

## Solving the Financial and Sovereign Debt Crisis in Europe

by

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*This paper examines the policies that have been proposed to solve the financial and sovereign debt crisis in Europe, against the backdrop of what the real underlying problems are: extreme differences in competitiveness; the absence of a growth strategy; sovereign, household and corporate debt at high levels in the very countries that are least competitive; and banks that have become too large, driven by dangerous trends in 'capital markets banking'. The paper explains how counterparty risk spreads between banks and how the sovereign and banking crises are serving to exacerbate each other. Of all the policies proposed, the paper highlights those that are coherent and the magnitudes involved if the euro is not to fracture.*

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## I. Introduction and executive summary

While the current financial crisis is global in nature, Europe has its own special brand of institutional arrangements that are being tested in the extreme and which have exacerbated the financial crisis. The monetary union is being subjected to asymmetric real shocks through external competitiveness and trade. With the inability to adjust exchange rates, these pressures are forced into the labour market and unemployment. This has led some countries over past years to try to alleviate pressures with fiscal slippage. The resulting indebtedness has been exacerbated by the financial crisis and recession, and this in turn is contributing to underlying financial instability – Europe’s biggest problem.

The financial system has undergone a massive transformation since the late 1990s, via deregulation and innovation. Derivatives rose from 2-1/2 times world GDP in 1998 to a quite staggering 12-times GDP on the eve of the crisis, while primary securities remained broadly stable at around 2-times GDP over this period. These divergent trends are indicative of the growth of ‘capital markets banking’ and the re-hypothecation (repeated re-use) of the same collateral that multiplies counterparty risk throughout the banking system.

Europe mixes ‘traditional’ and ‘capital markets banking’, and this is interacting with the sovereign crisis in a dangerous way. The countries with large capital markets banks are heavily exposed to the sovereign debt of larger EU countries like Spain and Italy, and these securities’ sharp price fluctuations affects collateral values and true mark-to-market losses. Any concern about solvency immediately transforms into a liquidity crisis. Securities dealing, prime broking and over-the-counter (OTC) derivatives are based on margin accounts and the need for quality collateral, calls for which are periodically triggered by significant price shifts. When banks cannot meet collateral calls, liquidity crises emerge and banks are not given the time to recapitalise through earnings. Small and medium-sized enterprise (SME) funding depends on banks, and deleveraging as a consequence of these pressures reinforces downward pressure on the economy.

When governments have to raise saving to stabilise debt, it is helpful if other sectors can run down savings to offset the impact on growth. However, the monetary union has resulted in high levels of debt in the household and corporate sectors in many of the countries that are in the worst competitive positions. The combination of generalised deleveraging and a banking crisis risks an even greater recessionary impact, which would begin to add private loan losses to the banking crisis – particularly troubling, as the cross-border exposure of banks in Europe to these countries is much larger for non-bank private (as opposed to sovereign) debt.

The suite of policies required to solve the crisis in Europe must be anchored to fixing the financial system, and requires a consistent growth strategy and specific solutions to the mutually reinforcing bank and sovereign debt crises. Table 1 shows the broad list of policies that have been discussed over the past two years, together with their main advantages and disadvantages.

**Table 1. Alternative policies for solving the financial and sovereign debt crisis in Europe**

	Policy	Advantages	Disadvantages
<b>Fiscal consolidation, etc.</b>			
1	Fiscal consolidation. Fiscal compact rules for deficits and debt burdens in the future.	Debt reduction/affordability improves. Euro credibility improves.	Growth negatives undermines fiscal adjustment. Recession=banking system problems multiply.
2	Richer country transfers/debt haircuts.	Helps fund periphery. Euro viability improves.	Politically difficult/wrong incentives to adjust.
3	Governments allowed issuing Eurobonds.	Reduces costs for problem countries.	Increases costs/lower ratings for sound countries
<b>ECB role</b>			
4	Lender-of-last-resort funding including LTRO operations & reduced collateral requirements.	Provides banks with term funding & cash for collateral. Supports interbank lending. Avoids bank failures. Maintains orderly markets.	Encourages banks to buy 2yr sovereigns to pledge as collateral for margin call, etc., pressures. Greater concentration on the crisis assets.
5	Operations to put a firm lid on bond rates, or more general QE policies.	Avoids debt dynamics deteriorating. Supports a growth strategy.	None. Liquidity can be sterilised if need be. (Is some inflation really a cost?)
6	Possible lender to the EFSF/ESM or IMF.	See below.	See below.
<b>EFSF/ESM roles</b>			
7	Borrows & lends to governments. Buying cheap in secondary market. Invests in banks: recapitalisation. Buying from the ECB holdings of sovereign debt at discounted prices.	Funding/& ability to restructure debt by passing on discounted prices to principal cuts. Helps recapitalise banks (some can't raise equity). Deals with losses from restructuring. Provides an ECB exit strategy. No CDS events. No monetary impact if ECB funding excluded.	Credit rating downgrades of the governments involved. Inability to raise enough funds & the overall size of funds required is much higher than €500bn. Monetary impact if the bank capitalisation part is funded by the ECB (see below).
<b>Policies to augment resources IF EFSF/ESM €500bn is not enough</b>			
8	Bank license for EFSF/ESM plus more leverage.	More fire power to deal with banks lack of capital & losses. ECB can be the creditor.	None in the short term. Longer-run inflation risks. Sterilisation of ECB balance sheet required.
9	EFSF capitalises an SPV (EIB sponsor), or acts as a guarantor of 1st loss.	Increases resources via extra leverage in SPV, or helps sell more bonds as guarantor.	Limited private sector interest in investing in SPV. Large guarantees=credit rating risk. Resources.
10	IMF funded by loans from the ECB.	No pressure on European budgets. IMF already a bank. Speed. Can lend for \$ or € funding. Conditionality/debt restructuring role possible. Good credit rating. No treaty change required.	Stigma. Possible monetary impact if not sterilised.
11	SWF funds attracted via lending to IMF.	No monetary impact/IMF buys euros with dollars.	EU credit risk shifted onto the IMF.
<b>EURO fractures</b>			
12	Periphery countries forced to leave, or large countries choose to leave.	Transforms sovereign credit risk into more manageable inflation risk. Competitiveness channel.	Inflation rises in some countries. Legal uncertainty on € contracts. Other countries leave/€ damaged.
<b>Structural policy needs</b>			
13	Structural growth policies: labour markets, product markets, pensions.	Reduces the cost of fiscal consolidation and improved competitiveness via labour markets.	Political difficulties & civil unrest.
14	Leverage ratio 5%, based on more transparent accounting for hidden losses. Separation of retail & investment banking activities.	Deals with 2 forms of risk: leverage & contagion of domestic retail from high-risk globally-priced products. Risk fully priced/no TBTF. More stable SME lending.	None, as the approach envisages allowing time to achieve the leverage ratio.

Source: OECD.

Some of the above policies are emphasised in financial markets as ‘critical’ and others, particularly those related to what needs to happen in the banking system (such as structural separation and a leverage ratio) have been recommended at the OECD early on in this crisis.<sup>1</sup> In some cases the costs outweigh the benefits. The list that seems to have the most coherence, if a fracturing of the euro is to be avoided, is the following:

- The ECB continues to support growth and confidence via term funding for banks and putting a lid on sovereign bond rates in key countries via its operations, including quantitative easing (QE) policy, well into the future.
- The ‘Greece problem’ needs to be resolved once and for all with a 50% (or larger) haircut on its sovereign debt and necessary ancillary policies, so that its chances of remaining in the euro improve.
- The OECD favours a growth strategy with a balanced approach to fiscal consolidation and the gradual achievement of longer-run ‘fiscal compact’ rules, combined with clear structural reforms: bank restructuring and recapitalisation; labour and product market competition; and pension system reform. Without a growth strategy, the banking crisis is likely to deepen and the sovereign debt problems will worsen.
- The recapitalisation of banks needs to be based on a proper cleaning up of bank balance sheets and resolutions where necessary. This can only be achieved with transparent accounting.
- European banks are not only poorly capitalised, but also mix investment banking with traditional retail and commercial banking. Risk exposures in large, systemically important financial institutions (SIFIs) cannot be properly quantified let alone controlled. These activities have to be separated. Retail banks where depositor insurance applies should not cross-subsidise high-risk-taking businesses; and these traditional banking activities should also be relatively immune to sudden price shifts in global capital markets. Traditional banks need to be well capitalised with a leverage ratio on un-weighted assets of at least 5%. These policies will improve, not diminish, the funding of domestic SMEs on which growth depends.
- The ECB cannot lend directly to governments in primary markets and it cannot recapitalise banks: the role of the EFSF/ESM may be critical in providing a ‘firewall’ via these functions; and it also provides an exit strategy mechanism for ECB holdings of sovereign debt on its balance sheet. The size of resources the EFSF/ESM may need for all potential roles, particularly bank recapitalisation, should not be under-estimated. This is not independent of what the ECB does, but it could be around € 1tn.
- The current EFSF/ESM resources of € 500bn are not enough. Furthermore, the EFSF has not found it easy to raise funds at low yields even with guarantees. If the size is not enough, then the paid in capital and leverage ability may need to be raised and brought forward – the € 500bn limit could apply to the ESM and not be consolidated with the € 440bn resources of the EFSF. But if these structures as envisaged cannot raise enough funds from private investors – as seems likely – then other funding sources will need to be brought in. The only plausible mechanisms are: (a) a bank license to the EFSF and credit from the ECB (and increasing leverage); (b) the IMF is a ‘bank’ and the ECB could lend to them the appropriate sums; (c) sovereign wealth funds could be cajoled with appropriate guarantees (possibly via the IMF) to provide the funds.

These policies with a growth and structural change focus provide a chance for Europe to solve its problems without fracturing the euro. But this remains a risk. Leaving the euro permits countries to convert credit risk into inflation risk: monetisation of their debt and an exchange rate route to a growth strategy. But the cost for Europe as a whole would be large. It is to be hoped that this can be avoided.

## II. The vulnerable banking system and the sovereign crisis

### 1. Regulation and the two forms of bank risk

At its core, the cause of the financial crisis has been the under-pricing of risk. Excessive risk in banking can always be traced to two basic causes: first, to too much leverage; and second – for given leverage – to increased dealing in high-risk products. Risk-weighted asset optimisation has made a nonsense of the Basel rules – the so-called Tier 1 ratio, which provides no meaningful constraint on either form of risk. By having nothing to say about the ratio of risk-weighted assets to total assets, the Basel Tier 1 rule controls very little at all.<sup>2</sup> Systemically important banks are permitted to use their own internal models and derivatives to alter the very risk characteristics of assets to which the capital weighting rules apply.<sup>3</sup> The Basel rule as constructed – and so widely supported by the banks – cannot control the two forms of risk at the same time. Following the introduction of Basel II, leverage accelerated sharply.<sup>4</sup> Now, as funding problems arise, banks are being forced to cut back leverage with negative consequences for the economy.

At the same time deregulation and financial innovation has been rapid. There has been a move away from traditional banking based on private information to a form of capital markets banking.<sup>5</sup> Before the late 1990s under Glass-Steagall, US securities' dealing was carried out via specialist firms, while in Europe this occurred as separate businesses and products within universal banks. There was a state of '*incomplete markets*' in bank credit and securities. However, in the past two decades securitisation, derivatives and repo financing has facilitated a move to '*complete markets*' in bank credit and changes in bank business models to exploit opportunities for fees and for regulatory and tax arbitrage. Investors can go long or short bank credit in the capital markets, like any other security, and the structuring of products via derivatives has opened up new opportunities for earnings growth and profitability, while repo-type products have facilitated the management of liabilities including margin call financing.

### 2. '*Complete markets*' and the mixing of high-risk products into traditional banking

This move away from traditional banking to a form of 'capital markets banking' was associated with an explosion of leverage and a greater mixing of mark-to-market products with retail and traditional commercial banking assets and liabilities. Stand-alone investment banks (IBs) were subsidised by their favourable treatment under Basel II in their dealings with other banks. IBs, holding companies that owned IBs and universal banks were all direct beneficiaries of the boom in new instruments through their securities dealing, prime broking and OTC derivatives businesses as regulations became even more lax.

Far from acting to contain the risk of the proliferation of high-risk financial products, regulatory practices moved to clear the way for them.<sup>6</sup> In the US the removal of Glass-Steagall opened the way for contagion between IBs and traditional banking in this new world. In Europe it is often argued that since Glass-Steagall did not apply, and there had been no great difficulties until recent years, then there should be no problem with the

universal banking model as such. This is exactly the sort of argumentation – a fallacy of hasty generalisation – that does not recognise the nature of the secular changes and the changed environment for banking. In the days of incomplete markets the universal bank model was much less dangerous and Glass-Steagall much less needed than is now the case with complete markets. Internal contagion between products booked at fair value (mark-to-market, where valuation changes are immediately reflected in profit-and-loss accounts) and (traditional) products booked at amortised cost is now much more material, and interconnectedness risk through derivative counterparties has risen to levels that simply did not apply a couple of decades ago.

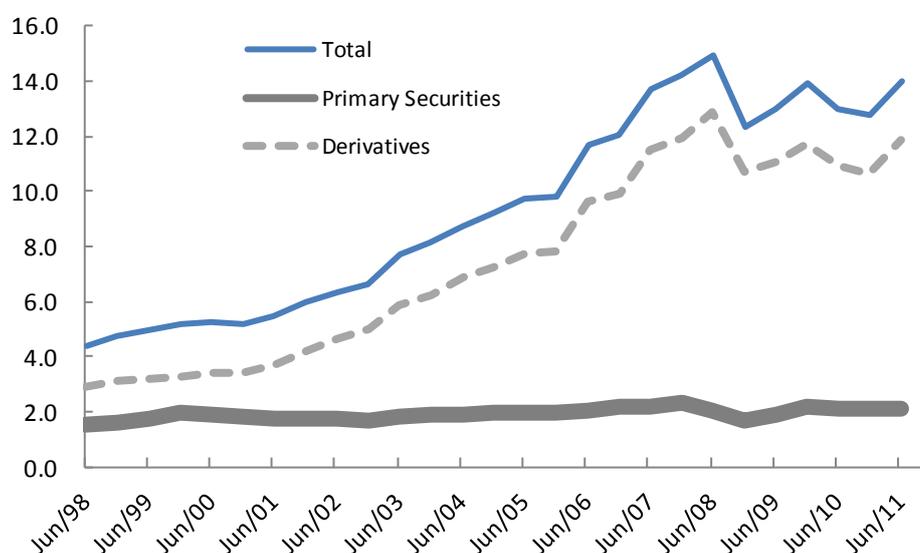
### 3. *The explosion of derivatives and counterparty risk*

Figure 1 shows primary securities and assets that essentially fund investment and growth (equities, securities and bank assets), which has grown in line with world GDP. The notional value (the correct measure of exposure in the event of extreme unexpected events) of global derivatives grew from 2½ times world GDP in 2008 to a staggering 12 times world GDP on the eve of the crisis. Derivatives do not fund real investments yet carry all the bankruptcy characteristics of debt. Banks' justification in the past for this mountain of derivatives has been that they were necessary for risk control and for innovation and productivity in the economy – yet these trends have been accompanied by the worst decade of growth in the post-War period and the biggest financial risk event since the Great Depression.

Some of this mountain of derivatives is for socially useful purposes, such as end-users hedging business risks (*e.g.* an airline hedging the cost of fuel, a pension annuity product minimising the volatility of income, etc). However, in the past decade socially less useful uses of derivatives have abounded. Notable in this respect is the use of derivatives for tax arbitrage (*e.g.* interest rate swaps to exploit different tax treatment of products). Credit default swaps (CDS) have been used extensively for regulatory arbitrage to minimise the capital banks are required to hold. How this creates bank instability has been discussed in previous OECD papers,<sup>7</sup> and some of the technical mechanics recently at work in Europe are elaborated further below.

This process has permitted leverage to rise and counterparty risk to become extreme. Important in this respect is the widening gap between derivatives and primary securities in Figure 1, keeping in mind that derivatives are based on primary securities which provide the collateral for the trades. These divergent trends are indicative of re-hypothecation (repeated re-use) of the same collateral that multiplies counterparty risk throughout the banking system.

The payouts to SIFIs from their exposure to the single counterparty AIG during the crisis were enormous. When the US government chose to settle the AIG derivative exposures to avoid a global meltdown, the amounts involved for some large European banks with respect to one single counterparty were in the vicinity of 30-40% of their equity capital – and it would have become even larger had it been allowed to go on. Nowhere does one see in any bank publication before the AIG crisis risk exposure reports approaching anything remotely like the amounts that were actually paid. Capital markets banks never have much *ex-ante* risk with their hedges and netting (as reported by their models), but they certainly can have massive *ex-post* exposures. It is precisely the fear of contagion and counterparty risk, and the funding problems to which these give rise, that are affecting bank credit default swap spreads in Europe right now.

**Figure 1. Global primary securities versus OTC derivatives**

Source: OECD, BIS, World Federation of Stock Exchanges, Datastream.

#### 4. 'Capital markets banks' & the spread of interconnectedness risk

To understand how massive losses for banks via counterparties may arise, it is important to look at what the capital markets banks actually do – as compared to the traditional banking functions. Their main operations include:

- Securities underwriting and dealing in companies, sovereigns and securitised credit products funded via repurchase agreements (repos).
- Prime broking, typically with hedge funds.
- OTC derivative transactions.

These IB activities boost leverage in the financial system and expose it to severe counterparty risk. It is for this reason that the OECD has argued from the outset of the crisis for a sensible leverage ratio (*e.g.* 20) and for the separation of these IB activities from traditional retail/commercial banking.

#### 5. How volatility puts banks with significant IB activities and little capital at risk

##### *Bank dealer financing via short-term repo-style transactions*

Dealer banks fund their holdings of much longer-term euro and dollar sovereigns, asset-backed securities, corporate bonds, etc. by rolling short-term repos and other credits on a daily basis – mostly backed with collateral. While creditors could keep lending in volatile periods and take possession of the collateral of the dealer bank in the event of insolvency, they are loath to do this due to the legal complexity and the risk that the sale of assets would not cover the shortfall in cash in the event that the dealer does not return it. Instead, these creditors cut off funding with the dealer who would then have to rely on central bank funding. While a liquidity shortage is observed, the fear that gives rise to this shortage in a causal sense is the potential insolvency of the dealer bank. Haircuts on

collateral increase when there is uncertainty, falling confidence and volatility in collateral values. This requires more collateral and hence prompts the sale of assets by dealer banks, which itself results in falling prices and further pressure for haircuts in an unstable feedback loop. In Europe, US money market funds (MMFs) have been huge creditors to EU banks – funding more than US\$ 650bn in this way. As solvency concerns rose, they have shortened the maturity of lending and cut exposures sharply. Real money creditors have also begun to cut credit lines. It is for this reason that coordinated dollar swap arrangements have again been put in place by major central banks in September 2011 and more forcefully at the start of December 2011.

To believe that these issues are merely liquidity problems that can be smoothed away by central banks misunderstands the fundamental cause of how breakdown mechanisms come into play. They are not primarily liquidity problems that arise randomly without cause. The problem arises in the first place due to concerns about solvency of dealer banks with little capital and no balance sheet flexibility in the face of unexpected volatility. These problems will not be solved and will recur until banks have adequate capital and a structure that does not commingle these high-risk activities with traditional retail banking.

### *Prime broking*

Prime brokers deal mainly with hedge fund clients in derivatives, margin and stock lending. The prime broker keeps an inventory of securities and derivatives and provides financing for hedge funds. It may take cash from hedge fund A, hold some in reserve and lend that to hedge fund B. It may also take assets from hedge fund A, and re-hypothecate those cash or securities using them as collateral for a loan from another lender in order to lend to hedge fund A or indeed to another hedge fund. The ability to re-hypothecate a hedge-funds' assets is what makes prime brokerage accounts more profitable and enables brokers to offer securities and derivatives instantly and at efficient prices.

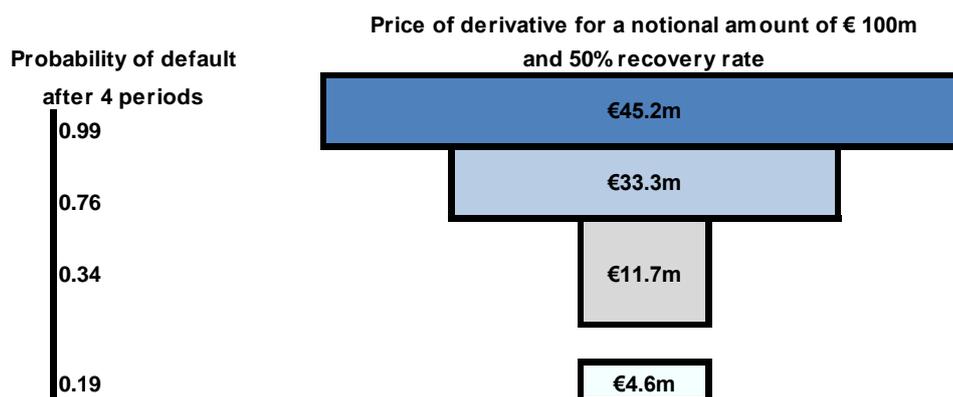
The mixing of this activity with retail banking – which is never a problem in normal times – can be quite disastrous in a crisis unless the hedge fund has demanded segregated accounts for its assets. In the event of a solvency concern with respect to the broker/dealer bank, the un-segregated client would find itself in the position of being an unsecured depositor (if it had not demanded segregated accounts and/or did not take protective action) and may never get its assets back. As with the repo situation, when uncertainty about solvency rises, a hedge fund client may decide to move its account to another broker/dealer bank or demand to move its assets into segregated accounts. This protective action following a solvency fear once again creates a liquidity crunch: the prime broker has to come up with the cash lent and/or the securities re-hypothecated and may not be able to do so, foreshadowing a collapse. When this arises, hedge funds often buy CDS on the dealer bank at risk in order to hedge the risk to their assets. These actions explain some of the patterns in recent bank CDS spreads.

### *OTC derivatives*

A simple derivatives illustration is provided in Figure 2 for the CDS contract most often used for regulatory arbitrage. In this example notional protection of \$100m is bought, and a 50% recovery rate in the event of an actual default is assumed (so the maximum final value of the contract payout would be \$ 50m).<sup>8</sup> A four-period model is used. In the first period, four successive re-evaluations of the survival in each of the subsequent periods are considered: 95%, 90%, 70% and 30%. The bottom rung shows the

value of the contract where the probability of the reference entity surviving in each of the 4 periods is 95%. So the probability of default over the life of the contract is only 19%, shown on the left-hand side, and the value of the contract is \$ 4.6m. The second rung shows a rise in the value to \$ 11.7m as the survival probabilities have fallen, resulting in a 34% probability of default over the life of the contract. This rises to \$ 33.3m for a 76% chance of default over four periods and \$ 45.2m for a 99% chance.

**Figure 2. Simple derivative interactions**



Source: OECD.

It is not difficult to see how a bank (or insurance company like AIG) that wrote this contract would come under scrutiny from its creditors if the probability of default of the reference entity rises in a crisis situation – the diagram begins to take on an ‘atomic bomb’ shape for potential losses. If a bank’s counterparty fails to post collateral in such cases and perceptions of solvency problems for the dealer bank rise, other banks and intermediaries will begin to take defensive action. A dealer bank at risk to the insolvency of the writer bank can try to cover by borrowing from the at-risk dealer, or by entering into further offsetting new OTC derivative contracts with the dealer (that can be netted). However, all of these actions exacerbate the dealer’s weak cash position. The most likely defensive response of a broker/dealer bank or client exposed to a bank at risk of insolvency would be to request novation away from the bank concerned. This creates huge pressure for the bank under attack, as it has to transfer cash collateral to the new bank. This means selling assets and unwinding trades at possibly fire-sale prices. It is these very processes that lead to rapid bank failures.

More generally, for all OTC derivatives, the moment a bank does not have sufficient cash buffer of short-term securities of sufficient quality to be able to meet collateral calls it is essentially, in the absence of direct official support, going to go rapidly into a failure situation.

The risk of a sovereign default (spread widening) or the downgrading of the credit rating of a bank or sovereign will exacerbate the situation by requiring new collateral to be posted and larger haircuts to collateral to apply, thereby further increasing the cash pressure on the dealer bank. When the OTC derivatives market allows banks not to post collateral in their book squaring trades, and also permit this for favoured clients such as sovereigns and some corporations with good credit ratings, market participants have little choice but to buy CDS contracts referencing the bank or government concerned – as there

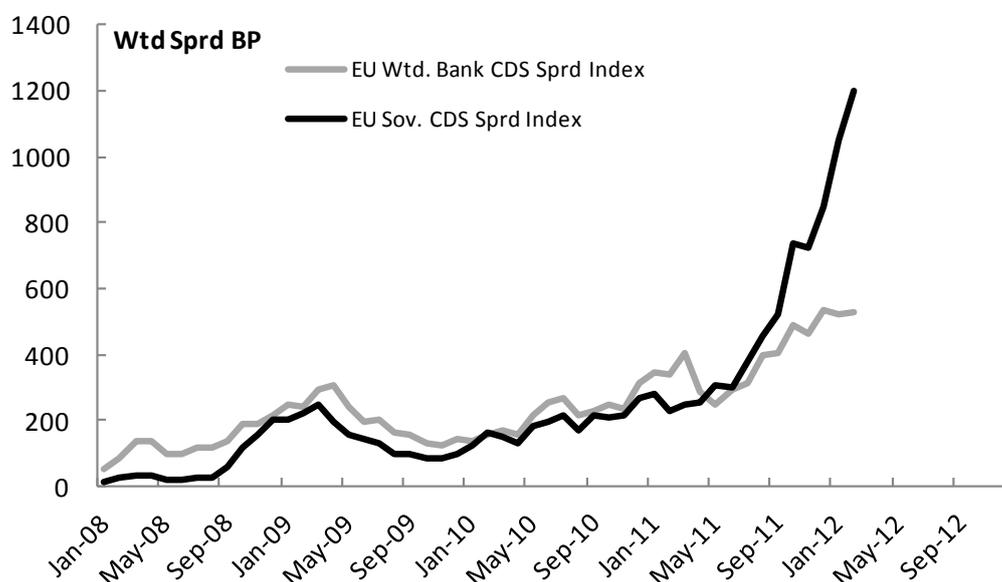
is no other way to hedge a ‘jump-to-default’ risk situation. The bidding for such cover forces up the spread.

### 6. *Sovereign and bank crisis interactions*

The interaction between bank CDS and sovereign CDS spreads can be seen in Figure 3, which shows the weighted average CDS spreads for European Sovereigns and for European banks.

They have been moving in a correlated way, showing the interaction of market concerns about the jump-to-default of sovereign risks and the impact the increased financial volatility might have on banks. Some break in the correlation occurs from late 2011 as ECB tightening policy is reversed.

Figure 3. *Bank versus sovereign CDS spreads*



Sources: OECD, Datastream.

### 7. *Bank exposures to sovereign debt & interaction with collateral for derivatives*

Table 2 shows the exposure of banks of the country in the left column to the sovereign debt of Greece, Ireland, Portugal, Spain, Italy and France. The data are shown in millions of Euros and as a percentage of core Tier-1 capital.<sup>9</sup> A few observations stand out:

- For Europe as a whole, bank balance sheet exposures to the sovereign debt of the periphery countries is actually quite small: only € 76bn in total for Greece, or 8% of core tier 1 capital, and much less for Ireland and Portugal. These holdings suggest very clearly that this is not a sovereign crisis spilling into banks right across Europe via direct holdings of periphery sovereign debt. The exposures outside of the “own” country are simply not big enough.

**Table 2. Bank exposures by country to the sovereign debt of six countries**In millions of euro and in per cent of Core Tier 1 capital, as of December 2011<sup>a)</sup>

Sovereign Exposure to Greece				Sovereign Exposure to Ireland			
Banks	Sov. Exp.€m	Core_Tier_1 €m	%Core Tier 1	Banks	Sov. Exp.€m	Core_Tier_1 €m	%Core Tier 1
GR	48376	22819	212%	IE	12,844	30,626	42%
CY	4,926	3,804	129%	CY	361	3,804	9%
BE	4,267	20,460	21%	PT	547	17,386	3%
PT	1,020	17,386	6%	BE	376	20,460	2%
LU	82	1,480	6%	FI	41	4,945	1%
DE	6,450	120,092	5%	FR	1,144	172,357	1%
FR	7,053	172,357	4%	DE	751	120,092	1%
IT	1,459	93,410	2%	SI	9	1,447	1%
Other	2,659	558,205	0%	Other	1,124	616,078	0%
<b>Total</b>	<b>76,292</b>	<b>1,010,014</b>	<b>8%</b>	<b>Total</b>	<b>17,197</b>	<b>987,196</b>	<b>2%</b>

Sovereign Exposure to Portugal				Sovereign Exposure to Spain			
Banks	Sov. Exp.€m	Core_Tier_1 €m	%Core Tier 1	Banks	Sov. Exp.€m	Core_Tier_1 €m	%Core Tier 1
PT	22,680	17,386	130%	ES	155,175	102,066	152%
BE	1,993	20,460	10%	DE	16,895	120,092	14%
LU	143	1,480	10%	BE	2,605	20,460	13%
DE	3,760	120,092	3%	LU	173	1,480	12%
ES	3,177	102,066	3%	IT	3,529	93,410	4%
FR	2,938	172,357	2%	FR	5,610	172,357	3%
NL	659	73,609	1%	NL	1,238	73,609	2%
GB	1,288	235,367	1%	GB	3,371	235,367	1%
Other	464	213,752	0%	Other	345	168,354	0%
<b>Total</b>	<b>37,113</b>	<b>987,196</b>	<b>4%</b>	<b>Total</b>	<b>188,941</b>	<b>987,196</b>	<b>19%</b>

Sovereign Exposure to Italy				Sovereign Exposure to France			
Banks	Sov. Exp.€m	Core_Tier_1 €m	%Core Tier 1	Banks	Sov. Exp.€m	Core_Tier_1 €m	%Core Tier 1
IT	150,636	93,410	161%	FR	84,207	172,357	49%
LU	1,396	1,480	94%	NL	21,683	73,609	29%
BE	17,409	20,460	85%	SI	268	1,447	19%
DE	26,259	120,092	22%	CY	493	3,804	13%
FR	30,775	172,357	18%	DE	15,471	120,092	13%
PT	959	17,386	6%	BE	2,194	20,460	11%
AT	1,050	19,402	5%	GB	20,251	235,367	9%
ES	5,344	102,066	5%	SE	2,379	46,290	5%
Other	9,886	440,542	2%	Other	3,190	313,769	1%
<b>Total</b>	<b>243,715</b>	<b>987,196</b>	<b>25%</b>	<b>Total</b>	<b>150,136</b>	<b>987,196</b>	<b>15%</b>

<sup>a)</sup> Greek exposure to Greece is based on the August 2011 stress test (it was not updated in December).

Source: Bank reports, December 2011 stress test, OECD.

- Own-country banks do have very big exposures. Greece and Cyprus for example have a € 53bn exposure (top left of Table 2) – a 50% haircut for Greece would require a € 26bn injection to Greek and Cypriot banks, which is not a large sum for Europe, to avoid bank failures in that country. € 38bn should cover the exposure of all banks in Europe to a 50% haircut in Greece. This is not the reason that bank share prices and CDS spreads reflect insolvency fears which, in turn, lead to dangerous liquidity crises.

- The failure to quarantine the problem from larger countries is another matter. The exposure of EU banks to the sovereign debt of Spain and Italy are quite substantial at 19% and 25%, respectively, of core Tier-1 capital in Europe as a whole. Once again, the own-country exposure is very large: for Spain 152% of Tier 1 capital and for Italy 161%. The countries with big IB banks, *i.e.* Germany, Belgium, Luxemburg, Italy and France, are the most exposed to Spain and Italy. While the default of these countries is much less likely than for Greece, the failure to contain the contamination of spreads results in mark-to-market losses and it reduces the value of these securities when offered as collateral for the derivatives exposures of EU banks that mix traditional and IB activities.

#### **8. Cross-border exposures to Italy, Spain and France are the problem**

Table 3 shows the foreign (cross-border) exposure of banks in the countries shown across the top row to the sovereign debt, bank debt, and non-bank private debt of some key EU countries shown in the leftmost column. The extent of banks' foreign exposure to these countries through guarantees, including CDS, is also shown. The most notable features of the table are:

- Foreign banks' cross-border exposure to the sovereign debt of Greece, Portugal and Ireland is actually quite small and essentially negligible outside of Europe. But it is large for Italy, France and Spain and heavily concentrated within European banks. This underlines why it is essential for the ECB to put a lid on rates to prevent contamination. Similar observations can be made with respect to cross-border exposures of banks to other banks (small *vis-à-vis* the periphery and large with respect to France, Italy and Spain).
- There are also very large cross-border exposures between banks and the non-bank private sector in Europe. As parts of Europe enter into recession in 2012 the extent of cross-border losses from these sources will rise, and may present a new leg to the crisis. If the recession is bigger than expected the contagion from such losses could be large.
- One surprising feature of the table is the interconnectedness of US banks to Europe in the case of CDS derivatives (for all sectors). Cross-border guarantees extended including CDS to securities of the six countries on the left are large (US\$ 1.2tn), with US\$ 344bn from EU banks and a much higher US\$ 865bn from US banks (US\$ 347bn to France, US\$ 238bn to Italy and US\$ 149bn to Spain). This diversification of risk makes sense for Europe, but it underlines how the EU crisis could quickly return to the United States in the event of insolvencies within Europe.

**Table 3. Cross-border exposures of banks**

In millions of US dollar, 2001H1

\$m	Exposure of banks of the area/country to the financial instruments shown in the column							
	All	Of which.....						
	Countries Banks	European Banks	German banks	French banks	Spanish banks	Italian banks	Non-EU Banks	US banks
<b>Greece</b>								
Sovereign	39,027	36,578	12,411	10,686	462	1,871	2,449	2,321
Banks	9,692	6,696	1,842	1,583	28	191	2,996	2,487
Non bank priv.	82,307	77,439	7,119	43,470	665	1,666	4,868	3,547
Guarantees incl. CDS	48,580	10,057	3,106	4,411	27	355	38,523	38,460
<b>Portugal</b>								
Sovereign	32,106	29,896	8,978	6,153	7,138	509	2,210	1,144
Banks	36,306	33,609	12,554	6,170	5,050	1,867	2,697	2,250
Non bank priv.	136,036	133,145	14,320	13,339	76,295	1,556	2,891	1,856
Guarantees incl. CDS	72,838	25,778	15,628	489	5,883	1,076	47,060	46,891
<b>Ireland</b>								
Sovereign	16,753	13,522	3,470	2,896	163	584	3,231	1,898
Banks	78,066	63,202	21,532	9,841	1,174	4,402	14,864	11,730
Non bank priv.	371,154	302,268	85,507	19,278	7,874	9,857	68,886	39,960
Guarantees incl. CDS	89,935	41,869	14,852	18,453	560	3,120	48,066	46,062
<b>France</b>								
Sovereign	254,979	173,331	31,373	-	6,610	2,420	81,648	24,927
Banks	701,894	456,894	116,084	-	10,906	30,322	245,000	191,557
Non bank priv.	394,583	290,961	75,828	-	15,271	17,821	103,622	55,196
Guarantees incl. CDS	477,036	120,999	35,166	-	3,550	5,349	356,037	347,166
<b>Spain</b>								
Sovereign	106,581	86,523	29,454	30,492	-	6,394	20,058	7,633
Banks	227,536	192,471	69,144	38,616	-	6,722	35,065	28,375
Non bank priv.	407,573	363,969	78,867	81,784	-	16,860	43,604	30,765
Guarantees incl. CDS	206,379	56,701	34,757	8,273	-	2,314	149,678	148,848
<b>Italy</b>								
Sovereign	288,732	237,322	47,624	106,764	11,173	-	51,410	12,891
Banks	164,087	138,705	48,338	44,657	4,240	-	25,382	19,110
Non bank priv.	485,218	460,433	65,795	264,952	24,351	-	24,785	14,898
Guarantees incl. CDS	329,403	89,001	47,045	23,367	7,092	-	240,402	237,581
<b>Totals for above 6 countries</b>								
Sovereign	738,178	577,172	133,310				161,006	50,814
Banks	1,207,889	884,881	267,652				323,008	253,022
Non bank priv.	1,794,564	1,550,776	320,317				243,788	142,675
Guarantees incl. CDS	1,224,171	344,405	150,554				879,766	865,008

Source: BIS, OECD.

### III. Dealing with the sovereign/financial crisis in Europe

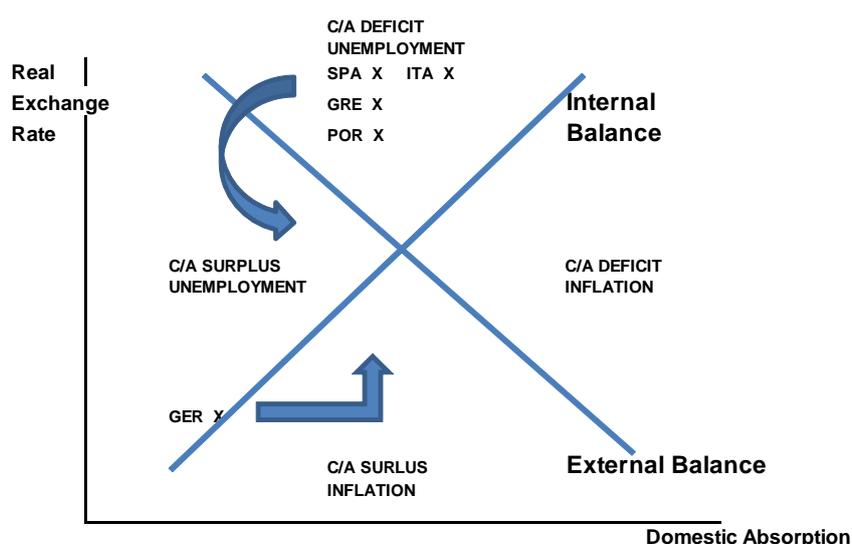
#### 1. The growth problem

While the current financial crisis is global in nature, Europe has its own special brand of institutional arrangements that are being tested in the extreme and have exacerbated the financial crisis:

- The euro area consists of a monetary union amongst 17 countries with very different structures that are being subject to asymmetric real shocks – most notably via external competitiveness and trade.<sup>10</sup> German unit labour costs are thought to be 25% more competitive than those of Greece and some 33% more competitive than Italy's. At the same time, the industrial development of China and the emerging world more generally constitutes a massive global real shock affecting commodity prices and the demand for higher technology investment goods. Northern Europe is generally more vertically integrated into the emerging markets through its high-technology investment goods focus than is southern Europe that is subject to greater competition in manufactured consumer goods.
- In the absence of exchange rate flexibility, these pressures are forced into the labour markets and (as these are not flexible enough) to unemployment. Europe does not have a single fiscal authority, and governments have tried to avoid these social pressures by allowing differential fiscal imbalances to emerge. These imbalances have been exacerbated by the financial crisis and recession and these, in turn, contribute to the financial instability.
- The EU financial system mixes traditional and capital markets banking and this is interacting with the sovereign crisis in a dangerous way. Securities dealing, prime broking and OTC derivatives are based on margin accounts and the need for collateral, which is being undermined by significant mark-to-market price shifts. When banks are unable to meet collateral calls liquidity crises emerge and banks are not given the time to recapitalise through the earnings benefits of low interest rates and a positive yield spread. SME funding depends on banks, and deleveraging as a consequence of the above pressures is reinforcing the downward pressure on the economy.

The basic problem can be seen in Figure 4, which shows the familiar internal and external balance lines, in the real exchange rate domestic absorption space (drawn for existing levels of debt, bank, industrial and trade structures, etc.).

Figure 4. Policy problems in Europe



Source: OECD.

Germany possibly lies closer to internal balance and has a large trade surplus related to very strong competitiveness compared to periphery countries that are uncompetitive and have high unemployment. This is the difficult problem of adjustment in a monetary union. Domestic absorption is much too weak due to fiscal consolidation policies and banking system deleveraging. At the same time the real exchange rate is too high and is difficult to adjust downwards, without separate nominal exchange rate adjustment. Periphery countries are being forced via fiscal consolidation to move left, further away from internal balance and slowly downwards as wages adjust, towards external balance. Structural policies will help to reduce these high costs, but this takes time and is politically difficult. It is difficult for Germany to help, as its trade surplus has a global orientation and it has a strong aversion to moving right into the domestic inflation zone (which would only help some European countries at the margin anyway).

## 2. *The risk of more general deleveraging and further banking problems*

Table 4 shows sovereign, corporate and household debt levels as a share of GDP for selected OECD countries. Sovereign debt built up quickly in Greece, Ireland and Portugal during the crisis and is projected to go much higher in the absence of fiscal consolidation policy to stabilise it. Greek government debt for example is expected to stabilise at over 170% of GDP if current policy commitments are followed and growth is not undermined by these measures. Thus far, however, these stabilisation efforts are leading to falling GDP. In the absence of growth, the deficits are hard to reverse.<sup>11</sup> Italy already had high sovereign debt, but its budget deficit is fortunately relatively small. Other countries have to consolidate fiscal policy too, so contraction is synchronised.

**Table 4. Sovereign, household and corporate debt**

In per cent of GDP, end-2010

2010	Government	Household	Corporate	TOTAL
USA	93.6	92.1	49.1	234.8
Germany	87.0	61.6	66.5	215.1
France	94.1	55.1	104.7	253.9
Italy	126.8	45.0	81.4	253.2
Spain	66.1	85.7	141.6	293.5
UK	82.2	99.5	112.2	293.9
Greece	147.3	60.0	62.6	269.9
Portugal	103.1	95.4	152.9	351.3
Ireland	102.4	118.9	222.5	443.7

*Note:* Debt figures focus on loans and securities and ignore equity liabilities, trade credit etc. In the case of Ireland, a financial centre, the figures for corporate debt may be misleading in terms of pressure on the domestic economy. Household debt are loans only.

*Sources:* US Federal Reserve, Eurostat, Datastream.

When such generalised increases in government saving are required, it is helpful if other sectors can reduce their saving and spend. However, household debt is very high in Spain, the UK, Portugal and Ireland. Corporate debt is very high in France, Italy, Spain the UK and Portugal. It is unlikely that these sectors will be able to support the economy to the extent required. This raises risks of recession and loss issues extending from the sovereign bond sector to other instruments – private loans, securities and guarantees.

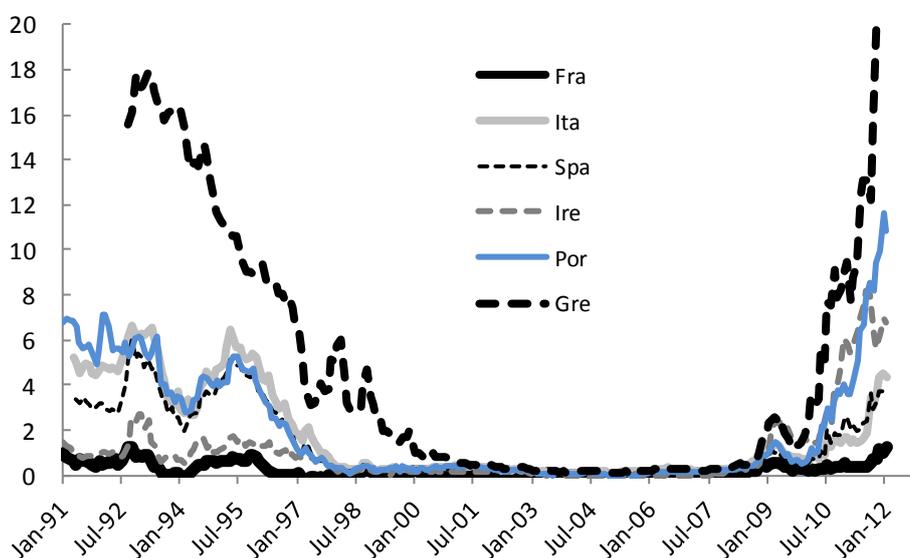
### 3. A fracturing of the euro?

If a workable solution to these problems cannot be found and enunciated to the market, the general trend of reducing exposure to Europe will continue and expectations of a fracturing of the euro will continue to rise, as central banks in Europe become less keen to facilitate cross-border transactions.<sup>12</sup> Fund managers, hedge funds and other investors have already been seeking legal advice on the implications of different scenarios for such a fracturing (large countries leave *versus* small countries leaving).

In general, markets never like credit risk and default and prefer to deal with inflation risk that can be hedged. Leaving the euro would essentially convert credit risk on sovereign bonds to inflation risk. Governments can monetise their debt, and depreciation occurs to the extent required to attract investors. Provided the indexation link to wages can be broken competitiveness improves, providing a plausible growth strategy.

The difficulty and sometimes inability of some EU countries to borrow for fear of default has led to illiquid sovereign markets and severe moves in spreads – with default probabilities being built into bond rates in the absence of monetisation and currency adjustment mechanisms. These spreads are shown for the decade before the Euro was introduced alongside the period since 1999 in Figure 5. The convergence of bond yields in the expectation that fiscal rules would be followed and that monetary union meant equal credit risk is quite striking. In the last two years the spreads have reverted to pre-euro patterns (other than Greece which has moved outside the scale), reflecting differential credit risks and/or market expectations of the chance of the euro fracturing.<sup>13</sup>

Figure 5. Spreads before and after Monetary Union



Sources: Datastream, OECD.

Countries could borrow readily at similar spreads and higher interest rates before the euro was introduced but while fixed exchange rates under EMU were in place. Debt levels were lower for most countries and there was no banking crisis in the 1990s. Banks were not deleveraging in a difficult funding environment and could buy the bonds that were not perceived of as likely to default.

#### 4. *Policy requirements*

What makes the situation in Europe so difficult to deal with is that there are conflicts in policy objectives and all of the main players have very different agendas. At the same time, there are major structural reforms required to solve longer-run issues as well as near-term critical issues that could lead to rapid financial collapse. Any plan for Europe that is to avoid a fracturing of the euro must recognise:

- That this is primarily a banking crisis that is interacting with the sovereign debt sustainability issues. Both crises must be solved simultaneously, or neither will be solved.
- That inflation concerns are not the main risk now – on the contrary: financial markets imply that the principle risk is deflation (the reason why the yield curve is flat out to 2 years for the United States and inverted for Germany). Debt deflation dynamics (Fisher, 1933) are exactly what are not required right now.
- That policies to deal with chronic longer-term incompatibilities are required: new fiscal compact rules; unit labour cost reduction in uncompetitive economies (labour market flexibility); and pension system reform.
- That some countries cannot reasonably be expected to meet new fiscal goals without debt haircuts (if a fracturing of the euro at some point is to be avoided).
- That policies to deal with critical shorter-run liquidity and funding issues are also required on a sufficient scale to avoid a significant worsening of the crisis.

#### 5. *The role of the ECB in the current liquidity squeeze*

The role of the ECB is critical – it is the one area where things are clear and there are no legal obstacles to essentially unlimited action to provide funding to banks to avoid bank liquidity crises and to support government bond prices in the secondary market. Prior to December 2011 this had not been done. The extent of premature tightening and its subsequent reversal is reflected in Figure 6. The ECB moves in December 2011 were very much steps in the right direction and if continued to the extent required in markets will provide time for the European crisis to be dealt with more fundamentally.

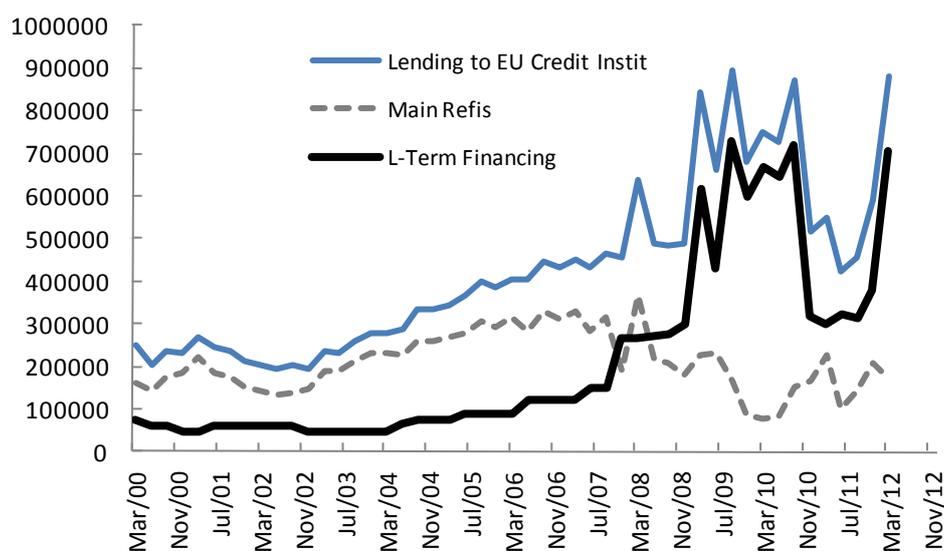
The 3-year LTROs have been reintroduced; ratings for certain ABS used as collateral for ECB loans have been reduced to increase the availability of collateral; and the reserve requirement ratio was cut by 1 percentage point (freeing up € 100bn). These measures allow banks greater access to ECB cash, enabling them to meet margin calls during bouts of financial volatility and to deal with refunding pressure in early 2012. The overall benefits outweigh the costs (see Table 1).

This does not constitute QE policies that would put a firm lid on bond rates – reinforcing a firewall against Greek contagion. Some policy makers fear that a commitment to stabilise bond rates might introduce a conflict in policy objectives: taking the pressure off governments to consolidate fiscal policy and risking inflation. Placing a firm lid on rates of countries like Italy and Spain not only prevents debt dynamics from deteriorating in the fiscal consolidation phase in those countries, but it removes spread widening and hence CDS and other OTC derivatives margin calls for many banks and the need for more haircuts on posted collateral.

On its own, the 3-year LTRO facility risks banks buying more periphery sovereign debt around the 2-year maturity (the LTRO is out to 3 years) in the near term to pledge to

the ECB for valuable cash, thereby raising their exposure to the problematic assets. It also risks distorting the yield curve at times (flat to 2 years and steepening to 10 years) for countries like Italy and Spain, which may not be the most efficient development for market sentiment and growth.

**Figure 6. ECB balance sheet**



Sources: ECB, OECD.

#### IV. Favoured policies

The research provided in this paper supports the following selection of policies from those shown in Table 1:

- The ECB continues to provide term funding and puts a lid on sovereign bond rates in key countries, or some other more general form of quantitative easing (QE) policy, well into the future. This is essential to maintain confidence, to avoid distortions in the yield curve and to promote the prospects for growth.
- The ‘Greece problem’ needs to be resolved once and for all with a 50% (or larger) haircut on its sovereign debt and necessary ancillary policies, so that its chances of remaining in the euro improve and contagion and confidence effects from this source are excised.
- The OECD favours a growth strategy with a balanced approach to fiscal consolidation and the gradual achievement of longer-run ‘fiscal compact’ rules, combined with clear structural reforms: bank restructuring and recapitalisation (including investments from the EFSF/ESM); labour and product market competition; and pension system reform. Without a growth strategy, the banking crisis is likely to deepen and the sovereign debt problems will worsen.
- The recapitalisation of banks needs to be based on a proper cleaning up of bank balance sheets. This can only be achieved with transparent accounting, and the full resolution of banks that are insolvent even after allowing a reasonable time

for profits to rise (the positive yield spread) with dividends and bonuses withheld. As bank share prices and credit default swap spreads attest, European banks are very far from this perspective at this point in time.

- European banks are not only poorly capitalised, but also mix investment banking with traditional retail and commercial banking. Risk exposures in large SIFIs cannot be properly quantified let alone be controlled. A most basic problem facing the financial sector is the mixing of high-risk securities businesses (of dubious social usefulness) that are traded in global markets with traditional domestic banking based on loans to households and SMEs, on which economic growth depends. These activities have to be separated. Retail banks where depositor insurance applies should not cross-subsidise high-risk-taking businesses; and these traditional banking activities should also be relatively immune to sudden price shifts in global capital markets. Traditional banks need to be well capitalised with a leverage ratio on un-weighted assets of at least 5% (not on risk-weighted assets where regulatory arbitrage plays such a large role). The UK (based on the Vickers Report)<sup>14</sup> is implementing the most significant reform since the crisis (including ring-fencing retail banking from investment banking), the USA has the Volcker rule (that imposes restrictions on banks' proprietary trading) half-way house, but Europe has done nothing on bank separation. Unfortunately, the gate is being left open for regulatory arbitrage and business migration.
- Structural growth policies and banking reform will take time. The ECB's role is important in providing such time, but it is not enough. The ECB cannot lend directly to governments in primary markets and it cannot recapitalise banks: the role of the EFSF/ESM may be critical in providing a 'firewall' via these functions – and it also provides an exit strategy mechanism for ECB holdings of sovereign debt on its balance sheet. The size of the resources the EFSF/ESM may need for all of its potential roles should not be under-estimated: to provide reasonable-yield loans to governments facing liquidity crises; to offset bank losses from restructuring haircuts; to deal with other hidden losses on banks' cleaned-up balance sheets; to help to build a 5% leverage ratio in cases where banks cannot attract new equity investors; and to take over bonds held on the ECB balance sheet. This is not independent of what the ECB does, but it could be around € 1tn or more (see Box 1.)
- The current € 440bn of the EFSF is not enough. The ESM should replace the EFSF this year (2012). It will have paid-in capital of € 80bn (which will only be phased in) and a lending limit (combined EFSF/ESM) of € 500bn. This, too, may not be enough. Furthermore, the EFSF has not found it easy to raise funds at low yields even with guarantees (which are only as good as the credit ratings of the countries involved). These guarantees will not apply under the ESM. If the size is not enough, then the paid-in capital and leverage ability may need to be raised and brought forward – the € 500bn limit could apply to the ESM and not be consolidated with the € 440bn resources of the EFSF, for example.

### Box 1. How big does the EFSF need to be cover bank recapitalisation as well?

Greece, Portugal, Italy, Ireland and Spain will need to borrow just over € 700bn in 2012 and just over € 400bn in 2013 (new loans and refunding). How much the EFSF/ESM would have to fund is unknown and will not be independent of ECB policies in secondary markets.

The ECB has acquired over € 200bn in sovereign debt in its securities market program and the EFSF may need to play a role in the exit strategy later on.

Bank sovereign bondholders need to absorb a 50% haircut on € 48.4bn Greek bonds ( see Table 2), *i.e.* € 24bn. Applying probabilities of default implicit in sovereign spreads to banking book holdings for Portugal, Spain, Italy and Ireland suggest much higher mark-to market losses that should be backed by capital (possibly as high as € 130bn).

The EFSF needs to play a role in re-capitalising banks. Bank share prices have collapsed and investors are not interested in new capital raisings in problem countries. Table 5 shows the core-Tier 1 capital of European banks and the leverage ratio (the banks are ordered from highest to lowest leverage). The two columns on the right show the capital the banks would require to meet the very light Basel III 3% parallel run leverage ratio (on the left side of the range) and that required to meet the “well-capitalised” standard of 5% that applies to US banks (on the right side of the range). These banks would have to raise € 400bn to achieve a 5% leverage ratio (bottom row 4<sup>th</sup> column). Being able to absorb a 5% loss on their total balance sheet 5% should really be thought of as a minimum.

**Table 5. Selected bank capital positions**

		Core Tier 1 Capital (EUR million)	Leverage Ratio	Capital Required (EUR million)		Capital Required (% of Core Tier 1)			
Deutsche Bank	DE	30,361	63	26,838	-	64,970	88%	-	214%
Societe Generale	FR	27,824	41	6,156	-	28,809	22%	-	104%
ING Bank	NL	30,895	40	6,538	-	31,493	21%	-	102%
Allied Irish Banks	IE	3,669	40	690	-	3,596	19%	-	98%
Barclays	GB	46,232	38	6,107	-	41,001	13%	-	89%
Credit Agricole	FR	46,277	37	5,675	-	40,310	12%	-	87%
BNP Paribas	FR	55,352	36	4,624	-	44,608	8%	-	81%
Dexia	BE	17,002	33	0	-	11,349	0%	-	67%
Nordea Bank	SE	19,103	30	0	-	9,954	1%	-	52%
Danske Bank	DK	14,576	29	0	-	6,850	0%	-	47%
Banco Santander	ES	41,998	29	0	-	18,909	0%	-	45%
Royal Bank of Scotland	GB	58,982	29	0	-	26,139	0%	-	44%
Millennium bcp	PT	3,521	28	0	-	1,483	0%	-	42%
Commerzbank	DE	26,728	28	0	-	11,007	0%	-	41%
Bayerische Landesbank	DE	11,501	28	0	-	4,325	0%	-	38%
KBC Bank	BE	11,705	27	0	-	4,344	0%	-	37%
UniCredit	IT	35,702	26	0	-	10,797	0%	-	30%
la Caixa	ES	11,109	26	0	-	3,185	0%	-	29%
SEB	SE	9,604	25	0	-	2,553	0%	-	27%
Intesa Sanpaolo	IT	26,159	25	0	-	6,796	0%	-	26%
Lloyds Bank	GB	47,984	24	0	-	10,082	0%	-	21%
EFG Eurobank	GR	4,296	24	0	-	901	0%	-	21%
Bank of Ireland	IE	7,037	24	0	-	1,341	0%	-	19%
Rabobank	NL	27,725	24	0	-	4,919	0%	-	18%
BBVA	ES	24,939	22	0	-	2,712	0%	-	11%
HSBC	GB	86,900	21	0	-	4,953	0%	-	6%
Erste Bank	AT	10,507	20	0	-	0	0%	-	0%
Caixa Geral de Depositos	PT	6,510	19	0	-	0	0%	-	0%
Raiffeisen Bank	AT	7,641	17	0	-	0	0%	-	0%
National Bank of Greece	GR	8,153	15	0	-	0	0%	-	0%
<b>All Banks</b>		<b>759,991</b>	<b>30</b>	<b>56,637</b>	<b>-</b>	<b>397,387</b>	<b>7%</b>	<b>-</b>	<b>52%</b>

Sources: Bank reports, August 2011 Stress test, OECD.

- If funding still proves to be difficult (in case the EFSF/ESM cannot attract enough investors under the envisaged structure), then further thought will need to be given to contingency plans. This means that more leverage may be required and/or other funding sources may need to be brought in. The only plausible mechanisms are: (a) a bank license to the EFSF and credit from the ECB (and increasing leverage); (b) the IMF is a ‘bank’ and the ECB could lend to it the appropriate sums; (c) sovereign wealth funds could be cajoled with appropriate guarantees (possibly via the IMF) to provide the funds.

## V. Conclusions

Markets believe a fracturing of the euro has a material probability. Investors understand that any country with funding problems leaving the euro would do so to take advantage of converting credit risk into inflation risk – which is easier to manage. A fracturing allows monetisation and at least a potential route to improving competitiveness with less unrest. There are also costs to such a severe turn of events:

- High inflation in any country is costly.
- For Europe and the rest of the world the cost could also be large – not least legal uncertainty about financial contracts in euro; other countries within the eurozone coming under increased pressure; and a weakening of the status of the euro as a global currency.

These issues are very complex and, as a consequence of the monetary union, quite unique to Europe. Policies consistent with a growth strategy and including a proper cleaning up of bank balance sheets, recapitalisation and separation are critical to solving this crisis while maintaining the euro intact. The interim role of the ECB and the EFSF/ESM provides time, but that time needs to be used for thorough structural reform.

## Notes

1. See OECD (2009).
2. See Blundell-Wignall and Atkinson (2008, 2010 and 2011); OECD (2009); Blundell-Wignall *et al.* (2010).
3. In the recent package of measures designed to shore up the crisis in Europe a 9% Tier 1 capital rule was included. Notwithstanding the request by regulators to meet the requirement by raising equity, a number of banks came right out and told shareholders not to worry as they could meet some of the new rules by adjusting their risk models to optimise risk weights (see Vaughan, 2011).
4. See Blundell-Wignall and Atkinson (2008, 2010, and 2011).
5. The traditional theory of banking posits that banks take deposits, keep a small amount of capital and allocate between short-term and (higher-yielding) long-term assets,

achieving a maturity transformation by exploiting the law of large numbers – so that depositors do not experience liquidity problems (see Diamond and Dybvig, 1983).

6. Gramm-Leach-Bliley removed Glass-Steagall in 1999, in response to pressure from the banks. In 2004 the SEC allowed US IBs to be regulated on a ‘consolidated entities basis’ in line with weaker European standards making it easier for IBs to leverage their positions in the USA. Basel II was also announced, and essentially handed over risk modelling to large banks that would permit them to influence risk-weighted assets and hence the amount of capital they would be forced to hold. European policy makers (that had always allowed the mixing of retail banking and all other financial activities) remained static in the face of innovation and rapid structural change in markets that would increase the risk profile of the financial system. More than elsewhere, Europe strongly supported the lax Basel standards, which permitted regulatory arbitrage and provided no effective constraint on leverage.
7. See for example Blundell-Wignall and Atkinson (2011) and the references therein.
8. The model also assumes a 6% discount factor and a 4% one-off premium paid in the first period.
9. Sovereign debt held in the banking book at par value and not marked to market is very large. This means that were a country to restructure its debt, the attendant losses banks would be exposed to and recognised as losses for accounting purposes would become significant – depending on the size of the haircut.
10. The theory of exchange rate regimes posits that countries where nominal (monetary policy) shocks are the most likely source of disturbance can fix their exchange rates to a larger economy with stable monetary policy credentials to optimise objectives in terms of deviations from inflation and growth targets. Such countries may form a monetary union. If countries do not have similar industrial structures and are subject to real shocks that will have asymmetric effects on their economies, then a monetary union will result in more extreme deviations of output and inflation from trend. See Blundell-Wignall and Gregory (1990).
11. A country’s public debt will grow continually higher as a percentage of GDP (*i.e.* will be unsustainable) whenever the primary budget surplus as a share of GDP does not offset the burden of debt service as the economy grows – the key parameters are the size of the debt, the interest rate, nominal growth (GDP plus inflation) and the primary deficit. Formally, and ignoring currency effects on external debt holdings, debt will grow according to:

$$\Delta d_t = -pb_t + \frac{(i_t - g_t)}{(1 + g_t)} d_{t-1}$$

where  $d$  is public debt (D) as a share of GDP;  $pb$  is the primary budget balance as a share of GDP (*i.e.* it excludes debt service);  $i$  is the effective interest rate on the public debt,  $g$  is the rate of nominal economic growth, and  $t$  refers to time.

12. The mechanics work as follows: suppose a deposit shift out of Greece to another EU country bank is such that the other bank won’t accept a claim on the Greek bank as payment. In this case it is settled via the central banks in the Eurosystem – the Bank of Greece lends to its bank funded with a matching liability essentially to the central bank of the other country, which acquires a claim on the Bank of Greece. These net claims are aggregated in the Target 2 settlement mechanism at the ECB. From 2007 to September 2011, the Bank of Greece has increased its balance sheet by some 272%, to € 158.7bn via loans to its banks. Virtually all of the increase has been funded by

Target 2 liabilities (and some via excess currency issuance). From 31% of the balance sheet in 2007 Target 2 has increased to 72% of it in 2011. This means the bank of Greece is rapidly acquiring massive liabilities to other central banks, notably the Bundesbank. If other countries follow Greece, a major inconsistency could arise.

13. It is not correct to argue that a country leaving the euro would be worse off as its currency depreciated. There is an equivalence here: bonds of a peripheral country can get cheaper by the yield rising dramatically in the single currency, or the currency falling to the level where it can be expected to rise again. The lower currency carries advantages for trade.
14. See Independent Commission on Banking (2011).

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