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Is fiscal policy pro-cyclical in bad times?

Abstract:
This paper analyses the cyclical behaviour of fiscal policy in euro area member states over the period 1995-2014. In particular it addresses the question of whether fiscal policy is pro-cyclical in bad times due the combination of binding fiscal rules and hard budget constraint imposed by financial markets. The estimates reveal that fiscal policy tend to be pro-cyclical when the output is above its potential while in bad times fiscal policy stance seems independent of the cycle. The empirical analysis also shows that risk premia, the 'binding' fiscal rules and public debt seem to exert a pressure for a prudent fiscal stance, but fail to systematically affect the cyclicality of the fiscal policy stance, as measured relative to the output gap. Yet in bad times, high risk premia induce pro-cyclicality and binding fiscal rules (i.e. large fiscal deficits) eliminate counter-cyclicality, which is observed when governments have fiscal space. In good times, fiscal rules (high deficits) seems to reduce pro-cyclicality.
Acknowledging that governments have only incomplete information about the state of the economy at the time policies are set, we also estimate the same specifications using real-time data for the output gap. The analysis suggests that the ex-post policy stance is independent of the cycle as estimated at that moment of the decision regardless of the cyclical conditions.

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1 Introduction

The question of the cyclicality of the fiscal policy has come back to the fore as central issue in the debate around the fiscal-monetary policy mix in the euro area. This has been revamped by the economic context where the 'conventional' monetary policy instrument is trapped at the zero lower bound, unconventional monetary policy seems to have only limited impact on the economy and national fiscal policy is de facto the only available instrument for cyclical stabilization. This issue is a long-debated one and saw support for, or opposition to, discretionary fiscal policy or 'fiscal activism" fluctuate together with the macroeconomic paradigms.

In general terms, pro-cyclical fiscal policy (expansive during booms and restrictive during downturns) goes against both the purpose of economic stabilization and discipline. During good times, pro-cyclical policies risk producing an overheating of the economy fiscal and prevent the build-up of buffers to be used in bad times. During bad times, cutting fiscal expenditure can be destabilizing and even defeat the purpose of consolidation if it exacerbates the output fall. While there is consensus on what fiscal policy should do, the evidence that fiscal policy acts to counter the cyclical lacks across regions and over time. More often, fiscal policy tend to be asymmetric over the business cycle: pro-cyclical during the upturn and countercyclical during the downturn, resulting in persisting budget deficits (so-called deficit bias in setting fiscal policy) which lead to debt accumulation.

In the original governance framework of the EMU, fiscal rules were designed with the primary purpose of preventing persistent deficits and the accumulation of debt in member states and thought to induce fiscal policy to be countercyclical, with a preference for discipline over stabilization as contained in the asymmetric fiscal rule of the 3% deficit. In reality, there is little doubt that discipline has not worked and it is unclear how much stabilization has been achieved through fiscal policy.[1]

The asymmetric nature of the rule, in reality may have sometimes resulted in a pro-cyclical bias: fiscal deficits are limited in downturns, when the constraint becomes binding as effect of the GDP reduction, but do not comprise rules for prudence in upturns. The governance reforms introduced by the Six- and the Two-Pack after 2010 strengthened the fiscal rules and reinforced economic policy coordination through the EU semester but also increased the complexity of rules, whose enforcement remains limited. More recently the European Commission has moved towards a more flexible[2] interpretation of the rules by giving countries hit by the crisis more time to comply with the rules or to get a 'discount' in exchange of more reforms.

[1] It has to be acknowledged that the extent to which counter-cyclical policies have a stabilizing or destabilizing impact on the business cycle ultimately depends on the magnitude of the fiscal multipliers as well as the time lag and the persistence of its effects. In this respect, recent studies have underscored the importance of the state of the economy in determining the multiplier effect, in particular, they offer evidence of large multipliers when economies confront a binding zero lower bound on interest rates and more in general recessionary conditions relative to expansionary phases either because the supply constraint is asymmetric or agents face a binding budget constrain. See among others Auerbach and Gorodnichenko (2011) and Batini et al. (2014) .

[2] http://ec.europa.eu/economy_finance/economic_governance/sgp/pdf/2015-01-13_communication_sgp_flexibility_guidelines_en.pdf

Broadly speaking after the stimulus measures implemented in a coordinated way just in the aftermath of the Lehman crisis, throughout 2009 and 2010 with the so-called European Recovery Plan, to offset the sharp fall in GDP, fiscal policy stance turned less loose or even restrictive in several euro area countries, especially those most exposed to market turbulences. It is after the start of the sovereign debt crisis in Greece that the use of fiscal policy as macroeconomic stabilization tool regained interest especially within the EMU member states. Besides the question of size of the effect of countercyclical policies on GDP, as affected by the size of the fiscal multiplier, few questions aroused.

What is the role of existing rules in preventing fiscal policy from being a tool for stabilization during crisis, when fiscal rules becomes binding? What is the role of (excessive) market pressure on governments in preventing fiscal policy from being a tool for stabilization during crisis, when access to financial markets is more difficult? Is the imperfect understanding of the current cyclical conditions responsible for a pro-cyclical stance while policy makers genuinely intended to be counter-cyclical? Is the presence of inside lags with the use of fiscal policy measures, planned in previous periods, which result even in pro-cyclical effects? These are the questions we attempt to address in this paper.

We start by testing whether, during the crisis, fiscal policy was pro-cyclical by estimating a simple policy reaction function, where the dependent variable is the change in the cyclically adjusted primary balance and reacts to the cycle conditions, as measured by the output gap. In particular the paper aims at assessing the impact of fiscal rules on the cyclicality of fiscal policy. In the EU the contemporaneous presence of several types of rules would require a full assessment of the whole system of fiscal governance. In order to measure the impact of rules, in what follows we choose to focus explicitly only on the 3% rule on the nominal fiscal deficit, the target rule on which the trigger for the excessive deficit procedure (EDP) is based.

The second step consists in testing whether financial markets by making access to borrowing more expensive induce pro-cyclicality in the fiscal stance. Lastly, we want to test whether the cyclicality of the fiscal policy is affected by the information available to policy makers when decisions are taken. In order to do this, we replace the ex-post estimates of the output gap with real time data. As it will explain later in more detail, we keep as dependent variable the ex-post value of the fiscal balance to assess what materialised given the information available.

The remainder of the paper is organized as follows. Section 2 is devoted to a review of the literature on the cyclicality of fiscal policy, by looking at empirical findings based on ex-post and real time data. Section 3 illustrates some stylized facts about fiscal policy in the euro area countries. Section 4 seeks to investigate the evolution of the fiscal stance over the cycle since the inception of the EMU, paying particular attention to the developments in the fiscal stance during upturns as well as downturns and the recent crisis. Our specification extends the work done by Huart (2011) and Turrini (2008) who have not considered the crisis years and add to their findings by spelling out the role of fiscal rules and markets in affecting cyclicality of fiscal policy. The second part of the same section presents the estimates of the fiscal policy reaction function based on real

time data and compare the results to the empirical analysis based on ex-post data. The last section concludes.

2 Review of the literature

The literature on discretionary fiscal policy has typically been concerned with estimating the reaction of fiscal policy to cyclical swings in economic activity. Fiscal policy reaction functions are usually defined as the way the discretionary component of fiscal changes in response to a business cycle indicator as well as to other factors of concerns for fiscal authorities, such as the debt level and the past deficit levels. Discretionary fiscal policy is typically measured by the changes in the cyclically adjusted (primary) balance while the output gap (or its changes) is generally used as a business cycle indicator.

Although there is a widespread consensus that fiscal policy is a tool for stabilization and should be managed so to offset demand shocks, evidence that this happens is very weak, if it exists at all.

Gavin and Perotti (1997) are probably the first ones to empirically investigate the cyclicality of fiscal policy. They look into the behaviour of budgetary policy in Latin America and find increasing deficits in good times and a tightening stance in times of recession pointing to strong pro-cyclicality. The findings of Talvi and Vegh (2000) and Lane (2003) confirmed a strong pro-cyclical bias in fiscal policy for developing economies.

The bulk of literature that has analysed industrialized countries find a more mixed results. For instance Fatas and Mihov (2009), who use OECD data for the period 1970-2007, find that fiscal policies appears mostly a-cyclical or inconsistent, in the sense that no systematic behaviour relative to the cycle can be identified. Indeed, the cyclical component of the output appears weakly correlated with changes in the cyclically adjusted primary balance. Results from the studies that have focused on EMU countries over the pre-2008 period provide results along the same lines, and indicate that, overall, the reaction of discretionary fiscal policy to changes in the output gap tends to be either weak or pro-cyclical. Looking at the evolution over key periods of EMU integration, the EC (2004) and Gali and Perrotti (2003) show that while there is evidence of pro-cyclical bias in the fiscal stance in the run-up to the Maastricht Treaty, discretionary fiscal policy in EMU countries become acyclical afterwards. They also find that the introduction of common fiscal rules, through the Stability and Growth Pact, did not hamper member states' ability to use fiscal policy as a stabilization tool during the first decade of the EMU. This finding is consistent with a general trend among countries where fiscal rules are in force.

A number of studies looked at whether the cyclicality of discretionary fiscal policy is asymmetric over the cycle and usually distinguished periods of positive and negative output gap. Among other Debrun et al. (2004) and European Commission (2004) find that discretionary changes in the fiscal stance tend to present some degree of asymmetry over the business cycle, and report a pro-cyclical bias during good times, while during recessions there is no evidence of pro-cyclicality. Turrini 2008 finds that fiscal policy stance is on average a-cyclical, but with a pro-cyclical bias in good times driven by strong pro-cyclical bias in expenditure.

The pro-cyclicality of fiscal policy during good times is usually explained by political economy considerations and the low weight that politicians attach to stabilization objectives. In good times, interest groups typically pressure politicians to redistribute fiscal windfalls (the voracity effect of Tornell and Lane, 1999), whereas at the same time, the 'common pool problem' is exacerbated as the more resources become available, (see Drazen 2000, for a review of the political of pro-cyclical fiscal policy). As for explaining episodes of pro-cyclical fiscal policy during downturns, Gavin and Perotti (1997) show that procyclical fiscal consolidation episodes are largely driven by the lack of access (or a high cost) to financial markets during crisis times. Turrini (2008) argues that in the EMU pro-cyclical fiscal consolidation episodes have tended to occur after episodes of fiscal profligacy, particularly in those countries carrying a high debt.

Huart (2011) considers a different measure of the cyclical conditions, namely negative and positive changes in the output gaps rather than the levels, and finds that, according to this definition, fiscal policy has become more counter cyclical in particular during bad times (negative changes in output gaps) over the period 1999-2005, but no evidence is found of counter cyclicality during good times. She also concludes that countercyclical fiscal policy in bad times is associated with either deficits larger than 3% of GDP or debt above 60% of GDP, which looks at odd with the presence of fiscal rules. Section 4 of this paper addresses similar question.

Lastly, a key element of fiscal policy making that has recently attracted more attention, is the potentially large gap between the information available to policy makers at the time of taking decisions and the ex-post data. Potential discrepancies usually relate to the degree of uncertainty around the measurement of the actual cyclical conditions and the nature and duration of shocks, negative or positive that hit the economy. In addition to the danger of pursuing policies that may turn out inappropriate due to a poor assessment of the situation, the gap between intended actions and actual outcomes can be due to the lag in the materialization of the policy response. When accounting for this, it may happen that the outcome of ex-post data results in a misleading assessment of the historical policy behaviour. In this respect, the existing literature using real time data focused on the analysis of the fiscal plans in reaction to the current information about the cycle, namely the real time projection for the output gap. Cimadomo (2007) is the first one to use fiscal plan as measure of the *ex-ante* fiscal policy and other have followed his approach. Studies that have used real time data in order to capture policy makers' intentions point to stronger evidence of counter-cyclicality in fiscal policy in the euro area. Over the period 1994-2008 Golinelli and Momigliano (2006) find that discretionary fiscal policies has been stabilizing and symmetric over the cycle, with no significant difference in the behaviour of fiscal policy in recessions and expansions. Pina (2009) uses budgetary plans to estimate fiscal reaction functions with real-time data, and compares it with ex-post data. Considering 15 EU countries from 1987 to 2006, ex-post revisions generally lead to weakening the counter-cyclicality of fiscal policy, in particular on the government expenditure side. Golinelli, and Momigliano (2009) review the literature on the cyclicality of fiscal policy and find that differences in the estimates are driven partly by the choices in modelling fiscal behaviour and the notions of fiscal policy cyclicality. Results are also affected by data source and vintage (ex post or real-time), but in general ex-post data suggest either a-

cyclicality or weak counter-cyclicality, while real-time information gives clearer indications of counter-cyclical behaviour.

Cimadomo (2012), using fiscal plans reported at the time of budgeting, together with other information available to fiscal policy-makers in real time, for the period 1994-2006 shows that OECD countries have often planned a counter-cyclical fiscal stance, especially during upturns. This starkly contrasts with findings based on ex-post data, which point towards a-cyclicality or pro-cyclicality, especially in good times. He explains the difference in the estimates with forecast errors for the government structural balance and the output gap.

Overall, it appears that prior to the sovereign crisis, euro area policy makers have intended to pursue counter-cyclical fiscal policy, but these intentions somehow failed to be reflected in an actual counter-cyclical policy stance, especially in good times. As it will be argued later this may signal excessive optimism on the side of policy makers.

3 Data and stylized facts

The analysis presented in this paper considers a panel of EA11 countries[3] over the period 1995-2014, which corresponds to the period that saw the process of monetary integration develop. The data used in this paper was extracted from the AMECO database and includes output gap computed from a production function and the cyclically adjusted balance data.

In the baseline estimation we use "ex-post" data. This means that the results presented help understanding policy outcomes and do not necessarily reflect policy makers' intentions. The dependent variable representing fiscal activism is the changes in the cyclically adjusted primary balance, i.e. we focus on the discretionary component of the fiscal policy and leave out interest payments, which are assumed to be out of control of fiscal authorities, but also the expenditure related to automatic stabilizers, which is automatically activated and driven by changes in the cycle. The variables are expressed as a share of potential output. Data points for the cyclically adjusted fiscal balance were corrected for the one-off bank guarantees provided by the Irish government in 2009. Positive (negative) changes in the cyclically adjusted primary balance is associated with a contractionary (expansionary) fiscal policy change. Fiscal policy pro-cyclicality is defined as cases where an expansionary (restrictive) fiscal policy is associated with a positive (negative) output gap and vice versa for counter-cyclicality.

It is worth noting that while almost all studies looking at the stabilizing role of fiscal policy focus only on its discretionary component, in order to discount differences in the welfare state across countries, it however is crucial to keep in mind that an important part of the fiscal stabilization, at least in Europe, is driven by automatic stabilizers. Therefore, such studies fail to consider full

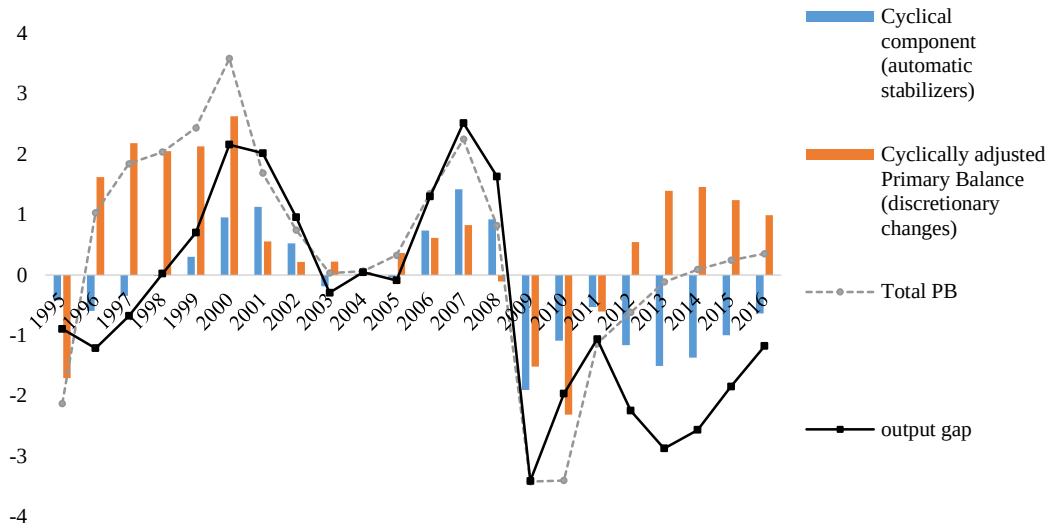
[3] Countries included are: Austria, Belgium, Finland, France, Germany, Ireland, Italy, Netherlands, Portugal, and Spain. Luxembourg is left out due the peculiarity of its economy. In the next session we will also be forced to leave Greece out given that data are only available for the last years of the sample and the very large changes in the output gap seem to affect results in a disproportionate way.

stabilization properties of a country when compare it to others. Deroose, et al. (2008) show that fiscal stabilisation in the euro area is less dire than commonly assumed when this point is taken into account. Most notably, this is the case when the euro area is compared to the US, given that automatic stabilizers play a significantly larger role than in the US.

Moreover, in reality the distinction between discretionary spending and automatic stabilizers is not as clear-cut as one could believe. As argued in Deroose et al. (2008), the progressive taxation and unemployment benefit expenditure, which are the main elements of the automatic stabilizers, in reality only have limited countercyclical features due to the fact that total taxation tend to be proportional to GDP rather than progressive (because social contribution is regressive) and that unemployment benefit expenditure is usually small part of the expenditure. Moreover, some policy changes, which have a permanent effect on the structure of automatic stabilizers effect both discretionary expenditure and automatic stabilizers at the same time.

Figures 1 depicts the cyclical and discretionary components of the primary balance as % of GDP. It suggests a positive correlation among the two variables during the 'central part' of the sample (199-2012), which can be interpreted, at least to some degree, as counter-cyclicality of discretionary fiscal stance (at the level of the euro area). However, recent years and the years before the creation of the EMU, clearly exhibit an opposite trend, with the negative cyclical component of the primary balance driven by a negative output gap countered by a surplus of the structural part, almost of the same magnitude, most likely induced by consolidation efforts.

Figure 1. Euro Area Primary balance: cyclical and discretionary components as % of GDP



Source: Authors' elaboration based on Ameco data

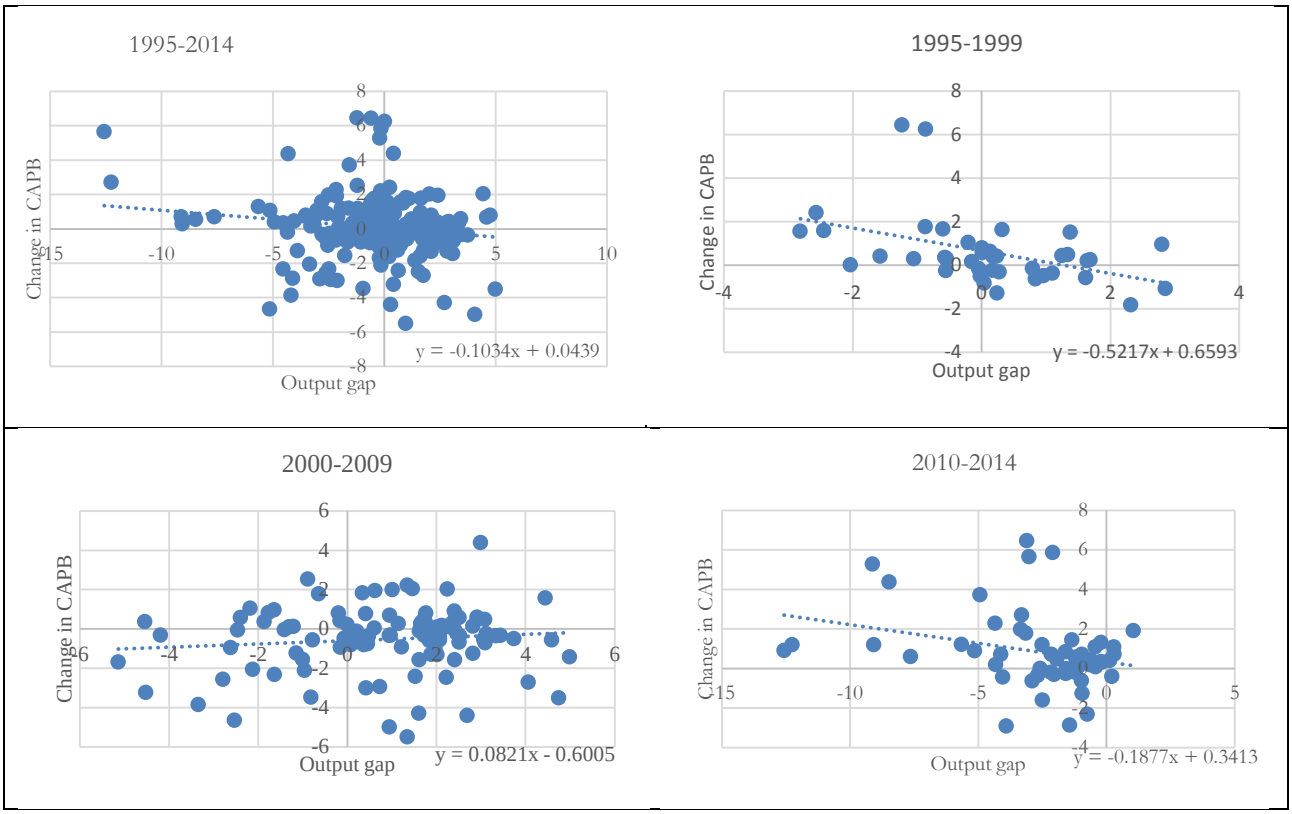
This shows the limits of looking only at discretionary part of the primary balance to assess the stabilization properties of the fiscal policy. Indeed during last 5 years of the sample, the discretionary part of the fiscal policy, looks pro-cyclical with a tightening stance while the output gap is still negative, but automatic stabilizers are still at work.

We keep this caveat in mind, yet in order to follow a panel analysis, which considers the behaviour of fiscal policy in individual countries, we will focus on the cyclically adjusted primary balance (CAPB), and in particular in its changes.

A first gauge on the cyclicality of fiscal policy can be obtain by plotting changes in the cyclically adjusted primary balance against the output gap.

The scatter plot charts presented in Figure 2 provides a first view of the pattern of fiscal policy over the cycle in the euro area during different periods. The slope coefficients are a rough estimate of the correlations between output gap and changes in CAPB across the sample, disregarding other factors affecting the primary balance. While the slopes change from one chart to the other signalling different behaviours, and possibly inconsistencies in the design of fiscal policy over time, the slope is negative in three of the 4 samples and very close to zero in one, the period preceding the crisis. Overall this would point to the conclusion that fiscal policy has been pro-cyclical, on average, in the euro area.

Figure 2. EA-11 Fiscal policy over the cycle

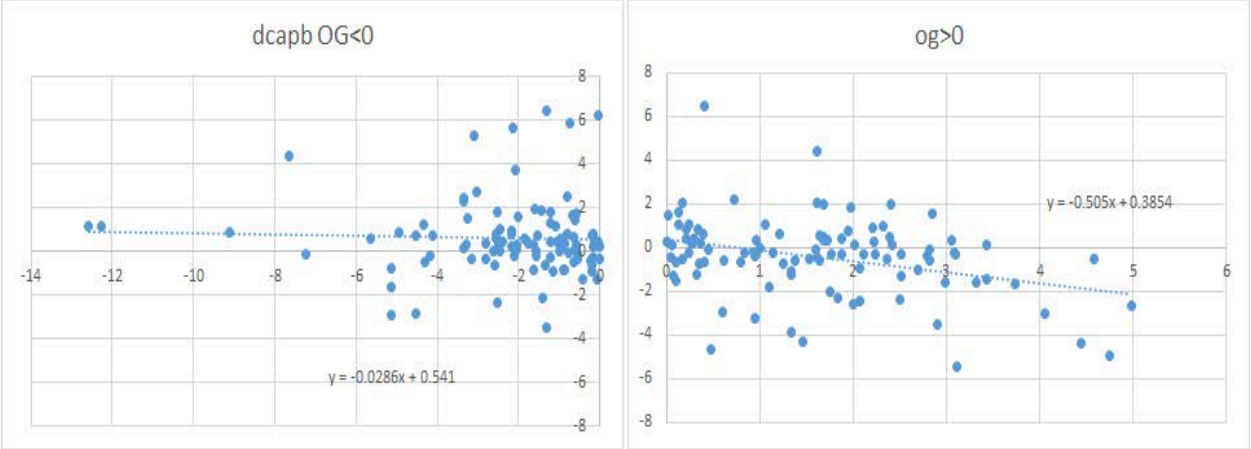


Source: Authors' elaboration based on Ameco data

Another way to look for further insight about the cyclicality of fiscal policy is to split the sample separating positive from negative output gaps. Figure 3 suggests that while fiscal policy stance is on average independent of the cycle when the output is below potential (see chart on the left hand side), a deterioration of the fiscal balance is associated with improvements of the output gap when this is above potential. The latter means pro-cyclicality during upturns.

Figure 3. EA-11 Fiscal policy over the cycle: Positive versus negative output gaps

(Change in CAPB on vertical axis and output gap on the horizontal axis)

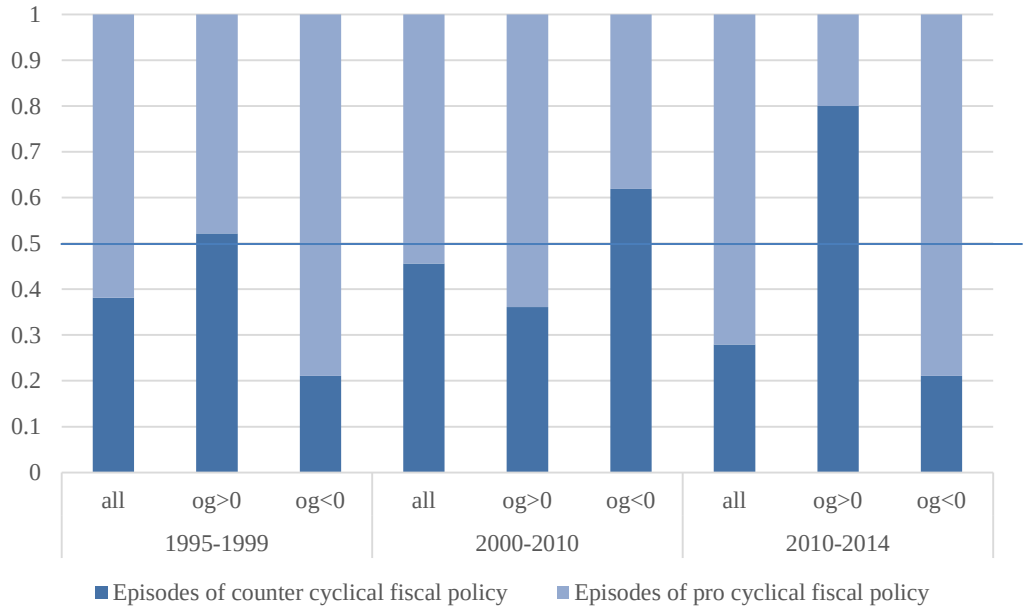


Source: Authors' elaboration based on Ameco data

While the trend line depicted in the charts provided first hint of the average behaviour of fiscal policy, it does not offer a clear picture of the frequency of counter and pro-cyclical episodes, and even less so about the periods during which it happened. Figure 4 shows that the frequency of cases of pro-cyclical policy – defined as cases where the OG is >0 (<0) and changes in CAPB > 0 (<0) - have been higher (around 60 percent) over the period 1995-2014, both when the output gap is positive and negative. Breaking down the sample into three periods to allow for a comparison of policy makers' action over time, and distinctive general economic contexts, shows that the risk of pro cyclical fiscal policy was relatively larger during periods of negative output gaps than during positive output gap periods over the first and last periods of the sample. At the same time, and in contrast to the periods 1995-1999 and 2010-2014, the period 2000-2009 displayed a large degree of pro-cyclicality in good times and a counter-cyclicality in bad times (quite rare during that period). This is in line with the "deficit bias" hypothesis discussed in the literature, which was likely to be exacerbated by the exceptional stability of economic conditions and growth over that period, characterized as the great moderation. After 2010, when the sovereign crisis started, the risk pro-cyclicality dramatically increased as a result of consolidation.

Against this prima-facie evidence, we move to investigate the cyclicality of fiscal policy focusing on the existence of external constraints which may affect it.

Figure 4. Episodes of counter and pro cyclical policy (1995-2014)



4 The model and the data: Estimating fiscal policy reaction functions

In order to gain further insights into the results displayed in the previous section we consider econometric estimations, where the relation between the CAPB and the output gap is assessed after controlling for other factors which may be important in the setting the fiscal policy stance.

In the economic literature the decision of fiscal authorities are explained by few independent variables beyond the output gap, which is expected to capture the fiscal stabilization motive. These are the lagged primary balance, which accounts for a possible inertia in the decision taking, and usually the lag of the level of public debt relative to GDP to capture some debt stabilization purpose. Unlike most of the literature, we prefer to focus on changes in the cyclically adjusted primary balance rather than the level, and we use it as dependent variable. This should better measure the policy stance and capture its reaction to the changes in the economic conditions reducing the path dependency in the level of the balance which is usually large. This has also econometric advantages, as reduces endogeneity problems.

4.1 Ex-post fiscal policy reaction functions

We follow the literature and in our baseline specification the change in cyclically adjusted primary balance is regressed on the lag dependent variable, the lag public debt and the output gap. We add only a specificity, the output gap is split into two series, positive and negative values, to be able to assess potential asymmetry in the fiscal policy behaviour as a stabilization device to cyclical fluctuations. The output gap variables are represented in their absolute values. This implies that a negative coefficient when the output gap is positive should be interpreted as an evidence of pro-cyclicality, by contrast a negative coefficient when the output is negative is evidence of counter-

cyclicality. The lags are used in order to capture the delay in the policy reaction, and to reduce the risk of endogeneity issues.

A second specification, as shown in the equation below, augments the baseline with three explanatory variables. A dummy for the year 2009 and 2010, which should capture the special economic conditions (aftermath of the Lehman collapse and huge fall in trade) and more specifically the joint fiscal stimulus coordinated at the level of the EU (European Recovery Plan), the risk premia, measured as spread on 10-year sovereign bonds relative to the German bund and, last but not least, a dummy variable taking value 1 if the nominal fiscal deficit is greater than 2.5% of GDP and zero otherwise.

$$\Delta CAPB_{i,t} = \beta_1 \Delta CAPB_{it-1} + \beta_2 D_{i,t-1} + \beta_{OG}^{p} OG_{i,t-1}^{p} + \beta_{OG}^{n} OG_{i,t-1}^{n} + \beta_3 D_{09-10} + \beta_{i,rp} Risk_{i,t} + \beta_{fr} D_{defi,t-1} + \varepsilon_{i,t}$$

The risk premia premium is expected to proxy the effect of market sentiment on public finances, while the dummy associated with the nominal deficit is a proxy for the effect of fiscal rules. As mentioned earlier, we only consider the 3% target rule for the budget deficit and assuming that rules are enforced, when the threshold is approached, or exceeded, the fiscal policy stance adjusts, to comply with the rule, regardless of the cycle.

The estimates of the fiscal reaction functions as specified above are presented in the first two columns of Table 1. They are based on a panel comprising the EA10 countries over the period 1995-2014, controlling for the country fixed effects as customary in the literature.

The results are robust across the two specifications: the change in CAPB does not show any inertia, as the autoregressive coefficient is not significant. In line with the existing literature, the level of debt is significant and has positive coefficient suggesting that higher level of debt calls for a contractionary or less loose stance and fiscal policy seems procyclical in the upturns and acyclical in the downturns. In the second specification (rules and markets) both the risk premia and the dummy for the deficit are significant and have the expected positive sign. This means that both market sentiment and rules exert pressure on policy makers for 'prudent' fiscal stance. Finally the dummy for the years 2009-10 seems to capture well the expansionary stance of fiscal policy during the global crisis.

Table 1. Discretionary fiscal policy and the cycle, EA-10, 1995-2014

Fixed effect[4]	*(1)*	*(2)*	*(3)*	*(4)*
Dependent variable $\Delta CAPB_t$	*Baseline*	*Rules and markets*	*Market discipline*	*Fiscal rules*
$\Delta CAPB_{t-1}$	-0.0298	-0.0964	-0.131*	-0.114
	(0.07)	(0.07)	(0.07)	(0.07)
$Debt_{t-1}$	0.035***	0.019*	0.031***	0.032***
	(0.01)	(0.01)	(0.01)	(0.01)

[4] Table shows simple fixed effect estimates. In Annex 1 we show the outcome of the dymamic panel estmates using the Arrellano-Bond approach. The system GMM approach allows to get effcient estimates of the autregressive coeffient and of other regressors possibly correlated with it. Since results are considetnt and we show the simple fxed effect estimates.

OG_P_{t-1}	-0.361***	-0.252**	-0.348***	
	(0.13)	(0.13)	(0.12)	
OG_N_{t-1}	-0.127	-0.184*		
	(0.10)	(0.10)		
$Dummy_{2009-10}$		-1.663***	-1.460***	-1.622***
		(0.37)	(0.38)	(0.39)
$Risk_t$		0.397***		
		(0.12)		
$DummyDef_{t-1}$		0.748**		
		(0.29)		
OG_N_{t-1}high risk $_t$			0.258*	
			(0.14)	
OG_N_{t-1}low risk $_t$			-0.14	
			(0.11)	
OG_N_{t-1}lowDef $_{t-1}$				-0.451**
				(0.23)
OG_P_{t-1}lowDef $_{t-1}$				-0.391***
				(0.13)
OG_N_{t-1}HighDef $_{t-1}$				0.0195
				(0.10)
OG_P_{t-1}HighDef $_{t-1}$				-0.0355
				(0.22)
Constant	-3.601***	-2.306**	-3.106***	-3.189***
	(1.11)	(1.10)	(1.06)	(1.07)
Observations	183	183	183	183
R-squared	0.18	0.32	0.28	0.28
Countries	10	10	10	10

Note. Fixed effect, coefficients of fixed effect are not reported. $\Delta CAPB_t$ is the change in the cyclically adjusted primary balance. $DummyDef_{t-1}$=1 if nominal fiscal deficit> 2.5% of GDP; low deficit means less than 2.5% of GDP, high >2.5% of GDP, high risk means a spread on sovereign bonds larger than 100 basis points.
*, **, and *** denote, respectively, significance at the 10, 5 and 1 per cent level. Standard deviation in parentheses.

Further to these two specifications and in order to better understanding the role of market sentiment and rules during downturns (and crisis), we consider two additional specifications.

First, we focus on how risk premia can affect the cyclicality of the fiscal policy in bad times. In order to do this we interact the output gap in bad time (negative) with a dummy variable which is 1 when the risk premium is higher than 1% and zero otherwise.[5] The coefficient, positive and significant, means that market pressure through higher premia induce pro-cyclicality during downturns. The other coefficients are consistent with previous results.

[5] The threshold of 1% is set in arbitrarily and its low, but sensitivity analysis suggests that that is the level associated with the change. For instance setting the threshold at 2% barely changes the magnitude of the coefficient and leave significance unaltered.

Second, we investigate whether the budget deficit rule affects the cyclicality of fiscal policy and, if it does so, whether this happens in an asymmetric way. In order to do this, we interact the negative and positive output gap with a dummy variable for the budget deficit below and above 2.5%. The coefficients suggest that when rules are not binding, namely the deficit, if any, is smaller than 2.5% of GDP, there is a deficit bias. Fiscal policy is pro-cyclical in good times and countercyclical in bad times. By contrast, when the fiscal budget exceeds the 2.5% threshold, the stance become acyclical regardless of the cyclical conditions.

This implies that overall both fiscal rules and market pressures do have an effect on the cyclicality of fiscal policy. Thought the effect is not systematic, it is in line with expectations. Both market sentiment and fiscal rules can put governments under pressure and influence the policy setting during downturns and especially if they have limited, or no space for action.

It is worth to notice that the explanatory power of our model is quite limited. Indeed only less than one third of the variability of the dependent variable is explained, yet this is much in line with the literature. Models which use levels of the CAPB rather than changes are much more powerful, but the higher degree fit comes exclusively from the autoregressive coefficient, which does not add much relevant information.

4.2 Real-time fiscal policy reaction functions

Acknowledging that governments have only incomplete information about the state of the economy at the time policies are set, we also estimate the same specifications as above using real-time data for the output gap.

As above, we maintain the ex-post change in the cyclically adjusted primary balance as dependent variable and we replace the ex-post output gap with the measure of it available at the time of the decision, i.e. the output gap autumn forecasts at year t-1 for year t. We do not use real time estimate of the primary balance, because in reality they do not necessarily reflect the intentions of the policy makers, which should be read in the fiscal plans, and do not say anything about what materialised. We also choose not to use fiscal plan, as Cimandomo (2012), because national plans are likely to be biased towards excessive optimism when assessing the state of public finances. Cimadomo (2012) overcomes this shortcoming by using the OECD database of adjsusted plan. We prefer to investigate the actual (ex-post) outcome of the policy decisions, regardless of the intentions of policy makers, taken on the basis of the information available at that moment.

Given that real time data are not available for the entire sample, but only starting in 2002, in Table 2 we report estimates for ex-post and real time over the same period to be able to compare the results. The exercise also serves as a test of the robustness of previous findings.

The outcome of the table is quite straightforward. The regressions based on the ex-post data but for a different sample deliver the same results as before, with 1 exception, fiscal policy is not anymore countercyclical in dab times when governments have fiscal space. The results of the regressions based on real time data confirm risk premia and fiscal rules trigger a prudent

behaviour, but there is no evidence of cyclicality, with or without interaction with market sentiment or the level of fiscal deficits. Also the lag debt level is not significant anymore once the risk premia is considered.

These findings are in line with stream of the literature which finds lower degree of cyclicality in fiscal policy when real-time data is considered.

Table 2. Discretionary fiscal policy and the cycle, EA-10, 2002-2014, comparing real time and ex-post

	(6)	*(7)*	*(6)*	*(7)*	*(8)*	*(9)*	*(10)*	*(11)*
Dependent variable $\Delta CAPB_t$	*Baseline*	*Rules and markets*	*Baseline Real time*	*Rules and markets Real time*	*Market discipline*	*Fiscal rules*	*Market discipline Real time*	*Fiscal rules Real time*
$\Delta CAPB_{t-1}$	0.0189	-0.0355	0.0075	-0.0432	-0.123	-0.0575	-0.0933	-0.0899
	(0.088)	(0.0897)	(0.0912)	(0.0908)	(0.0952)	(0.0892)	(0.0948)	(0.0907)
$Debt_{t-1}$	0.038***	0.017	0.038***	0.016	0.037***	0.0175	0.037***	0.0196
	(0.012)	(0.0125)	(0.012)	(0.012)	(0.011)	(0.013)	(0.012)	(0.012)
$OG\_P_{t\|t-1}$	-0.389**	-0.245	-0.197	0.047	0.0416		-0.0272	
	(0.168)	(0.16)	(0.181)	(0.178)	(0.171)		(0.163)	
$OG\_N_{t\|t-1}$	-0.208	-0.218*	-0.0422	-0.073				
	(0.126)	0.124	0.115	(0.114)				
$Dummy_{2009-10}$		-1.531***		-1.69***	-1.813***	-1.532***	-1.593***	-1.63***
		(0.394)		(0.413)	(0.476)	(0.40)	(0.434)	(0.432)
$Risk_t$		0.400***		0.383***		0.410***		0.388***
		(0.126)		(0.129)		(0.127)		(0.133)
$DummyDef_{t-1}$		0.847**		0.944**				
		0.384		(0.389)				
$OG_N_{t\|t-1}$high risk $_{t-1}$					0.216		0.17	
					(0.153)		(0.192)	
$OG_N_{t\|t-1}$low risk $_{t-1}$					0.165		0.0823	
					(0.134)		(0.115)	
$OG_N_{t\|t-1}$lowDef $_{t-1}$						-0.574		-0.271
						(0.35)		(0.325)
$OG_P_{t\|t-1}$lowDef $_{t-1}$						-0.416**		-0.11
						(0.159)		(0.179)
$OG_N_{t\|t-1}$HighDef $_{t-1}$						-0.118		0.022
						(0.12)		(0.114)
OG_N_{t-1}HighDef $_{t-1}$						-0.0227		0.0314
						(0.294)		(0.718)
Constant	-3.93***	-2.25*	-4.12***	-2.40*	-3.95***	-1.87	-3.96***	-2.34*
	(1.307)	(1.288)	(1.232)	(1.223)	(1.201)	(1.305)	(1.268)	(1.264)
Observations	130	130	130	130	129	130	129	130
R-squared	0.212	0.372	0.179	0.352	0.281	0.365	0.271	0.324
Number of countries	10	10	10	10	10	10	10	10

Note. Fixed effect, coefficients of fixed effect are not reported. $\Delta CAPB_t$ is the change in the cyclically adjusted primary balance. $DummyDef_{t-1}$=1 if nominal fiscal deficit> 2.5% of GDP; low deficit means less than 2.5% of GDP, high >2.5% of GDP, high risk means a spread on sovereign bonds larger than 100 basis points.
*, **, and *** denote, respectively, significance at the 10, 5 and 1 per cent level. Standard deviation in parentheses.

5 Concluding remarks

This paper presented an investigation of the cyclical behaviour of the fiscal policy in the euro area looking at ex-post data and at real time data. The analysis based on ex-post data is relevant to the extent it helps understanding how fiscal policy behaved relative to the actual cycle. The real time analysis is important because it helps understanding how the fiscal policy that materialised links to the information about the state of the economy available ate time the decision was taken. This is of course different than assessing the intention of fiscal authorities in setting the policy stance. The main findings of the paper are the following.

Fiscal policy is almost never countercyclical, even if counter-cyclicality is in the intensions of the policy makers (see Cimadomo, 2012). This result is robust across different sample and using ex-post or real-time data. The detailed analysis of the role of fiscal conditions and rules suggest that the only situation when fiscal policy is countercyclical is when the country has fiscal space and it is in recession, which may be rather unusual combination. When using real-time data, there is no evidence of it.

The evidence of deficit bias when governments have fiscal space, we find using ex-post data is in contrast with finding of Huart (2011), who finds that counter-cyclicality is associated with debt above 60% and deficit exceeding 3%. While this result is rather counterintuitive, such difference in the results can be explained by the fact that in her exercise cyclicality is defined in relation to changes in output gap and not in the level of output gap, as it is case in our specification.

The second finding is that, according to ex-post data, fiscal policy tends to be pro-cyclical in good times, but this is not supported by the real time data.

Overall these findings seem point to the general conclusion that the output gap is overestimated in good times (or there is the belief that good time will continue in the future) while bad times maybe underestimated and believe shorter than it turned out to be.

Lastly the model we consider for fiscal policy reaction functions tend to have limited explanatory power. Only one third, or less, of the total variability of the dependent variable is explained. Different specifications, which use the level of primary balance as dependent variable usually exhibit higher fit. In facts, this is driven by the high inertia in expenditure and taxes which is captured by the autoregressive coefficient and not necessarily by a better understanding of the determinants of fiscal policy.

References

Auerbach A. J. and Y. Gorodnichenko (2011), “Fiscal Multipliers in Recession and Expansion”, NBER Working Paper No. 17447, in in Fiscal Policy after the Financial Crisis, Alesina and Giavazzi, 2013

Batini, N., L. Eyraud, and A. Weber (2014), “A Simple Method to Compute Fiscal Multipliers”, IMF Working Papers WP/14/93

Bernoth, K., A. Hughes-Hallett, and J. Lewis (2008): “Did Fiscal Policy Makers Know What They Were Doing? Reassessing Fiscal Policy with Real Time Data,” CEPR Discussion Papers No. 6758

Cimadomo J. (2008), Fiscal Policy in real time, ECB Woking Paper Series N. 919

Cimadomo J. (2012) “Fiscal Policy in Real Time” The Scandinavian Journal of Economics, 114(2) pp. 440-465

Deroose S., M. Larch and A. Schaechter (2008) ”Constricted, lame and pro-cyclical? Fiscal policy in the euro area revisited” , European Economy, EconomicPapers 353|December

Drazen A. (2000), “The Political Business Cycle after 25 Years," NBER Macroeconomics Annual 2000, Cambridge MA: MIT Press

Debrun X., H. Faruqee et R. Beetsma (2004), ”Has Fiscal Behavior Changed Under the European Economic and Monetary Union?”, *IMF World Economic Outlook*, Chapter 2.

European Commission (2002), Public finances in the EMU, European Economy N.3/2002

European Commission (2004), ‘Focus: The pro-cyclicality of fiscal policy in EMU’, Quarterly report on the euro area III

Fatas, A. and I. Mihov (2003), ‘The case for restricting fiscal policy discretion’, Quarterly Journal of Economics, November, 1419-47.

Gavin, M. and R. Perotti (1997), ‘Fiscal policy in Latin America’, NBER Macroeconomics Annual, 11-71.

Golinelli, R, and S. Momigliano (2006) Real-time determinants of fiscal polices in the euro area? JOrnal of policy modelling 28, pp. 943_64,

Golinelli, R, and S. Momigliano (2009), '*The cyclical response of fiscal policies in the euro area. Why do results of empirical research differ so strongly*?‘ Fiscal Studies 30, 39-72

Huart F. (2013), “Is Fiscal Policy pro-cyclical in the euro area?” German Economic Review Vol.14 Issue 1, February 2013, pp.73-88

Lane, P., (2003) 'The cyclical behaviour of fiscal policy: evidence from the OECD', Journal of Public Economics, 87, 2661-2675.

OECD (2003), Economic Outlook, 74, OECD, Paris.

Talvi, E. and Vegh, C. A. (2000), Tax Base Variability and Procyclical Fiscal Policy, NBER Working Paper No. 7499.

Turrini A. (2008), “Fiscal Policy and the cycle in the Euro Area: The role of government revenue and expenditure” European Economy, Economic Paper 323

Annex

Table 3. Discretionary fiscal policy and the cycle, fixed effect Arellano-Bond estimates

Dependent variable $\Delta CAPB_t$	Baseline	Rules and markets	Market sentiment	Fiscal rules
$\Delta CAPB_{t-1}$	-0.0436	-0.0991***	-0.140***	-0.123*
	0.05	0.04	0.03	0.07
$Debt_{t-1}$	0.0384***	0.0184	0.0344***	0.0352***
	0.01	0.02	0.01	0.01
OG_P	-0.402***	-0.294*	-0.384**	
	0.13	0.16	0.15	
OG_N	-0.141	-0.194*		
	(0.12)	(0.11)		
$Dummy_{2009-10}$		-1.610***	-1.414***	-1.600***
		(0.38)	(0.32)	(0.38)
$Risk_t$		0.437***		
		(0.16)		
$DummyDef_{t-1}$		0.812**		
		(0.33)		
OG_N_{t-1}high risk $_t$			0.253***	
			(0.06)	
OG_N_{t-1}low risk $_t$			-0.152	
			(0.12)	
OG_N_{t-1}lowDef $_{t-1}$				-0.482**
				0.22
OG_P_{t-1}lowDef $_{t-1}$				-0.428***
				0.13
OG_N_{t-1}HighDef $_{t-1}$				0.00785
				0.10
OG_P_{t-1}HighDef $_{t-1}$				-0.0679
				0.23
Constant	-2.284***	-1.449	-1.921***	-2.016***
	0.64	0.93	0.70	0.70
Observations	173	173	173	173
Countries	10	10	10	10

Note. Fixed effect, coefficients of fixed effect are not reported. $\Delta CAPB_t$ is the change in the cyclically adjusted primary balance. $DummyDef_{t-1}$=1 if nominal fiscal deficit> 2.5% of GDP; low deficit means less than 2.5% of GDP, high >2.5% of GDP, high risk means a spread on sovereign bonds larger than 100 basis points.

*, **, and *** denote, respectively, significance at the 10, 5 and 1 per cent level. Standard deviation in parentheses.

Table 4. Comparison ex-post and real-time, Arellano-Bond estimates

	(6)	(7)	(6)	(7)	(8)	(9)	(10)	(11)
Dependent variable $\Delta CAPB_t$	*Baseline*	*Rules and markets*	*Baseline Real time*	*Rules and markets Real time*	*Market discipline*	*Fiscal rules*	*Market discipline Real time*	*Fiscal rules Real time*
$\Delta CAPB_{t-1}$	-0.0259	-0.0479	-0.0451	-0.0597	-0.186**	-0.0855	-0.136*	-0.13
	(0.066)	(0.076)	(0.072)	(0.083)	(0.091)	(0.088)	(0.076)	(0.088)
$Debt_{t-1}$	0.048***	0.021*	0.047***	0.0164	0.042***	0.0202	0.045***	0.0232*
	(0.006)	(0.012)	(0.004)	(0.014)	(0.010)	(0.013)	(0.007)	(0.013)
$Dummy_{2009-10}$		-1.560***		-1.675***	-1.985***	-1.538***	-1.594***	-1.585***
		(0.351)		(0.347)	(0.363)	(0.401)	(0.362)	(0.425)
$Risk_t$		0.507***		0.508***		0.501***		0.485***
		(0.126)		(0.143)		(0.13)		(0.132)
$DummyDef_{t-1}$		1.565***		1.606***				
		(0.464)		(0.554)				
OG_P_{t-1}	-0.407***	-0.14	-0.282*	-0.024	0.0547		-0.0317	
	(0.144)	(0.15)	(0.169)	(0.085)	(0.168)		(0.164)	
OG_N_{t-1}	-0.214	-0.241	-0.050	-0.117				
	(0.225)	(0.189)	(0.189)	(0.154)				
OG_N_{t-1}high risk $_t$					0.354**		0.234	
					(0.168)		(0.145)	
OG_N_{t-1}low risk $_t$					0.267		0.0923	
					(0.189)		(0.183)	
OG_N_{t-1}lowDef $_{t-1}$						-0.599*		-0.405
						(0.358)		(0.327)
OG_P_{t-1}lowDef $_{t-1}$						-0.470***		-0.247
						(0.163)		(0.193)
OG_N_{t-1}HighDef $_{t-1}$						-0.068		0.0258
						(0.132)		(0.121)
OG_N_{t-1}HighDef $_{t-}$						0.175		-0.0177
						(0.332)		(0.741)
Constant	-2.946***	-2.213***	-3.261***	-2.127***	-3.172***	-1.297	-3.146***	-1.737**
	(0.669)	(0.696)	(0.476)	(0.658)	(0.971)	(0.923)	(0.815)	(0.826)
Observations	120	120	120	120	119	120	119	120
R-squared								
Number of countries	10	10	10	10	10	10	10	10

Note. Fixed effect, coefficients of fixed effect are not reported. $\Delta CAPB_t$ is the change in the cyclically adjusted primary balance. $DummyDef_{t-1}$=1 if nominal fiscal deficit> 2.5% of GDP; low deficit means less than 2.5% of GDP, high >2.5% of GDP, high risk means a spread on sovereign bonds larger than 100 basis points.

*, **, and *** denote, respectively, significance at the 10, 5 and 1 per cent level. Standard deviation in parentheses.