

LLEE Working Paper Series

EXTRA GOVERNMENT DEBT IN THE GREAT RECESSION:
ALL INTENTIONAL?

Riccardo Fiorito

Working Paper No. 110

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Luiss Lab of European Economics

Department of Economics and Business

LUISS Guido Carli

Viale Romania 32, 00197, Rome -- Italy

<http://dp tea.luiss.edu/research-centers/luiss-lab-european-economics>

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Abstract

Among the Great Recession costs there was the adoption of fiscal policies, generally bounded to increase government debt. In the Oecd area, however, the resulting debt jump was not simply due to counter-cyclical discretion, mostly because of two reasons: the first is that such policies were not always feasible, given the surveillance on the Eurozone countries. The second is the occurrence of an unusual nominal recession, increasing the debt-to-GDP ratio and affecting most Oecd economies in 2009 and the Euro periphery also later. Using a simple accounting scheme, the sources of the debt creation are evaluated during the 2008-13 crisis and the years immediately before (2000-07), comparing the US and the UK with the four biggest Eurozone countries. In general, deficits, inflation and real growth do not have the same role before or during the crisis. Differences are also found for countries pursuing, in special times, more counter-cyclical fiscal policies (US, UK but also Spain and France) and countries like Italy and, especially, Germany following more prudential lines: in one case, because of Italy's limited fiscal space and, in the other, because of a predilection for stability that Germany maintained even during the most destabilizing, postwar, crisis.

1. Motivation

No size of government debt can be considered sustainable, unsustainable or simply large unless related to some benchmark which almost naturally refers to nominal GDP. Since in the postwar evidence a rising nominal GDP was the rule, the attention to the debt/GDP ratio was confined to the numerator only, given the confidence that inflation and real growth could do the rest by themselves.

Last crisis was, indeed, an exception. Not only for its depth and for the largest number of countries ever involved (Fiorito, 2013) but also because it firstly displayed a *nominal* recession that affected ¾ of the Oecd countries in 2009 and the Eurozone (henceforth: EZ) periphery afterwards. The coexistence of little - or even negative - growth rates with unusually low inflation increased the debt-to-GDP ratio also because of the denominator, regardless and sometimes despite which fiscal policy was actually pursued.

However relevant, this issue did not receive enough attention and in Europe was basically ignored in the EZ fiscal policy design, given the dominance of the inflation target despite prices generally rose less than the 2% threshold. The recession depth activated instead, mostly in the US, an academic debate on the benefits of government spending (especially in bad times) versus the reasons of the previously avowed, prudential, views². The implied multiplier disputes, however, basically rest on estimating the effects of purchases that in most of the Oecd countries are about 1/5 of total outlays and it is extremely dubious that the remaining 4/5 are discretionary enough to produce a well defined multiplier (Coricelli-Fiorito, 2013). Thus, the high or low estimated multipliers may rather reflect something else and this is probably why they differ so much in the empirical literature.

To avoid these limits and problems, I shall address the government debt issue in a plain and impartial way, i.e.

¹ University of Siena (e-mail: rfiorito@iol.it).

² The literature is large and still growing, though yet unable to reach fully shared results. Two useful surveys are Ramey (2011) and Parker (2011).

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- i) Avoiding any causal linkage between fiscal policy and the economy.
- ii) Using only a simple accounting scheme to disentangle between major sources of the recent debt increase in an Oecd sample.
- iii) Comparing the crisis years (2008-13) with those immediately before (2000-07) to tentatively assess the recession impact on the debt ratio size.

Given the differences in the way each country faced the crisis, the sample includes the US and the UK on one side and the four biggest EZ economies (Germany, France, Italy and Spain) on the other to find what is similar and what differs among periods and countries as far as the debt increase is concerned.

2. Arithmetic

Our accounting scheme is based on the simple arithmetic implied by the government debt definition. To start with, let us time-differentiate the debt-to-GDP ratio (B/Y), obtaining:

$$(1) \quad \frac{d}{dt} \left[\frac{B(t)}{Y(t)} \right] = \frac{\dot{B}(t)}{Y(t)} - \left[\frac{B(t)}{Y(t)} \right] \frac{\dot{Y}(t)}{Y(t)} .$$

where both debt (B) and GDP (Y) are nominal variables.

From Eq. (1) it appears that the ratio will fall if the first fraction is smaller than the generally positive product $\left[\frac{B(t)}{Y(t)} \right] \frac{\dot{Y}(t)}{Y(t)}$. In discrete units, the first term $\frac{\dot{B}(t)}{Y(t)}$ is approximated by the government balance ratio, i.e. the deficit-to-GDP ratio (henceforth: deficit) if the balance is – as so frequently - negative.

Actually, changes in the debt stock can differ – sometimes widely - from the corresponding deficit (surplus) measurement because debt flows are evaluated on a cash rather than on the accrual basis, used in the (NIPA) national accounts.³ An additional reason for difference is that debt cash flows stem also from government transactions on non-financial assets such as land, buildings and alike.

In the right-hand side of Eq. 1, the second composite term is the product of the debt ratio in brackets times the logged GDP time derivative ($\dot{Y}(t)/Y(t)$), which in practice amounts to the nominal GDP percentage changes. Virtually, nominal GDP changes can be either positive or negative, though in modern times nominal GDP contractions are very unusual⁴.

Nominal GDP being the product ($Y = p * y$) of the implicit price deflator (p) by its volume level (y), the $\frac{\dot{Y}(t)}{Y(t)}$ term can be split into its price and real growth components, yielding:

$$(2) \quad \frac{\dot{Y}(t)}{Y(t)} = \frac{\dot{p}(t)}{p(t)} + \frac{\dot{y}(t)}{y(t)} .$$

³ The fiscal policy implications of the way of defining government deficit and debt were first stressed by Eisner and Pieper (1984).

⁴ The Great Recession provides a recent exception. However, even the more ‘normal’ real GDP contractions are few, involving about the 10% of all annual, postwar, Oecd data (Fiorito, 2013).

Given (2), finite debt changes in Eq. (1) can be approximated as:

$$(3) \quad \Delta b_t = d_t - b_{t-1} [\pi_t + \lambda_t] + e_t,$$

where Δ is the first-difference operator and where $d(t) = D(t)/Y(t)$ and $b(t) = B(t)/Y(t)$ are the deficit⁵ and debt-to-GDP ratios while $\pi(t) = \dot{p}(t)/p(t)$ and $\lambda(t) = \dot{y}(t)/y(t)$ denote the inflation (π) and the real GDP (y) growth rate (λ), respectively. Finally, the e_t variable combines all possible discrepancies in the approximation and should not be interpreted as a white noise residual.

Ignoring the e_t term, from Eq. (3) it is immediate to see that, for any deficit share, the debt equilibrium ratio falls with the nominal GDP increase, i.e. when inflation and/or real growth rise:

$$(4) \quad b = \frac{d}{[\pi + \lambda]}.$$

Squaring Eq. (3) and ignoring cross terms that should be relevant in a less mechanical – i.e. wide-sense causal – approach, it is possible to evaluate how debt-to-GDP changes reflect in each period their independent components. The resulting $\Delta\beta_t^2$ variable obviously differs from actual Δb_t^2 changes because of the missing cross terms and is obtained as in Eq. (5) by summing only the squared components, where π^* and λ^* are the inflation and the real GDP growth variables, weighted as in Eq. (3) by the corresponding debt size, respectively⁶. Finally, the squared term e_t^2 is also considered in the empirical decomposition since e_t does not have to be zero in each period because of the cash/accrual accounting difference⁷:

$$(5) \quad \Delta\beta_t^2 = d_t^2 + \pi_t^{*2} + \lambda_t^{*2} + e_t^2.$$

As it is shown in Section 4, the $\Delta\beta_t^2$ changes can be separated into the portions belonging to the ‘policy-induced’ deficit ratio and those reflecting the growth of nominal income components and the residual term e_t . Finally, it should not be ignored that the residual term e_t is sometimes driven also by a deliberate policy of postponing payments to comply with annual budget guidelines which is one of the reasons why cash and accrual balances can also notably differ (Robinson, 2009).

3. Last Crisis and Before

Given the problem at hand, the available data are few because of the annual frequency which, however, is still preferable when evaluating NIPA government data in some detail. Before reporting the debt sources as calculated via Eq. 5, let me present first for a few macroeconomic variables (Table 1) the cumulated losses hitting each country during the Great Recession. Below I provide also some extra data on the rise of private debt before and during the

⁵ Deficit (D) is here a shorthand way for defining the General Government Net Lending variable, when negative.

⁶ In the discrete approximation, $\pi_t^* = (B_{t-1}/Y_{t-1}) * (\Delta p_t/p_{t-1})$ and $\lambda_t^* = (B_{t-1}/Y_{t-1}) * (\Delta y_t/y_{t-1})$.

⁷ Differences can persist even in the average, at least for relatively short periods.

crisis (Cecchetti et al., 2011), given their importance for the overall deleveraging occurring sometimes in the same period (Buiter and Rahbani, 2011).⁸

Table 1 - Cumulated % changes for selected variables (2008-13) and private debt share (2000-2010)

Country	(1)	(2)	(3)	(4)	(5)	(6)		(7)	
	Real GDP	Nominal GDP	Employment	Gross Fixed Investment	Govt Debt to GDP	Household Debt to GDP	2000 2010	Nonfinancial Corporate Debt to GDP	2000 2010
US	4.9	14.9	-1.3	-6.1	42.8	74	95	66	76
UK	-1.1	11.7	1.9	-14.4	62.1	75	106	93	126
Germany	4.1	10.3	4.8	-1.1	15.5	73	64	91	100
France	-0.3	8.1	0.8	-9.4	30.3	47	69	123	155
Italy	-8.7	0.5	-2.5	-28.7	28.4	30	53	96	128
Spain	-5.8	-1.0	-20.2	-53.2	55.1	54	91	133	193

Source: Cols 1-5 stem Oecd *Economic Outlook* EO93 database which includes 2013 forecasts, here and in the rest of the paper. Government Debt refers to Gross General Government and its ratio to nominal GDP. For Germany, France, Italy and Spain Maastricht definitions apply. Gross fixed investment is in volume; Cols (6) and (7) denote private debt ratios to nominal GDP (Source: Cecchetti et al., 2011).

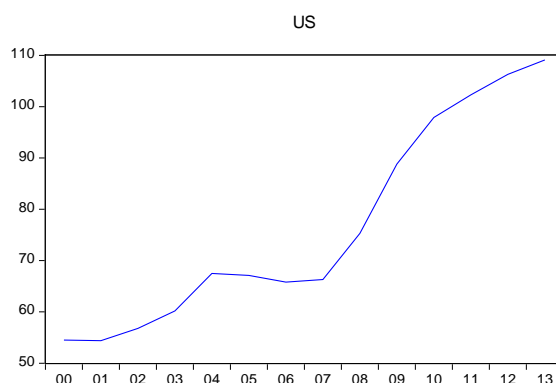
A few synthetic notes on the 2008-13 crisis and its likely impact on the government debt can be summarized by the following eight points:

1. During the crisis, cumulated losses for real growth are general (Table 1) but they look impressive for Spain and Italy. Losses involve also supply sources as employment and fixed investment
2. All countries face a recession in 2009 and the average real GDP growth falls everywhere (Tables 3.1-3.6). Italy and Spain face double-dip recessions (2012-13), occurring also in Greece and in Portugal. The average growth is null in France, being in Germany modest. All of this weakens the whole EZ area.
3. Yet, the real novelty of last crisis is the fall in *nominal* GDP that characterized 27 out of 34 Oecd countries in 2009, affecting always Greece between 2009 and 2013, Japan in 2011, Portugal between 2011 and 2013 and Italy and Spain in the 2012-13 biennium (Oecd, 2013).
4. In the 2000-07 period, the debt ratio decreases often and everywhere: 3 times in France and in the UK, 4 times in Germany and in the US, 6 times in Italy and always in Spain.
5. Figures below also show that the debt ratio rises everywhere after 2007: very strongly in Spain and in UK, strongly in the US, almost strongly in France. Less in Germany and in Italy, apparently for different reasons.
6. Despite inflation was not a concern before crisis, it is generally lower in the 2008-13 years, especially in Spain.
7. Regardless of the debt increase, 10-years government bond yields decrease in the US, in the UK, in Germany and in France. The yield slightly rises in Spain only, suggesting once more that market perception of sovereign risk is a much more complex issue.
8. During the crisis, the nominal rate declines more than inflation does and the *real* interest rate generally falls (US, UK, Germany, France). This does not hold for Italy and, especially, for Spain.

Looking at the debt graphs reported below, the Great Recession impact is apparently similar everywhere, especially if the attention focuses on the timing rather than on the size of response.

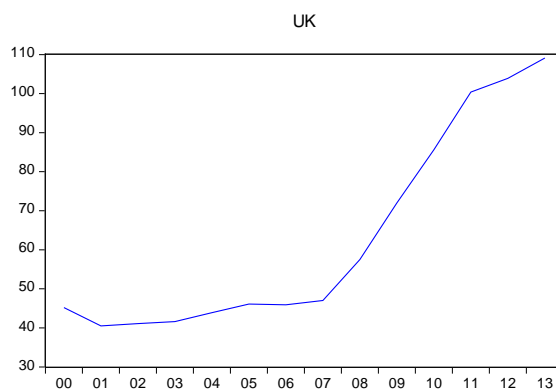
⁸ More data on government debt sources are available in the Appendix Tables.

Fig. 1: Debt to GDP Ratio (2000-2013)



The similarities between the two Anglo-Saxon countries are, however, clear also on the basis of the data reported in the Appendix. This applies also to the SDI indexes in the two periods which conform well enough to the shape of all graphs presented here⁹.

Fig. 2: Debt to GDP Ratio (2000-2013)



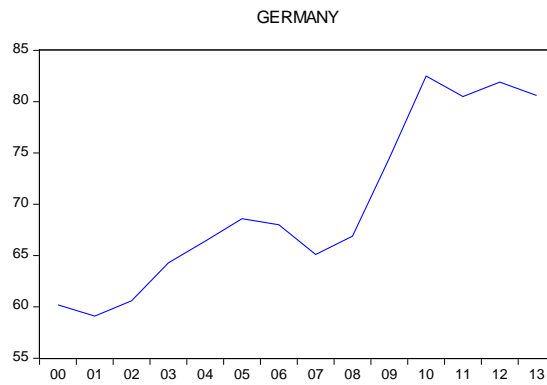
Looking at the EZ countries, the Great Recession in general interrupts the convergence process measured on different variables by Estrada, Galí and Lopez-Salido (2013) and confirmed here also for the debt-to-GDP ratio that falls everywhere before the crisis, strongly rising instead in the 2008-2013 period.

There are, however, several differences to be noticed. In Germany (Fig. 3), debt growth is the smallest (Table 3.3) in the 2000-13 period, increasing of about $\frac{1}{4}$ only. Moreover, while the slope increase is very steep between 2009 and the 2010 peak, then the debt ratio is firstly maintained and next slightly reduced. Accordingly, Germany's SDI becomes negative between 2010 and 2013, making the average 2008-13 index slightly positive but smaller than in 2000-07 period.

This is an atypical result since Germany here is the only country for which SDI improves in the second part of the sample, though not obtaining a stable, negative, value as we found in the earlier years for the US, the UK and for Spain.

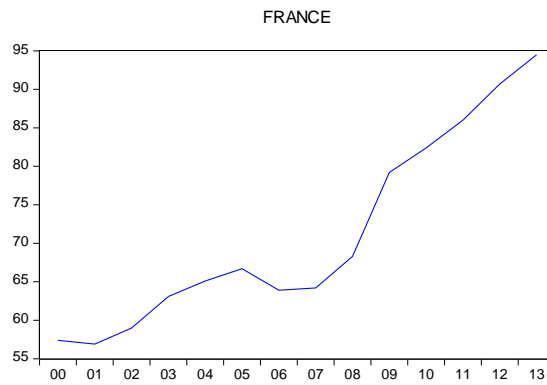
⁹ The alleged sustainable debt index (SDI) is obtained as the difference between the real interest rate and the real GDP growth (see Tables 3.1-3.6). Thus, stability requires a negative number.

Fig. 3: Debt to GDP Ratio (2000-2013)



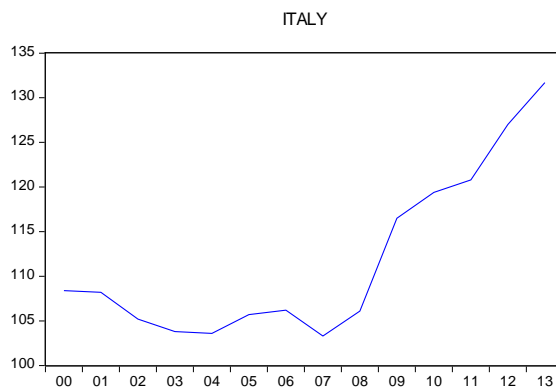
In France the debt ratio falls between 2006 and 2008 (Table 3.4) but the increase is more pronounced in the crisis years and its slope is not reduced at the end of the sample as in Germany. Overall, the SDI index is much lower than in Germany's pre-crisis years, though strongly increasing in the 2008-13 period in which the average growth was actually null.

Fig. 4: Debt to GDP Ratio (2000-2013)



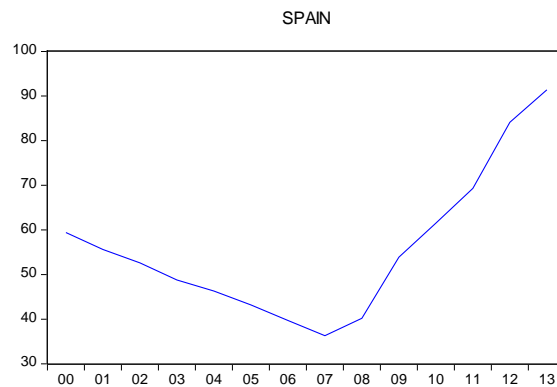
Italy's case (Table 2.5) is peculiar, being here the only country in which the debt size was already high in the first part of the sample. The effort of reducing debt in the pre-crisis period was frustrated in the recession years by a nominal GDP growth which on average is about null, being even negative in three years as also in Spain. As a result, the debt ratio strongly rises in 2009 (Fig. 5), attenuates its growth without eventually falling because nominal recession cuts the denominator. As a side consequence, except for 2000, the SDI index is always positive, displaying an even bigger average value in the 2008-13 recession years.

Fig. 5: Debt to GDP Ratio (2000-2013)



Conversely, Spain is here the case in which the debt ratio decreased more in the 2000-07 period (Table 3.6) to rise even more in the crisis years as Fig. 6 shows in the most impressive way.

Fig. 6: Debt to GDP Ratio (2000-2013)



The graph for Spain displays a peculiar V-shaped pattern which is also reflected in the *always* negative SDI in the first part of the sample and in the *always* positive SDI in the 2008-13 period. Actually, in no other country, the debt ratio first decreased and then increased so rapidly, creating during the Great Recession a problem that was totally missing before.

4. Sources of the Debt Increase

Previous graphs and the data in the Appendix are descriptive devices that cannot assess the importance of every source behind debt changes. This task is made available here, using the methodology described in Section 2 to calculate the weight of the debt-to-GDP components in each period and country.

In presenting results based on independent sources, an extra cautionary note is due to the fact that the calculated weights refer - as in equation (5) - to the squared debt-to-GDP differences but originate from total changes that in each year can be small or large, positive or negative, i.e. from types of adjustment that should not be interpreted in the same way. This is why, along with the calculated shares, Tables 2.1-2.6 include as a memo in a separate column the debt ratio changes in each year and in the average of the two adjacent sub-periods.

United States

The major result (Table 2.1) is that the deficit weight almost doubles in the 2008-13 period in which the debt ratio strongly rises while it was almost constant before (Table 3.1). Namely, the average deficit weight jumps from the 47% of the 2000-07 period to a massive 87% in the 2008-13 years in which the deficit share is also less volatile.

Looking at the annual episodes, the deficit weight is also big in 2002 and 2003 when the debt ratio starts to increase after previous period decumulation, clearly interrupted by 2001 events and consequences. However, it is only during the Great Recession that the weight significantly rises because of prolonged counter-cyclical policies that include a deficit share reduction (2013) as soon as recovery is perceived. Accordingly, this deficit share pattern supports the

view that discretionary fiscal policy (Coricelli-Fiorito, 2013) – and government spending, in particular - in the US basically worked as a temporary device to be used even heavily in bad times and to be quickly abandoned when no longer necessary, though the depth and the duration of this crisis made the interventions deeper and lengthier than in previous episodes.

Government balances in the US seem then to behave in a clear counter-cyclical way which is also found in the UK response (Table 2.2) to the Great Recession: in the US, however, the deficit weight not only rises more when recession peaks but is also faster in decreasing after stabilization and recovery are likely to be achieved.

Table 2.1 – % Contributions to Government Debt-to-GDP Changes*

US	(1) Deficit/GDP	(2) GDP deflator growth	(3) Real GDP growth	(4) Other	<i>To remember: Debt to GDP % changes</i>
2000	21	18	57	4	-6.0
2001	10	43	10	37	-0.1
2002	89	5	5	1	2.4
2003	84	5	7	4	3.4
2004	27	4	6	63	7.3
2005	52	25	21	2	-0.4
2006	36	37	25	2	-1.3
2007	59	26	11	4	0.5
Average 2000-07	47.2 (.61)	20.4 (.74)	17.7 (.98)	14.6 (1.57)	0.7 (5.33)
2008	73	4	--	23	9.0
2009	96	--	4	--	13.5
2010	95	1	3	1	9.1
2011	90	4	3	3	4.4
2012	90	4	6	-	4.0
2013	79	7	11	3	2.8
Average 2008-13	87.2 (.11)	3.3 (.76)	4.5 (.82)	5.0 (1.8)	7.1 (0.57)

*Pearson's coefficient of variation in parenthesis, here and in the companion tables.

Similarly to the other countries, in the 2008-13 period nominal GDP growth (Table 3.1) deeply diminishes. This is reflected in the debt generating sources: on the average, the GDP deflator is strongly reduced with respect to the 2000-07 years in which nominal components accounted for about 40% of the overall debt changes.

As far as real GDP is concerned, its weight disappears in the 2008-13 period, contributing also in this way to make dominant the deficit portion. As implied by its very definition, the residual component has some role in few cases only: in 2001 and, especially, in 2004 when there is a large debt-to-GDP increase, not based on the denominator components. All of this seems to suggest that the rising deficit weight was possibly driven by policy discretion, basically requiring also a substantial symmetry of the adjustment.

United Kingdom

The results of debt decomposition (Table 2.2) are similar to those found for the US. However, in the UK the increase of the deficit weight in the 2008-13 period is much smaller. Moreover, in the UK the deficit weight is less smooth, making difficult to separate persistent intentions from previous policy corrections. Accordingly, the deficit weight strongly rises during the 2009 recession peak to be then reduced in the next two years and to be increased again in 2012 and 2013 when real growth is still low.

Table 2.2 – % Contributions to Government Debt-to-GDP Changes

UK	(1) Deficit/GDP	(2) GDP deflator Growth	(3) Real GDP growth	(4) Other	<i>To remember: Debt to GDP % Changes</i>
2000	42	--	13	45	-2.2
2001	5	9	26	60	-4.7
2002	65	15	15	5	0.6
2003	78	6	14	2	0.5
2004	75	8	9	8	2.3
2005	71	8	10	11	2.2
2006	67	19	14	--	-0.2
2007	60	8	22	10	1.1
Average 2000-07	57.9 (.42)	9.1 (.63)	15.4 (.38)	17.6 (1.26)	0 --
2008	35	3	--	62	10.5
2009	92	--	4	4	14.5
2010	65	3	1	31	13.6
2011	39	2	--	59	14.8
2012	92	4	--	4	3.5
2013	90	7	2	1	5.2
Average 2008-13	68.8 (.39)	3.2 (.72)	1.2 (1.3)	26.8 (1.10)	10.3 (0.48)

The price component is also reduced in the crisis years although in the UK – as also in Germany – average inflation did not change between the two periods. As in the US, nominal GDP does not help in containing a large debt increase that was even bigger than in the US because of a longer real GDP stagnation. As a result, the debt increase was still – though generally less - related to the deficit weight, given the major role exerted in the UK by the residual component (OTHER) that here summarizes all the remaining accounting discrepancies in the debt numerator. As in other countries, the share of this residual variable is negatively correlated with the deficit weight and tends to rise during recession episodes¹⁰. Looking at single years, the residual component has its peak in 2004 but also in 2008 and 2011.

As far as the 2008-13 years are concerned, the dominance of the deficit weight is also due to the collapse of the nominal GDP portion which becomes about negligible in both price and real growth components.

Germany

In the crisis years, also in Germany the debt ratio rose but its increase was much lower than elsewhere, moving from about 65% in 2007 to about 80% in 2013. It should also be noted that this relative success is not due to a great

¹⁰ Further evidence is available on request.

macroeconomic performance since Germany's economy (Table 3.3), after absorbing the 2009 shock, did not grow in an intense way.

Table 2.3 – % Contributions to Government Debt-to-GDP Changes

Germany	(1) Deficit/GDP	(2) GDP deflator Growth	(3) Real GDP growth	(4) Other	<i>To remember: Debt to GDP % changes</i>
2000	19	2	46	33	-1.2
2001	55	4	6	35	-1.1
2002	85	4	--	11	1.5
2003	97	3	--	--	3.7
2004	82	9	4	5	2.1
2005	97	1	2	--	2.2
2006	27	1	68	4	-0.6
2007	--	17	76	7	-2.9
Average 2000-07	57.7 (.66)	5.1 (1.06)	25.2 (1.3)	11.9 (1.18)	0.5 (4.83)
2008	--	4	3	93	1.8
2009	37	3	45	15	7.6
2010	21	1	11	67	8.0
2011	8	6	84	2	-2.0
2012	--	9	4	87	1.4
2013	4	84	9	3	-1.3
Average 2008-13	11.7 (1.25)	17.8 (1.83)	26.0 (1.25)	44.5 (.96)	2.6 (1.67)

Germany's debt decomposition in Table 2.3 is, indeed, peculiar since the deficit share was important only in the *pre-crisis* period when the country had rather to face large unification and modernization costs. Actually, in the 2000-07 years, the deficit weight was providing almost the 60% of debt ratio changes, widely exceeding nominal GDP share.

In particular, the deficit share was higher between 2002 and 2005 when Germany did not comply with the 3% EZ rule to sustain the unified economy, though implementing reforms that proved to be useful afterwards when the Great Recession hit more other EZ countries. Thus, unlike all the other cases in the sample, the debt increase in the 2008-13 years is little related to the deficit weight which is much smaller than it was before.

Another peculiar Germany's result is that the largest weight of the 2008-13 debt changes belongs to the residual component (OTHER) which, however, is per se difficult to be evaluated, especially in an aggregate analysis. As far as the nominal GDP is concerned, on the average the real GDP share remains the same in the two periods while the inflation weight increases in the second because of the 2013 anomalous result.

As a whole, debt decomposition in Germany displays a counter-cyclical orientation only in the 2000-07 years, while during the 2008-13 period the economic policy was apparently addressed at containing a debt ratio increase that in fact was smaller than elsewhere and even declining after the 2010 peak.

France

In France the debt ratio was acceptable according to Maastricht standards in the 2000-07 years in which the SDI index was about stable, being negative only in a few years and, on the average, close to zero. In the 2008-13 years, however, the debt ratio increased in France notably more than in Germany because of a more counter-cyclical fiscal policy that probably lessened some macroeconomic losses but that did not succeed, however, in sustaining real growth (Table 3.4). Finally, as in other cases, in France too the nominal GDP weight falls in the recession years, both because of the deflator and of the real growth component.

Debt decomposition shows in Table 2.4, that France adjustment is more straightforward than in Germany since in the 2008-13 years the debt ratio increase almost parallels the deficit ratio increase as implied by fiscal policies trying to sustain the economy in difficult times. Thus, the dominance of the deficit weight is large, not occasional, and holding for all years: not only between 2009 and 2013 but also in the 2000-07 period in which debt changes were – as in general - much smaller and negative in three cases.

Table 2.4 – % Contributions to Government Debt-to-GDP Changes

France	(1) Deficit/GDP	(2) GDP deflator Growth	(3) Real GDP growth	(4) Other	<i>To remember: Debt to GDP % changes</i>
2000	27	12	60	1	-1.5
2001	50	29	21	--	-0.5
2002	81	13	2	4	2.1
2003	79	6	1	14	4.1
2004	76	7	12	5	2.0
2005	61	12	9	18	1.6
2006	39	16	20	25	-2.8
2007	60	22	16	2	0.3
Average 2000-07	59.1 (.33)	14.6 (.53)	17.6 (1.06)	8.6 (1.07)	0.7 (3.36)
2008	58	14	--	28	4.1
2009	89	--	7	4	10.9
2010	90	1	3	6	3.2
2011	88	4	6	2	3.6
2012	92	5	--	3	4.7
2013	89	8	--	3	3.8
Average 2008-13	84.3 (.15)	5.3 (.96)	2.7 (1.19)	7.7 (1.30)	5.0 (0.58)

However, real GDP growth was in France missing in the crisis years while inflation was – as in most cases - lower than before. Thus, nominal GDP was unable in the 2007-13 period to compensate - as far as the debt was concerned - the expansionary fiscal policy. This also explains why the deficit component became so large after 2008, given also the small weight found here for the residual component: another difference with respect to Germany.

Italy

As already mentioned, among the countries include here Italy has a special position not only for having the highest debt ratio in the 2008-13 period but also for exceeding even before the 100% threshold. This probably explains why

in the first part of the sample an effort was made (see Fig 5) to slightly reduce the debt ratio that, in the second part, increased less than the other countries but Germany.

This high-debt heritage certainly reduced the available *fiscal space* (Ostry et al., 2010), limiting in the EZ frame the way of contrasting the Great Recession. As a result, almost no discretionary intervention appears in the 2008-13 phase, characterized not only by a negative growth (Table 2.5) but also by a nominal recession not simply in 2009 but also in 2012 and 2013. The large inherited debt hence determined a severely constrained fiscal policy which could explain the apparent paradox that Italy is the only country running with Germany a primary surplus (Tables 3.5 and 3.3) in most of the crisis years. Further, the deficit size increased in the 2008-13 period less than elsewhere because of the EZ surveillance and, presumably, because of Italy's reluctance to be formally involved - as Spain, among the others - in an excess deficit procedure (EDP).

Table 2.5 – % Contributions to Government Debt-to-GDP Changes

Italy	(1) Deficit/GDP	(2) GDP deflator Growth	(3) Real GDP growth	(4) Other	<i>To remember: Debt to GDP % changes</i>
2000	3	19	74	4	-4.8
2001	26	27	10	37	-0.2
2002	35	49	1	15	-3.0
2003	48	42	--	10	-1.4
2004	59	28	12	1	-0.2
2005	80	14	5	1	2.1
2006	52	14	26	8	0.5
2007	22	55	22	1	-2.9
Average 2000-07	40.6 (.59)	31.0 (.51)	18.7 (1.29)	9.6 (1.27)	-1.2 (1.80)
2008	41	38	9	12	2.8
2009	41	7	49	3	10.4
2010	78	1	17	4	2.9
2011	83	15	2	--	1.4
2012	32	15	32	21	6.2
2013	46	18	27	9	4.7
Average 2008-13	53.5 (.40)	15.7 (.80)	22.7 (.75)	8.2 (.93)	4.7 (0.68)

Despite that, however, Italy's debt ratio was notably affected in the crisis years by the denominator side when the low inflation did not offset real GDP contractions in three out of possible six cases. In any case, the deficit weight on debt formation increases only slightly in the recession years to rise in 2010 and 2011 and to decrease afterwards.

Italy's case is peculiar because the debt increase during the Great Recession was faced by a deficit share increasing less than other EZ country because of the limited fiscal space admitted by the large debt size. Further, Italy is also the case in which the real growth component still matters in the 2008-13 years, though this paradoxically happens because the average GDP falls in real terms and is about constant in nominal terms: hence, the debt-to-GDP ratio increases despite – unlike Spain and to less extent France – government deficit was about in line with the 3% rule.

Overall, the impression is not only of a limited counter-cyclicality of fiscal policy but also of a lagging policy response which clearly appears in 2009 with respect to other countries. This probably reflects the limits of automatism or a lack of discretion that would imply a faster response to exceptional or at least unusual events as recessions are.

Spain

Though for different reasons, Spain is also a special case, being the country in which the difference between the two periods is largest and the cost of the recession apparently highest (Table 1). Moreover, the debt ratio shows in Spain (Fig. 6) a peculiar V-shaped pattern, reflecting in the first period not only a low but also a decreasing ratio, given the numerator sound balances and the denominator components growing more than elsewhere in Europe.

This process was reversed in the 2008-13 period (Table 3.6) where the debt ratio mostly doubled, blending in the most peculiar way strong deficits, long recession and a much declining inflation.

The debt sources for Spain are shown in the Table below. The deficit weight, slightly exceeding the 10% in the 2000-07 period, jumps to 95% in the crisis years, becoming in practice the only relevant source of the debt increase. This change even exceeds the one found for the US whose discretionary policy was not subject to the currency union discipline, holding instead for Spain though under special surveillance clauses.

Moreover, in the 2008-13 period nominal GDP components become negligible as a result of an inflation lower than elsewhere and – as in Italy - of a negative real growth in four out of six years and on the average as well. Finally, also residual factors prove to be negligible, confirming again that the dominating role of the debt ratio increase stems in Spain from the, somewhat agreed, deficit increase.

Table 2.6 – % Contributions to Government Debt-to-GDP Changes

Spain	(1) Deficit/GDP ratio	(2) GDP deflator Growth	(3) Real GDP growth	(4) Other	<i>To remember: Debt to GDP % changes</i>
2000	6	29	54	11	-3.0
2001	4	54	41	--	-3.8
2002	3	69	25	3	-3.0
2003	1	65	34	--	-3.8
2004	--	53	34	13	-2.5
2005	13	35	22	30	-3.1
2006	31	18	17	34	-3.5
2007	41	20	22	17	-3.4

Average 2000-07	12.4 (1.23)	42.9 (.47)	31.1 (.39)	13.5 (.96)	-3.3 (0.14)
2008	94	4	--	2	3.9
2009	97	--	2	1	13.7
2010	96	--	--	4	7.6
2011	99	--	--	1	7.8
2012	90	--	1	9	14.8
2013	95	1	4	--	7.3
Average 2008-13	95.2 (.03)	0.8 (2.0)	1.2 (1.33)	2.8 (4.75)	9.2 (0.46)

5. Conclusions

This paper evaluates for several Oecd countries the sources of government debt increase during the Great Recession and the years immediately before. This is done adopting an intentionally neutral approach, based on a simple accounting scheme that decomposes annual debt-to-GDP changes into its numerator (deficit, discrepancies) and denominator (inflation, real GDP) independent weights.

This limited choice is made basically for two reasons. The first is avoiding controversial (and often inconclusive) debates on the way in which fiscal policy reflects/affects the aggregate economy. The second is related to the obvious – though often neglected - recognition that a rising debt-to-GDP ratio cannot depend on the fiscal numerator only. In particular, the role of the GDP denominator (and its components) clearly rises in recession times and especially when recessions are *nominal*.

The sample is based on annual data for six Oecd countries during the Great Recession (2008-13) and the 2000-07 years to evaluate if and how the crisis affected the debt-to-GDP size. The selected countries are the US and the UK on one side and the four biggest EZ economies (Germany, France, Italy and Spain), also sometimes labeled as belonging to the EZ ‘core’ (Germany, France) and to the Mediterranean ‘periphery’ (Italy, Spain), respectively. In this vein, the EZ frame also matters for the choice of the pre-crisis years in which the common currency was already working along with the accompanying deficit rule and the attention paid to the debt size as well.

Looking at the graphs in Section 3, the Great Recession impact is apparently similar everywhere if the attention focuses on the timing rather than on the size of the debt-to-GDP responses. Decompositions in Section 4 indicate that debt-to-GDP increases were more or less large in the 2008-13 years and not always resulting from deliberate fiscal policies only: there was also a general reduction (except Germany) of the nominal GDP weight, due to the combination of low prices and low or even negative growth.

Debt decomposition also shows that the deficit weight rises - though differently - in all countries but Germany, where it was instead dominating in the pre-crisis years. Thus, during the Great Recession, changes in debt and deficit go together in all cases but Germany and - to lesser extent – Italy, i.e. in the only two countries exhibiting, for different reasons, a primary surplus during the crisis years.

In countries displaying instead a more counter-cyclical policy, the debt change numerator (often, the deficit) prevails in the 2008-13 period and recovery seems starting before. This typically refers to the US economy if compared with the general EZ, lagging, inertia. Prevailing deficit weights are also found in England and in Spain, a country subject

to the EZ discipline but also to the possibility of postponing at 2016 the correction deadline. Conversely, in the remaining EZ area considered here, France could be placed into an intermediate position between Italy and Spain, though in France (moderate) deficit stabilization mattered also before.

Overall, debt decomposition results seem basically indicating three fiscal responses to the Great Recession and its influence on the government debt-to-GDP size:

There is a specific German response aiming at minimizing its fiscal adjustment, probably because the crucial one occurred in the years before (2000-07) when the country had to face the unification costs and reform programs that proved to be useful afterwards. While making reforms in good rather than in bad times seems efficient per se, the cost of this strategy was, however, a modest real growth since the recession occurred anyway. The peculiar weight reversal before and during the Great Recession suggests also the prevalence of a stability ideology that was not really stabilizing in the crisis years.

As far as the other EZ countries are concerned, they actually differ but can be grouped for convenience to show how agreed fiscal policies may actually range from debt-induced discipline (Italy) to several degrees of accommodation (Spain, France), given other differences in the private sector. Yet, in all cases the 2008-13 debt changes reflect an increasing deficit weight which is huge in Spain, big in France and moderate in Italy. Finally, the average real GDP growth was, null for France, negative for Spain and even more for Italy, affecting also in this way the debt ratio parameter.

The last response involves the US and, partially, the UK: the cases where the Great Recession debt changes reflect a temporary, counter-cyclical, policy that neatly differs from the EZ mix, made by common inertia and ad hoc heterogeneity. In this respect, it should also be noticed that a counter-cyclical pattern implies also reducing extra spending and related deficit weights as long as the recovery shows up as the US data confirm and the UK expectations suggest.

References

Buiter W., Rahbani E. (2012), *Debt of Nations*, Citicorp, November.

Cecchetti S.G, Mohanty M.S. and Zampolli F. (2011), *The Real Effects of Debt*, BIS WP 352, September.

Coricelli F. and Fiorito R. (2013), *Myths and Facts about Fiscal Discretion: A New Measure of Discretionary Expenditure*, Documents de Travail du Centre d'Economie de la Sorbonne, April.

Eisner R. and Pieper P.J. (1984), *A New View of the Federal Debt and Budget Deficits*, American Economic Review, March, 1182-29.

Estrada A., Galí J. and Lopez-Salido D. (2013), *Patterns of Convergence and Divergence in the Euro Area*, IMF Economic Review, 4, 601-31.

Fiorito, R. (2013), *Business Cycles and Recessions in the Oecd Area*, Modern Economy, March.

Oecd (2013), *Economic Outlook 94*, November.

Ostry, J.D., Ghosh A.R., Kim J.I. and Qureshi M.S. (2010), *Fiscal Space*, IMF Staff Position Note, September.

Parker, J (2011), *On Measuring the Effects of Fiscal Policy in Recessions*, Journal of Economic Literature, 703-18.

Ramey, V.A. (2011), *Can Government Purchases Stimulate the Economy?* Journal of Economic Literature, 673-85.

Robinson, M. (2009), *Accrual Budgeting and Fiscal Policy*, IMF Working Paper, April.

Appendix

Table 3.1 – Government Debt % Changes and Sources

United States	(1) Debt to GDP Changes	(2) GDP Deflator Changes	(3) Real GDP Changes	(4) Nominal GDP Changes	(5) Debt to GDP	(6) Deficit to GDP	(7) Primary Deficit to GDP	(8) Govt Bond Yields	(9)= (8) - (2) Real Int.Rate	(10)= (9) – (3) SDI Sustainable Debt Index
2000	-6.0	2.3	4.1	6.4	54.5	-1.5	3.9	6.0	3.7	-0.4
2001	-0.1	2.3	1.1	3.4	54.4	0.6	1.6	5.0	2.7	1.6
2002	2.4	1.7	1.8	3.5	56.8	4.0	2.0	4.6	2.9	1.1
2003	3.4	2.2	2.5	4.7	60.2	5.0	3.1	4.0	1.8	-0.7
2004	7.3	2.9	3.5	6.4	67.5	4.4	2.7	4.3	1.4	-2.1
2005	-0.4	3.4	3.1	6.5	67.1	3.3	1.4	4.3	0.9	-2.2
2006	-1.3	3.3	2.7	6.0	65.8	2.2	0.3	4.8	1.5	-1.2
2007	0.5	2.9	1.9	4.9	66.3	2.9	1.0	4.6	1.7	-0.2
Average 2000-07	0.7 (5.33)	2.6 (0.23)	2.6 (0.38)	5.2 (0.25)	61.6 (0.09)	2.6 (0.82)	2.0 (0.59)	4.7 (0.13)	2.1 (0.45)	-0.5 (2.66)
2008	9.0	2.2	-0.3	1.9	75.3	6.6	4.8	3.7	1.5	1.8
2009	13.5	0.9	-3.1	-2.2	88.8	11.9	11.6	3.3	2.4	5.5
2010	9.1	1.3	2.4	3.8	97.9	11.4	9.3	3.2	1.9	-0.5

2011	4.4	2.1	1.8	4.0	102.3	10.2	7.9	2.8	0.7	-1.1
2012	4.0	1.8	2.2	4.0	106.3	8.7	6.4	1.8	0	-2.2
2013	2.8	1.5	1.9	3.4	109.1	5.4	4.6	1.9	0.4	-1.5
Average 2008-13	7.1 (0.57)	1.6 (0.30)	0.8 (2.63)	2.5 (0.98)	96.6 (0.13)	9.0 (0.29)	7.4 (0.37)	2.8 (0.28)	1.1 (0.81)	0.3 (8.6)

Source: Oecd Economic Outlook database (EO93) which includes 2013 forecasts; Debt (gross), deficits and components refer to General Government. Debt for Germany, France, Italy and Spain refers to the Maastricht definition. Negative numbers for deficits indicate a surplus; Ratios to GDP involve nominal variables and all changes are in % units; Bond yields refer to a 10 year maturity; The SDI index is sustainable for negative values; To account for scale differences the volatility in parenthesis is Pearson's coefficient of variation.

Table 3.2 – Government Debt % Changes and Sources

United Kingdom	(1) Debt to GDP Changes	(2) GDP Deflator Changes	(3) Real GDP Changes	(4) Nominal GDP Changes	(5) Debt to GDP	(6) Deficit to GDP	(7) Primary Deficit to GDP	(8) Govt Bond Yields	(9)= (8) - (2) Real Int.Rate	(10)= (9) – (3) SDI (Sustainable Debt Index)
2000	-2.2	0.7	4.2	4.9	45.2	-3.7	-6.1	5.3	4.6	0.4
2001	-4.7	1.7	2.9	4.6	40.5	-0.6	-2.7	4.9	3.2	0.3
2002	0.6	2.4	2.4	4.8	41.1	2.0	0.2	4.9	2.5	0.1
2003	0.5	2.6	3.8	6.4	41.6	3.7	1.9	4.5	1.9	-1.9
2004	2.3	2.7	2.9	5.6	43.9	3.5	1.8	4.9	2.2	-0.7
2005	2.2	2.4	2.8	5.2	46.1	3.2	1.4	4.4	2.0	-0.8
2006	-0.2	3.0	2.6	5.6	45.9	2.6	0.9	4.5	1.5	-1.1
2007	1.1	2.2	3.6	5.9	47.0	2.7	0.9	5.0	2.8	-0.8
Average 2000-07	-0.05 --	2.2 (0.33)	3.1 (0.20)	5.4 (0.11)	43.9 (0.06)	1.7 (1.53)	-0.2 (13.1)	4.8 (0.06)	2.6 (0.38)	-0.6 (1.8)
2008	10.5	3.0	-1.0	2.0	57.5	4.9	3.5	4.6	1.6	2.6
2009	14.5	1.3	-4.0	-2.7	72.0	10.8	9.9	3.6	2.3	6.3
2010	13.6	2.8	1.8	4.6	85.6	10.0	7.6	3.6	0.8	-1.0
2011	14.8	2.3	1.0	3.4	100.4	7.9	5.1	3.1	0.8	-0.2
2012	3.5	1.4	0.3	1.7	103.9	6.5	6.1	1.9	0.5	0.2
2013	5.2	1.9	0.8	2.7	109.1	7.1	5.0	1.9	0	-0.8
Average 2008-13	10.3 (0.48)	2.1 (0.33)	-0.2 (11.4)	1.9 (1.28)	88.1 (0.23)	7.9 (0.28)	6.2 (0.36)	3.1 (0.34)	1.0 (.82)	1.2 (2.38)

Table 3.3 - Government Debt % Changes and Sources

Germany	(1) Debt to GDP Changes	(2) GDP deflator changes	(3) Real GDP Changes	(4) Nominal GDP Changes	(5) Debt to GDP	(6) Deficit to GDP	(7) Primary Deficit to GDP	(8) Govt Bond yields	(9) = (8) - (2) Real Int.Rate	(10)= (8) – (3) SDI (Sustainable Debt Index)
2000	-1.2	-0.7	3.3	2.6	60.2	-1.3	-3.9	5.3	6.0	2.7
2001	-1.1	1.2	1.6	2.8	59.1	2.8	0.5	4.8	3.6	2.0
2002	1.5	1.4	0	1.5	60.6	3.6	1.3	4.8	3.4	3.4
2003	3.7	1.2	-0.4	0.7	64.3	4.0	1.5	4.1	2.9	3.3
2004	2.1	1.1	0.7	1.8	66.4	3.8	1.3	4.0	2.9	2.2
2005	2.2	0.7	0.8	1.5	68.6	3.3	0.9	3.4	2.7	1.9
2006	-0.6	0.4	3.9	4.2	68.0	1.7	0.8	3.8	3.4	-0.5
2007	-2.9	1.6	3.4	5.1	65.1	-0.2	2.7	4.2	2.6	-0.8
Average 2000-07	0.5 (4.83)	0.9 (0.85)	1.7 (1.00)	2.5 (0.59)	64.0 (0.06)	2.2 (0.90)	0.6 (3.1)	4.3 (0.14)	3.4 (0.32)	1.8 (0.9)
2008	1.8	0.8	0.8	1.6	66.9	0.1	-2.3	4.0	3.2	2.4
2009	7.6	1.2	-5.1	-4.0	74.5	3.1	0.8	3.2	2.0	7.1
2010	8.0	0.9	4.0	5.0	82.5	4.2	2.0	2.7	1.8	-2.2
2011	-2.0	0.8	3.1	3.9	80.5	0.8	-1.2	2.6	1.8	-1.3
2012	1.4	1.3	0.9	2.2	81.9	-0.2	-2.4	1.5	0.2	-0.7
2013	-1.3	1.2	0.4	1.6	80.6	0.2	-1.8	1.4	0.2	-0.2
Average	2.6	1.0	0.7	1.7	77.8	1.4	-0.8	2.6	1.5	0.8

2008-13	(1.67)	(0.22)	(4.65)	(1.81)	(0.08)	(1.34)	(2.2)	(0.39)	(0.75)	(4.0)
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Table 3.4 – Government Debt % Changes and Sources

France	(1) Debt to GDP Changes	(2) GDP Deflator Changes	(3) Real GDP Changes	(4) Nominal GDP Changes	(5) Debt to GDP	(6) Deficit to GDP	(7) Primary Deficit to GDP	(8) Govt Bond Yields	(9) = (8) – (2) Real Int.Rate	(10) = (8) – (3) SDI (Sustainable Debt Index)
2000	-1.5	1.7	3.8	5.5	57.4	1.5	-1.1	5.4	3.7	-0.1
2001	-0.5	2.1	1.8	3.9	56.9	1.6	-1.0	4.9	2.8	1.0
2002	2.1	2.3	0.9	3.2	59.0	3.2	0.6	4.9	2.6	1.7
2003	4.1	2.0	0.9	2.9	63.1	4.1	1.5	4.1	2.1	1.2
2004	2.0	1.7	2.3	4.0	65.1	3.6	1.0	4.1	2.4	0.1
2005	1.6	2.0	1.8	3.8	66.7	3.0	0.5	3.4	1.4	-0.4
2006	-2.8	2.3	2.6	4.9	63.9	2.4	0	3.8	1.5	-1.1
2007	0.3	2.6	2.2	4.9	64.2	2.7	0.3	4.3	1.7	-0.5
Average 2000-07	0.7 (3.36)	2.1 (0.15)	2.0 (0.46)	4.1 (0.22)	62.0 (0.06)	2.8 (0.33)	0.2 (4.0)	4.4 (0.15)	2.3 (0.34)	0.2 (4.1)
2008	4.1	2.5	-0.2	2.4	68.3	3.3	0.7	4.2	1.7	1.9
2009	10.9	0.7	-3.1	-2.4	79.2	7.6	5.4	3.6	2.9	6.0
2010	3.2	1.1	1.6	2.6	82.4	7.1	4.8	3.1	2.0	0.4
2011	3.6	1.3	1.7	3.1	86.0	5.3	2.7	3.3	2.0	0.3
2012	4.7	1.3	0.0	1.4	90.7	4.9	2.2	2.5	1.2	1.2
2013	3.8	1.3	-0.3	1.0	94.5	4.0	1.4	2.0	0.7	1.0
Average 2008-13	5.0 (0.58)	1.4 (0.44)	0.0 --	1.3 (1.48)	83.5 (0.11)	5.4 (0.32)	2.9 (0.65)	3.1 (0.25)	1.7 (0.43)	1.8 (1.2)

Table 3.5 - Government Debt % Changes and Sources

Italy	(1) Debt to GDP Changes	(2) GDP Deflator Changes	(3) Real GDP Changes	(4) Nominal GDP Changes	(5) Debt to GDP	(6) Deficit to GDP	(7) Primary Deficit to GDP	(8) Govt Bond Yields	(9) = (8) – (2) Real Int.Rate	(10) = (9) – (3) SDI (Sustainable Debt Index)
2000	-4.8	2.0	3.9	5.9	108.4	0.9	-5.1	5.6	3.6	-0.3
2001	-0.2	2.9	1.8	4.7	108.2	3.1	-2.8	5.2	2.3	0.5
2002	-3.0	3.3	0.4	3.7	105.2	3.0	-2.2	5.0	1.7	1.3
2003	-1.4	3.1	0	3.1	103.8	3.5	-1.3	4.3	1.2	1.2
2004	-0.2	2.4	1.6	4.0	103.6	3.6	-1.1	4.3	1.9	0.3
2005	2.1	1.8	1.1	2.9	105.7	4.5	0	3.6	1.8	0.7
2006	0.5	1.7	2.3	4.0	106.2	3.4	-1.0	4.0	2.3	0
2007	-2.9	2.4	1.5	4.0	103.3	1.6	-3.1	4.5	2.1	0.6
Average 2000-07	-1.2 (1.80)	2.4 (0.25)	1.6 (0.76)	4.0 (0.23)	105.5 (0.02)	2.9 (0.39)	-2.1 (0.77)	4.6 (0.14)	2.1 (0.33)	0.5 (1.0)
2008	2.8	2.5	-1.2	1.3	106.1	2.7	-2.2	4.7	2.2	3.4
2009	10.4	2.1	-5.5	-3.5	116.5	5.4	1.0	4.3	2.2	7.7
2010	2.9	0.4	1.7	2.1	119.4	4.3	0	4.0	3.6	1.9
2011	1.4	1.3	0.5	1.8	120.8	3.7	-1.0	5.4	4.1	3.6
2012	6.2	1.6	-2.4	-0.8	127.0	2.9	-2.3	5.5	3.9	6.3
2013	4.7	1.5	-1.8	-0.4	131.7	3.0	-2.7	4.2	2.7	4.5
Average 2008-13	4.7 (0.15)	1.6 (0.46)	-1.4 (1.72)	0.1 (25.4)	120.2 (0.07)	3.7 (0.28)	-1.2 (1.22)	4.7 (0.14)	3.1 (0.27)	4.6 (0.46)

Table 3.6 – Government Debt % Changes and Sources

Spain	(1) Debt to GDP Changes	(2) GDP Deflator Changes	(3) Real GDP Changes	(4) Nominal GDP Changes	(5) Debt to GDP	(6) Deficit to GDP	(7) Primary Deficit to GDP	(8) Govt Bond Yield	(9) = (8) - (2) Real Int.Rate	(10) = (9) – (3) SDI (Sustainable Debt Index)
2000	-3.0	3.7	5.0	8.7	59.4	1.0	-2.0	5.5	1.8	-3.2
2001	-3.8	4.3	3.7	8.0	55.6	0.7	-2.1	5.1	0.8	-2.9
2002	-3.0	4.5	2.7	7.2	52.6	0.5	-2.1	5.0	0.5	-2.2
2003	-3.8	4.3	3.1	7.4	48.8	0.2	-1.7	4.1	-0.2	-3.3
2004	-2.5	4.1	3.3	7.4	46.3	0.1	-1.7	4.1	0	-3.3
2005	-3.1	4.5	3.6	8.1	43.2	-1.3	-2.8	3.4	-1.1	-4.7
2006	-3.5	4.3	4.1	8.4	39.7	-2.4	-3.7	3.8	-0.5	-4.6
2007	-3.4	3.3	3.5	6.9	36.3	-1.9	-3.0	4.3	1.0	-2.5
Average 2000-07	-3.3 (0.14)	4.1 (0.10)	3.6 (0.19)	7.8 (0.08)	47.7 (0.17)	-0.4 (3.33)	-2.4 (0.39)	4.4 (0.16)	0.3 (3.21)	-3.3 (0.27)
2008	3.9	2.4	0.9	3.3	40.2	4.5	3.4	4.4	2.0	1.1
2009	13.7	0.1	-3.7	-3.7	53.9	11.2	9.9	4.0	3.9	7.6
2010	7.6	0.4	-0.3	0.1	61.5	9.7	8.3	4.2	3.8	4.1
2011	7.8	1.0	0.4	1.4	69.3	9.4	7.5	5.4	4.4	4.8
2012	14.8	0.3	-1.4	-1.1	84.1	10.6	7.9	5.8	5.5	6.9
2013	7.3	0.7	-1.7	-1.0	91.4	6.9	3.5	4.9	4.2	5.9
Average 2008-13	9.2 (0.46)	0.8 (1.03)	-1.0 (1.73)	-0.2 (14.3)	66.7 (0.29)	8.7 (0.29)	6.7 (0.40)	4.8 (0.15)	4.0 (0.29)	5.1 (0.46)