Euro's Crisis: From the Sovereigns to the Banks and back to the Sovereigns

Dr Constantin Gurdgiev*
Trinity College, Dublin
and
St.Columbanus AG

Abstract

The global financial crisis of 2007-2009 crystallized the underlying imbalances that are currently acting to tear apart the Euro area monetary and fiscal systems by focusing markets and public attention on the core cause of the overall Euro crisis – the insolvency of the Euro area member-states model of debt financing of public and private expenditure and investment. Hence, any repair of the system will require addressing the twin malaises of the Euro area model of economic development: the private and public sectors debt trap and the social-economic model reliant on deficit financing of public and private consumption and expenditure.

All errors and omissions are author own. This research reflects solely the opinions of the author and does not reflect the views or opinions of any private or public organization or entity to which the author holds any affiliation.

* Author contact details: School of Business, Trinity College, Dublin 2, Ireland.
Email:gurdgic@tcd.ie

Image: Mark Tansey 'Push/Pull'. Copyrighted. Please exercise own discretion if reprinting.

Contents:

Although the trigger for the European economic and financial crisis was the subprime and subsequently banking crisis in the US, the true roots of the European malaise are to be found in the structural weaknesses of the European growth and Euro area development model based on debt financing of public and private expenditure and investment. These drivers were amplified by the lack of effective economic policy mechanisms from both the monetary and fiscal sides of macroeconomic management. The global financial crisis of 2007-2009 did not cause the underlying imbalances that are currently acting to tear apart the Euro area monetary and fiscal systems. Instead, it crystallized markets and public attention on the underlying core cause of the overall Euro crisis – the insolvency of the public financing system of the European Union member states.

1. Global crisis and contagion to Europe

A this point in time, the experience of the European economies shows clearly that the US subprime crisis acted as a the catalyst for the global financial systems shocks that have helped to expose the structural weaknesses of the European economies. In turn, subprime mortgages were the core starting point of the global financial crisis that is distinct from, although inter-related to, the European sovereign crisis.

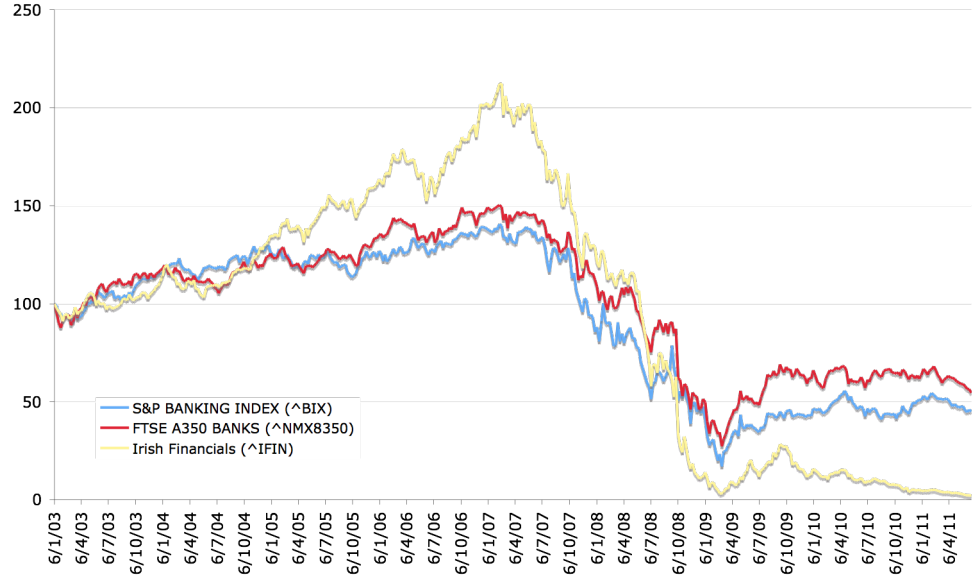
At the end of 2006, at the peak of the US property cycle, subprime lending accounted for roughly 13% of the total mortgages pool, up from 10% at the end of 2004[1]. These were heavily concentrated on the balance sheets of larger financial institutions and the Federally mandated lenders, such Fannie Mae and Freddie Mac. As the crisis gained force, first the default rates on US subprime mortgages doubled from 11% in Q1 2006 to 20% by the beginning of 2008. In the same quarter, the combined share of subprime and alternative mortgages peaked at 34.8% of all originations, an increase that roughly coincided with the peak in the housing market in the US.[2]

Second, the securitization process that has aggregated large pools of non-performing and high-risk mortgages on banks balance sheets has led to the mortgages crisis contagion across the world. By early 2008, securitized mortgages losses have triggered significant contraction in the liquidity and the loss of market confidence in the quality of the assets held by the global financial institutions. Even following the nationalization of the largest UK mortgage lender, the Northern Rock, and the rescue of the US federally mandated lenders, as well as the investment bank, Bear Stern, the markets continued to price in the systemic counterparty and default risks across the entire spectrum of financial services institutions, with the risk premia directly impacting equity valuations as illustrated in Chart 1 below. The destruction of equity values in the case of PIIGS financials (with exception of Italy which managed to weather the storm much better than banks in Spain, Ireland, Portugal and Greece) has been even more dramatic.

European lenders, despite their repeated statements to the contrary, were exposed as the significant bearers of securitized US-originated mortgages and other linked instruments. As the US insurance giant – AIG – was underwritten by the Federal Government, and investment banks – Morgan Stanley and Goldman Sachs were re-registered as commercial banks to avail of the US Federal Reserve emergency liquidity assistance, Europe's Dexia and Fortis banks received direct aid from European member states.

The peak of the global financial crisis occurred with the collapse of the Lehman Brothers which triggered another dramatic wave of risk re-valuations and in effect has led to a temporary shutdown of the liquidity flows across the advanced economies. More importantly from the Euro area crisis point of view, the Lehman Brothers collapse brought to the forefront the issue of financial systems solvency.

Chart 1: Select indices of banking sector shares, 2003-2011, 100=January 2003



Source: Data from Yahoo Finance and author own calculations.

The financial crisis precipitated – through real assets revaluations and the shutting down of trade, investment and operating capital finance flows – a world-wide economic crisis. Collapse of US and European demand and capital investment led to a rapid decline in global trade flows and jobs losses in the advanced economies. Exports volumes fell 12% in 2009 and net exporters – small and large – especially in the advanced economies such as Germany and Japan – recorded steep declines in economic activity. German GDP fell 4.7% in 2009, while Japan's real income was down 5.2%.

However, in a number of countries, such as Ireland, the Baltic States and elsewhere, the economic recession started before the bankruptcy of Lehman Brothers. In particular, in the case of Ireland, the recession was based on domestic forces, discussed below.

Credit contraction and mounting losses on the balance sheets of the banks have resulted in a claw-back of earnings by the multinational banking institutions, precipitating large-scale liquidity withdrawals from Eastern and Central Europe to Germany, Austria and the rest of the Euro area. If pre-crisis global banks retained profits on the books of their Eastern European subsidiaries, now capital demands of the parent organizations required an outflow of funds from the new Member States of the EU. In tandem, contracting capex and credit crunch have led to a 37% fall off in global FDI in 2009[3].

Disruptions in financial system confidence also took place in countries like Ireland, where the UK retail and investment banks and banking systems are closely linked through funding and asset ownership ties. However, the core source of pressures on the financial in Ireland was the domestic collapse of the property markets that started in late 2007 and accelerated in 2008. According to Daft.ie asking prices database, residential property prices in Ireland have peaked in July 2007 at €368,552 and declined by 10.5% by September 2008 – the month when the banking crisis crystallized through the collapse of the third largest banks, the Anglo Irish Bank and the issuance of a blanket state guarantee that covered deposits and bonds of the six Irish banking institutions. Between 2003 and 2006 Building and Construction sector alone accounted for 8.7% of Irish GNP in constant prices, with added contribution of the Real Estate Services and Finance sub-sectors pushing the weight of overall property sector to above 16% of GNP. By 2008 the sector contribution to Irish economy has fallen to 5.8% and at the end of 2010 it stood at 3.3%. Irish GNP contracted by 2.8% in 2008 relative to the peak attained in 2007, followed by an annual decline of 9.8% in 2009. GDP fell by 3.1% in 2008 and again by 7% in 2009. Cumulative losses in real terms between 2007 and 2010 amounted to 12.11% in GNP terms and 10.15% in GDP terms.

Globally, contagion from the financial crisis to the real economy was fully completed by the end of 2009, with world GDP declining 0.58%, resulting in a first global recession since WW2. The EU has led this process with the block's GDP declining 4.10% in 2009. 26 out of 27 member states recorded declines in GDP, with Poland proving to be the only exception to the rule, the Euro area GDP declined 4.07% against the US loss of income of 2.63%. Other macroeconomic parameters performed equally poorly, as summarized in the table below.

Table 1: Summary Macroeconomic Performance Statistics

	World	Emerging economies	Advanced economies	Euro area	France	Germany	UK	US
Gross domestic product, constant prices, % change								
-2008	2.83	6.01	0.24	0.47	0.09	0.99	-0.07	0.00
-2009	**-0.58**	**2.51**	**-3.23**	**-4.07**	**-2.55**	**-4.72**	**-4.90**	**-2.63**
-2010	4.77	7.07	2.71	1.68	1.57	3.33	1.70	2.64
Investment, % of GDP								
-2008	23.74	24.79	20.90	21.85	22.04	18.50	16.65	18.04
-2009	**21.59**	**18.76**	**17.84**	**18.90**	**18.98**	**16.50**	**13.65**	**14.82**
-2010	22.59	20.55	18.44	18.84	19.60	16.99	14.45	15.85
Gross national savings, % of GDP								
-2008	23.84	33.74	19.38	21.99	20.13	28.40	15.00	12.42
-2009	**21.56**	**31.98**	**16.88**	**19.04**	**17.05**	**23.31**	**12.54**	**10.86**
-2010	22.75	32.44	17.86	19.58	17.81	24.92	12.22	12.41
Export volume of goods and services, % change								
-2008	2.75	4.57	1.86	0.43	Na	Na	Na	Na
-2009	**-10.78**	**-7.80**	**-12.37**	**-14.42**	Na	Na	Na	Na
-2010	11.30	11.93	10.97	10.51	Na	Na	Na	Na
Unemployment rate, % of labor force								
-2008	Na	Na	5.79	7.56	7.83	7.30	5.55	5.82
-2009	Na	Na	**7.96**	**9.41**	**9.43**	**7.49**	**7.45**	**9.28**
-2010	Na	Na	8.29	10.07	9.81	7.05	7.88	9.73
Employment, Index 2000=100								
-2008	Na	Na	107.45	109.25	106.37	103.00	107.12	106.18
-2009	Na	Na	**105.13**	**107.21**	**105.04**	**103.05**	**105.44**	**102.18**
-2010	Na	Na	104.88	106.29	104.52	102.86	105.47	101.82

Sources: IMF WEO April 2011, World Bank and the Bank for International Settlements.

2. Euro area crisis: a special case of structural and financial imbalances

Amidst global disruptions, the Euro area crisis was emerging as a combination of the macroeconomic imbalances driven by a confluence of a global recession and domestic structural failures, and the near collapse of the financial system.

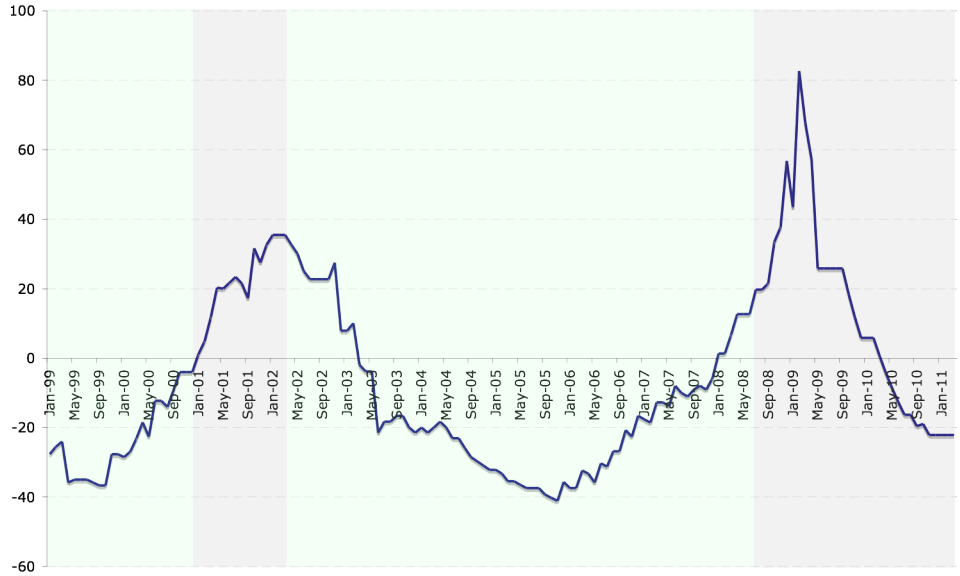
The ECB response was, in the long run, to reduce significantly interest rates and provide unlimited liquidity on the emergency assistance basis. However, before setting on the stable policy path, the ECB carried out a number of long-term inconsistent interventions, such as the July 2008 hike in the policy rate of 25bps from 4.00% to 4.25% (see chart below). By the time the ECB began the process of catching up with other advanced economies policy rates, Frankfurt-based authorities had to start from a massive 83% premium in policy rates above the blended average of other advanced economies policy rates, reached in February 2009. In other words, full 12 months after the financial crisis had spilled over into real economic crisis, the ECB was still running monetary tightening appropriate for a booming global economy. The process of rates cuts, rapid as it was, took ECB until May 2010 to reach parity with the advanced economies average rate – a

delay of some 20 months into the global financial crisis.

Even more importantly, by the time ECB's policy caught up with its peers, the PIIGS (Portugal, Ireland, Italy, Greece and Spain) were already in a recession for at least 12 months. The Euro area as a whole also experienced negative growth since Q3 2008.

Chart 2 below clearly shows deeply counter-cyclical nature of the ECB policy responses, when set against the rates policies adopted by other advanced economies, and against the backdrop of global economic trends.

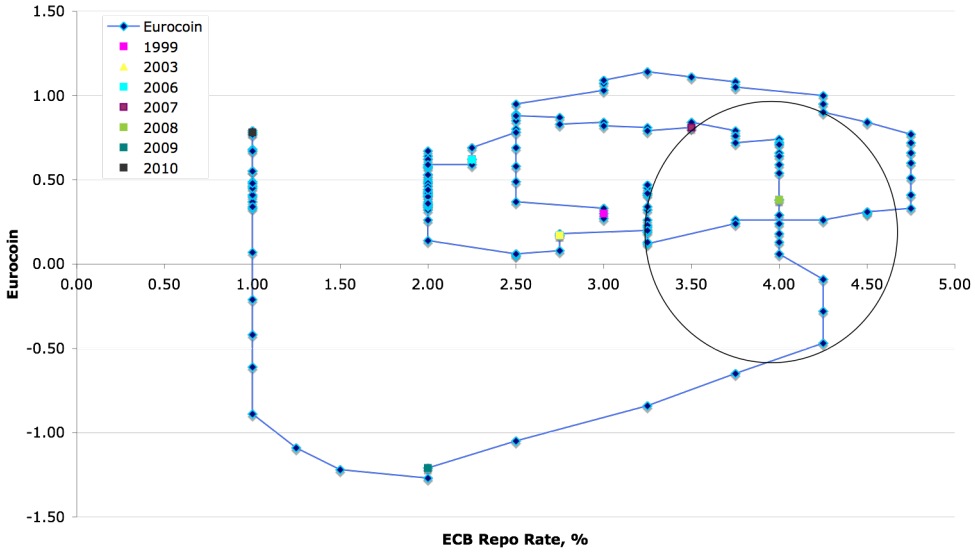
Chart 2: ECB policy rate premium over the average for advanced economies, %



Source: Reserve Bank of Australia and author own calculations
Note: Grey shaded areas mark economic slowdowns / recessions, green shaded areas mark economic expansions. Average rates include: US, UK, Canada, Australia and Japan.

The ECB monetary policy stance was deeply inappropriate for the Euro area economy as a whole and for the PIIGS states in particular. As Chart 3 below illustrates, over its entire history, ECB has failed to deliver a policy that would track leading indicators of economic growth. For example, CEPR-Bank of Italy eurocoin indicator of expected economic activity, shows virtually no correlation with ECB repo policy rates. Over its entire history since January 1999, ECB rate variation and variation in eurocoin are correlated at statistically and economically insignificant 3.4%. The estimated historical relation is: ECB Repo Rate (%) = 2.5778+0.4382 eurocoin with R2 = 0.0338, exhibiting extremely weak pro-cyclicality. An even weaker relationship can be found between ECB Repo Rate and real growth in Euro area GDP.

Chart 3: ECB policy rate and Leading Indicator of Economic Growth (eurocoin)

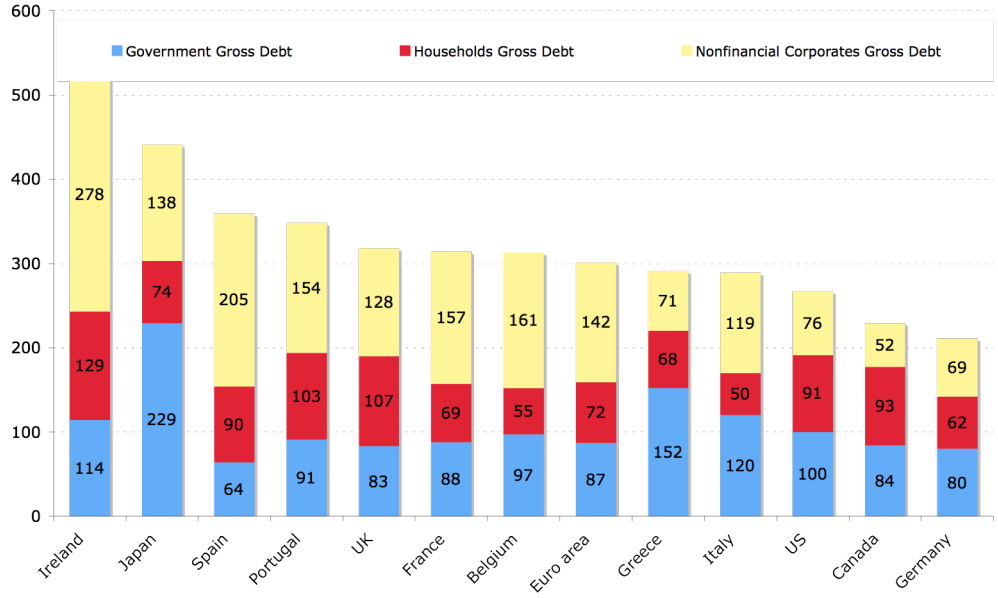


Source: Reserve Bank of Australia, eurocoin and author own calculations
Note: area circled covers January 2007-September 2008 the period where eurocoin persistently signaled economic slowdown yet ECB attained their 5-year peak.

The deployment of liquidity assistance and rapid move by other central banks into quantitative easing measures aimed at first restoring liquidity supply to the banking sector and subsequently at repairing banks balance sheets took a long time to impact ECB policies. Throughout the peak crisis period of late 2008 – early 2009, the ECB maintained interest rates well above its peers, pushing the value of the Euro to the point of slowing down already pressured exports. By the end of 2010, European Central Bank continued to operate a policy that completely ignored the issues of solvency (chart 3 below) in the Euro area-wide banking sector, as evidence by the declines in the overall levels of capital available to the Euro area banks.

The relative inaction by the ECB has left national Governments of the Member States to develop their own policy responses to the banking crises. Perhaps the most striking example of this was the issuance of the blanket public guarantee for 6 domestic banking institutions in Ireland on September 30, 2008. The guarantee originally covered virtually all debts and all deposits of these institutions and extended over estimated volume of assets and liabilities of €440 billion or over 3.5 times Irish GNP. Issued without agreement with other Euro area states, the Irish guarantee triggered system-wide responses from other sovereigns in the common currency area. This launch the process of inter-bank contagion across the EU. However, despite the vocal opposition from the European member states, including the UK, Germany and France, the banking systems of these states enjoyed (and still enjoy) significant indirect benefits of the Irish guarantee via cross-holdings of Irish banks and sovereign securities on and off their balance sheets. For example, in the case of Germany, assuming a 40% 'haircut' (market pricing benchmark), German banking system has been indirect recipient of support from the Irish Exchequer

Chart 4: Indebtedness and leverage in 2011, as percentage of 2010 GDP



Source: IMF GFSR October 2010, and author own calculations.
Note: Figure for Canada's Nonfinancial Corporations is computed on the basis of the ratio of Corporate Debt to Equity.

amounting to ca €20-25 billion via the underwriting of Irish banks bonds and other liabilities by the Irish State.

In addition, Euro area member states have engaged directly in injecting equity into the banking systems, with measures here ranging from ordinary equity purchases to investments in preference shares capital and to purchasing and guaranteeing toxic assets. In some countries, like Ireland, Government guarantees and purchases of toxic assets took the form of quasi-sovereign underwriting of special debt obligations that were used to recapitalize banks balance sheets. This has contributed to a rise in the banks claims on public sector. As of the end of 2010, banks claims on public sector stood at above 20% of GDP in Belgium, Germany, Greece, Italy and Spain, completing the full cycle of contagion from the banking crisis to the sovereign financial crisis. In Ireland's case, by the completion of the Prudential Capital and Liquidity Assessment Reviews in March-May 2011, Irish banking crisis has consumed at least €70 billion (more than 50% of the country 2010 GNP) of taxpayer's funds, with many analysts expecting the figure to reach between €100 billion and €120 billion by the end of the crisis.

3. Euro area: From the banks to the sovereigns and back

The financial crisis had a series of extremely adverse effects on the Euro area fiscal environment. However, the core problem within the Euro area was not so much the immediate fallout from the financial sector disruptions, but a long-term structural process of increasing reliance of public and private consumption and investment on public and private debt accumulation.

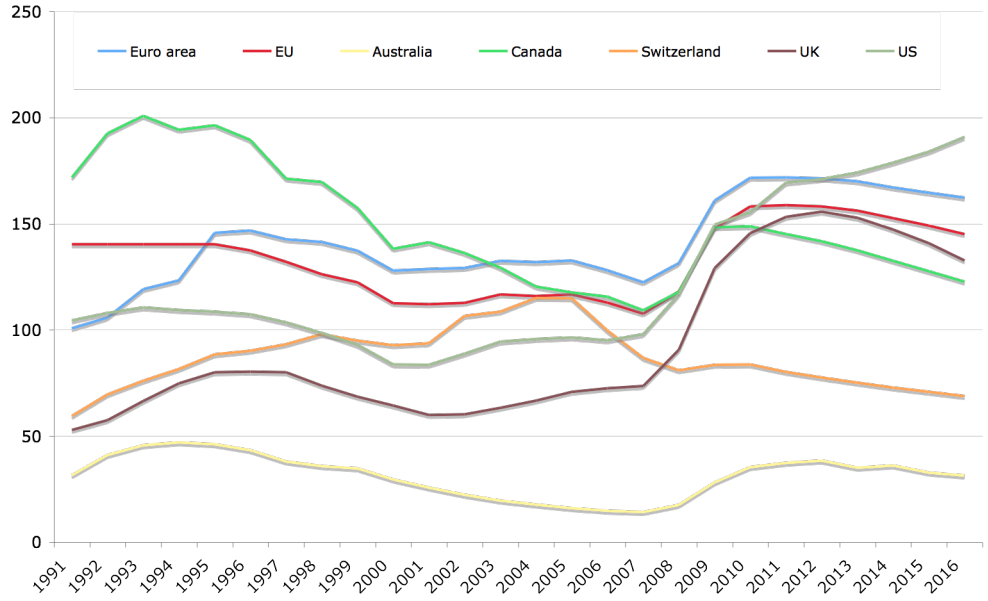
Increasing demands on public funding for banks recapitalizations, along with the need to ameliorate the negative effects on economic growth from simultaneously declining consumer and investors' confidence, lack of credit and a rapid contraction in the world trade flows have led to the rising deficits across the EU. In addition, a number of countries, especially those that experienced the most severe effects of the banking sector crisis, such as the so-called peripheral countries of PIIGS (including Portugal, Ireland, Italy, Greece and Span), but also Austria, Belgium, Germany and the Netherlands have seen dramatic re-focusing of the financial markets on adverse structural fiscal imbalances.

In addition to a cyclical reduction in tax revenues triggered by the recession, welfare states across the Euro area have experienced continued structural pressures on their balancesheets.

On the surface, this was evident in the fact that by 2010 all member states of the Euro area were in breach of the Stability and Growth Pact criteria for fiscal sustainability. Less noticed by the media, but certainly closely watched by the markets was the rapid rise in overall levels of indebtedness. Between 2007 and 2010 public debt figures rose from 65% of GDP to 85% of GDP and is projected to rise to over 87% by 2012.[4] Since 1991, through 2011, General Government Gross Debt to GDP ratio in the Euro area is expected to increase 61%, the third highest increase amongst all advanced economies after Japan and the UK[5].

Controlling for already sizeable share of Government spending, the overall public sector debt burden on the private economy (see Chart 5 below) had risen dramatically from 108.1% in 1991 to 122.4% in 2007 and 171.8% in 2011 (forecast)[6].

Chart 5: General Government Debt as a share of the Private Economy (GDP ex-Government Spending), percent



Sources: Author calculations based on IMF WEO data, April 2011.

The cumulated debts, coupled with continued expansion of the public finances as the share of GDP came at the time when EU-led privatizations and dramatic increases in PPP financing arrangements meant the reduction of overall public financing and services lines. In other words, increasingly more public money went to fund increasingly fewer activities. This, in turn, had an adverse impact on the net debt positions, with public asset bases eroding across majority of the Euro area states.

Once the banking crisis began to absorb significant share of public deficits financing in 2008-2009, and as the growth recession drove up social welfare spending and depressed tax revenues, a number of countries within the Euro area have run into difficulties refinancing their outstanding debts. This fed the vicious cycle of decreasing markets' confidence in the creditworthiness of many Euro area states, most notably PIIGS, but also Belgium and to a lesser extent the Netherlands and Austria. By December 2010, Greek 10 year bond yields rose to over 4 times those of Germany, Irish yields hit 3 times German yields. And the process of sovereign debt downgrades and rising yields continued. By the first quarter of 2011, yield curves were inverted in Greece, Ireland and Portugal, signalling higher default probabilities to the front end of the maturity structures. Credit ratings trailed the markets sentiment and pushed through significant downgrades across the four weakest economies of Greece, Ireland, Portugal and Spain, while threatening downgrades on some core Euro area states, such as Belgium and Italy.

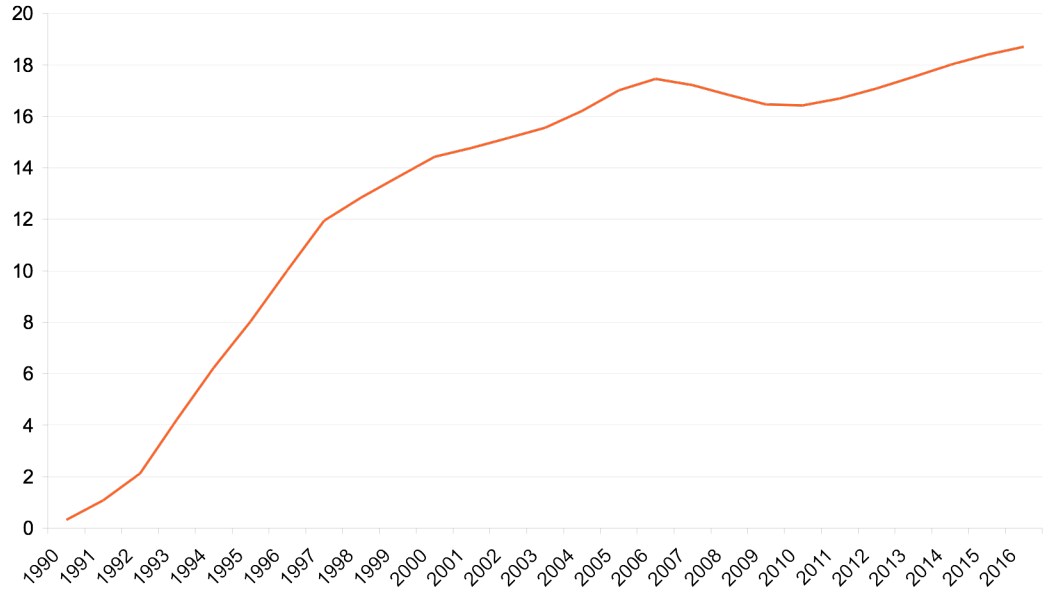
Revealingly, accumulation of public debt in the Euro area over time prior to the crisis had a divergent impact on the economy's ability to finance total investment from that in the US and the rest of advanced economies. Chart 6 below clearly shows that the relative underinvestment in the Euro area compared to that in the advanced economies persisted over time, rising by 13.6% of GDP between 1990 and 1999 and increasing to 17% by the end of 2007. The period of slower increases in the gap – between 2000 and 2006 suggests three core sources for the gap:

1) Over this period of time Euro area relative Government deficits have declined compared to those of other advanced economies;
2) Over this period EU experienced more robust rates of growth, and
3) With the US and other advanced economies experiencing a substantial boom in domestic investment associated with property markets bubble formation during 2003-2007, the more benign Euro area investment underperformance relative to historical trend during this period is consistent with a close link between US property bubble and the EU investment acceleration.

Using annual data on Gross National Savings and Investment rates since 1980 through 2010, table 2 below clearly shows that:

- In Greece, Portugal and Spain, investment exceeded national savings over the entire sample range, implying persistent excessive borrowing by these economies to finance investment;
- In Ireland and Italy, with exception of the decade of the 1990s, excess borrowing was present in the 1980s and 2000s.

Chart 6. Cumulative Investment Gap, Advanced economies v EU
1989=0, % of GDP



Source: Author own calculations based on IMF WEO data.

Table 2: Investment net of savings, % of GDP, Averages

	1980s	1990s	2000s
Greece	3.85	2.55	9.24
Ireland	5.44	-1.75	2.37
Italy	2.09	-0.58	1.53
Portugal	4.95	3.84	9.95
Spain	0.88	1.76	6.15

Source: Author own calculations based on IMF WEO data

Hence, overall impact of the banking sector collapse was to trigger the investors' run not on the banking assets, but on the sovereign assets of the Euro area member states with weakest fiscal and economic fundamentals. Decades of debt-financed suboptimally low investment, weakened – via excessive taxation – households' balancesheets and anaemic growth have created a fertile soil for contagion from the banking sector troubles to the sovereign balancesheet.

This was best exemplified in the context of two relatively different (in the context of pre-crisis environments), but nonetheless very much similar (in terms of crisis development) economies of Greece and Ireland.

4. From Greece to Ireland and on to the PIIGS

The Greek sovereign crisis was the first warning from the markets to the Euro area in respect of deteriorating public finances. The crisis officially started on October 16, 2009 when the Greek authorities were forced to admit that the country deficit will exceed 10% of GDP. Subsequently, a deficit of 15.37% of GDP was recorded for 2009, while 2008 deficit was revised to 9.54% of GDP. In parallel with Greece, Ireland posted a deficit of 14.36% GDP in 2009, up from projected deficit of 11% originally claimed by the Irish authorities. The difference accounted for by banks supports originally classified by the Irish authorities as being off the balance sheet of the Exchequer. Portugal's deficit has risen from a benign 2.93% in 2008 to 9.34% in 2009, while Spain's deficit rose from 4.15% to 11.13% over the same period of time.

But it was Greece, nonetheless, that led the crisis dynamics with rating agencies downgrading country debt below 'a'-level rating before the EU Commission placed the country under its budgetary supervision mechanism.

In a clear denial of the scope and the nature of the problems faced by the Greek economy, the Eurogroup imposed requirements on Greece to implement an austerity package within the scope of one month starting with February 2010. The failure of the Greek authorities to implement such drastic reforms – justifiable on the ground of rational economic policy considerations – resulted on April 11, 2010 in the adoption of a €110 billion 'bailout' or 'aid' package for Greece by the Eurogroup and the IMF.

Following this, European Financial Stabilization Mechanism was set up in early May 2010 based on €750bn capital base that permitted actual lending up to €560 billion. The EFSM was endowed from a number of funding sources, including:

- Community support fund - €60bn, earmarked for euro area member states which enhanced existent emergency assistance fund of €50bn available to the EU Commission for funding of non-euro area EU states
- European Financial Stability Fund (EFS) with effective lending capcity of €250bn secured against a guarantee fund of €440bn. The EFSF includes a mandate to purchase Government bonds and is established as a member states' owned SPV.
- IMF pledge of €250bn.

In addition, the ECB has engaged in direct purchasing of significant volumes of public debt of PIIGS along with accumulation of government bonds via its emergency liquidity operations. By June 2011, ECB held €47 billion of Greek Government bonds (just shy of the EU and IMF €53 billion in holdings and Greek own banks €50 billion exposure), €19 billion of Irish Government bonds (compared with €22 billion held by EU and IMF and just €5 billion held by Irish banks), €21 billion of Portugal's sovereign bonds (€18 billion held by EU and IMF and €17 billion held by domestic banks)[7].

By the early 2011 it became absolutely clear to virtually all independent analysts that:

1) The Greek 'bailout' package, having focused on repairing debt overhang in the public sector via issuing more debt for the public sector will fail just a year after its implementation, as Greece was facing a 15% to GDP deficit and a massive €42 billion bonds roll-over in 2010.

2) The Irish bailout of November 2010 that aimed to resolve the problem of banks insolvencies and government debt overhang through loading even more debt onto the shoulders of taxpayers will not last beyond mid-2013 with no hope for the Irish exchequer to renew borrowing from the markets any time before 2015.
3) Portugal will need a bailout of its own to finance unsustainable path of public spending and to shore up its own banking weaknesses.

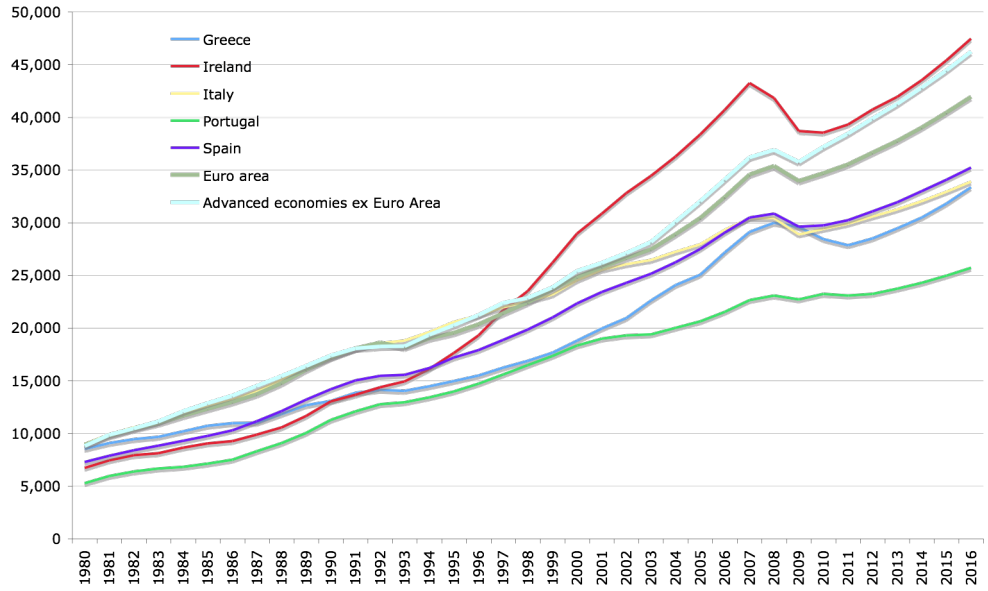
Meanwhile, the rating agencies continued to downgrade the three countries sovereign bonds, while also threatening downgrades on Spain, Belgium and Italy. As of June 2011, even France is facing negative watch listing by the rating agencies due to the emerging gap between its economic performance projections for 2011 and the reality of slower global growth.

4.1. PIIGS challenge of growth

There is much debate as to the appropriateness or the economic validity of the crisis focus on the peripheral countries of the Euro area, collectively known as the PIIGS (Portugal, Ireland, Italy, Greece, and Spain). The core data suggests that these countries, while heterogeneous, share some of the main characteristics of the crisis dynamics present across the Euro area at large.

The PIIGS have faced a similar deep deterioration in fiscal performance indicators during the current crisis, primarily driven by problems in private asset markets and banking. Structurally, the countries also have similarities in the processes that saw unsustainable long term deficit financing of public expenditure and declines in savings over time.

Chart 7. GDP per capita, PPP-adjusted, Current International Dollars



Source: IMF WEO April 2011 and author own calculations

As the chart above shows, with exception of Ireland, all PIIGS economies have failed to converge to the Euro area average level of per capita income. Broadly speaking, since

2003, two trends are pronounced in the peripheral economies of the Euro area. The first trend is the decoupling of the GDP per capita across the Euro area as a whole from other advanced economies[8]. The second trend is the divergence of the peripheral economies from those within the Euro area. Thus, for example, Greece had GDP per capita of ca 96.6% of the Advanced Economies (ex-Euro area) average in 1980, falling to 81.2% in 2008. The crisis has erased the gains made in the 2000-2006 period, leaving Greek GDP per capita at 76.5% of the Advanced Economies average in 2010. Italy started the 1980s with 102% ratio of its GDP per capita to that of the Advanced Economies, and ended 2008 at 79.1%. Portugal and Spain remained roughly on par with their starting points throughout the period of 1980 through 2008. Overall PIIGS average income per capita was at 83.5% of the Advanced Economies average back in 1980, falling to 79.2% by 1990, before rising to 89% in 2000 only to end at 80.4% in 2010.

4.2. The canary in the mine: what PIIGS fiscal positions tell us about the Euro area at large

As mentioned earlier, structural growth stagnation was not a unique feature of the PIIGS with the Euro area average income per capita falling from 101.1% of the average for Advanced Economies in 1980 to 93.4% in 2010. At the same time, Asia-5 economies of Japan, Korea, Taiwan, Hong Kong and Singapore have seen their income per capita rising from 62.8% of the Advanced Economies average in 1980 to 108.2% in 2010.

Slightly more complex, but equally troublesome picture arises in the context of the comparatives for structural internal and external balances.

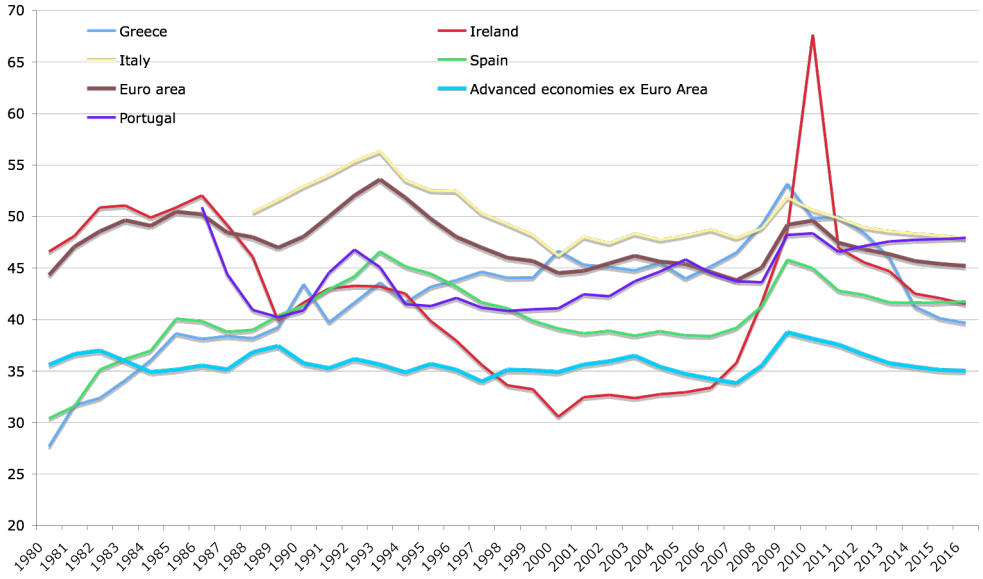
Using decades averages, we can compare gross savings rates dynamics across PIIGS, the Euro area, Asia-5 and Advanced Economies (ex-Euro area). In the decade of the 1980s, Greece averaged gross national savings of 19.1% of GDP, Ireland 15.5% of GDP, Italy 21.2%, Portugal 26.4 and Spain 21.2. Over the same decade, Asia-5 averaged gross national savings of 34% of GDP, Euro area of 22.3% and Advanced Economies – 25.0%. By the decade from 2000-2009, Greek savings rates have fallen to an average of just 12.2% of GDP, Ireland's having risen to 21% in the 1990s remained around 21.2% through 2000s, Italy's saving rates have fallen to 19.3%, Portugal's to 14.3%, while Spain's remained around 21.8%. Euro area average savings rate was running at around 20.9% in 2000-2009, against Asia-5 savings rate of 32.3% and the Advanced Economies' average of 24.5%. Controlling for savings accumulated in property finance in Spain and Ireland, all countries of the Euro area periphery had savings rates below those of the Euro area average and well below Advanced Economies average prior to the onset of the crisis.

The deterioration in gross savings positions across the PIIGS was contrasted by the relatively profligate performance by the PIIGS (again with exception, for the periods of the 1990s, of Ireland) in terms of Government Expenditure as a share of GDP. This is highlighted in Chart 8 below. In 1the 1980s, General Government Expenditure accounted for 35.4% of Greek GDP, 51% of Italian, 37% of Spanish and 44.1% of Portuguese GDP. These figures rose to 46.5% for Greek, 48.3% for Italian, 39.7% for Spanish and 44% Portuguese GDP in the period 2000-2009. If in the 1980s PIIGS average General Government Spending share of GDP stood at 40.9%, by the 1990s it was running at

44.1% and in ten years to 2009 it averaged 42.8%. Over the period 2010-2016 it is expected to average 46.2%[9].

A very similar picture emerges when one looks at the average General Government expenditure as a share of the economy across the Euro Area. Euro Area Government spending stood at 49.3% of GDP on average in the 1980s as compared to 36% across the Advanced Economies ex-Euro Area. By the 1990s these figures were 49.2% for the Euro area and 35.3% in the Advanced Economies. During the decade to 2009 Euro area General Government Expenditure to GDP ratio was 45.4% against the Advanced Economies average of 35.5%.

Chart 8. General Government Total Expenditure as percent of GDP

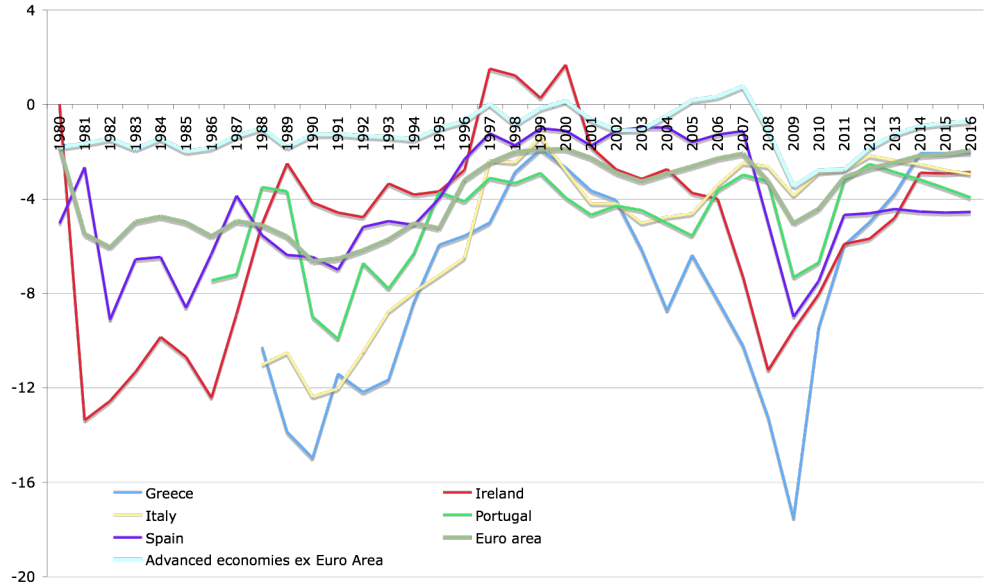


Source: IMF WEO April 2011 and author own calculations

The overhang of public spending relative to the overall economy across the Euro area and the PIIGS in particular was structural, as reflected in Chart 9 below. Structural deficits have become a persistent feature of these economies since 1980, with Ireland being the only country capable of achieving structural surplus in some years, namely 1997-2000. Even more striking is the fact that Euro Area and PIIGS structural deficits were deeper than those recorded in the Advanced Economies (ex-Euro area) in all years since 1980.

Overall, as chart 9 illustrates, Euro area economies have managed to live beyond their means for all, save three years over the last three decades. As noted above, these deficits did not go to finance capital investment, but were predominantly spent on permanent expansions of social services and other current spending programmes. Since the mid-1990s, the entire body of EU economic policy proposals represent one continued exercise in deploying public subsidies and incentives to specific sectors of economy. Be it the Lisbon Agenda, or the social economy, the 'smart' economy or the latest amalgamation of the past policy platforms published in 2010 under the heading Europe 2020, the EU has managed to achieve a virtually inseparable, continuous conception of state investment

Chart 9. General Government Structural Balance, percent of potential GDP



Source: IMF WEO April 2011 and author own calculations

and current expenditure. Thus, for example, Europe 2020 identifies as a form of investment social measures aimed at reducing income inequality, poverty, supports for 'social enterprises' and 'social innovation' and achieving social cohesion – the objectives, although undoubtedly noble in the their nature, best identified as social spending, rather than public investment[10].

The result of these and similar national-level policies was the overhang of debt – first, private, then, following the credit boom of the 2000s – also private.

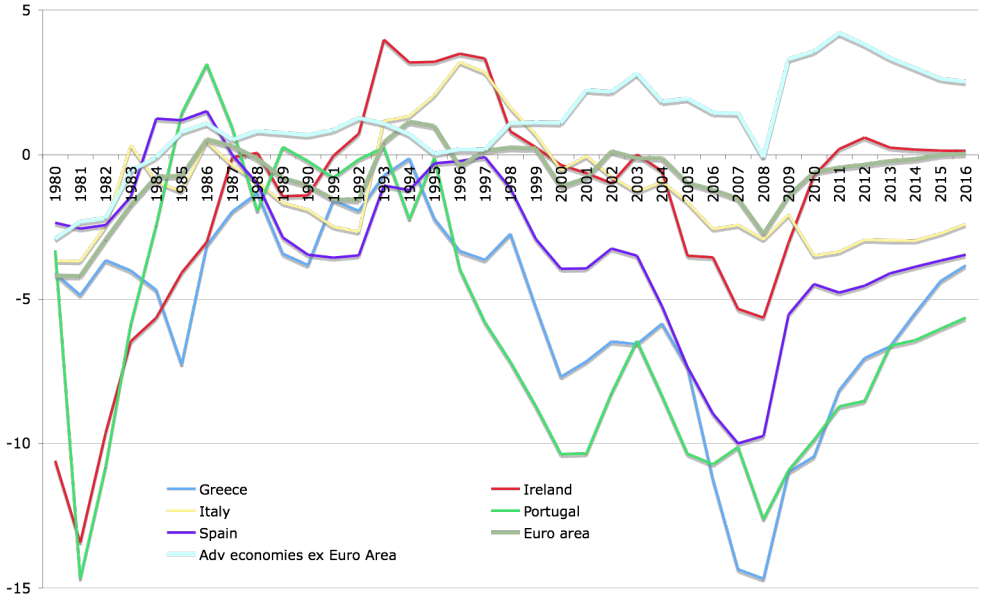
Greece, having started with 41.6% public debt to GDP ratio in the 1980s pushed its public debt to 105.3% average for the decade through 2009 and is set to see this ratio rising to 160-170% of GDP in 2013-2014. Ireland, having reduced its relative debt burden from 90.4% average for the decade of the 1980s to 35.3% in the decade through 2009 had seen its General Government Gross Debt skyrocket to 118% average for the period of 2010-2016. It is worth noting that in the entire period of declining debt/GDP ratios, Ireland has managed to reduce its nominal debt in only one year. Instead, the debt mountain inherited from the reckless fiscal policies of the 1980s was deflated via increases in GDP. Meanwhile, Italy had steadily accumulated public debt from 91.8% of GDP in the 1980s to 119.3% average for the years 2010-2016. In this context, Italy offers a clear example of what happens to the country once public debt reaches above 80-85% of GDP. Contrary to the arguments being advanced today by those who deny the existence of the insolvency crisis in the Euro area, the country with relatively healthy private sector can enter a debt trap and will have little chances of exiting it over the span of over 30 years.

Portugal and Spain saw their public debt burdens rising from 55.7% and 56.9% of GDP in the 1990s to 96.7% and 69% respectively for the years 2010-2016. Portugal's and Spain's debt levels, although appearing to be benign by comparison with the Euro area

averages, are however, underwritten by economies with structural growth and jobs creation weaknesses – the issue discussed above.

However, high public expenditure by the Euro area states coupled with high structural deficits, also led to overall increased burden on private economies. As Chart 5 earlier showed, the overall weight of public debt on private economy has risen from 108% of GDP in 1991 to the expected 172% of GDP in 2011. This wholesale 'dumping' of debt liabilities onto the shoulders of the private sectors required implicit transfers from the real economy to the public sector which is best illustrated through persistent current account imbalances, shown in Chart 10 below.

Chart 10. Current Account Balance, percent of GDP



Source: IMF WEO April 2011 and author own calculations

As Chart 10 above shows, while advanced economies ex-Euro area on average run current account surpluses every year between 1985 and 2007, majority of PIIGS run current account deficits over much of the years between 1980 and 2010. In particular, the situation deteriorated significantly in the years since 2000 as asset valuations bubble and low interest rates allowed financing of deep trade and payments deficits. Taking cumulated current account surpluses and deficits from 1980 through 2010:

- Greece cumulated net external deficits amount to 398.5% of GDP
- Ireland's cumulated net external deficits amount to 79.1% of GDP
- Italy's cumulated net external deficits are 30.6% of GDP
- Portugal's cumulated net external deficits add up to 409.5% of GDP
- Spain's cumulated net external deficits amount to 145.4% of GDP
- PIIGS average cumulated net external deficits stand at 174.4% of GDP
- Asia-5 cumulated net external surpluses are 81.1% of GDP
- Euro area cumulated net external deficits amount to 30.3% of GDP
- Advanced economies ex-Euro Area average net external deficits amount to 22.1% of GDP.

By all possible metrics of external sustainability, therefore, the PIIGS are simply more extreme examples of the very same disease that took hold of the Euro area at large and this disease is dependency on debt financing for public and private sectors development.

4.3. Greek fiscal crisis contagion to banking and economic crises

Overall, today, Greece finds itself in a deepest fiscal crisis ever experienced by a Euro area country since the World War II. Greek deficits currently are expected to decline 7.4% (in terms of net borrowing by the Government) from 9.6% in 2010, per IMF forecasts[11]. These forecasts, prepared prior to the ongoing acceleration in the crisis since the beginning of May 2011 are now considered to be extremely optimistic.

Greece's commitments under the EU/IMF rescue package passed in 2010 cover reductions in public deficits of ca 15% of the country GDP. New commitments, under the Budgetary changes passed in June 2011 and relating to the second bailout package, will add more austerity, and will push economic growth lower, while raising even further unemployment that is already touching 20% and within some demographic groups reaching to above 30%. Instead of resolving or even alleviating the problem of unsustainable public debt, the new 'solutions' will only exacerbate it. Based on the EU forecasts, even before the second bailout is factored in, Greek debts are expected to rise to €370.8 billion by 2012, or 161.1% of GDP. Interest payments on this debt alone will add up to 7.4% of the national income, swallowing €17 billion out f the austerity-linked forecast €30 billion savings[12].

In 2012-2014 Greece is facing the need to roll over some €192 billion worth of bonds and issue some €45 billion worth of new debt to finance its deficits (assuming the austerity metrics are met). With scheduled privatizations expected to net around €26.5 billion (an extremely optimistic figure), and with €43 billion of the first bailout funds still to be disbursed, Greek government will require total funding of some €122-125 billion in addition to the bailout of 2010[13]. It is worth noting that the EU plans for the second bailout expect a 30% private sector participation in the bailout burden – a figure that is highly unrealistic given that the EU expects voluntary basis for such participation and no Net present Value reductions in the overall debt levels.

These levels of disruption to the Greek economy are beyond any consideration of sustainability. Greek economy is 70% dependent on domestic demand for growth and the fiscal contraction of just 4.5% of GDP undertaken in 2010 has pushed the country economy into a renewed recession. More austerity is likely to see Greece GDP contracting by 4-5% in 2011 and 3-4% on average in 2012-2013.

In short, fundamentals suggest that Greece will remain on the default path post-2013, regardless of whether or not the country receives a new bailout funding. The reason for this is that Greek economy is now stuck in a debt trap, which is primarily concentrated on public debt, but is rapidly shifting onto private sector (via increased taxation and reduced public spending) and banking sector (via Greek banks' holdings of public debt and their increasing reliance on ECB financing). The debt trap is likely to get only worse with

time, as Greek debt matures and is rolled over into more expensive issuance. Greece's current average interest rate on its loans is around 4.25%, well below the 27% yields commanded by its bonds in the secondary markets. With growth of tax revenues held back by contractionary fiscal policies and tax increases, and with expected increases in the cost of funding from the ECB, the inter-bank lending markets and in the bond markets for the Euro area debt overall, Greece will face no prospect for reducing its debt to GDP ratio any time before the end of the second decade of the century.

The new bailout package, if successful in achieving private sector participation, is likely to shift the maturity profile of Greek debt into 2017-2020 period. Currently, the first peak of debt maturity for Greece falls onto 2014 (incidentally, similar to that of Ireland), with some €58 billion of long-term and €16 billion of short-term paper maturing. In 2015, almost €40 billion more of long term debt will come due. Re-profiling of this debt will likely shift it 3-5 years out (and in order to achieve voluntary participation necessary to avoid the CDS trigger, this will require preservation of the net present value of the debt via either increased coupon payments or increased principal amounts). It will also mean increased life-time costs of financing debt for Greek economy. Thus, the second bailout will not, in any way, resolve the debt trap problem faced by Greece, but will at the very best provide some liquidity to the economy.

Even this, already bleak analysis is dependent on extremely optimistic assumptions about Greek's ability to sustain the steep slope of fiscal austerity measures (remember that Greece had so far managed to fall short by some €1.2 billion of its budgetary targets for 2011 within the first five months of this year) and privatizations receipts.

4.4. Irish banking and economic crises as catalysts for fiscal collapse

In contrast to Greece, Ireland faced a different set of challenges at the onset of the crisis. Irish fiscal crisis that started in full in 2009 and continues to-date was driven by two major pressures – the pressure arising from the insolvency of the banking sector and the simultaneous insolvency of the Exchequer induced by structural economic imbalances.

Through 2007, Irish Government maintained a relatively healthy balancesheet with tax revenues continuously 'surprising' on the upside relative to the budgetary projections. This was lauded worldwide as a sign of robustness of the Celtic Tiger economy, but in reality, it concealed the nature of fiscal policies of the successive Governments that adopted a simplified 'When I have it, I spend it approach' to temporary revenue windfalls.

As Chart 9 clearly illustrates, no country in the PIIGS camp has lived within its means since at least the beginning of this decade and as Chart 8 shows, no country Government has lived within its means since the 1980s.

The difference, for Ireland, within the PIIGS group is that unlike Greece, Portugal, Italy and even Spain, the Celtic Tiger did produce spectacular growth that was based on a mixture of exogenous and endogenous factors (see Chart 7). That growth, stretching across the entire decade of the 1990s and, with some inertia, reaching into a good part of

the 2000s provides some hope for a recovery of the country fortunes, were it not for the excessive debt burden carried by the economy as a whole.

In 2007, the last year before the recession, Irish public debt to GDP ratio stood at just over 25%. A combination of rapid acceleration in unemployment (rising from 4.5% of the labour force in 2006 to 14.8% currently), sharply contracting GDP (see below) and the State absorbing private banking debt as public debt have resulted in the ratio rising to 96% of GDP by the end of 2010.

On the back of accelerated spending on social welfare and associated public health, Irish Government deficit rose from a surplus of 2.93% in 2006 and 0.05% in 2007 to a deficit of 7.34% in 2008. By 2009 the deficit sunk to 14.36% with banking sector supports accounting for roughly 4% of the increase between 2008 and 2009. In 2010, Government own deficit was around 11% and it registered a total deficit of 32.2% of GDP with the difference accounted for by banks demands for capital which were covered by the Exchequer.

Having implemented three consecutive budgets composed of cuts to capital spending, current spending re-allocations between various spending programmes, and massive tax increases, the Irish Government is now facing a projected 2011 deficit of 11%. In the five months through May 2011, Irish Government total net voted expenditure amounted to €18.364 billion, up 2.78% year on year and down just €700 million on comparable period of 2008. Spending on social welfare has risen in absolute terms 47.4% in Q1 2011 compared to the same period of 2008. Despite draconian tax increases which saw upper marginal personal income tax rate rising from 44% (inclusive of social security contributions) in 2008 to 59% (for some categories of earners) in 2011, total tax receipts for the first five months of 2011 stood at €12.8 billion, down 31.2% on pre-crisis 2007 and 5.4% on the mid-crisis marker of 2009. In the mean time, the burden of taxation has shifted dramatically. If in 2007 taxes on households (income and vat) amounted to 46.5% of total tax take, by 2010 this number rose to 54.4%. Business taxes (corporation tax and business share of vat) stood virtually flat, increasing marginally from 37.5% to 38.6%. At the same time transactions taxes that accounted for just under 16% of total tax receipts in 2007 fell to under 7.1% of total tax take in 2010.[14]

Currently, no serious analyst, including the IMF, expects the Irish Government net borrowing to achieve the 3% to GDP target set out for 2015-2016 under the EU-IMF bailout package agreed in November 2010.

IMF latest estimates, revised in late May 2011, show that Irish Government official debt will peak in 2013 at 120% of GDP. Using IMF own forecasts this adds up to just over €199 billion and is down from €208.7 billion projected for the same year by IMF in its April 2011 database. The revision reflects the results of the latest banks stress tests, the PCARs (Prudential Assessment Capital Reviews), published by the Irish Central Bank in March-May 2011.

In addition to these, Irish Government guaranteed ‘bad loans work-out vehicle’ Nama (National Asset Management Agency) has issued some €30.7 billion worth of bonds backed by our Government of which as of today €30 billion remain outstanding.

Although the Eurostat and IMF do not recognise these as Government debt (due to complex SPV ownership structure created explicitly for the purpose of keeping Nama liabilities off the Exchequer balancesheet), bonds rating agencies and markets participants do. And for a number of good reasons. Irish banks have already repoed their Nama bonds at the ECB/Central Bank of Ireland (CBI) as collateral for new debts they assumed. Should Nama fail to redeem these bonds, they will have to be covered either by the banks (under the current conditions this implies by the taxpayers) or by their guarantor (the State). As Nama generates cash flow, and assuming this cash flow is used to redeem bonds this quasi-Governmental debt will be reduced over time. By how much and when is the unknown. So until the repayments happen, with Nama factored in, Irish Government gross liabilities rise to €229 billion in 2013.

The IMF assessment of the Irish fiscal position issued on May 20 clearly states that under a possible growth shock scenario, ex-Nama debt to GDP ratio can reach 136 percent of GDP by 2016, or ca €229 billion. This shock scenario assumes average annual Irish GDP growth of 1.5% over 2011-2016 period down from the baseline scenario of 2.75%. Statistically, this decline represents just one third of a standard deviation for historical rates of growth, implying a relatively high probability of it materializing. Again, adding gross Nama liabilities pushes the total Governmental and quasi-Governmental debts to around €259 billion under this scenario.

There are other risks that at this stage should not be directly counted as our sovereign debt, but they should be kept in mind when the total debt sustainability is considered. In particular, banks recapitalisations factored into the IMF forecasts of May 20th are reliant solely on the Central Bank of Ireland assumed levels of required funding for the six domestic banks covered by the PCAR assessments of March-May 2011. These requirements are set at €24 billion with €5 billion set aside as expected to be sourced from private investment and subordinated bonds haircuts. The estimates cover the period of time from 2011 through 2013. The PCAR capital requirement estimates ignore any need for provision of banks capital post-2013 as the CBI assumes, rather optimistically, that the Irish banks will have full access to funding markets in 2013. Should this fail to materialize, there will be additional capital calls on Irish Exchequer.

The PCAR model assumes that the bulk of mortgages defaults and thus mortgages-related writedowns will take place in 2015-2018 and these are only partially covered by the €24 billion capital requirements set for the banks. Another unpriced risk arises due to accelerated deleveraging on banks balancesheets, which may require additional capital raising. At this point, one cannot assume that these losses, if they materialize, will be covered by the equity holders other than the State.

Lastly, there are massive debts accumulated by the banks (with all 5 of the Irish banks owned outright by the State and with the sixth bank – Bank of Ireland – likely to be majority owned by the State) under the Central Bank of Ireland-managed Emergency Liquidity Assistance operations (ELA). As of the latest data available, there are €49 billion worth of various loans outstanding under the ELA[15]. On May 30 this year, the Minister for Finance, Michael Noonan TD has solemnly promised the Irish Central Bank that "any shortfall on [these funds recovery] will be made good" by the Irish taxpayers. This, of course, begs a question: if the ELA funds are loss-free, why is the Minister for

Finance providing official statements of comfort to the Central Bank of Ireland?

Whether by Ireland's own design or by the interaction of complex forces of politics and economics (and I prefer the latter explanation to the former) we are now caught in an EU-wide crisis of unprecedented proportions. Instead of praying for a magic solution and sitting out this crisis, we need a credible plan to getting out of this mess. That plan must start with the analysis of the problems we face – the problems of debt overhang, not liquidity shortages, and of lack of real growth drivers.

Since the beginning of 2011, it is becoming increasingly clear that neither Ireland, nor Greece, nor the third current recipient of EU/IMF bailouts – Portugal - will be able to access external markets for funding post-2013, implying that Ireland and possibly Portugal will require another set of bailouts to be secured sometime around 2012. By then, Irish Government will have committed all its existent resources, including state assets, to cover its obligations under the November 2010 package.

There will be no where to hide at that point in time from the unpalatable prospect of a disorderly, unhedged default on sovereign debt.

5. From PIIGS to Brussels and Frankfurt: Contagion Cycle Completed

The bigger question in the context of the present crisis, however, is no longer the solvency of the PIIGS, but that of the entire Euro area. Reinhart and Rogoff (2011) provide evidence that the threshold for past default episodes is reached with the public debt of between 70 and 80 percent of GDP[16]. As noted above, with debt/GDP ratio in excess of 85%, Euro area is currently firmly in the danger zone for significant economic disruptions from the debt overhang. However, in addition to the official liabilities represented in the General Government Debt heading, Euro area countries also hold significant off-balancesheet exposures.

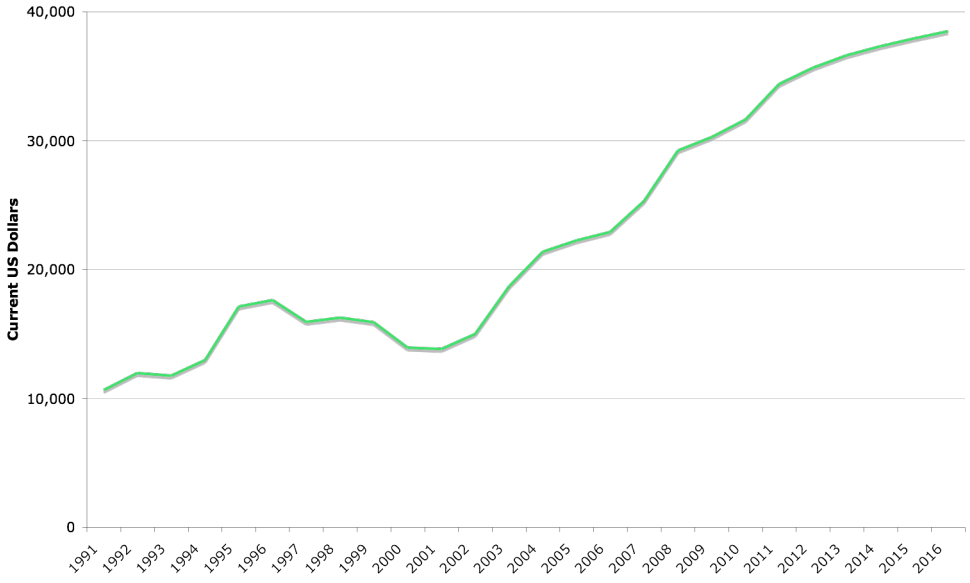
These exposures include:

- Various national banking deposits and liabilities guarantees
- Sovereign debt guarantees for Greece, Ireland and Portugal, and as the latest reports suggest, is about to underwrite Spanish debt as well[17]
- ESF, EFSF and ESM off-balancesheet special purpose vehicles created by the EU initially raised some €440 billion worth of additional commitments and direct liabilities, to be expanded to €750 billion in a post-2013 arrangement consolidating these off-balancesheet vehicles
- Banking sector liabilities across the EU continue to remain unresolved in terms of required writedowns. For example, in 2010, IMF estimated that the EU was well behind the US in terms of addressing the issue of impaired assets on banks balancesheets. Some reports in the press suggested that German Landesbanken system is hiding up to €800 billion (adverse scenario, admittedly) in bad debts[18]
- Extensive pensions and healthcare liabilities relating to the ageing demographics, and

- Substantial social welfare commitments that are difficult to unwind as population ageing sets in.

While the overall crisis sweeping across the Euro area today is undoubtedly related to the failures of the financial and monetary supervision and regulation, the core causes of the crisis lay elsewhere. Most notably, the crisis is related to the persistent rise of debt financing as the means for funding public sector expansions. In the context of the PIIGS, this aspect of the crisis has been covered above. However, during the last decade, public sector spending and investment boom across the Euro area was facilitated through lax monetary policy that was accommodative not of the private sector growth per se, but of the public sector revenues expansion in order to finance Government stimulus, investment and social spending. That this policy was conducive also to accumulation of debt is a corollary, not the cause of deficit financing.

Chart 11. Euro Area, Gross General Government Debt per capita, current US Dollars



Source: IMF WEO April 2011 and author own calculations

As shown in Chart 11, Euro area per capita general government debt rose from $ 10,638 in 1991 to $22,251 in 2005 and $31,641 in 2010. This increase can be broken down into broadly-speaking two periods.

The first period from 1991 though 2002 is associated (as shown in Chart 2) with rising cost of capital. Although flatter and more volatile, the period nonetheless saw per capita debt rising by 41% or 3.16% per annum. Over the same period of time, nominal GDP grew at an annualized rate of 1.62% per annum. In other words, public debt growth outstripped income growth by almost a factor of two to one even during the period of relatively high capital costs.

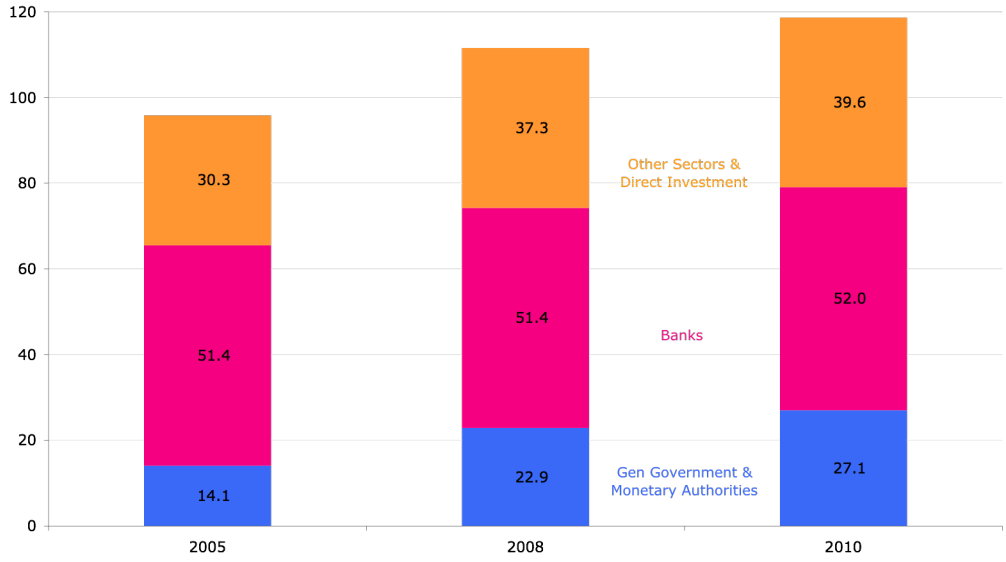
The second period started in 2003 and expected to be completed in 2011. During this period, incorporating the IMF projections for 2011, public per capita debt in the Euro

area is expected to rise at the annualized rate of 7.92% per annum while GDP per capita is expected to rise at the annualized rate of 5.31% per annum. Thus even accounting for the unprecedented debt crisis experienced by the Euro area member states today, there is virtually no change in the Euro area's appetite for debt. The distribution of public debt increases across the countries is also surprisingly wide. Between 2005 and 2011 (forecast), public debts increased by 8.8 percentage points (pps) in Finland, 9.9 pps in Austria, 10.7 pps in Slovakia, 11.2 pps in Luxemborugh, 12.1 pps in the Netherlands, 14.3 pps in Italy, 14.4 pps in Germany, 16.0 pps in Slovenia, 18.3 pps in France, 25.1 pps in Spain, 39.0 pps in Portugal, 57.4 pps in Greece and 84.7 pps in Ireland[19].

Overall, over the 25 years between 1991 and 2016, expressed in current US dollars per capita terms, Euro area's Government debt is expected to grow at an annualized rate of 5.28% against the GDP growth of 3.81%. Using IMF data, per capita public debt is expected to rise to $38,474 by 2016, implying that an average employed Euro area household can be expected to bear direct public sector liability of ca €190,000.

In addition to the Government debt, deficit financing of public spending and investment, coupled with relatively volatile (compared to other advanced economies, as per Chart 8 above), but historically flat high share of Government expenditure to GDP (excluding growing transfers to and from the EU by the member states) has led to continuously accumulating external deficits (Chart 10). The end result was a significant increase in total private and public sector indebtedness of the Euro area economies. Euro area's total external debt rose from 95.8% of GDP to 118.7% of GDP between 2005 and 2010, with most of the increase accounted for by the externally held General Government Debt and non-banking Private Sector debt (see chart 12).

Chart 12. Euro Area Total External Debt Composition, % of GDP



Source: IMF WEO April 2011, Bank for International Settlements, and author own calculations

If the debt overhang, across either public, private or banking sectors or any combination of these sectors is the core crisis faced by the Euro area, the only sustainable solution of this crisis will require a reduction in the net present value of future debt liabilities of the member states.

Such a write-down of the debt can be carried out either through a combination of involuntary haircuts on some private debts or via a monetization of the public debt or a combination of two, depending on specific debt conditions in the member state.

For example, in the case of Ireland, the lowest cost solution will involve applying significant haircuts and debt-for-equity conversions for banks bonds, plus a direct writedown of some of the emergency liquidity supports extended by the ICB and ECB. The total amount of writedowns through the system for Ireland should be around €40-50 billion, broadly in line with expected losses in the system through cycle. The existent sovereign debt, plus additional commitments required to sustain public deficits reduction to sustainable levels should be set at maximum of 95% of GDP through at least 2015, implying the need to monetize some €30-40 billion of sovereign debt. The net exposure of the Euro systems to such a repair of the Irish balancesheet will be limited to around €15-25 billion on the banking side, with the balance coming out of the private sector participation, plus sovereign debt monetization.

In the case of Greece, maintaining Greek membership within the Euro area will require sovereign debt writedowns/monetization of at least 50% of GDP, implying a net cost of ca €120 billion. In the case of Portugal, the cost of repairing the country balance sheet should not exceed 20% of GDP of ca €35 billion in order to allow gross debt to GDP ratio to remain stable over the next 4 years. Lastly, Spain's cost of restoring fiscal and financial sustainability will require a ca €20-50 billion of writedowns against banks liabilities, which can be delivered via the same instruments as those in the case of Irish banks, plus ca €110 billion in fiscal commitments.

The total cost of the financial measures required to stabilize Euro system will amount to ca €320-355 billion with Greek repairs or €200-235 billion absent Greek repairs[20]. A combination of banks guarantees and tax offsets can be used to further reduce the costs of banking sector writedowns in Ireland and Spain.

Bibliography and notes

[1] Michel Crouhy (2010) 'Risk Management Failures During the Financial Crisis', Federal Reserve *Bank of Chicago,* www.maths-fi.com/dossier-crise-financiere/Fed-Chicago-012609.pdf

[2] Major Coleman IV, Michael LaCour-Little, Kerry D. Vandell (2008) 'Subprime Lending and the Housing Bubble: Tail Wags Dog?' Working Paper: The Paul Merage School of Business, University of California, Irvine, April 2008

[3] Moody's Analytics (2010) Market Forces: Foreign Direct Investment Recovers, July 30, 2010: http://dismal.com/dismal/article_free.asp?cid=191885&src=dismal-advert-a&tid=098264A2-DEA7-4A66-85CA-B70E998693B8

[4] IMF WEO database, April 2011
[5] Author calculations based on the IMF, WEO Database projections, April 2011.
[6] Author calculations based on the IMF, WEO Database projections, April 2011.
[7] RBC Capital Markets (2011), see http://blogs.wsj.com/marketbeat/2011/06/15/greece-ireland-portugal-who-holds-the-debt/
[8] For more on Ireland's relative performance and core drivers for growth prior to the crisis, see Constantin Gurdgiev, Brian M. Lucey, Ciarán Mac an Bhaird and Lorcan Roche- Kelly: The Irish Economy: Three Strikes and You're Out? Panoeconomicus 2011 Volume 58, Issue 1, Pages: 19-41
[9] Forecasts from IMF WEO April 2011 database
[10] European Commission (2010) 'A Rationale for Action' Commission Staff working document accompanying the Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, Europe 2020 Flagship Initiative Innovation Union, Brussels, 6.10.2010 SEC(2010) 1161
[11] IMF WEO database, April 2011
[12] EU DG for Economic and Financial Affairs (2011), 'The Economic Adjustment Programme for Greece Third Review – Winter 2011', February 2011
[13] EU DG for Economic and Financial Affairs (2011), 'The Economic Adjustment Programme for Greece Third Review – Winter 2011', February 2011
[14] All data: Department of Finance, Monthly Exchequer Statements and author own calculations based on official data
[15] Central Bank of Ireland, monthly statistics database, May 2011
[16] Carmen M. Reinhart, Kenneth S. Rogoff (2011) 'A Decade of Debt', NBER Working Paper No. 16827 February 2011. http://www.nber.org/papers/w16827
[17] FT Deutschland (2011) EU rüstet sich für Griechen-Pleite, http://www.ftd.de/politik/europa/:schuldenkrise-eu-ruestet-sich-fuer-griechen-pleite/60070059.html
[18] Financial Times (2010) 'Is the eurozone insolvent?' by Wolfgang Münchau, 25/05/2010
[19] Der Spiegel based on European Commission data: http://www.spiegel.de/fotostrecke/fotostrecke-69417.html
[20] Note: the values of banks debt writedowns reflect full face value of the debt, with discounts assumed to be directed at repairing the banking sector balancesheets. Any discounts on sovereign bonds monetizations will be offset by the need to at least partially compensate domestic and foreign holders of the government bonds.