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### **The Stability and Growth Pact, Fiscal Policy Institutions, and Stabilization in Europe**

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# The Stability and Growth Pact, Fiscal Policy Institutions, and Stabilization in Europe

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## Abstract

Ever since its inception EMU has been subject to controversy. The fiscal policy rules embedded in the Treaty on European Union, and clarified in the Stability and Growth Pact (SGP), are probably the most contentious. The SGP as always being accused of being too rigid and of forcing procyclicality in fiscal policy. However, in an influential paper Galí and Perotti (2003) concluded that discretionary fiscal policy has actually become more countercyclical in EMU countries after the Maastricht Treaty. This paper concludes that this conclusion resists to several robustness tests using ex-post data, including the use of institutional variables, but not to the use of real-time data. Using ex-post data there is some evidence pointing to a more countercyclical use of discretionary fiscal policy (or at least to a decrease in the use of procyclical discretionary fiscal policy). However, the use of real-time data for the period 1999-2006 reveals that discretionary fiscal policy has been designed to be procyclical. Hence, the actual acyclical behaviour of discretionary fiscal policy in the period after 1999 seems to be simply the result of errors in the forecast of the output gap, and not the result of a change in the intentions of policy makers. As a result, there is no evidence in favour of the view that Maastricht rules have forced euro-area policy-makers to change their behaviour and design countercyclical discretionary fiscal policy.

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**Keywords:** Fiscal policy, stabilization, Stability and Growth Pact, institutional arrangements, real-time data.

**JEL codes:** E62, H62

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\* *Correspondence* to Faculdade de Economia, Universidade de Coimbra, Av. Dias da Silva, 165, 3004-512 Coimbra, Portugal. E-mail: marinheiro@fe.uc.pt. URL: <http://www4.fe.uc.pt/carlosm>. The text has benefited from comments received from António Afonso, Martin Larch, Peter Brandner, José Tavares, Alfred Sitz and other participants at the 63<sup>rd</sup> International Atlantic Economic Conference held in Madrid on the 14-18 March 2007 and at Workshop on the Sustainability of the Public Debt held in Klagenfurt University on the 20<sup>th</sup> May 2007. All remaining errors or omissions are solely my responsibility. This research has received financial support from the FCT –Fundação para a Ciência e Tecnologia- project POCI/EGE/60069/2004.

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## I. Introduction

The completion of EMU in Europe, with the introduction of the single currency – the euro- in 1999 has greatly affected the conduct of economic policy in the twelve participating member states. The only traditional short-term macroeconomic instrument that remains in the control of national authorities is fiscal policy. Consequently, fiscal policy has gained new responsibilities with EMU, but at the same time the Stability and Growth Pact (SGP) constrains its operation. Fiscal policy must now provide output smoothing, especially the smoothing of asymmetric shocks, and contribute to attaining price stability and external balance. These new objectives are particularly important for the case of small countries out of synchrony with the rest of the monetary union and require a flexible fiscal policy. This paper therefore aims at evaluating the actual cyclical properties of discretionary fiscal policy.

It has been argued that the fiscal rules imposed by the SGP would lead to the need to override the working of the automatic fiscal stabilisers, resulting in a procyclical discretionary fiscal policy. However, in an influential paper Galí and Perotti (2003) argued the opposite was true: discretionary fiscal policy in EMU countries had become in fact more countercyclical after the signing of the Maastricht Treaty in 1992, following the trend of other industrialized countries.

This paper contributes to the literature assessing the *robustness* of such finding in a number of different ways. Firstly, it will use a *different dataset* for all the 15 EU countries, but Luxembourg. Galí and Perotti (2003) have used OECD data, while here the main source of data is the AMECO database from the European Commission (version of autumn 2006). Secondly, it will also test for a *different sub-period division*. The authors have distinguished the before and after 1992 period. This paper breaks the after-1992 period into more detail. Thirdly, it is also tested the impact of an *extension of the estimation period to 2006*, i.e. including three more years of EMU. Fourthly, this paper tests the validity of the authors' conclusions to the inclusion of *controls for the effects of political-institutional variables* on the cyclically adjusted primary deficit. Fifthly, and lastly, this paper tests the validity of the previous conclusions to the use of *real-time data for the period 1999-2006*.

The structure of the paper is as follows. Section II reviews the economics of fiscal policy in Economic and Monetary Union (EMU). It briefly reviews the role of fiscal policy in the EMU setup. Section III presents the methodology and data used in the empirical application. Section IV presents the empirical results. The conclusions are discussed in Section V.

## II. Fiscal Policy in EMU

In a traditional Keynesian framework different short-term objectives are achieved by making use of different instruments: fiscal policy is responsible for the stabilisation of the business cycle; monetary policy tries to maintain price stability and might also help to stabilise the business cycle; and the exchange rate policy helps to stabilise external balance. Since the last two instruments have been lost in euro-area countries, fiscal policy obligations have increased. For euro-area countries, fiscal policy has to achieve three objectives: a) the stabilisation of the business cycle, especially the stabilisation of asymmetric demand shocks; b) help to stabilise inflation, especially in small countries when out of synchrony with the rest of the monetary union; and, c) the attainment of external balance.

Compared with the pre-EMU situation, fiscal policy now plays an extended role in the smoothing of output shocks, particularly idiosyncratic demand shocks. Even if the ECB pursues some degree of output smoothing, the single monetary policy could not be used to smooth asymmetric shocks.<sup>1</sup> Consequently, most of the short-term stabilisation effort relies on fiscal policy. Moreover, comparing the euro-area with other successful currency unions, namely, with the USA, we can say that *fiscal policy is particularly relevant for the smoothing of shocks in the euro-area as this latter currency area lacks most of the usual responses to asymmetric shocks*, that is, labour mobility within the area, flexibility of wages and prices, and finally some sort of insurance mechanism, like an automatic mechanism for transferring fiscal resources to the affected country(ies)/region(s). Marinheiro (2005) concludes for the decisive contribution of the government sector to the smoothing of output shocks in the euro area, particularly in smoothing more persistent shocks to output.

Negative demand shocks cause a fall in both the output gap and inflation. When there is a symmetric demand shock which affects the entire euro-area, both the centralised monetary policy and the automatic fiscal stabilisers could be used to smooth it out. However, the common monetary policy cannot be used to smooth out asymmetric shocks. The monetary policy only reacts when there is a change in the euro-area inflation and output gap. If the shock only affects (a small) part of the area, the aggregate statistics do not change (much), and so the ECB does not react. This is particularly true for the case of the *small countries* of the euro-area. For example, a 1% fall in the German GDP has a much larger impact in the euro-area aggregate than a 1% drop in the Portuguese GDP. Thus when small country is out of synchrony with the rest of the monetary union it suffers from the perverse effects of the single monetary policy: its inflation rate and output gap decline, but as the aggregate euro-area figures do not change, the ECB does not adjust its monetary policy. As a result, a small country affected by a negative asymmetric demand shock faces an interest rate that is higher

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<sup>1</sup> Under Article 2 of the ECB Statutes, “without prejudice to the objective of price stability” the ECB supports the general economic objectives of the European Community, namely the goal of a high level of employment. So only if it does not endanger the primary objective of price stability could the ECB pursue the stabilisation of the euro-area output gap.

than it would be if it were a country large enough to influence the monetary union average.<sup>2</sup> Such shocks must therefore be smoothed by the operation of fiscal policy, and by an increase in net exports. Fiscal policy is therefore more important than before, when there were national monetary policies, particularly for small countries.

### III. Methodology and data

The study will be based on a panel data estimation for all the 15 European countries, except Luxembourg. The source of data is the November 2006 version of the AMECO database of the European Commission, complemented with OECD Economic Outlook data for some years.<sup>3</sup> Since the purpose of the paper is to test for the robustness of the specification of Galí and Perotti (2003), the point of departure will be their specification:

$$d_t^* = \varphi_0 + \varphi_x E_{t-1} x_t + \varphi_b b_{t-1} + \varphi_x d_{t-1}^* + \mu_t \quad (1)$$

Where  $d_t^*$  is the cyclically adjusted primary deficit,  $E_{t-1} x_t$  is the expected output gap, and  $b_{t-1}$  is debt outstanding at the time of the budget decision (all variables are expressed a share of potential GDP).<sup>4</sup> The inclusion of the lagged debt ratio allows to control for sustainability considerations in the conduct of fiscal policy.

If fiscal policy were being used as a pure countercyclical instrument to dampen the amplitude of the business cycle, that is if the automatic stabilisers are allowed to work freely over the cycle, we should observe an increase in the budget deficit during recessions and an improvement during upturns. This implies a negative reaction of the budget deficit to the output gap. Since, the interest is on the behaviour of discretionary fiscal policy, cyclically adjusted data is being use. The use of the cyclically adjusted primary deficit as a proxy for discretionary actions is already standard in the literature, although in practice there are several difficulties in disentangling the automatic fiscal policy variations from discretionary actions.<sup>5</sup>

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<sup>2</sup> This non-responsiveness of the interest rate increases the real burden of public debt for highly indebted countries.

<sup>3</sup> In order to reach a balanced panel, some AMECO missing values were carefully linked with observations from the OCDE database. Some cyclically adjusted fiscal data is only available for some countries several years after 1980 in the AMECO database. It is the case of Greece (1988), Ireland (1995), Spain (1995), and Sweden (1993). Data on the unadjusted balances, and the (calculated) implied sensitivity to the cycle was taken from the OECD database. Using it together with the output gap from AMECO resulted into linked series. The OECD EO database is also the source of the US output gap estimate.

<sup>4</sup> Potential output is used as a deflator of all variables, instead of actual output, to reduce endogeneity problems and to minimize the influence of current GDP on the evolution of the fiscal ratios. See Bayoumi and Masson (1995) for a similar use. The output gap is defined as the difference between current and potential output as a fraction of potential output.

<sup>5</sup> The use of primary balance instead of the overall budget balance is motivated by the fact that interest payments are not under the control of the fiscal authorities, but simply reflect the evolution of the interest rate and the past accumulation of budget deficits. See also Brandner, Diebalek *et al.* (2006) for an application of an unobserved components model to estimate a core balance for Austria.

The expected output gap was proxied by Galí and Perotti (2003) making use of instrumental variable estimation. More precisely, for EU countries the output gap variable is instrumented by the lagged output and by the lagged US output. An interesting alternative would be the use of “real-time data” as in Forni and Momigliano (2004). However, such data is only available from 1993 onwards, invalidating its use in comparisons between the pre-euro and post-euro period.

There are also other interesting specifications in the literature to test for the cyclical properties of fiscal policy. Just see Wyplosz (2002), Auerbach (2002), Lane (2003), and Pina (2004). However, since the purpose is to test for the robustness of the conclusions of Galí and Perotti (2003), it makes sense to use their own specification to get directly comparable results.

However, since the seminal contribution of Roubini and Sachs (1989), an increasing amount of literature has signalled the importance of the institutional design of national budget institutions to the amount of the budget deficits. Just see, Brender and Drazen (2005), Volkerink and de Haan (2001), Mierau, Jong-A-Pin *et al.* (2006), Woo (2003), among others. Hence, the omission of such important variables might bias the previous results. As a result this paper incorporates some of such political-institutional variables into the reaction function proposed by Galí and Perotti (2003) to test for the robustness of the authors’ conclusions. The data source of such variables is Mierau *et al.* (2006).

#### **IV. Empirical evidence on the effective cyclical properties of fiscal policy**

The importance of fiscal policy as a countercyclical stabilisation means that it makes sense to see whether fiscal policy has in fact been used in Europe with such considerations in mind. Some feared EMU rules might force an overridden of automatic stabilizers by a procyclical use of discretionary fiscal policy.<sup>6</sup> Galí and Perotti (2003) concluded that Maastricht rules have signalled a shift of discretionary fiscal policy towards a more countercyclical instrument. This section will empirically test the robustness of this conclusion.

##### ***A. The impact of the euro***

Table 1 presents the results of a panel estimation for EU-15 countries and euro-area countries (except Luxembourg) for the cyclically adjusted primary deficit. Results are obtained allowing for different intercepts for each country using an instrumental variable (IV) fixed effects (LSDV) estimator. When using fixed effects, the inference is conditional on the particular set of countries and for the specific time periods observed.<sup>7</sup> This is precisely our objective. Another possibility would be to estimate the model using random effects. This would avoid the loss of degrees of freedom implied by the use of fixed effects, and the

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<sup>6</sup> For a discussion about the usefulness and desirability of discretionary fiscal policy, see the excellent surveys by Andersen (2001) and Auerbach (2002).

<sup>7</sup> See Baltagi (2001).

inference would pertain to the large population from which the sample is drawn. However, this technique is only appropriate if we are drawing the  $N$  individuals randomly from a large population. Thus, it is necessary to have a panel representative of the whole population for which we are trying to make inferences. As our population includes all the EU-15 countries, except Luxembourg, it makes no econometric sense to use a random effects estimator. In short, and in this case, econometric theory clearly points to the use of the fixed effects model.<sup>8</sup>

In order to replicate the results of Galí and Perotti (2003), we have only slightly modified such author's estimation. Equation (1) is estimated by Galí and Perotti (2003) allowing for a break in 1992 in all the variables (output gap, lagged debt, and lagged deficit), plus a break in the country-fixed effects. However, their results do not point to a break in the lagged debt and lagged deficit variables. Hence, in order to reduce the number of regressors, we have differently only allowed a break to occur only for the gap variable. In common with Galí and Perotti (2003), we have used the instruments lagged output gap, and lagged US output gap to instrument for the expected output gap.

Table 1 presents the empirical results of estimating equation (1) for a balanced panel of the 12 euro area countries, and for the 15 EU member countries, except Luxembourg, allowing for different breaks in the output gap variable. As mentioned before, the dependent variable is the cyclically adjusted primary deficit (as a percentage of potential GDP). Being this variable, by definition, immune to cyclical developments, and not influenced by the past debt accumulation, its evolution over time is an indicator of discretionary fiscal policy. A positive coefficient for the output gap variable can be interpreted as a procyclical discretionary fiscal policy.

Column (1) of Table 1 presents the panel estimates for EMU obtained in the panel estimate of Galí and Perotti (2003: 550) for the period 1980-2003, showing evidence for an increase in the degree of countercyclicality of discretionary fiscal policy after the signing of the Maastricht Treaty in 1992. Such policy was, according to their results, procyclical before 1992, and becomes acyclical after Maastricht. Moreover, the difference between such two sub-periods is statistically significant.

Column (2) tries to replicate such results for the same period, but for the 12 euro-area economies (except Luxembourg), using a different dataset.<sup>9</sup> The results are very similar to those of Galí and Perotti (2003) shown in column (1). Discretionary fiscal policy is found to

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<sup>8</sup> There is however a technical caveat regarding the use of fixed effects with a lagged endogenous variable resulting into inconsistent estimators. The alternative would be the use the estimator proposed by Arellano and Bond (1991). However, the small-sample properties of such estimator are not well understood. Moreover, as much of the focus is on the difference between the estimates of the gap coefficient between two periods, we have, as Galí and Perotti (2003: note 6) did, opted to present the results with a standard instrumental variables fixed effects estimator.

<sup>9</sup> Galí and Perotti (2003) used OECD data, here the main source of data is the AMECO database, from the European Commission.

be procyclical before 1992, and acyclical after 1992. The difference between the gap coefficients for the two sub-periods is also statistically significant.

Although the Maastricht Treaty was signed in 1992, it envisaged three stages until the adoption of a common currency, the date for the start of stage III was not initially defined. The Treaty stated only that if, “by the end of 1997, the date for the beginning of the third stage has not been set, the third stage shall start on 1 January 1999”. It was only in December 1995 that the European Council confirmed that stage three of EMU would start on 1 January 1999. In order a country to qualify to membership of the euro, it was required to achieve a budget deficit below the reference value of 3% of GDP before the start of stage three. Hence, it might make sense to subdivide the post-Maastricht period (1992-2003) into three different sub-periods: 1992-1995; 1996-1998; and, finally 1999-2003. The first of such sub-periods starts immediately after the signing of the Treaty, but before the decision of the start of EMU is taken. Hence, the consolidation efforts towards the 3% have been relatively modest.<sup>10</sup> The 1996-1998 period is the run-up period to the single currency. The start of the third stage, was already set to 1999, and member-countries did in fact made intensive consolidation efforts in this period, since the time to qualify to the membership of the monetary union was rapidly running out. Finally, the last sub-period, 1999-2003, is the period after the introduction of the euro. The 3% rule keep binding, under the Stability and Growth Pact (SGP) dispositions, but there is no provision for a country that does not keeps it deficit under the 3% ceiling to be expelled from euro-area. Hence, the actual start of the single currency might have induced a different fiscal policy behaviour from the qualifying stage.

Column (3) shows the empirical results when the sub-period after Maastricht is subdivided into the mentioned three sub-periods. The result for the pre-Maastricht period stays unaffected by the sub-division: discretionary fiscal policy is found to be procyclical in this sub-period. Yet, there is considerable variation in the post-1992 sub-period. The period immediately after the signing of the Treaty (1992-1995) is characterized by countercyclical discretionary fiscal policy (at the 10% significance level). However, the run-up to qualification for EMU (1996-1998) is characterized by a strong procyclical discretionary fiscal policy stance. The post-euro period (1999-2003) is characterized by an acyclical discretionary fiscal policy.

Next, the period under analysis was extend until 2006 (in the previous results it ended in 2003 as in Galí and Perotti (2003)). The previous conclusions are robust to the addition of three more years to the euro sub-period. The results are in columns (4) and (5). Column (4) presents the results for the Galí-Perotti’s subdivision of time (before and after Maastricht), while column (5) presents the results when disaggregating more the after-Maastricht period.

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<sup>10</sup> Stage II of EMU started only in 1994, and it was clear to participants that phase III would only start on the date limit imposed by Article 121 of the Treaty (1999).



It was also tested a different sub-division of time, considering the sub-period before and after the introduction of the euro. The results (not reported) were not substantially different from the reported ones: before the introduction of the euro discretionary fiscal policy is found to be procyclical, and becomes acyclical with the introduction of the euro.

Columns (6)-(9) extend the number of countries considered to encompass all EU-15 member countries, with the exception of Luxembourg. The results obtained are very similar to the obtained for the euro area. Discretionary fiscal policy presented procyclical behaviour in the pre-Maastricht period and is mostly acyclical after 1992. Further subdivision of the after Maastricht period yields same conclusions as before. Immediately after 1992, discretionary fiscal policy presents a countercyclical behaviour, which is reversed in the run-up to the single currency (1996-1998). After the introduction of the euro, discretionary fiscal policy has not reacted to the business cycle fluctuations.

With regard to the other controls included in the regression, both the lagged debt and the lagged deficit are statistically significant. The estimated debt coefficient is negative, ranging from -0.025 to -0.036, meaning that the average country reduced the structural primary deficit by approximately 0.03 of potential GDP for each additional point of debt in the previous year. This value, although small means that sustainability considerations enter into discretionary fiscal policy decisions.

**Table 1- Determinants of Cyclically Adjusted Primary Deficit (%Potential GDP)-1980-2003 & 1980-2006**

	Euro Area					EU-15			
	(1)*	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
GAP <sub>80-91</sub>	0.17 (3.47)	0.172 (3.1)	0.17 (3.09)	0.147 (2.82)	0.147 (2.85)	0.113 (2.24)	0.109 (2.19)	0.093 (1.9)	0.089 (1.85)
GAP <sub>92-2003</sub>	-0.08 (-0.98)	-0.043 (-0.7)	-	-	-	-0.038 (-0.66)	-	-	-
GAP <sub>92-95</sub>	-	-	-0.147 (-1.73)	-	-0.092 (-1.15)	-	-0.134 (-1.76)	-	-0.133 (-1.8)
GAP <sub>96-98</sub>	-	-	0.407 (2.09)	-	0.431 (2.61)	-	0.494 (2.98)	-	0.513 (3.19)
GAP <sub>99-2003</sub>	-	-	0.005 (0.05)	-	-	-	-0.038 (-0.36)	-	-
GAP <sub>99-2006</sub>	-	-	-	-	0.046 (0.53)	-	-	-	0.035 (0.4)
GAP <sub>92-2006</sub>	-	-	-	0.018 (0.06)	-	-	-	-0.005 (-0.09)	-
Lagged debt	-0.05 <sup>a)</sup> (-4.7)	-0.034 (5.42)	-0.031 (-5.14)	-0.026 (-5.02)	-0.025 (-4.86)	-0.038 (-6.37)	-0.036 (-6.06)	-0.029 (-5.71)	-0.028 (-5.5)
Lagged deficit	0.54 <sup>a)</sup> (10.01)	0.736 (21.4)	0.732 (21.3)	0.752 (23.3)	0.745 (23.2)	0.728 (23.3)	0.716 (23.1)	0.748 (25.7)	0.736 (25.5)
P-value BM-AM	(0.01)	(0.01)	(0.0)	(0.09)	(0.009)	(0.052)	(0.0)	(0.181)	(0.0)
P-value BM-A€	-	-	(0.138)	-	(0.054)	-	(0.527)	-	(0.211)
Wald test joint	-	674.7 (0.0)	697.0 (0.0)	735.0 (0.0)	762.1 (0.0)	819.0 (0.0)	860.1 (0.0)	874.3 (0.0)	920.0 (0.0)
AR1 test	-	-0.112 (0.91)	-0.209 (0.84)	-0.575 (0.57)	-0.575 (0.57)	0.164 (0.87)	-0.005 (0.996)	0.459 (0.65)	0.241 (0.81)
AR2 test	-	-0.204 (0.84)	-0.446 (0.66)	-0.549 (0.58)	-0.751 (0.45)	-0.236 (0.814)	-0.658 (0.51)	-0.42 (0.67)	-0.924 (0.36)

Notes: In parentheses T-stats for coefficients and p-values for tests. The estimation method is Least Squared Dummy Variables (LSDV). The main source of data is the AMECO database, Autumn 2006 version, complemented with data from the OECD Economic Outlook database (Nov. 2006). PCGIVE based calculations including a constant term (omitted). The AR1 test is asymptotically distributed as N(0,1) under the null of no first order serial correlation. *Idem* for AR2. A countercyclical discretionary fiscal policy implies a negative GAP coefficient. P-value BM-A€: p-value for the equality of coefficients before Maastricht and after the introduction of the euro \*Column (1) presents Galí and Perotti (2003) results for EMU (Table 3). a) Since Galí and Perotti (2003) present estimates for the periods before and after Maastricht, due to lack of space we have just retained only the before Maastricht coefficient and T-value (the two estimates are not significantly different from each other).

### ***B. The impact of the euro and institutional variables***

In this section it is being investigated whether the previous conclusions regarding the cyclical behaviour of discretionary fiscal policy are robust to controlling for the impact of institutional aspects. With such purpose in mind, equation (1) is augmented with the inclusion of political-institutional variables. In the practical estimation, proxies for political fragmentation in government or Parliament, and data on the occurrence of elections or the formation of a new government were used.

Following Volkerink and de Haan (2001), the following variables have been considered. As proxies of *size fragmentation*: the effective number of parties in government (ENoP\_G); the effective number of parties in parliament (ENoP\_P), capturing the government's position vis-à-vis parliament; the number of spending ministers (NSM), i.e. simply the total number of ministers in government minus the ministers of finance and/or the budget and the prime minister; and, seats in excess seats of collation in parliament (surplus seats). As measures of *political fragmentation* in government/parliament: political fragmentation in government (Frag\_G); political fragmentation in Parliament (Frag\_P). The latter variable might be relevant because the more politically divided parliament is, the less the government may have to fear from the opposition. Finally, dummies for elections (Elect) and for the formation of a new government (NewGov) were also considered.

As expected, there is a high degree of correlation between the variables regarding parliament and government, since the latter emanates from the former (see Table 2). There is also a high degree of correlation between the occurrence of elections and the formation of a new government. As a result, it is not advisable to include in the same regression all such variables, in order to avoid multicollinearity problems. Since, the purpose is to determine the orientation of discretionary policy, it was opted just to retain the indication of size fragmentation in government (number of parties in government, number of spending ministers), and the number of excess seats in parliament. In addition the election dummy is also included.

Political fragmentation variables were not retained because they proved to be not statistically significant. In line with the results in Volkerink and de Haan (2001), government ideology revealed to have no impact on cyclically adjusted primary deficit. Hence there is no support for the view that argues that as left-wing parties would like to spend more, they are also likely to have higher structural primary deficits. A possible explanation is given by in Volkerink and de Haan (2001). According to such authors, left-wing governments do not have higher deficits than right-wing governments, because although they spend more, they also tax more, leaving the balance unaltered.

**Table 2- Correlation among political variables – euro-area - 1980-2003**

	ENoP_G	ENoP_P	NSM	Frag_P	Frag_G	Surplus S.	NewGov	Elect
ENoP_G	1.00	0.86	-0.13	0.42	0.63	0.30	0.08	0.01
ENoP_P		1.00	-0.22	0.33	0.49	0.07	0.07	0.03
NSM			1.00	0.14	-0.22	0.04	0.11	-0.05
Frag_P				1.00	0.32	0.02	0.04	-0.02
Frag_G					1.00	0.18	-0.01	0.01
Surplus Seats						1.00	0.05	0.00
NewGov							1.00	0.70
Elect								1.00

Source of data: Mierau *et al.* (2006).

Table 3 presents the results regarding the determinants of cyclically adjusted primary deficit when controlling for the effects of political-institutional variables for the period 1980-2003.<sup>1</sup> For convenience, column (1) repeats the same regression shown previously in column (2) of Table 1. With regard to the institutional variables it can be seen that elections have a significant positive impact on the cyclically adjusted primary deficit (CAPD), meaning that elections induce a discretionary fiscal expansion. The effective number of parties in government (ENoP\_G) has a negative, but not statistically significant impact on the CAPD. The excess seats the government has in parliament has also a non statistically significant negative impact on the CAPD. On the contrary, the number of spending ministers (NSM) has a strongly positive and statistically significant impact in the CAPPD.

An important finding is that the previous results regarding the impact of the introduction of the euro are robust even after controlling for those political variables, except in the last specification. In general, discretionary fiscal policy is found to be procyclical in the period before Maastricht. After Maastricht, the same comments apply as before: the run-up period to the single currency was characterized by a procyclical behaviour, but the period after 1999 is characterized by a non reaction of discretionary fiscal policy to the cyclical conditions prevailing in the economy. As a result, Maastrich signals a shift from a procyclical fiscal policy to neutral fiscal policy decisions.<sup>2</sup>

<sup>1</sup> The political-institutional variables of Mierau *et al.* (2006) are only available until 2003.

<sup>2</sup> The difference between the estimates for the gap before and after Maastricht is statistically significant in all regressions.

It was also investigated whether some institutional variables have a direct impact on the reaction of discretionary policy to the output gap. Hence, it was included, one at a time, an interaction term between the political-institutional variables and the output gap. Column (4) presents the results including the interacted effective number of parties in government. Its coefficient shows a negative sign, and is statistically significant at the 10% level. It means, that coalition governments (and especially if involving more than two parties) show a tendency to design more countercyclical fiscal policies. This might be a side-effect of the negotiations of coalition agreements, which restrain the liberty of a given party to manipulate the deficit on his behalf. Next, it was included the interacted number of spending ministers. The coefficient is positive, small, and statistically significant at the 10% level.<sup>3</sup> The result indicates that the larger the government is, the more likely it is to pursue a procyclical discretionary fiscal policy.

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<sup>3</sup> The inclusion of such interaction term renders the output gap before Maastricht non-statistically significant. At the 10% significant level, discretionary fiscal policy is found to be countercyclical after Maastricht.

**Table 3- Determinants of Cyclically Adjusted Primary Deficit (%Potential GDP)-1980-2003**

	Euro Area				
	(1)	(2)	(3)	(4)	(5)
GAP <sub>80-91</sub>	0.172 (3.1)	0.174 (3.22)	0.172 (3.22)	0.326 (3.27)	-0.150 (0.75)
GAP <sub>92-2003</sub>	-0.043 (-0.7)	-0.05 (-0.83)	-	0.122 (1.09)	-0.354 (-1.85)
GAP <sub>92-95</sub>	-	-	-0.165 (-2.03)	-	-
GAP <sub>96-98</sub>	-	-	0.372 (1.99)	-	-
GAP <sub>99-2003</sub>	-	-	0.025 (0.24)	-	-
Elections	-	0.741 (3.93)	0.751 (4.02)	0.724 (3.85)	0.76 (4.03)
ENoP_G	-	-0.094 (-0.47)	-0.085 (-0.43)	-0.051 (-0.26)	-0.098 (-0.49)
Surplus seats	-	-1.467 (-1.07)	-1.571 (-1.16)	-1.414 (-1.04)	-0.978 (-0.7)
NSM	-	0.15 (3.17)	0.147 (3.14)	0.161 (3.38)	0.149 (3.15)
GAP*NSM	-	-	-	-	0.02 (1.67)
GAP*ENoP_G	-	-	-	-0.083 (-1.81)	
Lagged debt	-0.034 (5.42)	-0.031 (-5.16)	-0.029 (-4.89)	-0.029 (-4.92)	-0.033 (-5.41)
Lagged deficit	0.736 (21.4)	0.717 (21.2)	0.715 (21.2)	0.709 (20.9)	0.711 (21)
P-value BM-AM	(0.01)	(0.01)	(0.0)	(0.01)	(0.015)
P-value BM-A€	-	-	(0.083)	-	-
Wald test joint	674.7 (0.0)	767.1 (0.0)	794.6 (0.0)	777.9 (0.0)	775.8 (0.0)
AR1 test	-0.112 (0.91)	0.34 (0.73)	0.163 (0.87)	0.307 (0.76)	0.38 (0.7)
AR2 test	-0.204 (0.84)	-0.02 (0.98)	-0.274 (0.78)	0.025 (0.98)	0.259 (0.8)

*Notes:* In parentheses T-stats for coefficients and p-values for tests. The estimation method is Least Squared Dummy Variables (LSDV). P-value BM-AM: p-value for the equality of coefficients before and after Maastricht. ). P-value BM-A€: p-value for the equality of coefficients before Maastricht and after the introduction of the euro. See text for details.

### **C. High and low deficit countries**

Next, it is investigated whether there are considerable variations across groups of countries and at the country level in the euro area. Firstly, the euro area countries were divided into high-deficit and low-deficit countries. Countries were divided into such two subgroups according to their average cyclically adjusted primary deficit level in the period before the run-up to the single currency. Hence, countries which presented an average deficit in the 1980-1995 period larger than the unweighted euro area average were classified as “high deficit countries”.

Table 4 presents a panel estimate distinguishing both group of countries and the preferred subdivision of time. There is some evidence that the high-deficit countries make a more

procyclical use of discretionary fiscal policy than low-deficit countries do. For high-deficit countries a procyclical discretionary fiscal policy is found for the period before Maastricht, in the run-up period, and after 1999.<sup>4</sup> For low-deficit countries, only in the run-up period to the euro (1996-1998) a procyclical discretionary is found, both before Maastrich and after the introduction of the euro discretionary fiscal policy is broadly acyclical.<sup>5</sup> The inclusion of control for institutional variables (and the consequent loss of three years of data) does not affect these conclusions.

Next, the same fiscal reaction equation is estimated at the country level in the eleven euro area countries considered. The results are shown in Table 7 of the appendix. There a limited amount of variation in the cyclical properties of discretionary fiscal policy across countries. A majority of countries before Maastricht presented procyclical discretionary fiscal policies (all of them presented a positive coefficient on the output gap). After the introduction of the euro, in the 1999-2006 period, all but two countries presented acyclical discretionary fiscal policies. The exceptions are Greece and Spain that present a procyclical stance.<sup>6</sup> Moreover, in the nine countries with an acyclical fiscal policy, five present a negative gap coefficient, and the other four a positive one. A statistically significant negative coefficient signals a countercyclical discretionary fiscal policy. However, due to the general non statistical significance of the output gap coefficient in the period after 1999, only for Italy the hypothesis of an equal coefficient for the period before Maastricht and after the euro is formally rejected by the data.

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<sup>4</sup> When controlling for institutional variables, discretionary fiscal policy after the introduction of the euro is found to be acyclical in high-deficit countries, since the positive coefficient on the gap is not statistically significant.

<sup>5</sup> Moreover, there is a change in sign in the non-statistically significant coefficient on the output gap. While it is positive in the period before Maastrich, it is negative in the period after the introduction of the euro.

<sup>6</sup> The regression for Portugal presents a low fit to the data.

**Table 4- Determinants of Cyclically Adjusted Primary Deficit (%Potential GDP) – Panel for euro area countries: high and low deficit countries- 1980-2006**

		Deficit level 1980-2006	1980-2003
<b>GAP<sub>80-91</sub></b>	High	0.167 (4.2)	0.152 (3.09)
	Low	0.117 (1.18)	0.152 (1.45)
<b>GAP<sub>92-95</sub></b>	High	0.174 (1.14)	0.165 (0.95)
	Low	-0.28 (-4.06)	-0.297 (-3.28)
<b>GAP<sub>96-98</sub></b>	High	0.566 (2.96)	0.463 (2.23)
	Low	0.357 (2.85)	0.407 (3.11)
<b>GAP<sub>99-2003/6</sub></b>	High	0.077 (2.89)	0.087 (1.28)
	Low	-0.037 (-0.29)	-0.106 (-1.15)
Elections		-	0.684 (3.96)
ENoP_G		-	-0.093 (-0.58)
Surplus seats		-	-0.713 (-0.78)
NSM		-	0.142 (2.1)
Lagged debt		-0.025 (-3.47)	-0.027 (-5.26)
Lagged deficit		0.723 (12.9)	0.687 (11.9)
P-value equal coeff.	High	(0.0)	(0.02)
	Low	(0.0)	(0.0)
P-value equal coeff.	High	(0.0)	<b>(0.097)</b>
<b>BM/AC</b>	Low	<b>(0.15)</b>	(0.0)
Wald test joint		-	127.6 (0.0)
AR1 test		-0.75 (0.45)	-0.808 (0.42)
AR2 test		-1.217 (0.22)	-1.08 (0.28)

*Notes:* In parentheses T-stats for coefficients and p-values for tests. The estimation method is Least Squared Dummy Variables (LSDV). See text for details.

#### ***D. Use of real time data***

In the previous sections, in order to assess the actual degree of countercyclicality of discretionary fiscal policy, ex-post data on the output gap has been used. There is however a caveat in the use of real time data: when designing future fiscal policy decisions policy-makers do not have such data available, and have to resort to (ex-ante) real-time output gap estimates. Such estimates may differ, and usually do differ, from actual (ex-post) gap estimates, which use more information than that available at the time of the decision (see Orphanides and van Norden (2002)).



A practical limitation to the use of real-time data is that international organizations have started to produce comparable estimates of output gaps only relatively recently in the late 1990s. This makes it impossible to estimate fiscal rules comparing the period before Maastricht with the period after Maastricht using real-time data. Notwithstanding, in a leading paper Forni and Momigliano (2004) estimated a fiscal rule using real time data on the output gap as calculated by the OECD for the period 1993-2003. Differently from Galí and Perotti (2003) the authors distinguished the fiscal policy reaction in favourable cyclical conditions from the fiscal reaction during adverse cyclical conditions. They found a countercyclical reaction of discretionary fiscal policy to adverse economic conditions and again a negative (but not statistically significant) reaction of the deficit to the output gap during favourable economic conditions. These results contrast with the authors' estimates using ex-post data, when the estimated reaction of fiscal policy to adverse cyclical conditions was weaker and not statistically significant.

I have collected the output gap estimates for year  $t$  made by the European Commission in the spring and autumn of the previous year ( $t-1$ ). The data starts only in 1999. I have then used this real-time estimate on the output gap together with the rest of the previously used (ex-post) data.<sup>7</sup> The LSDV results are in Table 5. As the majority of national budgets in Europe are submitted to the respective national Parliaments in September/October and the autumn forecast is only made public in November, the most relevant forecast is in my opinion the Spring forecast, since is the only (Commission's) forecast available at the time the budget decisions are being made by the national governments. Due to the short time dimension of this real-time data it is not possible to distinguish positive from negative output gaps, and historically high-deficit countries from low-deficit countries.

The results point to a positive, and statistically significant, coefficient on the (ex-ante) output gap variable. This signals that discretionary fiscal policy has been designed since 1999 to be procyclical. This result contrasts with the previous results using ex-post data and with the results obtained by Forni and Momigliano (2004). As seen before, using ex-post data the euro period (1999-2006) was characterised by an acyclical discretionary fiscal policy (due to a small positive but non-statistically significant coefficient on the gap variable). In contrast, using ex-ante data, the coefficient on the output gap is much larger in size (0.336 using the spring forecast) and statistically significant. This indicates that the discretionary fiscal policy that has been designed ex-ante to be procyclical, has in fact not reacted to the cycle (being acyclical) due to the errors in the output gap forecast. As shown in Figure 1, the forecasts for the output gap of year  $t$  made in the spring of  $t-1$  since 1999 were less favourable (more negative) than the actual ex-post output gaps, resulting into mainly positive deviations vis-à-vis the spring forecast made in the previous year. This is mainly the result of an overestimation of the growth potential of economies in the early 2000s, probably still the result of the dot.com bubble which suggested better future

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<sup>7</sup> For instance, the measure of the output gap for 2001 used in the regression was the forecast of the output gap made by the Commission services in the Spring (or Autumn) of 2000.

prospects.<sup>8</sup> As a result, the evolution of the economy in the beginning of the 2000s appeared to be less favourable than it was in reality, leading to the estimation of an output gap more negative than the ex-post gaps.<sup>9</sup>

This result obtained with real-time data casts some doubts on the conclusions derived from evidence from the previous sections, since the actual acyclical behaviour of discretionary fiscal policy in the period 1999-2006 seems to be simply the result of errors in the forecast of the output gap, and not the result of a change in the intentions of policy makers. According to this section's results, there is no evidence in favour of the view that Maastricht rules have forced policy-makers to change their behaviour and design countercyclical discretionary fiscal policy.

**Table 5- Determinants of Cyclically Adjusted Primary Deficit (%Potential GDP) – Panel for euro area countries using real-time data- 1999-2006**

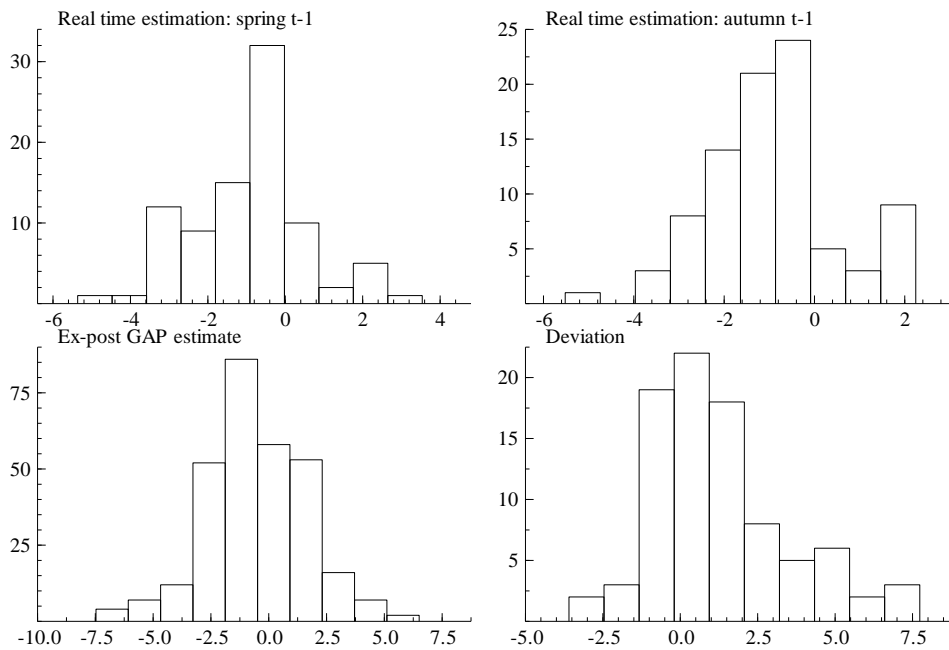
	<i>Forecast made in:</i>	
	<b>Spring<sub>t-1</sub></b>	<b>Autumn<sub>t-1</sub></b>
<b>GAP<sub>t</sub></b>	0.336 (3.96)	0.223 (2.06)
Lagged debt	-0.018 (-1.15)	-0.026 (-1.23)
Lagged deficit	0.496 (7.79)	0.545 (7.48)
Wald test joint	121.1 (0.0)	96.2 (0.0)
AR1 test	-1.21 (0.23)	-1.09 (0.28)
AR2 test	-2.05 (0.04)	-2.06 (0.04)

*Notes:* In parentheses T-stats for coefficients and p-values for tests. The estimation method is Least Squared Dummy Variables (LSDV) using robust standard errors. See text for details.

<sup>8</sup> For example, for France the output gap in 2000 was forecasted in 1999 on the “Broad Economic Policy Guidelines” to be -2.3%. The ex-post data, as available in the spring of 2007 forecast, point to a positive output gap of 2.4%, i.e. to a deviation of 4.7% of the potential GDP. For Germany, the numbers are similar (the initial forecast was -0.7 and the ex-post value is 1.3%). For Italy, the numbers for 2000 are -3.1 (ex-ante) vs. 1.8% (ex-post), and for Spain -3.1 vs. 2.2%.

<sup>9</sup> According to Jonung and Larch (2006) an even larger degree of optimism in the medium-term growth outlook is present in national official government's growth projections of France, Germany, Italy and the United Kingdom. Such optimism has resulted into cyclical conditions that turn out systematically better than assumed at the time of presenting the budget deficit.

**Figure 1- Output gap forecasts 1999-2006**



Notes: The first three graphs represent the distribution of the output gap estimate for euro-area countries (made in  $\text{spring}_{t-1}$ ;  $\text{autumn}_{t-1}$ ; ex-post estimate). The last graph represents the distribution of the deviation between the ex-post estimate for year  $t$  and the forecast made in  $\text{spring}_{t-1}$ .

## V. Concluding remarks

Some have feared that Maastricht rules would force fiscal policy in euro-area to be procyclical. Galí and Perotti (2003) were among the first influential papers to find some evidence against such view. Using data for the period 1980-2003, Galí and Perotti (2003) found that discretionary budget deficits have actually become more countercyclical in EMU countries after the Maastricht Treaty than before. This paper contributes to this literature by testing for the robustness of such conclusions to: i) a different dataset; ii) a different sub-period division; iii) an extension of the estimation period to 2006, i.e. including three more years of EMU; iv) to control for the effects of political-institutional variables on the cyclically adjusted primary deficit; v) and, to the use of real-time data for the period after the introduction of the euro.

Overall, this paper finds that the results of Galí and Perotti (2003) are broadly robust to the first four mentioned changes using ex-post data, but not to the use of real-time data. Using a panel data approach for EU-15 countries, and *ex-post data*, it is found that discretionary fiscal policy is procyclical before the signing of the Maastricht Treaty in 1992. After 1992, it becomes acyclical. However, there is considerable variation in the after-Maastricht period. Immediately after the signing of the Treaty (1992-1995) discretionary fiscal policy became countercyclical. However, in the three years after the decision regarding the start of stage III of EMU is taken in December 1995, i.e. in the run-up to the single currency period (1996-1998), discretionary fiscal policy becomes again strongly procyclical. Once the euro becomes a reality in 1999, it appears that discretionary fiscal policy has been acyclical in the euro-area countries (and also in EU-15). Yet, there is some degree of variation at the country level. Distinguishing high-deficit from low-

deficit countries, there is some evidence in favour of the view that low-deficit countries tend to pursue more countercyclical discretionary fiscal policies.

Controlling for the influence of political-institutional variables does not change the overall conclusion regarding the cyclical properties of discretionary fiscal policy. The realization of elections is found to have a positive impact on the cyclically adjusted primary deficit (CAPD). The CAPD increases also with the number of spending ministers in the government. Interestingly, it was found that coalition governments tend to pursue more countercyclical discretionary fiscal policy. On the reverse, a large number of spending ministers might lead to procyclical fiscal decisions.

These first four robustness checks were based on the use of instrumental variables to proxy for the expected output gap in the fiscal rule, estimated using ex-post data. However, in practice policy-makers have to resort to real-time estimation of the output gaps when deciding fiscal policy. Hence, it is important to check the robustness of previous results to the use of real time data. A practical difficulty is the length of real-time data: the European Commission forecasts for the output gap have only started to be regularly published since 1999. Hence, it is not possible to assess the impact of the SGP using real-time data. Notwithstanding, it is possible to estimate the fiscal reaction function since 1999. Using such data, an interesting conclusion emerges: in the euro-area, discretionary fiscal policy in the period after the introduction of the euro has been designed (using the information available at the time) to be procyclical. However, the economic conditions have been in general more favourable than initially estimated leading to forecasting errors in the output gap estimates, making actual discretionary fiscal policy acyclical in the period 1999-2006, when evaluated using ex-post data. This conclusion contrasts with the results of Forni and Momigliano (2004).

All in all, there is some evidence, using ex-post data, pointing to a more countercyclical use of discretionary fiscal policy (or at least to a decrease in the use of procyclical discretionary fiscal policy), but there is not (yet) definitive evidence that SGP rules have made fiscal policy countercyclical over the cycle, at least for all euro-area countries. However, the use of real-time data for the period 1999-2006 reveals that discretionary fiscal policy has been designed to be procyclical. Hence, the actual acyclical behaviour of discretionary fiscal policy in the period after 1999 seems to be simply the result of errors in the forecast of the output gap, and not the result of a change in the intentions of policy makers. As a result there is no evidence in favour of the view that Maastricht rules have forced euro-area policy-makers to change their behaviour and design countercyclical discretionary fiscal policy.

## References

- Andersen Tm (2001) Stabilization Policy, *University of Aarhus, unpublished manuscript*, June
- Arellano M and Bond S (1991) Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *Review of Economic Studies* 58: 227-297
- Auerbach Aj (2002) Is There a Role for Discretionary Fiscal Policy?, *NBER Working Paper*, No. 9306,
- Baltagi Bh (2001) *Econometric Analysis of Panel Data*. 2<sup>nd</sup> edition, Wiley & Sons Chichester
- Bayoumi T and Masson Pr (1995) Fiscal Flows in the United States and Canada: lessons for monetary union in Europe. *European Economic Review* 39: 253-274
- Brandner P, Diebalek L and Koehler-Toeglhofer (2006) Budget Balances Decomposed: tracking fiscal policy in Austria. *Presented at the Workshop on Fiscal Indicators in the EU Budgetary Surveillance*, No. Brussels, 22 September
- Brender A and Drazen A (2005) Political budget cycles in new versus established democracies. *Journal of Monetary Economics* 52: 1271-1295
- Forni L and Momigliano S (2004) Cyclical Sensitivity of Fiscal Policies Based on Real-Time Data. *Applied Economics Quarterly* 50: 299-326
- Galí J and Perotti R (2003) Fiscal policy and monetary integration in Europe. *Economic Policy* 37: 533-572
- Jonung L and Larch M (2006) Improving fiscal policy in the EU: the case for independent forecasts. *Economic Policy* 21: 491-534
- Lane Pr (2003) The Cyclical Behaviour of Fiscal Policy: evidence from the OECD. *Journal of Public Economics* 87: 2661-2675
- Marinho C (2005) Output Smoothing in EMU and OECD: Can we Forgo the Government Contribution? A risk-sharing approach. In: De Grauwe P and Mélitz J, eds.), *Prospects for Monetary Unions after the Euro*, MIT Press Cambridge, Massachusetts, 187-223
- Mierau Jo, Jong-a-Pin R and De Haan J (2006) Do Political Variables Affect Fiscal Policy Adjustment Decisions? New empirical evidence, *Paper submitted for EPCS2006*,
- Orphanides A and Van Norden S (2002) The unreliability of output-gap estimates in real time. *Review of Economics and Statistics* 84: 569-583
- Pina Á (2004) *Fiscal Policy in Portugal: Discipline, Cyclicity and the Scope for Expenditure Rules*, proceedings of the 2nd Conference on Portuguese Economic Development in the European Context, held by the Bank of Portugal in Lisbon, 11-12 March 2004, forthcoming
- Roubini N and Sachs J (1989) Political and economic determinants of budget deficits in the industrial democracies. *European Economic Review* 33: 903-933
- Volkerink B and De Haan J (2001) Fragmented government effects on fiscal policy: new evidence. *Public Choice* 109: 221-242
- Woo J (2003) Economic, political, and institutional determinants of public deficits. *Journal of Public Economics* 87: 387-426
- Wyplosz C (2002) Fiscal Discipline in EMU: Rules or Institutions?, *Paper prepared for the April 16, 2002 meeting of the Group of Economic Analysis of the European Commission*.  
<http://heiwww.unige.ch/~wyplosz/>

## APPENDIX

**Table 6- Determinants of Cyclically Adjusted Primary Deficit (%Potential GDP)-1980-2003 – Arellano & Bond estimation method- euro-area**

	(1)*	(2)	(3)	(4)	(5)	(6)	(7)
GAP <sub>80-91</sub>	0.172 (3.1)	0.175 (2.96)	0.173 (2.95)	0.177 (3.29)	0.175 (3.27)	-0.134 (-0.59)	0.321 (2.24)
GAP <sub>92-2003</sub>	-0.043 (-0.7)	-0.037 (-0.39)	-	-0.044 (-0.45)	-	-0.335 (-1.47)	0.119 (0.71)
GAP <sub>92-95</sub>	-	-	-0.145 (-1.23)	-	-0.163 (-1.41)	-	-
GAP <sub>96-98</sub>	-	-	0.395 (3.78)	-	0.365 (2.95)	-	-
GAP <sub>99-2003</sub>	-	-	0.023 (0.32)	-	0.04 (0.81)	-	-
Elections	-	-	-	0.747 (4.62)	0.759 (4.38)	0.765 (4.68)	0.731 (4.71)
ENoP_G				-0.081 (-0.79)	-0.073 (-0.64)	-0.085 (-0.81)	-0.041 (-0.39)
Surplus seats				-1.434 (-1.33)	-1.529 (-1.51)	-0.968 (-0.8)	-1.387 (-1.27)
NSM				0.142 (1.9)	0.138 (1.95)	0.141 (1.82)	0.153 (1.91)
GAP*NSM				-	-	0.019 (1.37)	-
GAP*ENoP_G	-	-	-	-	-	-	-0.793 (-1.01)
Lagged debt	-0.034 (5.42)	-0.031 (5.6)	-0.029 (-5.38)	-0.029 (-7.44)	-0.027 (-6.94)	-0.031 (-6.82)	-0.028 (-5.93)
Lagged deficit	0.736 (21.4)	0.772 (18.2)	0.768 (16.1)	0.743 (16.5)	0.744 (15.0)	0.737 (15.5)	0.735 (14.7)
P-value equal coeff.	(0.01)	(0.0)	(0.0)	(0.0)	(0.0)	(0.001)	(0.0)
Sargan test	-	159.2 (0.57)	159.3 (0.57)	169.0 (0.36)	168.6 (0.37)	168.2 (0.37)	167.8 (0.38)
AR1 test	-0.112 (0.91)	-0.454 (0.65)	-0.506 (0.61)	-0.034 (0.97)	-0.176 (0.86)	-0.004 (0.997)	-0.042 (0.966)
AR2 test	-0.204 (0.84)	-0.815 (0.42)	-1.033 (0.301)	-0.42 (0.67)	-0.824 (0.41)	0.04 (0.97)	-0.282 (0.78)

*Notes:* In parentheses T-stats for coefficients and p-values for tests. The estimation method is GMM with lags 2 to 10 of the dependent variable. 1<sup>st</sup> step estimation in PCGIVE including a constant term (omitted) and individual dummies, using robust standard errors. Autocorrelation tests in the first-differenced residuals. The AR1 test is asymptotically distributed as N(0,1) under the null of no first order serial correlation. *Idem* for AR2. Sargan test of overidentifying restrictions under the null of the validity of instruments. A countercyclical discretionary fiscal policy implies a negative GAP coefficient. \*Column (1) presents our previous results using LSDM.

**Table 7- Determinants of Cyclically Adjusted Primary Deficit (%Potential GDP) in euro area –country level results: 1980-2006**

	Country	GAP <sub>80-91</sub>	GAP <sub>92-95</sub>	GAP <sub>96-98</sub>	GAP <sub>99-2006</sub>	P-value BM-AM	P value BM-A€	P-value J test
<b>High deficit countries</b>	Belgium	0.160 (0.51)	0.482 (1.66)	0.491 (0.92)	-0.112 (-0.27)	0.764	0.502	0.319
	Greece	0.969 (4.46)	0.944 (2.59)	1.564 (6.25)	1.592 (2.99)	0.146	0.283	0.328
	Ireland	0.327 (2.36)	-0.008 (-0.06)	0.292 (5.56)	0.234 (1.11)	0.098	0.711	0.194
	Italy	0.782 (4.24)	0.648 (2.15)	1.662 (1.92)	-0.06 (-0.22)	0.099	0.016	0.089
	Portugal	0.175 (1.54)	-0.128 (-0.5)	0.131 (0.19)	0.103 (0.411)	0.732	0.805	0.04
<b>Low deficit countries</b>	Austria	0.342 (2.0)	-1.135 (-3.82)	1.16 (2.11)	0.027 (0.15)	0.0	0.151	0.123
	Finland	-0.121 (-1.07)	-0.469 (-5.53)	-0.221 (-2.0)	-0.591 (-1.53)	0.069	0.247	0.773
	Germany	0.528 (7.61)	0.069 (0.52)	0.431 (0.89)	-0.269 (-0.39)	0.0	0.262	0.293
	France	0.301 (2.34)	-0.071 (-0.21)	0.678 (5.76)	0.05 (0.347)	0.0	0.204	0.565
	Netherlands	0.233 (1.37)	0.375 (0.78)	0.693 (0.84)	-0.065 (-0.31)	0.589	0.237	0.316
	Spain	0.160 (1.58)	-0.302 (-1.88)	-0.042 (-0.18)	0.576 (2.22)	0.06	0.08	0.297

Notes: Omitted results for lagged deficit and debt. T-values based on robust standard errors. High deficit countries: countries that presented an average cyclically adjusted deficit in period 1980-1995 larger than the unweighted euro area average.

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