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Adjustment Difficulties in the GIPSY Club

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(Preliminary version)

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Abstract

This paper describes the key economic variables and mechanisms that will determine the adjustment process in those euro area countries now under financial market pressure. (Greece, Ireland, Portugal, Spain and ItalY = GIPSY)

The key finding is that the adjustment will be particularly difficult for Greece (and Portugal) because these are two relatively closed economies with low savings rates. Both of these countries are facing a solvency problem because they combine high debt levels with low growth and high interest rates. Fiscal and external adjustment is thus required for sustainability, not just to satisfy the Stability Pact. By contrast, Ireland and Spain face more of a liquidity than a solvency problem. Italy seems to have a much better starting position on all accounts.

Fiscal adjustment alone will not be sufficient to ensure sustainability. Without significant reductions in labour costs, these economies will face years of stagnation at best. Especially in the case of Greece, it is imperative that the cuts in public sector wages are transmitted to the entire economy in order to restore competitiveness, and thus ensure that export growth can become a vital safety valve.

Without an adjustment of wages in the private sector, the adjustment will become so difficult that failure cannot be excluded.

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Strategic background

The general post-crisis background in Europe today is not too different from the busts that have followed other credit booms. The key characteristic of a boom is the expansion of leverage (i.e. private debt).[1] The key characteristic of the subsequent bust is the explosion of public debt as private debt cannot be serviced. The economies of Ireland and Latvia (and to some extent Spain) offer good examples of this trend: in both countries public debt was not an issue prior to the crisis (then only about 25% of GDP in Ireland and close to zero in Latvia). The crisis has changed this radically: by 2011 public debt in Ireland is expected to reach 95% of GDP and 60% of GDP in Latvia.

Within the euro area, however, it is no longer possible to make such a clear distinction between public and private debt given that no euro area country has access to the printing press (which is the element that makes government debt risk free in nominal terms in countries with their own currency). The cases of Greece and Portugal illustrate this point. Their governments borrowed heavily on international capital markets to finance unsustainable consumption booms. The public debt of the peripheral euro area countries has thus more of the characteristics of private debt in the general case. Only the public debt of the core countries with solid public finances (essentially Germany) remains public debt in the sense in which the term is usually used, namely the one kind of debt that is riskless.

What is thus happening in the euro area is the age-old process whereby creditors put pressure upon the strongest debtors (the euro area core governments) to support the weaker debtors (banks, euro peripheral countries). If history serves as any guide, this pressure will prevail because the alternative is perceived to be a potentially disruptive breakdown in markets and hence further delay in the recovery.

In this sense Europe seems destined to repeat the classic bust scenario in which private debt becomes public debt of the core countries. However, the willingness and ability of the core countries to accept this burden have their limits. Hence one needs to prepare for the second stage of crisis, namely an increased danger of sovereign default. This danger is likely to persist for some time. The perceived need to take immediate action on the particular case of Greece should not constitute an excuse not to act on this longer-term strategic problem.

The GIPSY (Greece, Ireland, Portugal, Spain, ItalY) club is in reality quite heterogeneous, but as markets sometimes lump them together (at least the first four members), data will in general be provided for all five members.[2] Portugal and Greece share a key feature, namely an extremely low rate of national savings, which implies that they have to rely continuously on

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[1] See Alcidi & Gros (2009).

[2] This acronym seems better than the 'PIGS' used in some financial market circles.

large inflows of capital to finance consumption.[3] By contrast, Ireland and Spain have much higher savings rates, but are more exposed to financial markets because their construction booms went hand in hand with a huge expansion of financial activity. In short, for Greece and Portugal the problem is insolvency; for Spain and Ireland illiquidity. Italy seems different from both these subgroups in that its savings rate is higher than even in Ireland and Spain and its foreign imbalances are much smaller. With a rather conservative financial sector, it should be able to weather the storm quite well.

Key obstacles for a successful adjustment

The reminder of this note analyses three aspects that will determine the adjustment process in Greece and the other Southern euro area member countries. A first aspect is the impact of the fiscal adjustment on demand and hence output, which leads to lower tax revenues, thus potentially creating a vicious circle. Section 2 deals with another aspect which will come to the forefront over time, namely the impact of the higher risk premia on investment and consumption in Greece and other countries affected by the crisis. Are these premia justified? Given the current combinations of high-risk premia, low growth and very high external debt levels, Section 3 shows that the doubts about the sustainability of the external position of Greece and Portugal are justified.

The case of Argentina is also referred to in parallel because the way in which this country slid slowly towards default is very instructive: it shows the economic/political mechanisms that produced a disaster. Argentina thus provides a cautionary tale of what can go wrong (see box below).

Box 1. The Argentine debt saga

By 1998, Argentina appeared to constitute a success story. The tight 1:1 link of the peso to the USD had apparently brought stability. Growth had rebounded strongly after the 'Tequila' crisis of 1995, averaging over 6% for three years. Fiscal policy was at first sight[4] well behaved with a deficit around, but usually below 3% of GDP. A current account deficit had developed, but at 3-4% of GDP it seemed manageable, especially since it was entirely covered by FDI (thus not creating any debt). However, starting around 1998 this honeymoon period came to an end as the Federal Reserve increased interest rates and risk aversion in international financial markets increased with the Russian debt crisis. Between 1998 and 2000 Argentina entered a period of a crisis which worsened over time as a vicious circle developed between increases in the risk premium, the need for stronger fiscal adjustment and a deteriorating growth outlook. Three IMF programmes failed to break this circle although they were designed to exactly achieve this and could not stave off the eventual default at the end of 2000 (see Gros &.Mayer, 2010). In the two years leading to the default, real GDP fell by about 4%.

1) On the feasibility of a huge fiscal adjustment

The problem facing Greece could be described as the need for a very large fiscal adjustment without a safety valve. Several factors explain why it will be difficult:

1. The pure Keynesian multiplier is likely to be high (because the savings rate is low, as also is the degree of trade openness).

[3] See Gros (2010).

[4] The numbers also had to be adjusted frequently given the lack of proper accounting of expenditure at the level of the powerful provinces.

2. The low degree of trade openness means that higher exports cannot provide a strong offset to lower domestic demand.
3. The elevated risk premium on external debt is being transmitted to the entire domestic economy, thus providing an additional shock equivalent to an interest rate increase of about 300 bps.

Portugal has in most respects very similar characteristics, but in a somewhat attenuated form (somewhat higher degree of openness, slightly less dependence on foreign capital).

A first benchmark for the cost of the fiscal adjustment in terms of output fall can be obtained using the standard fiscal multiplier. To keep things simple, we follow the simplest Keynesian macro model imaginable: an open economy, where exports are determined by foreign demand (and hence exogenous in the short run) and imports vary proportionally with domestic income.

Table 1. Simplistic Keynesian multipliers

Country	Keynesian multiplier: 1/(1-c+m)=1/(s+m)	Excess deficit (actual 2009 – 3%)	Impact of fiscal adjustment on output relative to baseline, in %
Greece	2.5	9.7	-24.6
Italy	1.5	2.2	-3.4
Spain	2.0	8.2	-16.5
Portugal	1.7	5.0	-8.2
Germany	0.6[5]	0.4	-0.2
Ireland	1.3	9.5	-12.6

Note: The marginal savings rate, s, is computed as the ratio of the increment in private savings relative to the increment in GDP over the period 2002-07; similarly the marginal propensity to import, m, is computed as the ratio of the increment in imports relative to the increment in GDP over the same period.

Source: AMECO.

The impact of the fiscal adjustment on output in all countries in the GIPSY club, except Italy, is clearly so large as to be politically unfeasible. This judgment would not change even if one takes into account that the adjustment would be stretched over a number of years (three in the case of Greece) and that one should adjust the numbers in the last column for the cumulative effect of trend growth over this period. For Greece, even assuming a trend growth rate of 3% per annum, the overall predicted fall in GDP would still be around 15%.

In the standard approach of assessing the effect of fiscal stimuli, large multipliers are seen as 'magnifiers' of fiscal policy measures and are therefore welcome. However, large multipliers also imply that the effect of fiscal cuts is going to be larger. Greece exhibits the largest multiplier as it is the country with the lowest level of savings rate (12% on average, compared to 24% in Germany), while Ireland is the country with the smallest. The latter is largely driven by the very high level of imports-to-GDP ratio rather than a high propensity to save.

In the last column of Table 1, Greece stands out as the country with the largest impact of the fiscal adjustment on GDP, resulting from a combination of the largest multiplier and largest

[5] Note that in the standard Keynesian model the multiplier is always larger than 1 ($s+m\leq 1$), yet according to our estimates Germany's marginal propensity to import is so high (in fact, over the period considered, both increments in imports and exports are higher than the increment in GDP) that the multiplier turns out to be smaller than 1. See Annex A for multipliers based on average propensities.

adjustment need. Ireland has a similar fiscal adjustment need, but the impact on output should be somewhat smaller ('only' about 13%) given that Ireland is a much more open economy. The simplistic multipliers used here exaggerate the severity of the recession that would follow the fiscal adjustment required by a strict adherence to the Maastricht criteria, but they imply that the official EU convergence programme for Greece of February 2010, which is based on the assumption that GDP growth will be positive during the entire adjustment period, is not realistic.

Overall Table 1 suggests that the fiscal adjustment required in the GIPSY group would have such a large negative impact on output that it might well be politically impossible. This might be the reason why financial markets continue to harbour doubts about the sustainability of public finances of these countries.[6]

2) The impact of higher risk premia

The impact of the increasing sovereign risk premium is not likely to remain limited to the cost of public debt, but it will affect the cost of capital for the private sector as well.

There are several dimensions to take into account,[7] but the key element is simply the resource constraint for the entire economy. If the government tries to achieve a deficit reduction by cutting transfer spending or increasing taxes, households and enterprises have to cut back either consumption and investment (illustrating the Keynesian effect discussed above) or they can try to borrow more. However, in this case they will have to borrow abroad since domestic savings are not sufficient. Moreover, households would have to go through the domestic banking system, which might not be able to extend further credit because its capital base has been weakened by substantial mark to market losses on its holdings of government debt. Moreover, for international financial markets the rating (and thus risk premium) of the sovereign is usually the benchmark applied to private-sector entities of that country. This implies that Greek banks or large companies are likely to have to pay an even higher risk premium. Hence the increase in the cost of capital for the government is likely to be transmitted to the entire economy with a further negative impact on investment and consumption demand.

How important is foreign capital for the GIPSY group? Figure 1 shows the ratio of the current account balance to the total amount of savings available for the economy, namely the sum of (gross) national savings plus the current account. This measure of the reliance of the country on foreign capital places Greece again in the most delicate position as it is the country that depends the most on foreign borrowing. The increase in the risk premium on Greek government debt is thus likely to permeate throughout the entire economy.

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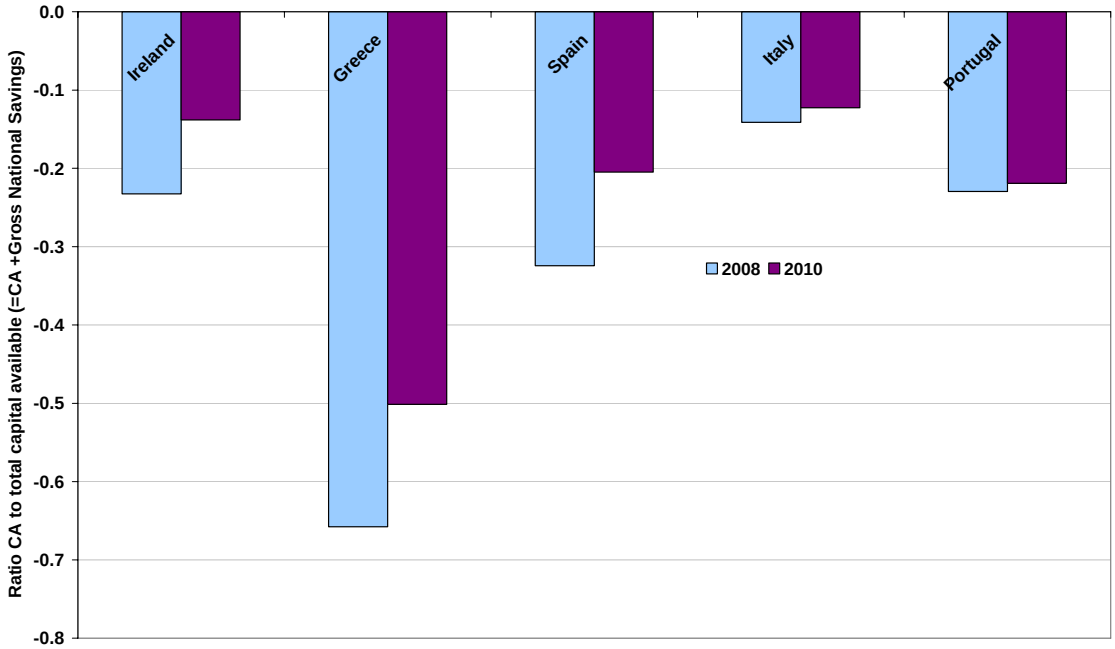
[6] Even though the state of public finances is at the centre of the discussion, Greece suffers from a twin deficit disease, and large current account deficits (well known to the market) must be reduced as well. Yet this requires a change in the behaviour of the private sector that cannot be controlled by the Government. Annex B shows that under the assumption that import behaviour stays unchanged and no improvement in competition materializes, the fall in GDP induced by fiscal austerity will reduce imports but may be not sufficient to substantially absorb the existing deficit.

[7] According to the textbook approach, in an economy where government debt is held by residents and the Ricardian equivalence does not hold, an increase in the return on government bonds (which are wealth for households) results in higher consumption, regardless of the reasons of the increase. On the contrary in a Ricardian economy, because the expectation of higher future taxes is discounted immediately, no effect on the consumption should be observed. However, reality differs in one crucial aspect from the assumptions in textbooks: Greek public debt is held mainly by foreigners. Hence, the entire discussion about Ricardian equivalence is beside the point for countries such as Greece and Portugal where the government deficit was financed by capital inflows.

Figure 1. Reliance on foreign capital



Source: AMECO and own calculations.

3) Are risk premia justified? Threats to external and internal sustainability as boom turns to bust

How to assess the sustainability of the external debt position of a euro area member?

A first point is that ratios to GDP provide little information on sustainability because external debt has to be serviced via exports (and tax revenues if public). The following table therefore shows three indicators of the sustainability of external debt for Greece and some members of the GIPSY club (as of 2008) as well as Argentina (1999).

Table 2. Gross foreign debt

	Gross foreign debt (2008)		
	% GDP	**% Exports**	**% Tax revenue**
Greece	147	659	422
Portugal	215	635	570
Spain	156	581	471
Italy	117	406	273
Pro memoria: Argentina (1999)	52	529	658

Sources: IFS, AMECO, WEO and own calculations.

In the short run, gross debt is the decisive variable because this is the amount that has to be serviced and refinanced (often at much higher rates).

It is apparent that on the first, standard, indicator, Greece and Portugal appear to be in a much worse situation than even Argentina since their debt-to-GDP ratios (between 150 and above 200% of GDP) are much higher than that of Argentina in 1999, two years before it defaulted.

One could argue that net debt might be the more important concept in the longer run. On this account, as shown in Table 3, the indebtedness of most countries appears to be much smaller.

Table 3. Net foreign debt

	Net foreign debt (2008)		
	% GDP	**% Exports**	**% Tax revenue**
Greece	69	312	200
Portugal	77	228	204
Spain	74	276	224
Italy	28	96	65
Pro memoria: Argentina (1999)	0.3	2	80

Sources: Idem

However, one should keep in mind that Argentina had very little net external debt prior to its crisis (see Table 3). This is not surprising given that Argentina had not run large current account deficits prior to the crisis (deficits of the size observed within the euro area would anyway not have been financed by international capital markets). However, its government had borrowed heavily from international capital markets whereas its citizens had preferred to send their money abroad rather than paying taxes at home. Argentina defaulted because the government was not able to tax the wealth its citizens had squirreled abroad. The Greek government might find itself soon in a very similar position. This is why the gross debt figures are the more relevant ones in a time of crisis.

It is often remarked that until recently financial markets seemed to provide Greece with ample financing, although its current account deficits and the approximate size of its public debt were well known. However, this was during a period when Greek GDP was growing in nominal terms by over 7% and nominal (long-term) interest rates were between 3.5 and 4%. With the nominal growth rate 3 percentage points higher than the interest rate, sustainability was not an issue. However, the situation has how changed radically. The interest rates paid by the Greek government and also its private sector, as illustrated below, have gone up to over 6% due to the increase in the risk premium on Greek sovereign bonds while nominal growth rates going forward have plummeted to below 2% p.a.. Table 4 below shows the growth rates expected by the European Commission up to 2011.

Table 4. The evolution of a key factor for sustainability: Growth rates of nominal GDP

	Annual average values		**Difference boom to bust**
	2003-07	**2009-11**	
Ireland	7.5	-2.9	-10.4
Greece	7.4	1.5	-5.9
Spain	7.3	-0.6	-7.9
Italy	3.5	1.1	-2.5
Portugal	3.7	0.4	-3.3

Source: Own calculations based on AMECO data.

In Greece the growth rate of nominal GDP has fallen by about 6 percentage points (from 7.4% p.a. before the crisis to 1.5% p.a. now). Given that nominal risk-free interest rates have not changed much, but the risk premium has increased by over 3 percentage points this implies that the differential between the growth rate and the interest rate has deteriorated by over 9

percentage points, from almost plus 4% to below minus 5%. Here again Greece seems in a worse situation than most other members of the GIPSY club.

Sustainability of public finances requires that the primary deficit is large enough to offset the so-called 'snowball effect'. In this respect, the situation has changed radically. During the boom phase, i.e. until 2007 the growth rate of nominal GDP was for Greece at 7.4 more than 3 percentage points higher than the cost of public debt (around 4.1% on 10-year government bonds during that period). The government could thus run a primary deficit of 3-4% of GDP and still keep the debt-to-GDP ratio constant.[8] However, with the bust came much lower growth prospects after the crisis and a much higher risk premium. Greece is now paying 6-6.5% on this government debt, about 5 full percentage points more than nominal GDP growth, which is now expected to be only 1.5%, as shown in Table 4. This implies that Greece now needs to have a primary *surplus* of 6% of GDP just to keep the debt-to-GDP ratio from increasing even further. The total swing in the primary balance required just to maintain sustainability is thus about 10% of GDP. The adjustment required by the EU is therefore not needed merely to satisfy the parameters of the Stability Pact, but they are necessary in any event to put Greek public on a sustainable path.

Table 5. Primary balance adjustment required to offset snowball effect

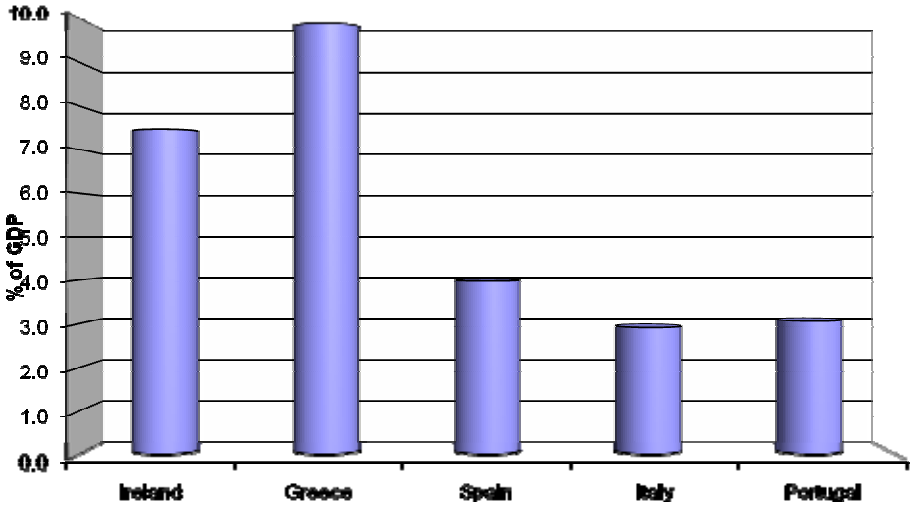
		Snow ball effect		Difference Boom to Bust
	Debt/GDP (2009)	Boom: 2003-07	Bust: 2009-11	Primary balance adjustment required to offset snowball effect (% GDP)
Ireland	0.6	2.2	-5.3	7.4
Greece	1.2	3.9	-6.0	9.9
Spain	0.5	1.7	-2.3	4.0
Italy	1.13	-0.7	-3.6	2.9
Portugal	0.75	-0.2	-3.3	3.1

Source: Own calculations based on AMECO data.

The overall adjustment in the primary balance required to offset the deteriorating snowball effect is shown for all the countries in question in Figure 2.

[8] The exact level of this ratio is difficult to pin down given the repeated massaging of the figures, but this does not matter in this context.

Figure 2. Boom to bust: Change in primary fiscal balance required to keep debt ratios from increasing

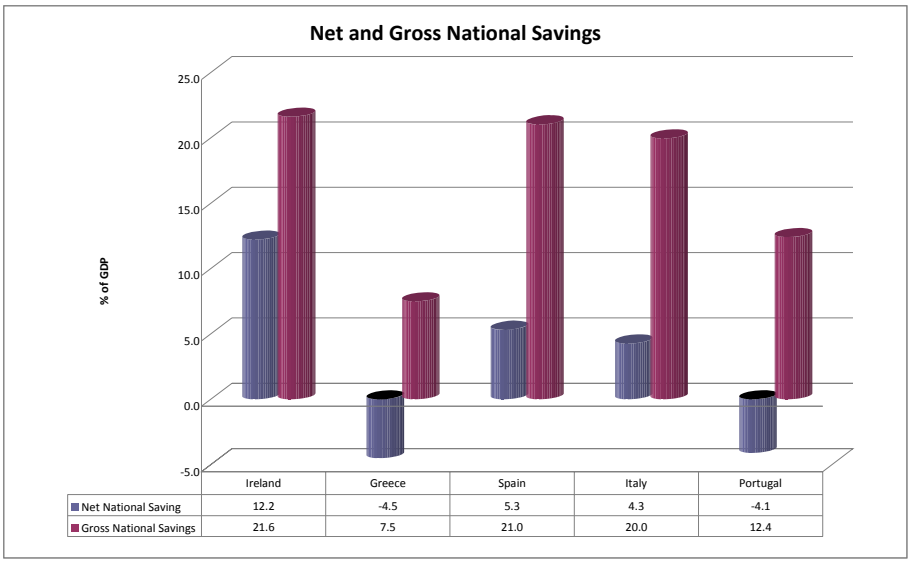


Source: Own calculations based on AMECO data.

Another important factor impinging on sustainability which is not pursued here is the question of whether the build-up of debt was used to finance investment or consumption.

In the case of Greece and Portugal, it was mainly consumption, as can be seen from their low national savings rates.

Figure 3. Net and gross national savings as % of GDP in 2007



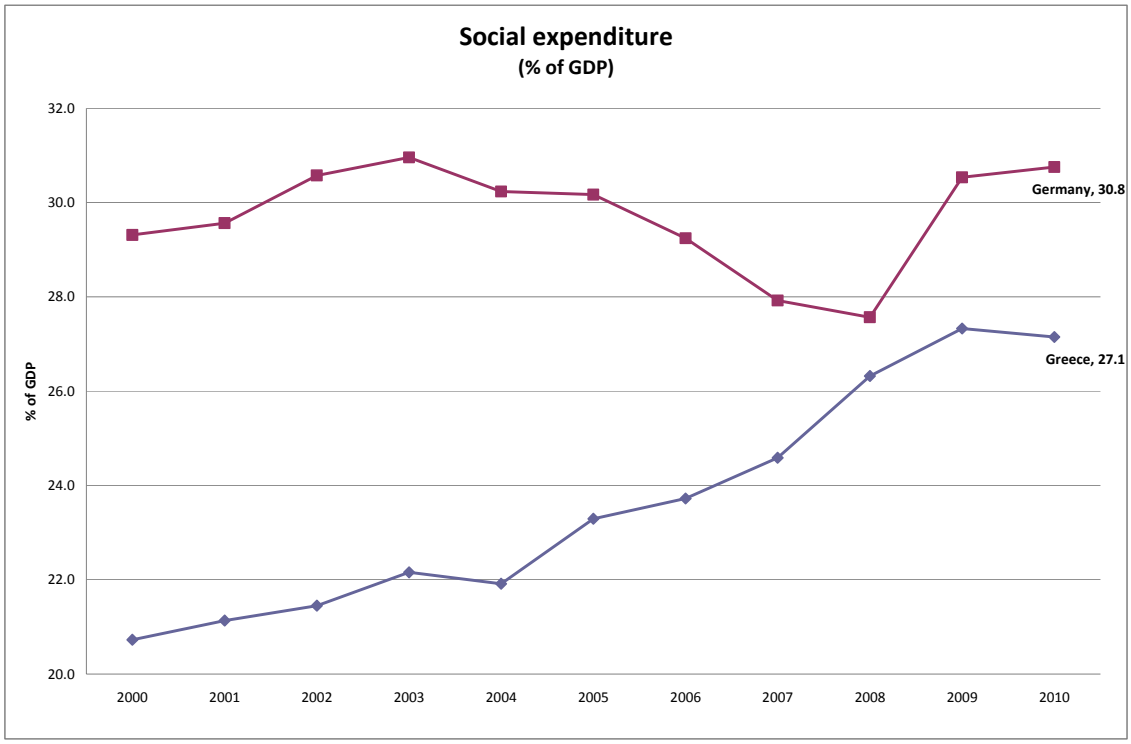
Source: AMECO

Indeed, as Figure 3 shows, the net national savings rate of Greece and Portugal were substantially in negative territory and the gross savings rates in single digits, while the other members of the GIPSY group have positive net savings rates and much higher gross rates as well. The external deficits of Portugal and Greece were thus not due to particularly high

investment rates (as in Spain and Ireland), but due to the fact that the increase in consumption over the last decade could not be financed out of current production.

How would Greek households finance their consumption boom? Partially at least from an extraordinary increase in public sector social expenditure, which doubled in nominal euro terms since the introduction of the euro, bringing the share of social expenditure from 20% of GDP in 1999 to close to 30% in 2007. By contrast, as shown in Figure 4, public sector social expenditure in Germany has always been higher, but was on a declining path since the reforms started in 2003.[9]

Figure 4. Social expenditure as % of GDP



Source: AMECO.

In the cases of Spain and Ireland, both of which have much higher national savings rates than Greece, the foreign debt financed mainly an excess of housing investment.[10]

The factors discussed here have nothing to do with the often-heard view that in a monetary area "current accounts do not matter". It is clear that within the euro area the current account of member countries does not matter in the classic sense. However, the current account still expresses the mismatch between savings and investment. Short-term deviations from the equilibrium between these two macroeconomic variables have indeed no significance in a monetary union. Yet sustained current account deficits lead to a build-up of debt, which might become unsustainable.

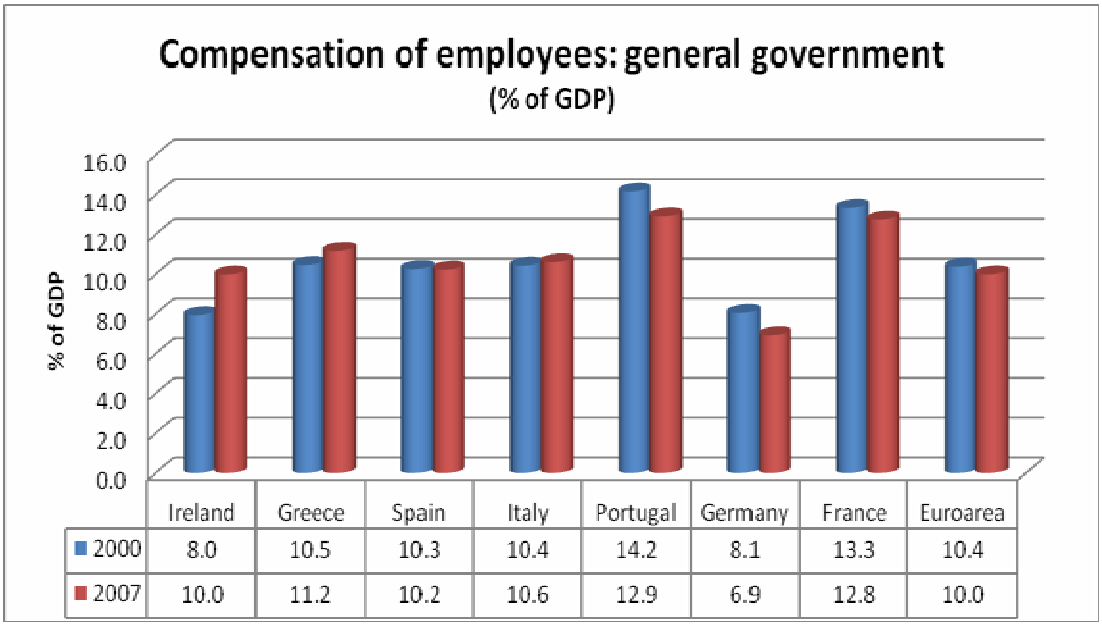
9 Under the impact of the economic crisis, however, there has been a noticeable increase in Germany more recently.

10 See Gros (2010).

Box.2. Compensation of employees and adjustments

Public sector wages are currently among the most (un)popular target of the adjustment programmes throughout Southern Europe, and particularly in Greece. According to a widespread perception, the cost of government employment should be the root cause for the increase in public expenditure and thus the deficits. However, closer inspection of the data does not corroborate this view. In particular in the case of Greece, the cost of public sector employment (measured by the total compensation of public employees) absorbed 'only' 11.2% of GDP in 2007, not much higher than in 2000, and not far from the euro area average (see the table below.) In this respect Portugal does much worse. Within the euro area, Germany and Portugal thus constitute the two outliers. The former registers the lowest score and a declining trend, whereas in the latter (Portugal) compensation of employees constitutes almost 13% of GDP.

A key conclusion from these numbers is, however, that compressing the cost of public sector employment can only constitute a fraction of the overall fiscal adjustment. Starting from about 11% of GDP, even a massive cut would yield savings worth 2.2% of GDP. This is less than a quarter of the total adjustment of 10 percentage points of GDP required by Greece. This is not surprising since compensation of public sector employees constitutes less than a quarter of total government expenditure almost everywhere. Of course, in the case of Portugal, the contribution from cutting public sector wages could be much higher.



	Ireland	Greece	Spain	Italy	Portugal	Germany	France	Euroarea
2000	8.0	10.5	10.3	10.4	14.2	8.1	13.3	10.4
2007	10.0	11.2	10.2	10.6	12.9	6.9	12.8	10.0

Source: AMECO.

Given the dependency on foreign capital for many members of the GIPSY club, a fiscal adjustment alone is not sufficient. Foreign capital has become scarcer also because financial markets recognise that it is not only the internal fiscal position of the government that has become untenable as the boom has turned into a bust. The same applies also the external position of the country as a whole. The key for external sustainability is the difference between the interest paid on foreign debt and the growth rate of exports. As usual, the situation appeared quite comfortable during the boom, when exports were growing at a rate even slightly higher than GDP (and interest rates were low). However, the constellation has now reversed: export

growth is likely to remain anaemic since the major export market is the eurozone whose growth prospects are not encouraging.

Table 6 shows by how much the trade balance would have to adjust to maintain external debt constant (and thus at the very high level as shown above).[11] Here again Greece stands out as having the largest adjustment need at around 7.5% of GDP. *Ceteris paribus*, this would require a huge compression of domestic demand.

Table 6. The external adjustment required as boom turns to bust

Hp: Fall in export growth rate (Δe_t) =4%		
	Risk premium (π)	**Adjustment in trade balance-to-GDP: $\Delta(TB_t/Y_t)$ required for sustainability**
Greece	3	7.5
Portugal	0.5	4
Spain	1.3	6
Italy	0.8	2

Source: Own calculations based on AMECO data.

This analysis of the requirements for internal (fiscal) and external debt sustainability suggests a very large fall in output is unavoidable unless exports can be boosted via a substantial internal devaluation (i.e. a cut in nominal wages throughout the economy).

This section has put the emphasis on the fact that deficits that were sustainable during a boom have to turn into surpluses as growth prospects deteriorate and risk premia increase. However, in some of the countries, fiscal policies are so expansionary that they would not be sustainable even during a boom. The adjustment required from the present positions is thus even larger as Table 7 below shows. Comparing the figures in this table to those in Table 1 above shows that the adjustment needed to ensure sustainability is rather close to the adjustment that is needed to satisfy the Stability Pact.[12]

Table 7. The actual fiscal adjustment needs

	Actual (2009) primary balance % of GDP	**Primary surplus required for sustainability**	**Adjustment required for sustainability**
Ireland	-10.2	2.6	12.8
Greece	-7.7	5.9	13.6
Spain	-9.4	1.2	10.6
Italy	-0.5	3.1	3.6
Portugal	-5	2.4	7.4

Note: Primary surplus required for sustainability is derived from the equation. (B3) in Appendix B.
Source: Own calculations based on AMECO data.

[11] The details for these calculations are provided in Annex B; one has to take into account the fact that the risk premium affects overall foreign debt, but not the returns received on Greek assets abroad.

[12] See Economic Forecast Autumn 2009 for a description of the unsustainable path of Government debt, in the euro area members, under the hypothesis of no fiscal adjustment.

A similar reasoning applies to the external debt situation. Table 8 shows the adjustment required in the trade balance to move from the current position to a sustainable path. According to the table, Italy is the country closest to sustainability.[13] The largest adjustment required can be observed again for Greece and Portugal. This implies that in order to reach a sustainable external position, both countries will either have to reduce their consumption of foreign goods equivalent to 10% of GDP or experience an export boom. Since the latter is rather unlikely in the short run, it seems that a substantial compression in domestic demand is unavoidable before external equilibrium can be reached. A sustainable external position is also a pre-condition for lower risk premia on international financial markets. It is thus likely that these risk premia will not fall substantially as long as the external deficits continue at their present unsustainable scale.

Table 8. The actual external adjustment needs

	Actual trade balance (% of GDP)	**Trade surplus (% of GDP) required for sustainability**	**Adjustment required for sustainability**
Greece	-4.9	5.2	10.0
Spain	-1.5	3.0	4.5
Italy	-0.3	1.2	1.5
Portugal	-7.6	2.3	9.9

Note: A trade balance that is compatible with sustainable debt is based on the assumption that the export growth rate is the same in each of the countries and equal to 1.5%. It is derived from eq. (B3) in Appendix B.
Source: Own calculations based on AMECO and IFS data.

Concluding remarks

Greece represents the first test for adjustment in the eurozone. Unfortunately, it is likely to represent a particularly difficult case because of a combination of factors which distinguish the Greek economy: high debt ratios, a low degree of openness and a continuing high dependency on external financing.

It seems unavoidable that any fiscal adjustment of the order of magnitude demanded by the EU (and promised by the Greek government) is likely to lead to deep recession and social unrest. The inescapable reality is that a 'sudden stop' of capital inflows requires ultimately a sharp compression of consumption (investment is already low). But this takes time!

The main danger facing Europe right now is not so much the sudden emergence of a crisis in the spring of 2010, but rather a slowly developing vicious circle, which over time saps the willingness of the Greek political system to pursue the adjustment effort they signed up to.

What can Greece do to escape the 'Argentine' vicious circle of higher risk premia and a worsening economic outlook?

The only way to minimise the cost of the external and fiscal adjustments that are required to make the situation sustainable is to make Greece more competitive and thus stimulate exports.

[13] We leave out the case of Ireland for which the data on gross external debt are difficult to interpret since they comprise the debt of local subsidiaries owned 100 % by foreign financial and other corporations. In the case of Ireland the computation of the trade surplus required for sustainability (based on formula B3 in Appendix B) would be unduly affected by this phenomenon (which does not really represent foreign debt).

This can be achieved only by an across-the-board reduction of wages (or rather labour costs) in the private sector of between 10 and 20%. Cuts in wages of this order of magnitude will encounter fierce popular resistance. They could come about either at the end of an extremely painful process when unemployment has reached peaks never seen before or they could come much earlier as the result of an overarching national agreement in which the government, opposition parties and the social partners agree on what is needed in the light of present circumstances. Greece thus needs a concerted effort at the national level not just a government that pushes austerity measures through Parliament.

The reduction in labour costs required to re-establish an external balance is probably higher for Greece than for other countries precisely because the economy is relatively closed. But the more time that is lost in dealing with this root cause, the more difficult the adjustment will become.

Europe, or rather the EU, however, needs to prepare itself for the eventuality that the political system of Greece is not strong enough to implement these painful adjustments. Gros & Mayer (2010) plead for the construction of a Euro(pean) Monetary (or rather Stability) Fund that could allow Europe to manage a sovereign default by limiting the disruption to financial markets it would cause. Knowing that there is no alternative to adjustment should stiffen the resolve of the Greek government and soften the resistance to the kind of measures that are clearly needed.

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Annex A. Keynesian multipliers and the effect of fiscal consolidation

To assess the cost of the fiscal adjustments in terms of output fall we compute first the fiscal multiplier for Greece, as well as for other euro area countries. To keep things simple we follow the simplest Keynesian macro model imaginable: an open economy, where exports are determined by foreign demand (and hence exogenous in the short run) and imports vary proportionally with domestic income. The impact of an exogenous change in government spending on GDP can then be computed as follows:

$$\text{(A1)}\ \Delta Y = \frac{1}{1-c+m}\Delta\overline{G}$$

Where G is government spending, *c* is marginal propensity of consumption and *m* the marginal propensity to import. The pure Keynesian multiplier is thus given by *1/(1-c+m)*, or *1/(s+m)*, where *s* is the marginal propensity to save (of the private sector). In percentage terms equation (1) can be written as a relationship between the change in government expenditure as a proportion of GDP and the growth rate of GDP:

$$\text{(A2)}\ \frac{\Delta Y}{Y} = \frac{1}{1-c+m}\left(\frac{\Delta\overline{G}}{Y}\right)$$

In this simplest of Keynesian approaches the change in government expenditure is exogenous and the same multiplier would apply to any other exogenous change in expenditure, for example exports or investment. However, under the present circumstances it is difficult to find any major expenditure category that could be 'crowded in' indirectly as a consequence of a cut in government expenditure. Given that banks throughout the euro area seem still reluctant to extend credit, investment is likely to remain weak everywhere. Similarly, intra-area exports are unlikely to revive given that major changes in cost competitiveness can occur only via major cuts in nominal wages, which are not on the cards for the time being.

The large drop in output suggested by the simplistic multipliers suggests that fiscal consolidation might be much more difficult than assumed by the official convergence programmes since the drop in output will also lead to lower tax revenues. If tax revenues vary with demand the multiplier has to be adjusted to take into account the leakage at each stage of spending includes not only savings and imports, but also taxes. Assuming additional revenues face a marginal tax rate of t the multiplier becomes:[14]

$$\text{(A3)}\ \frac{\Delta Y}{Y} = \frac{1}{s+t+m}\left(\frac{\Delta\overline{G}}{Y}\right)$$

[14] Here we make the assumption that $T = \overline{T} + tY$ and $G = \overline{G} + gY$ (both Government spending and tax revenue have an exogenous component and a component proportional to the income) and that t=g.

Table A1. Keynesian multipliers including tax

Country	Keynesian multiplier including tax: 1/(s+m+t)	Impact of government spending on deficit: (s+m)/(s+m+t)
Greece	1.4	0.5
Italy	0.8	0.5
Spain	1.0	0.5
Portugal	0.9	0.6
Germany	0.5	0.8
Ireland	0.9	0.7

Note: t, the marginal tax rate, is computed as ratio of the increment in tax burden of the total economy relative to the increment in GDP over the period 2002-07.

Source: AMECO.

This multiplier is considerably lower than the one calculated above. However, in this case the change in the deficit that can be achieved by a cut in government spending read as follows:

$$\text{A(4)}\quad \frac{\Delta Def}{Y} = \left[1 - \frac{t}{s+t+m}\right]\left(\frac{\Delta G}{Y}\right) = \left[\frac{s+m}{s+t+m}\right]\left(\frac{\Delta G}{Y}\right)$$

Equation (4) suggests that the final impact on the deficit will be only a fraction of the cut in government expenditure. This in turn means that the 'effort' in terms of cutting expenditure might be much higher than assumed so far.

Taking into account taxation thus suggests that the multiplier is lower, but the required cut in expenditure higher. These two effects just cancel out as one can see by substituting equation (4) back into equation (3) which confirms the original multiplier in terms of the required deficit reduction:

$$\text{(A5)}\quad \frac{\Delta Y}{Y} = \frac{1}{s+t+m}\left(\frac{\Delta G}{Y}\right) = \frac{1}{s+t+m}\left(\left[\frac{s+t+m}{s+m}\right]\left(\frac{\Delta Def}{Y}\right)\right) = \frac{1}{s+m}\left(\frac{\Delta Def}{Y}\right)$$

Accordingly, in order to achieve a reduction in the deficit of 4%, which is the Greek target for 2010, government expenditure should be cut by, at least, 8% which is expected to reduce output by about 11%.

Annex B. Debt sustainability

Sustainability of public debt

The traditional debt sustainability analysis usually concentrates on a simple question: Is the debt-to-GDP ratio compatible with the government's intertemporal budget constraint? The answer to this question is affirmative if the present constellation of expected primary deficits, growth rates and interest rates can go on forever, without leading to exploding debt levels.

Typically, standard exercises focus on the fiscal adjustment that will keep the public debt-to-GDP ratio constant. The rational is that if the debt-to-GDP ratio is stable, or declining, the intertemporal budget constraint is satisfied. A constant debt-to-GDP ratio requires that:

$$\text{(B1)}\quad \frac{\overline{PD}_t}{Y_t} = \frac{D_{t-1}}{Y_t}\left(\frac{i_t - y_t}{1+y_t}\right) + SF_t \qquad (4)$$

where $\overline{PD}$ is the primary deficit compatible with a sustainable debt, Y is the GDP at current prices, D the general government debt, i is the "implicit" interest rate (actual interests paid divided by the stock of debt), y is the nominal GDP growth rate, SF is the stock-flow adjustment and subscript t stands for time. The element $(D_{t-1}/Y_t)\times[(i_t-y_t)/(1+y_t)]$ represents the so-called *snowball effect* and crucially depends of the difference between (long run, steady state) interest rate and growth rate. The stock-flow adjustment captures the various factors that influence changes in the valuation of the stock of debt (or debt assumption outside the budget). The latter element has become much more important in many countries as government support for banks resulted in large increases in public debt that is not accounted for under the normal (national accounts based) deficit figures.

Hence, according to equation (4) a constant debt-to-GDP ratio implies that the primary deficit completely offset the snowball effect and the possible negative effect arising from valuation elements.

Before the outbreak of the crisis, the Greek nominal growth rate was 7.5% and the average interest rate of 4%, after the crisis the projections for the nominal growth rate has fallen to 1.5% and, because of the increase in the risk premium, the interest rate has jumped to 6.5%. In terms of debt sustainability this implies that the snowball factor has moved from +3.2% to -5%. Given a debt- to-GDP ratio of 1.2, this means that the required fiscal adjustment (in the primary balance) is 1.2*(3-(-5)), i.e. just below 10% of GDP.

Table B1 below shows the contribution of both factors (nominal growth and the interest rate) to the change in the snowball factor for the other countries belonging to the GIPSY club.

Table B1. Boom-bust difference in the snowball factor

	GDP (nominal growth rates)		**Difference**	**Nominal interest rate**		**Difference**
	2003-07	**2009-11**	**Boom to Bust**	**2003-07**	**2009-11**	**Boom to Bust**
Ireland	7.5	-2.9	-10.4	3.9	5.9	2.0
Greece	7.4	1.5	-5.9	4.1	6.5	2.4
Spain	7.3	-0.6	-7.9	3.9	4	0.1
Italy	3.5	1.1	-2.5	4.1	4.3	0.1
Portugal	3.7	0.4	-3.3	4.0	4.8	0.8

The resulting snowball effect is given in Table 5 in the main text.

While traditional debt sustainability analysis provides useful indications about how certain policies can affect debt dynamics and it sustainability, it embeds shortcomings that become particularly acute when applied to foreign debt in time of stress and thus high risk premia.

Sustainability of external debt

As shown in Table 2and 3, Greece external debt is very high and one important implication of it is that ultimately it has to be served by a 'transfer' of resources to the rest of the world through exports (of goods and services). Accordingly the foreign debt-to-exports ratio is more relevant than the standard debt-to-GDP ratio to assess the external sustainability.

Applying the traditional approach of debt sustainability to the foreign debt implies that the condition under which the foreign debt-to-export ratio is stable is :

$$\text{(B2)}\quad \frac{\overline{TB}_t}{E_t} = \frac{ND_{t-1}}{E_t}\left(\frac{i_t - e_t}{1+e_t}\right)$$

Where TB is the trade balance, ND is net external debt and e is the exports growth rate. Similarly to the case of government debt, the stability condition is given by the relative size of the interest rate with respect to the growth rate. Yet when considering external debt, another source of complexity emerges. A country external debt is defined as the difference between assets and liabilities (this is the gross debt) net of foreign investment. In time of crisis the interest paid by a country in time of crisis on its liabilities is larger than the one it receives on its holdings, with the difference being the risk premium. Accounting for this implies that the condition above is modified as follow:

$$\text{(B3)}\quad \frac{TB_t}{E_t} = \frac{ND_{t-1}}{E_t}\left(\frac{i^{rf}{}_t - e_t}{1+e_t}\right) + \frac{\pi_t}{1+e_t}\frac{GD_t}{E_t}$$

Where i^{rf} is the risk free rate, π is the risk premium and GD the gross external debt. The existence of the risk premium makes external adjustment more difficult.

$$\text{(B4)}\quad \frac{TB_t}{Y_t} = \left\{\frac{E_t}{Y_t}\right\}\left\{\frac{ND_{t-1}}{E_t}\left(\frac{i^{rf}{}_t - e_t}{1+e_t}\right) + \frac{\pi_t}{1+e_t}\frac{GD_t}{E_t}\right\}$$

This equation shows that the (change in the) trade balance as a proportion of GDP required to maintain sustainability after the emergence of a risk premium is roughly proportional to the gross debt to export ratio times the ratio of exports to GDP. Formally the difference between the trade balances (as a proportion of GDP) which main external debt constant in a boom and bust would be given by:

$$\text{(B4)}\quad \frac{TB_t}{Y_t}_{boom} - \frac{TB_t}{Y_t}_{bust} = \left\{\frac{E_t}{Y_t}\right\}\left\{\frac{ND_{t-1}}{E_t}\left(e_{bust} - e_{boom}\right) + \pi_t\frac{GD_t}{E_t}\right\}$$

Where it is assumed, as usual that (1+e) is approximately equal to one. In the case of Greece, the exports (goods and services) to GDP ratio is about 0.25, as shown above. The gross external debt to exports ratio is about 6 and the net debt to exports ratio about 3. A comparative analysis of the situation before and after the crisis suggests that with a combination of a risk premium of

3% and a fall in the growth rate of export of about 4%[15], the adjustment needed in terms of trade balance to GDP ratio is in the order of 7.5% with respect to the previous period (see the cell at the intersection of the third column and the third row in the table below.

The matrix below shows the adjustment in the trade balance (as a % of GDP) that is required by different combinations of the risk premium on foreign debt and the fall in the growth rate of exports that.

Table B2. Effect of risk premia on growth in exports

Adjustment in trade balance-to-GDP: $\Delta(TB_t/Y_t)$		**Fall in export growth rate (Δe_t)**		
		2	**4**	**6**
Risk premium (π)	**1**	3	4.5	6
	2	4.5	6	7.5
	3	6	7.5	9
	4	7.5	9	10.5

A comparisons across different columns suggests is that a devaluation (or increase in competitiveness) can contribute substantially reducing the required adjustment (in other words to improve the sustainability of the external debt) even if does not have a large impact on the current account in the short run, Of course, a once off cut in wages cannot be expected to lead to a sustained higher growth rate of exports. But even if the immediate impact is only a small step increase in exports a cut in wages might still have an important impact on investors expectations that further cuts might be forthcoming, thus leading to a sustained higher rate in exports (at least until the time external equilibrium has been restored).

Table B3. The required external adjustment

	Hp: Fall in export growth rate (Δe_t) =4%					
	Net debt-to-exports	Gross debt-to-export	**Risk premium (π)**	**Adjustment in trade balance-to-exports**	Export-to-GDP	**Adjustment in trade balance-to-GDP: $\Delta(TB_t/Y_t)$ required for sustainability**
IRE	0.6	13	2.4	34	0.8	28
PT	2.8	5.8	0.5	14	0.3	4
SP	2.3	6.3	1.3	17	0.3	6
IT	0.96	4	0.8	7	0.3	2

[15] According to the European Commission Economic Forecast (Autumn 2009), the year on year percentage changes in export markets would suggest an even larger fall. The difference between the average 2005-07 and 2009-11 amounts to more than 8% in the case of Greece. Here we prefer to use a less dramatic number and proxy the fall export by the fall in the average growth rate of euro area GDP.

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