

26 April 2010 | 68 pages

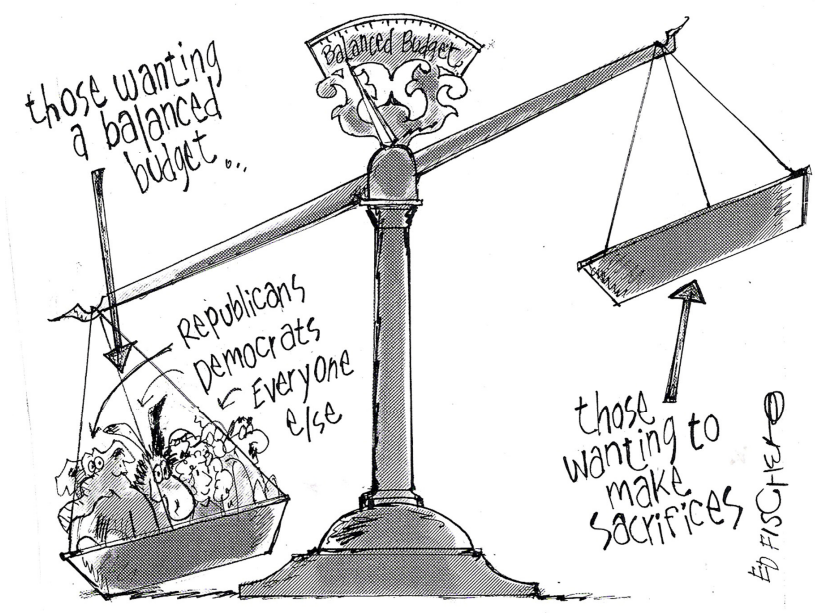
Global Economics View

Sovereign Debt Problems in Advanced Industrial Countries

- Most advanced industrial countries in worst ever peacetime fiscal shape
- Sovereign default can become the least bad solution for a country
- Sovereign default risk outside Greece low but non-negligible
- Most countries will eventually choose a 'fiscal pain' solution
- Debt restructuring, possibly with haircuts, likely to be part of the 'fiscal pain' package
- Inflationary solution to public debt burden highly unlikely in Europe, unlikely in US
- Euro Area needs mutual fiscal insurance mechanism to survive and prosper
- Restoring fiscal balance will be a drag on growth for years to come for advanced industrial countries

Willem Buijer
 +44-20-7986-5944
 willem.buijer@citi.com

With thanks to
 Veronika Kosova



Source: www.cartoonstock.com

See Appendix A-1 for Analyst Certification, Important Disclosures and non-US research analyst disclosures.

Contents

Sovereign Debt Problems in Advanced Industrial Countries	3
1. Introduction	3
2. The Dimensions of the Fiscal Problem	3
2.1 The Roots of the Fiscal Unsustainability Problems	5
2.2 Fiscal Unsustainability is not Confined to the Euro Area	9
2.3 The Biggest Peacetime Increase in Public Sector Debt and Deficits Ever	11
2.4 The Coming Age-Related Public Spending Conflict	12
2.5 Some More Thoughts on the Fiscal Predicament of the USA	13
3. Achieving Fiscal Sustainability	14
3.1 The Arithmetic of Fiscal Sustainability	14
3.2 The Political Economy of Restoring Fiscal Sustainability	20
3.3 Fiscal Pain as the Means for Re-establishing Fiscal Sustainability	22
3.4 Inflating Away the Real Burden of the Public Debt	25
3.4a Motive	25
3.4b Opportunity	26
4. Sovereign Default as a Policy Option	29
4.1 When is Sovereign Default ‘Individually Rational’?	29
4.2 What are the Systemic Externalities from a Sovereign Default?	31
5. Sovereign Default Risk in the Euro Area	34
5.1 The Greek Sovereign Debt Crisis	35
5.2 More on Why a Tough Bailout for Greece and the Creditors is the Most Likely Outcome	43
5.2a Greece is Small	44
6. The Modalities of a Bailout in the Euro Area/EU	47
6.1 Is a Bailout Legally Possible in the EU/Euro Area?	47
6.2 Bail-outs by other EU Member States or by the EC	48
6.3 Does the German Constitution Allow a Bail-out of Greece?	49
6.4 Bailouts by the ECB	49
6.5 Bailouts by the IMF	50
6.6 Is a Bailout Politically Feasible in the EU/Eurozone?	52
7. Will the Euro Area Break up and Will the Euro Collapse?	53
7.1 Better In than Out	53
7.2 Prospects for EMU: Institutional Reform to Survive and Prosper	55
8. Contagion Risks to EMs	57
Russia	60
9. Conclusion	61
References	63
Appendix A-1	66

Sovereign Debt Problems in Advanced Industrial Countries

1. Introduction

Fiscal unsustainability affects most industrial countries

The public finances in the majority of advanced industrial countries are in a worse state today than at any time since the industrial revolution, except for wartime episodes and their immediate aftermaths. Most of the richest industrial nations (certainly if they are weighted by population size or GDP) are on unsustainable fiscal-financial trajectories. This essay explains how and why this situation came about and how it is likely to evolve during the rest of this decade.

In Section 2, we establish that unsustainable public finances are not just an issue for Greece, the other countries of the south-west Euro Area periphery, the Euro Area or the EU. The overall fiscal position of the Euro Area is stronger than that of the UK, Japan and the US. We explore the origins of this widespread loss of fiscal control, its scope and some of its unique features. Section 3 addresses the portfolio of options open to the fiscally challenged countries for restoring fiscal sustainability: fiscal pain, inflating away the burden of the public debt, economic growth, sovereign default and a bail-out. Section 4 reviews the private (individual country) and social cost-benefit analysis of sovereign default. Section 5 investigates sovereign default risk in the Euro Area, focusing on Greece. The legal, or Treaty-related aspects of a bailout in the Euro Area are reviewed in Section 6. The implications of the sovereign debt problems of some Euro Area member states for the viability and survival of the EMU are considered in Section 7. Section 8 discusses the risk of contagion to European EMs. Section 9 sums up and concludes.

2. The Dimensions of the Fiscal Problem

Seven small industrial countries are in fine fiscal fettle

Among the rich countries in reasonable fiscal-financial shape are Australia, New Zealand, Denmark, Norway, Sweden, Finland and Switzerland. Some advanced industrial countries that today are widely considered (and consider themselves) to be in reasonably good fiscal-financial condition – Canada, Germany and the Netherlands come to mind - are so only compared to the truly dire conditions experienced by most of their peers.

A few more look reasonable only relative to the dismal average

Canada's fiscal situation, for instance looks quite good relative to the US, but with gross general government debt at 82.8 percent of annual GDP and a 4.8 percent of GDP general government financial deficit in 2009 (see Figure 1), Canada's fiscal performance is nothing to write home about. Neither Germany nor the Netherlands, had they not already been Euro Area members, would have been able to join the Euro Area in 2009, based on their fiscal performances that year. Germany's general government gross debt was 77.4 percent of GDP in 2009 (the Maastricht Treaty's debt ratio ceiling is 60 percent) and its general government financial deficit for that year was 3.2 percent of GDP, compared to a Maastricht Treaty's deficit ratio ceiling of 3 percent. The corresponding figures for the Netherlands in 2009 were 71.4 percent and 4.5 percent (see Figure 1). Thus today's 'best of breed' may be the same dog that yesterday was fit only for the World's Ugliest Dog Contest –

an indicator of just how far the fiscal conditions in most advanced industrial countries have deteriorated.¹

Figure 1. Selected Countries – Fiscal Data for 2009

	Gross Debt	Net Debt	Budget Balance	Structural Balance	Cyclically Adjusted Primary Balance
	% of Nominal GDP				
Australia	15.9	-5.7	-4.0	-2.4	-1.1
Canada	82.8	28.6	-4.8	-3.2	-2.4
Czech Republic	46.5	-0.3	-5.9	-4.2	-3.2
Denmark	45.3	-3.9	-2.7	0.5	0.5
Euro area	81.8	51.7	-6.1	-3.8	-1.1
Austria	72.9	38.1	-3.4	-3.4	-1.2
Belgium	101.2	81.3	-6.0	-3.3	0.4
Finland	43.7	-52.1	-2.2	1.4	0.8
France	84.5	53.1	-7.5	-6.6	-3.7
Germany	77.4	50.2	-3.3	-2.0	0.3
Greece	114.9	86.1	-13.6	-10.4	-6.0
Ireland	65.8	24.9	-14.3	-8.7	-8.2
Italy	123.6	97.4	-5.3	3.0	1.9
Luxembourg	18.2	-44.6	-0.7	-0.5	-1.1
Netherlands	71.4	30.9	-5.3	-3.6	-1.9
Portugal	83.8	55.6	-9.4	-5.6	-2.8
Slovak Republic	36.7	7.2	-6.8	NA	NA
Slovenia	NA	NA	-5.9	NA	NA
Spain	59.3	33.2	-11.2	-6.6	-5.6
Hungary	85.2	58.8	-4.0	-1.6	2.3
Iceland	117.6	35.4	-15.7	-15.3	-6.5
Japan	189.3	96.5	-7.4	-6.5	-5.6
Korea	33.2	-34.5	-1.8	NA	NA
New Zealand	27.0	-14.7	-1.2	0.7	-0.2
Norway	59.9	-140.4	9.6	-4.4	-7.0
Poland	58.1	25.7	-7.1	-6.8	-4.7
Sweden	52.7	-16.7	-0.5	1.4	1.4
Switzerland	44.4	9.9	-0.7	-0.2	0.3
United Kingdom	71.0	46.9	-11.5	-9.2	-6.8
United States	83.9	56.4	-11.2	-8.9	-7.3

Sources: Eurostat, OECD and Citi Investment Research and Analysis

Developing countries and emerging markets are in much better fiscal shape

Equally remarkable is the absence of the ‘usual suspects’ from the list of countries with unsustainable fiscal trajectories. The developing countries and emerging markets that used to top this list are absent. For some this may be a reflection of external constraints on their ability to get into public debt trouble rather than of domestic self-restraint and fiscal virtue. Argentina comes to mind: since its sovereign default on December 23, 2001, the sovereign has been excluded from the international capital markets, although domestically held public debt is estimated to be around 49 percent of annual GDP at the end of 2009.²

But other past serial defaulters on public debt, like Turkey, Brazil and Indonesia, have escaped from fiscal delinquency status and have achieved a measure of fiscal respectability: Brazil’s last sovereign default on external debt

¹ World’s Ugliest Dog Contest is an annual contest held in Petaluma, California, U.S., as part of the Sonoma-Marin Fair, to decide which of the dogs entered in the contest is the ugliest. Along with the title of “The World’s Ugliest Dog,” the winner’s owner gets USD \$1,000. See http://en.wikipedia.org/wiki/World's_Ugliest_Dog_Contest.

² Source: IMF.

was in 1983, and on internal debt in 1990. Turkey last defaulted on its external debt in 1982, and Indonesia in 2002.³

2.1 The Roots of the Fiscal Unsustainability Problems

Four causes of fiscal loss of control:

The roots of these fiscal unsustainability problems are fourfold.

Not making hay while the sun shone

First, strongly pro-cyclical behavior by the fiscal authorities during the boom period between the bursting of the tech bubble at the end of 2000 and the onset of the financial crisis of the North-Atlantic region in August 2007.

Bailout costs

Second, the direct fiscal costs of the financial crisis, that is, the bail-outs and other budgetary rescue measures directed at propping up the financial system, starting with the collapse of Northern Rock in September 2007, and expanding massively with the rescue of Fannie and Freddie by the Federal government on September 7, 2008, the Lehman Brothers insolvency on September 15, 2008 and the last-minute rescue by the Federal government and the Fed of AIG and its counterparties in a number of interventions that started on September 16, 2008.

Cyclical revenue losses

Third, the world-wide recession that started in 2008 and lasted in most of the advanced industrial countries until the end of 2009. The recession weakened many government revenue sources and boosted certain public expenditure categories (like unemployment benefits) for the usual cyclical or automatic fiscal stabilizer reasons.

Structural revenue losses

Fourth, the end of asset booms and bubbles, especially in real estate markets, plus the normalisation, from extraordinary heights, of profits and pay in the financial sector, are likely to produce a lasting reduction in the buoyancy of government revenues with respect to GDP, resulting in an increase in the structural primary (non-interest) deficit.

Together, these four developments caused an unprecedented peacetime deterioration in the public finances of most of the advanced industrial countries. They also caused a sharp deterioration in the public finances of a number of emerging market economies – mainly in Central and Eastern Europe (CEE) and the countries of the Commonwealth of Independent States (CIS, the successor states of the former Soviet Union minus the three Baltic nations, which are part of CEE). Country-specific developments – albeit aided and abetted by a permissive global financial environment prior to August 2007 – produced fiscal crises in Iceland and Dubai.

A short history of post-2007 sovereign debt crises:

Although the acute fiscal crises that have hit Iceland (a European Economic Area member state) and Hungary, Latvia and Romania (EU member states from CEE that are not part of the Euro Area (EA)), have received some attention, markets, commentators, analysts and policy makers have been focused mainly on the fiscal plight of many of the 'old' EU15 member states. Special and possibly disproportionate attention has been paid to a number of Euro Area member states (Greece, Portugal, Spain, Ireland and to some extent Italy) that

³ This is on a strict definition of sovereign default, where a sovereign default occurs when the sovereign fails to meet principal or interest payments on the due date. We prefer a wider definition of sovereign default, which includes restructuring of the sovereign debt, even if this represents a 'voluntary' restructuring, standstill or other modification of the terms of the original obligation which does not reduce the present value of the debt service payments. Manasse and Roubini (2005) use an even wider definition, which includes among defaults those episodes of incipient defaults that were averted through large-scale international or multilateral bailouts, such as the bailouts of Mexico in 1995, of Turkey in 2000 and of Brazil in 2001.

have been identified as particularly vulnerable and at risk of sliding into sovereign default.

Iceland

In September and October of 2008, Iceland became the first developed country to succumb to the 'too big to save' conundrum faced by any small open economy with a large internationally active banking/financial sector, a currency that is not a global reserve currency and limited 'fiscal spare capacity' relative to the size of the real resource transfer required to stabilize its financial system. They did not have the fiscal resources to bail out Iceland's four internationally active banks, all of which failed.⁴ Although the Icelandic sovereign did not default on any of its sovereign obligations, fear of insolvency stopped it from bailing out its internationally active and exposed financial system.

Ireland

Ireland's authorities almost overreached themselves when they guaranteed most of the unsecured liabilities of the Irish banks⁵. Statements by the then German Finance Minister Peer Steinbrück on February 16 and February 18, 2009, to the effect that Eurozone member states would have to act if one of their number were to be unable to service or refinance its debt – an implicit guarantee of a fiscal bail-out - calmed the markets⁶.

Latvia, Hungary and Romania

Three new EU members in Central and Eastern Europe, Latvia, Hungary and Romania, have had both EU financial support and IMF Stand-By programs since 2008. Hungary's Stand-By Arrangement was approved on November 6, 2008, Latvia's on December 23, 2008 and Romania on May 4, 2009. All three countries were able to borrow more than 1000 percent of their IMF quota. Greece's IMF quota is SDR (Special Drawing Rights) 0.8bn, approximately €0.9bn, so if the experiences of Latvia, Hungary and Romania are anything to go by, Greece ought to be able to borrow (perhaps in tranches) at least € 10bn from the IMF⁷. One could even envisage Greece being able to borrow up to 20 times quota, which would be around €18 bn, roughly half of the funding needs facing Greece for the remainder of the year.

Dubai

In Dubai, following the collapse of its construction and real estate boom and faced with the global tightening of financial conditions caused by the north-Atlantic region financial crisis, the sovereign was unable to provide support in November and December 2009 for the debt (admittedly neither sovereign nor sovereign-guaranteed) of a number of state-owned corporations. Abu Dhabi provided a \$10 billion lifeline to help restructure the most directly threatened corporate debt and this has given the Emirate some breathing space to address the wider issue of the high level of quasi-sovereign indebtedness.

⁴ The external deposit insurance liabilities which the Icelandic state was pressured into assuming by the British and Dutch authorities represent a heavy charge on the future fiscal capacity of Iceland.

⁵ Department of Finance, Government of Ireland (2008). The guarantee was announced on September 30, 2008 by the minister of finance and became law on October 2, 2008. The guarantee is effective until September 29, 2010.

⁶ On February 18, 2009, the Financial Times reported, in an article by Bertrand Benoit and Tony Barbers, 'Germany ready to help eurozone members', the following:

"Asked on Wednesday [February 18, 2009 WHB] whether Germany would risk seeing the eurozone break up rather than take action, Peer Steinbrück, finance minister, told a press conference: "Could you imagine anyone would be willing to put up with this? We would have to take action."

Mr Steinbrück told an event in Düsseldorf on Monday night [February 16, 2009 WHB] that "the euro-region treaties don't foresee any help for insolvent countries, but in reality the other states would have to rescue those running into difficulty".

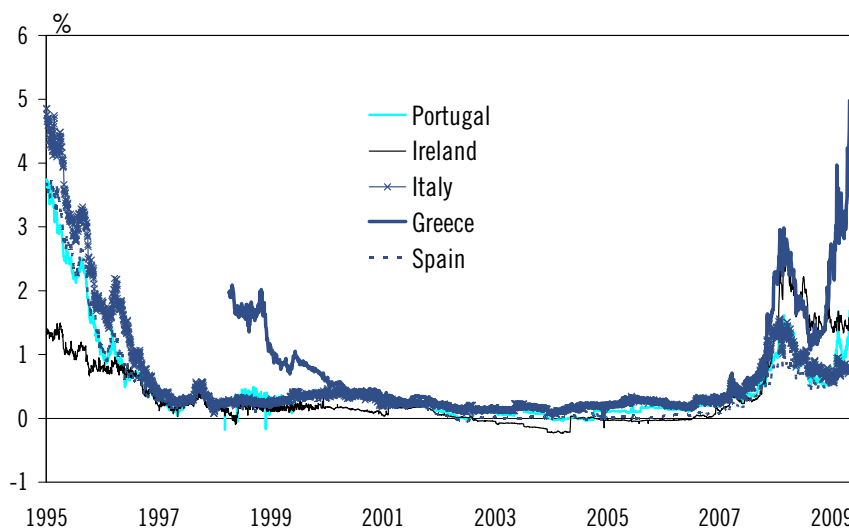
⁷ See <http://www.imf.org/external/np/sec/memdir/members.htm>. The SDR-€ exchange rate is for February 10, 2010.

Greece

In October 2009, following the Greek general election and change of government, Greece's general government budget deficit was revealed by the new government to be 12.7 percent of GDP rather than the 6.0 percent reported by the old government, and the 3.7 percent promised to the European Commission at the beginning of 2009. The most recent estimate from Eurostat puts the 2009 general government deficit of Greece at 13.6 percent of GDP. Greece's budgetary problems are compounded by the growing uncompetitiveness of much of its industry, as measured for instance by relative normalized unit labor costs or a range of real exchange rate indices. Spain, Portugal and Italy have similar structural real competitiveness problems.

Financial markets became extremely nervous at the end of 2009 and during January 2010. Spreads over the 10-year German Bund rate of the sovereign 10-year bonds of Greece, Portugal, Spain, Ireland and Italy (all Euro Area members) have fluctuated quite wildly around a steadily rising trend since 2008, as can be seen from Figure 2. Five-year CDS spreads for these five countries tell a similar story. Since September 2009, the markets have clearly perceived Greece to be in a sovereign risk class of its own, as reflected in its sovereign default risk spreads in both the CDS and the government bond markets. The euro weakened significantly against most other currencies over the same period.

Figure 2. Selected Euro Area Countries – 10-Year Government Bond Spread vs. Bunds, 1995-Apr 2010



Note: Inflation and exchange rate depreciation driving spreads over Bunds before EMU. A lull from 1999/2001 to 2007. Sovereign default risk driving spreads over Bunds in EMU after 2007. Sources: DataStream and Citi Investment Research and Analysis

The attention paid to the five fiscally weakest Euro Area member states is rather surprising when it is recognized that the fiscal-financial position of the Euro Area as a whole is stronger than that of the UK, the US and Japan.⁸ It is to be expected that markets, commentators and analysts will in due course realize that fiscal unsustainability is not just a problem of a handful of Euro Area members, and that, unless there is a radical change of course by those in

⁸ The UK reports lower gross and net general government debt to GDP ratios than the Euro Area, but its primary deficit is much larger. In addition, the UK public sector may well make use of off-balance sheet accounting tricks to a greater extent than the Euro Area average.

charge of fiscal policy in the US, Japan and the UK, these countries' sovereigns too will, sooner (in the case of the UK) or later (in the case of Japan and the US) be at risk of being tested by the markets and, ultimately, of being denied access to new and roll-over funding, that is, of being faced with a 'sudden stop'.

The sovereign debt problems encountered by most advanced industrial countries are the logical final chapter of a classic 'pass the baby' (aka 'hot potato') game of excessive sectoral debt or leverage. First excessively indebted households passed part of their debt back to their creditors – the banks. Then the banks, excessively leveraged and at risk of default, passed part of their debt to the sovereign. Finally, the now overly indebted sovereign is passing the debt back to the households, through higher taxes, lower public spending, the risk of default or the threat of monetization and inflation.

2.2 Fiscal Unsustainability is not Confined to the Euro Area

It is clear from Figure 1, that the fiscal deterioration is not confined to a few Euro Area member states.

Euro Area in aggregate in better fiscal shape than US and UK

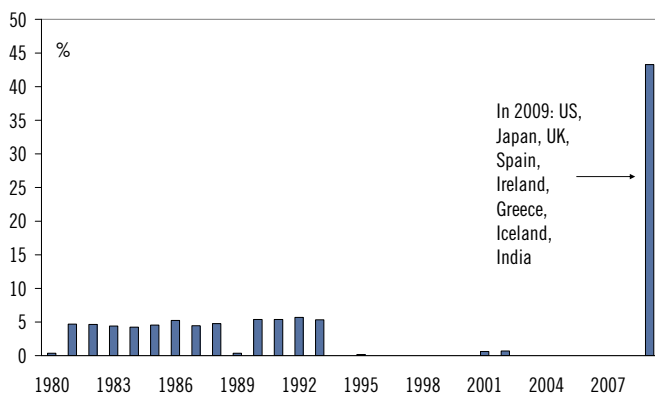
The deterioration in the structural (or cyclically adjusted) fiscal balance of the US and the UK is larger than in Greece, Portugal or Spain. Only Ireland and oil-rich Norway have a larger cyclically adjusted budget deficit. Rising gross general government debt to annual GDP ratios are likely to take the US and the UK no later than 2011 into the higher-than-90 percent bracket for which Reinhart and Rogoff (2009b) have identified a marked negative effect on the growth rate of real GDP.

India is only large EM with dodgy public finances

The deterioration in the fiscal positions of most industrialized countries has been spectacular, even more so when set against the remarkable fiscal restraint demonstrated by most emerging markets over the same period. This is clear from Figure 4. The share of global GDP accounted for by countries whose sovereigns had general government deficits of 10 percent of GDP or more shot up from near the near zero level achieved since the early 1990s, to nearly 45 percent in 2009. There is only one emerging market amongst the high-government deficit countries in 2009 – India. And India, with a gross general government debt to GDP ratio of over 80 percent during 2009 (see IMF (2010)), is much better able to manage a more than 10 percent of GDP general government deficit, because during 2009 it had a growth rate of nominal GDP of around 11.5 percent and most of its public debt is denominated in domestic currency and held domestically. It remains true, of course, that India, unlike most other leading emerging markets at the moment, is highly vulnerable to a sudden weakening of nominal GDP growth, which could cause its public debt-GDP ratio to rise sharply unless its underlying government deficit is reduced.

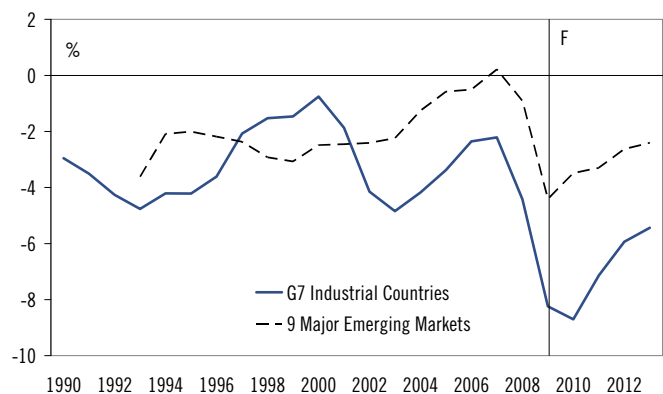
Figure 4 shows the diverging behavior of G7 fiscal balances and those of nine major emerging markets using a different metric. Again, the loss of fiscal control in the G7 stands in sharp contrast to the continued fiscal restraint shown by the emerging markets.

Figure 3. Major Economies with Fiscal Deficits at or above 10% of GDP, (% of Global GDP), 1980-2009



Sources: IMF and Citi Investment Research and Analysis

Figure 4. Global — Fiscal Deficits in Industrial Countries and Emerging Markets, (% of GDP), 1990-2013F



Sources: IMF and Citi Investment Research and Analysis

The change in the relative and absolute fiscal positions of the G7 and the major emerging markets is such that two propositions, motivated by Figure 3, Figure 4 and Figure 5 below, suggest themselves.

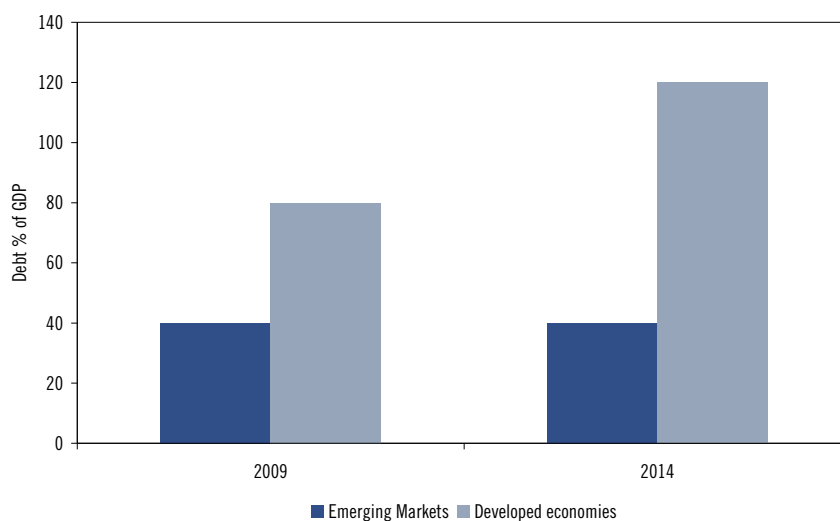
The end of the risk-free security?

First, we are getting close to the position where there may no longer be a risk-free security (in the sense of free of default risk and/or of with a safe real rate of return) anywhere in the world. At the moment, US dollar-denominated US Treasury nominal (non-inflation-linked debt) and euro-denominated German government nominal debt is probably still just about free of default risk, even though the 5-year US Sovereign CDS spread is around 40 basis points, implying a cumulative probability of default (CPD) over a five-year horizon of just over 3.5 percent, and the five-year German sovereign CDS spread is just over 30 basis points, implying a CPD of 2.8 percent.⁹

Triple-A sovereign ratings may in the not too distant future be found only in the history books. CMA's own Implied Ratings (based on their proprietary model), already have the UK stripped of its AAA status (the Implied Rating is AA). We expect that the actual ratings provided by the rating agencies won't be far behind. Other countries at imminent risk of losing their AAA rating include, in our view, France (because of its large and persistent structural deficits) and Switzerland (because of the implicit exposure of a weak confederal central fiscal authority to a banking sector with a very large balance sheet). Unless the US, the UK, France, Japan (currently AA rated) and even Germany change course quite radically and sooner rather than later towards a sustained higher degree of fiscal tightening, there may not be a single AAA-rate sovereign left 5 years from now.

Second, the sovereign debt of some leading emerging market economies could soon be safer than that of any of the G7 countries.

Figure 5. Public debt (% of GDP) in 20 Emerging Economies and 20 Developed Economies, IMF Projections, 2009 and 2014



Sources: IMF and Citi Investment Research and Analysis

⁹ CMA (2010)

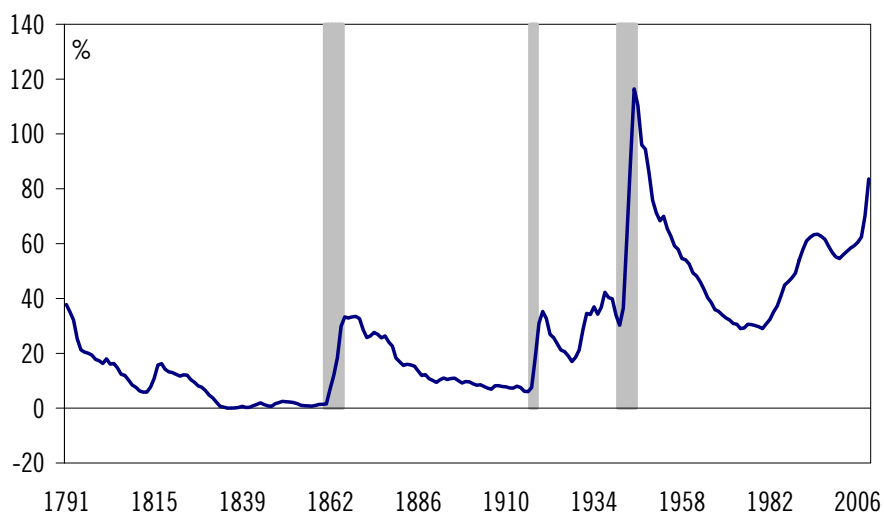
2.3 The Biggest Peacetime Increase in Public Sector Debt and Deficits Ever

Larger deficits and public debt burdens only following major wars

In the US, there have been larger increases in government deficits and public debt burdens than the rise, and more recently the surge, that started around 1974 (following the first oil price shock) or 1981 (following the second oil price shock). However, these earlier spikes in the burden of the public debt occurred only during wartime periods. This is clear from Figure 6, which shows the peaks in the US public debt to GDP ratio following the revolutionary war, the Civil War, World War I and World War II. A similar pattern is shown in Figure 6, which shows the UK's public debt burden since shortly after the Glorious Revolution.

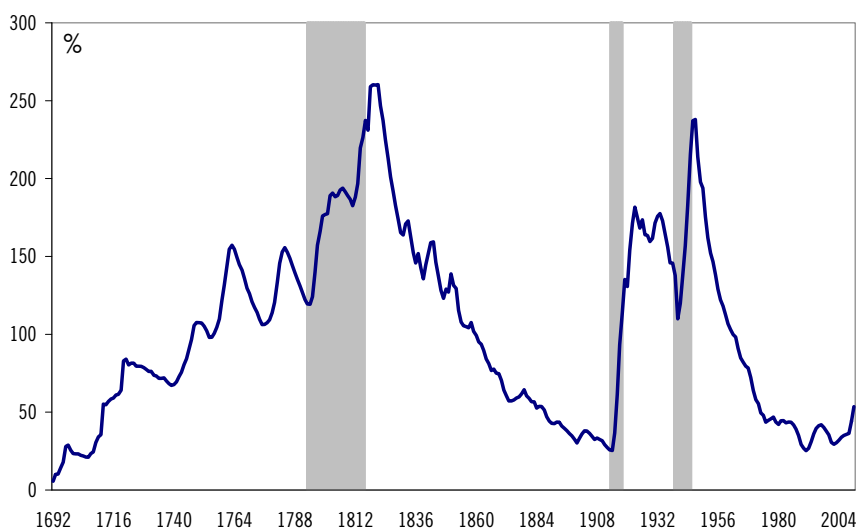
As regard the US, except for the 4 years (1998 – 2001) of the second Clinton Administration during which the US Federal government ran its only budget surpluses since 1969, the past 35 years have seen a relentless increase in the public debt burden.

Figure 6. US – US Treasury Debt (% of GDP), 1790-2009



Note: Shaded areas represent American Civil War (1861-1865), World War I (1917-1918) and World War II (1941-1945). Sources: US Nominal and Real GDP 1790-2009: Louis D. Johnston and Samuel H. Williamson, "What Was the U.S. GDP Then?" Measuring Worth, 2009. URL: <http://www.measuringworth.org/usgdp/> US Treasury securities outstanding: US Treasury and Citi Investment Research and Analysis

Figure 7. UK – Net Public Debt (as % of GDP), 1692-2009F



Note: Shaded areas represent Napoleonic Wars (1793-1815), World War I (1914-1918) and World War II (1939-1945). Sources: www.ukpublicspending.co.uk and Citi Investment Research and Analysis

The UK's all-time peak in the public debt-GDP ratio was immediately following the Napoleonic wars, when it reached more than 260 percent of GDP. The next big spikes were associated with World War I and World War II. In 1946 and 1947, the net debt to GDP ratio reached 238 percent. The post-World War II trough was reached in 1991, when the ratio stood at 25 percent.

The 18th century GDP data should be taken with a very large pinch of salt. For those who are willing to suspend disbelief, the Glorious Revolution was bracketed by the War of the Grand Alliance (1688-1697), there was the War of Spanish Succession (1701-1713), the War of the Quadruple Alliance (1718-1720), the French and Indian War (1754), the Seven Years' War (1757-1763), the American Revolutionary War (1775-1783) and from 1792, the Wars of the French Revolution that mutated into the Napoleonic Wars.

2.4 The Coming Age-Related Public Spending Conflict

Intergenerational distributional conflict further complicates fiscal burden sharing

The unprecedented peacetime deterioration in the public finances of the advanced industrial countries is not to any significant extent driven by the demands on the state budget coming from age-related spending. Most of the budgetary impact of population aging, both through an increase in longevity and through a reduction in the birth rate not fully compensated for through an increase in the net inflow of young immigrants, is yet to come.

It is not very informative to extrapolate mechanically the implications of current entitlement programmes, tax structures and contribution rules as they collide with the major demographic transition that is on the way. Claims based on legal contracts (debt) are different from the present discounted value of political promises, hopes and expectations (like the 'implicit liabilities' of social security retirement schemes, Medicare and other social programmes). We consider it to be a foregone conclusion that the age of eligibility for social security retirement programmes will be raised before long to 70 or more in

most rich industrial countries, and then 'indexed' to demographic developments so as to maintain a constant life expectancy conditional on reaching the age of eligibility.

Budgetary funding of medical care and care for the elderly will be capped and rationed one way or the other. But the coming clash of rising age-related spending ambitions and limited revenue sources add to the polarization of the polity, by adding an intergenerational conflict dimension to the many divisions that already exist and thus making it even more difficult to achieve a consensus on public spending cuts and/or tax increases to regain a fiscally sustainable trajectory.

2.5 Some More Thoughts on the Fiscal Predicament of the USA

US sovereign debt understated, even if unfunded Soc. Sec. liabilities & Medicare are ignored

The fiscal-financial situation in the USA is, in our view, a lot more threatening than the official data reveal. This is true even without the addition to the conventional liabilities of the government of the "unfunded commitments" of the Social Security system, and the "unfunded commitments of Medicare". The term 'liability' or debt instrument should be reserved for future payment commitments that are contractual in nature - and where the holder of the debt instrument has, in principle, recourse to the courts when the terms of the contract are not fulfilled. Unfunded Social Security and Medicare 'liabilities' are calculated by extrapolating estimated future payments and receipts under current entitlement programs, laws, rules and regulations. These 'commitments' can, frequently are, and undoubtedly will be in the future, changed through the political process. They are soft commitments, promises, hopes, aspirations, expectations or declarations of intent rather than contractual commitments enforceable in a court of law.

What should be included in the 'hard' US public debt date are all sovereign or sovereign-guaranteed debts of the general government. The general government sector includes all activities of the central/federal, state/provincial, and local/municipal governments and all federal, state and local government agencies and funds except for government enterprises that work according to market principles and don't benefit, *de facto*, from a sovereign guarantee for their liabilities. The general government sector provides public services that are mainly non-market in nature, including collective consumption, public infrastructure investment and the transfer or redistribution of income and wealth. Its constituent entities are covered, *de jure* or *de facto*, by a government guarantee. They are financed mainly through taxes and other compulsory levies. State or government enterprises are engaged mainly in market activity and are financed from fees or other market revenues.

The general government ought to include the central bank, an agency of the state that operates on non-market principles, and is *de facto* owned by the state, even though it may have operational independence for the performance of certain tasks, like setting the official monetary policy rate, and even though its formal, *de jure* ownership structure can be rather unusual. The bottom line is represented by the fact that nearly all the profits made by the Federal Reserve System are transferred to the US Treasury. For reasons that are unclear, the common definition of the general government excludes the central bank. In what follows we shall refer to the consolidated general government and central bank as the *augmented* general government.

Fannie and Freddie represent large liabilities ...

It is clear that The Federal National Mortgage Association (FNMA) and the Federal Home Loan Mortgage Corporation (FHLMC), the two largest government-sponsored enterprises of the US federal government, authorized to make loans and loan guarantees for residential housing, have been part of the general government sector at least since they were placed into the conservatorship of the Federal Housing Finance Agency (FHFA) on September 7, 2008¹⁰. The US Treasury now holds senior preferred stock and common stock warrants amounting to 79.9% of both Fannie and Freddie. And the Federal government's ability to 'make whole' the unsecured creditors of the two GSEs is limited only by the overall ceiling on the federal debt, which adjusts passively and mechanically with the federal government's need to borrow.

From an economic and financial perspective therefore, the outstanding liabilities of Fannie and Freddie are guaranteed by the federal government. Their liabilities at the end of the third quarter of 2010 were just over \$ 1,761 bn¹¹. In addition, there were off-balance sheet contingent liabilities (mainly through guarantees and MBS held by third parties), of \$4,379 bn, making for total, on-balance sheet and off-balance sheet liabilities of \$6,140 bn. The usual figure for the gross debt of the general government should consequently be augmented by at least the on-balance sheet debt of Fannie and Freddie of just under \$1.8 trillion or just under 13 percent of GDP. The fair value of the contingent exposure is anyone's guess.

... and doubtful assets

Of course there are financial assets on the other side of the balance sheets of Fannie and Freddie, but these come into play only for the net general government debt figures. Also, as many of these assets are illiquid and imperfectly marketable, even the *net* debt totals would, under normal public sector accounting conventions, not include the imputed value of these assets - likely to be significantly below their notional or face value.

3. Achieving Fiscal Sustainability

3.1 The Arithmetic of Fiscal Sustainability

A little bit of debt dynamics algebra ...

The arithmetic of public debt dynamics is simple but inexorable. We refer henceforth to the net non-monetary debt of the augmented general government (the consolidated general government and central bank) as the *public debt*. If s is the augmented general government primary (non-interest) surplus as a share of GDP, r the effective real interest rate on the public debt, γ the growth rate of real GDP, and d the public debt to GDP ratio at the beginning of a period then, letting Δd denote the 'change in' the public debt to GDP ratio between

¹⁰ From Wikipedia, I quote the following: "Under (the) plan announced on September 7, 2008, the federal government, via the Federal Housing Finance Agency, placed the two firms into conservatorship, dismissed the firms' chief executive officers and boards of directors, and caused the issuance to the Treasury new senior preferred stock and common stock warrants amounting to 79.9% of each GSE. The value of the common stock and preferred stock to pre-conservatorship holders was greatly diminished by the suspension of future dividends on previously outstanding stock, in the effort to maintain the value of company debt and of mortgage-backed securities. The authority of the U.S. Treasury to advance funds for the purpose of stabilizing Fannie Mae, or Freddie Mac is limited only by the amount of debt that the entire federal government is permitted by law to commit to. The July 30, 2008 law enabling expanded regulatory authority over Fannie Mae and Freddie Mac increased the national debt ceiling US\$800 billion, to a total of US\$10.7 Trillion in anticipation of the potential need for the Treasury to have the flexibility to support the federal home loan banks.

¹¹ Fannie Mae's outstanding liabilities on September 30, 2009 were reported at \$905.2 bn, and its MBS held by third parties and other guarantees at \$2441.4 bn. For Freddie Mac, the corresponding totals were reported at \$856.2 in liabilities and \$1937.4 in guarantees.

the end and the beginning of a period, it follows that the change in the ratio of public debt to GDP is given by:

$$\Delta d = -s + \left(\frac{r - \gamma}{1 + \gamma} \right) d \quad (1)$$

So to keep the ratio of net public debt to GDP constant, the augmented general government's primary surplus as a share of GDP has to satisfy:

...does you good.

$$s = \left(\frac{r - \gamma}{1 + \gamma} \right) d \quad (2)$$

Greece currently has an effective average nominal interest rate on its outstanding public debt of about 4.5 percent. Under the terms offered by the Euro Area member states as part of the financial support package, the marginal cost of funds would be between 5 percent (300 basis points over the swap rate for loans with maturity up to 3 years) and 6 percent (400 basis points over the swap rates for loans with a maturity over 3 years). The growth rate of real GDP for Greece this year is likely to be between minus 2 percent and minus 4 percent. Inflation (on the GDP deflator definition) is unlikely to be much above 1 percent.

With the effective real interest rate conservatively set at 4 percent ($r = 0.04$), the real growth rate at minus two percent ($\gamma = -0.02$) and a net general

government debt-to-GDP ratio of 86 percent ($d = 0.86$), the term $\left(\frac{r - \gamma}{1 + \gamma} \right) d$

will add 5.27 percentage points to the debt-to-GDP ratio this year. This explosive contributor to the public debt burden dynamics has to be counteracted through primary surpluses (positive values of s of sufficient magnitude) to stop the emergence of an explosive public debt dynamics that would inevitably lead to default.

It turns out that the condition for the sovereign to be solvent can be made to look very similar to the condition for keeping the public debt-to-GDP ratio constant given in (2). We define the following: \bar{s} , the 'permanent' primary (non-interest) government surplus as a share of GDP, $\bar{\gamma}$, the permanent growth rate of real GDP, \bar{r} , the permanent effective real interest rate on the public debt. *Permanent* means roughly 'expected future long-run average'.

Any sustainable fiscal-financial-monetary programme of the sovereign has to satisfy the condition that the outstanding public debt cannot exceed the present discounted value of current and future expected primary surpluses of the augmented general government. That statement can also be written as the following condition:

Sovereign solvency

$$\bar{s} \geq \left(\frac{\bar{r} - \bar{\gamma}}{1 + \bar{\gamma}} \right) d \quad (3)$$

The minimum value of the primary surplus (as a share of GDP) that will ensure solvency for the sovereign, \bar{s}^{\min} , is therefore given by

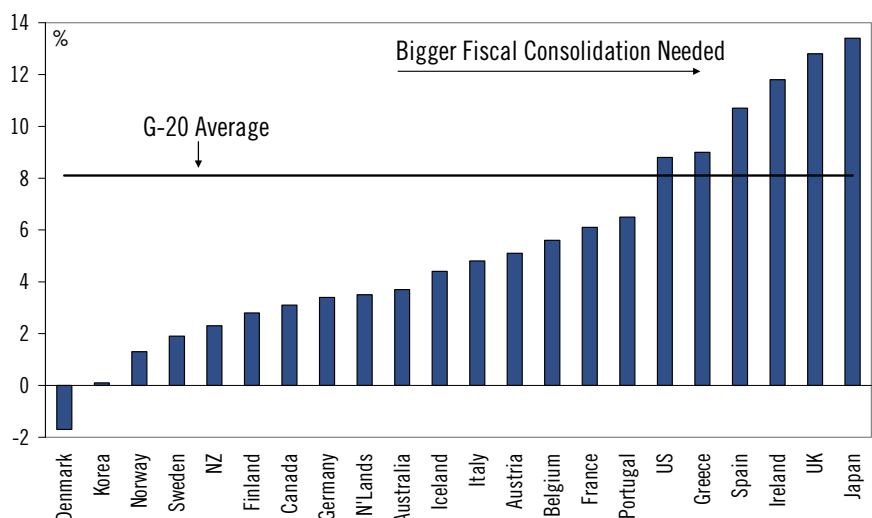
$$\bar{s}^{\min} = \left(\frac{\bar{r} - \bar{\gamma}}{1 + \bar{\gamma}} \right) d \quad (4)$$

Thus, if the long-run effective real interest rate on the public debt exceeds the long-run growth rate of real GDP (which is likely to be the case for today's advanced industrial countries), any country that has a positive outstanding stock of (net) public debt will have to run, on average, future or primary augmented general government surpluses. For instance, a country with a 103 percent net public debt to annual GDP ratio, an expected long-run growth rate of real GDP of 3 percent per annum, and an average effective real interest rate on the public debt of 4 percent will have to run, on average, a 1 percent of GDP primary surplus in the future. If the actual structural (or cyclically adjusted) augmented general government primary deficit were, say, 7 percent of GDP, this country would have to raise tax revenues or cut public spending by 8 percent of GDP 'permanently', that is, on average in the future. These figures are (except for the interest rate and growth rate, which are merely illustrative) consistent with the likely position of the US fiscal authorities by the end of 2012 (from Figure 1).

Solvency gaps are massive...

Figure 8 below shows some calculations by the IMF about the reduction in the primary public sector deficit required to restore fiscal sustainability in a number of countries, based on a logic similar to that of equation (3), although equation (3) only requires that solvency is achieved over an infinite horizon. The calculations underlying Figure 7 require the achievement of a given target level for the gross public debt by 2030. But Figure 7 too shows the US, the UK and Japan as being in a situation similar to or worse than that of Greece, Spain, Portugal, Ireland and Italy.

Figure 8. Advanced Economies – Fiscal Tightening (% of GDP) Needed between 2010 and 2020 to Achieve 60% of GDP Public Debt Ratio by 2030



Note: Primary balance (assumed to improve gradually during 2011-20 and then maintained constant until 2030) improvement needed to stabilize debt at end-2011 level. Japan's target public debt ratio is 80% of GDP. Sources: IMF and Citi Investment Research and Analysis

The logic of the long-term solvency condition of equation (3) implies that any country that has a positive net public debt position (shown in column 2 of Figure 1) will have to generate a positive permanent primary balance (the last column of Figure 1 should be positive, on average, in the future). The assumption that makes this a necessary condition is that the permanent interest rate exceeds the permanent growth rate of GDP. A lower bound on the amount permanent fiscal tightening that a country will have to engage in, on average in the future, once a cyclical recovery has eliminated the revenue losses and abnormal public expenditures associated with the recession, is therefore given by the amount the structural primary balance in the last column of Figure 1 has to increase to turn it into a positive number.

US needs around 8 percent of GDP worth of permanent fiscal tightening

For the US, with a structural primary deficit in 2009 of 7.3 percent of GDP, the arithmetic of solvency indicates the need for at least 7.3 percent of GDP worth of permanent fiscal tightening (not counting the long-term fiscal tightening required to accommodate future age-related public spending ambitions). For the UK, with a structural primary deficit in 2009 of 6.8 percent of GDP, the required permanent fiscal tightening (beyond what is achieved automatically by a cyclical recovery) would be at least 6.8 percent of GDP. In neither country are policy makers debating how to achieve anything like these degrees of fiscal tightening. In the US, beyond the expiration of part of the Bush tax cuts, no additional fiscal tightening has been planned. With the policy makers in denial, the fiscal situation is likely to deteriorate further, with the result that the magnitude of the permanent fiscal tightening that is required, when the markets eventually demand an immediate fiscal adjustment, will keep on rising.

It is clear from equation (3) that no matter how high a nation's public debt to GDP ratio, solvency of the sovereign can be achieved if the augmented general government is capable of generating sufficiently large future primary surpluses, and is believed by the markets to be capable of generating those surpluses. There are, however, technical, economic and political limits on the ability of governments to generate primary surpluses. The primary surplus of the augmented general government (as a share of GDP) is made up of taxes as a share of GDP, τ , minus public spending as a share of GDP, g , plus monetary base issuance by the central bank as a share of GDP, μ

$$s = \tau - g + \mu \quad (5)$$

Higher taxes are distortionary, costly to extract and politically unpopular. Lower public spending is politically unpopular and can hurt growth when public spending cuts fall on productive infrastructure spending and essential 'intermediate' public administration goods and services. In addition to these adverse supply side and distributional effects of fiscal tightening, fiscal tightening will weaken effective demand through the usual Keynesian channels. Attempts to raise seigniorage revenue will, sooner or later result in higher inflation which is distortionary and politically unpopular. Empirically, the demand for real base money balances takes a form that is consistent with the existence of a long-run seigniorage Laffer curve: real seigniorage revenues first increase but ultimately peak and decline as the rate of inflation rises.

All this supports the view that there is, in any polity, an upper limit on the size of the permanent primary surplus that can be supported. Call this upper limit \bar{s}^{\max} . It will be determined by political, social and cultural factors as well as by conventional economic factors. For a country to be safe from sovereign default risk it therefore has to be the case that

$$\bar{s}^{\max} \geq \bar{s}^{\min} \quad (6)$$

The 'solvency gap', GAP , is the difference between \bar{s}^{\min} and \bar{s}^{\max} :

$$GAP = \bar{s}^{\min} - \bar{s}^{\max} \quad (7)$$

It is the minimal amount by which the maximum permanent primary surplus (as a share of GDP) that can be generated by the sovereign has to increase to ensure solvency.

Let \tilde{r} be the risk-free long-term real interest rate. It follows that the government's fiscal-financial-monetary programme is sustainable only if the condition given in (8) holds: the maximum augmented primary surplus that can be extracted is large enough to satisfy the solvency constraint or intertemporal budget constraint (3) or (5), when the government's debt is perceived to be absolutely safe, and the interest rate on the public debt is the risk-free rate:

The same fundamentals ...

$$\bar{s}^{\max} \geq \left(\frac{\frac{\rho}{\tilde{r}} - \bar{\gamma}}{1 + \bar{\gamma}} \right) d \quad (8)$$

... can support an equilibrium with low interest rates and no default ...

But there is no guarantee that this nice outcome, where the markets perceive or anticipate the absence of sovereign default risk, the interest rate on the public debt consequently is the risk-free rate, and the government is able to meet all its present and future debt obligations, is the only possible one.

Let π denote the probability of default. From (3) this is the probability that $\bar{s}^{\max} < \left(\frac{\bar{r} - \bar{\gamma}}{1 + \bar{\gamma}} \right) d$. The permanent interest rate \bar{r} is the sum of the risk-free rate and a default risk premium. In the simplest case, when the markets are risk-neutral, it has to be the case that $\frac{\rho}{\tilde{r}} = \bar{r}(1 - \pi(1 - R))$, where R is the recovery rate when a default occurs. With risk-neutrality, the risk-free rate, $\frac{\rho}{\tilde{r}}$ equals the expected rate of return on a risky investment. This is the interest rate on the sovereign debt times the probability that a default does not occur, $\bar{r}(1 - \pi)$ plus the payout when a default occurs times the probability of default, $\bar{r}R\pi$. Letting Prob stand for probability, we can write the condition defining the likelihood of a sovereign default as follows:

$$\pi = \text{Prob} \left\{ \bar{s}^{\max} < \left(\frac{\left(\frac{\frac{\rho}{\tilde{r}}}{1 - \pi(1 - R)} \right) - \bar{\gamma}}{1 + \bar{\gamma}} \right) d \right\} \quad (9)$$

Consider the extreme but simple case where the recovery rate conditional on a default occurring is zero (that is, $R = 0$). In that case the equation defining the probability of default becomes:

$$\pi = \text{Prob} \left\{ \bar{s}^{\max} < \left(\frac{\left(\frac{\frac{\rho}{\tilde{r}}}{1 - \pi} \right) - \bar{\gamma}}{1 + \bar{\gamma}} \right) d \right\} \quad (10)$$

Assume that condition (8) (which is condition (10) with $\pi = 0$) is satisfied, and the government would therefore with certainty be able to meet its obligations provided the interest rate on its debt were the risk-free rate. Nevertheless, assume that markets believe that the government will default for sure, that is, the market believes that $\pi = 1$. That too would be an equilibrium

in which the market's expectations would be realized, because if the market is certain that a default will happen, the interest rate on the debt would go to infinity, and no matter how large \bar{s}^{\max} is, it cannot overcome an infinite interest rate on the public debt. This economy therefore has (at least) two equilibria, one in which there is a zero sovereign default risk premium and no default occurs, with $\pi = 0$; and another in which the market believes that sovereign default is certain, the default risk premium explodes and default does indeed occur, with $\pi = 1$.

... and a second equilibrium with high interest rates and inevitable default

It may be argued that these multiple self-fulfilling beliefs are not all equally plausible. Why, if the fundamentals support an outcome in which the markets expect a zero risk of default and the government delivers as expected, would the markets choose as a focal point the extreme opposite set of beliefs: that default is certain? We have some sympathy for this objection, but not enough to rule out the possibility that, in a richer, more realistic setting, with incomplete and asymmetric information, and with rationality tempered by hubris, greed, fear and panic, self-fulfilling destructive beliefs and expectations of market participants can create havoc that defies the fundamentals – indeed the distinction between fundamentals and extraneous drivers of asset prices and rates of return becomes blurred.

The internal transfer many have to complemented by...

The discussion of fiscal sustainability has focused only on the *internal transfer* side of the problem: the resource transfer from the domestic private sector to the sovereign, through revenue increases or public spending cuts, that is, through larger government primary surpluses. When at least part of the public debt is held abroad, the internal transfer will have to be accompanied by an *external transfer*, that is a resource transfer from the domestic economy to the rest of the world through higher exports and/or lower imports, that is, through larger national or external primary surpluses.¹² The external transfer is likely to require a depreciation of the real exchange rate to be effective and sustainable.

an external transfer

It therefore makes sense to consider not only the balance sheet and financial deficit of the government (as shown in Figure 1), but also that of the external sector. This information is given in Figure 9, which shows the current account balance and the net international investment position (external assets minus external liabilities) of the nation (the consolidated private and public sectors).

¹² The national or external primary surplus is the non-interest current account surplus on the balance of payments.

Figure 9. Selected Countries – Net International Investment Position, (2000-2008) and Current Account (2009)

	2000	2008	2009
	Net International Investment Position		Current Account Balance
	% GDP		
Switzerland	114.1	121.5	8.7
Norway	20.4	52.3	13.8
Japan	24.8	50.6	2.8
Belgium	61.2	31.4	-0.3
Germany	3.3	25.3	4.8
Netherlands	-15.3	10.4	5.2
UK	-9.7	6.9	-1.3
Finland	-148.8	-4.2	1.4
Sweden	-24.0	-5.8	6.4
Denmark	-14.4	-8.5	4.0
Austria	-19.5	-14.4	1.4
France	8.9	-18.1	-1.5
Italy	3.6	-20.2	-3.4
USA	-13.4	-24.0	-2.9
Turkey	-37.0	-27.1	-2.3
Slovenia	-11.8	-30.8	-0.3
Czech Republic	-8.9	-38.3	-1.0
Poland	-32.2	-46.1	-1.6
Romania	-22.5	-50.1	-4.4
Slovakia	-20.9	-53.1	-3.2
Ireland	-15.0	-55.2	-2.9
Lithuania	-35.1	-60.4	3.8
Greece	-38.8	-69.7	-11.2
Estonia	-48.9	-72.4	4.6
Croatia	-24.9	-72.5	-5.6
Latvia	-29.7	-75.6	9.4
Spain	-32.3	-75.6	-5.1
Portugal	-39.9	-91.9	-10.1
Bulgaria	-34.8	-98.6	-9.5
Hungary	-69.9	-106.2	0.4
Iceland	-55.7	-215.8	3.8

Note: Current Account for Belgium, Croatia, the Czech Republic, Hungary, Norway, Poland, the Slovak Republic, Slovenia, Sweden and Switzerland as of 2008. Source: Haver and Citi Investment Research and Analysis

Greece, Spain and Portugal all have large negative net international investment positions and large current account deficits. Ireland too is a sizeable net external debtor, although much of its external liabilities consist of equity (the stock of past FDI in the country). Italy's external net debt and current account deficit are both quite modest.

3.2 The Political Economy of Restoring Fiscal Sustainability

We argued earlier that the relevant concept of 'government' for fiscal sustainability analysis is the augmented general government - the consolidated general government (federal, state and local, including social security etc.) and central bank. The debt under consideration consists of the non-monetary liabilities of the consolidated general government and central bank¹³.

¹³ This is not quite what the data give us, which tends to be, outside the US, the general government debt and for the US, the Federal debt only.

Six ways to reduce the public debt burden:

Fiscal pain

It is clear from equations (1) and (5) that there are six ways of achieving a reduction in the public debt burden.

Seigniorage/inflation tax

Lower interest rate

Higher growth rate

Default

Bailout

1. Fiscal pain, that is, an increase in taxes, τ , or a cut in public spending, g .
2. Increased recourse to seigniorage or revenues from monetary issuance by the central bank, that is, an increase in μ .
3. A lower interest rate on the public debt, that is, a reduction in r .
4. A higher growth rate of GDP, that is, an increase in γ .
5. Default, which here includes every form of non-compliance with the original terms of the debt contract, including repudiation, standstill, moratorium, restructuring, rescheduling of interest or principal repayment etc. In terms of equation (1) it is an exogenous disappearance of part or all of d into thin air.
6. A bailout (which can be interpreted either as a current transfer payment from abroad (an increase in τ from external sources) or a capital transfer from abroad (which would show up as an exogenous reduction in d).

The effective interest rate on the public debt, r , is determined by history for existing fixed rate debt and by the markets for new issuance. Of course, both domestic policy actions and the expectation and reality of external financial support can have a powerful impact on market-determined interest rates. In the best of all possible worlds, r equals the risk-free real rate of interest. When there is doubt about the willingness or ability of the authorities to maintain the budget on a sustainable path, default risk premia can boost the interest rate very sharply, as the recent example of Greece makes clear.

The growth rate of real GDP is not, unfortunately, a policy instrument. Governments know how to reduce γ but not how to boost it in a lasting manner. In the Euro Area in particular, growth is likely to be weak in the foreseeable future. It is, however, important not to mis-interpret the arithmetic effect of higher growth on the fiscal debt burden. It is true that, other things being equal, higher growth reduces the public debt to GDP ratio more rapidly. It also raises revenues, which may appear to provide a painless way of generating larger primary surpluses. But, through human psychology and political entrepreneurship, higher growth also raises the pressures for increased public spending.

The advanced industrial countries that have unsustainable fiscal positions today, at high levels of per capita income, did manage sustainable fiscal positions in the past at much lower levels of per capita income. The notion that without growth a country cannot eliminate, say, a 9 percent of GDP primary deficit is a logical and economic nonsense. It is possible for individuals and countries to live within their means at any level of real income above subsistence and with any real growth rate. Psychologically and politically, the notion that a growing cake makes it easier to engage in fiscal burden sharing has little to recommend it.

This leaves as policy instruments for addressing fiscal sustainability just fiscal pain, increased monetary issuance, a bail-out or default. Before discussing which of these options is most likely to be chosen by any particular

government, I will consider an alternative but equivalent version of the public debt dynamics equation (1):

$$\Delta d \equiv \delta - \left(\frac{\gamma}{1+\gamma} \right) d - \left(\frac{\pi}{(1+\pi)(1+\gamma)} \right) d \quad (11)$$

where δ is the budget deficit, (including debt interest payments) of the augmented general government (as a share of GDP) and π is the rate of inflation (strictly, the proportional rate of change of the GDP deflator)¹⁴. Since

$$\delta \equiv -s + \left(\frac{i}{(1+\pi)(1+\gamma)} \right) d, \text{ where } i \text{ is the nominal interest rate on the public}$$

debt, it is clear that the fiscal pain and monetary issuance channels for reducing the public debt burden can be identified easily even in this alternative presentation of the government's fiscal options. But (5) draws attention to the fact that, if the public debt is nominally denominated and of not too short a maturity, higher unexpected inflation can also reduce the real burden of the debt: a small increase in the inflation rate reduces the public debt to GDP ratio

by an amount $-\left(\frac{1}{(1+\pi)(1+\gamma)} \right) d$. However, if the higher inflation is

anticipated, if the maturity of the debt is very short or if the debt is index-linked or denominated in foreign currency, then the nominal interest payments on the debt will increase. If the inflation is completely anticipated, the maturity is extremely short or all debt is index-linked or foreign-currency denominated, higher inflation will have no effect on the real burden of servicing the debt whatsoever.

3.3 Fiscal Pain as the Means for Re-establishing Fiscal Sustainability

Sovereign default in rich countries is about willingness to pay, not ability to pay.

Even the least well off countries among the industrialized nations, like Portugal and Greece, are 'rich' as regards their ability to restore fiscal sustainability by raising taxes or cutting public spending without forcing standards of living down to levels that would threaten health, housing, education and a reasonable social safety net. Greece had a per capita gross national income (at PPP exchange rates) in 2008 of \$28,470, Portugal \$22,080, Spain \$31,130, Ireland \$37,350 and Italy \$30,250. Germany's 2008 per capita gross national income was \$35,940.¹⁵ As Figure 8 makes clear, even the most fiscally unbalanced country (Japan, according to the metric of Figure 8, which focuses on *gross* public debt) can restore fiscal sustainability through a long-term fiscal tightening worth less than 14 percent of GDP annually.

Political economy problem of finding fiscal burden sharing solution

What stands in the way of a resolution of the fiscal imbalances is a political failure: the inability of a wide variety of national social choice mechanisms to come up with a fiscal burden sharing scheme that is both fair and efficient.

Achieving agreement on fiscal burden sharing when faced with an unsustainable fiscal situation - some combination of a high initial public debt to GDP ratio, d , a large 'permanent' primary government deficit as a share of GDP, $-\bar{s}$, a low permanent growth rate of real GDP, $\bar{\gamma}$, and a high

¹⁴ $1+i = (1+r)(1+\pi)$.

¹⁵ Source for the per capita national income data is the World Bank (2010), World Development Indicators 2010.

permanent real interest rate on the public debt, \bar{r} - is much easier when the high debt burden and the high structural deficit have been incurred as the result of a common effort during a conflict with an external enemy, than when the source of the public debt and deficit is a self-inflicted wound. Assigning blame and trying to shift the burden of the fiscal correction (tax increases and public spending cuts) to other groups or individuals takes precedence over searching for timely, fair and efficient retrenchment measures. The result can be a 'war of attrition' in which fiscal adjustment is delayed and postponed, making the eventual burden even greater.

We should therefore not take too much comfort from the fact that in 1946 (see Figure 6) the US had a Federal debt to GDP ratio which, at 121 percent, was much above the current 83.9 percent Federal debt to GDP level, but managed to bring this down to just 31 percent in 1974. Neither should we conclude from the fact that the UK had a net public debt to GDP ratio of 238 percent in 1947 (again, much higher than the current level of around 50 percent), but managed to bring that down to 25 percent in 1991 (see Figure 7).

War of attrition among beneficiaries of public spending and tax payers

The public debt problems of the advanced industrial countries are 'won't pay' problems, not 'can't pay' problems. More precisely, these countries face the political economy problem of having to agree on, design and implement a fiscal burden sharing agreement – one that commands sufficient political and popular support to be successfully adopted and implemented over a period of years (almost certainly not less than 3 years, with 5 years of fiscal tightening the likely modal outcome and some countries in fiscal consolidation mode for a decade or more. As noted above, this kind of stalemate can be viewed, informally, or modeled formally as a feature of a 'war of attrition' game, in which the players make alternating offers about the distribution of the 'fiscal pain' (the present value of current and future tax increases and public spending cuts). If the other players accept the latest offer, the fiscal burden sharing plan contained in the offer is implemented. If the offer is rejected, one of the other players gets to make an offer. Time passes between offers and as time passes, the aggregate fiscal pain that is to be shared increases.¹⁶

Delays in fiscal adjustment raise aggregate cost

With full information, this game would come to an end immediately, as delay is costly and inefficient. When there is asymmetric and incomplete information, a player may not be sure about the other players' breaking points – what the worst offer is they would accept. So fiscal adjustment is postponed and in the aggregate everyone is worse off – the size the cake the citizens are fighting over is shrinking as they fail to agree on a sharing rule.

What are the determinants of the likelihood that a given country will swiftly achieve a fiscal burden sharing solution when it has experienced a large increase in the public debt burden?

Fiscal pain solution requires less polarized polity, strong institutions and effective leadership

Fiscal pain is more likely to be chosen as the method for addressing fiscal unsustainability the less polarized are the electorate and the polity in general. Even if a national consensus on fiscal burden sharing can be established, government institutions capable of swift and decisive action are also required. Finally, beyond a low degree of polarisation and effective political institutions, the quality of the political incumbents matters greatly.

¹⁶See Hendricks, Weiss and Wilson (1988) and Alesina and Drazen (1991).

Greece scores badly here

We view Greece as a prime example of a country with a high degree of political and social polarisation and with ineffective and corrupt political institutions. Political strikes and vehement political disagreement frequently spill over into violence in the streets. This makes an easy and early resolution of the fiscal dilemma unlikely. The threat of imminent default – and the associated risk that both the government primary budget and the external primary budget (the non-public-debt-interest current account) would have to be balanced instantaneously as the capital markets impose a sudden stop on financial flows into the government budget and into the national economy – is likely to be necessary for Greece to implement the required dosage of fiscal pain.

Spain has regional burden sharing problems

Spain has special problems because of its quasi-federal fiscal system. The 17 autonomous communities, 2 autonomous cities and the municipalities account for 51% of public spending, with more than 50 percent of this financed by grants from the centre. Regional issues and the threat of separatism constrain the capacity of the central government to contain the spending programmes of the autonomous communities and municipalities. Thus far

Portugal's public debt problems necessitate painful corrections, but are not in the same league as those of Greece, both as regards the inherited stock of debt and as regards the underlying deficit (see Figure 1). Its political system also appears to be more capable of engineering a medium-term fiscal burden-sharing coalition than that of Greece. It also does not have the quasi-fiscal federalist problems that may delay adjustment in Spain.

US requires near-crisis conditions to choose fiscal pain solution

The US is, in our view, a more polarized and divided society today than at any time since World War II, including the Vietnam war era. Its government institutions are so encumbered by checks and balances that decisive prompt action is only possible during times of national emergencies – times, that is, that are widely recognized across the political spectrum as national emergencies. We don't believe that the fiscal threat is as yet perceived as a likely candidate for a national emergency. Things will have to get worse, say through the country being put on negative outlook for its sovereign credit rating, or indeed losing its triple-A sovereign credit rating, before a fiscal burden sharing agreement is likely to be achieved. The way things are now, the Republicans will veto all tax increases and the Democrats all public spending cuts.

UK capable of implementing fiscal pain solution unless there is hung Parliament

The UK's political system can be characterized as an 'elected dictatorship', with a *de-facto* uni-cameral parliamentary system, a first-past the post electoral system and no tradition of interference in economic affairs by an independent judiciary. An executive with a reasonable majority in the Commons (which can be achieved with barely 30 percent of votes cast) can legislate more or less as it wishes. From the point of the ability of the government to take radical and decisive fiscal actions, such executive dominance is an advantage. If therefore the May 2010 parliamentary elections produce an outright majority for any one party, there can be little doubt that the UK will choose the fiscal pain route.

Should there, however, be a hung Parliament, with no party achieving a workable majority, then the markets may test the determination of the sovereign by raising sovereign bond and CDS spreads and by weakening sterling while the British political classes and political parties learn the ropes of coalition politics.

Only Ireland has taken decisive action so far

Ireland appears to have bitten bullet by agreeing on fiscal tightening worth 7 to 8 percent of GDP, including significant cuts in public sector salaries and pensions. It also has a real economy that is much more flexible than that of the other members of the South-West Euro Area Periphery (SWEAP) club.¹⁷ The recent (April 22, 2010) upward revision of the estimate of its 2009 general government budget deficit to 14.3 percent of GDP means that the task facing the country is even harder now. Still, barring a sudden and implausible implosion of the collective common sense displayed in the past year, Ireland is unlikely to be tested too severely by the markets.

3.4 Inflating Away the Real Burden of the Public Debt

Inflating the public debt away requires motive and opportunity

This option is more likely the stronger motive and opportunity.

Long maturity, fixed rate nominal debt, mainly held abroad makes inflation attractive

3.4a Motive

Motive is provided by a large stock of nominally denominated fixed-rate public debt. Because the total burden of servicing nominally denominated interest-bearing debt over its lifetime is reduced only by unanticipated inflation, that is, inflation unanticipated at the time the debt was issued (and therefore not reflected in the nominal interest rate established at the time of issuance), the incentive to inflate is stronger the longer the average remaining maturity or duration of the debt.

Based on the historical evidence surveyed by Reinhart and Rogoff (2009a), externally held debt is more likely to be defaulted upon than internally held debt. Few countries have enjoyed the 'exorbitant privilege' accorded the US since World War II, of being able to borrow abroad using debt instruments denominated in their own currency, so there is no direct evidence on whether domestic currency-denominated debt held abroad is more likely to be inflated away than domestic currency-denominated debt held by domestic residents.¹⁸ If capital levies through unanticipated inflation are in spirit and motivation similar to formal default or repudiation, however, then there may be a presumption that domestic currency-denominated public debt held abroad provides a stronger incentive to use unanticipated inflation as a means of reducing the real burden of that debt than would that same debt held at home.

As regards motive, a significant share of the US nominally denominated debt is held abroad. Between 55% and 70% of total US currency stock (around \$928 bn in circulation at the end of 2009) is estimated to be held abroad.¹⁹ As this is non-interest-bearing, it is eroded by both unanticipated and anticipated inflation. In addition, about 51.4 percent of US Treasuries are held abroad – \$3.6 trillion out of \$7.0 trillion held outside the Fed and excluding Intragovernmental Holdings - at end of December 2009.²⁰

Motive is strengthened by a longer maturity or duration of the nominally denominated debt. Here the situation is currently less inviting for the US than it was in 1946, the all-time peak of the US public debt to GDP ratio, as the

¹⁷ The members are Greece, Italy, Spain, Portugal and Ireland.

¹⁸ The UK during second half of the 19th century and up to World War I is the closest candidate.

¹⁹ Sources: US dollar notes and currency in circulation: US Treasury, Financial Management Service. Share held abroad: Porter and Judson (1996).

²⁰ Sources: Office of Debt Management, Office of the Under Secretary for Domestic Finance.

average maturity of the US Treasury debt is only half of what it was in 1946, falling to around 4 years by the end of 2009.²¹

Unanticipated inflation also affects the real burden of servicing private domestic-currency denominated debt: it redistributes resources from private creditors who hold domestic currency denominated private debt to the issuers of that debt. Such intra-private sector redistribution of wealth is not politically neutral (nor is it likely to be devoid of macroeconomic effects). With much US mortgage debt still at fixed rates for long maturities, unanticipated inflation would redistribute wealth towards households owing mortgage debt and away from banks and other mortgage lenders. In the current political climate, this might not be unwelcome to many would-be voters and their representatives.

3.4b Opportunity

Less independent central bank makes inflation solution more likely

For there to be the opportunity to use (unanticipated) inflation to erode the real value of the public debt, it is also necessary that either the central bank be not too independent or that, even though independent, it is not too strongly committed to price stability.

We understand the drivers of the behavior of three of the four leading central banks reasonably well. They are the Fed, the ECB and the Bank of England. The *modus operandi* – objectives, perceptions and constraints, political and informational – of the Bank of Japan we have found much more difficult to establish. Of the comprehensible three, the Fed is the least independent, taking formal and substantive independence together. The Fed is a creature of Congress, never more than a single Act of Congress and an override of a Presidential veto away from having its mandate or the composition of the Board and/or the FOMC, transformed.

Fed least independent of leading central banks

There is, we believe, a greater chance of the Fed being cajoled or pushed into inflationary monetisation of public sector debt and deficits than the other leading central banks. For this to happen, it would be necessary that the current majorities on the Board and the FOMC, which would not go along with an inflationary solution to the US public debt problem, be replaced, or for the mandate of the Fed to be changed. In practice this would require either a strongly populist majority in both houses of the Congress and a strongly populist president in the White House, or a sufficiently large populist majority in the Congress to override a presidential veto. Either configuration looks currently unlikely but not impossible – a low-probability event but not a tail event, although were it to occur, it is likely to be at least 3 to 5 years in the future.

UK financial fragility protects Bank of England independence

Formally, the Bank of England is even more vulnerable to political usurpation than the Fed. The Chancellor of the Exchequer can, without even a vote of Parliament, decide to raise the inflation target to any number he thinks appropriate. The Reserve Powers clause of the Bank of England Act 1998 permits the Chancellor of the Exchequer to take back the monetary policy making powers from the Bank of England's Monetary Policy Committee without even the *ex-ante* permission of Parliament. A confirming vote of Parliament is required within 28 days, but much damage could be done by then.

However, should any Chancellor be foolish enough to attempt either to raise the inflation target sharply or to take back the power to make monetary policy from the Bank of England's Monetary Policy Committee, there would, in

²¹ Sources: US Treasury.

addition to the mass resignation of the MPC, be an immediate run on Sterling and a collapse of the exchange rate that would wreck the balance sheet of the UK's large banking and financial sector (the banking sector balance sheet is more than 400 percent of annual GDP as opposed to less than 100 percent of GDP for the US).²² With considerable maturity and liquidity mismatch between the roughly 200 percent of GDP foreign-currency-denominated assets and liabilities of the UK financial system, the damage to the UK financial system and the consequent disruption of the real economy would be very serious indeed. So the financial vulnerability of the UK economy is the *de facto* safeguard of the independence of the Bank of England.

ECB über-independent

The ECB is widely considered to be (among) the most independent central bank(s) ever, *de jure and de facto* (see e.g. Crowe and Meade (2008), building on methodologies developed by Grilli, Masciandaro and Tabellini (1991), Cukierman Webb and Neyapti (1992) and Eijffinger and de Haan (1996)). With the Treaty protections in place (and subject only to amendment by unanimity among the 27 member states of the EU), there is in our view no chance at all of the ECB monetizing public sector debt or deficits if it considered this to be incompatible with its price stability mandate.

This has obvious implications for the fiscal choices of Euro Area member states. If they favor an inflationary solution to their public debt problems, they will not get it as members of the Euro Area. If they were to leave the Euro Area (which would require them to leave the EU also, see below), they would not be able to inflate away their outstanding stock of euro-denominated public debt. Redenominating that debt into the new currency issued after the country left the Euro Area would constitute an act of default, akin to the abrogation of the gold clause by the US federal government in 1933 when the US went off the Gold Standard.²³

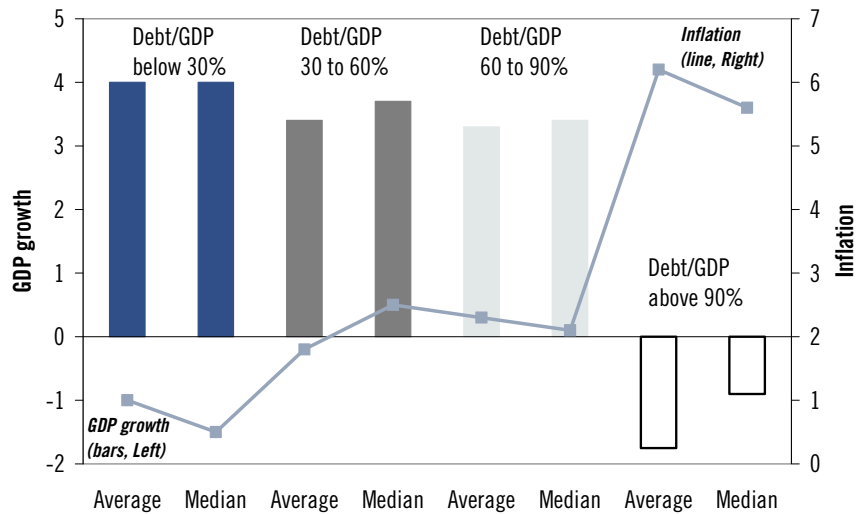
US has form inflating the public debt away

We argued earlier that none of the major industrial countries was likely to choose an inflationary solution to its public debt problems, but that of the US, the Euro Area and the UK, the US was least unlikely to pursue such a course of action. The country also has form as regards using inflation to amortize the real value of the public debt, as is apparent from Figure 10, taken from Reinhart and Rogoff (2009b). It shows that, historically (since 1790), the US has exhibited a tendency to respond to high public debt burdens with high inflation.

²² Source: UK, Haldane (2009). The Board of Governors of the Federal Reserve System report the total assets of all US commercial banks as of 31-03-2010 at \$11.9 trillion. There no longer are any large, stand-alone investment banks. The Bureau of Economic Analysis estimates US 2009 GDP at \$14.5 trillion.

²³ Most Greek sovereign debt and much Greek non-sovereign debt held by foreigners was issued under Greek law. Under Greek law, for debt to count as foreign debt is both has to be held by foreigners and denominated in a foreign currency (that is, not in euro). It has been argued that this makes it easier for Greece to restructure its debt or even to write it down unilaterally, without recourse to non-Greek courts for foreign holders of euro-denominated Greek sovereign and other debt. No doubt this issue will end up in court, ultimately at the European Court of Justice, should it ever come to that.

Figure 10. US Federal Government Debt, GDP Growth and Inflation, 1790 - 2009



Sources: Reinhart and Rogoff and Citi Investment Research and Analysis

The relationship between inflation and the public debt burden is tracked by the (grey) line. The bar columns show the relationship in the data between the public debt burden and the growth rate of real GDP. There is no association except at public debt levels above 90 percent of GDP, which tend to be associated with significantly lower GDP growth.

It is also instructive to note how the US reduced its Treasury debt to GDP ratio from 121.20% of GDP in 1946 (its all-time peak) to 31.67% of GDP in 1974 (its post-World War II low). Arithmetically, of the 89.53 percentage points reduction in the public debt burden, inflation accounted for 52.63 percentage points and real GDP growth accounted for 55.86 percentage points²⁴. Federal surpluses accounted for minus 20.51 percentage points, on average, there were Federal deficits. There were surpluses in individual years (1947, 1948, 1949, 1951, 1956, 1957, 1960 and 1969).

The same decomposition for the change in the UK net public debt to GDP ratio between 1947 and 1991 shows that the 212 percentage points of GDP

²⁴ Equation (5) can be written more symmetrically as

$$\Delta d \equiv \delta - \left(\frac{\gamma}{(1+\gamma)(1+\pi)} \right) d - \left(\frac{\pi}{(1+\pi)(1+\gamma)} \right) d - \left(\frac{\pi\gamma}{(1+\pi)(1+\gamma)} \right) d,$$

where $-\left(\frac{\gamma}{(1+\gamma)(1+\pi)} \right) d$ measures the effect of real growth on the debt to GDP ratio,

$-\left(\frac{\pi}{(1+\gamma)(1+\pi)} \right) d$ the effect of inflation and the nuisance term and

$-\left(\frac{\pi\gamma}{(1+\gamma)(1+\pi)} \right) d$ the interaction between real growth and inflation; this last term accounted for

only 1.55 percentage points of the total reduction in the debt-to-GDP ratio.

reduction in the net public debt to GDP ratio, was achieved as follows: cumulative public sector deficits *added* 124 percentage points of GDP, inflation reduced the ratio by 228 percentage points of GDP and real GDP growth reduced the ratio by 98 percentage points of GDP. The inflation-growth interaction term reduced the ratio by about 10 percentage points. So if the inflation was to a significant extent unexpected, inflation contributed to the massive reduction in the UK public debt burden in the post-World War II era - more than twice as much as real growth.

The qualification 'if the inflation was unexpected' is important. The numerical decomposition of the change in the public debt-to-GDP ratio into its three components (and the growth-inflation interaction term) does not provide enough information to answer the counterfactual question: would a higher rate of inflation have lowered the public debt-to-GDP ratio more or faster? Only an unanticipated increase in the inflation rate reduces the real burden of servicing the debt over its entire lifetime. An anticipated increase in the rate of inflation raises both the nominal coupon payments and the nominal discount rates proportionally, leaving their real present discounted value unchanged.

4. Sovereign Default as a Policy Option

4.1 When is Sovereign Default 'Individually Rational'?

Sovereign default not unthinkable
anywhere

The first point to note is that sovereign default in one of the advanced industrial countries is not inconceivable or impossible. It is true that, since the (West) German currency reform and sovereign default of 1948, there have been no sovereign defaults in Western Europe, North America (excluding Mexico), Japan, Australia or New Zealand. However, as amply demonstrated by Reinhart and Rogoff (2009), sovereign defaults have been common phenomena in the rest of the world. This includes Central and East European nations and the CIS, especially since the fall of the Berlin Wall in 1989.

Like all defaults, sovereign default represents a step in the process of resolving the inherent distributional conflict between creditor and debtor. With a sovereign default, the creditors lose and the sovereign is the proximate winner. Ultimately, the beneficiaries of a sovereign default are the current and future tax payers and the current and future beneficiaries of public spending, who would, in the absence of default, bear the burden of servicing the public debt.

Private contracts, including debts and loan contracts, are enforced either by the self-interest of the parties involved (if the present discounted value of honoring the terms of the contract continues to be positive throughout the life of the contract for all parties involved) or through third-party, external enforcement. The state is the principal external enforcer of private contracts. External or third-party enforcement of contracts involving the sovereign is therefore unlikely, barring gun-boat diplomacy by other governments and in the absence of a supranational authority capable of enforcing sovereign debt contracts.²⁵

Sanctions can sometimes be imposed by or on behalf of the creditors of a sovereign that has defaulted. These include attaching (confiscating) the assets

²⁵ The Icesave – related developments show, however, that given the right circumstances, governments can bring to bear considerable pressure on another government, not just to honour existing sovereign obligations, but to assume private obligations as if they were sovereign commitments.

of the sovereign located in foreign jurisdictions. Often the only penalty is the temporary exclusion of a defaulting sovereign from the international capital markets. The period of exclusion can be rather short. Of course, even after regaining access to the global financial markets, a borrower that has defaulted in the recent past may have to pay a premium over the safe rate, reflecting the market's assessment of future default risk.

Main sanction against defaulting sovereign is temporary exclusion from capital markets

With a period of exclusion from the international capital markets the main 'private' costs of default to a sovereign contemplating the costs and benefits of default, two key determinants of individually rational sovereign default suggest themselves. First, the larger the stock of outstanding sovereign debt, the greater the 'private' benefit from default. Second, the greater the likelihood that the sovereign will need to or wish to borrow again in the future (and especially the greater the likelihood that the sovereign will need future access to the international capital markets), and the greater the magnitude of these future borrowing needs, the greater the 'private' cost of default to the sovereign.

Individually rational default when debt is large and future borrowing needs are low

Thus the ideal candidate for a 'privately' rational sovereign default would be a sovereign with a large stock of net sovereign debt but with small or negative primary deficits, or even primary government surpluses both in the present and anticipated for the future.

Debt Laffer curve may make write-downs collectively rational for creditors

Once the markets doubt the ability of the sovereign to service its debt on the contractually agreed terms, the outstanding debt will start trading at a discount relative to its face value or notional value. This has two consequences. The first is that the *notional value* of the outstanding stock of debt could become so large, given the future primary surpluses the authorities are likely to be able to manage, that the *market value* of the debt would increase if the notional value of the debt were to be reduced. As the notional stock of debt increases, the probability of default rises. If the probability of default rises more than proportionally with the notional debt burden, the expected value of the debt (which would equal its market value in a risk-neutral world) would decline as the size of the notional debt increases. The existence of a 'debt Laffer curve' has been much studied in the economic development literature and in the context of past emerging market crises (see e.g. Claessens (1990) and Cohen (1991)). It now seems to be well-established.

If there is a debt Laffer curve and the debt level is beyond the point at which the expected value of the debt is maximized, it is in the collective interest of all creditors to agree to a reduction in the notional value of the debt and thus to capture a higher expected value. However, there is a collective action problem or 'cartel defection' problem. Every individual creditor would like all other creditors to agree to a write-down of their debt holdings without participating himself in the write-down. We don't think that, when we plug \bar{s}^{\max} , the largest politically sustainable permanent primary surplus (as a share of GDP) that the Greek state can generate into the Greek sovereign debt pricing function, we would find ourselves already on the wrong side of the peak of the debt Laffer curve (although without prompt and strong corrective action, Greece will reach that point in the not too distant future).

Sovereign contemplating restructuring has incentive to depress market value of debt

The second point, more relevant possibly at this stage, is that once the policy authorities in a highly indebted country consider a restructuring of the sovereign debt with a reduction in the net present discounted value (NPV) of future debt service to be a realistic option, they have every incentive to lower the market value of their debt, by increasing the discount on the notional value,

through any means at their disposal. The reason is that the haircut on the notional value of the debt that can be achieved in a debt restructuring with a reduction in the NPV of future debt service, is likely to be larger the larger the discount of the market price relative to the notional value of the debt.

When the debt trades at, say, 75 cents on the euro in the secondary markets, an offer by the sovereign to buy back the debt at 80 cents on the euro may well prove attractive to the existing bond holders. Since the price of the debt in the secondary markets depends first and foremost on the efforts that will be made by the sovereign to service it, the incentives for the sovereign to adopt a strategy of 'trash and buy back', that is, engage in statements or actions likely to reduce the market value of the debt and then offer to buy it back at a large discount, are clear.

4.2 What are the Systemic Externalities from a Sovereign Default?

Systemic externalities from sovereign default

The social impact of a sovereign default depends first on the macroeconomic impact of the redistribution from the creditors to the debtor (the sovereign and ultimately national tax payers and beneficiaries from public spending), and second on any systemic externalities resulting from a sovereign default. The two main systemic externalities are *financial stability externalities* and *rule of law externalities*.

Financial stability externalities due to contagion or to excessive concentration of risk

Financial stability externalities result either from contagion or from a high degree of concentration of the exposure to the liabilities of the sovereign in systemically important but financially fragile financial institutions.

Contagion to nearby emerging markets is discussed in Section 8. One form of contagion can be interpreted in terms of the discussion of Section 3.1, as a sudden shift, following a sovereign default or restructuring in one country, of the markets' 'focal point' for other countries' sovereign risk from the good outcome with probability of default $\pi = 0$ to the bad outcome with $\pi = 1$.

Alternatively, when a nation has a lot of foreign-currency denominated liabilities, there could be a 'bank run-style' rush for the exit by foreign creditors whose loans to the sovereign or sovereign bond exposure mature. This can cause a sovereign default either if the foreign exposure is sovereign exposure or if the foreign exposure is by private institutions deemed, by the sovereign, too systemically important to fail, but that also turn out to be too big to save. A sovereign rescue attempt can then result in sovereign default. This almost happened in Iceland, where the sovereign at the last moment decided not to risk its own solvency by guaranteeing the unsecured debt of its cross-border banks.

No evidence of 'blind' contagion

More generally, there could be a reassessment of other nations' sovereign risk based partly on learning (a Euro Area member state sovereign default would be news, after all), partly on blind fear and panic. We have been impressed, in most financial crises since the 1980s, with how little contagion through blind fear and panic there has been. Although there has been jitteriness and nervousness galore, the markets, and creditors in general have on the whole been highly discriminating and selective as regards the sovereigns singled out for special attention. Countries with sound fiscal fundamentals have not been tested in this crisis.

Concentration risk is an important feature of the current crisis. As will be made clear from our discussion below of the Greek sovereign debt problems, bank supervisors and regulators in the EU and in the Euro Area in particular have failed singularly to prevent a very high concentration of exposure to Greek risk, and to Greek sovereign risk, in their banks. Ironically, this supervisory and regulatory failure may well be the result in part of an attempt to correct an earlier supervisory and regulatory error that was highlighted by the financial crisis that started in August 2007: the low share of liquid assets in the balance sheets of the banks. Supervisors and regulators are pressing the banks in their jurisdictions to hold more liquid assets. Eurozone sovereign debt was viewed as liquid and safe by supervisors and regulators and therefore also by the banks. This ignored two fundamental truths: first, that no sovereign is completely safe, and, second, that there are large variations in the default risk associated with different sovereigns, even among the EU and Euro Area sovereigns.

High-risk Euro Area sovereign debt concentrated in Euro Area banks

The upshot is that, until the excessive concentration of holdings of high-risk sovereigns in the balance sheets of the EU and Euro Area banks is remedied, either by spreading this risk voluntary by selling the debt (at a loss) to a wider range of private investors or by socializing the risk, partly or completely, a sovereign default by a Euro Area member state could undermine the viability of Euro Area banks and cause further systemic distress.

Sovereign default not the end of the world

Even with the concentration risk present in the Euro Area, a sovereign default is likely to be less systemically damaging from a financial perspective than the failure of a large, complex cross-border financial institution like Lehman Brothers. One reason for this is that, as former Citicorp Chairman Walter Wriston pointed out (in a much misinterpreted statement): *“Countries don’t go out of business... The infrastructure doesn’t go away, the productivity of the people doesn’t go away, the natural resources don’t go away. And so their assets always exceed their liabilities, which is the technical reason for bankruptcy. And that’s very different from a company”*.²⁶

Countries remain open for business

Note that Wriston did not say that banks and other private creditors cannot go broke by lending to sovereigns or that sovereigns don’t default. His statement, which is correct, means that when the sovereign defaults, as they have done often historically, the country that they are sovereign over does not get wound up, broken up or liquidated, with its assets sold at fire-sale prices by creditors in fear of missing out in the rush for the exit. The sovereign default tends to be followed by a form of Chapter 11 lite – very lite, with the debtor firmly in control of the assets of the nation. The country remains open for business. The assets within its jurisdiction can typically not be attached. As regards doing cross-border business, both the sovereign and likely also the private entities of a state where the sovereign has defaulted recently, will operate on a cash-in-advance basis. But even Argentina has continued to trade internationally following its repeated defaults and its people and government officials have continued to travel freely internationally.

Recovery rates quite high

Partly because a sovereign default allows the country to continue operating as a ‘going concern’, the recovery rates following sovereign defaults tend to be quite high. There are exceptions, notably defaults that take the form of

²⁶ Cited by IMF Money Matters: An IMF Exhibit -- The Importance of Global Cooperation; Debt and Transition (1981-1989) http://www.imf.org/external/np/exr/center/mm/eng/mm_dt_01.htm

repudiations, as with Russia's Tsarist debt, West Germany's Nazi-era debt and Cuba's Batista era debt. And of course Argentina's 2001/02 default left at least 70 percent of the creditors with just 30 cents on the dollar. But these are the exceptions.

Asonoma (2009) studied 35 sovereign debt renegotiations during the period 1986-2007. He considered only on *ex post-default* and *preemptive renegotiations*, and excluded episodes of delays in payment such as Paraguay in 2003, and Venezuela in 1995, 1998, 2005, and the swap agreement for Peru in 2000. Figure 11 shows the recovery rates for this recent sample of sovereign defaults.

Figure 11. Selected Countries – Stylized facts about sovereign debt negotiations in 1998-2007¹

Country	Year of default ^{v2}	Defaulted debt (\$ billions)	Defaulted debt (% of GDP) ^{v2}	Recovery rates (%) ^{v3}	Increases in spreads ^{v7}
Ex post-default-					
Russia	1998	72.7	26.8	35 ⁴	70.0
Ecuador	1999	6.6	39.6	40 ⁴	7.7
Ecuador	2000	0.4	2.5	100	18.7
Ivory Coast	2000	15.6	148.3	59	16.8 ⁸
Argentina	2001	82.3	30.6	37 ⁴	20.3
Grenada	2004	0.3	68.0	60 ⁵	14.7
Moldova	2004	0.2	9.8	42 ⁶	NA
Pre-emptive-					
Pakistan	1998	1.6	2.7	70 ⁴	35.9 ⁸
Ukraine	1998	1.3	3.9	72 ⁴	34.1 ⁸
Ukraine	2000	1.1	3.4	60	47.9
Moldova	2002	0.1	2.4	94 ⁶	NA
Dominica	2003	NA	NA	71	NA
Uruguay	2003	5.7	51.3	71 ⁴	11.5
Dominican Republic	2005	1.6	5.6	95 ⁵	25.8
Belize	2006	0.2	19.9	76 ⁵	2.6 ⁸

Notes: ¹ We list only export-default and preemptive negotiation episodes in 1998-2007. We exclude the cases of swap agreement or delay in payment such as Venezuela in 1995, 1998 and 2005, Peru in 2000 and Paraguay in 2003. ² Data (year of default and defaulted debt) is from Moody's (2007). The debt is total amount of sovereign bonds which the government defaulted on and does not include the private debt. ³ Data for recovery rate is from Benjamin and Wright (2008). ⁴ Recovery rates for Russia, Ecuador, Argentina, Pakistan, Ukraine, and Uruguay are from Struzzeneger and Zettelmeyer (2007). ⁵ Recovery rates for Grenada, Dominican Rep. and Belize are from Bedford, Penalver and Salomon (2005). ⁶ Recovery rate for Moldova 2002, 2004 is from Finger and Mecagni (2007). ⁷ Data (spreads) is from J.P. Morgan Emerging Market Bond Index (EMBI) on Datastream and we define "spread increases" as difference in spread between at the time of negotiations and one with one year before the negotiations. ⁸ Spread data for Pakistan and Ukraine is measured at 6/2002 and at 9/2001 respectively. Spread data for Ivory Coast and Belize is one of African composite sovereign bonds. Sources: Asonoma (2009), Table 1 and Citi Investment Research and Analysis

IMF tends to require burden sharing by creditors when public debt burden is high

We would expect that, should a default occur during the next few years in one of the Euro Area or EU countries, it would primarily take the form of a restructuring (i.e. lengthening) of maturities, with only limited haircuts (up to 20 percent or, in a worst-case scenario, up to 30 percent) for the creditors in NPV terms. The participation of the IMF in the financial support, fiscal adjustment and structural reform programs makes some form of 'burden sharing', that is, PDV haircuts for creditors more likely, as burden sharing has in the past couple of decades become an integral part of IMF programs for developing countries and emerging markets. But we would expect that most of the recovery rates would be at the higher end of the range shown in Figure 11.

Restructuring of maturities and other features of a debt contract without loss of NPV for the creditors is appropriate if the problem faced by the debtor is one of

liquidity (typically a bunching of refinancing needs because a large amount of debt matures in a short period of time). If the problem is not just illiquidity but insolvency, or a material risk of insolvency, reductions in the NPV of debt service payments are inevitably part of any restructuring.

Sovereign default is not Lehman

Other reasons why the systemic damage caused by sovereign defaults is limited compared to that caused by default of a large, complex, cross-border financial institution is that sovereigns, even the most highly indebted ones, tend to have much lower leverage, as measured by sovereign net debt (or even gross debt) to GDP or sovereign net debt to tax revenue, compared to, say, the ratio of bank debt to earnings before interest, tax, depreciation and amortization. Also, government financial assets and liabilities tend to be rather simple and transparent instruments, compared to the often opaque and complex financial instruments on both sides of a bank's balance sheet, and the supervisors and regulators are more likely to know who or which institutions are exposed to a sovereign. This simplicity of the sovereign portfolios has been encroached upon somewhat through the use of derivatives, including currency swaps and interest rate swaps. In addition, private parties are exposed to the sovereign through the issuance and acquisition of derivatives such as credit default swaps (CDS). Still, compared to the travail involved in getting a true picture of the global exposures of and to, say, Lehman Brothers, understanding the financial affairs of most sovereigns is a simple matter.

'Rule of law' externality

The 'rule of law' externality is less direct, but possibly more damaging. A private default is (supposed to be) settled under the rule of law by a transparent legal process involving the courts, administrators, conservators, arbitrators, bailiffs and other law enforcement agencies. Private defaults are (supposed to be) resolved under the rule of law, and do not therefore undermine the rule of law or what, in rather idolatrous terms, is sometimes called the 'sanctity of contracts'. This is one of the reasons why the *ad-hoc* bail-outs of systemically important financial institutions during the recent crisis provoked such strong emotions. It was perceived by many as a perversion of the rule of law and of the social contract.

When the state itself defaults on its obligations, the rule of law inevitably is harmed. Social capital and trust are destroyed. When the party to the social contract that is supposed to enforce private contracts impartially is itself involved in a breach of contract, respect for all contracts and respect for the rule of law is undermined. Governments, the political elites and sometimes even the polity as a whole tend to be aware of the long-term social cost of this weakening of the rule of law. This is why sovereign defaults tend to occur only in countries that have either been shocked by extraordinary events, often beyond their control, or that are deeply polarized and internally divided, with little social capital, weak and corrupt political institutions and ineffective political leadership.

5. Sovereign Default Risk in the Euro Area

Euro Area default would be 'won't pay', not 'can't pay' event

In the case of Greece or any other advanced industrial country, sovereign default is a policy choice, not some exogenous calamity visited on the country. We are not dealing with post-earthquake Haiti or some other extremely poor country where, because of bad luck, bad neighbors or bad institutions and policies, the resources to service the debt simply are not there, even if one were to 'auction off' the country. Default in any of the advanced industrial countries would, as argued earlier, be a case of 'won't pay', not 'can't pay'.

Euro Area membership hid fiscal weaknesses for a while

The fiscal problems of Greece and the other countries of the SWEAP are long-standing, as Figure 1 makes clear.

Prior to the creation of the Euro Area on January 1, 1999, Spain, Portugal, Italy and Ireland all had significant spreads of their 10-year sovereign bond yields over the Bund yield. This reflected market expectations of inflation and exchange rate depreciation for the currencies of these countries – unsustainable fiscal programmes were ‘resolved’, by opting for an inflationary solution and associated expectations of currency depreciation vis-à-vis the D-mark. This was then, prior to Euro Area membership, an option because each of the countries had its own independent currency but no independent central bank committed to price stability. Greece did not join the EMU until January 1, 2001.

For some reason, perhaps misplaced faith in the ability of the Stability and Growth Pact (SGP) to enable the fiscally responsible Euro Area member states to discipline the fiscally irresponsible ones, the markets believed that joining the EMU would deliver a lasting improvement in fiscal sustainability. From 1999 till late 2007 (for Greece from 2001 till late 2007), sovereign spreads over bunds for the SWEAP countries became very small indeed, often only 20 basis points or less. The onset of the crisis revealed that nothing much had changed as regards the fundamental drivers of fiscal sustainability (or of its absence). So the sovereign spreads opened up again, but this time they reflected not inflation and exchange rate depreciation expectations, but differential perceptions of sovereign default risk.

5.1 The Greek Sovereign Debt Crisis

Greece likely to default without external financial support

The Greek sovereign has to raise about €54bn in the current fiscal year. As of the last week of April 2010, Greece’s remaining sovereign funding needs are around €30bn. We believe that without external sticks (tough conditionality, credibly enforced through the joint efforts of the Euro Area member states (though the European Commission (EC) and the ECB) and of the IMF) and carrots (funding, guarantees etc.) it is unlikely that the domestic political equilibrium in Greece supports a restoration of fiscal sustainability through spending cuts or tax increases.

Brinkmanship by Germany as regards bailout

Without an external financial backstop, market rates for Greek sovereign debt would soon exceed the seven percent plus level experienced during the second week of April 2010, or the 10 percent 2-year rate seen on April 22, the day after the German parliament decided not to action on the Greek financial support programme under fast-track procedure proposed by the German finance minister Schäuble. This means that a decision on Greece can be postponed until after the elections in the German Land of North-Rhine Westphalia on May 9th. With Greece having to come up with about €8.5bn of additional funding by May 19th, this certainly is an example of brinkmanship taken to the limit.

Market interest rates produce explosive debt dynamics

From the debt burden arithmetic captured by equation (3), we conclude that funding rates at the levels we have seen early in April, let alone towards the end of April, would not be politically and economically manageable for Greece. The war of attrition between different groups/classes in Greece about whose taxes will be increased and whose favorite spending programmes will be cut, is likely to last longer than the willingness of the markets to refinance the Greek sovereign at non-crippling interest rates, in the absence of an external

intervention that changes the domestic balance of power in parliament and in the labor and product markets.

Or future reference, *unilateral default* will mean a formal act of default that triggers CDS and may also open the gates to a range of legal actions against the debtor by the creditors. *Restructuring* means any 'voluntary' or agreed upon changes in the terms and conditions of the debt contract. This can involve just maturity lengthening (with constant NPV of debt service), a haircut (reduction in the NPV of debt service) or a combination of the two.

Most likely outcome of game between Greece and rest of Euro Area ...

In the 'game' between Greece and the Euro Area member states (EA) (where EA is shorthand for all the other parties at the other side of a potential conditional financial rescue effort for Greece), we argue that the only plausible outcome is where Greece does not default unilaterally but adjusts, most likely with restructuring of its debt, where the EA offers financial support with tough conditionality ('tough love'). Any ('voluntary') restructuring would, at the very least, smooth out and lengthen the repayment profile for Greece's sovereign debt, avoiding the lumpy financing needs of more than €40 bn in both 2011 and 2012, while keeping the NPV of the debt service constant. It is also quite likely that a haircut of, say, 20 to 25 percent (taking late-April secondary market prices as a guide), will be imposed on the creditors as part of the deal. The IMF tends to insist on burden sharing of this kind when it enters into a multi-year structural adjustment program with a highly indebted country. This 'Nash equilibrium' can be motivated quite readily.²⁷

Painful fiscal adjustment for Greece,...

Greece has a number of choices open to it. It either defaults unilaterally, or it commits not to default unilaterally but to adjust instead, supported and guided by a joint stabilization and structural adjustment programme of the EA (through the EC and the ECB) and the IMF. A voluntary sovereign debt restructuring programme with its creditors is likely to be part of the agreement, or to be added to the agreement later on, if it is not part of the initial setup..

With maturity restructuring

If Greece commits not to default unilaterally, it can, subsequently, either implement the adjustment program or renege and fail to adjust. The EA can either deny financial support to Greece, or commit to provide financial support should it be required. If it denies financial support and Greece is about to default unilaterally, it can either stick to its commitment not to bail out Greece or it can cave in and bail out Greece anyway. If it commits to bail out Greece conditional on Greece meeting certain conditions, it can subsequently either stick to its conditionality if Greece does not comply with the conditionality and let Greece go into default. Alternatively it can give in and bail out Greece even though Greece has chosen not to meet the conditionality. We ignore as implausible the possibility that the EA will not bail out Greece even when Greece has met the conditionality.

And haircut for creditors

Even though this game can appear quite involved, it is only necessary to rank a limited number of outcomes (resulting from pairs of choices by Greece and the EA) in order to get a sense of the most likely outcome(s). These are (1) the outcome we consider to be the unique (subgame-perfect) Nash equilibrium, where Greece does not default unilaterally, the EA imposes tough conditionality and Greece implements the tough conditionality, probably with voluntary restructuring and quite likely with a haircut, (2) the outcome where Greece

²⁷ A Nash equilibrium is a pair of choices such that Greece's choice is the best it can do given the choice of the EA, and the EA's choice is the best it can do given the choice made by Greece. Strictly speaking, since the game involves actions by the players over time, the equilibrium we are looking at is a subgame-perfect Nash equilibrium.

defaults unilaterally and no EA financial support is forthcoming, (3) the outcome were EA financial support is forthcoming, supposedly with tough conditionality attached, and Greece does not default but Greece also does not implement the tough conditionality and the EA does not cut off its financial support as a result.

'Voluntary' restructuring, not formal default

In our characterization of the strategic interaction between Greece and the other EA member states, we have assumed that without EA financial support, Greece would default unilaterally, because financial markets would be sufficiently uncertain about Greece's willingness and ability to engage in sufficient sustained fiscal tightening, that the sovereign risk premium on the Greek sovereign debt would become prohibitively high, even if Greece were to engage in a good-faith adjustment effort.

We also assume that, given a sufficiently large EA financial backstop (promise of financial support should it be needed), Greece's sovereign risk premium would be sufficiently low that it can successfully pursue the necessary fiscal tightening, without the need for any net fiscal transfer or subsidy from the EA member states in present discounted value terms. Voluntary restructuring, including a haircut for the creditors, is likely to be part of this solution.

Both the assumption that Greece would default unilaterally in the absence of external financial support and the assumption that, provided the scope of the support is large enough (which is assured for 2010 but not yet for the later years of the programme), and provided the support is not priced too much above the safe rate, Greece can and most likely will avoid unilateral default, are no more than informed guesses based on past evidence of successes and failures of fiscal consolidation efforts (see e.g. von Hagen et. al. (2002), Alesina and Ardagna (2002), Tavares (2003), Briotti (2004), Ardagna (2004), Ahrend et. al. (2006), European Commission (2007) and Wagschal and Wenzelburger (2008)).

Fiscal adjustment successes had better initial conditions

There have been some notable successes, including Canada (1994-98), Sweden (1993-98), and New Zealand (1990-94), although the initial public debt and deficit positions were not as unfavorable in any of these three countries as they are in Greece today. Canada's general government deficit was 9.1% of GDP in 1992 and its net public debt peaked at 70% of GDP in 1996; Sweden's general government deficit was 11.2% of GDP in 1993 but its net general government debt was just 4.6 percent of GDP in 1993. Its gross general government debt was 78.2 percent of GDP in 1993 and peaked at 84.4 percent in 1996. New Zealand had a general government deficit of 4.5 % of GDP in 1990 and its gross and net general government debt-to-GDP ratios in 1993 were 64.4 percent and 51.1 percent, respectively.²⁸

Ardagna (2004) investigates how initial conditions affected fiscal consolidations in 17 OECD countries between 1975 and 2002 providing 413 observations. She finds that "...past economic growth has a positive and statistically significant impact...but its effect is small...a one percentage point increase in lagged GDP growth increases the probability that the government is able to solve a fiscal imbalance from 0.19 to 0.21." (Ardagna (2004), pp. 1060-61). She also finds that a higher level of the initial deficit-to-GDP ratio decreases the likelihood of successful consolidation but that a higher level of the initial debt-to-GDP ratio increases it.

²⁸ Source: OECD Economic No. 86, November 2009, <http://www.oecd.org/dataoecd/41/33/35755962.pdf>

Among the lessons that stand out from the literature cited above are the following.

Successful lasting fiscal adjustment requires economy-wide structural reform

First, for improvements in the public finances to be lasting, significant public sector reforms and other structural reforms including deregulation, privatization, labor market reforms and product market reforms are required. These tend to reduce the scope and scale of the state's involvement in the economy, through public sector employment, pay and pensions and through changes in ownership, accountability mechanisms and incentives. They also increase the flexibility of the wider economy and raise the level and possibly the growth rate of potential output

Tightening mainly through cuts in current spending

Second, fiscal consolidations achieved mainly through reductions in public spending, and specifically through reductions in current public spending (mainly public sector pay and employment) tend to be sustained more effectively than consolidations achieved principally through tax increases.

Negative effects of tightening on output lower when initial fiscal situation is dire

Third, there is some evidence that fiscal tightening is less contractionary (its direct and Keynesian multiplier-enhanced effects on aggregate demand are smaller) both when the initial public debt and deficit situation is dire and worsening rapidly and when the fiscal tightening mainly takes the forms of cuts in current public spending (Alesina and Ardagna (2002), European Commission (2007)). There are even examples of what looks like negative multipliers, that is, expansionary effects of fiscal tightening.

Theoretically, a weaker contractionary effect from fiscal tightening can be rationalized through wealth effects, interest rate effects, confidence effects and supply-side effects. All fiscal tightening, if sustained, will lower current and future real interest rates. If without fiscal tightening, there would have been a material risk of government insolvency, the uncertainty created by this prospect (and by the government's possible reaction to this project) would have increased risk premia both on the sovereign debt and throughout the economy. The fiscal tightening eliminates or at least reduces the risk of sovereign default and associated financial disruption.

If household consumption behavior is at least in part driven by forward-looking behavior (not every household is liquidity-constrained or disposable income-constrained), the substitution of public spending cuts falling on current goods and services for tax increases will raise human capital – the present discounted value of future after-tax wage income. This will boost consumer demand. The adverse effect of higher taxes on labor supply (labor income taxes, workers' social security contributions), on labor demand (employers' social security contributions, profit taxes) and on investment expenditure (if the taxes fall on corporate profits or labor costs) are not a major issue as long as production is constrained by effective demand, as the supply side constraints will not be binding. This state of affairs cannot be expected to last forever, however, so forward looking investment demand will be discouraged by higher taxes.

Greece's initial fiscal disequilibrium is larger than that experienced by past successful adjusters, as measures by the initial public debt-to-GDP ratios and the initial structural primary deficits. The political economy of sustained fiscal tightening is, in our view, more complex than it was in Canada, Sweden and New Zealand when these countries went through the fiscal wringer. Our maintained hypothesis that without external support the Greek sovereign would most likely default, but that with a comprehensive and reasonably priced

financial backstop, sovereign default can be avoided, therefore seems reasonable.

Rate caps in EA package too high

The package agreed by the EA member states, although incomplete (the exact role of the IMF has not yet been agreed between the IMF and the EA member states) and vague (what will be the maturity of the loans; will the money be tranching?) is likely to cap Greek borrowing rates at levels that are too high to be manageable economically and politically without debt restructuring and a haircut for creditors. In addition to spending cuts and revenue raising measures, the presence of the IMF ensures that the multi-year adjustment programme will include deeper structural reforms of both the expenditure and the revenue sides of the budget. This will include, but is not limited to raising the age of eligibility for the state pensions, cuts in public sector pay, pensions and employment, cuts in defence spending, tax base widening, and anti-tax evasion and avoidance measures. Both regulatory measures and tax reform will aim to reduce the size and scope of the informal economy.

IMF presence means greater emphasis on structural reform

Measures aimed at increasing the competitiveness of the Greek economy will also be part of the IMF's price for participating. This will include privatization, de-regulation of labor and product markets, and reductions in the pervasive red tape and administrative and official discretion that feed the rampant corruption and have made Greece one of the worst performers in the World Bank's Doing Business Surveys. In the 2010 Doing Business Survey, Greece ranked 109th out of 183 countries, 9 places down from where it was in 2009, and behind such countries as Yemen, Egypt, Guyana and Ethiopia.²⁹The next worst EA member state was Italy, in 78th position.

Need for financial support likely to extend beyond 3 years

The package is a 3-year loan commitment with associated multi-year conditionality. In the first year, the 15 EA member states other than Greece will make available up to €30 bn, at an interest rate that is 300 basis points over the swap rate for loans up to 3 years and 400 basis points for longer maturity loans. Today, this would imply a rate of interest on loans up to 3 years maturity around 5 percent – which is, at best, on the very edge of what Greece will be able to live with, but more likely too high (see the debt burden dynamics of equation (3)). The loans to Greece will be packaged by the European Commission out of bilateral loans from the other 15 EA governments, with each government's contribution scaled by their relative shares in the ECB's capital, given in the last column of Figure 12.

²⁹ See <http://www.doingbusiness.org/documents/fullreport/2010/DB10-full-report.pdf>.

Figure 12. Euro Area – Relative Shares in the ECB's Capital

	Capital Key (% of EA share)	Capital Key (% of EA excl. Greece share)
Belgium	3.48	3.58
Germany	27.13	27.92
Ireland	1.59	1.64
Greece	2.82	
Spain	11.9	12.24
France	20.38	20.97
Italy	17.91	18.42
Cyprus	0.2	0.2
Luxembourg	0.25	0.26
Malta	0.09	0.09
Netherlands	5.71	5.88
Austria	2.78	2.86
Portugal	2.51	2.58
Slovenia	0.47	0.48
Slovakia	0.99	1.02
Finland	1.8	1.85
	100	100

Sources: ECB and Citi Investment Research and Analysis

Thus Germany and France together would provide just under 50 percent of the facility.

Greece applied for the facility to be activated on 23 April 2010. With market rates touching 10 percent, early use of the facility appears unavoidable.

It is unclear whether the unanimous consent of the other 15 EA member states (requiring parliamentary votes in at least some of them) to the creation of the facility would represent the end of the involvement of national EA parliaments in the management of the facility, or whether parliamentary approval will also have to be sought each time a disbursement is made under the terms of the facility. The need for parliamentary consent to *establish* the facility is not unreasonable, as long as it is done swiftly. The action (or inaction) of the Bundestag on April 21 is not a hopeful sign. Parliamentary consent for every drawing under the facility would turn Greek access to funding when it most needs it into a lottery. We now know what would be likely to happen if Greece really needed to draw on the facility during the week before an election in one of the German Länder?

The IMF has been reported as having agreed to provide in addition for the first year an amount of up to half the €30bn provided by the 15 EA member states. This would be part of a three-year stand-by arrangement. The IMF funds would be available at rates considerably lower than the EA money, reaching maybe 3.5 percent if the full €15bn were to be drawn upon.

With market rates touching 10 percent, use of the facility appears unavoidable.

ECB will continue to provide quasi-fiscal subsidies to Greece through collateral policy

With Greece needing to raise another €30bn this year and a backstop facility for this year of up to €45bn, the EA and IMF are, at least for 2010, approaching the financial backstop issue in the spirit of the 'Powell doctrine' – financial support should only be provided as a last resort, but if it has to be provided, it should be done on a scale sufficient to meeting any conceivable demand.³⁰

³⁰ The "Powell doctrine", named after Colin Powell, US Secretary of State under George W Bush (2001-2005) and Chairman of the Joint Chiefs of Staff (1989-1993), during the Gulf War, holds that the US should go to war only as a last resort and then only with overwhelming force.

Together with the ECB's decision to maintain the minimum rating required for non-ABS securities (including sovereign debt) to be eligible as collateral for loans from the Eurosystem at BBB- (or equivalent), rather than raising it back to its old level of A- (or equivalent) at the end of 2010, this EA-IMF loan facility makes a unilateral sovereign default by Greece during 2010 unlikely.³¹ Greece is now rated A-, BBB+ and BBB- (or the equivalent) by the three main rating agencies. It is our view that without external support, Greek sovereign debt would be unlikely to be eligible collateral at the Eurosystem from the beginning of 2011, even with BBB- as the eligibility threshold.

Clearly, Greece would prefer outcome (3) where it does not default and does not adjust but instead gets a steady stream of subsidies from the EA. That, unsurprisingly, is dominated as regards the EA both by Greece not defaulting unilaterally thanks to tough love (and Greek fiscal tightening) and by Greece defaulting unilaterally.

Bailing out Greece as a 'one-off' cheaper for EA than bailing out EA banks holding Greek debt

A Greek sovereign default would not be costless to the rest of the EA. The reason is that most of the exposure to the Greek sovereign and to other Greek borrowers (e.g. the Greek banks) is with the banks from other EA member states (see below). The choice faced by the French and German authorities in particular is to either bail out Greece or to bail out their own banks. Politically, neither financial rescue action would be popular. Which one would be cheaper financially?

We believe it is plausible that a bailout of Greece with tough conditionality would be cheaper for the EA member states than a bailout of their own banks, should Greece default unilaterally. The reason is that a tough bailout would discourage recidivism by Greece as well as emulation of its fiscal irresponsibility by other would-be applicants for financial support (e.g. Spain, Portugal, Italy, Ireland etc.). However, a soft bailout of Greece would be more expensive than a bailout of the domestic banks of the other EA members, because it would lead to open-ended and uncapped demand for financial support from all and sundry.

The reason unilateral default is dominated for Greece not just by open-ended financial subsidies but also by financial support with tough conditionality, is that the Greek sovereign not only has a lot of debt (that is an argument in favor of defaulting), but that Greece also has a large primary (non-interest) government deficit and a large primary external deficit. Following a sovereign default, Greece would be cut off from the markets. Both the government and, in all likelihood also the private sector, would not have access to external financing on market terms. With the government's primary deficit between 9 and 10 percent of GDP and the external non-government interest current account deficit around 9 or 10 percent of GDP, the country would, following

³¹ On April 8, 2010, the Governing Council of the European Central Bank (ECB) announced that it would keep the minimum credit threshold for marketable and non-marketable assets in the Eurosystem collateral framework at investment-grade level (i.e. BBB-/Baa3) beyond the end of 2010, except in the case of asset-backed securities (ABSs). In addition, as of 1 January 2011, a schedule of graduated valuation haircuts will apply to the assets rated in the BBB+ to BBB- range (or equivalent). This graduated haircut schedule will replace the uniform haircut add-on of 5% that is currently applied to these assets. However, the new graduated increased haircuts for securities in the BBB+ to BBB- range, won't apply to central government and central bank securities – a further concession to Greece! The minimum rating had been A- (or equivalent) up to October 2008. Four credit rating agencies are recognised by the ECB (S&P, Moody's, Fitch and RDBS). At least one of them has to rate a country BBB-. One of the four, RDBS, the Canadian agency, does not rate Greece. That leaves S&P (current Greek rating BBB+), Fitch (BBB-) and Moody's (A3, equivalent to A-).

unilateral default and the resulting sudden stop on external inflows, face the necessity of an immediate fiscal tightening of 9 to 10 percentage points of GDP and import compression worth 9 to 10 percent of GDP. This would bring about the mother of all economic contractions. Much better to accept the tough love of the EA and the IMF, which requires no more than 4 percent of GDP worth of fiscal tightening in the first year.

The time for an individually rational sovereign default is when a government has a large debt but only small government and external primary deficits (or even primary surpluses), and perceives a low likelihood of having to borrow again in the future.

Letting Greece default cheaper for EA than open-ended uncapped support

The outcome where Greece does not default unilaterally but chooses to adjust instead because of the imposition of tough conditionality by the EA is an equilibrium only if the tough conditionality can indeed be imposed by the EU once the financial support is in place. There are two reasons why this is likely to be the case. First, if the EC, ECB and IMF use their grey matter, the financial support will be tranching (made available in installments) and any amount made available will be made available as a revolving credit, each time for a short period only - 3 or at most 6 months. Disbursement of the next installment or renewal of an earlier installment will be made dependent on Greece meeting the conditionality attached to the release of the earlier tranches.

Credible tough conditionality is key

Greece's adjustment program will take at least 3 years and more likely, given the anticipated negative effect of fiscal tightening on economic activity and the tax base, up to 5 years. If, should Greece violate the conditionality, the EA cannot credibly threaten to withhold the next tranche of the financial support scheme, the conditionality will not be credible. But the Euro Area governments have a credible threat towards Greece that the IMF – with a long track record of borrowers ignoring its conditionality – does not have. The EA sovereign states can tell Greece: 'we either bail you out or we bail out our banks'. The IMF, which can only lend to sovereigns, cannot use this threat.

Today, the threat of letting Greece fail and instead bailing out the banks of France, Germany and other Euro Area countries whose banks are exposed to the Greek sovereign and to Greek private sector risk, may have rather limited credibility because of the extreme concentration of this exposure in the Euro Area banks. But presumably, the Euro Area regulators and supervisors are correcting, as we write this, the astonishing regulatory and supervisory blunder that permitted this concentration of EA bank exposure to Euro Area sovereigns of dubious fiscal-financial probity. As the exposure to the Greek sovereign, and to Greece generally, is moved off the balance sheets of the Euro Area banks and dispersed more thinly over a wide range of private sector portfolios (or taken under the wings of the state, by transferring it to state-owned or state-controlled banks like KfW or CDC, or directly to a government-owned 'bad bank' or to the Treasury balance sheet), the systemic damage that could be caused by a Greek sovereign default would diminish. The threat: 'we don't have to bail Greece out, we can live with the financial consequences of a sovereign default in Greece', should become more credible as time passes.

The vulnerability of Greek banks

The most immediate threat to the Greek sovereign is, in our view, likely to come through its banking system. Greece has no independent national central bank which can, in the final analysis, be compelled by the government to act the way the government wants it to act.

Margin calls by the Eurosystem

It is likely that the Greek commercial banks now obtain most of their short-term funding from the ECB/Eurosystem, using mainly Greek sovereign debt as collateral. When the value of the Greek sovereign debt declines in the secondary market, the mark-to-market value of the collateral offered by the Greek banks to the ECB/Eurosystem declines and triggers margin calls (demands for additional collateral to make up for the reduced value of the existing collateral). Eventually the Greek banks could run out of additional collateral acceptable to the ECB/Eurosystem. Their funding needs are likely to be exacerbated by a withdrawal of deposits that could become a run – both from deposits over the limit of the deposit insurance scheme and from deposits below that limit, if the solvency of the national deposit insurance scheme is in doubt.

This would put the ECB in the unenviable position of either having to reduce the minimum quality threshold on securities acceptable as collateral (currently BBB- or the equivalent), or refuse to lend to the Greek banks, thus triggering a funding crisis and possible bank failures. Although a banking crisis would not trigger a sovereign default in any mechanical way, it could increase the reluctance of the markets to fund the sovereign and may precipitate a ‘sudden stop’, which would leave the sovereign wholly dependent on funding from the IMF and the other Euro Area member governments. The ECB/Eurosystem could end up with large mark-to-market losses on its loan portfolio.

5.2 More on Why a Tough Bailout for Greece and the Creditors is the Most Likely Outcome

The increasingly tough German rhetoric in the weeks before April 8, 2010 and the failure by the Bundestag to vote on the Greek rescue package at the first time of asking, at times caused us to wonder whether the German authorities perhaps preferred a Greek unilateral default to a tough bail-out. The logic of the game outlined in the previous section suggests that the most likely outcome of the Greek sovereign debt crisis would have been a bailout with voluntary debt restructuring (maturity lengthening and a 20 to 30 percent NPV haircut for creditors) funded by Euro Area member states, supported by the IMF as a source of expertise on the design of conditionality and on the verification of conditionality compliance, and with tough conditionality. As it turned out, the IMF will be part of the arrangements not just as a source of expertise, but also as a source of funds. Nothing in Greece’s situation made that necessary or desirable. It is the result of domestic political developments in Germany.

There is no doubt that the scale of the fiscal tightening foreseen in the Greek fiscal adjustment programme is tough, and that a lot of fiscal pain is about to be inflicted on the Greek population. Greece is likely to be required to implement its declared intent to reduce the general government deficit from 12.7 percent in 2009 to 8.7 percent in 2010, 5.6% in 2011, 2.8% in 2012 and 2% in 2013³² as part of the IMF-EA conditionality. Structural reforms in the public sector, labor and product markets are also likely to be on the menu.³³

³² See <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/10/116>.

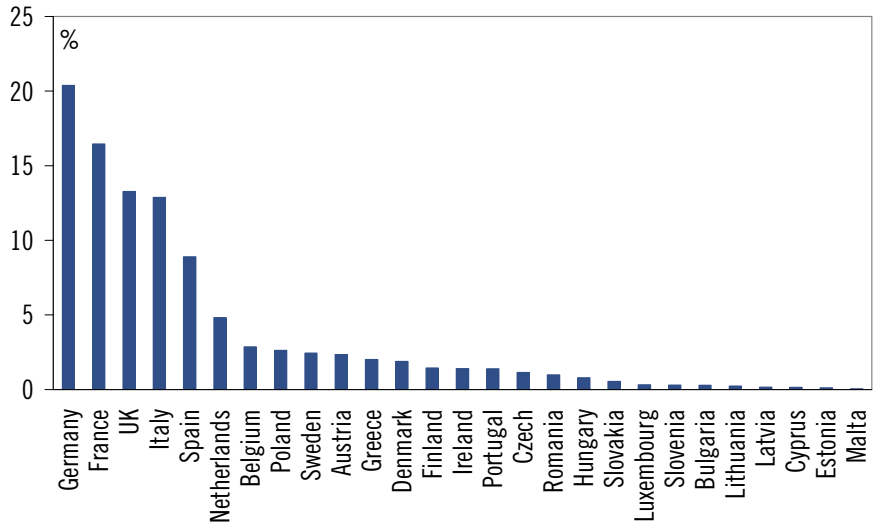
³³ Measures currently under discussion include a value-added tax increase, a further increase in fuel taxes, salary cuts for civil servants and employment cuts at public-sector corporations. An increase in the age of eligibility for the state pension, reductions in the generosity of public sector pensions and measures to strengthen Greece’s lamentable tax compliance performance (with technical assistance from the IMF) are also on the cards.

5.2a Greece is Small

Greece is small

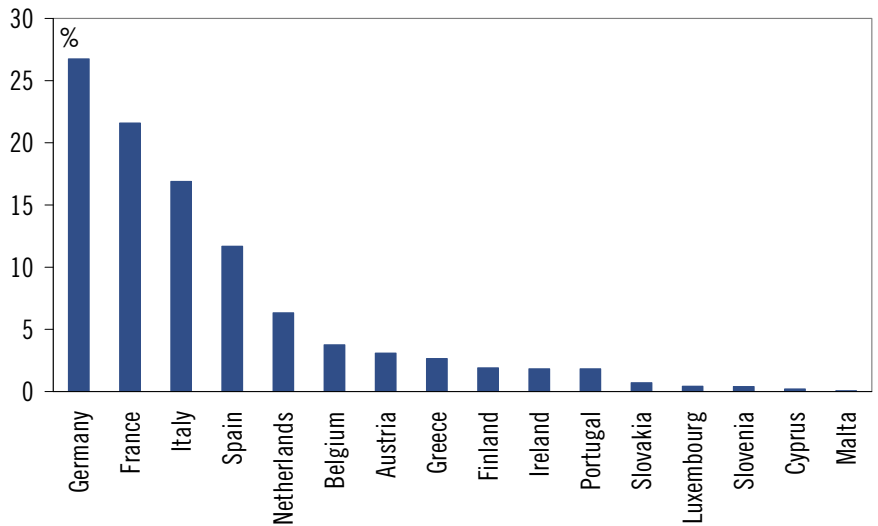
The first reason Greece is likely to be bailed out (albeit with tough conditionality) is that Greece is definitely not too large to save, as is clear from Figures 13 and 14. Greece is just 2.6 percent of Euro Area GDP and 2.0 percent of EU GDP.

Figure 13. European Union – Shares of 2009 European Union GDP (%)



Sources: Eurostat and Citi Investment Research and Analysis

Figure 14. Euro Area – Shares of 2009 Euro Area GDP (%)



Sources: Eurostat and Citi Investment Research and Analysis

Even Spain (11.6 percent of Euro Area GDP and 8.6% of EU GDP) is no larger relative to the Euro Area or the EU than the state of California is relative to the US economy, although the outstanding debt stock and the public sector deficit of Spain are much larger than those of California.³⁴ Italy (about 13.1 percent of EU GDP and 16.7 percent of Euro Area GDP) is about 1.5 times larger as a share of Euro Area or EU GDP than California is as a share of US GDP.

Figure 15 shows that Greece is not only a small share of Euro Area GDP, it also represents a rather small share of Euro Area sovereign debt — 3.7 percent of the Euro Area total (as well as just and 3.1 percent of the EU total).³⁵

Figure 15. Gross Public Debt, Euro Area, 2008

	Amount (EUR Bn)	% of Euro Area Total
Euro Area (16 countries)	6421.7	100.00
Italy	1663.0	25.90
Germany	1644.5	25.61
France	1314.1	20.46
Spain	432.1	6.73
Netherlands	346.7	5.40
Belgium	309.7	4.82
Greece	237.2	3.69
Austria	176.6	2.75
Portugal	110.4	1.72
Ireland	80.2	1.25
Finland	63.0	0.98
Slovak Republic	18.6	0.29
Slovenia	8.3	0.13
Luxembourg	5.3	0.08

Sources: Eurostat and Citi Investment Research and Analysis

5.2b The Euro Area's Real Choice: Bailing out Greece or Bailing out EA Banks

Euro Area banks are highly exposed to Greece

European banks, especially Euro Area banks, are seriously exposed to Greek risk, as is clear from Figure 16, which reproduces some of the BIS data on the consolidated foreign claims of reporting banks — ultimate risk basis. For the 24 reporting countries, the total exposure of their banks to Greece at the end of September 2009 was US\$298.3bn. European banks accounted for almost all of this, \$272.4bn.

³⁴ California's \$18.6 billion deficit is about 1 percent of the state's \$1.8 trillion gross state product in 2009, and its debt is just over 6.7 percent of state GDP. Sources: Bureau of Economic Analysis and The State of California Debt Affordability Report, October 2009.

³⁵ Source: Eurostat

Figure 16. Claims of European Banks on Greece, USD Bn, September 2009

	Q3 2009		Q4 2009	
	Total USD Bn	% of European Banks Total	Total USD Bn	% of European Banks Total
European Banks	272.4		193.1	
France	78.9	29.0	78.8	40.8
Switzerland	78.6	28.9	3.7	1.9
Germany	43.2	15.9	45.0	23.3
United Kingdom	12.5	4.6	15.4	8.0
Netherlands	12.1	4.4	12.2	6.3
Portugal	10.5	3.8	9.8	5.1
Ireland	8.7	3.2	8.6	4.5
Italy	8.6	3.1	6.9	3.6
Belgium	8.3	3.0	3.8	2.0
Austria	6.3	2.3	4.8	2.5
Spain	1.2	0.4	1.2	0.6
Sweden	1.0	0.4	0.7	0.4
Turkey	0.5	0.2	0.3	0.2

Note: European banks refer to domestically owned banks of European countries that report claims on an ultimate risk basis (i.e. Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey and the United Kingdom). Sources: BIS (2010), <http://www.bis.org/statistics/consstats.htm>, Table 9D, and Citi Investment Research and Analysis

The BIS exposure data are somewhat different from IMF data covering some of the same ground. They are very different, as regards Swiss exposure, to data provided by the Swiss National Bank. We don't fully understand the marked reduction in Swiss bank exposure to Greece, from \$78.6bn in Q3, 2009 to \$3.7bn in Q4, 2009.

One reason for the difference may be that the IMF data (and possibly also the Swiss data) include only fixed income and equity claims. The BIS data in principle include derivatives like CDS also. The gross outstanding stock of Greek sovereign CDS is around €80bn, which is significantly less than the underlying stock of government debt, which now stands at around €280bn (see Figure 17).

Figure 17. Selected Euro Area Countries – Sovereign CDS and Underlying Government Bonds Outstanding, 2 Apr 2010

	Gross Outstanding	Net Outstanding	Number of Contracts	Total Govt Debt (incl. regional)
SovX Index	\$105 bn	\$8 bn	2,158	
Germany	\$66 bn	\$13 bn	1,733	\$1,652 bn
Greece	\$71 bn	\$8 bn	3,177	\$412 bn
Italy	\$217 bn	\$24 bn	5,291	\$2,024 bn
Spain	\$98 bn	\$15 bn	3,789	\$715 bn
Portugal	\$57 bn	\$9 bn	2,341	\$168 bn
UK	\$39 bn	\$7 bn	2,146	\$1,428 bn

Sources: SovX Index and Total Govt Debt from Bloomberg; Key Sovereign Stats from Depository Trust and Clearing Corporation (as per 2 Apr 2010), and Citi Investment Research and Analysis

There may be a problem of understatement of the true stock of Greek sovereign debt outstanding. The same issue affects the reported stocks of Italian sovereign debt, and possibly some other EU member states as well. Currency swaps have been used to convert Greek and other European sovereign debt denominated in US\$ and yen into euro using an exchange rate for the euro that overvalued the euro relative to the market exchange rate. This provides the borrower (the Greek sovereign, say) with immediate access to additional euro funds, at the cost of a very expensive eventual repayment of the US dollar or

yen-denominated debt on maturity. Current indications are that in the case of Greece, where the swaps in question occurred in 2002, the amounts involved are small relative to the officially reported stock of outstanding sovereign debt – no more than 2.1 percent of the reported total.³⁶

6. The Modalities of a Bailout in the Euro Area/EU

6.1 Is a Bailout Legally Possible in the EU/Euro Area?

Alleged no bailout clause in Treaty does not exist

One often hears statements, especially from opponents of bail-outs of EU member states by other EU-member states, that the ‘no-bailout clause of the Treaty’ (currently the Lisbon Treaty) forbids a bail-out of a member state government by other member state governments, the European Commission (EC) or the European Central Bank (ECB). In fact, there is nothing like a blanket no-bail-out clause that prevents the bailout of an EU or EU sovereign by another sovereign or by any EU institution, including the ECB.

It would indeed have been surprising if a no bail-out clause were to be found in the Treaty. After all, sovereign EU member states can give foreign aid, that is, financial assistance, transfers or outright subsidies, to whatever foreign country they want, be it Afghanistan, Haiti or Greece. And, not surprisingly, no article or clause forbidding financial assistance by EU member states to each other can be found in the Treaty. What Article 125.1 of the Treaty forbids, subject to a key qualification, both the EC (the Union) and member states from engaging in, is *to assume the commitments* of the public sector of another member state, or *to be liable for them*. In plain English, this prevents the EC and member states from guaranteeing the public debt of other member states. The exact text is as follows:

Treaty only forbids guarantees

“Article 125

(ex Article 103 TEC)

1. The Union shall not be liable for or assume the commitments of central governments, regional, local or other public authorities, other bodies governed by public law, or public undertakings of any Member State, without prejudice to mutual financial guarantees for the joint execution of a specific project. A Member State shall not be liable for or assume the commitments of central governments, regional, local or other public authorities, other bodies governed by public law, or public undertakings of another Member State, without prejudice to mutual financial guarantees for the joint execution of a specific project.”

except for ‘projects’

Note that this does not prevent the EC or member states bilaterally or jointly making loans to or giving grants to another member state. It does not prevent the EC and member states from purchasing outright the debt of another

³⁶ Source FT.com/Alphaville, “How to borrow €1bn without adding to your public debt figures”, February 15, 2010, <http://ftalphaville.ft.com/blog/2010/02/16/150141/titlos-and-greek-currency-swap-titillation/>

member state sovereign. It does not prevent member states from guaranteeing bank loans provided by private banks or state-owned/state-controlled banks to a member state sovereign. Only guarantees of foreign public debt are not permitted, and even (mutual financial) guarantees are permitted as long as they are “for the joint execution of a specific project”.

What is a project? It is not defined in the Treaty. Anything can be a project. To a wife, a husband is a project. Article 125.2 grants the Council the power to define a project to be anything it wants it to be:

“2. The Council, on a proposal from the Commission and after consulting the European Parliament, may, as required, specify definitions for the application of the prohibitions referred to in Articles 123 and 124 and in this Article.”

So provided the Council defines the financial rescue of Greece to be a specific project – *Project Greece: Restructuring and Sovereign Solvency*, say – the EC and member states severally or jointly can guarantee Greek public debt. Given this Alice-in-Wonderland escape clause – words mean what I want them to mean – there are effectively no restrictions on the modalities of aid provided to an EU member states by the EC or by other member states.³⁷

6.2 Bail-outs by other EU Member States or by the EC

EC cannot use funds used to assist non-EA EU members

The European Commission (EC) cannot itself provide financial assistance to Greece by invoking the same Treaty clause used to provide financial assistance to EU members that have a derogation or an opt-out from the euro. Latvia, Hungary and Romania, which all have joint IMF-EC adjustment programmes, fall into that category.

Article 143 (ex Article 119 TEC) states:

“1. Where a Member State with a derogation is in difficulties or is seriously threatened with difficulties as regards its balance of payments either as a result of an overall disequilibrium in its balance of payments, or as a result of the type of currency at its disposal, and where such difficulties are liable in particular to jeopardise the functioning of the internal market or the implementation of the common commercial policy, the Commission shall immediately investigate the position of the State in question and the action which, making use of all the means at its disposal, that State has taken or may take in accordance with the provisions of the Treaties. ...”

Article 122.1 of the Lisbon Treaty authorizes the Council, on a proposal from the Commission, to “... decide, in a spirit of solidarity between Member States, upon the measures appropriate to the economic situation, in particular of severe difficulties arise in the supply of certain products, notably in the area of energy”. Clearly, it would be a stretch to interpret the Greek predicament as being due to severe difficulties in the supply of certain products. An interruption of energy supplies is not the issue. However, “in particular” does not mean “only in the case of”, and if the EU is willing to ignore the intent of Article 122.1, then aid could be provided to a fiscally challenged member state without violating the letter of the Article.

³⁷ From Lewis Carroll, *Through the Looking Glass*: ‘When I use a word,’ Humpty Dumpty said, in rather a scornful tone, ‘it means just what I choose it to mean -- neither more nor less.’

‘The question is,’ said Alice, ‘whether you *can* make words mean so many different things.’

‘The question is,’ said Humpty Dumpty, ‘which is to be master -- that’s all.’

Article 122.2 in addition states: *“Where a Member State is in difficulties or is seriously threatened with severe difficulties caused by natural disasters or exceptional occurrences beyond its control, the Council, on a proposal from the Commission, may grant, under certain conditions, Union financial assistance to the Member State concerned....”*

Obviously, Greece’s fiscal predicament is not due to a natural disaster but to an internal man-made disaster. Unless one believes that the causes of the failure of Greece’s fiscal-financial policies and institutions are beyond its control, it is hard to justify a Council decision to provide Union financial assistance to Greece on the basis of Article 122.2.

6.3 Does the German Constitution Allow a Bail-out of Greece?

German Basic Law does not prohibit bailouts or subsidies

It is sometimes argued that the German Constitution (or Basic Law) would stand in the way of Germany contributing to financial support for Greece or any other Euro Area or EU member state. It is never made clear which of the 146 articles of the Basic Law present financial assistance (on market terms, subsidized terms or indeed any terms) includes or implies such a prohibition, however.³⁸ Thus far, not a single one of the many statements (by politicians, by economists and by lawyers) asserting the incompatibility of ‘subsidized financial support’ for Greece with Germany’s Basic Law has contained a ‘chapter and verse’ citation from the Basic Law. It is apparent that any financial support for any EA or EU member state involving Germany as a source of funds is deeply unpopular with much of the German population. This may prevent the German political leadership from following through on their commitments to be part of a common financial facility for Greece. But it behooves all participants in the debate to distinguish between political obstacles, which clearly are present, and constitutional obstacles, which are not.

6.4 Bailouts by the ECB

ECB/Eurosystem can buy Greek debt in secondary markets

Article 123 (ex Article 101 TEC) states that:

“1. Overdraft facilities or any other type of credit facility with the European Central Bank or with the central banks of the Member States (hereinafter referred to as ‘national central banks’) in favour of Union institutions, bodies, offices or agencies, central governments, regional, local or other public authorities, other bodies governed by public law, or public undertakings of Member States shall be prohibited, as shall the purchase directly from them by the European Central Bank or national central banks of debt instruments.”

This does not preclude the ECB (or the Eurosystem) from purchasing any amount of sovereign debt in the secondary markets, making the Article vacuous as a substantive check on central bank monetization of sovereign debt and deficits in the Euro Area. And the ECB does indeed hold a relatively small amount of sovereign debt on its balance sheet. The 16 national central banks (NCBs) that together with the ECB comprise the Eurosystem, also own Euro Area sovereign debt outright.

³⁸ See Basic Law for the Federal Republic of Germany, Promulgated by the Parliamentary Council on 23 May 1949 as amended up to June 2008 <https://www.btg-bestellservice.de/pdf/80201000.pdf>

We don't believe that the ECB/Eurosystem will in fact choose to purchase any significant amount of Euro Area sovereign debt outright, but that is because of a strong ideological/cultural opposition by the majority of the Executive Board and the Governing Council to such monetisation of public debt and deficits. It is not because of any legal or Treaty-based obstacles to the ECB/Eurosystem monetising Euro Area sovereign debt. The ECB/Eurosystem also has a well-established practice of accepting Euro Area sovereign debt as collateral in its repo operations and at the discount window.

6.5 Bailouts by the IMF

**IMF can provide funds even though
Greece does not have its own national
currency**

The argument is sometimes made that there could be a technical or legal obstacle to the IMF providing funds to the Greek government as part of a stand-by program or other standard Fund intervention. No such obstacle has ever been argued to exist to the Fund providing technical assistance to a member state.

The argument that the IMF cannot lend to Greece is based on the argument that the IMF can only lend to countries with balance-of-payments difficulties and that Greece does not have a balance of payments.

Article V (Operations and Transactions of the Fund), Section 3 (Conditions governing use of the Fund's general resources), paragraph (a) states that *"The Fund shall adopt policies on the use of its general resources, including policies on stand-by or similar arrangements, and may adopt special policies for special balance of payments problems, that will assist members to solve their balance of payments problems ..."*.

In addition, in Article V, Section 3 (b) it is stated that *"A member shall be entitled to purchase the currencies of other members from the Fund in exchange for an equivalent amount of its own currency subject to the following conditions:*

(ii) the member represents that it has a need to make the purchase because of its balance of payments or its reserve position or developments in its reserves;...".

Since it became a member of the Euro Area in 2001 and adopted the euro as its currency, Greece no longer has a "balance of payments" in the sense of 'monetary balance', 'international reserve balance' or 'official settlements balance' – measuring the net increase in gold and official foreign exchange reserves (typically held by the central bank). Only the 16-nation Euro Area as a whole has a balance of payments in this narrow sense.

However, it is clear that IMF itself does not use the term balance of payments in this narrow way, but instead uses it to refer to the balance of a nation's external transactions more broadly. Indeed, in the recently completed *Sixth Edition of the IMF's Balance of Payments and International Investment Position Manual (IMF (2010a)*, there even is an appendix on "Regional Arrangements: Currency Unions, Economic Unions, and Other Regional Statements" (IMF (2010b, Appendix 3)) which explains how to present the accounts for the currency union as a whole and for individual member states of the currency union. In the Overview chapter, the balance of payments is defined as *"... - a statement that summarizes economic transactions between residents and nonresidents during a specific time period;"* (IMF (2010a, Chapter 2, p. 7)). Later in the same chapter we find the following statement *"The balance of payments is a statistical statement that summarizes transactions between*

residents and nonresidents during a period. It consists of the goods and services account, the primary income account, the secondary income account, the capital account, and the financial account.” (IMF (2010a, Chapter 2, p. 9). The official settlements balance, which is a subset of the financial accounts in a country with its own currency, is not even mentioned in the chapter!

In Chapter 14 of the IMF’s Balance of Payments and International Investment Position Manual, “Selected Issues in Balance of Payments and International Investment Position Analysis”, the official settlements balance is introduced as a special case of a sectorally disaggregated set of balance of payments accounts where the focus is on changes in the central bank’s net external assets³⁹.

Clearly, Greece has a balance-of-payments problem. Its low private and public sector saving rates have resulted in persistent external current account deficits, which have cumulated into a large negative net external investment position (since 2000 it almost doubled from -38.8% to -69.8% in 2008, see Figure 9). It is at risk of a ‘sudden stop’ – a cessation of inflows on its financial account - when the rest of the world refuses to roll over existing external obligations of Greek residents (including the Greek sovereign) and is *a-fortiori* unwilling to extend new credit. The fact that Greece no longer has an independent currency does not mean it cannot have an external debt crisis (private and public) and/or a public debt crisis. The IMF, with its long history of providing external resources to over-tended governments and nations on a short-term basis and against strict macroeconomic, financial and budgetary conditionality is ideally set up to address precisely these kinds of difficult conditions. It can do so in partnership with the EU, as it is doing in Latvia, Hungary and Romania.

While there are no technical or legal obstacles to the IMF being involved in a fiscal adjustment programme for a Euro Area member state, the ECB, the President of the Eurogroup, Jean-Claude Juncker and many other Euro Area representatives (notably the French government) have vehemently opposed any IMF participation on the funding side. Too much pride and prestige are tied up with the Euro Area project for many of its leaders to be happy to admit that the Euro Area cannot sort out its own sovereign debt problems, but needs external financial assistance, like old-style developing countries and emerging markets.

Some governments of EU member states outside the Euro Area (notably Sweden and the UK) held the opposite point of view, but until Germany came out in favor of IMF funding, and indeed made it a pre-condition for their own participation in a financial rescue, the pro-IMF camp looked unlikely to prevail. Now, we think, all players recognize that facts are facts: neither the SGP, nor the Broad Economic Policy Guidelines have been able to ensure fiscal and financial sustainability for a large number of Euro Area member states. For domestic political reasons, Germany could not agree on an arrangement that could have been (and would have been seen as) the first step towards a sovereign mutual insurance mechanism in the Euro Area. The compromise solution was to have the IMF contributing funds as well as expertise. The presence of the IMF as a lender simply recognizes the continuing

³⁹ **“Analytic” presentation 14.16** *“The analytic presentation is a reorganization of the standard presentation of balance of payments statistics to facilitate a basic distinction between (a) reserves and closely related items and (b) other transactions. The analytic presentation is an example of a satellite account and is designed to focus on management of reserves and closely related items, but the term “analytic” should not be taken to suggest that this presentation is suitable for all analytical purposes or that other presentations are not useful for other kinds of analysis.”* IMF (2010a, Chapter 14, p. 225).

disorganization and paralysis that characterizes the EU in general and the EA in particular when it comes to cross-border financial support mechanisms, whether these take the form of insurance-type arrangements or of cross-border burden sharing.^{40 41}

6.6 Is a Bailout Politically Feasible in the EU/Eurozone?

A bail-out of Greece is technically, financially and economically feasible. The same holds for bail-outs (should they be required) of any of the SWEAP countries or indeed of any Euro Area member state. Such bailouts could be funded by the Euro Area member states, by all EU member states, by the IMF or even by the ECB/Eurosystem, which has already provided financial support by extending the relaxation of its collateral requirements and which could (but probably won't) purchase Greek sovereign debt outright in the secondary debt market. The IMF and the ECB can also provide technical advice and support with the design of the programme, with its implementation and with the monitoring of Greece's compliance. If all EU member states, including the 11 countries not currently in the Euro Area, co-operate, any conceivable fiscal conflagration in the Eurozone could be managed.

Bailouts are political poison

But bailouts are political poison, especially but not just in Germany, as opinion poll after opinion poll demonstrates. This, of course, will help those charged with enforcing the conditionality to convince Greece that it might be less damaging politically for the would-be 'donors' to bail out their own banks that are exposed to Greece than to bail out Greece. The credibility of this threat hinges on aid to Greece being even less popular and/or more costly than aid to banks, but we believe that this case can be made and will have to be made to incentivize Greece to engage in sufficient fiscal tightening.

The ability of the EC and of the other members of the rescue squad to enforce conditionality is also strengthened by the across-the-board lack of political goodwill in Europe towards Greece, and the widespread lack of sympathy for its fiscal plight. This is the result of the unfortunate reputation past Greek governments have established for repeatedly falsifying key economic and financial data. The willingness to 'teach Greece a lesson', even if those paying

⁴⁰ It would of course always have been possible for Greece to go the IMF directly, without involving the other EA member states.

⁴¹As regards the IMF's financial contribution, which could be up to one third of the total, this is likely to be provided under a Stand-By Arrangement (SBA). The duration of an SBA is flexible. It typically covers a period of 12–24 months, but no more than 36 months. Greece clearly needs the full-Monty 36 months, because its own plan for bringing its general government deficit back below the 3 percent of GDP level takes 3 years – and the growth projections underlying that scenario have a distinct Rosy Scenario flavour.

Borrowing terms. Access to IMF financial resources under SBAs are guided by a member country's need for financing, capacity to repay, and track record with use of IMF resources. Within these guidelines, the SBA provides flexibility in terms of amount and timing of the loan to help meet the needs of borrowing countries. These include:

Normal access. Borrowing limits were recently doubled to give countries access of up to 200 percent of quota for any 12 month period, and 600 percent of total credit outstanding (net of scheduled repurchases).

Exceptional access. The IMF can lend amounts above normal limits on a case-by-case basis under its Exceptional Access policy, which entails enhanced scrutiny by the Fund's Executive Board. During the current global economic crisis, countries facing acute financing needs have been able to tap exceptional access SBAs.

Front-loaded access. The new SBA framework provides increased flexibility to front load funds where warranted by the strength of the country's policies and the nature of its financing needs.

Rapid access. Fund support under the SBA can be accelerated under the Fund's Emergency Financing Mechanism, which enables rapid approval of IMF lending. This mechanism was utilized in several instances during the recent crisis, but not, of course, in the case of Greece.

for the lesson are unlikely to be those who cheated their way into the Euro Area and fudged their commitments under the Stability and Growth Pact, is unparalleled in the history of the EU.

Both these considerations make it possible (not certain), that the EC and the IMF will be able to enforce rather strict conditionality on Greece during, at least, the next three years. Greece does not expect to bring its general government deficit down below three percent of GDP before the end of 2012. With fiscal tightening depressing economic activity, it could easily take 4 or 5 years of fiscal tightening before a sustainable public debt and deficit configuration is established. Whether political support for fiscal pain will last that long is an open question. Should it fade before the adjustment is complete, the EA members will have to choose between letting Greece default unilaterally and assisting it in further restructuring its sovereign debt (this time definitely with a sizeable NPV haircut for the debt holders) or consenting to a possibly open-ended resource transfer to Greece. Germany has had 21 years of experience filling a domestic fiscal black hole since the unification of West Germany and East Germany (the DDR) in 1989. We doubt whether German willingness to fund without adjustment will extend to Greece. If it does not, and Greece does not implement the conditionality it has agreed to, there is a small but non-trivial risk of a unilateral Greek sovereign default from 2011 on.

It is most unfortunate, in our view, that Greece will be required to take painful fiscal measures to keep its creditors safe, while paying at least 300 basis points and possibly as much as 400 basis points over the safe rate (swap rate) for any funds it borrows from the EA member states. A country imposing fiscal pain on its citizens to make the creditors whole – to keep their investments in Greek sovereign debt safe - while paying a rate appropriate to unsafe investments accurately reflects the logic of markets but not of politics. There is a risk that Greece will throw its toys out of the pram and opt for unilateral default when it could have persisted and succeeded with its adjustment programme had it been able to negotiate something closer to the safe rate on its new funding.

7. Will the Euro Area Break up and Will the Euro Collapse?

7.1 Better In than Out

Euro Area not at risk from a weak member state leaving

Is a fiscally challenged country likely to want to leave the Euro Area? The brief answer is no - quite the contrary: a fiscally weak country is better off in the Euro Area than outside it.

The only argument for leaving the Euro area is that the introduction of a new national currency (New Drachma, say) would lead to an immediate sharp nominal and real depreciation of the new currency and a gain in competitiveness, which would be most welcome. It also would not last. The key rigidities in small open economies like Greece are real rigidities, not persistent Keynesian nominal rigidities, which are necessary for a depreciation or devaluation of the nominal exchange rate to have a material and durable impact on real competitiveness. Unless the balance of economic and political power is changed fundamentally, a depreciation of the nominal exchange rate would soon lead to adjustments of domestic costs and prices that would restore the old uncompetitive real equilibrium.

All other arguments either favor staying in for a fiscally weak country or are neutral.

- As regards the existing stock of sovereign debt, in or out makes no difference. Re-denominating the old euro-denominated debt in New Drachma would be an act of default (this is disputed by some; see footnote 22). A country might as well stay in the Euro Area and default on the euro-denominated debt.
- As regards new government borrowing, issuing New Drachma-denominated debt would be more costly (because an exchange risk premium would be added to the sovereign risk premium) than new borrowing using euro-denominated debt as part of the Euro Area.
- There would be massive balance sheet disruption for banks, other financial institutions and other corporates with large balance sheets, as the existing stock of assets and liabilities would remain euro-denominated but there would no longer be a euro lender of last resort. It may be possible for contract and securities internal to Greece, that is entered into or issued under Greek jurisdiction alone, to be redenominated in New Drachma, but cross-border contracts and securities issued in other jurisdictions could not be redenominated that way without this constituting an act of default.
- There would be no fiscal-financial support from other Euro Area member states should a country leave the Euro Area.

Leaving EA means leaving EU

- Leaving the Euro Area means leaving the EU. There is no such thing as a former Euro Area member that continues as an EU member. A current EA member wishing to leave the EA but continue as an EU member would have to leave the both Euro Area and the EU and then re-apply for EU membership. Under the Lisbon Treaty, there now is a procedure for leaving the EU (see Athanassiou (2009)).

A country cannot be expelled from EA or EU

- A country cannot be expelled from the Euro Area, or from the EU (see Athanassiou (2009)).
- The only real threat to Euro Area integrity is one or more of the fiscally strongest and more competitive members (Germany) were to leave, because of a fear of becoming the bailer-out of first resort for all would-be fiscally insolvent Euro Area member states. The changing of the generations in Germany from Kohl to Schröder and then to Merkel has weakened the traditional umbilical link of Germany, and especially Germany's political class, to the EU and the Euro Area, but not (yet) to the point that one can reasonably envisage Germany leaving the Euro Area and the EU. Given half a decade of funding and subsidizing other EA countries with unsustainable fiscal positions and no capacity or willingness to correct these, that could change.

Any rational would-be sovereign defaulter would stay in the Euro Area. The near-term risks to the Euro Area, though very small, come from possible outbursts of irrationality and misunderstandings of each others' intentions by the protagonists in the sovereign debt debate. A clear example would be the removal of the Greek PM and finance minister (Papandreou and Papaconstantinou) from their positions and their replacement by isolationists, populists or conspiracy theorists. The new leadership could, in a fit of collective blindness, decide to leave the Euro Area and the EU. We consider this unlikely, but not impossible. The risk of Germany and other fiscally strong

**Only threat to EA is from strong country
leaving following soft bailout**

countries deciding to leave the Euro Area and the EU (and to recreate it under a different name without the fiscally weak current EA member states) is both farther into the future (say 5 to 10 years) and very small, because we don't consider a soft bailout to be a likely outcome of the current bailout game.

Although we believe that the 'too big to save' problem has been overstated as regards Spain and even Italy, a collective, simultaneous fiscal crisis affecting all the SWEAP countries could stretch the political fabric of cross-border fiscal-financial solidarity to breaking point. The financial and economic resources to prevent a default are clearly there – the average fiscal position of the Euro Area is significantly stronger than that of the US and the UK, and we consider neither the US nor the UK to be likely candidates for sovereign default. The politics of cross-border mutual fiscal insurance and support are, however, complex and may not fall in place at the pace required by an unfolding financial crisis.

7.2 Prospects for EMU: Institutional Reform to Survive and Prosper

**EMU needs minimal fiscal Europe to
survive and prosper**

The Greek crisis and the other unresolved sovereign debt problems in the Euro Area have made manifest a serious design flaw at the heart of the Economic and Monetary Union: the absence of even a minimal 'fiscal Europe' to complement the monetary union. This black hole at the center of the EMU has not led to serious problems before because of the extraordinarily benign global and European macroeconomic climate since the inception of EMU in 1999. This 'Great Moderation' came to an end in August 2007, but the fiscal implications did not become clear until late 2008 and 2009.

A 'minimal fiscal Europe' is necessary for both technical economic reasons and for political reasons. A common currency is not just a technical monetary arrangement. It is also an important substantive and symbolic step towards deeper political union among the participants. Control of the currency – of the 'coinage' – is one of the defining attributes of the sovereign. Indeed, the continued use of the term 'seigniorage' to refer to the revenues obtained by the central bank through the issuance of base money reflects this association of the ruler and the currency. With the national flag, the national anthem and the national football team, the national currency completed the quartet of (almost) universal symbols of nationhood.⁴²

To the nations sharing a common currency in a formally symmetric monetary union (rather than by unilateral adoption of another nation's currency), national sovereign default becomes an issue of common concern, beyond what would be called for by purely individually rational national concerns about contagion and other spillovers. This does not mean that national sovereign risk is fully pooled in a monetary union. The debt of the sovereign of a member state can still be restructured, be subject to a haircut or be defaulted on unilaterally. Subsidies from solvent sovereigns to sovereigns of doubtful fiscal probity are not necessarily called for. We use 'subsidy' here in the standard economic sense of funds made available from a donor to a recipient on terms

⁴² The continued anaemic spectator interest in 'soccer' in the US is one of the enduring mysteries of cultural anthropology.

that don't fully reflect the risk-adjusted opportunity cost of these funds to the donor.⁴³

Unilateral sovereign default by one or more Euro Area member state governments would from a technical economic and financial perspective be consistent with the survival of the Euro Area. The defaulting sovereign would have no economic incentive to leave, and the countries that would otherwise have been called upon to provide financial support to prevent the sovereign default will also be happy to stay in, even if they would have been inclined to leave should the financial support for the fiscally weak member state have turned into an open-ended and uncapped stream of subsidies. It is, however, likely that political support for continued membership in the Euro Area (and the EU) would decline both among the political elites of the defaulting country and among its citizens. We consider a mutual sovereign risk insurance mechanism among the Euro Area member states, with tough conditionality attached (including the credible threat that financial support will be withdrawn should a borrowing country flout the conditionality) to be the minimum manifestation of EU-wide solidarity and cohesion required to keep EMU politically viable in the medium and long term.

Mutual fiscal insurance fund (EMF)

From an economic perspective too, it is clear that a minimal fiscal Europe is necessary to make up for the loss of independent monetary policy as a sovereign default prevention mechanism. The loss of macroeconomic stabilization potential associated with giving up independent national monetary policy (including its alleged ability to manage the real exchange rate in a desirable manner) is, in our view, negligible and may well turn out to represent a net gain rather than a loss. This is because, in a world with a high degree of financial capital mobility and a floating exchange rate, the exchange rate is more likely to be a source of extraneous noise, excess volatility and persistent misalignment of real exchange rates than an effective buffer against internal or external shocks. But giving up any scope for the discretionary use of both the anticipated and the unanticipated inflation taxes to reduce the real value of domestic-currency-denominated government monetary and non-monetary debt should be compensated for by some form of mutual fiscal insurance.

Mutual fiscal insurance requires a fund, the European Monetary Fund (EMF), say, and a blue print or template for disbursing funds and designing, implementing, monitoring and enforcing macroeconomic and structural reform conditionality. The Greek experience can provide the template or blue print. The EMF can be established by the member states of the Euro Area under the Enhanced Cooperation provisions of the Treaty of Lisbon. It would not require a Treaty amendment. Subscriptions to the fund would be in proportion to the EA member states' equity stakes in the ECB. The amount subscribed would have to be significant, say €2 trillion, but the amount paid in could be smaller than that, say just €200 bn, provided the body in charge of managing the EMF (the EMF Board) would be able to call for any or all of the subscribed but not paid in funds to be paid in on demand. The EMF Board would consist of

⁴³ If there is a gap (wedge) between the risk-adjusted opportunity cost to the donor and the marginal cost to the recipient of obtaining funds in the market, it is therefore possible that, by pricing the funds inside that wedge, it is possible for the recipient to obtain funds from the donor on terms better than those available in the market, without this constituting a subsidy in the economic sense of that word. The 'wedge' could be the reflection of a number of market failures, including illiquidity, asymmetric information and monopoly power.

**Systemically important cross-border
financial institution
recapitalisation/liquidation fund**

representatives of the EA member states, of the European Commission and of the ECB. Should the conditionality attached to the financial support provided by the EMF not be adhered to, in the view of the EMF, the support would be withdrawn. Sovereign default would always remain an option. Financial support provided by the EMF might be contingent on the prior or early restructuring of sovereign debt, and even on burden sharing by creditors, that is, haircuts.

In addition to the mutual fiscal insurance provided by the EMF, a well-functioning monetary union requires a fund to recapitalize systemically important cross-border financial institutions, either to permit them to continue operating or to allow them to be wound up or liquidated without unnecessary social costs. Let's call this the Financial Institution Recapitalisation Fund (FIRF). The most important of these systemically important cross-border financial institutions is the ECB or the Eurosystem. A central bank that is not backed by the deep pockets of the tax payers (through the FIRF) could either become insolvent (through its exposure to risky assets that perform badly) or might have to choose between insolvency and undesirably high inflation. But other systemically important banks and other financial positions could be beneficiaries of the FIRF also, subject to strict conditionality.

The funding of the FIRF (which could also be created using the Enhanced Cooperation procedures in the Lisbon Treaty) could come from the national Treasuries of the EA or the EU, from the systemically important financial institutions that would benefit from it, or from some combination of these two sources. Clearly, if there were to be an EA or EU-wide systemic financial crisis, rather than an insolvency threat to an isolated private financial institution, only the tax payer can provide the necessary resources.

The EMF and the FIRF could be separate institutions or they could be merged. The minimal fiscal Europe we consider both politically and economically necessary for the Euro Area to survive and prosper therefore does not require independent tax and borrowing powers for a supranational European Fiscal Authority (EFA). The two funds provide insurance (in the case of the EMF) and fiscal burden-sharing (in the case of the FIRF). There is no further cross-border redistribution of income or wealth implied, nor supranational spending programmes funded by supranational taxes or borrowing.

We believe that both the EMF and the FIRF could be operational within a couple of years, if the Euro Area member states get sufficiently scared by the fiscal black hole that threatens to absorb and unmake every EU and EMU achievement since 1957.

8. Contagion Risks to EMs

Little contagion risk to Ems of CEE

What are the contagion risk and channels of contagion from sovereign risk in the SWEAP countries to emerging markets?

The main issue is central and eastern Europe (CEE), where there are three main possible channels of contagion.

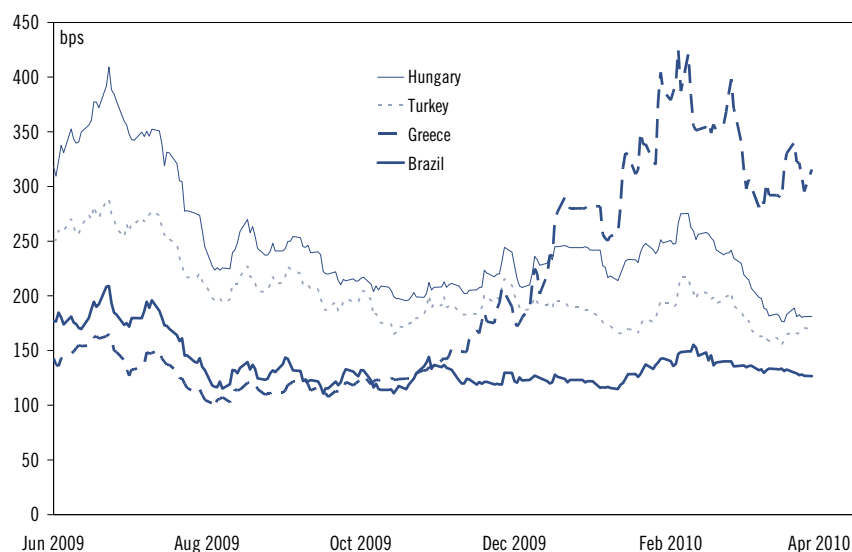
Financial contagion

1.'Financial' contagion. The risk here lies in Bulgaria and Romania, where Greek banks own 29% and 16% of banking sector assets. If Greek banks lost access to funding that might encourage them to shrink their balance sheets in these two countries rather aggressively, putting downward pressure on growth

there. This would hurt Bulgaria more than Romania, a) because Bulgaria's banks have been running high loan/deposit ratios (200% for the Greek-owned banks) and b) because Bulgaria's currency board with the euro has had the obvious effect of making its real effective exchange rate (REER) appreciate: in December 2009 Bulgaria's REER was 4% stronger than it was on average in H1 2008 (i.e. pre-crisis); while Romania's REER was 6% weaker. Portuguese and Spanish banks aren't heavily exposed to CEE. As far as Spanish banks' exposure to Latin America is concerned, there doesn't seem much to worry about. In the first place, BBVA and Santander run very low loan-to-deposit ratios in Latin America. Second, the region is growing. Third, these two banks have ways of getting access to liquidity that don't require withdrawing funding from Latin America (e.g. BBVA has a EUR 4 bn stake in Telefonica; Santander could float Abbey).

Hungary's public debt crisis in the second and third quarters of 2009 preceded and was quite independent of the Greek crisis, although both countries were eased into their financial excesses by a permissive international financial environment. Figure 18 shows the CDS story for Hungary, Greece and two other benchmark EMs.

Figure 18. Selected Countries – 5 year CDS, Jun 2009-Mar 2010



Sources: Markit and Citi Investment Research and Analysis

Fiscal contagion

2. 'Fiscal' contagion. In other words: will investors try to find CEE economies with SWEAP-like fiscal problems and attack? SWEAP-like fiscal vulnerability in CEE is more or less limited to Hungary, where the public debt/GDP ratio is around 80%, and Poland, where the public debt/GDP ratio is nearly 50%. But in both cases the risks are small, at least in the short run. Hungary has a new government since the April election, and the history of post-communist Hungarian governments augurs well for fiscal discipline in the first two years of an administration at least.

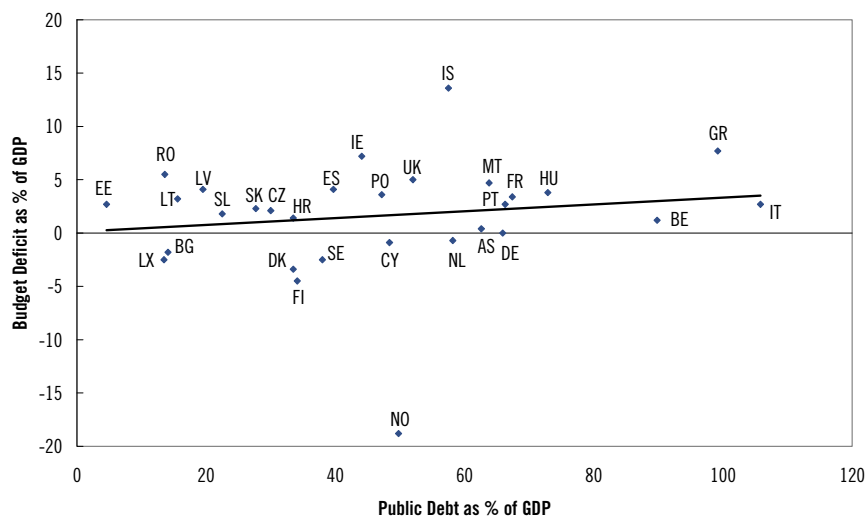
In addition, the incoming Fidesz party seems committed to rapid euro-adoption, and says it wants to renew the IMF agreement when it expires this

October. Banks are liquid and profitable now, and the risk of an unfinanceable public deficit seems low at the moment.

In Poland, the economy is growing and the PM is trying to use this moment of outperformance to shore up Polish fiscal credibility (and strengthen his position within the EU, among other things). Accordingly, the Polish PM has recently proposed a new fiscal rule (to limit the growth of real spending to 1% until the general government deficit falls to 3% GDP), and new measures to tighten the finance ministry's control over excess liquidity in the public sector. The recent death in a plane crash of the Polish President and many other members of the Polish political, military and administrative elite, has brought the Fall presidential elections forward to June 2010. The implications of these events for Polish budgetary policy and for the market's perception of its sovereign creditworthiness is unclear. If anything, the orderly and dignified management of the immediate aftermath of the disaster has strengthened the country's reputation for stability and competence.

Most other CEE governments have rather low public debt burdens (see Figure 19).

Figure 19. Europe – General Government Deficit and Debt (Pct. of GDP), 2008



Note: Negative budget deficit means a surplus. Sources: Eurostat and Citi Investment Research and Analysis

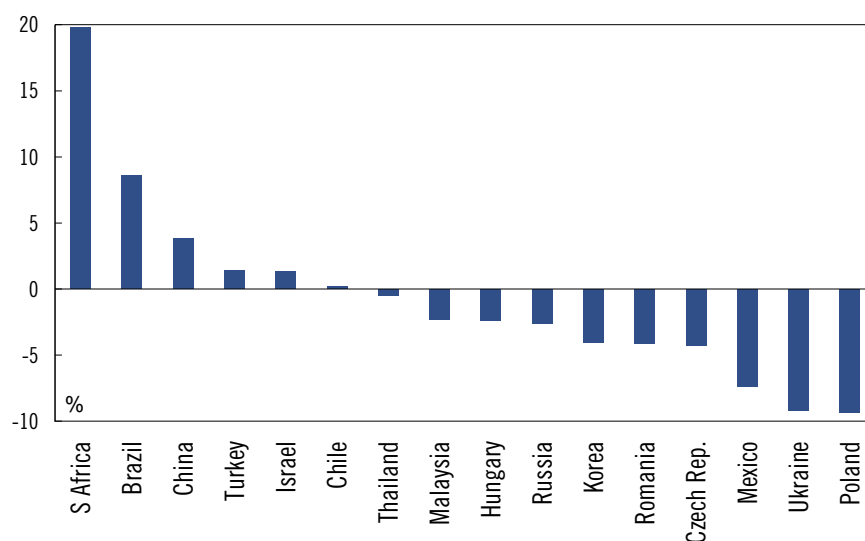
CEE's vulnerability to SWEAP-contagion would have been a lot higher if Greece's debt crisis had become visible in late 2008. As things stand, CEE is to some extent "over the hump" of its crisis, particularly with respect to external vulnerability: current account deficits have collapsed in the past 18 months, and the involvement of the IMF eases refinancing risks.

Real contagion

3. 'Real' contagion. If Eurozone growth falls due to "untreated" rising sovereign risk or due to widespread fiscal tightening to address the rising sovereign risk, how does that affect CEE? This issue will become important over the next couple of years. The problem is that, with the exception of Poland and Ukraine, no CEE economy has enjoyed a big positive competitiveness shock during the crisis: real exchange rates hardly depreciated (Figure 20). So there is no obvious engine for export-led growth in CEE - especially in a country like Hungary where competitiveness was eroded

during the 2000s by a very high tax wedge, low labor flexibility, low labor participation etc. And since banks are likely to grow their balance sheets very cautiously in the region, potential growth has probably suffered. This could lengthen the path towards euro-adoption at least and, in the extreme, generate questions about a "lost decade" for some countries.

Figure 20. Emerging Market Countries -- Real Effective Exchange Rate Feb 2010 vs. 2008 average



Sources: BIS and Citi Investment Research and Analysis

Russia

Finally, Russia should be able to generate around 5% GDP growth this year after a contraction in 2009 of nearly 9%, thanks to a) a big fiscal stimulus - non-oil deficits of 15% in 2009 and 2010; b) the central bank's ability to finance the capital outflow in 2008 and 2009 without destroying its balance sheet; and c) the recovery in commodity prices, including oil but not, unfortunately for Russia, gas. Public debt remains very low (less than 10% of GDP), and the main economic risk lies not so much in fiscal or external vulnerability - the current account surplus remained above \$50 bn in 2009, and should stay around this level in 2010 — but in the lack of diversification of the economy.

During the decade Russian consumer spending was heavily supported by the persistence of negative real interest rates, which in turn was facilitated by the accumulation of balance of payments surpluses onto the central bank's balance sheet. That basic model seems to remain intact. President Medvedev has spoken of the need for diversification and the creation of a more transparent business environment but it's not clear to what extent that ambition is achievable.

9. Conclusion

The current fiscal problems faced by the majority of the advanced industrial countries are of a severity unprecedented in peace time.

Most of the fiscally impaired nations will, eventually, opt for the fiscal pain exit from unsustainable public finances. Many will wait to do so until forced into action by increasingly unruly government debt markets and, ultimately, by the imminent threat of a 'sudden stop' the exclusion of the sovereign from the international financial markets and possibly even from the domestic markets.

'Growing your way out of debt' may, up to a point, be a reasonable option for India with its double-digit growth rate of nominal GDP and a 7 or 8 percent real GDP growth rate. It is not a realistic prospect for advanced industrial countries given their low real GDP growth rates and low rates of inflation.

An inflationary solution to the problem of an excessive public debt is all but impossible in the Euro Area and unlikely in all advanced industrial nations. It is least unlikely for the US.

Sovereign default is not likely but also not impossible for any of the advanced industrial nations.

The most likely outcome for the Greek sovereign debt problem is that formal sovereign default is avoided thanks to a painful, multi-year program of fiscal tightening and structural economy-wide reform, financially supported by a multi-year Euro Area-IMF backstop mechanism and with tough conditionality. 'Voluntary' restructuring (lengthening) of maturities is highly likely to be part of the deal. This assumes that the financial terms on loans from the EA will be revised to be more generous than the 300 or 400 basis points over the swap rate currently on offer. With the financial terms currently on offer (from the EA member states and from the markets), a significant haircut for creditors or even a formal default become more likely.

The Euro Area and the EU could come out of this crisis stronger than it went in. This requires the creation of a minimal 'fiscal Europe' consisting of (1) a mutual fiscal insurance mechanism (through a European Monetary Fund) and of (2) a burden-sharing arrangement for the recapitalization or orderly liquidation of systemically important cross-border financial institutions (through a Financial Institution Recapitalisation Fund).

All advanced industrial countries with unsustainable fiscal positions (that is, that is, the US, Japan and most of Western Europe) will have to tighten fiscally by more and sooner than was anticipated before the Greek fiscal crisis hit. A few countries, including Germany and Norway, may be able to maintain a stimulating fiscal policy stance for the current year. By 2011 all but a few small advanced industrial countries are likely to be in fiscal tightening mode, including Germany, France, the US, the UK and Japan. The markets will demand it.

If this fiscal tightening takes place, it will reduce demand growth in the advanced industrial countries below expectations. There may also be some mild spillover effects to the EMs. Outside CEE, however, the EMs seem increasingly capable of maintaining their own growth momentum.

If countries fail to tighten fiscally, the slowdown of demand will occur through a different mechanism: a rise in sovereign long rates, reflecting a combination of supply effects in the government debt markets, rising sovereign credit risk perceptions and fears of future higher inflation, once the current deflationary episode is behind us. Corporate bond rates and loan rates will also follow the sovereign rates up.

There is therefore, in the advanced industrial countries, no hiding place from a fiscally engineered (either by commission or by omission) slowdown in demand growth. The fiscal tightening is likely to last at least 5 years, and for some countries may take the best part of a decade. This should mean, however, that central banks will keep rates lower for longer and will maintain or even boost QE, CE and enhanced credit support. We fear that the ECB is the central bank least likely to recognize the need for a greater monetary stimulus to counteract the contractionary impact of fiscal tightening or of the failure to engage in fiscal tightening. This provides another reason why we are not very bullish on the medium-term growth prospects for the Euro Area.

Another offset to the fiscal tightening in the advanced industrial countries will come from the depreciation of their real effective exchange rates vis-à-vis the rapidly growing emerging markets. Such real appreciation is most easily and promptly achieved through an appreciation of the nominal exchange rates of the emerging markets. It is therefore encouraging that there are indications that China may decide to let the nominal exchange rate of the Renminbi appreciate in the near future.

References

Ahrend, R., Catte, P. and Price, R. (2006), 'Interactions between monetary and fiscal policy: how monetary conditions affect fiscal consolidation', OECD Economics Department Working Paper, No 521.

Briotti, G. (2004), 'Fiscal adjustment between 1991 and 2002: stylized facts and policy implications', ECB Occasional Papers, No 9.

Guichard, S., Kennedy, M., Wurzel, E., and Andre, C. (2007), What promotes fiscal consolidation: OECD country experiences, OECD Economics Department Working Papers No. 553

Hagen von, J., Hughes Hallett, A. and Strauch, R. (2002), 'Budgetary consolidation in Europe: quality, economic conditions and persistence', Journal of the Japanese and International Economies, Vol. 16, No 4, pp. 512–535.

Tavares, J. (2003), Does Right or Left matter? Cabinets, Credibility and Fiscal Adjustments, Universidade Nova, Lisbon

Wagschal, U. and Wenzelburger, G. (2008), *Successful Budget Consolidation: An international Comparison*, Guetersloh: Verlag Bertelsmann Stiftung

Alesina, Alberto and Allan Drazen (1991), "Why are stabilizations delayed?", *American Economic Review*, American Economic Association, vol. 81(5), pages 1170-88, December.

Alesina, Alberto and Silvia Ardagna (2002), "Tales of Fiscal Adjustment", *Economic Policy*, Volume 13 Issue 27, pp. 487-545, Published Online: 4 Jan 2002.

Alessandri, Piergiorgio and Andrew G. Haldane (2009), "Banking on the State", Bank of England, November.
<http://www.bankofengland.co.uk/publications/speeches/2009/speech409.pdf>

Ardagna, S. (2004), 'Fiscal stabilisations: when do they work and why?' *European Economic Review*, Vol. 48, No 5, pp.1047–1074

Asonuma, Tamon (2009), "Sovereign default and renegotiation: recovery rates, interest spreads and credit history", Boston University working paper, April 12, https://editorialexpress.com/cgi-bin/conference/download.cgi?db_name=NASM2009&paper_id=288

Athanassiou, Phoebus (2009), "Withdrawal and Expulsion from the EU and EMU", European Central Bank Legal Working Paper Series No. 10, December 2009.

CMA (2010), Global Sovereign Credit Risk Report, 1st Quarter.

Cecchetti, Stephen (2010), "The future of public debt: prospects and implications", BIS Powerpoint Presentation.

Crowe, Christopher and Ellen E. Meade (2008), Central bank independence and transparency: Not just cheap talk (Part 1), VoxEU, 27 July, <http://www.voxeu.eu/index.php?q=node/1475>

Cukierman, Alex, Steven B. Webb and Bilin Neyapti (1992), "Measuring the Independence of Central Banks and Its Effect on Policy Outcomes," World

Bank Economic Review, Oxford University Press, vol. 6(3), pages 353-98, September.

Cohen, Daniel (1991), *Private Lending to Sovereign States: A Theoretical Autopsy*, Cambridge, Massachusetts: MIT Press.

Claessens, Stijn, (1990), "The debt Laffer curve: Some estimates," *World Development*, Elsevier, vol. 18(12), pages 1671-1677, December.

Department of Finance, Government of Ireland (2008), Credit Institutions (Financial Support) Act 2008, 2 October 2008,
<http://www.finance.gov.ie/documents/publications/legi/creditinstsup08.pdf>

Eijffinger, Sylvester C. W. and Johan de Haan, (1996). "The Political Economy of Central-Bank Independence," Princeton Studies in International Economics 19, International Economics Section, Department of Economics Princeton University,.

European Commission (2007), "Lessons from successful fiscal consolidations", Part IV of Public Finances in EMU 2007, *European Economy* No 3/2007, Directorate-General Economic and Financial Affairs, pp. 193-238.

European Commission (2010),
http://ec.europa.eu/economy_finance/financial_operations/balance/index_en.htm

Grilli, Vittorio , Donato Masciandaro and Guido Tabellini (1991): "Political and Monetary Institutions and Public Financial Policies in the Industrial Countries", *Economic Policy*, 13, 341-92

Hendricks, Ken, Andrew Weiss and Charles A. Wilson (1988), "The War of Attrition in Continuous Time with Complete Information," *International Economic Review*, Department of Economics, University of Pennsylvania and Osaka University Institute of Social and Economic Research Association, vol. 29(4), pages 663-80, November.

International Monetary Fund (IMF) (2010), India: 2009 Article IV Consultation—Staff Report; Staff Statement; Public Information Notice on the Executive Board Discussion; and Statement by the Executive Director for India, *IMF Country Report No. 10/73*, March.

International Monetary Fund, Articles of Agreement, Article V.
<http://www.imf.org/external/pubs/ft/aa/aa05.htm#2>

IMF (2010a) Sixth Edition of the IMF's Balance of Payments and International Investment Position Manual, January;
<http://www.imf.org/external/pubs/ft/bop/2007/bopman6.htm>

IMF (2010b) Appendix 3, Regional Arrangements: Currency Unions, Economic Unions, and Other Regional Statements;
<http://www.imf.org/external/pubs/ft/bop/2007/pdf/appx3.pdf2>

Jonung, Lars and Eoin Drea (2009), "The euro: It can't happen. It's a bad idea. It won't last. US economists on the EMU, 1989 – 2002", *European Economy, Economic Papers* 395, December 2009,
http://ec.europa.eu/economy_finance/publications/publ_page8701_en.htm

Manasse, P. and N. Roubini (2005), 'Rules of thumb' for sovereign debt crises', *IMF Working Paper No. WP/05/4*.

Porter, Richard D. and Ruth A. Judson (1996), "The international market for US currency", *Federal Reserve Bulletin*, October.

Reinhart, Carmen and Kenneth Rogoff (2009a), *This time is different; eight centuries of financial folly*, Princeton University Press.

Reinhart, Carmen and Kenneth Rogoff (2009b), "Growth in a time of debt", American Economic Association, Papers and Proceedings, forthcoming.

Appendix A-1

Analyst Certification

The research analyst(s) primarily responsible for the preparation and content of all or any identified portion of this research report hereby certifies that, with respect to each issuer or security or any identified portion of the report with respect to an issuer or security that the research analyst covers in this research report, all of the views expressed in this research report accurately reflect their personal views about those issuer(s) or securities. The research analyst(s) also certify that no part of their compensation was, is, or will be, directly or indirectly, related to the specific recommendation(s) or view(s) expressed by that research analyst in this research report.

IMPORTANT DISCLOSURES

Within the past 12 months, Citigroup Global Markets Inc. or its affiliates has acted as manager or co-manager of an offering of securities of Greece, United Kingdom, Hungary, Germany.

Citigroup Global Markets Inc. or its affiliates has received compensation for investment banking services provided within the past 12 months from Greece, United Kingdom, Hungary, Germany.

Citigroup Global Markets Inc. or an affiliate received compensation for products and services other than investment banking services from Greece, United States, United Kingdom, Hungary, Germany in the past 12 months.

Citigroup Global Markets Inc. currently has, or had within the past 12 months, the following as investment banking client(s): Greece, United Kingdom, Hungary, Germany.

Citigroup Global Markets Inc. currently has, or had within the past 12 months, the following as clients, and the services provided were non-investment-banking, securities-related: Greece, United States, United Kingdom, Hungary, Germany.

Citigroup Global Markets Inc. currently has, or had within the past 12 months, the following as clients, and the services provided were non-investment-banking, non-securities-related: Greece, United States, United Kingdom, Hungary, Germany.

United States or its affiliates beneficially owns 5% or more of any class of common equity securities of Citigroup Inc.

Rohini Malkani has in the past worked with the India government or its divisions in her personal capacity.

Analysts' compensation is determined based upon activities and services intended to benefit the investor clients of Citigroup Global Markets Inc. and its affiliates ("the Firm"). Like all Firm employees, analysts receive compensation that is impacted by overall firm profitability which includes investment banking revenues.

For important disclosures (including copies of historical disclosures) regarding the companies that are the subject of this Citi Investment Research & Analysis product ("the Product"), please contact Citi Investment Research & Analysis, 388 Greenwich Street, 28th Floor, New York, NY, 10013, Attention: Legal/Compliance. In addition, the same important disclosures, with the exception of the Valuation and Risk assessments and historical disclosures, are contained on the Firm's disclosure website at www.citigroupgeo.com. Valuation and Risk assessments can be found in the text of the most recent research note/report regarding the subject company. Historical disclosures (for up to the past three years) will be provided upon request.

NON-US RESEARCH ANALYST DISCLOSURES

Non-US research analysts who have prepared this report (i.e., all research analysts listed below other than those identified as employed by Citigroup Global Markets Inc.) are not registered/qualified as research analysts with FINRA. Such research analysts may not be associated persons of the member organization and therefore may not be subject to the NYSE Rule 472 and NASD Rule 2711 restrictions on communications with a subject company, public appearances and trading securities held by a research analyst account. The legal entities employing the authors of this report are listed below:

Citigroup Global Markets Ltd

Willem Buiters

OTHER DISCLOSURES

Citigroup Global Markets Inc. and/or its affiliates has a significant financial interest in relation to Latvia. (For an explanation of the determination of significant financial interest, please refer to the policy for managing conflicts of interest which can be found at www.citigroupgeo.com.)

For securities recommended in the Product in which the Firm is not a market maker, the Firm is a liquidity provider in the issuers' financial instruments and may act as principal in connection with such transactions. The Firm is a regular issuer of traded financial instruments linked to securities that may have been recommended in the Product. The Firm regularly trades in the securities of the issuer(s) discussed in the Product. The Firm may engage in securities transactions in a manner inconsistent with the Product and, with respect to securities covered by the Product, will buy or sell from customers on a principal basis.

Securities recommended, offered, or sold by the Firm: (i) are not insured by the Federal Deposit Insurance Corporation; (ii) are not deposits or other obligations of any insured depository institution (including Citibank); and (iii) are subject to investment risks, including the possible loss of the principal amount invested. Although information has been obtained from and is based upon sources that the Firm believes to be reliable, we do not guarantee its accuracy and it may be incomplete and condensed. Note, however, that the Firm has taken all reasonable steps to determine the accuracy and completeness of the disclosures made in the Important Disclosures section of the Product. The Firm's research department has received assistance from the subject company(ies) referred to in this Product including, but not limited to, discussions with management of the subject company(ies). Firm policy prohibits research analysts from sending draft research to subject companies. However, it should be presumed that the author of the Product has had discussions with the subject company to ensure factual accuracy prior to publication. All opinions, projections and estimates constitute the judgment of the author as of the date of the Product and these, plus any other information contained in the Product, are subject to change without notice. Prices and availability of financial instruments also are subject to change without notice. Notwithstanding other departments within the Firm advising the companies discussed in this Product, information obtained in such role is not used in the preparation of the Product. Although Citi Investment Research & Analysis (CIRA) does not set a predetermined frequency for publication, if the Product is a fundamental research report, it is the intention of CIRA to provide research coverage of the/those issuer(s) mentioned therein, including in response to news affecting this issuer, subject to applicable quiet periods and capacity constraints. The Product is for informational purposes only and is not intended as an offer or solicitation for the purchase or sale of a security. Any decision to purchase securities mentioned in the Product must take into account existing public information on such security or any registered prospectus.

Investing in non-U.S. securities, including ADRs, may entail certain risks. The securities of non-U.S. issuers may not be registered with, nor be subject to the reporting requirements of the U.S. Securities and Exchange Commission. There may be limited information available on foreign securities. Foreign companies are generally not subject to uniform audit and reporting standards, practices and requirements comparable to those in the U.S. Securities of some foreign companies may be less liquid and their prices more volatile than securities of comparable U.S. companies. In addition, exchange rate movements may have an adverse effect on the value of an investment in a foreign stock and its corresponding dividend payment for U.S. investors. Net dividends to ADR investors are estimated, using withholding tax rates conventions, deemed accurate, but investors are urged to consult their tax advisor for exact dividend computations. Investors who have received the Product from the Firm may be prohibited in certain states or other jurisdictions from purchasing securities mentioned in the Product from the Firm. Please ask your Financial Consultant for additional details. Citigroup Global Markets Inc. takes responsibility for the Product in the United States. Any orders by US investors resulting from the information contained in the Product may be placed only through Citigroup Global Markets Inc.

Important Disclosures for Morgan Stanley Smith Barney LLC Customers: Morgan Stanley & Co. Incorporated (Morgan Stanley) research reports may be available about the companies that are the subject of this Citi Investment Research & Analysis (CIRA) research report. Ask your Financial Advisor or use smithbarney.com to view any available Morgan Stanley research reports in addition to CIRA research reports.

Important disclosure regarding the relationship between the companies that are the subject of this CIRA research report and Morgan Stanley Smith Barney LLC and its affiliates are available at the Morgan Stanley Smith Barney disclosure website at www.morganstanleysmithbarney.com/researchdisclosures.

The required disclosures provided by Morgan Stanley and Citigroup Global Markets, Inc. on Morgan Stanley and CIRA research relate in part to the separate businesses of Citigroup Global Markets, Inc. and Morgan Stanley that now form Morgan Stanley Smith Barney LLC, rather than to Morgan Stanley Smith Barney LLC in its entirety. For Morgan Stanley and Citigroup Global Markets, Inc. specific disclosures, you may refer to www.morganstanley.com/researchdisclosures and https://www.citigroupgeo.com/geopublic/Disclosures/index_a.html.

This CIRA research report has been reviewed and approved on behalf of Morgan Stanley Smith Barney LLC. This review and approval was conducted by the same person who reviewed this research report on behalf of CIRA. This could create a conflict of interest.

The Citigroup legal entity that takes responsibility for the production of the Product is the legal entity which the first named author is employed by. The Product is made available in Australia through Citigroup Global Markets Australia Pty Ltd. (ABN 64 003 114 832 and AFSL No. 240992), participant of the ASX Group and regulated by the Australian Securities & Investments Commission. Citigroup Centre, 2 Park Street, Sydney, NSW 2000. The Product is made available in Australia to Private Banking wholesale clients through Citigroup Pty Limited (ABN 88 004 325 080 and AFSL 238098). Citigroup Pty Limited provides all financial product advice to Australian Private Banking wholesale clients through bankers and relationship managers. If there is any doubt about the suitability of investments held in Citigroup Private Bank accounts, investors should contact the Citigroup Private Bank in Australia. Citigroup companies may compensate affiliates and their representatives for providing products and services to clients. The Product is made available in Brazil by Citigroup Global Markets Brasil - CCTVM SA, which is regulated by CVM - Comissão de Valores Mobiliários, BACEN - Brazilian Central Bank, APIMEC - Associação dos Analistas e Profissionais de Investimento do Mercado de Capitais and ANBID - Associação Nacional dos Bancos de Investimento. Av. Paulista, 1111 - 11º andar - CEP. 01311920 - São Paulo - SP. If the Product is being made available in certain provinces of Canada by Citigroup Global Markets (Canada) Inc. ("CGM Canada"), CGM Canada has approved the Product. Citigroup Place, 123 Front Street West, Suite 1100, Toronto, Ontario M5J 2M3. The Product is made available in France by Citigroup Global Markets Limited, which is authorised and regulated by Financial Services Authority. 1-5 Rue Paul Cézanne, 8ème, Paris, France. The Product may not be distributed to private clients in Germany. The Product is distributed in Germany by Citigroup Global Markets Deutschland AG & Co. KGaA, which is regulated by Bundesanstalt fuer Finanzdienstleistungsaufsicht (BaFin). Frankfurt am Main, Reuterweg 16, 60323 Frankfurt am Main. If the Product is made available in Hong Kong by, or on behalf of, Citigroup Global Markets Asia Ltd., it is attributable to Citigroup Global Markets Asia Ltd., Citibank Tower, Citibank Plaza, 3 Garden Road, Hong Kong. Citigroup Global Markets Asia Ltd. is regulated by Hong Kong Securities and Futures Commission. If the Product is made available in Hong Kong by The Citigroup Private Bank to its clients, it is attributable to Citibank N.A., Citibank Tower, Citibank Plaza, 3 Garden Road, Hong Kong. The Citigroup Private Bank and Citibank N.A. is regulated by the Hong Kong Monetary Authority. The Product is made available in India by Citigroup Global Markets India Private Limited, which is regulated by Securities and Exchange Board of India. Bakhtawar, Nariman Point, Mumbai 400-021. The Product is made available in Indonesia through PT Citigroup Securities Indonesia. 5/F, Citibank Tower, Bapindo Plaza, Jl. Jend. Sudirman Kav. 54-55, Jakarta 12190. Neither this Product nor any copy hereof may be distributed in Indonesia or to any Indonesian citizens wherever they are domiciled or to Indonesian residents except in compliance with applicable capital market laws and regulations. This Product is not an offer of securities in Indonesia. The securities referred to in this Product have not been registered with the Capital Market and Financial Institutions Supervisory Agency (BAPEPAM-LK) pursuant to relevant capital market laws and regulations, and may not be offered or sold within the territory of the Republic of Indonesia or to Indonesian citizens through a public offering or in circumstances which constitute an offer within the meaning of the Indonesian capital market laws and regulations. The Product is made available in Italy by Citigroup Global Markets Limited, which is authorised and regulated by Financial Services Authority. Foro Buonaparte 16, Milan, 20121, Italy. The Product is made available in Japan by Citigroup Global Markets Japan Inc. ("CGMJ"), which is regulated by Financial Services Agency, Securities and Exchange Surveillance Commission, Japan Securities Dealers Association, Tokyo Stock Exchange and Osaka Securities Exchange. Shin-Marunouchi Building, 1-5-1 Marunouchi, Chiyoda-ku, Tokyo 100-6520 Japan. If the Product was distributed by Nikko Cordial Securities Inc. it is being so distributed under license. In the event that an error is found in an CGMJ research report, a revised version will be posted on the Firm's Global Equities Online (GEO) website. If you have questions regarding GEO, please call (81 3) 6270-3019 for help. The Product is made available in Korea by Citigroup Global Markets Korea Securities Ltd., which is regulated by Financial Services Commission and the Financial Supervisory Service. Hungkuk Life Insurance Building, 226 Shinmunno 1-GA, Jongno-Gu, Seoul, 110-061. The Product is made available in Malaysia by Citigroup Global Markets Malaysia Sdn Bhd, which is regulated by Malaysia Securities Commission. Menara Citibank, 165 Jalan Ampang, Kuala Lumpur, 50450. The Product is made available in Mexico by Acciones y Valores Banamex, S.A. De C. V., Casa de Bolsa, Integrante del Grupo Financiero Banamex ("Accival") which is a wholly owned subsidiary of Citigroup Inc. and is regulated by Comision Nacional Bancaria y de Valores. Reforma 398, Col. Juarez, 06600 Mexico, D.F. In New Zealand the Product is made available through Citigroup Global Markets New Zealand Ltd. (Company Number 604457), a Participant of the New Zealand Exchange Limited and regulated by the New Zealand Securities Commission. Level 19, Mobile on the Park, 157 Lambton Quay, Wellington. The Product is made available in Pakistan by Citibank N.A. Pakistan branch, which is regulated by the State Bank of Pakistan and Securities Exchange Commission, Pakistan. AWT Plaza, 1.1. Chundrigar Road, P.O. Box 4889, Karachi-74200. The Product is made available in Poland by Dom Maklerski Banku Handlowego SA an indirect subsidiary of Citigroup Inc., which is regulated by Komisja Nadzoru Finansowego. Dom Maklerski Banku Handlowego S.A. ul. Chalubinskiego 8, 00-630 Warszawa. The Product is made available in the Russian Federation through ZAO Citibank, which is licensed to carry out banking activities in the Russian Federation in accordance with the general banking license issued by the Central Bank of the Russian Federation and brokerage activities in accordance with the license issued by the Federal Service for Financial Markets. Neither the Product nor any information contained in the Product shall be considered as advertising the securities mentioned in this report within the territory of the Russian Federation or outside the Russian Federation. The Product does not constitute an appraisal within the meaning of the Federal Law of the Russian Federation of 29 July 1998 No. 135-FZ (as amended) On Appraisal Activities in the Russian Federation. 8-10 Gashheka Street, 125047 Moscow. The Product is made available in Singapore through Citigroup Global Markets Singapore Pte. Ltd., a Capital Markets Services Licence holder, and regulated by Monetary Authority of Singapore. 1 Temasek Avenue, #39-02 Millenia Tower, Singapore 039192. The Product is made available by The Citigroup Private Bank in Singapore through Citibank, N.A., Singapore branch, a licensed bank in Singapore that is regulated by Monetary Authority of Singapore. Citigroup Global Markets (Pty) Ltd. is incorporated in the Republic of South Africa (company registration number

2000/025866/07) and its registered office is at 145 West Street, Sandton, 2196, Saxonwold. Citigroup Global Markets (Pty) Ltd. is regulated by JSE Securities Exchange South Africa, South African Reserve Bank and the Financial Services Board. The investments and services contained herein are not available to private customers in South Africa. The Product is made available in Spain by Citigroup Global Markets Limited, which is authorised and regulated by Financial Services Authority. 29 Jose Ortega Y Gassef, 4th Floor, Madrid, 28006, Spain. The Product is made available in Taiwan through Citigroup Global Markets Taiwan Securities Company Ltd., which is regulated by Securities & Futures Bureau. No portion of the report may be reproduced or quoted in Taiwan by the press or any other person. No. 1, Songzhi Road, Taipei 110, Taiwan. The Product is made available in Thailand through Citicorp Securities (Thailand) Ltd., which is regulated by the Securities and Exchange Commission of Thailand. 18/F, 22/F and 29/F, 82 North Sathorn Road, Silom, Bangrak, Bangkok 10500, Thailand. The Product is made available in Turkey through Citibank AS which is regulated by Capital Markets Board. Tekfen Tower, Eski Buyukdere Caddesi # 209 Kat 2B, 23294 Levent, Istanbul, Turkey. In the U.A.E, these materials (the "Materials") are communicated by Citigroup Global Markets Limited, DIFC branch ("CGML"), an entity registered in the Dubai International Financial Center ("DIFC") and licensed and regulated by the Dubai Financial Services Authority ("DFSA") to Professional Clients and Market Counterparties only and should not be relied upon or distributed to Retail Clients. A distribution of the different CIRA ratings distribution, in percentage terms for Investments in each sector covered is made available on request. Financial products and/or services to which the Materials relate will only be made available to Professional Clients and Market Counterparties. The Product is made available in United Kingdom by Citigroup Global Markets Limited, which is authorised and regulated by Financial Services Authority. This material may relate to investments or services of a person outside of the UK or to other matters which are not regulated by the FSA and further details as to where this may be the case are available upon request in respect of this material. Citigroup Centre, Canada Square, Canary Wharf, London, E14 5LB. The Product is made available in United States by Citigroup Global Markets Inc, which is regulated by FINRA and the US Securities and Exchange Commission. 388 Greenwich Street, New York, NY 10013. Unless specified to the contrary, within EU Member States, the Product is made available by Citigroup Global Markets Limited, which is regulated by Financial Services Authority. Many European regulators require that a firm must establish, implement and make available a policy for managing conflicts of interest arising as a result of publication or distribution of investment research. The policy applicable to CIRA's Products can be found at www.citigroupgeo.com. Compensation of equity research analysts is determined by equity research management and Citigroup's senior management and is not linked to specific transactions or recommendations. The Product may have been distributed simultaneously, in multiple formats, to the Firm's worldwide institutional and retail customers. The Product is not to be construed as providing investment services in any jurisdiction where the provision of such services would not be permitted. Subject to the nature and contents of the Product, the investments described therein are subject to fluctuations in price and/or value and investors may get back less than originally invested. Certain high-volatility investments can be subject to sudden and large falls in value that could equal or exceed the amount invested. Certain investments contained in the Product may have tax implications for private customers whereby levels and basis of taxation may be subject to change. If in doubt, investors should seek advice from a tax adviser. The Product does not purport to identify the nature of the specific market or other risks associated with a particular transaction. Advice in the Product is general and should not be construed as personal advice given it has been prepared without taking account of the objectives, financial situation or needs of any particular investor. Accordingly, investors should, before acting on the advice, consider the appropriateness of the advice, having regard to their objectives, financial situation and needs. Prior to acquiring any financial product, it is the client's responsibility to obtain the relevant offer document for the product and consider it before making a decision as to whether to purchase the product.

© 2010 Citigroup Global Markets Inc. Citi Investment Research & Analysis is a division and service mark of Citigroup Global Markets Inc. and its affiliates and is used and registered throughout the world. Citi and Citi with Arc Design are trademarks and service marks of Citigroup Inc and its affiliates and are used and registered throughout the world. All rights reserved. Any unauthorized use, duplication, redistribution or disclosure is prohibited by law and will result in prosecution. Where included in this report, MSCI sourced information is the exclusive property of Morgan Stanley Capital International Inc. (MSCI). Without prior written permission of MSCI, this information and any other MSCI intellectual property may not be reproduced, disseminated or used to create any financial products, including any indices. This information is provided on an "as is" basis. The user assumes the entire risk of any use made of this information. MSCI, its affiliates and any third party involved in, or related to, computing or compiling the information hereby expressly disclaim all warranties of originality, accuracy, completeness, merchantability or fitness for a particular purpose with respect to any of this information. Without limiting any of the foregoing, in no event shall MSCI, any of its affiliates or any third party involved in, or related to, computing or compiling the information have any liability for any damages of any kind. MSCI, Morgan Stanley Capital International and the MSCI indexes are services marks of MSCI and its affiliates. The information contained in the Product is intended solely for the recipient and may not be further distributed by the recipient. The Firm accepts no liability whatsoever for the actions of third parties. The Product may provide the addresses of, or contain hyperlinks to, websites. Except to the extent to which the Product refers to website material of the Firm, the Firm has not reviewed the linked site. Equally, except to the extent to which the Product refers to website material of the Firm, the Firm takes no responsibility for, and makes no representations or warranties whatsoever as to, the data and information contained therein. Such address or hyperlink (including addresses or hyperlinks to website material of the Firm) is provided solely for your convenience and information and the content of the linked site does not in anyway form part of this document. Accessing such website or following such link through the Product or the website of the Firm shall be at your own risk and the Firm shall have no liability arising out of, or in connection with, any such referenced website.

ADDITIONAL INFORMATION IS AVAILABLE UPON REQUEST
