

Restoring financial stability in the euro area

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Abstract

The pricing of sovereign credit risk is a necessary component of the financial architecture of the European Monetary Union. However, unnecessarily high and volatile risk premia on government bonds are currently preventing effective financial intermediation within the euro area, thereby inhibiting its economic recovery. Several proposals have been made on how these risk premia should be brought down, namely i) permanent pooling of funding through joint bond issuance, ii) temporary liquidity assistance through multilateral funds, iii) debt buybacks using multilateral funds, and iv) debt restructuring.

This paper attempts to evaluate these four proposals. It argues that joint bond issuance will not achieve a meaningful reduction of liquidity premia in the sovereign bond market; these instruments would either create perverse incentives or accelerate the sovereign debt crisis for peripheral Europe. An institution to provide temporary liquidity assistance is a necessary addition to the institutional framework of EMU – there needs to be an EMF to complement the ECB. Debt buybacks using multilateral funds can be a very useful tool for solvent countries such as Spain; they can prevent an overshooting of risk premia that could turn a sovereign liquidity crisis into a solvency crisis. A quantitative assessment shows that debt buybacks at market prices are insufficient to correct Greece's debt overhang, however. In the case of Greece, a voluntary exchange of existing government bonds into new obligations, complemented by a buyback option at a steep discount to face value, could restore sovereign creditworthiness and allow the private sector to regain market access at acceptable interest rates. In the absence of such an orderly and controlled reduction of public debt, highly indebted euro area governments will likely opt to restructure their sovereign debt unilaterally, if they fail to regain market access after several years. This could have unwelcome consequences for financial stability in the euro area, which should be avoided through a creative and cooperative approach to the problem.

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1. Sovereign risk premia are useful price signals within EMU

Since the beginning of the sovereign debt crisis, many politicians and academics have called for forceful policy action to reverse the divergence of credit spreads within the euro area. For instance, Cohen (2010) argues that allowing Greece to fund itself at a risk-free rate would turn it into a solvent country again, while allowing risk premia to prevail in European financial markets would lead to self-fulfilling sovereign debt crises. Before evaluating the feasibility of policy proposals aimed at lowering risk premia in the euro area periphery, it is worth asking whether it is desirable to move back to the market state that prevailed in the years before October 2009. For close to a decade, there was almost no dispersion among the borrowing rates of governments in the euro area. Should politicians, central bankers or regulatory agencies strive to re-establish a market setting that would allow the Spanish or the Irish government to borrow at risk-free rates?

To properly guide savings and investment decisions, only assets without credit risk should trade at a risk-free rate. This implies that financial markets regulation should only try to eliminate credit risk premia on euro area sovereign debt if euro area governments cannot default on their bonds. However, history shows that is clearly possible for European states to restructure their public debt, and economic theory suggests that the introduction of European Monetary Union has made sovereign defaults more likely.

Throughout the centuries, countries have often defaulted on their public debt. From 1557 to 1882, Spain defaulted 13 times on its sovereign debt. During the 19th century, Portugal defaulted six times on central government obligations, and Greece defaulted four times (Reinhart et al., 2003). The UK restructured its government debt five times between 1749 and 1932, by unilaterally lowering the coupon rates. Between 1841 and 1873, ten US states defaulted on their government debt, and three of those states repudiated their debts altogether. The US imposed a haircut of 40% on federal government debt in 1933 by abrogating the gold clause (Reinhard and Rogoff, 2010). Germany defaulted on its external public debt in 1931, and achieved a write-off of about 50% in the London Debt Agreement of 1953 (Guinnane 2004).

Since fiat currencies gained prevalence, governments have often resorted to currency debasement through inflation and depreciation in order to lower the real value of their debt. This has allowed most OECD governments to avoid outright defaults in the last sixty years, and it has given rise to the belief that sovereign debt crises in advanced economies are a thing of the past. For the countries of the euro area, however, this is a misguided belief. By adopting the euro, European governments have voluntarily put themselves into the position of “Emerging Markets” issuers, and have subjected themselves to elevated default risk.

In many Latin American, Eastern European and Asian countries, frequent use of the printing press to finance interest payments on government debt or the insistence on non-market exchange rates as a means of financial repression made it impossible for governments to borrow meaningful amounts in their own currencies. This contributed to the build-up of large amounts of foreign-currency denominated sovereign debt. The resulting currency mismatches on public sector balance sheets were the main cause of the wave of sovereign defaults that hit “Emerging Markets” since 1982 (Eichengreen et al. 2005, Goldstein and Turner 2004). In fact, it can be argued that the presence of sizable liabilities in a currency that the government cannot control is the defining characteristic of an “Emerging Market”. The presence of sizable liabilities indicates that the country is indeed a “market” and not shut off from the global economy, and the fact that these liabilities are denominated in a foreign currency means that the country will be subject to an elevated degree of macroeconomic volatility, which turns it into an unstable “Emerging Market” rather than a stable and “advanced economy”, to use the IMF terminology.

A country with largely foreign-currency denominated liabilities faced with a “sudden stop” of capital inflows will not be able to accommodate this balance of payment shock by letting its currency depreciate, as this would lead to an explosion of debt servicing costs on foreign-currency denominated liabilities and trigger large-scale private and/or public sector defaults (Calvo et al., 2003). Instead, the country will typically have to tighten fiscal policy in the midst of a recession to demonstrate its ability and willingness to continue servicing its foreign debt,

which will likely contribute to a severe economic downturn. This macroeconomic setting can lead to a self-reinforcing and self-fulfilling sovereign debt crisis.

“Emerging markets” can therefore be defined as countries that are unable to run counter-cyclical fiscal and monetary policies because they rely on foreign-currency denominated debt. These countries regularly suffer from elevated macroeconomic volatility. In the good years of expanding global liquidity, they attract large capital inflows at low real interest rates and enjoy a credit-funded boom. In the bad years, when creditors suddenly retract, they find themselves deprived of fiscal and monetary policy options to smooth the decline in output and subject to high sovereign country risk premia, which choke the economy. Hausmann and Gavin (1996) found that the volatility of economic growth rates in Latin America has been more than twice as high as in industrial economies, and the volatility of private consumption growth nearly three times higher. Eichengreen et al. (2005) show that countries which face difficulty in borrowing in their own currency exhibit a larger degree of output fluctuations. Allen et al. (2002) argue that virtually all financial crises in ‘emerging markets’ over past decades have involved currency mismatches. Schnabel (2004) shows that the high level of foreign-currency denominated debt caused the banking crisis and the sovereign default of Germany in 1931.

Policy-makers in Latin America, Eastern Europe and Asia have become increasingly aware of the inherent dangers of running liabilities in a currency they cannot control. Roughly ten years ago, they started to eliminate mismatches on public and private balance sheets by borrowing in their own currencies. As a result, countries such as Brazil, Turkey or Indonesia can probably no longer be qualified as ‘emerging markets’ – they are now economies with high and relatively stable economic growth. For the first time in about 30 years, these countries have been able to increase fiscal stimulus, lower central bank rates and allow their currencies to depreciate during the financial crisis of 2008/2009 without running the risk of sovereign default. At the same time that emerging markets started to eliminate a major source of macroeconomic vulnerability, the governments of Ireland, Spain and Greece voluntarily entered the European Monetary Union and thereby relinquished the ability to

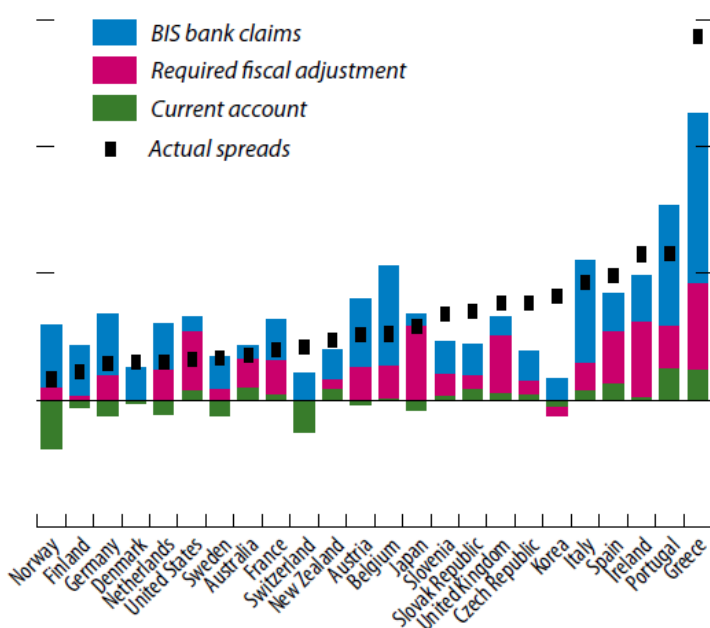
borrow in a currency they can control. The result is elevated sovereign default risk for these countries.

To illustrate this argument, it is useful to compare the fates of Spain and the United Kingdom. Each country went through a credit-driven real estate boom in the run-up to the current downturn. Once the bubble burst, economic output contracted, unemployment rose and the fiscal accounts slipped into a large deficit. According to the latest IMF projections, Spain will be running a fiscal deficit of 6.9% of GDP in 2011, and gross general government debt will rise to 70% of GDP. The UK, on the other hand, will be running a fiscal deficit of 8.1% of GDP this year, and public debt is expected to reach 82% of GDP (IMF 2010c). In light of substantially better sovereign debt indicators in Spain, how can we explain that financial markets assign a probability of 19% to a sovereign default over the next five years, but only a probability of 5% that the UK will resort to public debt restructuring? The reason is that it is almost impossible for financial markets to provoke a sovereign default in the UK, while there is a distinct possibility of such an event in any euro area government. If financial markets suddenly decided to stop funding the UK government, then gilt yields would rise and the currency would depreciate. But the floating exchange rate regime implies that for every pound sterling that jittery investors exchange into foreign currency, a pound sterling will also be bought by other market participants. Money supply would remain constant, and the exodus from the government bond market would lead to an increase in bank deposits – as long as nominal interest rates are reasonably high and there are no doubts about bank solvency. Commercial banks would then lend to the government at short tenors, in the absence of safer alternatives, and there would be no sovereign credit event. Even in the extreme case of a system-wide bank run, the Bank of England could still lend to the government and thereby prevent a sovereign default. By and large, this is the reason why Brazil, with its floating exchange rate regime and limited stock of dollar-denominated debt, was able to avoid a sovereign default in 2002 (Schwartzman, 2002).

On the other hand, a sudden stop of market funding *can* mechanically lead to a sovereign default in Spain or in any other country of the euro area. The fixed exchange rate implies that an

exodus of investors from the government bond market can lead to a contraction of domestic money supply, as investors allocate the proceeds of government bond sales to other countries of the euro area. In the absence of market funding, the government won't be able to borrow from the central bank, as monetary financing of member states' government expenditures is prohibited under Article 123 of the Treaty on the Functioning of the European Union (TFEU). When the government then runs out of cash, it will default on its obligations in the same way an 'emerging market' such as Argentina would have to default on its sovereign dollar bonds. Greece got fairly close to this situation in May 2010, when emergency funding from the IMF and other euro area countries arrived only two days before the redemption payment on a large government bond.

Figure 1. Macroeconomic determinants of sovereign CDS spreads (basis points)



Source: IMF (2010a), Figure 1.6.

Note: This chart shows the result of a cross-sectional regression over the 5-year sovereign CDS spreads of 24 countries. Estimates on the required fiscal adjustment are drawn from the IMF Fiscal Monitor, May 2010. Regression parameters (t-stats): CDS spread = -2.35 (-1.89) current account balance +4.45 (3.08) required fiscal adjustment +4.14 (4.93) BIS bank claims. Adjusted $R^2 = 0.81$.

We have shown that by adopting the common currency, euro area governments have subjected themselves to a high degree of sovereign default risk. Financial markets regulation should foster the efficient pricing of this risk. This implies that measures to fully eliminate credit risk premia on

euro area sovereign bonds are misguided, as long as they are not taken as part of an overall change of the constitutional setting of the euro area that would turn it from a federation of sovereign states into a single nation state.

By and large, markets are now pricing relative sovereign default risk correctly. The results of a recent IMF study, reproduced in Figure 1, show that 81% of the cross-country variation in sovereign credit spreads can be explained by only three macroeconomic factors: the required fiscal adjustment to stabilize government debt, foreign bank claims on the public sector, and the current account position. Large primary deficits and strong reliance on foreign funding mean that Greece, Portugal and Ireland command elevated risk premia.

This result raises the question of why markets failed to price sovereign credit risk adequately in the run-up to the current crisis. Unfortunately, regulatory policies prevented the market from doing its job in the decade from 1999 to 2009. Three factors contributed to this policy failure:

- i) European bank regulation put a zero capital charge on all EU government debt. Specifically, the Capital Requirements Directive (EU 2006) states in Annex VI, Part 1, point 1.2.4 that "exposures to Member States' central governments and central banks denominated and funded in the domestic currency of that central government and central bank shall be assigned a risk weight of 0%." This directive has been adopted into national law by all EU member states. It encouraged commercial banks to buy Greek government bonds at a relatively small spread over Euribor, fund them in the wholesale market at Euribor flat and earn an interest rate margin without any regulatory capital requirement. The return on equity of this carry trade was infinite, which made it very attractive to ignore any embedded tail risks.
- ii) European regulation allowed investment funds to invest up to 35% of their net assets into bonds issued or guaranteed by the governments of any EU member state. This provision of Art. 22, par. 3 of the UCITS directive (EU, 1985) encouraged fund managers to overweight higher-yielding EU government debt, in defiance of prudent portfolio diversification.

- iii) The ECB failed to differentiate for sovereign credit risk in defining initial margins for its refinancing operations.

In addition to these regulatory failures, rating agencies played an important role in facilitating large-scale lending to risky sovereign issuers in peripheral Europe. Against hefty fees from the issuers, these agencies were happy to defy basic economic logic and to assign AA ratings to the sovereign debt of countries that were running large and unsustainable twin deficits in their fiscal and current accounts under a fixed exchange rate regime. In this way, they invited investors to contribute to the credit boom.

The resulting lack of dispersion among government borrowing rates has contributed to an unsustainable credit boom in the euro area periphery. Once the boom came to an end, many governments were left with a large debt burden and/or unsustainable fiscal trajectories. European sovereigns have defaulted on their debt in the past, and by replacing their domestic-currency denominated debt with euro-denominated debt, governments have put themselves into a situation where the market can actually force them into bankruptcy. These developments have increased the risk of sovereign defaults in Europe, and this credit risk is now being priced by government bond markets. Contrary to the proposals by Cohen (2010) and others, politicians, financial market regulators and central banks should not try to eliminate the pricing of sovereign credit risk, but rather reform financial market regulation in a way that strengthens warning signals from markets in good times. This, however, will be insufficient to deal with the current financial crisis the euro area.

2. The current level of sovereign risk premia is threatening financial stability

Since the onset of Greece's sovereign debt crisis in October 2009, European financial markets are to a large degree failing to fulfil their role in intermediating between savers and investors. Sovereign spreads of many countries in the euro area have risen rapidly, notably in Ireland, Spain and Portugal. Due to the strong linkages between sovereign creditworthiness and bank solvency, problems in the government bond market have spilled over to the banking sector. Once Greece's government had lost market access in the spring

of 2010, none of its commercial banks were able to fund themselves in the bond market any more. In Spain, rising sovereign spreads drove up risk premia on all of the country's banks by 150 to 330 basis points, and even institutions with strong international diversification such as BBVA and Santander were hit. The increase in marginal borrowing rates for commercial banks quickly fed through to a commensurate increase in the deposit rates these institutions have to pay in order to prevent customer withdrawals. The resulting rise in the overall liability costs of commercial banks in turn acts as a constraint on credit extensions, and increases lending rates for the non-financial sector of peripheral countries of the euro area.

Figure 2 shows the evolution of the average CDS spreads of liquid non-financial corporate borrowers with investment-grade ratings in Spain and Germany over the past eight years. The graph demonstrates that corporate issuers in both countries faced diminished market access during the financial crisis of 2008 and 2009, and improving financial conditions following the G-20 meeting in April 2009. Since early 2010, however, the Spanish corporate sector is facing rising borrowing costs due to contagion from the sovereign's financing problems.

Figure 2. Non-financial corporate CDS spreads in Germany and Spain (basis points)



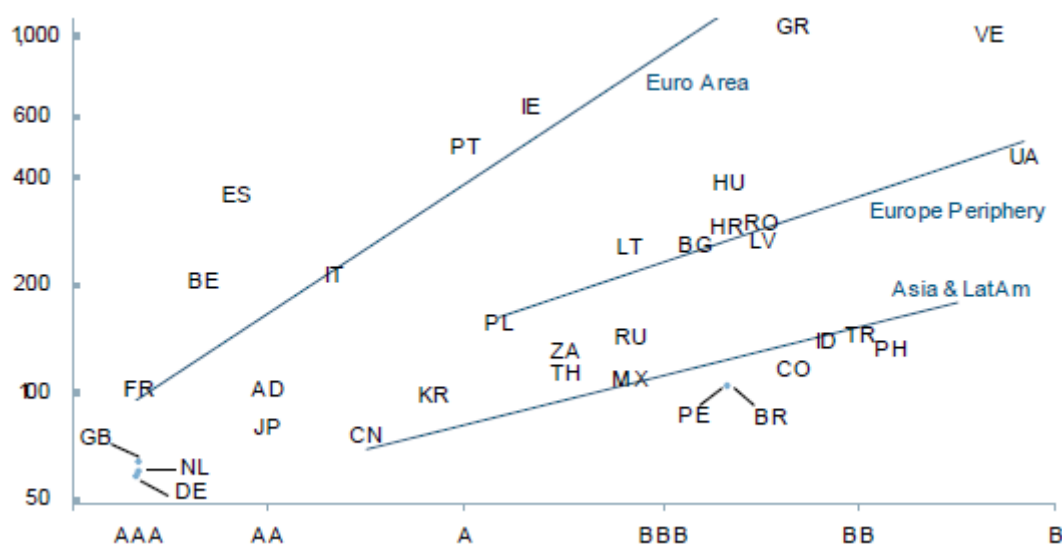
Sources: Markit, Bloomberg, Spinnaker Capital.

Note: This chart shows simple averages of the risk premia on the nine Spanish issuers and the 30 German issuers that are included in the ITraxx Europe Main index.

Furthermore, financial markets are currently assigning a common risk premium on all euro area government bonds, regardless of the vulnerabilities of individual countries. It is a well-documented phenomenon that the variation of sovereign risk premia over time can be attributed to such a common factor. In an early paper, Eichengreen and Mody (1998) demonstrated that “market sentiment” plays a dominant role in explaining changes in credit risk premia on ‘emerging markets’ government bonds. Remolona et al. (2008) find that the cross-sectional variation in sovereign spreads can largely be explained by country-specific fundamental variables, while the overall level of risk premia is driven by a common factor related to investor risk appetite (as proxied, in their study, by the level of equity index volatility). Remolona et al. also find statistical evidence for the common pricing of sovereign debt within geographical regions, which is due to the fact that investors assign risk factors not only to countries, but also to continents. Figure 3 shows that financial markets are presently penalizing sovereign debt

issued by all euro area governments with an elevated risk premium. The inability of policy-makers to re-establish financial stability in the euro area has resulted in a collective punishment by markets. In sum, the sudden loss of market confidence in the ability of governments to service their debts is preventing effective financial intermediation between private savings and private investments in the euro area. This inhibits the economic recovery, and may lead to a self-reinforcing spiral of weaker activity, lower tax revenues, and even greater doubts about sovereign creditworthiness. European policy-makers should act to prevent a de-stabilising overshooting of markets. The following sections evaluate the main policy proposals that have been made to restore financial stability in the euro area, namely i) permanent pooling of funding through E-bonds, ii) temporary liquidity assistance through multilateral funds, iii) debt buybacks using multilateral funds, and iv) debt restructuring.

Figure 3. Common regional factors in sovereign CDS spreads (basis points, log scale)



Source: Standard Chartered (2011). Market data and ratings as of January 2011.

3. E-Bonds are not going to work

Since the onset of the European sovereign debt crisis, many European academics and politicians have been calling for the issuance of “E-Bonds” that are collectively guaranteed by the governments of the euro area. These proposals differ in many important details: De Grauwe and Moesen (2009) suggest that euro area member states should be enabled to fund themselves

through E-Bonds at the same marginal interest rate they pay on their national debt issues; Edmond Alphandéry (2010) argues that access to this financing facility should be granted only under strict fiscal and macroeconomic conditionality, etc. The most prominent concept for E-Bonds was developed by Jacques Delpla and Jakob von Weizsäcker (2010). This “Blue Bond Proposal” has become the basis of policy

proposals for collective debt issuance put forward by Monti, Juncker, Tremonti and other politicians (see Juncker and Tremonti, 2010).

Delpla and von Weizsäcker propose that euro area member states be allowed to issue sovereign debt of up to 60% of GDP jointly in the form of “Blue Bonds” that enjoy seniority over national debt and that carry a joint and several guarantee. Sovereign debt that exceeds this threshold would become a junior obligation of the state. These “Red Bonds” would continue to carry the individual credit risk of each member state. A country with payment difficulties would then opt for a selective default on the “Red Bonds” in the first step, while remaining current on the “Blue Bonds”. If the country’s resources turn out to be insufficient to service these senior obligations, then the guarantee on the “Blue Bonds” will be called and the other member states of the euro area would have to absorb bondholder losses.

The proposal by Delpla and von Weizsäcker shows that the basic idea of E-Bonds is to split sovereign liabilities into senior and junior tranches. In a reduced form, a risky sovereign has the present value of future payments to creditors on the asset side of its balance sheet, and the present value of its debt on the liability side of its balance sheet. The idea is to split the liabilities on the sovereign’s balance sheet in two: senior “Blue Bonds” and junior member state debt. The Modigliani-Miller theorem suggest that, absent market distortions, the weighted average interest rate of the “Blue Bonds” and “Red Bonds” should be identical to the interest rate before the liability split, because there has been no change on the asset side of the balance sheet. In that case, there would be no merit to the “Blue Bond” proposal.

To illustrate this point, we can consider the example of Portugal. The country will likely have accumulated gross general government debt (d) of 90% of GDP next year (IMF 2010b), and the current market yield on five-year Portuguese government bonds (r) is 7%. If we assume that the Portuguese government splits its government debt according to the proposal by Delpla and Weizsäcker, then it would be left with 60% of GDP in “Blue Bonds” (d_B) and 30% of GDP in “Red Bonds” (d_R). If we further assume that “Blue Bonds” would trade at the same level as bonds issued by the European Union under the EFSM, then five-year Portuguese “Blue Bonds” (r_B) would yield 2.80%. The present value of

payments made available to sovereign creditors does not change because of this liability split, which implies that we can derive the yield on five-year Portuguese “Red Bonds” (r_R) from $d \cdot r = d_B \cdot r_B + d_R \cdot r_R$. Under current market parameters, risk-neutral investors that face no market distortions would therefore price five-year Portuguese “Red Bonds” at 15.4%. It is clear that Portugal would not be able to access the primary market for “Red Bonds” at such a level.

This example shows that implementing the “Blue Bond” proposal would immediately force most peripheral euro area countries into a partial sovereign default. However, the result relies on a number of simplifying assumptions. Under which circumstances would the liability split lower the weighted average borrowing costs of the sovereign to an extent that becomes attractive for issuers?

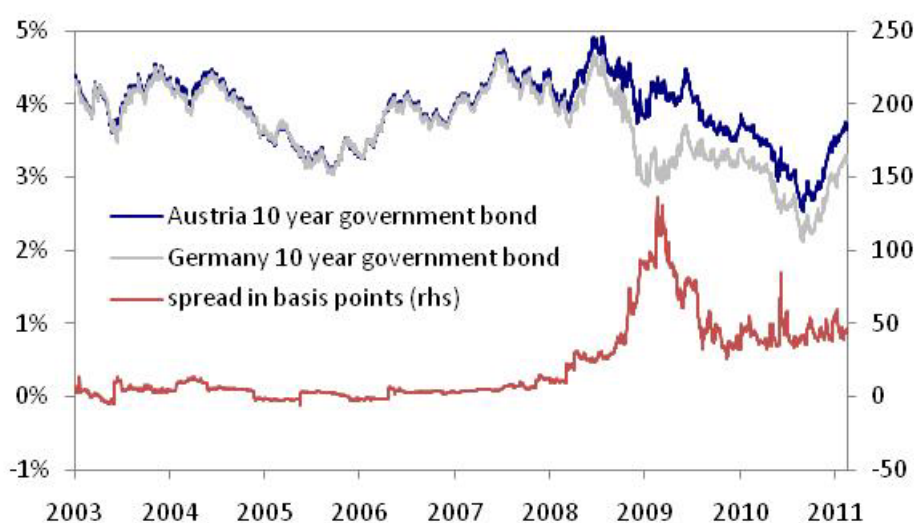
Juncker and Tremonti (2010) believe that the *elimination of liquidity premia* would lower the weighted average borrowing costs of the sovereign. They argue that “the absence of well-functioning secondary markets” is forcing investors to demand an elevated yield on sovereign bonds issued by peripheral countries of the euro area and that the introduction of E-Bonds would eliminate the resulting sovereign spreads. It is reasonable to assume that higher liquidity would indeed lower the yield on “Blue Bonds”. The interest rate (r) on sovereign debt in the euro area has three basic components: risk-free Eonia swaps (e), a credit spread (c) that compensates investors for the default risk of that sovereign, and a liquidity premium (l) that compensates investors for market volatility. In sum, $r = e + c + l$. The market quotes r and e , and we can derive the overall spread ($c+l$). Although c and l are unobservable individually, we can assume that l is going to be greater than zero. Juncker and Tremonti argue that splitting sovereign liabilities into a large portion of ultra-liquid “Blue Bonds” and a smaller portion of less liquid “Red Bonds” will reduce the overall liquidity premium on the stock of debt, and thereby lower borrowing costs. This may be the case, but the effect is likely to be very small. First, Juncker and Tremonti fail to mention that the liability split would not only lead to the issuance of “Blue Bonds” with low liquidity premium, but it would also leave the sovereign with “Red Bonds”, which would require an even higher liquidity premium. Second, the assumption that

the entire yield spread of European sovereign bonds over the risk-free rate can be attributed to liquidity premia is clearly false.

Figure 4 shows the spread of ten-year Austrian government bonds over German government bonds with the same maturity. This spread is a good proxy for the pure liquidity component in sovereign spreads of euro area countries. It compares the funding cost of an issuer with prime rating that is tapping the most liquid bond market in Europe (Germany) with another issuer with prime rating that operates in a market with relatively small trade volumes (Austria). The figure shows that yield spreads of Austrian over

German government bonds had almost disappeared before the onset of the financial crisis. The spread stood at 47 basis points in February 2011, slightly above the long-term average of 21 basis points. If the price of significantly lower liquidity is currently around 50 basis points in yield premium for issuers with identical credit risk, then it follows that the yield spreads of government bonds issued by Belgium (120 basis points over Eonia), Spain (230 basis points over Eonia) or Portugal (430 basis points) can largely be attributed to credit risk, and not to liquidity premia.

Figure 4. Liquidity premium on Austrian government bonds



Sources: Bloomberg, author's calculation. 2971 daily observations, median 6 bps, arithmetic average 21 bps.

This illustration is confirmed by a large body of empirical research. A detailed study of liquidity premia in the European government bond market concludes that “yield spreads were significantly affected by liquidity premiums before the start of EMU [but] this liquidity effect largely vanished with EMU” (Bernoth et al. 2006). Using a different econometric technique, another study reaches the same conclusion: “Liquidity differences play at most a minor role, and this role appears to arise partly from their interaction with fundamental risk” (Pagano and von Thadden, 2004).

We can conclude that a reduction in liquidity premia could lower the average funding costs of peripheral countries of the euro area by a small margin only, contrary to the assertions of Juncker and Tremonti (2010). Delpla and von Weizsäcker (2010) acknowledge this by assuming a liquidity

premium of 30 basis points only. For most peripheral euro area countries, this small lowering of the overall funding costs would still leave them with double-digit market yields on “Red Bonds” and the risk of an immediate partial sovereign default.

There is a second reason why a liability split could lower the weighted average borrowing costs of the sovereign: “Blue Bonds” would not only be senior claims against the member state, but they would also constitute *joint and several liabilities* of all euro area member states. This collective guarantee significantly reduces default risk on “Blue Bonds” due to the limited default correlation of the guarantors, and thereby lowers borrowing costs. Pooling part of the sovereign debt of euro area member states through the issuance of “Blue Bonds” has the advantage that

these countries would re-gain access to a form of financing that remains immune to market seizure under most plausible scenarios. “Blue Bonds” would enjoy higher credit quality and possibly higher liquidity than German Bundesanleihen. If private investors were to sell “Blue Bonds” in a speculative attack on European bond markets and deposit the proceeds of these sales with banks, then these same funds would very likely be reinvested into short-term “Blue Bonds” by commercial banks that are in need of safe assets to match their growing deposit base. Thereby, “Blue Bonds” would allow euro area governments to collectively reinstitute control over the currency in which their liabilities are denominated.

However, the fact that the market won't be able to enforce a default on “Blue Bonds” under most plausible scenarios does not imply that providing joint and several guarantees for these instruments carries no risk for the guarantors. Assuming that all euro area member states would continue to honour “Blue Bonds” of up to 60% of their GDP during an economic crisis requires a leap of faith. Euro area member states should be happy to grant seniority to such instruments ex ante, but it would be very difficult to motivate these member states to remain current on almost half of their debt stock in a severe economic crisis, in order to preserve the interest of their European partners.

As Tommaso Padoa-Schioppa put it, the euro is “a currency without a state”. The euro area is not a nation state with a federal government and a federal treasury; it is a group of sovereign countries. This implies that the budget prerogative rests with national parliaments, and national parliament will act based on national interest. National parliaments have the power to repudiate national debt, in full or in part. From a constitutional point of view, it is very difficult for the European Union or the Eurogroup to infringe with this national prerogative. From the *realpolitik* perspective, there are many examples of the failure of attempts by the Union to interfere with fiscal policies of member states:

- Germany and France broke the 3% ceiling on fiscal deficits in 2003, but no sanctions were imposed.
- Greece underreported its fiscal deficit every single year, since 2000, and only corrected the numbers with long delays (Ophranidis, 2010)

– and there was nothing the European Commission could do about it.

- When the European Commission argued in favour of structural reforms and asset sales in the second review of the assistance programme for Greece in February 2011, the government reacted with hostility, stating that “the behaviour of EU, IMF and ECB officials was unacceptable. We asked nobody to interfere in domestic affairs ... We only take orders from the Greek people.”

This constitutional and political setting implies that the Stability and Growth Pact is incompatible with the nature of European Union. Member states will be happy ex ante to agree on rules and sanctions, but it will be impossible to enforce these sanctions, because of the budget prerogative of national parliaments. There is a broad understanding of this problem by now, which explains the desire to effectively replace the Stability and Growth Pact with national fiscal rules that are founded in member states' constitutions.

This setting also implies that a mutual guarantee for the public debt of member countries is incompatible with the nature of European Union. Neither the Union nor individual member states have the constitutional or political power to prevent fiscally challenged states from defaulting on “Blue Bonds” in times of crisis, and from turning them into direct obligations of the guarantors, i.e. the fiscally prudent countries that chose to avoid sovereign default.

In sum, we can conclude that a liability split into senior “Blue Bonds” with a joint and several guarantee of all euro area governments and junior “Red Bonds” could lower the aggregate borrowing cost of countries in the European periphery, but mainly because this construction would be based on an illusion of seniority that cannot be enforced in times of crisis. In the end, member countries that wish to remain current on their own obligations may end up having to pay for Portuguese, Greek or Irish sovereign debt.

4. Temporary liquidity assistance through multilateral funds is necessary

We have seen in previous sections that fully eliminating sovereign spreads is not desirable

under the current constitutional setting of the European Union, and that a permanent pooling of funding through a liability split into “Blue Bonds” and “Red Bonds” would either create perverse incentives or drive fiscally challenged countries into immediate sovereign default. However, it would be wrong to conclude from this that sovereign debt markets should best be left to their own devices, as many German academics and politicians suggest.

Under the fixed exchange rate regime with open capital accounts that characterises the euro area, sudden swings in creditor sentiment can lead to sovereign defaults even if a country’s public debt is sustainable in the medium term. Sovereign defaults are costly both for creditors and debtors, mainly because they typically go in hand with banking crises. The resulting breakdown in domestic financial intermediation can be quite harsh – as in the cases of Russia (1998) and Argentina (2001), where the chain of payment broke and households and firms partially reverted to barter. This led to a severe loss in output and employment, which lowered the country’s welfare and its capacity to repay sovereign debt. Yeyati and Panizza (2011) show that countries which become subject to elevated sovereign default risk typically suffer severe output contractions, independently of whether or not the government ultimately decides to validate the market’s anticipation of a default or not. The prospect of multilateral liquidity assistance for countries with sustainable sovereign debt burden can limit these avoidable output losses and thereby increase welfare. It can act as a catalyst to restore market confidence.

This finding is consistent with the theoretical literature on sovereign debt crises. Calvo (1988) demonstrates in a simple model that the sovereign debt market is characterised by multiple equilibria. As long as interest rates remain reasonably low, governments with sustainable debt burdens maximise welfare by remaining current on their obligations. But a benevolent government would choose to (partially) repudiate its sovereign debt if the interest rate rises too much above the growth rate of the economy. The non-uniqueness of equilibria implies that investor expectations of rising default risk, which are articulated through elevated risk premia on sovereign debt, can become self-fulfilling. Small changes in market

sentiment can drive a solvent country into default. Due to the costs of debt repudiation, this solution to the sovereign debt crisis is a pareto-inferior ‘bad equilibrium’. It follows from this model that an international lender of last resort can help to steer market expectations towards a ‘good equilibrium’ – provided, however, that the sovereign’s debt is indeed sustainable. Morris and Shin (2006) present a game-theoretical model of sovereign debt crises with three actors: the debtor country, private creditors, and an international lender of last resort. If the sovereign’s cash holdings are smaller than the sum of interest payments and maturing debt in any one period, then “the fate of the country lies in the hand of its short term creditors”, even if the sovereign is fundamentally sound. For annual periods, this is the case for all member states of the euro area. The inefficient outcome of a sovereign default can be avoided if an international lender of last resort provides liquidity assistance – provided, however, that the sovereign reacts to financial crisis and multilateral intervention with an increased macroeconomic adjustment effort. The sovereign’s increased effort, in turn, alters the incentives among private creditors and induces a debt rollover.

In her analysis of Germany’s banking crisis and sovereign default of 1931, Schnabel (2004) concludes that “only an ‘international lender of last resort’ could have provided the ‘liquidity’ (foreign currency) needed to prevent the German collapse”. This is precisely the reason why the IMF was created in 1944: in a system of fixed exchange rates, there is a need for an institution capable of providing emergency funding when capital markets seize up. The European Union today needs a similar institution; an international lender of last resort to provide liquidity assistance to governments of solvent countries that lose market access, as suggested by Gros and Mayer (2010).

Haufler et al. (2011) disaffirm the need for a permanent facility to support countries facing liquidity crises. They believe that “states that need the rescue fund because their creditors are not convinced that they merely face a liquidity bottleneck must then be considered insolvent.” As shown above, equating illiquidity with insolvency ignores key findings of the theoretical literature on sovereign debt crises. Shifts in

creditor expectations and creditor coordination failures can drive solvent sovereign borrowers into a default on their obligations, especially if these obligations are denominated in a currency that that sovereign does not control. Furthermore, there is ample empirical evidence on interventions of international lenders of last resort in sovereign debt markets that have successfully prevented liquidity problems from turning into solvency crises: the joint assistance of the IMF and the US Treasury to Mexico in 1995, the IMF programme for Turkey in 2002, the joint EU-IMF assistance programmes for Hungary, Latvia and Romania in 2008, to name but a few. In all of these cases, the recipients of multilateral liquidity assistance were able to regain market access and remain current on their debt without having to resort to sovereign defaults. Romania had gross general government debt of 21.3% of GDP (IMF 2010c) when it was hit by contagion from the global financial crisis in 2008 and had to request multilateral liquidity assistance to avoid a sovereign default. Arguing that this request for liquidity assistance automatically implies that the country “must then be considered insolvent” without giving consideration to fundamentals, as Haufler et al. suggest, is bordering on the ridiculous. By turning a blind eye to theoretical findings and empirical evidence, the authors are following the example of the Bank of England, which denied liquidity assistance to the German Reichsbank in 1931 and thereby contributed to the most devastating sovereign default and banking crisis that shook Germany in the past century.

This is not to say that sovereign debt restructuring should be avoided at all times. But the empirical evidence suggests a limited need to complement liquidity assistance with haircuts on private creditors in order to overcome fiscal and balance of payment crises. Bini Smaghi (2010) calculated that out of 113 IMF support programmes over the last 20 years, only 19 countries defaulted or restructured their debts.

Others have argued that European countries should leave the task of providing emergency assistance to the IMF instead of setting up their own lender of last resort. However, the sums involved in backstopping euro area sovereign issuers far exceed the lending capacity of the IMF. This can be illustrated by taking a closer look at

the public sector borrowing requirements in various European countries.

One of the key lessons from the crises in Asia and in Argentina is that multilateral financial assistance in the context of a fiscal adjustment programme needs to be sufficiently large to take the country out of the market for two or three years – otherwise, the intervention will likely lack credibility. Emergency funding in fiscal crises aims to remove the tail risk that a solvent country has to default on its sovereign debt because it runs out of cash. As long as this tail risk persists, it can be rational for investors to stop refinancing solvent countries, to sell down their exposure or to put on “short” positions, because the value of these claims will decline further as the sovereign moves closer to a default. If international liquidity assistance is provided at small scale, then these funds will likely end up being used to finance capital flight only, as in the cases of Russia in 1998 or Argentina in 2001. Only programmes that cover the sovereign’s gross financing requirements well in excess of one year will be large enough to contribute to a meaningful reversal of private capital flows. Such a programme has the potential to remove the tail risk of an unnecessary default, and thereby induce the private sector to resume lending to and investing in the country. For the countries of the euro area, the IMF is unable to provide the needed liquidity assistance on its own. IMF stand-by arrangements are typically capped at 500% of quota. In the case of Greece, the IMF took the exceptional step of providing €30 billion, which amounts of 3,200% of quota. At present, five out of 27 member states of the European Union have obtained credit from the IMF. Table 1 shows that the total size of IMF commitments to these countries is within a range of 10% to 14% of GDP. The total size of multilateral assistance programmes has varied between 16% and 48% of GDP, and co-financing through the European Union, the euro area or other lenders has amounted to 35% to 77% of the total programme volume. Programmes have been sized to cover the government’s gross financing requirement for eighteen months to three years. The Latvia programme went significantly beyond this metric, as it was primarily a balance of payments assistance programmes meant to smooth the adjustment of the excessive current account deficit.

Table 1. Actual and potential assistance programmes in the European Union

<i>in € billions, unless noted otherwise</i>	<i>Existing programmes</i>					<i>Potential programmes</i>	
	Hungary	Latvia	Romania	Greece	Ireland	Portugal	Spain
IMF quota	1.2	0.1	1.2	0.9	0.9	1.0	3.4
2010 GDP	98.4	17.8	121.7	229.9	156.5	171.4	1051.3
<i>Three-year cumulative public sector financing requirements, from programme inception onwards</i>							
Principal amortisations	42.1	0.3	4.3	97.2	62.9	46.3	288.5
Projected net borrowing	5.9	2.3	13.3	73.4	42.4	21.0	157.1
Gross financing requirement (GFR)	48.0	2.5	17.6	170.6	105.3	67.3	445.6
(Potential) IMF credit	12.5	1.7	12.9	30.0	22.5	24.0	147.2
(Potential) IMF credit, in % of quota	1065%	1186%	1108%	3226%	2375%	2448%	4272%
(Potential) IMF credit, in % of 2010 GDP	13%	10%	11%	13%	14%	14%	14%
EU co-financing	6.5	3.1	5.0	80.0	40.2	29.8	209.3
Other co-financing	1.0	2.7	2.0	0.0	4.8	0.0	0.0
Total programme	20.0	7.5	19.9	110.0	67.5	53.8	356.5
Co-financing, in % of total programme	38%	77%	35%	73%	67%	55%	59%
Total programme, in % of GDP	20%	42%	16%	48%	43%	31%	34%
Total programme, in % of public sector GFR	42%	295%	113%	64%	64%	80%	80%

Sources: IMF, European Commission, Bloomberg, author's calculations.

Note: SDR are converted into EUR using an exchange rate of 1.13. Three-year financing requirements are calculated from the (assumed) programme inception onwards: 2009-2011 for Hungary, Latvia and Romania, 2010-2012 for Greece, 2011-2013 for Ireland, Portugal and Spain. For existing programmes, GFR are taken from various IMF staff reports. For potential programmes, GFR are calculated based on Bloomberg data on debt maturities and on government deficit targets under the excessive deficit procedure of the EU's Stability and Growth Pact.

The table also shows that under reasonable assumptions, existing funds in the different assistance facilities are barely sufficient to backstop Portugal and Spain, if needed. The EFSF can borrow up to €255 billion while maintaining its AAA rating and the EFSM can borrow up to €60 billion. €40 billion of these funds have already been committed to Ireland, which leaves €275 billion in available lending capacity. If we assume that IMF commitments to Portugal and Spain would be capped at 14% of GDP, then the European financial assistance could be complemented by €171 billion in IMF credit, for a total assistance volume of €446 billion. A credible multilateral intervention should cover around 80% of the cumulative gross financing requirement of the public sector in the first three years of the programme, which would amount to €410 billion for Portugal and Spain combined.

In sum, an institution to provide temporary liquidity assistance is a necessary addition to the institutional framework of EMU. This role cannot be assumed by the IMF alone, due to the size of the necessary interventions. There is a need for a European Monetary Fund (EMF), as suggested by Gros and Mayer (2010), to complement the European Central Bank.

5. Loans from a European Monetary Fund need to be senior to market debt

In the previous section, we have not covered the most common objection against multilateral emergency funding to sovereign borrowers: this liquidity assistance is said to create 'moral hazard' in the sense that it induces governments to borrow beyond their sustainable debt level, because they expect that they (or rather, their private creditors) would be 'bailed out' by multilateral lenders if markets seize.

It is clear that any insurance mechanism is prone to moral hazard. The only way to fully eliminate moral hazard in multilateral lending to sovereigns would be to stop providing such insurance against market seizure. This, however, would imply that euro area governments should hold no public debt at all. Experience with countries that borrow in a currency they cannot control has shown that markets can seize up for reasons that are unrelated to a country's fundamentals (such as occurred during the Russian crisis of 1998 or the global financial crisis of 2008) and that markets can drive into default sovereign issuers that have perfectly sustainable debt levels. An example of this is the case of

Romania, which lost market access in 2008, although it had government debt of merely 21.3% of GDP. In the two-period model of Morris and Shin (2006), the market can drive a sovereign into default if its cash holdings are smaller than the sum of interest payments and maturing debt in any one period. Extending this game-theoretical exercise beyond two periods would show that a sovereign which is borrowing in a currency it does not control needs to hold cash well in excess of its gross financing requirement for one year in order to be protected against market seizure. This raises the question of why such a government should borrow at all, since holding 40% or 50% of its credits in cash reserves would most certainly render any borrowing uneconomical. Indeed, the result of the sovereign defaults of US states in the 1840s was that most states stopped borrowing in meaningful size, and that most state constitutions now require balanced cash budgets. The absence of a robust international lender of last resort in the Asian crisis of 1997 led to a massive accumulation of international reserves which has turned almost all Asian sovereigns from net debtors into net creditors. Opponents of insurance mechanisms to protect euro area member states against market seizure implicitly argue that these countries should have no public debt at all. If, however, euro area member states are unable to borrow and there is no meaningful federal budget at the level of the European Union, then macroeconomic volatility should be expected to rise significantly, as governments are no longer in a position to smooth aggregate demand over time. This problem is exacerbated by the fact that monetary policy in the euro area cannot be expected to react to asymmetric shocks that hit individual member countries. Rising macroeconomic volatility due to inadequate fiscal and monetary policy responses to fluctuations in output is associated with welfare losses. There are three options to avoid such welfare losses:

- i) EMU breaks up and member states revert to a situation in which they are able to borrow in a currency they can control,
- ii) EMU is transformed into a full transfer union comparable to the USA, where member states don't borrow and hold no debt, but a large portion of overall taxes flow to the federal government, which issues debt to smooth aggregate demand,
- iii) EMU member states keep their sovereign debt, and an insurance mechanism is put into place to protect them against market seizure.

If member states of the euro area indeed opt to set up a European Monetary Fund (EMF) as a joint insurance mechanism against market seizure, then they should look at ways of reducing moral hazard within this institutional framework, instead of embarking on the elusive quest of eliminating moral hazard altogether. The best way to minimize moral hazard in multilateral lending to sovereigns is to insist on seniority over market debt.

Countries can lose market access for two reasons: market failure could lead to a liquidity crisis, or excessive debt could lead to a solvency crisis. This leads to a dilemma for multilateral lenders: it is difficult to tell these two types of crises apart when markets seize. The sustainable debt burden of a sovereign is not clearly defined, and liquidity crises can turn into solvency crises when high market interest rates result in prohibitive debt servicing costs, as explained by Calvo (1988). However, emergency funding through an international lender of last resort can only be justified in the context of market failure and a liquidity crisis. If there is no market failure, then there is no reason for public interventions in financial markets. Emergency funding that is provided to a solvent lender can act as a catalyst to re-start private lending and thereby help to steer the market to a 'good equilibrium'. However, emergency funding provided to a country which is actually facing a solvency problem that has been correctly diagnosed by market participants will only serve to bail out reckless lenders.

Fortunately, there is a way out of this dilemma: seniority of multilateral lending. The IMF typically provides emergency funding in limited size, for a limited time and at concessional terms. If the country manages to regain market access after being granted liquidity assistance and pays back its multilateral credits, then this is a sign that it was only facing a surmountable liquidity crisis. If the country fails to regain market access, then this is a signal that it was facing a solvency crisis and has to bring down its debt overhang. In that case, IMF seniority will prevent a waste of the lenders' resources. Seniority of funding is instrumental in preventing moral hazard by limiting the risks for the multilateral lender: IMF

programmes to Russia, Argentina, Uruguay, etc. have created no costs to the international community because IMF loans have been repaid in full in all of these cases, in spite of the parallel restructurings of private sector debt (Jeanne and Zettelmeyer, 2006).

Basic welfare economics dictates that multilateral liquidity assistance needs to come at non-market, i.e. concessional lending rates. A multilateral institution that provides liquidity assistance at market rates, as suggested recently by Weber (2011), should not lend at all. If market rates are affordable to the sovereign, then lending should be left to markets. Multilateral institutions should only intervene when there are signs of a failure of financial markets, i.e. when there is a temporary overshooting in market risk premia that could lead to a self-reinforcing sovereign debt crisis. In turn, it is clear that seniority of multilateral financial assistance is a pre-requisite for concessional lending rates. To quote Nouriel Roubini and Brad Setser:

The IMF is not as a private lender seeking profitable lending opportunities but a public institution responsible for stabilizing the international financial system. ... The IMF's preferred status lets it lend when private creditors will not, even though it has to guard against losing the taxpayers' funds it manages. ... Without effective seniority, the IMF would have to act more like a private lender ... It would need to lend to a sovereign at high market rates in order to avoid systematically losing money and would be less able to put money in when other creditors are pulling out. (Roubini and Setser 2004, p. 253f.).

Gros (2010) has argued convincingly that the presence of multilateral debt with preferred creditor status puts private creditors into a more junior position, which raises the required risk premium for private debt. Daniel Gros also believes that this would prevent the country from regaining market access. We have shown in the discussion of the "Blue Bond" proposal in section 3 of this paper that this may indeed be the case, if senior financing is very large, as a share of GDP or as a share of the sovereign's total stock of debt. This shows how important it is to size assistance programmes correctly: they need to be large enough to be credible and act as a catalyst to restart private lending, and they need to be small enough to encourage continued private lending at reasonable rates. However, experience has shown

that it is possible to strike the right balance. In fact, there is no empirical evidence that IMF seniority has stopped private creditors from providing new money to solvent sovereigns that were recipients of multilateral funds over the past twenty years or so. Brazil, Turkey, Ukraine, etc. were all able to raise money in the market after the IMF stepped in to provide liquidity assistance. Hungary, Latvia and Romania were all able to raise new money in the primary market, in spite of the explicit seniority of loans that these countries received from the IMF and through the EU's balance of payments assistance facility under Article 143, TFEU (EU 2009).

If we were to face a situation in Europe in which seniority of funding provided by multilateral lenders of last resort would make it impossible for a sovereign to raise new money in the primary market on a permanent basis, then this should be seen as a signal of debt overhang. In that case, the solution is not to provide multilateral funding on equal terms with private creditors, but to restructure the sovereign debt and to let the private sector take a hit.

6. Debt buybacks at market prices could make sense for Spain

We have established that provisions for temporary liquidity assistance through a multilateral lender of last resort are a necessary addition to the institutional framework of the European Monetary Union. This raises the question whether temporary liquidity assistance should only be used to repay maturing private debt at par, or whether governments should be enabled to buy back their own debt in the secondary markets, if it is trading at a significant discount to par. After all, such buybacks would allow a certain amount of debt relief.

Buybacks at a discount have been a regular feature in past sovereign debt crises. For instance, the German government bought back a significant portion of its non-performing sovereign debt in the market after the 1931 default. Many Latin American countries bought back performing and non-performing debt throughout the 1980s, or exchanged it into physical assets. With hindsight, these operations were insufficient to deal with the sovereign debt overhang these countries were facing, and did not result in a re-activation of international lending. The Philippines carried out relatively successful

buyback operations in the early 1990s. Commercial bank creditors were given the choice to convert their existing Philippine sovereign bonds into Brady bonds or to tender them for cash, at 52% of face (Chemical Bank, 1992). The options were calibrated to achieve identical net present value. Buybacks were largely financed by new loans from the World Bank and the IMF. Documents retained by Citibank show that the Philippine sovereign debt restructuring achieved a participation rate of 96% of outstanding debt. Holders of 27% of eligible debt chose the buyback option, and holders of 69% of eligible debt opted for an exchange into new sovereign obligations. Sovereign spreads quickly receded once the debt restructuring was completed.

Debt only trades at a significant discount to par if creditors assign a high probability to non-payment. If countries retire debt at a discount they won't have to pay back the full amount of their borrowing at maturity, even if they do remain current on their obligations. Krugman (1988) shows in a simple model that sovereign debt buybacks at a discount reduce the expected total payments to all creditors, as they deprive creditors of the option value of full repayment. As a result, "the country gains at creditors' expense". Krugman concludes that creditors will typically not allow buybacks, unless they assign a very low option value to full repayment because they are convinced that the country will default anyway. In that case, a debt restructuring may be more straightforward. Krugman's model may explain why debtors have often been prohibited from repurchasing their own obligations at a discount under sovereign loan and bond documentation. But in the European case, there are no legal impediments against sovereign debt buybacks – in fact, the governments of Hungary and Portugal have carried out several buyback operations in recent months to restore market order. In a narrow sense, governments may have gained at creditors' expenses from these buybacks, as Krugman suggests. But in a broader sense, buybacks may have been pareto-efficient, as they have helped to prevent an overshooting of market risk premia.

Bulow and Rogoff (1988) argue that sovereign debt can only be bought back at a significant discount when the country's actual payment capacity is very low. In that case, the country would likely have alternative uses of its scarce

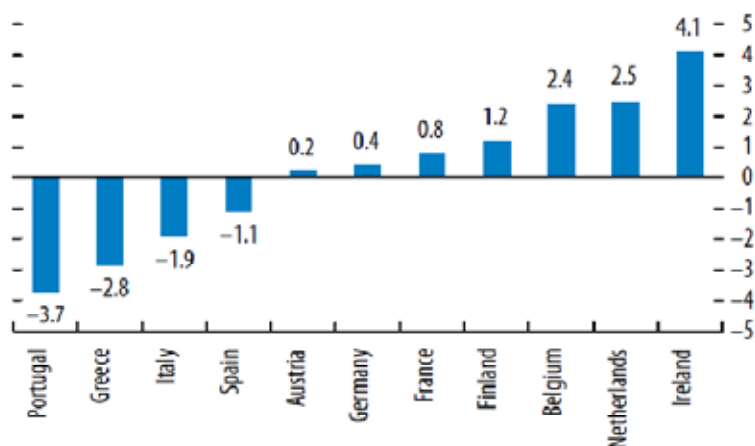
resources that have a higher value for it than debt repurchases. Dornbusch (1988) criticises that this cost-benefit analysis "oversimplifies the issue". If additional resources are made available to a distressed sovereign borrower that are earmarked for market-based debt reductions, then the country should clearly take advantage of the fact that its debt is trading at a discount to par and repurchase it from creditors, in order to benefit from lower total debt servicing costs. Bulow and Rogoff acknowledge this criticism by giving qualified support for market-based debt reduction schemes: "for a buyback to make sense for a country, it must ... receive incremental new loans and grants to cover part of the cost."

We conclude that debt buybacks at market prices make sense for solvent borrowers that have been given access to additional resources to carry out these operations.

Under current circumstances, this may be of particular relevance for the Spanish sovereign, which appears to be solvent according to most metrics. The Spanish government bond market has been hit by contagion from the escalating sovereign debt crisis in Greece, as Figure 5 demonstrates. Based on Granger-causality tests, it can be shown that the widening of Spanish sovereign bond spreads that occurred in early 2010 has largely been driven by the CDS market (Fontana and Scheicher, 2010). This is an indicator for a speculative attack by leveraged investors. Indeed, anecdotal evidence suggests that many hedge funds generated handsome profits from short positions in Spanish sovereign debt during 2009 and 2010. Price signals in the CDS market have fed through to the government bond market, and seem to have triggered an exodus of mutual funds, pension funds and insurance companies from Spain. According to proprietary flow data from European investment banks, the retreat of international investors accelerated sharply during the fourth quarter of 2010. Anecdotal evidence suggests that major European institutional investors have underweighted Spain vis-à-vis their benchmarks, if they hold any positions at all. Initially, this investor positioning does not necessarily reflect a view on the solvency of the Spanish government. Instead, it can be rational to 'short' Spain, outright or against a benchmark, if investors expect others to sell as well. The seminal paper on this type of noise trading cites Keynes to illustrate this point:

Investment based on genuine long-term expectation is so difficult ... as to be scarcely practicable. He who attempts it must surely ... run greater risks than he who tries to guess better than the crowd how the crowd will behave. (DeLong et al., 1990).

Figure 5. Custodial bond flows, 2007 – June 2010, as percent of 2010 general government debt



Source: IMF (2010b), Figure 1.9.

Investor re-positioning and the resulting changes in borrowing rates are necessary components of well-functioning sovereign debt markets. However, under a fixed exchange rate regime with open capital accounts, a speculative attack on a government bond market can lead to a self-reinforcing sovereign debt crisis. In such circumstances, there is a case for sovereign debt buybacks to prevent the market from becoming a one-way street. Buybacks at a discount to par would be beneficial for the issuer, and they could help restore market order, in a similar way to automatic 'circuit breakers' that have been established by many stock exchanges.

At present, European policy-makers have delegated the task of stabilising government debt markets to the ECB. However, the Securities Markets Programme brings the ECB dangerously close to monetising government debt, as Weber (2010) and others have rightly criticised. Instead, giving a solvent country like Spain access to EFSF funds of €50 billion or €100 billion to buy back its own government debt in the market would allow the ECB to disengage from quasi-fiscal policy. Expectations of such large-scale asset purchases have already deterred speculators and contributed to a meaningful tightening of Spanish sovereign spreads and to a lowering of auction yields in the first weeks of 2011.

In sum, allowing the EFSF to finance sovereign debt buybacks of solvent euro area member countries could mark the turning point in the European sovereign debt crisis.

7. Greece should undertake a debt exchange at non-market prices

For solvent countries, sovereign bond buybacks can serve to restore market order. Beyond this function, buybacks have been proposed as a means of eliminating the debt overhang that some countries in the periphery of the euro area may be facing.

Gros and Mayer (2011) have proposed such a market-based debt reduction scheme for euro area member states that are insolvent according to most metrics, such as Greece. In the first stage of their concept, private creditors would be allowed to exchange Greek government bonds into EFSF obligations at market prices. In order to be able to harvest the full market-implied debt reduction, this swap offer would be based on market prices that prevailed prior to the announcement of the debt management exercise. The EFSF would then sell its holdings of Greek bonds on to the sovereign, and provide it with credit at concessional terms to finance the buyback. As a result, the EFSF would become the main lender to Greece, and private creditors

would have been given an exit, at a market-based discount to par.

Several objections have been raised against this proposal for “debt reduction without default”. Most notably, the Bundesbank (2011) warns that debt buybacks in the secondary market may be insufficient to restore fiscal sustainability for euro area governments, because markets are not pricing in a steep enough discount to par value. In the case of Greece, this criticism appears to be valid.

Table 2 shows the economics of a debt buyback according to the mechanism proposed by Gros and Mayer (2011). The current stock of Greece’s bonded debt amounts to €285.7 billion face value, and bonds traded at a market-cap weighted average price of 77.5% in February 2011. The average coupon rate that Greece pays on this debt is 4.26%, and the annual interest bill on this portion of public debt is €12.2 billion. In order to buy up all bonded Greek public debt at current market prices, the EFSF would have to spend

€221.5 billion (plus accrued interest). The EFSF can then sell these bonds on to Greece and provide Greece with a credit of €221.5 billion to finance the buyback. The EFSF is currently funding itself at a spread of eight basis points over euro swaps. Ten-year euro swaps are currently trading at 3.52%. Because of over-collateralisation and cash reserve requirements, the EFSF would be able to provide Greece with ten-year loans at a minimum rate of roughly 4.00%. If a debt exchange were carried out under these parameters, then Greece would henceforth only face the EFSF as a creditor, apart from the emergency loans provided by other euro area governments and the ECB. Greece would have an annual interest bill of €8.9 billion on its stock of EFSF debt, provided that the debt exchange achieves a participation rate of 100%. This implies that such a market-based debt reduction would lower Greece’s annual public debt service by a maximum of 23%, and take it to around 5.0% of GDP.

Table 2. A market-based restructuring of Greece’s sovereign debt

<i>in € billions, unless otherwise noted</i>	Today	Post restructuring
Stock of bonded debt	285.71	221.48
Average coupon rate	4.26%	4.00%
Average bond price	77.5%	
2011 interest payments on bonded debt	12.18	8.86
2011 interest payments on IMF and bilateral loans	2.38	2.38
2011 total interest payments on public debt	14.56	11.24
2011 debt service, in % of GDP	6.5%	5.0%
Change in debt service		-23%

Sources: Bloomberg, author’s calculations

Note: This calculation is based on instrument-level data on 7 T-Bill issues (€8 billion total notional), 46 domestic bonds (€258 billion total notional) and 29 bonds issued under international law (€19 billion total notional). Bond prices are based on closing levels as of 2 February 2011. Debt service on IMF and EU loans is estimated based on IMF data.

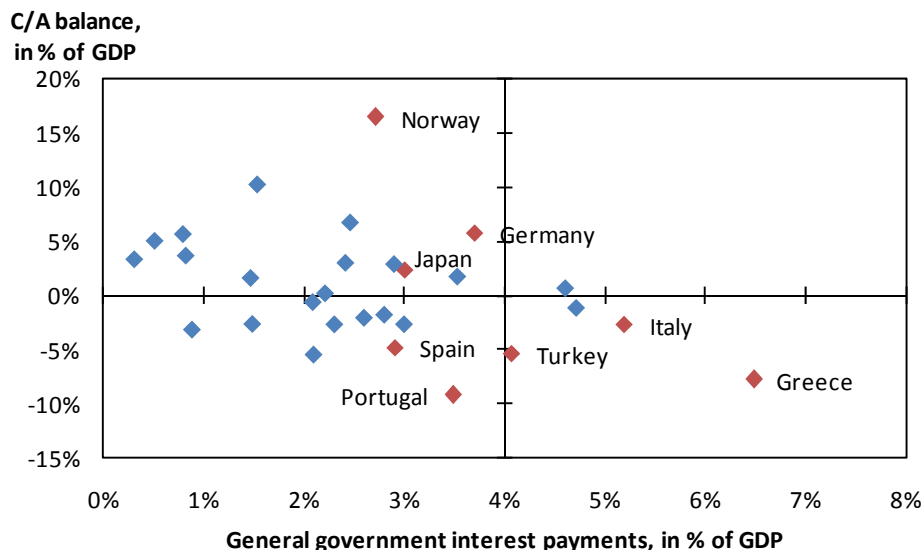
With this result at hand, we can ask whether a market-based debt reduction scheme would likely be sufficient to restore debt sustainability for Greece. Figure 6 provides a cross-sectional view of the public debt service of major economies. It seems reasonable to assume that the government of an advanced economy can sustain a debt service of around 4% of GDP. This is what Turkey is paying today and has been paying on average over the past decade. In order to service

its current stock of debt, the Greek government will have to pay interest of 6.5% of GDP in 2011, and this burden is projected to increase further in the years ahead. Combined with the fact that most of Greece’s public debt is held by non-resident investors, this appears to be unsustainable. A market-based debt reduction could potentially lower Greece’s public debt service to around 5.0% of GDP, and it would at best take Greece’s public debt burden to around 134% of GDP by the end

of 2011. As the country would still be running a substantial current account deficit, this amount of debt reduction would seem to be insufficient to restore investors' confidence in the sustainability of Greece's public finances. Investors would

continue to demand elevated risk premia for Greek government bonds in the primary market, and the associated borrowing rates would lead to a snowballing of Greece's debt servicing costs in the years ahead.

Figure 6. Government debt affordability (projections for 2011)



Sources: IMF, Moody's, author's calculations.

Gros and Mayer (2011) acknowledge that a voluntary exchange of government bonds into EFSF debt may be insufficient to restore debt sustainability, as the market discount is too small. In that case, they propose that the EFSF would charge Greece a lower interest rate, in return for the issuance of GDP warrants that would allow the EFSF to participate in a better-than-expected future performance of the Greek economy. It would certainly be possible to calibrate the interest rate on multilateral loans in a way that results in a sustainable debt burden for Greece – for instance, taking the interest rate to 2% would lower Greece's annual debt service on bonded public debt by 64%. Under this scenario, Greece would end up with public debt service of around 3% of GDP, which should be a sufficient reduction under most plausible assumptions. However, allowing Greece to fund itself at such a concessional rate would result in a negative net interest margin for the EFSF or its successor institution, the ESM. This would most certainly trigger significant rating downgrades, and would make it impossible for the EFSF to raise sufficient funds in the market to provide Greece with loans to finance a bond buyback. Alternative mechanisms can be designed to provide Greece with concessional loans in order to carry out bond

buybacks at market prices. But if such highly concessional loans are required in order to achieve a sustainable debt burden, then the international community will rightly ask why it should finance what is effectively a transfer payment to Greece's private creditors.

In sum, the relatively low discounts that the market applies to Greek government bonds effectively rule out a market-based debt reduction scheme along the lines of the proposal developed by Gros and Mayer (2011). However, these low discounts are not a binding constraint on a successful debt exchange. After all, current market prices on government bonds issued by countries in the periphery of the euro area are artificially high because of ECB purchases through the Securities Market Programme. Instead of starting with current market prices and then adjusting the EFSF funding rate down in order to achieve a sustainable debt burden for Greece, as Gros and Mayer suggest, we can start with a view on the sustainable debt burden for Greece, and then calculate the discount on government bonds that is required to achieve this debt burden.

If we assume that Greece can afford to pay interest of 3.5% of GDP on its public debt under

most plausible scenarios and that nominal GDP will reach around €224 billion this year, then we can set the sustainable total public debt service at €7.84 billion, which is 46% below the current level. Interest payments on IMF loans will likely amount to around €0.44 billion in 2011 which

leaves roughly €7.40 billion in payment capacity on other public debt. At a coupon rate of 4%, this payment capacity can sustain a debt stock of €185 billion face value of private sector and bilateral debt. Table 3 gives a summary of this calculation.

Table 3. A restructuring of Greece's sovereign debt at below-market prices

<i>in € billions, unless otherwise noted</i>	Today	Post restructuring
Stock of bonded debt	285.71	185.00
Average coupon rate	4.26%	4.00%
Stock of bilateral loans	32.08	nil
2011 interest payments on bonded debt	12.18	7.40
2011 interest payments on bilateral loans	1.94	nil
2011 interest payments on IMF loans	0.44	0.44
2011 total interest payments on public debt	14.56	7.84
2011 debt service, in % of GDP	6.5%	3.5%
Change in debt service		-46%

Sources: Author's calculations.

Note: This calculation assumes that bilateral loans provided by member states of the euro area under the inter-creditor agreement of May 2010 are restructured into new Greek government bonds.

In order to reduce its current stock of bonded debt and bilateral loans to a sustainable level of around €185 billion, the government of Greece could make a voluntary exchange offer. Holders of government bonds could be given a menu of three options:

- i) **Discount bond option:** Holders can choose to exchange every €1.00 million face of existing bonds into €0.58 million face of new bonds, with a coupon rate of 4% and a maturity of 20 years. At an exit yield of 6%, these bonds would have a market value of €0.45 million. Holders should be offered complimentary GDP warrants with a market value of around €0.10 million for every €1.00 million tendered. These GDP warrants would allow them to participate in a better-than-expected future performance of the Greek economy, as suggested by Gros and Mayer.
- ii) **Par bond option:** Holders can choose to exchange every €1.00 million face of existing bonds into €1.00 million face of new bonds, with a coupon rate of 1.20% and a maturity of 20 years. At an exit yield of 6%, these bonds would have a market value of €0.45 million as well. Participating holders should

also be offered complimentary GDP options worth €0.10 million. The par bond option should be particularly attractive to commercial banks that are holding Greek government bonds in their banking books, where these instruments are not subject to mark-to-market requirements.

- iii) **Buyback option:** Holders can choose to sell their existing bonds to the EFSF at a price of 45% of face value. The EFSF would then sell the bonds on to the Greek government and provide it with credit to finance the debt buyback, as proposed by Gros and Mayer. Holders who decide voluntarily to sell their bonds in this cash tender should not be offered GDP warrants; instead, these instruments should be issued to the EFSF.

The above proposal is very similar to the sovereign debt restructuring undertaken by the Philippines in 1992, which was discussed in section 6 of this paper. There are two main differences between this approach and the market-based debt reduction scheme proposed by Gros and Mayer (2011): First, the buyback and exchange of existing debt would not be carried out at market prices, but at a discount that is

sufficient to restore public debt sustainability for Greece. Second, the design of the exchange offer would ensure that the large majority of private holders of Greek government bonds would likely choose to exchange their holdings into new obligations instead of tendering them for cash, in order to preserve the option value of participating in a future economic recovery of Greece. As a result, much of Greece's debt should be expected to remain in private hands after the exchange. This outcome is preferable to a situation in which Greece would only borrow from the EFSF, the IMF and other euro area governments, as proposed by Gros and Mayer (2010).

The proposal is structured as a voluntary debt exchange at non-market prices, which raises the question how a high participation rate can be achieved. The member states of the euro area and the European institutions have several tools at hand to promote this outcome. First, there are currently €32 billion in bilateral loans outstanding which have been provided to Greece by the member states of the euro area under the Inter-Creditor Agreement of May 2010. These medium-term loans are relatively expensive for Greece. They rank on equal terms with market debt and should therefore also be exchanged into new long-term Par or Discount bonds at a lower interest rate. Second, the ECB has purchased around €50 billion face of Greek government bonds through the Securities Market Programme. These holdings should be exchanged into new Par and Discount bonds as well. Third, Greek commercial banks have currently pledged around €130 billion of bonds in refinancing transactions with the ECB. The great majority of these assets are government bonds. The ECB could decide to accept only new Greek Par and Discount bonds as eligible collateral in refinancing operations, which would provide commercial banks with a very strong incentive to voluntarily exchange their holdings of Greek government bonds into new obligations. In sum, this should already ensure a participation rate of close to 60%. Furthermore, the Greek government could reserve the option of unilaterally changing the terms of all non-tendered bonds, as described in the following section of this paper, without awarding GDP warrants to their holders. This should further motivate existing investors to exchange their bonds into new obligations. Finally, there is the

change in relative liquidity after completion of the exchange: "hold-out" creditors would find that existing Greek government bonds have become extremely illiquid, while new Greek bonds would have much higher market liquidity. This is another incentive to agree on a voluntary exchange.

In sum, a voluntary exchange as described above should be able to achieve a participation rate in excess of 90%. In a legal sense, a voluntary exchange that is not ex ante binding to all holders will likely not constitute a credit event under the terms of ISDA master agreements, and should not trigger sovereign CDS contracts. As a result, investors who have bought protection on Greece in the market for credit derivatives would not be able to benefit from this form of mutually-agreed debt reduction. Such an orderly and controlled approach would allow the Greek government to significantly reduce its interest burden while avoiding threats to financial stability that may be associated with a unilateral debt restructuring. Most importantly, restoring financial stability would allow the Greek private sector to get back to business and to put the physical and human endowment of the country to productive use.

8. Unilateral debt restructurings are possible, but not desirable

A number of observers have categorically denied that it could be in the interest of the government of an advanced economy to restructure its government debt. If that were the case, there would be no need to derive orderly approaches to debt reduction. However, such arguments can easily be refuted.

Cottarelli et al. (2010) argue that governments in the periphery of the euro area are currently running large primary deficits. These government deficits before interest payments need to be eliminated through fiscal tightening in any case. If a government running a primary deficit decides to default on its debt, it will be shut out from borrowing and will have to cover all non-interest expenditures through primary revenues. Thus, it makes no sense for governments with primary deficits to default. Cottarelli et al. go on to argue that it would also be irrational for these governments to restructure their debt once they have achieved primary balance, as "the needed adjustment in today's advanced economies would not be much affected by debt

restructuring, even with a sizable haircut". They illustrate this point with a numerical example on Greece's public debt. Based on the numbers presented by Cottarelli et al., Greece would run a primary balance (**p**) of -8.6% of GDP in 2010. Public debt (**d**) is projected to reach around 148% of GDP between 2011 and 2015 and we have seen in section 7 of this paper that it carries an average nominal interest rate (**r**) of around 4.3%. Cottarelli et al. implicitly assume nominal trend growth (**g**) of 0.5% in the coming years to derive an interest-growth differential (**r-g**) of 3.8%. It can be shown that the debt-stabilizing primary balance (**p***) is defined as the interest-growth differential, multiplied by the stock of debt (Blanchard, 1990) – in short, $p^* = d(r-g)$.

Based on the parameters chosen by Cottarelli et al., this would mean that Greece has to achieve a primary surplus of 5.6% of GDP to stabilize its public debt. Therefore, Greece would be required to move from a 2010 primary deficit of 8.6% of GDP to a primary surplus of 5.6% of GDP – a total adjustment of 14.2% of GDP, which is quite unprecedented. Cottarelli et al. then argue that a debt restructuring with a 'haircut' of 50% would only reduce the debt-stabilizing primary surplus to 2.7% of GDP, which would still leave Greece with a cumulative fiscal adjustment need of 11.3% of GDP. The authors conclude that it would be irrational for a country such as Greece to restructure its public debt once it has gone through the pain of reducing its primary deficit to zero, as it would already have completed close to 80% of the needed adjustment to restore sustainability.

Cottarelli et al. have mis-specified the parameters of their calculations: IMF staff expects Greece to reach a primary deficit of 2.4%, not 8.6% in 2010, and it is implausible to assume an interest-growth differential of 3.8% at the outset. Furthermore, their argument against debt restructuring is based on a fallacy: the authors assume that the interest rate that Greece would have to pay on its public debt is independent of the level of debt. This is clearly wrong: governments with a high debt burden run a greater risk of defaulting on their debt and therefore have to pay higher risk premia. After a 'haircut' of 50%, Greece's public debt would fall from 148% to 74% of GDP according to the calculations of Cottarelli et al., and this would command a much lower interest rate. It has already been shown in Reinhart et al. (2003) that

the interest rate a country must pay on its debt is an endogenous variable [in debt sustainability analysis], which depends, among other things, on the country's debt-to-output (or debt-to-exports) ratio. Because the interest rate on debt to private creditors can rise very sharply with the level of debt, ... a trajectory that may seem marginally sustainable according to standard calculations may in fact be much more problematic.

Furthermore, it can be shown empirically that lower levels of public debt go hand in hand with higher trend growth. In sum, lowering the level of public debt changes debt dynamics both by affecting the average interest rate (**r**) on the debt and the growth rate of the economy (**g**). Instead of facing an interest-growth differential of 3.8% at an elevated level of public debt, Greece could face an average nominal interest rate of 4% after a successful debt exchange, and a nominal trend growth rate of 3%. This would reduce the debt-stabilizing primary surplus to around 1% of GDP, significantly below the 2.7% level suggested by a simplistic calculation. More importantly, keeping Greece's public debt level at 148% and its public debt service above 6% of GDP would almost certainly make it impossible for the country to fund itself in the market going forward.

Others have argued that sovereign debt restructuring would be too costly for advanced economies. While a breach of contract certainly carries economic costs because of damages to property rights and to the rule of law, it can be shown that most of the associated loss in output occurs anyway in a sovereign debt crisis, whether the sovereign ends up validating investor concerns by defaulting on its debt or not (Yeyati and Panizza, 2011).

In sum, there may be situations in which a benevolent government should choose to restructure its sovereign debt, as suggested by the simple model in Calvo (1988).

It has been argued by Gianviti et al. (2010) and others that it would be difficult for euro area sovereigns to undertake a unilateral debt restructuring because they would not know how to deal with the problem of non-consenting creditors. This is actually not the case. Euro area governments do not need elaborate "Sovereign Debt Restructuring Mechanisms" (SDRM) or "Collective Action Clauses" (CAC) to achieve very high participation rates in unilateral debt restructurings.

Past sovereign debt restructuring exercises in 'emerging markets' have suffered from free-riding problems, as non-consenting creditors ended up being paid in full, at the expense of cooperative lenders. This was due to the fact that emerging markets' sovereign debt has typically been issued under New York or English law, which made it impossible to render changes in the payment terms legally binding for all creditors. It was a minor problem, however. Based on a thorough review of past debt restructuring exercises, Panizza et al. (2009) conclude that proposals for an SDRM "can perhaps be criticized (with the benefit of hindsight) for having barked up the wrong tree – creditor coordination failures did not, in the end, turn out to be a significant impediment to the debt renegotiations of the 1998-2005 period." In the European context, there is even less of a need for an SDRM, as almost all public debt has been

issued under domestic law. 95% of all bonded Greek public debt is governed by Greek law and provides no contractual negotiation rights to creditors at all, as Box 1 shows. These instruments can be restructured unilaterally, as suggested by Buchheit and Gulati (2010), and there is nothing bondholders can do about it.

We conclude that it would be both feasible and desirable for highly indebted euro area governments to restructure their sovereign debt unilaterally, if they fail to regain market access after several years. This would likely have unwelcome consequences for financial stability in the euro area. Such an outcome should be avoided through a creative and cooperative solution such as the debt exchange proposal developed in this paper.

Box 1: Legal provisions on Greek domestic debt, compared to a typical Emerging Markets sovereign bond

Negative Pledge

Hungary: "The Republic undertakes that, if it or the National Bank of Hungary creates or permits to subsist any Security Interest upon ... their assets or revenues, present or future, ... the Republic shall, at the time or prior thereto, secure equally and rateably therewith the obligations of the Republic under the Notes."

Greece: "Negative Pledge: None."

Consequence: Greece can pledge any state income to third parties, such as airport taxes or lottery income, and these income streams would not be available to holders of sovereign debt in the event of a restructuring.

Cross default

Hungary: "If any of the following events occurs and is continuing: ... (ii) Breach of other obligations: the Republic defaults in the performance or observance of any of its other obligations ... then ... all of the Notes may ... be declared immediately due and payable."

Greece: "Cross Default: None"

Consequence: Greece can undertake a selective default without triggering a restructuring of its stock of public debt.

Governing Law

Hungary: "The Notes are governed by, and shall be construed in accordance with, English law. The Republic agrees for the benefit of the Note holders that the courts of England shall have jurisdiction to hear and determine any suit, action or proceedings, and to settle any dispute or difference arising out of or in connection with the Notes ... The Republic irrevocably waives any objection which it might now or hereafter have to the courts of England being nominated as the forum to hear and determine any Proceedings and to settle any Disputes, and agrees not to claim that any such court is not a convenient or appropriate forum."

Greece: "Governing Law: Greek law."

Consequence: Greece can dictate the conditions of a sovereign debt restructuring, and creditors will not be able to litigate in foreign courts or to freeze Greek assets abroad.

Note: Excerpts from the prospectuses of Hungary 5.75% government bonds due 2018, issued in 2008 (ISIN XS0369470397) and Greece 5.30% government bonds due 2026, issued in 2009 (ISIN GR0133004177).

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