique. The crisis has revealed powerful diverging forces, and while policymakers have responded with bold measures, the viability of the euro area is still being tested. While no readymade blueprint exists, a credible roadmap toward a robust monetary union will have to include intermediate progress toward risk sharing and a substantial reorientation of sovereignty.

Intermediate steps toward risk sharing

18. **An effective immediate step towards greater risk sharing would be to provide a common fiscal backstop for a banking union.**[8] Such a backstop, which could take the form of common debt (see below), would resolve many of the exacerbating factors of the crisis: among other things, it would help break the adverse feedback loops between banks and sovereigns and prevent further financial market fragmentation. To align incentives, delegation of responsibilities (e.g., for deposit insurance or bank resolution) would have to

[8] For a full discussion, see *The Eurozone Crisis and the Sovereign-Bank Nexus: The Case for a Eurozone Banking Union*, Euro Area 2012 Article IV Consultation: Selected Issues Paper.

go hand in hand with delegation of oversight (e.g., supervision and resolution) to designated common institutions.

19. **Common borrowing could provide such a backstop, ensure market access for sovereigns under stress, and create safe assets for the banking sector**. One option would be the introduction of limited and scalable Eurobonds. Among the many proposals discussed (see Table 1 in the Appendix) two are worth particular attention. One temporary approach is to make countries responsible for their own future fiscal policies, using common borrowing only to cover a certain amount of legacy debt, and reestablishing market discipline in the longer term (e.g., the mutualization of debt in excess of 60 percent of GDP as in the European Redemption Fund proposal). Another approach is to start with limited common borrowing (e.g., Eurobills) that could be scaled up in the future. Alternatively, extra-budgetary approaches, for example borrowing for specific purposes, either through established institutions (e.g., the European Investment Bank) or new projects ("project bonds") could also be considered. However, their benefits are limited because of the small size and low degree of risk sharing they offer.

20. **Eurobills and the Debt Redemption Fund go some way in overcoming implementation hurdles associated with changes in national and European law.** Common debt issuance can be designed in different ways (see e.g., IMF, 2012), but typically involves far-reaching changes to the current political and legal arrangements in the euro area. Against this background, proposals such as those of Hellwig and Philippon (2011) and the German Council of Economic Experts (2011) can be implemented more expeditiously, and could be a powerful vehicle to build trust:

- Eurobills would be joint and several liability instruments with maturity of less than one year, covering up to 10 percent of each country's own GDP. Participating countries would be unconstrained for long maturities, making Eurobills politically palatable for strong creditors. Participation could be made conditional on meeting fiscal targets. Based on mutual trust, Eurobills could be scaled up and/or their maturity lengthened.
- The Debt Redemption Fund implies the gradual transfer of debt exceeding 60 percent of GDP into a fund for which EMU members would be jointly and severally liable. Participating countries would repay its transferred debts within a total of 25 years. The participation in the fund would be conditional on a debt reduction plan and the adoption of structural reforms. To ensure creditworthiness countries would be required to deposit collateral and earmark part of the tax revenues for fulfilling payment obligations.

The need for more governance

21. **Regardless of the specific options chosen, the roadmap towards more fiscal integration would also need to spell out the governance requirements.** Partial schemes of common borrowing are one safeguard against moral hazard. Other possibilities are collateral mechanisms and stronger centralized governance.

- *Partial Eurobonds:* Tranching under partial Eurobond schemes could mean that countries enjoy lower average borrowing costs, while incurring higher marginal borrowing costs when issuing beyond the common debt framework. This feature of Eurobonds would make it easier to service outstanding debt and at the same time create incentives to reduce debt, and mitigate moral hazard.[9] Restricting common debt issuances to short maturities and making participation conditional on fiscal behavior would strengthen incentives not to deviate from agreed consolidation plans debt because debt would have to be rolled over frequently.
- *Collateral mechanisms:* Common borrowing in existing federations is often backed by a federal government with capacity to levy taxes, reassuring investors that debt will be paid back. By contrast, Eurobonds, along the lines discussed above, would have no single treasury to back them—at least in the near future. To overcome the lack of joint fiscal support, participants should commit collateral to guarantee future payments. Present assets and/or future revenues could be used as collateral. Specific (surcharges on) taxes or assets (e.g., currency and gold reserves) could be pledged for that purpose.
- *Central governance*: Recent reforms make stricter oversight of national policies possible.[10] Options to further strengthen governance include: time-bound commitments to improve fiscal transparency; the obligation of periodically publishing comprehensive fiscal risk assessments; time-bound commitments to improve budgetary practices, including top-down budgeting, moving to accrual accounting and conducting regular spending reviews; and the consent to annual auditing of public accounts conducted by independent parties.

[9] It has been argued that Eurobonds are one application of the Modigliani-Miller theorem, which says that the value of a firm is not affected by the way its liabilities are structured, limiting the gains to be realized by common debt. However, if joint and several guarantees succeed in shielding countries from being pushed into a bad equilibrium, the underlying risk of participants would decline.

[10] Fiscal governance is being upgraded since 2011 around the "six pack", the Fiscal Compact, and the "two pack" (see *Fiscal Consolidation under the SGP: Some Illustrative Simulations*, Euro Area 2012 Article IV Consultation: Selected Issues).

D. Conclusions

22. **A more viable EMU involves more fiscal and financial integration.** In view of low labor mobility and volatile capital flows, the euro area needs to embrace fiscal and financial policies that entail a higher level of risk sharing to respond more effectively to idiosyncratic regional shocks. Greater fiscal integration would help centralize macroeconomic and financial stabilization, provide ex ante insurance against risks, and this would also signal strong commitment to making EMU a closer union.

23. **Although getting to the endpoint of fiscal integration will take time, intermediate steps should be considered**. The limited but scalable introduction of common debt, with appropriate governance safeguards would help break the adverse feedback loop between banks and sovereigns, support the development of a banking union, and be a step towards a closer fiscal union.

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Table 1: Proposals for Common Euro Area Sovereign Debt: Main Features

	Eurobills Hellwigh/ Philippon (2011)	**European Redemption Pact** German Council of Economic Experts (2011)	**Blue/Red Proposal** Delpla / Von Weizsäcker (2010)	**ESBies** Brunnermeier et al. (2011)	**Stability Bonds** European Commission Green paper		
					Full joint and several liability (JSL)	Partial joint and several liability (JSL)	Several liability
Concept	Eurobills JSL with maturity of less than one year; countries give up their right to issue short term debt; Scale up and/or lengthen maturity later to evolve into Eurobonds	Gradual transfer of debt exceeding 60 percent of GDP into fund alongside payment obligations such that each country repays its transferred debts within 25 years	Blue bonds are JSL; red bonds are any national debt beyond a country's blue bond allocation	Securitization of existing sovereign debt into a safe tranche (€3.8 trillion) and a risky tranche (€1.7 trillion); new securities are not JSL	Euro Area sovereign debt is fully covered by JSL bonds	JSL bonds replace a limited portion of national issuance	Stability bonds underpinned by pro-rata guarantee partially replace national issuance; ESM is kept as a separte issuer for emergency financing
Principal objectives	Reduce liquidity risk premia; sever the banking-sovereign feedback loop	Serve as bridge to a long-term stability structure ensuring adherence to FC and SGP, create safe asset by issuing own bonds covering the participating countries' refinancing requirements during roll-in phase.	Achieving both higher and lower yields at the same time. Higher yields are early signal to irresponsible fiscal behavior. Lower yields desirable to reduce the cost of debt for taxpayers	Create a large pool of safe assets ; sever the banking sovereign-feedback loop; stabilize and diversify capital flows	(To varying degrees depending on the scheme) Alleviate liquidity constraints of distress sovereigns; reduce liquidity risk premia; assure high quality collateral for financial institutions; promote international role of the €		
Seniority	Eurobills are senior to other debts	Unspecified	Blue bonds are senior to red bonds; red bonds take the hit of default	Safe tranche is senior; risky tranche takes the hit of default	Only one class of bonds available in the market	Senior to national debt	Senior to national debt
Life span	Non open-ended commitment	Self unwinding when debt is redeemed (20-25 years)	Open-ended commitment	Non open-ended commitment	Open-ended commitment	Open-ended commitment	Open-ended commitment
Funding degree	Up to 10 percent of Euro Area GDP (= US Treasury billsshare in of US GDP)	Debt of EMU countries exceeding 60 percent of GDP, around EUR 2.3 trillion.	JSL up to 60 percent of each country's GDP, national debt for the remainder	Up to 60 percent of Euro Area GDP. The weight of each country's debt is equal to its share in the Eurozone's GDP. Some adjustment to sovereign risk could be considered	100 percent of Euro Area GDP	Quotas linked to policy compliance. No optimal calibration suggested	Unspecified
Authors' perspective on the legality	No Treaty change	No treaty change	Treaty change	No Treaty change	Treaty change	Treaty change	No Treaty change
Institutional set-up	A joint debt management office (DMO) allocates bond quota and issues Eurobills	European redemption fund to issue debt covering financing needs of participating countries up to cap	An independent stability council (ISC) allocates bond quota, countries issue themselves; allocations proposed by ISC are voted on by natinal parliaments	A debt agency buy on the secondary market sovereign debt	While countries could issue SBs on a decentralised basis, creating a single euro-area DMO would be more efficient. On who would play this role, it is suggested (i) a new DMO could be created; (ii) the EFSF/ESM could become a full-scale DMO; (iii) the EC acts as DMO		
Participation	All Euro Area countries	All non-program Euro Area countries	Voluntary, but opting out is a bad signal	All Euro Area countries	All Euro Area countries	All Euro Area countries	All Euro Area countries
Calculation of rates	Market determined rates	Market determined rates	Market determined rates	Market determined rates	While yields on SBs would be market-based, funding costs might be		

Table 1: Proposals for Common Euro Area Sovereign Debt: Main Features (concluded)

	Eurobills Hellwigh/ Philippon (2011)	**European Redemption Pact** German Council of Economic Experts (2011)	**Blue/Red Proposal** Delpla / Von Weizsäcker (2010)	**ESBies** Brunnermeier et al. (2011)	**Stability Bonds** European Commission Green paper		
					Full joint and several liability (JSL)	Partial joint and several liability (JSL)	Several liability
Likely gains	No quantification provided	Financing costs can be expected to fall within a range of around 2.5-3 percent. But higher yields also seem possible given market uncertainty at present.	30 basis point reduction in the liquidity premium	Based on conservative assumptions, default of the safe trance unlikely. ESBies would thus command a yield similar to German bonds; junior tranche would yield about 6 percent	Large reduction in liquidity premium; no estimates provided	Medium reduction in liquidity premium; no estimates provided	Lower liquidity effect; no estimates provided
Costs	Eurobills only take over short end of market. No further quantification provided	Bonds issued by the DRF would be comparable to Bunds in terms of liquidity and default risk, but there would be no currency risk left. Germany's refinancing costs would thus rise to between 2.5-3 percent.	No quantification provided	Even AAA rated countries could gain substantial amounts from these liquidity improvements. No quantification provided.	Strong shift of benefits from higher to lower rated countries	Smaller shift of benefits from higher to lower rated countries	No impact across countries
ECB's role	ECB not meant to buy Eurobills. If it does, countries must repurchase them within one quarter	Unspecified	Unlike blue bonds, red bonds are not accepted by ECB as collateral	ECB accepts safe tranche as collateral	ECB accepts SBs as collateral		
Moral hazard	Short maturity means credible seniority and easy monitoring	Low due to governance safeguards	The bligation to introduce CACs for red bonds facilitates orderly defaults, increases the marginal cost of public borrowing, and enhances fiscal discipline	With ESBies, the guarantee is provided by the pool of bonds, not by any future fiscal revenues as with Eurobonds. Moral hazard does not apply	High	Medium, but coupled with market incentives for fiscal discipline	Low, but stronger market incentives for fiscal discipline
Conditionality	Participation in Eurobills emissions is conditional on budgetary discipline	Continued participation in the fund conditional implementing debt reduction plan.	Countries with credible fiscal policies are allowed to borrow up to the full 60 percent of GDP; weaker fiscal performers borrow a lower proportion of GDP in blue Bonds	Unlike Eurobonds, ESBies to not require tight fiscal policy coordination among countries	Increased surveillance and instrusiveness in the design of national fiscal policies; seniority of debt service over any other spending; failing countries could be put under some form of "administration"		
Transition to new regime	Eurobills phased in as soon as DMO is created	Roll in phase is part of the design	All the legacy government debt is senior to the red debt but junior to the blue debt. Legacy debt would be gradually replaced by the blue and red tranches. The transition should in effect be completed after a decade	A target of issuing 60 percent of Euro-Area GDP would be reached via monthly issues over 5 years	Both accelerated and gradual phase-in are possible. Accelerated schemes allow for quick materialization of benefits but pose higher risk to market disruption		

III. FISCAL CONSOLIDATION UNDER THE SGP: SOME ILLUSTRATIVE SIMULATIONS[1]

A. Introduction

1. **The Stability and Growth Pact (SGP) continues to be at the core of European Union (EU) fiscal governance** (Figure 1). The SGP was put in place in Maastricht to avoid excessive deficits and debt levels. However, fiscal slippages during the first decade of the Economic and Monetary Union (EMU) led to high vulnerabilities during the crisis (Perez, 2011). To remedy past flaws, EU fiscal governance is being upgraded around a number of reforms focusing on intertwined objectives. These include tighter national enforcement of EU fiscal rules (implementation of the Directive on national fiscal frameworks under the "six-pack" and automatic correction mechanisms under the "Fiscal Compact"); expanded surveillance over internal and external imbalances (through the Excessive Imbalances Procedure introduced under the "six-pack"); and enhanced EU oversight of national budgetary processes ("two-pack"). Underpinned by these complementary processes, the SGP occupies a central role in the EU fiscal framework.

2. **Both the scale and speed of consolidation in EMU countries are influenced by SGP rules.** Bringing debt ratios down to safer levels will require a sustained period of adjustment. The key question is whether the pace of consolidation driven by the SGP is appropriate in the face of a weak outlook.

3. **This paper quantifies the output effects from fiscal consolidation implied by the SGP.** To this aim, we propose a conceptual framework in three steps. First, we take the April 2012 WEO as our baseline for fiscal consolidation.[2] Second, we quantify the gap between fiscal plans under this baseline and the SGP targets (in structural terms) keeping GDP at WEO levels (i.e. no multiplier effects are at play). Third, using the IMF's dynamic stochastic general equilibrium model—the Global Integrated Monetary and Fiscal model (GIMF)—we simulate the output effects of that fiscal shock. In short:

Step 1: We choose as baseline scenario the April 2012 WEO.

Step 2: We quantify the fiscal shock as

$$\alpha_t = \frac{Sb_{t,SGP}}{GDP_{t,WEO}} - \frac{Sb_{t,WEO}}{GDP_{t,WEO}}$$

[1] Prepared by Derek Anderson (RES), Marialuz Moreno Badia (FAD), Esther Perez Ruiz (EUR), Stephen Snudden (RES), and Francis Vitek (SPR). We are grateful for comments from DG ECFIN staff during the seminar held in Brussels, June 4, 2012.

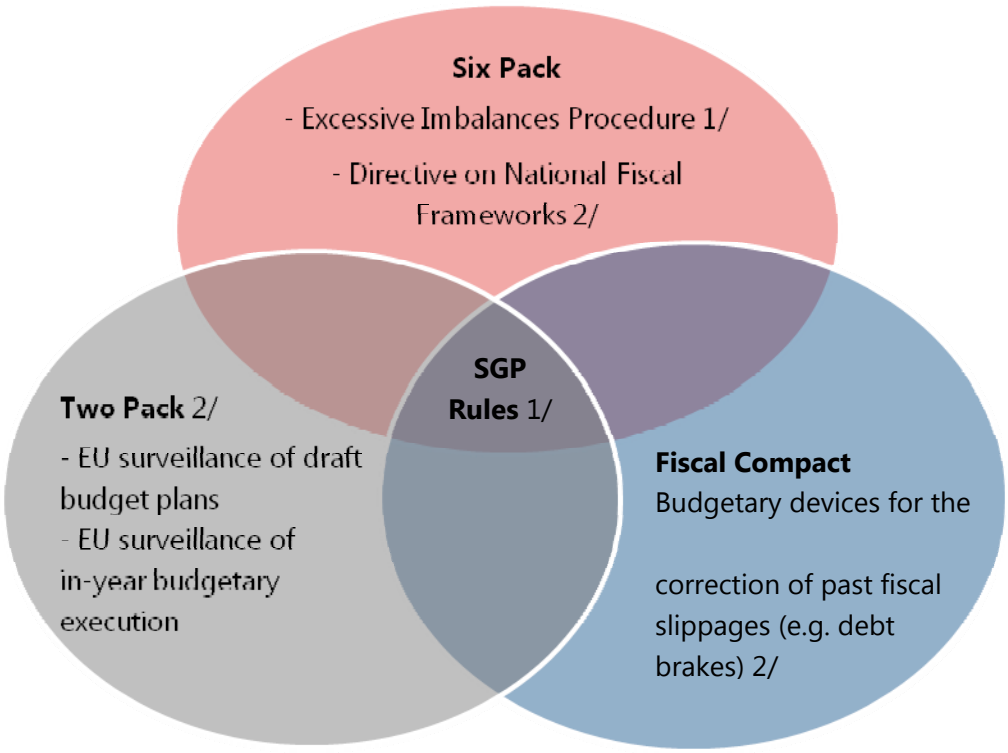
[2] The shock and simulation results presented in this paper take into account the fiscal plans adopted or specified in sufficient detail at the time of the elaboration of the April 2012 WEO forecasts. Since then, some countries have announced additional measures.

where α_t represents the change in the structural balance (*Sb*) to GDP ratio relative to the fiscal consolidation path projected in the WEO, for a given GDP (at WEO values).

Step 3: Shock our model economy with α_t and quantify the output decline $GDP_{t,SGP} - GDP_{t,WEO}$ when multiplier effects are at work.

4. **The rest of this paper is organized as follows.** Building on EU legislation and discussions with the European Commission (EC) during the 2012 Article IV Consultation, Section B outlines the order of prevalence between the various SGP benchmarks and quantifies fiscal consolidation needs relative to the April 2012 WEO. Section C subsequently presents the associated output loss under different sets of assumptions. From the different scenarios, it is evident that the effects of fiscal consolidation depend largely on the composition and credibility of fiscal packages, as well as the ability of monetary policy to cushion the fiscal tightening. We therefore conclude with a number of policy recommendations (Section D).

Figure 1. Recent EU Fiscal Governance Reforms



Note: 1/ Procedures currently in place; 2/ Expected entry into force is autumn 2012 for the two pack; January 2013 for the Directive on National Fiscal Frameworks; and January 2014 for the automatic correction mechanisms mandated by the Fiscal Compact.

B. A Characterization of SGP Regimes

5. **Since its introduction in Maastricht, the SGP system has become increasingly complex** (Table 1). Countries are: required to converge to the 60 percent of GDP debt benchmark; prohibited from breaching the 3 percent of GDP deficit threshold; and mandated to improve the structural deficit to GDP ratio at an average rate of 0.5 percent per year. In addition, government spending is constrained to grow in line with trend GDP. This raises the question of the order of prevalence between the existing rules, complicating the task of quantifying the fiscal shock implied by the SGP.

6. **To disentangle the order of prevalence between rules, we assume the strictest criteria apply.** EU regulations and discussions with the EC suggest that where there is an overlap between rules, countries would be subject to the strictest benchmark. This rules out the possibility of over-determination and makes it possible to calculate SGP consolidation paths in an unambiguous manner.

Table 1. EU Fiscal Rules from Maastricht to the Fiscal Compact

Type	Maastricht (SGP.1)	2005 Reform (SGP.2)	2011 "Six Pack" Reform (SGP.3)	Fiscal Compact
Debt Rule	Debt/GDP is reduced to below 60%	→	Yearly reduction in Debt/GDP equal to 1/20th of distance between current level and target	→
Deficit Rule	Deficit/GDP below 3 % at any t	→	→	→
Structural Balanced Budget Rule	Medium-term budget positions of "close to balance or in surplus"	Structural deficit/GDP to remain below 1 %	→	… below 0.5 %
Expenditure Rule			Primary expenditure (exc. unemployment benefits and tax discretionary increases) grows less than medium-term GDP growth	→

Sources: Staff, based on the EU treaty, SGP secondary legislation and the Fiscal Compact intergovernmental treaty.

7. **Over the WEO horizon, we assume compliance with the rules follows a three-stage process.** All fiscal commitments, independently of their nature, are translated into deviations from the WEO in terms of the structural deficit to GDP ratio.[3] Two regime switches operate during the WEO projection period, from the overall to the structural deficit benchmark; and from the latter to the debt reduction criterion. The relevant fiscal regimes can be summarized as follows:

- *EDP phase.* Countries currently under Excessive Deficit Procedures (EDP) are expected to deliver structural adjustments needed to meet the 3 percent of GDP deficit target by the requested deadlines (between 2012 and 2015, see Table 2).

Table 2. EDP Deadlines

2012	Belgium, Cyprus, Italy
2013	Austria, France, Germany, Netherlands, Portugal, Spain
2014	Greece
2015	Ireland

Source: European Commission.

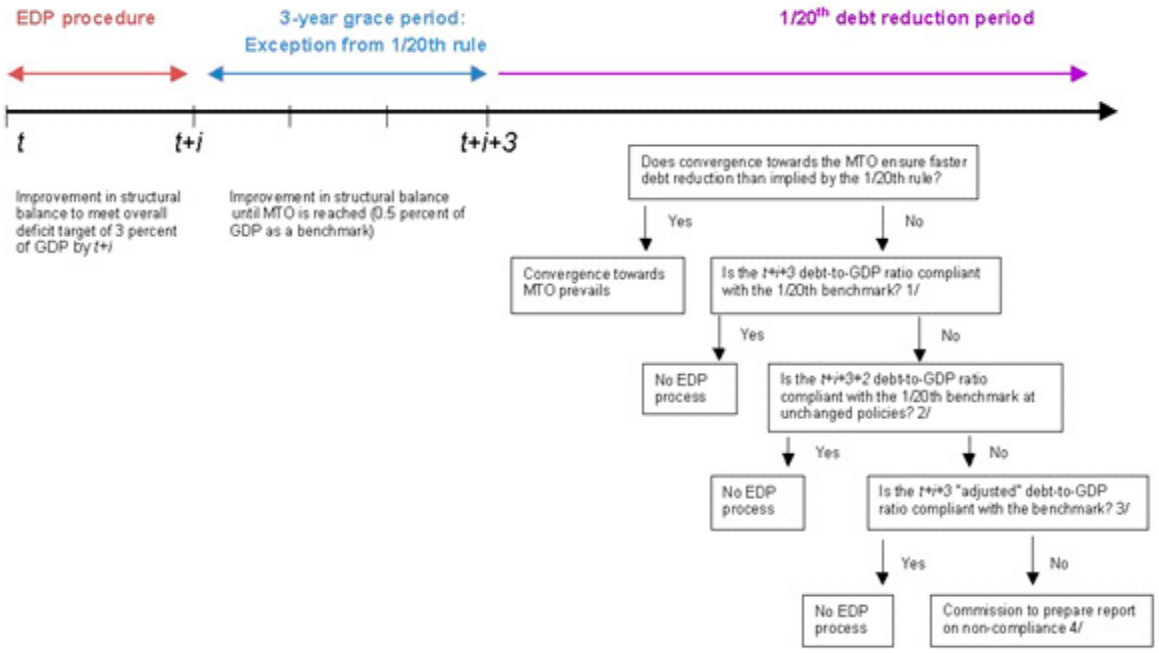
- *Grace period.* An exemption from the 1/20th debt reduction rule will apply over the three-year period following the closure of the EDP. During this period, countries are expected to improve structural balances by at least 0.5 percent of GDP each year until they reach their respective medium-term objectives (MTOs).[4]
- *1/20th debt benchmark.* Three years after exiting the EDP, structural balances will improve by 0.5 percent of GDP per year or more, if so required by the 1/20th debt benchmark. This benchmark ensures an annual pace of debt reduction no less than 5 percent of the gap between the observed debt level and the 60 percent of GDP target. EU authorities will first verify compliance with the debt rule in a backward-looking manner and then in a forward-looking manner for countries breaching the first criterion (Figure 2).

[3] We keep GDP at WEO levels and use OECD budgetary semi-elasticities to break down the overall deficit into the structural and cyclical components.

[4] MTOs are country-specific and updated each 3 to 4 years. Current MTOs are 0.5 for Belgium, Finland, and Luxembourg; 0 for Austria, Cyprus, Estonia, Greece, France, Italy, Malta, and Spain; -0.5 for Germany, Ireland, Netherlands, Portugal, and Slovak Republic; and -1 for Slovenia.

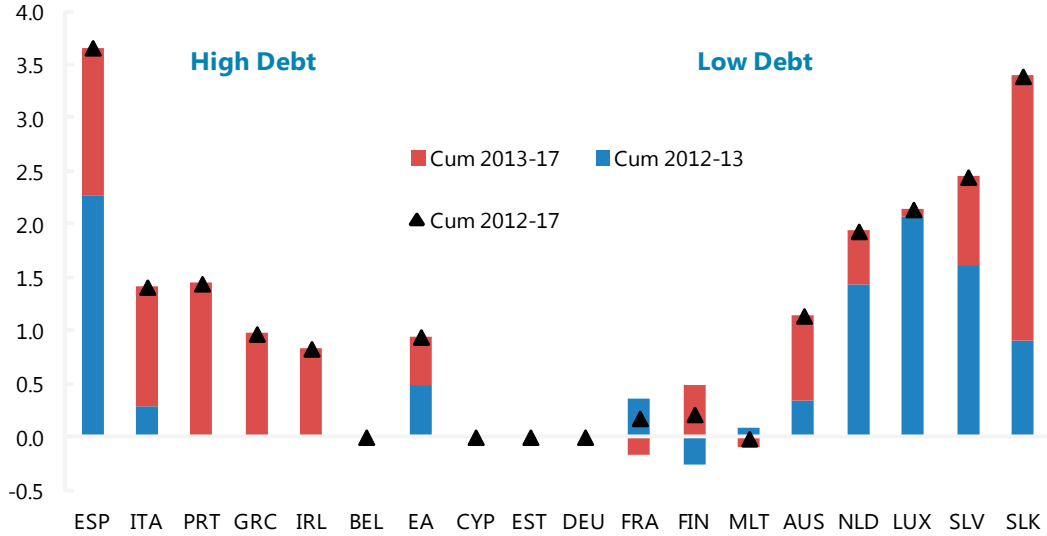
Figure 2. Translating SGP Regulations into a Fiscal Shock

Fiscal Regimes under the SGP



Change in Structural Balance 5/

(Percent of GDP, deviations from April 2012 WEO baseline)



Sources: IMF, April 2012 WEO; SGP regulations; and Staff calculations.

1/ The benchmark is given by $B_t/Y_t = 60 + (0.95/3)*(B_{t-1}/Y_{t-1} - 60) + ((0.95^2)/3)*(B_{t-2}/Y_{t-2} - 60) + ((0.95^3)/3)*(B_{t-3}/Y_{t-3} - 60)$.

2/ The formula specified in 1/ is applied to projected debt-to-GDP ratio up to $t+i+3+2$.

3/ The "adjusted debt measure" is given by $B_t/Y_t = B_t + \sum_0^2 C_{t-j} \Big/ Y_{t-3} \prod_0^2 \left(1 + Y^*_{t-j}\right)$, with C the cyclical budget and Y^* the growth rate of nominal potential GDP.

4/ To place a country under EDP, the report assesses risk factors such as the structure of debt, implicit liabilities related to ageing, or private indebtedness.

5/ The High Debt group comprises Belgium, Greece, Ireland, Italy, Portugal and Spain. The Low Debt group includes the rest of Euro area countries.

8. **Overall, planned fiscal efforts in the EA fall significantly short of SGP requirements.** For the euro area as a whole, the additional consolidation amounts to 1 percent of GDP over 2012-17, nearly half of which would be frontloaded over 2012-13 (Figure 2). For the analysis here, we split euro area countries into two blocs: those countries with acute fiscal sustainability issues (high-debt[5] or HD), comprising Greece, Ireland, Italy, Portugal, Spain and Belgium, and those countries with less acute fiscal sustainability issues (low-debt or LD), comprising the rest of the euro area. Additional consolidation needs in the HD bloc (at around 2.2 percent of GDP over the WEO horizon) are five times as large as in the LD bloc (at 0.4 percent of GDP over 2012-17). Across countries, the additional fiscal effort is the highest in Spain, mainly as a result of requirements under the EDP. In contrast, Germany, Cyprus and Estonia have no additional adjustment as the WEO path is consistently more demanding than requirements under the SGP. Among the larger euro area countries, additional consolidation is particularly frontloaded in Spain and the Netherlands.

C. The Output Effects from Fiscal Consolidation under the SGP

Assumptions

9. **The impact of fiscal tightening on economic activity will depend on the underlying simulation assumptions.** First, the composition of the fiscal adjustment makes a big difference, with multipliers being typically larger for spending-based consolidations. Second, the monetary policy reaction function is an important factor as multipliers are higher when interest rates are constrained by the zero lower bound. Finally, the credibility of fiscal packages also affects multipliers through anticipation of the future benefits of consolidation. This last effect may be substantial in some cases.

10. **In practice, however, there is considerable uncertainty surrounding these assumptions**. Information on the composition of the adjustment on a country basis is not readily available and it is difficult to predict over which time horizon monetary policy in the euro area will be constrained by the zero lower bound. Also, governments' credibility in delivering fiscal commitments is at stake and risk-premium effects are inherently difficult to quantify when spreads are very volatile and an increasing number of countries face punitive yields.

11. **Faced with these uncertainties we carry out a number of illustrative simulations.** These are intended to illustrate the possible response of the economy under three different scenarios rather than aiming at an accurate representation of the economic reality (Table 3):

- *Scenario 1: Myopia and growth-friendly consolidation.* Under this scenario, the consolidation package is tilted towards measures that have strong effects on

[5] For the purposes of the simulation the high-debt group includes countries with debt projected to be above 85 percent of GDP by 2017.

households' current disposable income, but little negative impact on factor supply and potential output. We further assume fiscal plans are not credible *per se*, but rather that credibility needs to be established by action. In particular, agents do not perceive the government's commitment toward consolidation as permanent but rather expect measures to revert back to baseline levels in each period. However, they change their beliefs *ex post,* once they verify past fiscal measures remain in place. This is meant to portray an economy where, due to a general lack of confidence in the future, agents base their decisions on short-term considerations. With regards to monetary policy, the zero-interest floor is assumed to bind over the 2012-17 period. To gauge the magnitude of spillovers, we run two variants of this scenario featuring joint and stand-alone consolidation (i.e. undertaken by the HD or LD groups separately).

- *Scenario 2: Credibility and growth-friendly consolidation.* The assumptions mimic scenario 1 except that agents are not myopic, i.e. changes in the structural balance are perceived as permanent as of the year of implementation. As a result, agents incorporate the long-term benefits of the consolidation already undertaken (lower real interest rates and future debt service costs) in their expectations. However, fiscal changes are not anticipated and do not affect behavior until they actually occur (i.e., absence of full Ricardian equivalence).
- *Scenario 3: Credibility and growth-unfriendly consolidation:* A variant of scenario 2, this is intended to illustrate the sensitivity of the results to the composition of the fiscal consolidation, with a package biased towards high-multiplier measures. In particular, fiscal efforts are switched (i) from consumption to corporate taxes; (ii) from government consumption to public investment; and (iii) from general transfers to transfers targeted to households with a high marginal propensity to consume. As empirical evidence shows (see, e.g., OECD, 2010 and the references therein), corporate taxes have the highest distortionary effects amongst revenue measures; on the other hand, government investment shrinks potential output and cuts in targeted transfers reduce the income of households whose marginal propensity to consume is equal to one.

Table 3. Assumptions Underlying SGP Simulations

Assumptions	*Explanation*	Scenario 1: Myopia and growth-friendly consolidation	Scenario 1A: As per scenario 1 plus ZIF	Scenario 1B: As per scenario 1B plus joint consolidation	Scenario 2: Credibility and growth-friendly consolidation	Scenario 3: Credibility and growth-unfriendly consolidation
Composition of adjusmtent						
1/ Growth-friendly consolidation	1/4 transfers, 1/3 government consumption, 1/4 labor income tax, 1/6 consumption tax	X	X	X	X	
2/ Growth-unfriendly consolidation	1/4 targeted transfers, 1/3 government investment, 1/4 labor income, 1/6 corporate tax					X
Spillovers						
3/ Joint consolidation	High Debt and Low Debt groups jointly consolidate			X	X	X
4/ Individual consolidation	Only one of the blocs consolidates (Euro area calculated by simple addition disregarding spillovers)	X	X			
Monetary policy reaction						
5/ Interest rates unconstrained by zero interest floor (ZIF)	Unconstrained reaction of nominal interest rates		X	X	X	X
6/ Interest rates constrained by ZIF	Nominal interest rates unchanged over first 5 years	X				
Credibility of fiscal plans						
7/ Myopia	Agents do not perceive as permanent the government's commitment toward consolidation; they only change their beliefs *ex post,* once they verify past fiscal measures remain in place	X	X	X		
8/ Partial Ricardian behavior	Changes in the structural balance are perceived as permanent as of the year of implementation				X	X

Source: Staff.

Simulation tools and Output Effects from Additional Fiscal Consolidation

12. **The simulations are conducted for the two euro area country groupings with the GIMF model.** [6] The analysis uses a general equilibrium framework applying a six region version of GIMF, with the euro area split into the HD and LD blocs, the US, Japan, emerging Asia, and a bloc encompassing the rest of the world. GIMF models both liquidity constrained and finite-planning horizon households. This provides non-neutrality in both spending- and revenue-based measures, which makes the model particularly appropriate to analyze the stabilization role of fiscal policy in the short term.

13. **Country-specific effects are examined using the G35 model.** [7] The G35 model is an estimated structural macroeconometric model of the world economy, disaggregated into 35 national economies, including 11 euro area countries.[8] Within this framework, each economy is represented by interconnected real, external, monetary, fiscal, and financial sectors. Spillovers are transmitted across economies via trade, financial, and commodity price linkages.

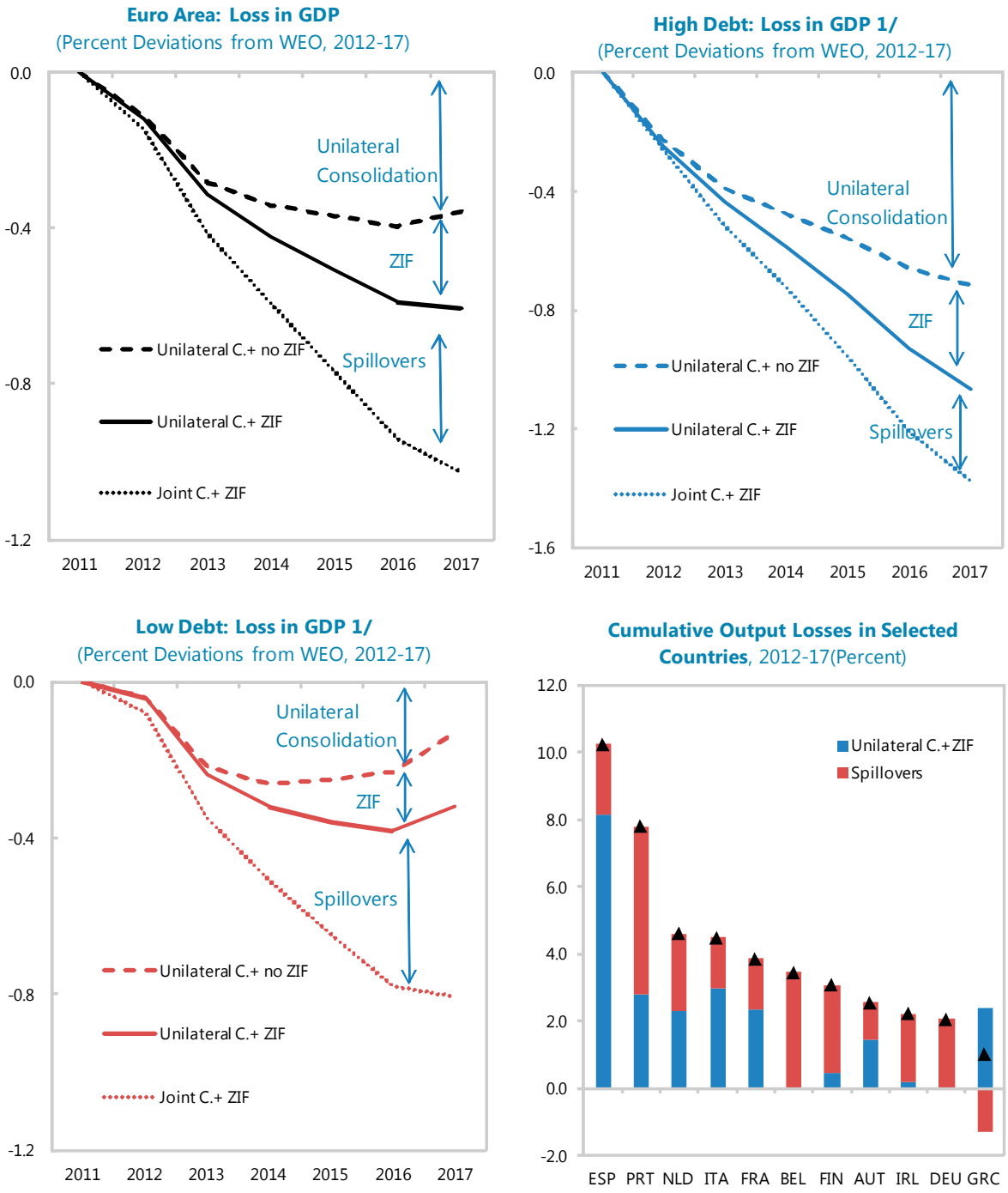
14. **Even with a growth-friendly consolidation package, the output effects are sizable** (Figure 3). Under scenario 1, output in the euro area is 1 percent lower than baseline by 2017. This implies a cumulative output loss of 3½ percent throughout 2012-17. The fairly large multiplier stems from negative spillovers (around 40 percent of the loss) and the inability of monetary authorities to ease the policy rate (20 percent of the loss). As expected, the HD bloc experiences the largest losses—1.4 percent of GDP by 2017 (cumulatively 5 percent over 2012-17)—mainly reflecting the scale of the additional fiscal adjustment required. On the other hand, losses among the LD bloc of 0.8 percent by 2017 (cumulatively 3 percent over 2012-17) are largely caused by spillovers from the HD bloc (given their relatively high propensity to import from the LD countries).

15. **The aggregate results conceal considerable cross-country heterogeneity.** Due to contractions in domestic demand, cumulative output losses are highest in Spain (at around 10 percent), closely followed by Portugal (at almost 8 percent), largely caused by substantial spillovers from fiscal tightening in its neighboring country. Negative spillovers are also sizable in small open economies like Belgium, Finland and Ireland. Somewhat surprisingly, Greece experiences positive spillovers from fiscal adjustment in other euro area countries. This is because a joint consolidation in the euro area reduces the world demand for commodities and improves Greece's terms of trade. As Greece is a relatively closed

[6] For further details on this model, see Kumhof and others (2010).
[7] For further details, see Vitek (2012).
[8] The list comprises Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, and Spain.

economy, this improvement in the terms of trade outweighs the reduction in its external demand, yielding a positive net spillover.

Figure 3. Output Effects from SGP Rules: Myopia and Growth-friendly Consolidation

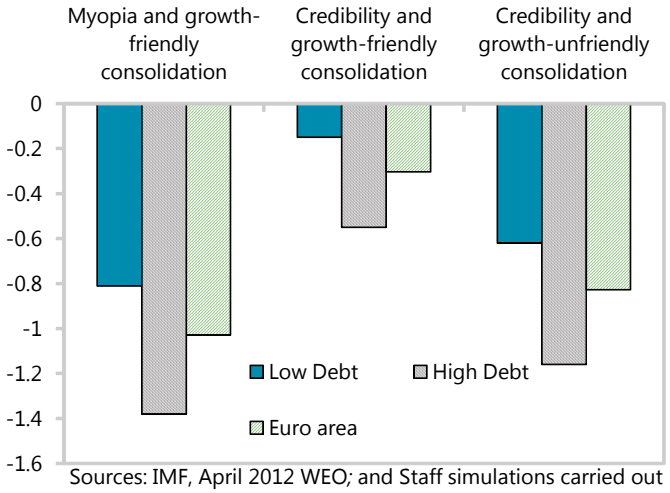


Sources: IMF, April 2012 WEO; and Staff simulations carried out with GIMF (first three charts) and G35 (fourth chart) models.
1/ The High Debt bloc comprises Belgium, Greece, Ireland, Italy, Portugal and Spain. The Low Debt bloc includes the rest of Euro area countries.

16. **Multiplier effects dramatically change with credibility and fiscal composition assumptions** (Figure 4). With myopia (scenario 1), private households and firms are so concerned with the short-term impact of fiscal retrenchment that they neglect the positive income effects arising from future lower tax liabilities when making their consumption, employment and investment choices. For a given composition of adjustment and the zero lower bound constraint, the 2017 GDP loss in the euro area is considerably reduced if fiscal plans are credible (scenario 2), falling from 1 percent to 0.3 percent of GDP. On the other hand, the multiplier effect is more than doubled when consolidation remains credible but becomes growth-unfriendly (scenario 3). In this case, the 2017 GDP loss in the euro area relative to the WEO amounts to 0.8 percent, against 0.3 under credible but growth-friendly consolidation. Cumulative losses in the euro area throughout 2012-17 amount to -1.5 percent under scenario 2 and -3.1percent under scenario 3.

17. **The output decline might be higher than implied by our simulations because of the current state of the economy.** Recent empirical work suggests that fiscal multipliers are larger when there is excess capacity (see, for example, Batini et al, 2012; and Baum et al, 2012). This could arise from tighter credit constraints, the need to repair balance sheets, and higher precautionary savings.

Figure 4. Comparing Output Losses across Scenarios
(Percent Deviations from WEO, 2017)



Sources: IMF, April 2012 WEO; and Staff simulations carried out with the GIMF model.
1/ High debt comprises the following countries in the Euro area: Belgium, Greece, Ireland, Italy, Portugal and Spain. Low debt includes the rest of Euro area countries

D. Policy Perspectives: How Can the Output Loss from Additional Fiscal Consolidation Be Mitigated?

18. **The SGP rules should be applied flexibly to accommodate unexpected events.** The appropriate pace of consolidation should depend on the state of public finances and growth, and the monetary policy stance. Given uncertainties surrounding these developments, consolidation strategies that adjust for new information can be welfare improving. In this context, the recent shift of focus towards structural targets under the SGP is very appropriate.

19. **Where financing conditions permit, the pace of fiscal consolidation should take into account the current adverse conditions.** With limited scope for monetary policy to mitigate output losses from fiscal tightening, negative output gaps, and joint consolidation efforts, multipliers are likely to be larger than normal. Furthermore, multipliers might increase with the size of consolidation.[9] Hence, in the current context, to the extent that market financing remains available at reasonable rates, adjustment should occur at a steady pace defined in cyclically-adjusted terms and should avoid heavy front-loading.

20. **The composition of fiscal adjustment should be tilted towards growth-friendly measures.** Where adjustment needs are very large, countries will have to act both on the revenue and spending side. However, given the high spending levels prevailing in many European countries, consolidation should focus on the spending side, targeting in particular those areas where multipliers are low or where spending is most inefficient.

21. **Reforms that underpin credibility are essential to limit output losses from fiscal tightening.** Our findings suggest that, by raising agents' expectations about the positive (future) income effects of consolidation, credible policies can reduce multipliers in the short term and act as a substitute for heavy frontloading. Anchoring adjustment in well-specified medium-term plans is key. A responsible implementation of automatic correction mechanisms under the Fiscal Compact will be important to safeguard durable fiscal efforts.

22. **Finally, monetary policy should accommodate the consolidation.** The simulations suggest significant output losses if monetary policy does not provide support. When the zero bound is binding or if conventional interest rate cuts are less effective than normal, this implies unconventional monetary policy stimulus may be needed.

[9] See Stehn and others (2011), Erceg and Linde (2010).

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IV. POSSIBLE SUBORDINATION EFFECTS OF EUROSYSTEM BOND PURCHASES[1]

A. Introduction

1. **The debt restructuring in Greece in February-March 2012 effectively extended senior creditor status to Eurosystem bond purchases.** By mid-February 2012, the ECB and Eurosystem central banks (henceforth ECB) swapped their Greek bonds acquired under the Securities Market Program (SMP) for new bonds of identical structure and nominal value, with different serial numbers. This provided the ECB an exemption from the subsequent private sector debt swap under so-called private sector involvement (PSI), effected through retroactive collective action clauses.[2] By swapping its debt purchases in advance of the PSI announcement, the ECB effectively received preferential (i.e., senior) creditor status on its Greek bond holdings.[3]

2. **According to the ECB, this exemption from PSI was "special"** because its bond market interventions were undertaken solely for monetary policy purposes. Treating Greece as a special case may imply that the subordination of private debt holders will not be repeated in other contexts. At the same time, the ECB has cautioned against incurring losses on the SMP, which could –in an extreme case– require recapitalization of the central bank and result in reduced financial independence.

3. **Currently, a key question is whether the SMP has become less effective after the Greek PSI exemption–or even earlier–due to subordination risk.** This treatment of the ECB may effectively have reshaped the seniority structure of all official holdings of sovereign bonds. From a market risk-return perspective, this implied a possible mispricing of many euro area bond markets leaving future SMP beneficiaries subject to rating downgrades as ECB interventions reduce the private investor base and increase losses in the event of restructuring. Anecdotal market evidence indeed confirms that the impact of SMP purchases has become controversial, although this may already have been priced in prior to the Greek debt exchange in February 2012. Indeed, after the euro area summit of heads of state and government on July 21, 2011, when PSI for Greece was first announced,

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[1] Prepared by Nico Valckx (EUR), Kenichi Ueda, Manmohan Singh (both RES). Comments from Tommaso Mancini-Griffoli and Christian Mulder (both MCM) and ECB counterparts are gratefully acknowledged.

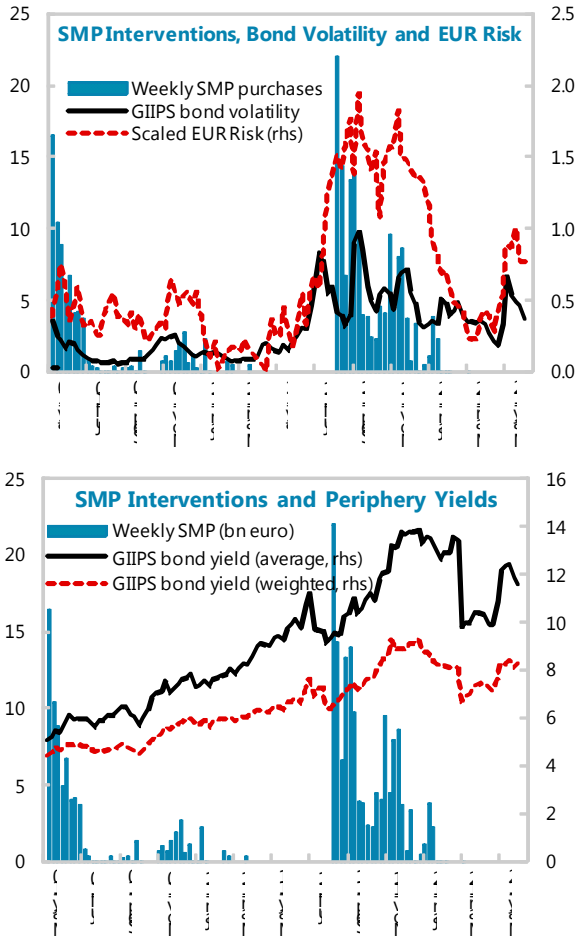
[2] The PSI invited Greek debt holders to exchange their existing holdings for new debt at a face amount of 31.5 percent and cash-equivalent EFSF notes with a 2-year maturity at 15 percent of the face amount. In contrast, the ECB received the full face (par) value of the Greek bonds which it had purchased in the markets at a discount on the face value (about €40bn versus €55bn face value) and would also benefit from future coupon payments on these new bonds.

[3] In addition, also Greek bonds purchased by Eurosystem central banks for investment purposes and European Investment Bank holdings were exempt from PSI.

subordination effects were already under consideration.[4]

4. **At the same time, while the SMP helped to temporarily reduce stress in government bond markets, due to the limited scale/time horizon of its effective use, it did not appear fully effective** (see Figure 1). Especially after its launch in May-June 2010 and after reactivation in August 2011, interventions were sizeable and helped stem the rise in periphery yields and the escalation of bond market volatility. Purchases amounted to €36bn and €21bn in the first two months of the program but dropped to less than a few billion afterwards. However, as purchases were scaled back, volatility and broad euro area financial market risks increased again and SMP interventions were scaled up again in November-December 2010. Similarly, as sovereign market stresses increased again over the summer of 2011, the reactivation of the SMP in August and September 2011 with purchases of €51bn and €37bn led to a reduction in broad market stresses. However, as stress in periphery debt markets re-emerged, SMP purchases increased again to €40bn in November 2011 before the ECB adopted other measures to help (periphery) banks in need of funding.

Figure 1



Sources: Bloomberg; and IMF staff calculations.
Notes: Bond yields refer to 10-year benchmark yields. Weighted series take government debt as weights. Bond volatility follows a GARCH(1,1). Scaled EUR risk is the principal component score of 13 euro area interbank market spreads, corporate CDS spreads, euro area equity risk premium, SovX and EMBIG CDS, and euro exchange rate implied volatility.

5. **This paper looks at various ways to quantify the extent of subordination arising from ECB debt purchases.** It first looks at illustrative empirical evidence, aimed at documenting developments in government bond prices and CDS risk premia around/after the ECB debt swap. Next, it looks at theoretical models to quantify and illustrate the potential effect of subordination on bond

[4] ECB President Trichet stated in an interview in the Süddeutsche Zeitung on July 22, 2011 on PSI: "It goes without saying that the governments will have to redeem their bonds that are on the balance sheet of the Eurosystem without any change. Of course, being part of the official sector, we will not be participating in the voluntary private sector involvement mentioned on Thursday as regards Greece." http://www.ecb.int/press/key/date/2011/html/sp110722_1.en.html

prices and CDSs. Finally, the paper offers some tentative policy conclusions. The main finding is that the impact of ECB seniority is primarily related to perceived probability of default and the proportion of outstanding debt already in the hands of the central bank. Moreover, credibility of SMP interventions matters.

B. Empirical Evidence on ECB Subordination Risk

6. **Insufficient data make it difficult to quantify the subordination risk from ECB debt purchases directly.** ECB debt purchases under the SMP were largely put on hold after the PSI exemption. Only one SMP intervention took place afterwards, in the week of March 5-9, 2012 for an amount of €27 million, the fifth-smallest intervention since the start of SMP purchases in May 2010, based on weekly Eurosystem financial statements. Hence, there is insufficient quantitative evidence to establish empirically the relation between subordination risk from ECB debt purchases and sovereign yields.

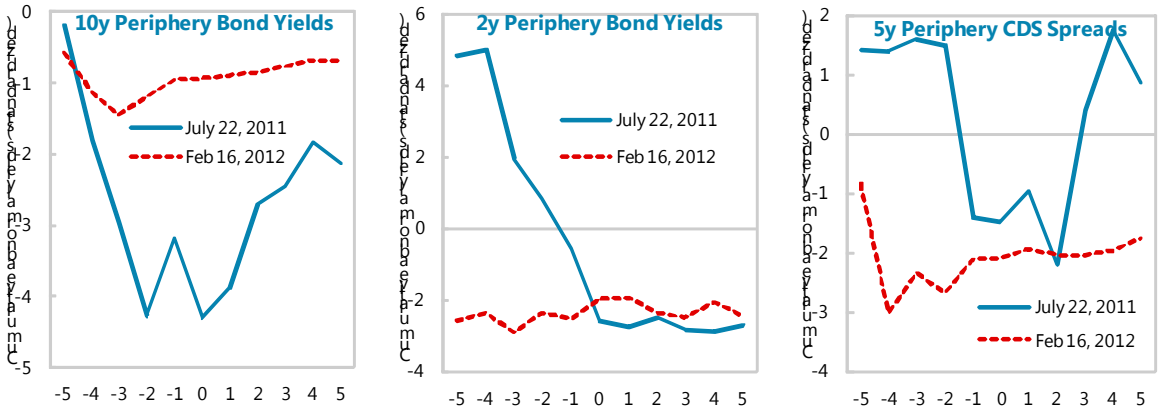
7. **However, an event study analysis of ECB news on its senior status can provide some gauge of subordination risk.**[5] In this context, innovations in bond yields and CDS premia in the days surrounding the July 22, 2011 ECB statement (see footnote 4) and the ECB debt swap on February 16, 2012 are examined. Following MacKinlay (1997), standardized cumulative abnormal yields and CDS spreads are estimated (in first differences). The underlying model is $\Delta Y_i = a_i + b_i \Delta Y_{LCH} + c_i \Delta SovX$ and $\Delta CDS = d_i + e_i \Delta SovX$, where Y_i denotes the government bond yield in country i, CDS is the sovereign credit default swap spread, Y_{LCH} is the LCH Clearnet benchmark 10-year yield on AAA countries and $SovX$ is the SovX Western Europe CDS index. Standardization makes it easier to compare cumulative abnormal yields/spreads. The models are estimated using 70 daily observations with data up until one month ahead of the event, in order to avoid coefficient bias due to the events.

8. **The results show little impact of the ECB debt swap on periphery yields, but the initial PSI announcement and the ECB's non-participation did have substantial short-term negative effects.** The market effect of the ECB, as a large creditor, shifting to a preferred debtor status, did not seem significant when evaluated around the time of the debt swap announcement (Figure 2). However, this appears to reflect the fact that this may have been anticipated and priced in by the market already. Indeed, longer-dated periphery bond yields and CDS default risk premia seem to have risen unexpectedly following President

[5] In addition, one could analyze the spread between subordinated and senior bank debt CDS premia, given the close co-movement between bank CDSs and sovereign CDSs, as a proxy for sovereign subordination risk. This would shows that the introduction of PSI under the draft ESM Treaty in November 2010 and its effective use in Greece as agreed in July 2011 and reaffirmed in October 2011 raised subordination substantially, more so than the actual ECB debt swap in February 2012. However, this spread may be confounded by bank-specific conditions (e.g., shares of subordinated debt) and country-specific legal considerations (related to bail-in and resolution regimes; currently under discussion by the European Commission (EC, 2011 and 2012).

Trichet's public statement that the ECB would not be participating in the voluntary Greek PSI on July 22, 2011 – one day after an important euro area summit had agreed on modalities of additional support for Greece (including PSI) and on greater flexibility of EFSF loans to the other program countries. In the days ahead of the summit, bond yields and CDS default risk premia had come down substantially, but this was reversed after the ECB's statement – although it cannot be excluded that markets may have been disappointed by some other summit-related news (for instance, the realization that size of the EFSF was not increased and large implementation risks).

Figure 2. Event Study Analysis of ECB Subordination on Bond Yields and CDS Spreads



Sources: Bloomberg; and IMF staff calculations.
Note: Periphery is an aggregation of Spain, Italy, and Portugal. Scales are standard normal, i.e., values exceeding +/-1.96 are statistically significant at the 5 percent level.

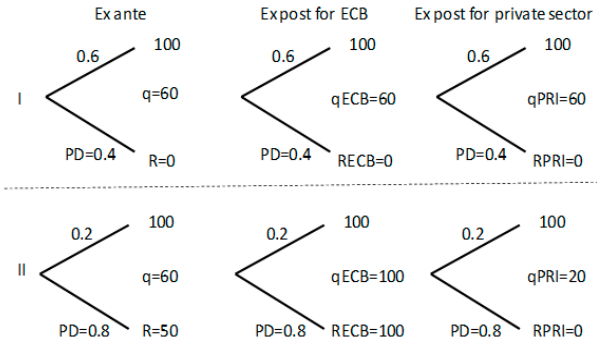
C. Theoretical Approaches to Quantifying Subordination Risks

9. **It is possible to incorporate the subordination effect in a closed-form bond price model or in a reduced form CDS model.** In both models, the subordination effect depends on three factors: probability of default, loss given default (one minus recovery rate), and the share of ECB bond holdings.

Sovereign bonds–closed form model

10. **ECB seniority matters when the recovery rate is not close to zero or to 100 percent.** For example, suppose a country's debt trades at 60 cents to par before establishment of the ECB's senior creditor status (Figure 3). This could reflect market estimates of 40 percent default probability with 100 percent loss given default (i.e., zero recovery value) and 60 percent (non-default) probability

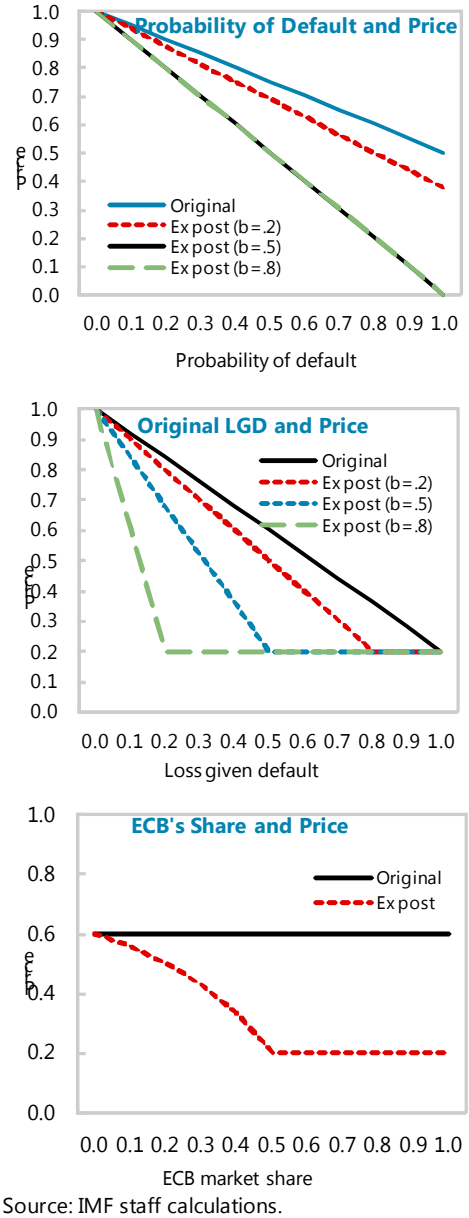
Figure 3. Two Cases for Original Price q=60 (ECB Share=50%)



Source: IMF staff calculations.

of full repayment. In this case (case I), seniority does not matter because upon default, no single bond holder is repaid. However, a pre-announcement price of 60 cents is also consistent with another case: 80 percent default probability with 50 percent recovery (case II). In this case, seniority matters. For example, if the ECB's share is 50 percent, the ECB can recover all its claims at face value because the country will repay first 50 percent of the total debt to senior creditors. For the ECB, the ex post (shadow) price of the bond becomes the full value. For private bond holders, the defaulted country will not have anything left to repay after the repayment to the ECB. The ex post market price of bond reflect this ex post zero recovery and will be traded at 20 cents since there is still a 20 percent probability of non-default with full repayment of 100. The annex develops this model more formally.

Figure 4. Bond Prices and SMP Determinants



Source: IMF staff calculations.

11. **The net impact of subordination thus depends on three major factors:**

- ***Probability of default (PD).*** This increases linearly with the subordination effect, i.e., the difference between the original price and ex post price (after subordination). Figure 4 (top panel) plots this effect over various default probabilities for a range of ECB debt market shares. Evidently, the larger the ECB market share, *b*, the lower the market price ex post for any given PD.
- ***Loss given default (LGD).*** If large, then having the senior status does not translate into a large advantage. Also, for a small loss given default, senior status is not valued much since even junior creditors could recover a large portion of the face value. The overall effect—the difference between the original price and ex post price—is thus not monotonic. Figure 4 (middle panel) illustrates this effect for an 80 percent default probability and various ECB market shares over various LGD values.
- ***The ECB share.***[6] As long as the SMP's share

[6] Note that this is not an independent third factor-but rather an attribute of loss given default: the higher the ECB share, the lower the recovery rate (or higher *LGD*) for private bond holders.

is small relative to the original recovery rate, even with the ECB expecting full repayment, the loss on private sector holdings will be limited. Therefore, the difference between the original price and the ex post price will be small. In contrast, when the ECB holds a large share relative to the recovery rate, the ECB's senior status will lower the ex post recovery rate for the private sector dramatically. Figure 4 (lower panel) shows that this effect is monotonic but not linear. In particular, when the ECB's share is larger than the original recovery rate, there is a kink, above which private bond holders will not receive anything ex post in bad states of nature. Note that what is important in pricing the bonds is the expectation of the ECB's share including future SMP. Increases in the expected ECB share (or related uncertainty) can create further negative effects.

12. **SMP purchases thus have two main effects on bond prices and yields:**

- ***Raising subordination risk.*** The rise in yields for distressed sovereigns at the time of announcement of a debt swap (in favor of the ECB) reflects a net expected transfer of value from private bond holders to the ECB. This subordination will also undermine the effects of any future SMP purchases because sovereigns will face higher issuance cost on any bonds not purchased by the ECB.
- ***Improving liquidity.*** To the extent that the SMP improves liquidity conditions, it would reduce the probability of default and hence increase the value of residual bonds. This happens when the ECB provides vital liquidity to the market, and ultimately to peripheral governments. Investors would be reassured that the ECB is willing to smooth out temporary liquidity shocks. Also, a lower interest rate could decrease the default probability by improving debt sustainability. This beneficial effect would be enhanced by a credible and clearly communicated SMP intervention strategy.

Therefore, the net impact of the subordination versus the liquidity support effect on bond prices is ex ante ambiguous.

CDS–reduced form model

13. **Along the same lines, CDS pricing implicitly reflects liquidity and seniority effects.** CDS and bonds should be perfectly cointegrated, as they are assets with exactly the same cash flow and thus the same price.[7] At the same time, the CDS model allows illustrating the role of SMP interventions somewhat differently and illustrates the role of credibility in SMP interventions (although this is also implicit in bond prices). More specifically:

[7] Note, however, that the CDS-bond basis may widen due to credit tightness or relative margin requirements (see, e.g., Garleanu and Pedersen (2011)).

- ***Liquidity effect.*** Starting from a standard CDS pricing formula, SMP interventions – by lowering sovereign yields, assuming the intervention is credible and sustained (see below) – reduce the cumulative probability of default (*PD*), which has a non-linear (but less than proportional) impact on CDS spreads:

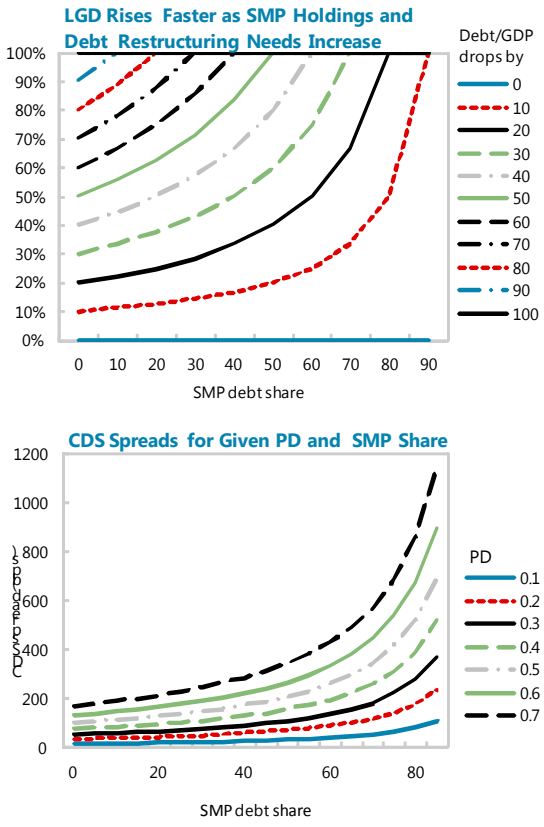
$$CDS = LGD \text{ x } (1 - (1- PD)^{1/n})$$

where *n* denotes the number of periods (years). In the subsequent analysis, we abstract from real world versus risk-neutral *PD*s, which is analyzed elsewhere.[8]

- ***Subordination risk.*** Due to perceived senior creditor status, SMP purchases may increase private sector loss given default (*LGD*) and possibly offset the lower probability of default.

14. **LGD for private bondholders increases with debt restructuring needs and the size of ECB holdings.** Intuitively, in case of a debt restructuring, the *LGD* will depend on how much debt/GDP reduction is needed ($\Delta D/GDP$) and on the participation rate. Using this fact, official sector holdings have a non-linear impact on expected private sector loss given default/haircut.[9] If the ECB is expected to be exempt from PSI, as in Greece, a higher ECB share of debt holdings, *b*, will increase the private sector haircut or *LGD*.

Figure 5. Role of SMP Purchases in a CDS Model



Source: IMF staff calculations.

Combining these elements gives:

$$LGD = (\Delta D/GDP)/(1- b)$$

This makes it clear that the negative effect of SMP purchases rises progressively with an increase in debt as it entails larger haircuts (see top panel of Figure 5).

Substitution in the previous equation yields

$$CDS = (\Delta D/GDP)/(1- b) \text{ x } (1 - (1- PD)^{1/n})$$

This shows that an increase in the share of SMP purchases *b* increases CDS spreads but more strongly so when CDS prices are already high (i.e, when *PD* is more elevated) and to a

[8] Note that the use of *PDs* abstract from the debate on real world versus risk neutral probabilities. As shown in Bilal and Singh (2012), there may be substantial differences between the two.
[9] This point is also made in Lin and Mutkin (2012).

limited extent when CDS premia are low, i.e., only when default or restructuring fears come into play (see lower panel of Figure 5). When putting this in a dynamic context (although not explicitly done in this model), the beneficial effect of SMP interventions can be shown to hinge on the ECB's credibility of its SMP intervention strategy: subordination may lead to self-fulfilling default dynamics (upward shift of the *PD* line), if, similar to models of currency crises, the central bank's purchases are not able to offset the increased private sector loss given default owing to the ECB subordination effect. This may occur when the ECB is not able to lower spreads (or yields) which would otherwise help improve debt sustainability and contribute to lowering the *PD* (or at least keep the *PD* unchanged).

D. Conclusions

15. **This SIP illustrates that the SMP may have a subordination effect, but this effect will be important only at the margin-as was the case in Greece- and depends on the program's credibility.** The rise in yields for the most distressed sovereigns at the time of announcement of the ECB's exemption from the Greek PSI reflected a net expected transfer of value from private sovereign bond holders to the ECB. This *de facto* subordination may undermine future SMP interventions because sovereigns may face higher issuance cost on any bonds not purchased by the ECB. As shown theoretically, this subordination effect depends on three factors: probability of default, loss given default and the share of ECB bond holdings. At low default probability levels, when LGD is relatively low and the debt market share of SMP is not too high, subordination risk plays a limited role. This is also borne out by the analysis in a CDS model, where further SMP interventions have a negative effect only when adjustment needs are very high or CDS spreads are already extremely high. The latter also helps to illustrate the importance of the ECB's credibility on the SMP: if it is low, SMP interventions may be unable to stop self-fulfilling debt default dynamics. This may occur when the ECB is not able to reduce sovereign spreads or yields, which would otherwise support debt sustainability and be conducive to lowering the *PD*.

16. **Should anything be done to accommodate market fears about subordination by SMP purchases?** SMP subordination currently does not seem to play a large role in pricing and markets. However, in principle it is possible to attenuate market fears about SMP subordination (beyond what is captured in our stylized models) by transferring some of the benefits for the ECB back to private sector bond holders.

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Annex. Valuation of Sovereign Bonds with ECB Senior Creditor Status

Ex ante: ECB pari passu with private bond holders

Suppose a country's debt is trading at 60 cents on the euro (q_0). This, for instance, could reflect market estimates of 80 percent default probability (*PD*) with 50 percent loss given default (*LGD*, i.e., upon default, the country can repay half of the total face value of bonds). The overall discount is 40 percent, beyond the risk-free discount, which is assumed to be zero. This means that, if the total face value F is 100 million euro, then the total market value V_0 is 60 million euro. These relationships can be captured by the following simple valuation equation:

$$V_0 = (1 - PD*LGD)*F,$$

and the price that trades at is $q_0 = V_0 / F$.

Assume that the ECB's share is b percent of the total outstanding. Then, b percent of the market value is held by the ECB and the rest is by the private sector. The values of ECB's holding V_{E0} and the private sector's V_{P0} are

$$V_{E0} = b*V_0, \quad \text{and}$$
$$V_{P0} = V_0 - V_{E0}, \quad \text{respectively.}$$

For example, if the ECB holds 20 percent, the value of ECB's holding is just 20 percent of the original market valuation V_0. The price (q_0) is unchanged to any level of b.

Ex-post: ECB as senior creditor

What if the ECB becomes a senior creditor? As shown below, the effect on existing debt depends on the share (b) of the ECB. Note, however, that what is important is the expectation of b from the future SMP. And, uncertainty about b can create further distress.

When the ECB was shielded from the Greek bond exchange, private sector's claims suddenly became subordinated. This lowered the value of bonds left in the hands of the private sector. Amid expectations that the senior status would be granted to the ECB regarding other Euro-area government bonds, their prices should also fall (i.e., yields went up). The degree of price decline varies with three factors: *the probability of default PD, the loss given default LGD, and the ECB's holding share of the outstanding bonds b.*

The reason why ECB's claim depends on its holding share is that its b percent holdings of bonds are now repaid before the private sector's claim. The private sector's claim is only the residual:

$$V_{P1} = V_0 - V_{E1}.$$

If its face value claim is less than what the country can repay, the ECB's claim would be fully guaranteed; that is, its' loss given default (LGD_{E1}) would be zero. Otherwise, the ECB would take all the repayments although it only owns b percent of total outstanding.

$$LGD_{E1} = 0\,, \qquad \text{if } b \leq (1 - LGD).$$
$$= 1 - (1 - LGD)/\,b, \qquad \text{otherwise.}$$

The ECB's holding is theoretically valued at V_{E1} by using the loss given default that the ECB faces:

$$V_{E1} = (1 - PD*LGD_{E1})*b*F.$$

And, the (shadow) price that the ECB faces is

$$q_{E1} = 1 - PD*LGD_{E1}.$$

The price that the private sector pays is now changed to the ratio of their valuation to the face value of the bonds that they possess,

$$q_{P1} = V_{P1} / (1 - b)F.$$