Fiscal policy

SUMMARY

Economists, policy-makers, and the media often argue that the Maastricht Treaty and the Stability and Growth Pact make it difficult for governments of EMU countries to stabilize their economies with appropriate fiscal policy and to provide adequate public investment. Our empirical analysis offers little support to this view. Discretionary budget deficits have actually become more counter-cyclical in EMU countries after the Maastricht Treaty, as well as in the other EU and non-EU industrialized countries we study. And while public investment has declined recently in EMU countries, a similar tendency is apparent in other countries and started well before the Maastricht Treaty was signed.

— Jordi Galí and Roberto Perotti

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Fiscal policy and monetary integration in Europe

Jordi Galí and Roberto Perotti

CREI, Universitat Pompeu Fabra and CEPR; European University Institute and CEPR

1. INTRODUCTION

The fiscal apparatus of stage three of economic and monetary union (EMU) is increasingly regarded by many as an unnecessary and harmful straightjacket on national fiscal policies, or even as downright 'stupid'.[1] According to a common argument, the Maastricht Treaty (MT) and the Stability and Growth Pact (SGP) constrain the use of fiscal policy precisely when EMU countries need it the most, having lost their autonomous monetary policy. In particular, critics complain that recessions can only be deepened by efforts to raise taxes and cut spending when cyclical downturns increase deficits towards the SGP's ceiling. Since the SGP fiscal targets do not take cyclical conditions into account, the need to stabilize the budget over the cycle may imply a procyclical fiscal policy and amplify economic fluctuations in EMU countries. A second criticism frequently levelled at the MT and the SGP is that they have

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[1] Interview with Romano Prodi in *Le Monde*, 17 October 2002.

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impaired the ability of EMU countries to maintain and increase the public capital stock. This could have long-run consequences on the growth potential of these countries that go well beyond their implications for the cyclical properties of fiscal policy.

Our first objective in the present paper is to assess the extent to which the constraints associated with the MT and the SGP have affected national fiscal policies *in practice*: we ask the data whether and how those constraints have made fiscal policy in EMU countries more procyclical. The second objective is to assess empirically whether the alleged negative effects of the MT and SGP on public investment can indeed be seen in the data.

1.1. Methods and results

Regarding the cyclical behaviour of fiscal policy, we test using available data two hypotheses associated with the criticisms mentioned above. The first hypothesis is that, because of the constraints imposed by the MT and the SGP, national fiscal policies can no longer fulfil the stabilizing role they had traditionally played. The second hypothesis is that the loss of an autonomous monetary policy calls for more strongly counter-cyclical fiscal policies in EMU countries. In order to test these hypotheses we estimate empirical fiscal policy rules for eleven EMU countries over the period 1980–2002, and perform a variety of tests for stability of the coefficient capturing the fiscal response to output gap fluctuations in the pre- and post-Maastricht periods. We compare the results with those of similar regressions on data for the three EU countries that did not join EMU, as well as for five OECD countries that do not belong to the EU.

From a methodological point of view, we restrict our analysis to measures that can be reasonably interpreted as indicators of *discretionary* fiscal policy, the component of fiscal deficit whose variation does not result from the automatic influence of the cycle or other non-policy influences. In the short and medium run, this is more likely to be affected by the MT and SGP constraints than the cyclical component of fiscal deficits, which depends on country-specific features that change very slowly over time, like the overall size and composition of government spending and the progressivity of the tax system. We also recognize that our cyclical indicators might be affected by exogenous fiscal shocks, and address this issue with an instrumental variables procedure.

We detect very little evidence that the Maastricht-related constraints have significantly impaired *in practice* the stabilization role of fiscal policy in EMU countries. If anything, we find evidence of the opposite: EMU countries' fiscal policy in the pre-Maastricht period seems to have been significantly procyclical, a feature that largely disappears during the post-Maastricht period. Overall, we detect what appears to be a global trend towards more counter-cyclical fiscal policies. Interestingly, EMU countries seem to lag behind the rest of OECD countries in terms of that trend. It is not yet possible to tell whether this may be a consequence of the MT and SGP constraints or of other factors or, indeed, a rationale for them.

Regarding the effects of the MT and SGP on public investment, we find that the decline in government investment as a share of total spending appears to be a global trend that started well before Maastricht. In fact, in the post-Maastricht period government investment declined *less* than in the 1980s, and *less* in EMU countries than in the other OECD countries.

We should clearly emphasize at the outset what our paper does not and cannot say. Our results do not imply that deficit limits are irrelevant: obviously, if a country is already close to the deficit limit and it is hit by a negative shock, then the limit will be relevant (to the extent, of course, that it is indeed enforced *ex post*). What we document is that in the circumstances so far experienced, there is no evidence of less counter-cyclical behaviour of fiscal policy after the MT – quite the contrary. But the potential for problems from as-yet unrealized crises simply cannot be assessed with our method.

2. DEBTS AND DEFICITS: THE RECORD

Box 1 reviews the key institutional constraints imposed on national fiscal policies by the Maastricht Treaty and the Stability and Growth Pact.[2] To provide some

Box 1. Fiscal policy constraints for EMU countries

The 1992 Maastricht Treaty and then the Stability and Growth Pact established targets on the size of debt and deficits, other obligations, and penalties. Article 104 (ex Art. 104c) of the Treaty establishes that 'member sates shall avoid excessive government deficits' (para. 1), and that compliance with budgetary discipline will be judged on the basis of two criteria (para. 2):

'(a) whether the ratio of the planned or actual government deficit to gross domestic product exceeds a reference value, unless:
  – either the ratio has declined substantially and continuously and reached a level that comes close to the reference value;
  – or, alternatively, the excess over the reference value is only exceptional and temporary and the ratio remains close to the reference value
(b) whether the ratio of government debt to gross domestic product exceeds a reference value, unless the ratio is sufficiently diminishing and approaching the reference value at a satisfactory pace.'

[2] For other detailed accounts we refer the interested reader to European Commission (2000) and European Central Bank (1999). Artis and Buti (2000), Buiter *et al.* (1993), Buiter and Grafe (2002), Buti and Giudice (2002), and Eichengreen and Wyplosz (1998) also provide good discussions of the institutional aspects of the Maastricht Treaty and of the Stability and Growth Pact, and detailed economic analyses of their rationale and impact.

As is well known, these two reference values were set at 3% and 60%, respectively.

The first criterion was also used, among other criteria like price stability, when a decision was made on which countries would be admitted to stage III of the EMU (the single currency) in May 1998. The Stability and Growth Pact was designed to provide concrete content to several provisions of the Treaty regarding economic policies in the EU. It consists of a Resolution of the European Council and of two ECOFIN Council Regulations (No. 1466/97 and No. 1467/97). The Resolution reaffirms the commitment to fiscal discipline and introduces the notion of 'medium-term budgetary objective of positions close to balance or in surplus', to be respected by member states, in order to 'allow all Member States to deal with normal cyclical fluctuations while keeping the government deficit within the reference value of 3% of GDP'.

Regulation No. 1466/97 clarifies the procedures to be followed for an implementation of the surveillance of the Pact, as envisioned in general terms in Art. 99 (ex Art. 103) of the Treaty. Member states must submit every year an update to the *stability programme* (called convergence programme for non-EMU members), containing a *medium-term objective* for the budgetary position, and a description of the *assumptions* and of the main economic policy *measures* the country intends to take to achieve the targets. The Council, on a recommendation from the Commission, delivers an *opinion* on each programme and its yearly updates and, if deemed necessary, a recommendation. There are three possible types of *recommendations*. First, a recommendation that the programme be adjusted if deemed deficient in some respect. Second, if after approving the programme the Council identifies a 'significant divergence of the budgetary position from the medium-term budgetary objective, or the adjustment path towards it', the Commission can issue a recommendation (*early warning*), in accordance with Art. 103(4). Third, if the divergence persists, the Council can issue a recommendation to take corrective action, and can make the recommendation public.

Regulation 1467/97 offers a more precise definition of the 'exceptional and temporary' excess of the deficit over the 3% of GDP threshold, introduced by Art. 104 (ex Art. 104c) of the Treaty. Deficits are 'exceptional and temporary' if they are the result of 'an unusual event outside the control of the Member State concerned' or of 'a severe economic downturn', more specifically 'if there is an annual fall of real GDP of at least 2%' or 'exceptional' circumstances can be argued on the basis of 'the abruptness of the downturn or on the accumulated loss of output relative to past trends'. This Regulation also clarifies the *Excess Deficit Procedure* set out in Art. 104 (ex Art. 104c) of the Treaty, including the imposition of fines.

background for our assessment of their practical relevance, we start by looking at a few descriptive statistics on the medium-term evolution of the size of debt and deficits of the general government (the union of the central and local governments and of the social security funds). We do so for the current EMU countries, as well as for two other groups of countries. The first, dubbed EU 3 in what follows, comprises the three EU countries that do not belong to the EMU (Denmark, UK and Sweden). The second, dubbed OECD 5, comprises five non-EU OECD countries for which we were able to assemble a consistent set of budget data: Norway, Australia, Japan, Canada and the United States.

While the OECD 5 countries we consider are clearly not affected by EMU fiscal constraints, the position of the EU 3 group is less clear. In principle, the MT and SGP fiscal constraints described in Box 1 apply to all EU member countries, but EU countries that have not adopted the euro are not subject to penalties in case their deficits exceed 3% of GDP (whether such fines would indeed be imposed on EMU member countries is far from clear, however; see Box 2 for a discussion).

Columns (a) and (b) in Table 1 display the average deficit/GDP ratio for the above groups of countries during two different five-year periods (1988–92 and 1997–2001); column (c) displays the difference between the first two columns. The first such period corresponds to the years immediately before the adoption of the MT, whereas the

Box 2. Enforcement of fiscal rules for EMU members and other EU countries

Several aspects of the SGP are not fully clear, and this might impair the actual stringency of the provisions of the pact.

The notion of a 'medium-term target' is ambiguously defined. The expression 'sound budgetary positions close to balance or in surplus' was initially identified with a position such that the budget deficit would still be less than 3% of GDP if the automatic stabilizers were allowed to operate during a deep recession, a subjective and controversial 'minimal benchmark'. The Commission computes it on the basis of the worst-case scenario for the output gap, taken to be the largest negative output gap since 1960, or two times the standard deviation of the output gap (see for example European Commission, 1999, p. 4). However, the revised Code of Conduct on the content and format of the stability and convergence programmes, endorsed by the ECOFIN Council in 2001, requires additional margins to cope with unforeseen budgetary risks and to reduce high debts and introduces a distinction between the notions of 'appropriate medium-term target' and the notion of 'close to balance or in surplus' which constitutes the key obligation of the SGP. A stricter bound on deficits might be justified in view of several considerations, like providing

for the costs of an ageing population, to create room for discretionary fiscal policies, etc. (see European Commission, 2002, p. 33).

An 'actual or expected significant divergence of the budgetary position from the medium-term budgetary objective' could trigger an early warning, but it is also less than unambiguously defined in the SGP framework. While cyclically adjusted budget balance could be used in making this assessment, the SGP does not refer to cyclical adjustment. Yet the new Code of Conduct states that 'cyclically adjusted balances should continue to be used, in addition to nominal balances, as a tool when assessing the budgetary position', and the 2002 Council Opinions on the programmes of six members mentions the notion of cyclically adjusted balances. However, the role of cyclical adjustment remains unclear. A country may be exempted from the 3% deficit limit for an unspecified period of time if 'exceptional circumstances' define a 'severe' recession even though GDP falls by less than 2%. This notion is also less than clearly defined, making the Excess Deficits Procedure prone to endless bargaining and controversy.

The SGP is also partly ambiguous as regards constraints imposed on EU countries that have not adopted the euro. Regulation 1467/97 establishing the SGP states that para. 1 of Art. 104 (ex Art. 104c) of the Treaty – 'Member States shall avoid excessive government deficits' – does not apply to the UK unless it moves to the third stage. However, the UK is still under the obligation of para. 4 of Art. 116 (ex Art. 109e) – 'In the second stage, Member States shall endeavour to avoid excessive government deficits'. The Council has also interpreted the SGP in the sense that the obligation to pursue a goal of 'close to balance or surplus in the medium term' applies to the UK (see, e.g., the '2002 Council Opinion' on the updated convergence programme).

In contrast to the UK, the resolution and the two regulations establishing the SGP fail to state explicitly that Art. 104(1) does not apply to Denmark. In fact, the 2002 Council Opinion on the updated convergence programme for Denmark states that 'Denmark is also expected to be able to withstand a normal cyclical downturn without breaching the 3% of GDP deficit reference value.'

However, both Denmark and the UK are explicitly exempted from the requirement of paras 9 and 11 of Art. 104 (ex Art. 104c), which establish the right of the Council to request specific actions and to impose non-interest bearing deposits and fines, in cases of a deficit in excess of 3%.

While Denmark and the UK have an *opt-out* from participation in stage 3 of the EMU (the single currency), technically speaking Sweden only has a *derogation*. The practical consequence for the applicability of the SGP, however, appears to be the same as for Denmark; Art. 122(3) of the Treaty establishes that paras 9 and 11 of Art. 104 do not apply to countries with a derogation.

Table 1

	Deficit/GDP ratio (%)			Debt/GDP ratios (%)		
	1988–92 (a)	1997–2001 (b)	(b) − (a) = (c)	1982 (d)	1992 (e)	2001 (f)
AUT	2.8	1.8	−1.0	40.3	57.2	61.7
BEL	7.4	0.7	−6.7	98.9	131.4	108.2
DEU	1.9	2.1	0.2	37.5	41.8	60.3
ESP	3.9	1.5	−2.4	31.1	52.4	69.1
FIN	−2.1	−2.7	−0.6	14.1	40.6	43.6
FRA	2.6	2.0	−0.6	33.5	44.7	64.8
GRC	13.1	1.9	−11.2	29.6	97.6	99.7
IRE	2.9	−2.3	−5.2	79.2	100.1	36.5
ITA	11.4	2.2	−9.2	65.1	116.1	108.7
NLD	4.8	−0.1	−4.9	54.2	77.6	53.2
PRT	4.0	3.1	−0.9	42.6	54.8	55.6
DNK	0.8	2.0	1.2	60.2	66.3	44.7
GBR	1.6	−0.4	−2.0	53.7	49.2	52.5
SWE	−0.4	−2.1	−1.7	60.2	69.0	52.9
NOR	−1.1	−9.4	−8.3	31.9	32.4	26.8
AUS	2.3	−0.4	−2.7	*18.4*	14.5	10.1
JPN	−1.5	6.2	7.7	60.1	63.5	132.8
CAN	6.4	−1.6	−8.0	68.4	110.4	101.6
USA	4.4	−0.5	−4.9	49.3	74.1	59.5
ALL	3.4	0.2	−3.2	48.9	68.1	65.4
EMU	4.8	0.9	−3.9	47.8	74.0	69.2
EU3	0.7	−0.2	−0.8	58.0	61.5	50.0
OECD5	2.1	−1.1	−3.2	45.6	590.7	66.2

Notes: Deficit is cyclically unadjusted general government deficit. Averages for different groups are unweighted.
Source: OECD *Economic Outlook* database, December 2002 issue.

second sub-period includes the first five years for which the constraints associated with the MT and/or the SGP were in place. (The decision about the set of countries qualifying to join EMU from its birth in 1999 was made in May 1998 on the basis of 1997 fiscal figures, among other factors). The table confirms the well-known substantial decline in the deficit/GDP ratio in all EMU countries except one (Germany). The average decline in the deficit/GDP ratio in EMU countries was close to 4.0 percentage points; Greece had the largest adjustment – more than 11 percentage points, followed closely by Italy with 9.2 percentage points. The only outlier among EMU countries, Germany, experiences a small increase of 0.2 percentage points (albeit starting from one of the lowest deficit ratios among EMU countries, 1.9% in the early sub-period).

To what extent was such a fiscal consolidation restricted to current EMU countries? Interestingly, the performance of our control groups suggests that sizeable consolidations were also taking place over the same period in non-EMU countries. The OECD 5 group experienced an average decline of 3.2 percentage points in the deficit/GDP ratio, a decline that becomes much larger (6.0 percentage points) if one

excludes Japan. The EU 3 group shows a smaller reduction in the deficit/GDP ratio, about 0.8 percentage points; this can largely be explained by the much more favourable initial position, an average deficit ratio of 0.7% in the 1988–92 sub-period.

One interpretation of the above evidence is that, while the MT and SGP may have provided political cover and hence facilitated the necessary adjustments in EMU countries, the economic rationale for fiscal consolidation could well be deeper than the requirements for monetary union. The substantial fiscal consolidations experienced by EMU countries in the 1990s, in fact, can be seen as part of a global trend common to most industrialized countries (with Japan as a major exception). The evolution of the debt/GDP ratios suggests a good reason for these worldwide fiscal consolidations. The last three columns in Table 1 show the value of that ratio in three selected years (1982, 1992 and 2001), pointing to the non-sustainability of the fiscal position that most industrialized countries were maintaining in the 1980s. In particular, the average debt/GDP ratio for current EMU members increased from 48% to 74% between 1982 and 1992, and from 52% to 62% among the OECD 5 countries. Only the EU 3 countries, which started their fiscal consolidation process at an earlier stage, managed to contain the rise in the debt/GDP ratio to only 3 percentage points, from 58% to 61%. It was only after the fiscal consolidations of the 1990s that most industrialized countries began to experience a decline or at least a deceleration in their debt/GDP ratios.

3. DECOMPOSING FISCAL POLICY

In order to study the issues set out in the introduction we first need to distinguish between changes in fiscal policy that are due to discretionary measures taken by policy-makers, and those that are due to the 'automatic' response of fiscal variables to business cycle fluctuations. In this paper, we focus primarily on the former; as mentioned in the introduction, the cyclical behaviour of the latter component is determined by the size and composition of government spending and taxation, and the structure of the tax system, all features that are difficult to change significantly in the short to medium run. We do, however, also study changes in the cyclical behaviour of the latter component, and find similar results, although quantitatively weaker, as expected.

We can think of the budget deficit in a given year as the sum of two components:

(1) The 'cyclical' or 'non-discretionary' deficit is the component whose variations are due (at least in the short run) to causes outside the direct control of the fiscal authorities, like business cycle fluctuations in unemployment and in the tax bases. In the case of taxes, these variations can be interpreted as changes in tax revenues due to changes in income, for given tax rates and for given definitions of the tax bases.[3] Among primary expenditures, only unemployment benefits probably have a non-negligible built-in

[3] For simplicity, we abstract here from automatic responses to inflation and interest rates. These are more difficult to estimate. For such an attempt, see Fatás and Mihov (2002b), Perotti (2002), and Canzoneri *et al.* (2002).

response to output fluctuations. Debt interest payments are also an element of this component, since interest rates are largely outside the control of the fiscal authorities.

(2) The 'structural', 'cyclically adjusted' or 'discretionary' deficit is the value that would be observed if output were at some reference 'potential' level. By removing the cyclical component, it aims at measuring the fiscal stance intentionally chosen by the policy-maker, rather than the result of uncontrolled economic fluctuations. Within this second component we can in turn define two components:

   (a) The 'systematic' or 'endogenous' component of the cyclically adjusted deficit corresponds to policy decisions affecting structural spending or revenues in response to changes in the actual or expected cyclical conditions of the economy. For instance, policy-makers wishing to pursue an active counter-cyclical policy could reduce tax rates or increase government consumption whenever the economy is in a recession, and the opposite in an expansion. The possible counter-cyclical behaviour of this component of the structural deficit is thus the result of a deliberate policy decision, rather than of automatic stabilizers.
   (b) The 'non-systematic' or 'exogenous' component of the cyclically adjusted deficit captures budgetary changes that do not correspond to systematic responses in cyclical conditions, but are instead the consequence of exogenous political processes or extraordinary non-economic circumstances (e.g., war spending efforts).

These definitions are conceptually straightforward, but the actual implementation of any cyclical adjustment is subject to a large element of subjectivity. As our benchmark, we use cyclically adjusted data constructed by the OECD according to the methodology described in Box 3.

As mentioned, most of our empirical analysis below focuses on a measure of the structural (or cyclically adjusted) primary deficit, which we interpret as an indicator of the stance of discretionary fiscal policy. By varying the structural primary deficit through changes in either taxes or government purchases the fiscal authority can influence aggregate demand and, hence, a country's level of aggregate economic activity. We do not have strong views as to whether the level or the change in the deficit is the appropriate measure of fiscal stance. The choice of the indicator of the fiscal policy stance depends very much on the underlying model of the economy and the notion of policy stance that one has in mind. In a simple IS-LM model, for example, the level of the budget deficit determines the position of the IS curve and its change in the budget surplus determines movements of this curve; 'expansionary' fiscal policy may be either a high deficit (and output) or an increasing deficit (and output). To ease comparability with the literature, we present all our results in terms of deficit levels. Note, however, that the fiscal rules estimated below feature the lagged structural deficit as an independent variable, to imply that if the dependent variable were the change rather than the level of the structural deficit the other coefficients of the regression would be the same as those we report.

Box 3. The structural budget deficit

Let Y^* be the reference value of GDP, and α and β the output elasticity of tax revenues and spending, respectively. Then the structural tax revenues and spending, T_t^* and G_t^*, are computed from the expressions:

$$\frac{T_t^*}{T_t} = \left(\frac{Y_t^*}{Y_t}\right)^{\alpha}; \quad \frac{G_t^*}{G_t} = \left(\frac{Y_t^*}{Y_t}\right)^{\beta}$$

In words, the revenue elasticity α is used to evaluate the value revenues would take if output were at its reference level T_t^* instead of its actual value Y_t, and similarly for government spending. Dividing T_t^* and G_t^* by the reference value of GDP, we obtain the 'structural' budget deficit as a share of reference GDP:

$$d_t^* = g_t^* - t_t^*$$

where d_t^*, t_t^*, and g_t^* are the structural primary deficit, primary revenues, and primary spending, all as shares of reference GDP. Thus, the output of the structural adjustment depends on the reference value of GDP used. Typically, this is some measure of smoothed output, like trend or HP-filtered GDP, or of potential output. In our benchmark results, based on data cyclically adjusted by the OECD, the reference value of GDP is potential output, constructed following a standard production function approach (see Giorno *et al.*, 1995; or OECD 2002). For robustness we also use different cyclically adjusted fiscal data, computed by the European Commission and based on two alternative reference GDPs: HP-filtered GDP and potential output based on the Commission's production function approach (see European Commission, 2002; the European Commission has just started using potential output in its cyclical adjustment, in addition to HP-filtered GDP, with the November 2002 release). A second source of variation in cyclical adjustment procedures is the elasticities used. The OECD elasticities are constructed starting from the tax code and the distribution of taxpayers by income brackets (see Giorno *et al.*, 1995 and van den Noord, 2002). The same elasticities are used by the European Commission. Some studies use elasticities estimated from a regression of tax revenues on GDP or the tax base. If taxes have a contemporaneous effect on output (as is likely in yearly data), the estimates so obtained are inconsistent. This would impair our estimates of the reaction of discretionary fiscal policy to cyclical conditions.

As a summary indicator of the cyclical conditions of an economy at any point in time, we use a conventional, production function-based output gap measure, also constructed by the OECD using the same measure of potential output used in the construction of the cyclically adjusted figures.

4. HAS DISCRETIONARY FISCAL POLICY CHANGED SINCE MAASTRICHT?

Our objective in this section is to ascertain the extent to which European governments have used *discretionary* fiscal policy as a stabilizing tool over the past two decades, and whether constraints on fiscal policy associated with Maastricht and the SGP may have hampered their ability and/or motivation to pursue active counter-cyclical fiscal policies.

4.1. Fiscal rules

Several researchers have estimated a relation of the form:

$$d_t = \phi_0 + \phi_x x_t + u_t$$

where d_t is the cyclically unadjusted total deficit (or some of its components) as a share of GDP and x_t is either the output gap or GDP growth (see Box 4 for a brief discussion of the recent literature on the subject; existing contributions include additional explanatory variables in the regression). This type of regression can provide a useful descriptive statistic of the cyclical relation between budget variables and economic activity, but it cannot identify discretionary policy reactions to cyclical conditions, because an important component of the budget deficit reflects automatic variations in government revenues and expenditures resulting from output and interest rate fluctuations that are outside the control of the fiscal authorities.

Box 4. The cyclical sensitivity of fiscal policy

Several recent papers also estimate the cyclical sensitivity of fiscal policy in OECD countries. There are two main differences with our investigation. First, in all this literature the fiscal variables are cyclically unadjusted, thus making it impossible to separately identify the automatic from the discretionary responses of fiscal policy to cyclical conditions, an issue which is the focus of our analysis. Second, in most papers the indicator of cyclical conditions is not instrumented, thus preventing a structural interpretation of the coefficient of the cyclical condition if fiscal policy has a contemporaneous effect on GDP in yearly data. To facilitate a comparison with our results, we will discuss these contributions as if their dependent variable were the deficit, although in most of them it is actually the surplus. Fatás and Mihov (2002a, b) regress the (cyclically unadjusted) primary deficit (or its first difference) on cyclical

indicators like the output gap, inflation and interest rate, and interpret the residual of this estimated equation as the indicator of the discretionary fiscal stance. In our terminology, they estimate the 'non-systematic' component of discretionary fiscal policy (subject to the caveat above that they do not instrument for the contemporaneous output gap on the right-hand side). They show that the average (across countries) standard deviation of this estimated residual has fallen in the 1990s, and interpret this result as evidence that EU countries have been less able to conduct counter-cyclical fiscal policy in the Maastricht years. Arreaza *et al.* (1999), Hercowitz and Strawczynski (1999) and Lane (2002) characterize the cyclical properties of fiscal policy in OECD countries by estimating similar regressions to Fatás and Mihov (2002a, b) both on a panel of OECD countries and on individual countries. These papers also look at how the cyclical behaviour of fiscal policy is affected by institutional and political factors, and they also disaggregate the deficit into its main spending and revenue components. Like Fatás and Mihov they use cyclically unadjusted data; only Lane (2002) instruments the cyclical indicator. Both Arreaza *et al.* (1999) and Lane (2002) find that the deficit/GDP ratio is counter-cyclical; Hercowitz and Strawczynski (1999) show that this is mostly due to recessions; in expansions, the deficit/GDP ratio is essentially acyclical.

A number of papers try to assess the automatic stabilizing properties of fiscal policy. Melitz (1997) and Wyplosz (1999) estimate similar regressions on a panel of European countries (typically including more variables, such as the debt/GDP ratio). They also find and note a counter-cyclical behaviour of the deficit/GDP ratio. Wyplosz (2002) regresses the cyclically unadjusted deficit/GDP ratio on the output gap in four countries: USA, UK, Germany and Italy. His regressions are most closely comparable to ours because he allows for a break in 1992. The differences in results are substantial. For instance, in the pre-1992 sample, he finds that the deficit is counter-cyclical in USA and Italy, and acyclical in Germany and UK; in contrast, we find that the structural deficit is essentially acyclical in USA, UK and Italy, and procyclical in Germany (see Table 2). Like us, Auerbach (2002) finds that the effects of the output gap on the legislated changes in the surplus (analogous to our measure of discretionary fiscal policy) have become slightly more counter-cyclical in the USA after 1992.

Of course, since the automatic response of revenues to the cycle would show up as a counter-cyclical response of the cyclically unadjusted deficit, in general we tend to find a less counter-cyclical behaviour of the deficit than in previous studies above, particularly in the first part of the sample and for the current EMU countries. For the purpose of assessing the possible changes induced by EMU constraints on fiscal policy, it is important to distinguish properly the discretionary and the cyclical component of the deficit.

To address this issue we decompose the general government deficit into its discretionary and cyclical components, and use each component as a dependent variable in turn. When the dependent variable is the discretionary component of the deficit, there is still a second problem. The disturbance term of the fiscal rule, which represents exogenous deficit shocks, is likely to be positively correlated with the output gap if such shocks affect the level of economic activity. This correlation will most likely generate an upward bias (and possibly even a sign switch) in the estimate in the coefficient on the output gap in the fiscal policy rule. To address this problem we use an instrumental variables (IV) procedure, regressing the deficit on a component of the output gap which is uncorrelated with exogenous discretionary fiscal shocks.

A third problem with the above specification of the fiscal policy rule is that it might not properly take into account the timing of fiscal policy decisions implied by the budgetary process of most countries. Since many discretionary fiscal parameters (e.g. tax rates) are largely determined the year before they become effective, any policy rule seeking to respond to output gap variations will have to be based on the *expectation* of the latter, conditional on information available in the previous period. In practice, this calls for replacing x_t with its expectation $E_{t-1}x_t$ in the relationship of interest. Following the lead of several authors (see, e.g., Bohn, 1998; Ballabriga and Martinez-Mongay, 2002; and Wyplosz, 2002), we also incorporate a debt stabilization motive by adding a measure of the size of the debt outstanding (relative to potential GDP) at the time of the budget decision, and which we denote by b_{t-1}. Finally, we account for the likely autocorrelation of budget decisions (possibly resulting from gradual adjustment to a target budget, or just from the serial correlation in the exogenous shocks) by adding the lagged dependent variable as a regressor.

The resulting specification of the fiscal rule is thus:

$$d_t^* = \phi_0 + \phi_x E_{t-1}x_t + \phi_b b_{t-1} + \phi_s d_{t-1}^* + u_t \quad (1)$$

In words (viewing the structural or cyclically adjusted deficit as the dependent variable for now), a negative value of ϕ_x indicates that policy-makers use discretionary fiscal policy in a systematic counter-cyclical way: when cyclical conditions are expected to improve (an increase in $E_{t-1}x_t$), discretionary fiscal policy becomes more restrictive, and the structural deficit falls. A negative value of ϕ_b, as well as a value of ϕ_s less than 1, indicates that the higher the initial debt, or the higher the initial deficit, the lower the structural deficit policy-makers set discretionarily.

We will be mostly interested in studying whether there was a detectable change in the value of ϕ_x, the coefficient of the expected output gap, in the post-Maastricht period in EU countries. More precisely, if the MT and SGP rules reviewed in Box 1 effectively prevent policy-makers from engaging in counter-cyclical fiscal policy, we would expect an increase in this coefficient after Maastricht, i.e. we should be able to detect a fall in the counter-cyclicality (or an increase in the procyclicality) of fiscal policy. To assess this effect, we estimate a version of Equation (1) that allows the output coefficient to differ before and after the possible regime change: formally,

$$d_t^* = c_{BM} + c_{AM} + \phi_{x,BM} E_{t-1} x_t + \phi_{x,AM} E_{t-1} x_t + \phi_b b_{t-1} + \phi_s d_{t-1}^* + u_t \quad (2)$$

where the subscripts 'AM' and 'BM' stand for 'after Maastricht' and 'before Maastricht', respectively. Thus, $\phi_{x,BM}$ and $\phi_{x,AM}$ are the values of the coefficient of $E_{t-1}x_t$ in the pre- and post-Maastricht periods, respectively: the estimation allows for a break in the coefficient of $E_{t-1}x_t$ in 1992, and the constant is also allowed to differ before that same year. The budget deficit variable refers to the general government. To estimate Equation (2) we replace $E_{t-1}x_t$ with x_t, and instrument the latter using x_{t-1} and the lagged value of the output gap of an alternative country or group of countries. Specifically, we use as instruments the EU 15 output gap for the US, and the US output gap for all other countries. The rationale of this choice is that we need to instrument the gap of each country with that of another country (or group of countries) with which it is likely to be correlated for reasons other than the existence of coordinated fiscal policies. We discuss extensively the robustness of this benchmark specification in the web appendix.[4]

4.2. Baseline results

Table 2 displays the results for our baseline specification over the sample period 1980–2002. It reports for each country estimates of the coefficients on the expected output gap in the pre-Maastricht (1980–91) and the post-Maastricht (1992–2002) periods, test statistics for significance of estimated changes of that coefficient, and estimates of the coefficients on lagged debt and deficit. At the bottom, the table shows average values for the EMU, the EU 3 and the OECD 5 groups.

As regards country-group averages, in the pre-Maastricht period discretionary fiscal policy was mildly procyclical in EMU countries. By contrast, it was counter-cyclical in the other groups: strongly in the EU 3, largely as a result of the very negative value estimated for Denmark; mildly in the OECD 5. Most interestingly, in all groups there is a clear trend towards a smaller value of the expected output gap coefficient in the post-Maastricht period. On average, between the two sub-periods this coefficient falls by about 0.5 in EMU and OECD 5 countries, and by 0.3 in EU 3 countries. Only Greece among EMU countries displays a higher output gap coefficient, and the difference is far from significant. In all other EMU countries there is evidence of more counter-cyclical discretionary fiscal policy after Maastricht. Among the EU 3 countries, only Denmark and Australia display a higher point estimate of the output gap coefficient in the post-Maastricht period, but again the difference is entirely insignificant.[5]

[4] Notice that Equation (1) can be interpreted also as the reduced form of a structural model of determination of the structural deficit, in which policy-makers have a target value of the debt/GDP ratio and there are costs in changing the structural deficit over time. Such an interpretation generates non-linear constraints among the reduced form coefficients. This is the route taken by Ballabriga and Martinez-Mongay (2002), who estimate such rules for EU countries over the whole period 1980–2000. Our focus, however, is on the difference between the pre- and post-Maastricht periods, and we also look at revenues and spending separately.

[5] We also find that the higher initial debt/GDP ratios, the lower the deficit, given last year's deficit; thus, the debt does exert a constraint on the deficit. In the EMU countries, we typically find that an extra 10 percentage points of debt/GDP ratio is associated with a lower deficit of about 0.8 percentage points the next year. The coefficient on the lagged discretionary deficit is lower than 1; on average, in the EMU countries, only about 40% of an increase in the structural deficit survives the next year, other things equal.

Table 2

	$\phi_{x,BM}$ E(gap)$_{BM}$		$\phi_{x,AM}$ E(gap)$_{AM}$			ϕ_b debty{1}		ϕ_s defy{1}	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
AUT	−0.05	(−0.24)	−0.59	(−1.17)	(0.34)	−0.02	(−0.59)	0.41	(1.80)
BEL	0.38	(1.52)	−0.84	(−1.06)	(0.15)	−0.07	(−2.18)	0.57	(3.17)
DEU	0.41	(3.40)	0.32	(0.84)	(0.83)	−0.02	(−0.38)	0.46	(3.18)
ESP	0.10	(0.92)	−0.06	(−0.37)	(0.44)	−0.05	(−2.05)	0.60	(4.49)
FIN	0.23	(0.64)	−0.35	(−1.81)	(0.18)	−0.03	(−0.55)	0.18	(0.64)
FRA	0.14	(1.55)	0.10	(0.56)	(0.87)	−0.10	(−3.86)	0.34	(1.74)
GRC	0.12	(0.55)	0.35	(0.68)	(0.69)	−0.03	(−0.85)	0.45	(2.49)
IRE	0.26	(1.10)	−0.07	(−0.23)	(0.21)	−0.05	(−1.05)	0.73	(4.78)
ITA	0.35	(1.53)	−0.86	(−1.24)	(0.13)	−0.07	(−2.36)	0.08	(0.36)
NLD	0.29	(0.98)	−0.72	(−1.11)	(0.19)	0.01	(0.17)	0.39	(1.69)
PRT	0.49	(5.24)	0.16	(0.90)	(0.10)	−0.36	(−4.60)	0.06	(0.44)
DNK	−1.40	(−2.11)	−0.24	(−0.47)	(0.25)	−0.00	(−0.06)	0.42	(2.32)
GBR	0.11	(1.81)	−0.90	(−2.92)	(0.01)	−0.05	(−1.01)	0.49	(4.05)
SWE	−0.52	(−1.18)	−1.61	(−2.39)	(0.06)	−0.13	(−2.21)	0.30	(1.16)
NOR	−0.39	(−1.12)	−1.22	(−2.66)	(0.12)	0.07	(0.54)	0.44	(1.81)
AUS	−0.19	(−0.66)	−0.13	(−0.62)	(0.83)	−0.14	(−1.63)	0.87	(6.45)
JPN	0.16	(1.57)	−0.33	(−0.85)	(0.23)	−0.01	(−0.82)	0.81	(13.37)
CAN	−0.15	(−0.75)	−0.39	(−0.76)	(0.67)	−0.02	(−0.65)	0.68	(3.06)
USA	−0.04	(−0.23)	−1.07	(−3.53)	(0.00)	0.00	(0.04)	0.25	(1.16)
ALL	0.02		−0.44			−0.06		0.45	
EMU11	0.25		−0.23			−0.07		0.39	
EU3	−0.60		−0.91			−0.06		0.40	
OECD5	−0.12		−0.63			−0.02		0.61	

Notes: This table displays country-specific estimates of the fiscal rule

$$d_t^* = c_{BM} + c_{AM} + \phi_{x,BM} E_{t-1} x_t + \phi_{x,AM} E_{t-1} x_t + \phi_b b_{t-1} + \phi_s d_{t-1}^* + u_t$$

where d_t^* is the primary deficit of general government, cyclically adjusted, divided by potential output. x_t is the output gap; b_t is the general government debt to potential GDP ratio.

IV estimation, using own lagged output gap and the lagged output of the EU15 countries for the US, and the lagged output of the US for all other countries.

Sample: 1980–2002 for all countries. BM refers to 1980–91 (Before Maastricht); AM refers to 1992–2002 (After Maastricht).

Column (1): estimate of $\phi_{x,BM}$, the coefficient of expected gap in 1980–1991 period. Column (2): *t*-statistics. Column (3): estimate of $\phi_{x,AM}$, the coefficient of expected gap in 1992–2000 period. Column (4): *t*-statistics. Column (5): *p*-value of the hypothesis that the two coefficients in columns (1) and (3) are equal. Column (6): estimate of ϕ_b, the coefficient of the lagged debt / potential GDP ratio. Column (7): *t*-statistics. Column (8): estimate of ϕ_d, the coefficient of the lagged structural deficit / potential GDP ratio. Column (9): *t*-statistics.

Estimates of the constants in the two periods, c_{BM} and c_{AM}, are omitted for lack of space.

Averages for different groups are unweighted.

Source: OECD *Economic Outlook* database, December 2002 issue (2002 data are preliminary forecast).

Thus, there appears to be no evidence of a less counter-cyclical or more procyclical discretionary fiscal policy in the EMU countries in the post-Maastricht period.

Since there are few degrees of freedom in our specification, the country-specific regressions above offer rather imprecise estimates. We have also estimated a panel version of the fiscal rule that, while restricting the parameters to be the same across

Table 3

	(1)	(2)	(3)	(4)
		EMU (No. obs. = 238)		
$E(gap)_{BM}$	0.17	(3.47)		
$E(gap)_{AM}$	−0.08	(−0.98)	−0.25	(0.01)
$debty\{1\}_{BM}$	−0.05	(−4.70)		
$debty(1)_{AM}$	−0.05	(−3.46)	0.00	(0.95)
$defy\{1\}_{BM}$	0.54	(10.01)		
$defy(1)_{AM}$	0.55	(6.58)	0.00	(0.98)
		EU3 (No. obs. = 66)		
$E(gap)_{BM}$	−0.09	(−0.74)		
$E(gap)_{AM}$	−0.76	(−2.62)	−0.67	(0.04)
$debty\{1\}_{BM}$	−0.10	(−3.30)		
$debty(1)_{AM}$	−0.05	(−1.29)	0.05	(0.34)
$defy\{1\}_{BM}$	0.58	(5.19)		
$defy(1)_{AM}$	0.65	(4.48)	0.08	(0.68)
		OECD5 (No. obs. = 110)		
$E(gap)_{BM}$	−0.14	(−1.29)		
$E(gap)_{AM}$	−0.72	(−3.40)	−0.58	(0.02)
$debty\{1\}_{BM}$	−0.00	(−0.08)		
$debty(1)_{AM}$	−0.00	(−0.08)	0.00	(0.99)
$defy\{1\}_{BM}$	0.76	(7.96)		
$defy(1)_{AM}$	0.60	(5.13)	−0.16	(0.30)

Notes: This table displays panel estimates of the same fiscal rule as in Table 2.
Country-fixed effects are included, and are allowed to have a break in 1992.
Column (1): value of the coefficient in each sub-period. Column (2): *t*-statistics. Column (3): difference 'After Maastricht' – 'Before Maastricht'. Column (4): *p*-value of the test of the null hypothesis that the coefficients 'Before Maastricht' and 'After Maastricht' are the same.
See Table 2 for other details and sources.

countries, can allow all the coefficients of the equation (and the country dummies) to differ before and after the Maastricht treaty. Table 3 displays the panel estimates of Equation (2), with country fixed effects, for the three groups of countries.[6] For each of the three groups of countries, we report estimates of the coefficient on $E_{t-1}x_t$ in the pre- and post-Maastricht periods, the difference between the two sub-periods, and a test for its statistical significance. The other rows of Table 3 are structured similarly.

The pattern that emerges is very similar to that of the country-specific regressions, but now the standard errors are considerably smaller. In all groups of countries, there is evidence of a significant *increase* in the degree of counter-cyclicality of discretionary fiscal policy. In the EMU group, discretionary fiscal policy was procyclical before Maastricht and becomes essentially acyclical after Maastricht; in the EU 3 and

[6] Because of the lagged endogenous variable on the right-hand side, the standard fixed effect estimator of our fiscal policy would be inconsistent. However, we are mostly interested in the *difference* between the estimates of the coefficients between the two periods. If the 'inconsistency' in the estimates were approximately the same in the two sub-periods, the difference would be largely unaffected. Because the small-sample properties of the consistent estimators that have been proposed in the literature are not well understood, and our sample size is small (10 years for each period), we have chosen to present results with a standard IV fixed effect estimator.

OECD 5 groups, it was acyclical before Maastricht and becomes significantly counter-cyclical after Maastricht. In all three cases, the difference in the output gap coefficient between the two periods is highly significant, and is estimated to be close to the average difference from the country-specific regressions, especially for the EMU and the OECD 5 countries.

The estimated coefficient of debt is negative in the EMU and EU 3 groups, but essentially zero in the OECD 5 group. In no case is it significantly different across the two periods. The average EMU country typically reduces the structural deficit by 0.05 percentage points for each additional percentage point of debt in the previous year – a number which is very close to the average of the same coefficient in the country-specific regressions. Similarly, the estimated coefficient on the lagged deficit is very close in all three groups of countries, ranging between 0.55 and 0.75, and again there is no evidence that it has increased after Maastricht. Thus, we find no evidence that, holding constant the expected cyclical conditions of the economy, in the post-Maastricht period the initial fiscal conditions exerted a stronger pressure on discretionary fiscal policy.

The estimates reported in Table 4 are derived from a similar specification for the two main components of the budget deficit, spending and revenues, as dependent variables. When cyclically adjusted primary spending is the dependent variable, the estimated value of the expected output gap coefficient falls for the three groups of countries in the post-Maastricht period, but only in the EMU group is the difference significant at the 10% level. Conversely, when we use cyclically adjusted primary revenues as the dependent variable, we detect some evidence of more counter-cyclical policy for the EU 3 and OECD 5: there is statistical evidence of a larger output gap coefficient for these groups of country (though only significant at the 0.16 level for the latter), but not for the EMU countries. Thus, the evidence suggests a more important role of spending policies in EMU as a counter-cyclical tool in the post-Maastricht or, to be more precise, an end to their procyclical pattern, which characterized the pre-Maastricht period. In the case of the EU 3 and the OECD 5 the evidence points to more proactively counter-cyclical revenue policies in the post-Maastricht period.

5. CHANGES OVER TIME IN NON-DISCRETIONARY FISCAL POLICY

We now provide some evidence on the responsiveness of the non-discretionary (or cyclical) component of fiscal policy to changes in cyclical conditions. That evidence can give us an indication of the role and importance of *automatic stabilizers* as a fiscal tool in euro area countries, as well as in the other countries in our sample. It should be viewed as complementary to the evidence on the stabilizing role of discretionary fiscal policy presented above.

To that end, we estimate a policy rule like in the form

$$d_t^{nd} = c_{BM} + c_{AM} + \phi_{x,BM} x_t + \phi_{x,AM} x_t + \phi_b b_{t-1} + \phi_s d_{t-1}^{nd} + u_t \qquad (3)$$

Table 4

	Spending				Revenues			
	(1a)	(2a)	(3a)	(4a)	(1b)	(2b)	(3b)	(4b)
				EMU (No. obs. = 238)				
$E(gap)_{BM}$	0.20	(4.50)	(0.00)		0.05	(1.36)	(0.17)	
$E(gap)_{AM}$	0.04	(0.49)	−0.17	(0.06)	0.01	(0.19)	−0.04	(0.53)
$debty\{1\}_{BM}$	−0.03	(−3.40)	(0.00)		−0.00	(−0.06)	(0.95)	
$debty(1)_{AM}$	−0.01	(−0.88)	0.02	(0.21)	0.03	(2.38)	0.03	(0.06)
$itemy\{1\}_{BM}$	0.83	(19.58)	(0.00)		0.82	(14.94)	(0.00)	
$itemy(1)_{AM}$	0.80	(8.95)	−0.03	(0.75)	0.67	(9.14)	−0.14	(0.12)
				EU3 (No. obs. = 66)				
$E(gap)_{BM}$	−0.19	(−2.03)	(0.05)		0.01	(0.10)	(0.92)	
$E(gap)_{AM}$	−0.45	(−2.85)	−0.26	(0.16)	0.41	(2.22)	0.41	(0.05)
$debty\{1\}_{BM}$	−0.04	(−1.95)	(0.06)		0.05	(2.40)	(0.02)	
$debty(1)_{AM}$	−0.02	(−0.80)	0.02	(0.61)	0.03	(0.95)	−0.03	(0.48)
$itemy\{1\}_{BM}$	0.18	(0.91)	(0.37)		0.70	(8.17)	(0.00)	
$itemy(1)_{AM}$	0.66	(6.01)	0.48	(0.04)	0.45	(2.12)	−0.26	(0.26)
				OECD5 (No. obs. = 110)				
$E(gap)_{BM}$	−0.11	(−1.19)	(0.24)		0.06	(0.79)	(0.43)	
$E(gap)_{AM}$	−0.26	(−2.06)	−0.15	(0.35)	0.27	(2.20)	0.20	(0.16)
$debty\{1\}_{BM}$	0.03	(1.39)	(0.17)		0.03	(1.45)	(0.15)	
$debty(1)_{AM}$	−0.01	(−0.49)	−0.04	(0.16)	0.01	(1.01)	−0.02	(0.48)
$itemy\{1\}_{BM}$	0.71	(6.40)	(0.00)		0.70	(8.65)	(0.00)	
$itemy(1)_{AM}$	0.76	(7.61)	0.05	(0.74)	0.73	(6.03)	0.03	(0.85)

Notes: This table displays panel estimates of the same fiscal rule as in Table 2, except that the dependent and lagged dependent variables itemy(.) are: spey(.), the primary spending of the general government, cyclically adjusted, divided by potential output in the left panel; and revy(.), primary revenues of the general government, cyclically adjusted, divided by potential output in the right panel.
Column (1): value of the coefficient in each sub-period. Column (2): *t*-statistics. Column (3): difference 'After Maastricht' – 'Before Maastricht'. Column (4): *p*-value of the test of the null hypothesis that the coefficients 'Before Maastricht' and 'After Maastricht' are the same.
See Table 2 for other details and sources.

where d_t^{nd} is the difference between the total primary deficit and the cyclically adjusted primary deficit, expressed as a share of potential GDP. We interpret the resulting variable as a measure of the non-discretionary component of fiscal policy, as defined in Section 4. The only difference with respect to (2), besides the different dependent and lagged dependent variables, is use of the actual rather than expected output gap measure on the right-hand side. This is justified by the very nature of non-discretionary fiscal policy, which represents movements in budget items that arise 'automatically' in response to changes in economic conditions without a deliberate *ex ante* policy decision. For example, variations over time in the volume of unemployment subsidy payments or personal income tax revenues (for any given tax rates) clearly depend on the actual, not the expected behaviour of output.

Table 5 displays the estimates of the coefficients on the expected output gap in the pre-Maastricht (1980–91) and the post-Maastricht (1992–2002) periods, respectively, with *t*-statistics in parentheses. As in the discretionary policy case we attempt to

Table 5

	$\phi_{x,BM}$ E(gap)$_{BM}$		$\phi_{x,AM}$ E(gap)$_{AM}$			ϕ_b debty{1}		ϕ_s defy{1}	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
AUT	−0.29	(−6.53)	−0.39	(−6.62)	(0.08)	0.00	(0.11)	−0.09	(0.74)
BEL	−0.60	(−53.9)	−0.63	(−28.8)	(0.15)	0.00	(0.57)	0.00	(0.21)
DEU	−0.49	(−4.24)	−1.06	(−4.33)	(0.04)	−0.03	(−1.57)	−0.10	(0.67)
ESP	−0.37	(−9.61)	−0.40	(−10.5)	(0.05)	0.01	(2.66)	−0.06	(−0.71)
FIN	−0.62	(−15.9)	−0.70	(−21.5)	(0.01)	−0.00	(−0.48)	0.01	(0.21)
FRA	−0.37	(−35.8)	−0.40	(−33.5)	(0.00)	0.00	(0.27)	0.00	(0.21)
GRC	−0.30	(−8.25)	−0.42	(−8.95)	(0.01)	−0.00	(−0.24)	0.45	(0.05)
IRE	−0.38	(−29.6)	−0.34	(−38.4)	(0.01)	−0.00	(−0.77)	−0.02	(−1.03)
ITA	−0.42	(−6.13)	−0.82	(−4.26)	(0.03)	−0.00	(0.38)	−0.22	(−1.45)
NLD	−0.70	(−8.68)	−0.80	(−12.6)	(0.30)	0.00	(0.32)	−0.02	(0.28)
PRT	−0.33	(−6.03)	−0.53	(−6.34)	(0.01)	0.01	(0.61)	−0.09	(−0.68)
DNK	−0.74	(−13.2)	−0.80	(−30.1)	(0.21)	0.00	(0.07)	0.01	(0.23)
GBR	−0.46	(−5.52)	−0.85	(−4.06)	(0.04)	0.04	(0.95)	−0.09	(−0.55)
SWE	−0.70	(−35.3)	−0.68	(−52.0)	(0.03)	0.00	(0.72)	−0.01	(−0.38)
NOR	0.63	(0.84)	−0.25	(−0.37)	(0.32)	−0.12	(−0.58)	0.78	(2.34)
AUS	−0.23	(−13.5)	−0.26	(−13.2)	(0.11)	0.00	(0.91)	0.01	(0.26)
JPN	−0.21	(−10.5)	−0.23	(−5.03)	(0.69)	−0.00	(−0.30)	−0.05	(−0.68)
CAN	−0.34	(−10.0)	−0.39	(−13.3)	(0.02)	−0.00	(−0.64)	0.03	(0.57)
USA	−0.24	(−61.2)	−0.26	(−68.4)	(0.01)	0.00	(0.62)	−0.01	(−1.35)
ALL	−0.38		−0.54			−0.00		0.01	
EMU11	−0.44		−0.59			−0.00		−0.05	
EU3	−0.63		−0.78			0.01		−0.03	
OECD5	−0.08		−0.28			−0.02		0.15	
(–NOR)	−0.26		−0.28			−0.00		−0.01	

Notes: This table displays country-specific estimates of the fiscal rule

$$d_t^{nd} = c_{BM} + c_{AM} + \phi_{x,BM} x_t + \phi_{x,AM} x_t + \phi_b b_{t-1} + \phi_s d_{t-1}^{nd} + u_t$$

which is the same as that estimated in Table 2 except that the dependent and lagged dependent variables are the non-discretionary component of primary deficit, divided by potential output.
See Table 2 for other details and sources, and for an explanation of the structure of this table.

control for the potential endogeneity of the output gap by instrumenting the latter variable with its own lag and the lag of the US output gap (the EU 15 output gap in the US case). The rest of the table has a structure identical to Table 3, with the third column test for equality of the output gap coefficients in the two periods, followed by the estimates of the coefficients on lagged debt and deficit. Again, averages for groups of countries are shown in the bottom panel.

Looking first at the averages, we observe in all groups a clear counter-cyclical behaviour of non-discretionary fiscal policy in the two sample periods considered. The only exception lies in the OECD 5 group in the pre-Maastricht period, which is close to being acyclical. The latter result, however, reflects the influence of Norway which, with a procyclical non-discretionary component in that sub-period, is a clear outlier. In fact, the average estimate of the output gap coefficient for the OECD 5

Table 6

	(1)	(2)	(3)	(4)
		EMU (No. obs. = 238)		
$E(gap)_{BM}$	−0.22	(−6.19)		
$E(gap)_{AM}$	−0.47	(−10.6)	−0.25	(0.00)
$debty\{1\}_{BM}$	−0.01	(−2.89)		
$debty(1)_{AM}$	−0.02	(−4.55)	−0.01	(0.12)
$defy\{1\}_{BM}$	0.34	(4.65)		
$defy(1)_{AM}$	0.17	(2.53)	−0.17	(0.08)
		EU3 (No. obs. = 66)		
$E(gap)_{BM}$	−0.21	(−2.35)		
$E(gap)_{AM}$	−0.83	(−8.33)	−0.62	(0.00)
$debty\{1\}_{BM}$	−0.05	(−3.84)		
$debty(1)_{AM}$	0.03	(1.71)	0.08	(0.00)
$defy\{1\}_{BM}$	0.49	(3.71)		
$defy(1)_{AM}$	−0.21	(−1.52)	−0.70	(0.00)
		OECD5 (No. obs. = 110)		
$E(gap)_{BM}$	0.20	(0.91)		
$E(gap)_{AM}$	−0.17	(−0.91)	−0.37	(0.20)
$debty\{1\}_{BM}$	−0.05	(−1.45)		
$debty(1)_{AM}$	−0.00	(−0.02)	0.05	(0.21)
$defy\{1\}_{BM}$	0.75	(3.57)		
$defy(1)_{AM}$	0.58	(3.31)	−0.17	(0.54)

Notes: This table displays panel estimates of the fiscal rule

$$d_t^{nd} = c_{BM} + c_{AM} + \phi_{x,BM} x_t + \phi_{x,AM} x_t + \phi_b b_{t-1} + \phi_s d_{t-1}^{nd} + u_t$$

which is the same as in Table 2 except that the dependent and lagged dependent variables are the non-discretionary component of the general government primary deficit, divided by potential output.
See Table 2 for other details and sources, and Table 3 for an explanation of the structure of this table.

group excluding Norway (shown in the last row of the table) suggests a non-negligible role for automatic stabilizers for that group as well, though one that is quantitatively less important than in EMU or EU 3 countries.[7]

Perhaps most interestingly, we notice among all groups an increase in the degree of counter-cyclicality of non-discretionary fiscal policy in the post-Maastricht period, as reflected in a smaller (i.e., more negative) value of the output gap coefficient. Quite strikingly, this finding appears to hold almost uniformly across countries, the only exceptions being Ireland and Sweden.

The basic evidence just described is also reflected in the panel-based estimates, reported in Table 6. In particular, we see an increasingly counter-cyclical non-discretionary fiscal policy in EMU countries and elsewhere.

Overall, we conclude that there is no evidence that the Maastricht Treaty and the SGP may have prevented automatic stabilizers in EMU countries from doing their job. On the contrary, EMU countries appear to have been able to join other industrialized economies in strengthening the counter-cyclical nature of that component of fiscal policy.

[7] This observation is consistent with the less progressive fiscal systems and smaller transfer programmes of the non-European countries of our sample.

6. ALTERNATIVE EXPLANATIONS

The most natural interpretation of our statistical evidence is that EMU-related constraints have not impaired the ability of EMU and countries to use discretionary fiscal policy as a counter-cyclical tool. On the contrary, the Maastricht Treaty seems to have brought to an end an era of procyclical discretionary fiscal policies in those countries.

We can think of several possible objections to this interpretation of our results. In this section, we discuss these objections in some detail, and provide what empirical evidence we can to address them. Some further robustness analysis is presented in the web appendix.

6.1. Does the loss of country-specific monetary policy matter?

It is often argued that a country that has given up the monetary instrument in a monetary union might need to run more of a stabilizing fiscal policy than before. This might explain why counter-cyclical discretionary fiscal policy has become more pronounced in EMU countries. Since the common monetary policy in place since 1999 is supposed to focus exclusively on euro area-wide conditions, and disregard national developments, one could think that in those circumstances fiscal policy should be used at the margin as a surrogate for the missing self-oriented monetary policy.

To what extent does this argument apply in practice to the EMU experience so far? In order to assess the merit of the 'surrogate' hypothesis we make use of a simple conventional indicator of deviations from appropriate monetary policy. The latter is approximated by a Taylor rule of the form:

$$r_t = \alpha + 1.5(\pi_t - \pi) + 0.5x_t$$

where r_t is the short-term nominal interest rate and π^* is the medium-term inflation target. This rule, originally proposed by John Taylor as a simple description of US monetary policy under the Greenspan mandate, can be viewed as a good first approximation to the behaviour of central banks that have been successful in stabilizing inflation and the output gap.[8] Such a rule has desirable properties when embedded in a dynamic optimizing model with realistic frictions.[9] We should emphasize, however, that in this section we use this rule exclusively to get a measure of the deviation of monetary policy from an appropriate country-specific configuration, without viewing it necessarily as a good approximation to the actual monetary policy rules followed by all the countries in the sample in all periods.

To assess the 'surrogate' policy hypothesis we introduce the deviation from the Taylor rule interest rate as an additional variable in our empirical fiscal policy rule. We allow its coefficient, like that of all other variables, to differ across the two subperiods. Thus we do not need to assume a common inflation target for all countries

[8] See, e.g., Taylor (1993), Clarida *et al.* (1998, 2000).

[9] See, e.g., some of the contributions in Taylor (1999).

Table 7

	(1)	(2)	(3)	(4)
		EMU (No. obs. = 238)		
$E(gap)_{BM}$	0.20	(3.88)	(0.00)	
$E(gap)_{AM}$	0.03	(0.24)	−0.17	(0.27)
$debty\{1\}_{BM}$	−0.06	(−5.12)	(0.00)	
$debty(1)_{AM}$	−0.05	(−3.58)	0.01	(0.48)
$defy\{1\}_{BM}$	0.60	(9.87)	(0.00)	
$defy(1)_{AM}$	0.50	(5.57)	−0.10	(0.36)
$tayl\_dev_{BM}$	0.16	(2.21)	(0.00)	
$tayl\_dev_{AM}$	0.12	(1.05)	−0.03	(0.82)
		EU3 (No. obs. = 62)		
$E(gap)_{BM}$	0.12	(0.83)	(0.41)	
$E(gap)_{AM}$	−0.55	(−1.13)	−0.67	(0.19)
$debty\{1\}_{BM}$	−0.14	(−3.44)	(0.00)	
$debty(1)_{AM}$	−0.05	(−1.29)	0.08	(0.16)
$defy\{1\}_{BM}$	0.72	(5.33)	(0.00)	
$defy(1)_{AM}$	0.68	(4.45)	−0.05	(0.82)
$tayl\_dev_{BM}$	0.31	(1.65)	(0.00)	
$tayl\_dev_{AM}$	0.14	(0.55)	−0.17	(0.59)
		OECD5 (No. obs. = 110)		
$E(gap)_{BM}$	−0.12	(−0.64)	(0.53)	
$E(gap)_{AM}$	−1.06	(−2.86)	−0.94	(0.03)
$debty\{1\}_{BM}$	−0.00	(−0.08)	(0.93)	
$debty(1)_{AM}$	0.01	(0.32)	0.01	(0.78)
$defy\{1\}_{BM}$	0.77	(5.62)	(0.00)	
$defy(1)_{AM}$	0.55	(3.68)	−0.22	(0.27)
$tayl\_dev_{BM}$	0.03	(0.22)	(0.00)	
$tayl\_dev_{AM}$	−0.20	(−1.33)	−0.22	(0.25)

Notes: This table displays panel estimates of the same fiscal rule as in Table 2, but including the deviation from the Taylor rule (tayl_dev) as an independent variable. Dependent variable: general government primary deficit, cyclically adjusted, divided by potential output.
See Table 2 for other details and sources, and Table 3 for an explanation of the structure of this table.

and sample periods: possible variations in the latter will be captured in the intercept of our regression, which is allowed to differ across countries, and to have a break in each country in 1992.

The results of that exercise are reported in Table 7. In the EMU countries, the decline in the expected output gap coefficient becomes smaller and insignificant; in EU 3 countries the decline does not change; in OECD 5 countries it becomes bigger. The coefficient on the Taylor rule deviation is typically positive in both periods in EMU and EU 3 groups, but close to zero for the OECD 5. That finding suggests that, at least for EMU and EU 3 countries, fiscal policy and monetary policy may indeed have often acted as substitutes: when monetary policy is tight, discretionary fiscal policy loosens (relative to what it would otherwise be). The coefficients, however, are not large: when the short-term interest rate exceeds the Taylor rule interest rate by 1 percentage point, the discretionary deficit increases by between 0.1 and 0.3 percentage points of GDP, on average.

Table 8

	(1)	(2)	(3)	(4)
		EMU (No. obs. = 110)		
$E(gap)_{92-97}$	0.02	(0.17)	(0.87)	
$E(gap)_{98-02}$	−0.11	(−0.27)	−0.13	(0.76)
$debty\{1\}_{92-97}$	−0.07	(−4.12)	(0.00)	
$debty(1)_{98-02}$	−0.10	(−1.36)	−0.02	(0.77)
$defy\{1\}_{92-97}$	0.36	(3.51)	(0.00)	
$defy(1)_{98-02}$	0.38	(1.63)	0.02	(0.94)
		EU3 (No. obs. = 30)		
$E(gap)_{92-97}$	−0.64	(−1.21)	(0.24)	
$E(gap)_{98-02}$	0.14	(0.16)	0.79	(0.47)
$debty\{1\}_{92-97}$	−0.11	(−1.29)	(0.21)	
$debty(1)_{98-02}$	0.07	(0.70)	0.19	(0.19)
$defy\{1\}_{92-97}$	0.90	(4.16)	(0.00)	
$defy(1)_{98-02}$	−0.36	(−0.59)	−1.26	(0.07)
		OECD5 (No. obs. = 50)		
$E(gap)_{92-97}$	−1.03	(−3.20)	(0.00)	
$E(gap)_{98-02}$	−0.28	(−0.45)	0.76	(0.28)
$debty\{1\}_{92-97}$	−0.00	(−0.06)	(0.95)	
$debty(1)_{98-02}$	−0.05	(−0.83)	−0.04	(0.63)
$defy\{1\}_{92-97}$	0.75	(5.14)	(0.00)	
$defy(1)_{98-02}$	0.73	(1.67)	−0.03	(0.95)

Notes: This table displays panel estimates of the fiscal rule in the form reported in Table 2, for the same specification as in Table 3, but on a different sample: 1992–2002.
See Table 2 for other details and sources, and Table 3 for an explanation of the structure of this table.

6.2. Did actual EMU implementation make a difference?

A second and related argument is that the true test of the impact of the SGP is in the years after monetary unification became effective, or at least after the exchange rates became irrevocably locked in. Obviously we will have to wait some time for an evaluation of this argument. But we can still try to say something with the available time series. Table 8 displays estimates of our fiscal rule over the period 1992–2002, allowing for a structural break in the coefficients of all variables in 1998, when the exchange rates were locked in and decisions on membership were made. Again, we do not find any evidence that in the EMU countries fiscal policy has become more procyclical (or less counter-cyclical) from 1998 onwards. We do find evidence of a larger expected output gap effect after Maastricht in EU 3 and OECD 5 countries, although the difference is not statistically significant.

6.3. Does discretionary fiscal policy respond differently to recessions?

Since the Maastricht-related constraints are only likely to become binding in a recession, one could think that in order to assess their effect one should only look at the

Table 9

Fiscal policy during recession episodes

	Early 1980s			Early 1990s			Early 2000s		
	Δ output gap	Δ primary c.a. deficit	Ratio	Δ output gap	Δ primary c.a. deficit	Ratio	Δ output gap	Δ primary c.a. deficit	Ratio
AUT	−3.45	−0.45	0.13	−3.07	0.19	−0.06	−2.78	−0.28	0.10
BEL	−5.82	−1.7	0.29	−4.88	−1.44	0.30	−3.23	−0.89	0.28
DEU	−8.08	−4.88	0.60	−4.49	−2	0.45	−2.1	1.16	−0.55
ESP	−1.83	1.1	−0.60	−6.74	−1.67	0.25	−1.08	−0.29	0.27
FIN	−2.58	0.66	−0.26	−15.85	1.81	−0.11	−4.1	1.82	−0.44
FRA	−5.78	−0.44	0.08	−3.82	1.84	−0.48	−1.52	0.86	−0.57
GRC	−13.64	−0.51	0.04	−4.51	−2.67	0.59	–	–	–
IRE	−7.74	−6.82	0.88	−7.97	−1.94	0.24	−5.04	5.09	−1.01
ITA	−6.72	−1.88	0.28	−4.46	−6.87	1.54	−1.4	−0.08	0.06
NLD	−5.5	−1.94	0.35	−2.76	−4.41	1.60	−4.25	0.42	−0.10
PRT	−12.06	−7.12	0.59	−8.37	−0.95	0.11	−3.85	−0.8	0.21
DNK	−5.01	−0.04	0.01	−2.74	1.1	−0.40	−1.68	−0.15	0.09
GBR	−8.15	−4.85	0.60	−8.41	3.84	−0.46	−1.55	2.58	−1.66
SWE	−3.36	−0.92	0.27	−10.34	8.83	−0.85	−1.83	1.24	−0.68
NOR	−4.39	−2.88	0.66	−0.36	4.46	−12.39	−0.87	−0.2	0.23
AUS	−6.59	0.32	−0.05	−5.76	4.72	−0.82	−1.58	0.93	−0.59
JPN	−3.7	−3.85	1.04	−4.43	4.87	−1.10	−2.93	−0.14	0.05
CAN	−8.45	−0.75	0.09	−7.63	1	−0.13	−2.07	0.89	−0.43
USA	−9.47	0.57	−0.06	−4.16	0.4	−0.10	−3.6	4.3	−1.19
ALL	−6.44	−1.91	0.30	−5.83	0.58	−0.10	−2.53	0.91	−0.36
EMU	−6.65	−2.18	0.33	−6.08	−1.65	0.27	−2.94	0.70	−0.24
EU3	−5.51	−1.94	0.35	−7.16	4.59	−0.64	−1.69	1.22	−0.73
OECD5	−6.52	−1.32	0.20	−4.47	3.09	−0.69	−2.21	1.16	−0.52

Notes: This table displays the cumulative change in the output gap, in the primary cyclically adjusted deficit, and the ratio between the two, in the three recession episodes in the three periods indicated.

Source: OECD *Economic Outlook* database, December 2002 issue.

recent mini-recessions of 2001–2. To address this argument, we analyse the behaviour of fiscal authorities during three recession episodes.

We begin by identifying for each country the years in which its output gap experiences a decline, during the three main global recession waves since 1980: the early 1980s, the early 1990s, as well as the most recent global downturn in the early 2000s. For each country and recession episode we compute the cumulative output gap decline (i.e., the cumulative output losses relative to trend), and the cumulative increase in the primary, cyclically adjusted budget deficit, measured as a share of GDP. These statistics are shown in Table 9, which also reports the ratio between the cumulative deficit change and the cumulative output gap decline. The latter ratio can be interpreted as a simple statistic that captures the sign and intensity of the discretionary fiscal response. Thus, a negative sign for the ratio is evidence of a deliberate counter-cyclical fiscal stance, whereas the size of the ratio captures the strength of that response relative to the size of the output gap decline. Like previous tables, Table 9 also reports averages for each variable and group of countries (EMU and control groups).

Consider first the fiscal behaviour of current EMU countries during the three recession episodes. In the recession of the early 1980s the average cumulative change in the primary adjusted deficit is negative, with a corresponding average ratio to cumulative GDP losses of 0.33. Only in Spain and Finland is the fiscal policy stance counter-cyclical. And fiscal behaviour during that recession in our control groups (EU 3 and OECD 5) does not differ significantly from that of EMU countries. Only Australia and the US show a (very weak) counter-cyclical stance among the non-EMU countries.

During the recessions of the early 1990s the average fiscal stance of EMU countries remained largely unchanged, with a ratio of cumulative deficit change to output losses of 0.27, indicating again a procyclical discretionary policy (most pronounced in Austria, Finland and especially France). Interestingly, however, the picture now becomes quite different for the two groups of non-EMU countries, which both feature counter-cyclical discretionary fiscal responses to the recession, on average as well as uniformly (in sign) across countries.

The most relevant data are those that measure the fiscal stance among EMU countries during the most recent downturn, which happens to be the first one where the constraints developed by the MT and the SGP have been effectively in place. Surprising as this may be for its critics, the SGP has not prevented EMU countries from pursuing counter-cyclical fiscal policies during the recent recession, the average ratio becoming negative (−0.24).[10]

[10] Still, this ratio is smaller in absolute value for the two control groups, suggesting a weaker counter-cyclical policy in the average EMU country. And the pattern is not uniform across EMU countries: Germany, France and Ireland account for much of the change in the average.

6.4. Is fiscal policy's stabilizing influence declining?

The ability of fiscal policy to stabilize the economy might have fallen in the 1990s. To compensate for this, EMU countries might have liked to use counter-cyclical discretionary policy *more intensively* after Maastricht. We do not have much to say on this point. While there is some evidence that the impact of fiscal policy shocks on GDP and its components has dampened in the last 20 years in 5 OECD countries (see Perotti, 2002), it would be extremely hard to assess whether the process has intensified in the 1990s relative to the 1980s.

6.5. Is fiscal policy's cyclical sensitivity declining?

Finally, the cyclical (non-discretionary) component of fiscal policy might have become less responsive to cyclical conditions after Maastricht – for instance because of a decline in the progressivity of income taxes or less generous unemployment benefits and tighter eligibility rules – thus providing less automatic stabilization. Once again, EMU countries might have liked to use discretionary fiscal policy more counter-cyclically than before to compensate for this effect. However, we have seen in Section 6 that exactly the opposite seems to have occurred: the cyclical component of the deficit has, if anything, become more counter-cyclical after Maastricht.

7. PUBLIC INVESTMENT AFTER MAASTRICHT

It is often argued that, for political economy reasons, government investment is the easiest component of government spending to cut in the short run. As a consequence, if the Maastricht-related constraints are binding they should have affected disproportionately government investment, thereby imposing long-term costs besides the (alleged) short-run costs from reduced stabilization.

In this section, we evaluate this claim by comparing the behaviour of government investment over time and across countries. Before doing this, it is important to clarify the nature of the data on government investment we use. First, one may worry that privatizations might impair the comparability of the data over time and across countries (as different countries have privatized in different degrees and at different times). However, it is important to note that the data we use refer to the general government, while the privatization process has concerned mostly state owned enterprises (like banks, airlines, telecoms) that were originally in the public sector, but not in the general government.

Second, we use gross investment proper rather than net capital expenditure by the government. The latter is sometimes used to answer the question we address here, but it includes (as a negative item) net capital transfers received. While in general net capital transfers are small and stable, over this period they include revenues from UMTS spectrum auctions, which were considerable in some countries. For instance,

Table 10

	1978–82 (1)	1988–92 (2)	1998–01 (3)	(3)–(2)
AUT	4.40	3.16	1.67	−1.49
BEL	4.52	1.91	1.65	−0.26
DEU	3.53	2.67	1.82	−0.85
ESP	2.12	4.63	3.21	−1.42
FIN	3.35	3.47	2.77	−0.71
FRA	3.22	3.57	3.05	−0.51
GRC	2.81	4.97	3.78	−1.19
IRE	5.57	2.01	3.38	1.37
ITA	3.19	3.23	2.38	−0.85
NLD	3.72	2.99	3.12	0.13
PRT	3.80	3.53	4.15	0.61
DNK	3.02	1.79	1.75	−0.03
GBR	2.21	1.99	1.17	−0.83
SWE	4.11	3.23	2.61	−0.61
NOR	3.93	3.62	3.20	−0.42
AUS	3.22	2.65	2.39	−0.27
JPN	5.86	5.02	5.31	0.29
CAN	3.02	2.86	2.29	−0.57
USA	3.41	3.62	3.28	−0.35
ALL	3.63	3.21	2.79	−0.42
EMU	3.66	3.29	2.82	−0.47
EU3	3.12	2.34	1.85	−0.49
OECD5	3.89	3.56	3.29	−0.26

Notes: The table displays the average government investment/potential GDP ratio in the three periods indicated. The last column displays the difference between the 1988–92 average and the 1998–2001 average.
Source: OECD *Economic Outlook* database, December 2002 issue.

in 2000 they were 2.5% of potential GDP in Germany, 1.2% in Italy, 0.7% in the Netherlands, and 0.4% in Greece (not all countries recorded the whole amount of auction revenues as net capital transfers received).

Table 10 reports government investment as a share of potential output in three separate five-year periods: 1978–82, 1988–92, and 1997–2001. We take averages over five years to minimize the contribution of cyclical or electoral variation in government spending. Again, the table reports indicators separately for the 19 countries in our sample, and also on average for the 11 EMU countries, the 3 EU, non-EMU countries, and the 5 remaining OECD countries.

The table makes two points. Between the 1988–92 period and the 1997–2001 periods, government investment as a share of potential GDP did fall in the EMU countries by 0.47 percentage points on average, but it also fell by 0.49 percentage points in the EU 3 countries and by 0.26 percentage points in the OECD 5 countries. Thus, there is a clear overall trend fall in government investment as a share of GDP. Second, this trend started well before Maastricht: between 1978–82 and 1988–92, the decline in the government investment/potential output share was also very similar

Table 11

	1978–82 (1)	1988–92 (2)	1997–01 (3)	(3)–(2)
AUT	9.77	6.83	3.62	−3.21
BEL	9.28	4.64	4.10	−0.54
DEU	8.16	6.57	4.33	−2.24
ESP	6.99	11.94	9.08	−2.86
FIN	9.12	7.70	6.39	−1.31
FRA	7.49	7.87	6.70	−1.18
GRC	8.80	14.09	10.67	−3.42
IRE	13.18	5.99	11.19	5.21
ITA	8.27	7.69	6.06	−1.63
NLD	8.07	6.69	7.88	1.19
PRT	10.36	10.01	10.87	0.86
DNK	6.20	3.58	3.39	−0.19
GBR	5.84	5.36	3.36	−2.00
SWE	7.66	6.00	5.30	−0.70
NOR	6.94	6.12	5.39	−0.73
AUS	10.92	9.23	7.78	−1.45
JPN	22.44	18.78	16.60	−2.18
CAN	8.83	7.75	7.28	−0.46
USA	12.45	12.73	12.09	−0.64
ALL	9.51	8.40	7.48	−0.92
EMU	9.04	8.19	7.35	−0.83
EU3	6.56	4.98	4.02	−0.96
OECD5	12.32	10.92	9.83	−1.09

Notes: The table displays the average government investment/cyclically adjusted spending ratio in the three periods indicated. The last column displays the difference between the 1988–92 average and the 1998–2001 average.

Source: OECD *Economic Outlook* database, December 2002 issue.

to the decline in the next decade in the EMU and OECD 5 countries, and actually considerably larger in the EU 3 countries.

The claim we wanted to address, however, is a statement about the impact of the Maastricht-related constraints on government investment *relative* to the rest of government spending. Hence, it should perhaps be assessed comparing the behaviour of government investment relative to total government spending. Table 11 displays the same information as Table 10, but this time government investment is expressed as a share of total primary government spending. The conclusions are the same: here too we find an OECD-wide trend towards a fall in the share of government investment in total spending, which started well before Maastricht.[11]

The Maastricht-related constraints may have a stronger impact on the cyclical behaviour of government investment than on its average value. Lane (2002) indeed

[11] The figure for the EMU average is somewhat influenced by Ireland, where the share of government investment in total primary spending increased by almost 6 percentage points between 1988–92 and 1997–2001. However, the qualitative conclusions would hold even if one excluded Ireland.

Table 12

	(1)	(2)	(3)	(4)
		EMU (No. obs. = 239)		
$E(gap)_{BM}$	0.04	(2.58)	(0.01)	
$E(gap)_{AM}$	0.04	(1.80)	0.00	(1.00)
$debty\{1\}_{BM}$	−0.00	(−1.63)	(0.10)	
$debty(1)_{AM}$	−0.01	(−3.02)	−0.01	(0.08)
$giy\{1\}_{BM}$	0.82	(19.42)	(0.00)	
$giy(1)_{AM}$	0.54	(6.49)	−0.28	(0.00)
		EU3 (No. obs. = 66)		
$E(gap)_{BM}$	0.02	(1.32)	(0.19)	
$E(gap)_{AM}$	−0.09	(−2.67)	−0.11	(0.00)
$debty\{1\}_{BM}$	−0.01	(−1.62)	(0.11)	
$debty(1)_{AM}$	−0.00	(−0.64)	0.00	(0.53)
$giy\{1\}_{BM}$	0.60	(5.52)	(0.00)	
$giy(1)_{AM}$	0.50	(2.92)	−0.10	(0.61)
		OECD5 (No. obs. = 110)		
$E(gap)_{BM}$	0.03	(1.20)	(0.23)	
$E(gap)_{AM}$	−0.04	(−1.66)	−0.07	(0.04)
$debty\{1\}_{BM}$	−0.00	(−0.52)	(0.60)	
$debty(1)_{AM}$	−0.02	(−5.20)	−0.01	(0.02)
$giy\{1\}_{BM}$	0.63	(8.61)	(0.00)	
$giy(1)_{AM}$	0.35	(2.92)	−0.28	(0.05)

Notes: This table displays panel estimates of a fiscal rule in the form reported in Table 2, except that the dependent and lagged dependent variables are the general government investment to potential output ratio ('giy'). Sample: 1980–2002 for all countries.
See Table 2 for other details and sources, and Table 3 for an explanation of the structure of this table.

finds that government investment is the most cyclical component of government spending. Table 12 reports estimates of our baseline fiscal policy rule, with the cyclically adjusted deficit replaced by government investment as a share of potential output. We do find some evidence of a mildly procyclical behaviour of government investment in EMU countries: in the pre-Maastricht period, on average the government investment/potential output ratio increased by about 0.04 percentage points for every extra percentage point in expected gap. However, there is no evidence that the cyclical behaviour of government investment has changed in the post-Maastricht period in any group of countries. And when we compare the cyclical behaviour of government investment in the 1992–97 and 1998–2002 periods, we find that in the EMU countries the coefficient of the expected gap declined in the second period by 0.17 (with the difference significant at the 14% level).

8. CONCLUSIONS

As the debate on the pros and cons of the SGP heats up, a popular view is that the constraints on fiscal policy have significantly impaired the ability of EU governments to conduct an effective counter-cyclical stabilization policy and to provide an adequate level of government services and of public infrastructure.

We do not find much support for this view. We document that discretionary fiscal policy in EMU countries has become more counter-cyclical over time, following what appears to be a trend that affects other industrialized countries as well. There is still some way to go before EMU countries' discretionary fiscal policy becomes as counter-cyclical as that of other industrialized countries. Whether the SGP will become an impediment to this remains to be seen.

The decline in public investment (as a share of GDP) observed over the past decade among EMU countries is also hard to view as a consequence of the MT and SGP constraints. Empirical evidence indicates that industrialized nations not subject to those constraints have experienced an even greater decline recently, and that the decline in public investment was even greater before Maastricht.

To conclude, we want to stress our desire not to read in the data more than they can tell us, and to keep in mind the necessary limitations associated with an empirical analysis of the sort provided in our paper. In particular, there is a caveat the reader must not ignore: real recessions have been quite rare among EMU countries during the post-Maastricht period, hence it may be that the available data cover a period when the constraints associated with the SGP were not really binding. If and when an active counter-cyclical fiscal policy is really needed in the future, the impact of the SGP could well be different from that we detect in the experience to date. Our findings can offer useful empirical caveats to an appealing but simplistic view, rather than a precise answer to a question that will likely remain open for some time to come.

APPENDIX

Available at http://www.economic-policy.org

Discussion

Philip R. Lane

Institute for International Integration Studies (IIIS), Trinity College Dublin and CEPR

This paper documents two shifts in fiscal policy between 1980–91 ('before Maastricht' or BM) and 1992–2001 ('after Maastricht' or AM). First, discretionary fiscal policy has become more counter-cyclical over time. Second, public investment has declined in importance relative to overall government spending. The former result challenges the concern that the Maastricht Treaty and the Stability and Growth Pact constrains European governments from using fiscal policy as a stabilization device; the latter trend in fact has been weaker in EMU countries than elsewhere in the OECD, such that it is hard to attribute to the binding nature of these fiscal agreements. The authors do a good job in developing their empirical work, addressing many potential objections but remaining suitably cautious in interpreting the results, in view of the inevitably short time interval.

The authors go further and explore a range of hypotheses as to why discretionary fiscal policy has become more counter-cyclical in recent years. Perhaps most importantly, they show that the automatic non-discretionary component of fiscal policy has also become more counter-cyclical in recent years, such that the shift in the behaviour of discretionary fiscal policy is not substituting for less-active automatic stabilizers.

However, one candidate explanation that they do not address is the Talvi and Vegh (2000) prediction that fiscal procyclicality is positively correlated with the degree of output volatility. Their argument is based on the political infeasibility of running large surpluses during boom times. For a high-volatility country, the appropriate surplus required during an expansion phase may be quite large as a ratio to GDP. However, a large surplus may unleash intense political pressure to increase public spending. In contrast, the required surplus in a low-volatility country may be quite small and may not attract the same degree of political opposition. The net result is that fiscal procyclicality is much more likely for countries or periods in which the amplitude of the business cycle is large.

In addition to the Talvi–Vegh political economy story, there is also a straightforward technical reason why volatility affects the cyclical performance of fiscal policy. Making a correct decomposition between the trend and cyclical components of output growth is centrally important in determining the appropriate stance for fiscal policy: for instance, a permanent increase in production may call for an increase in government investment to augment the public capital stock, whereas a temporary boom requires expenditure restraint. The more volatile is output growth, the greater is the likelihood of making a serious error in identifying the path for potential output and hence inadvertently adopting a procyclical fiscal stance.

In fact, the period studied by Galí and Perotti offers some evidence of a relation between volatility and fiscal cyclicality. Table 13 shows that volatility fell almost everywhere between 1982–91 and 1992–2001, thereby relaxing procyclical pressures on fiscal policy. Moreover, Figure 1 shows that, across countries and the two sub-periods, the positive correlation is reasonably strong between output volatility and the country-specific cyclicality coefficients estimated by Galí and Perotti (the point estimate is 0.41).[12]

It is also quite possible that the Maastricht Treaty and the Stability and Growth Pact have positively contributed to the improved cyclical behaviour of fiscal policy among EMU member countries, rather than being a negative or neutral force. This is based on the notion that fiscal consolidation is a precondition for an effective cyclical stabilization policy. For instance, if a fiscal position is deemed to be unsustainable, a government may be forced to run a procyclically tight fiscal policy even during a recession in order to satisfy financial markets. In contrast, if fiscal control is well established, a counter-cyclical fiscal policy will not call forth an increase in financial risk premia. The EMU member countries achieved a substantial improvement in the

[12] See also the results in Lane (2002).

Table 13. Standard deviation of the output gap, 1980–91 and 1992–2001

	1980–1991	1992–2001	Change
Australia	2.16	0.82	−1.34
Austria	2.00	0.83	−1.17
Belgium	2.83	0.98	−1.86
Canada	3.46	1.55	−1.91
Germany	2.27	0.63	−1.64
Denmark	2.23	0.75	−1.48
Spain	3.01	1.77	−1.24
Finland	4.47	3.24	−1.23
France	2.04	1.36	−0.68
United Kingdom	3.88	0.79	−3.10
Greece	2.10	1.61	−0.49
Ireland	2.38	3.42	1.04
Italy	1.59	0.71	−0.88
Japan	2.05	1.51	−0.53
Netherlands	2.27	1.11	−1.16
Norway	2.28	1.11	−1.18
Portugal	4.47	1.56	−2.92
Sweden	3.23	1.45	−1.78
United States	2.46	1.01	−1.45
Mean	2.69	1.38	−1.32

Note: Data from OECD *Economic Outlook* Database.

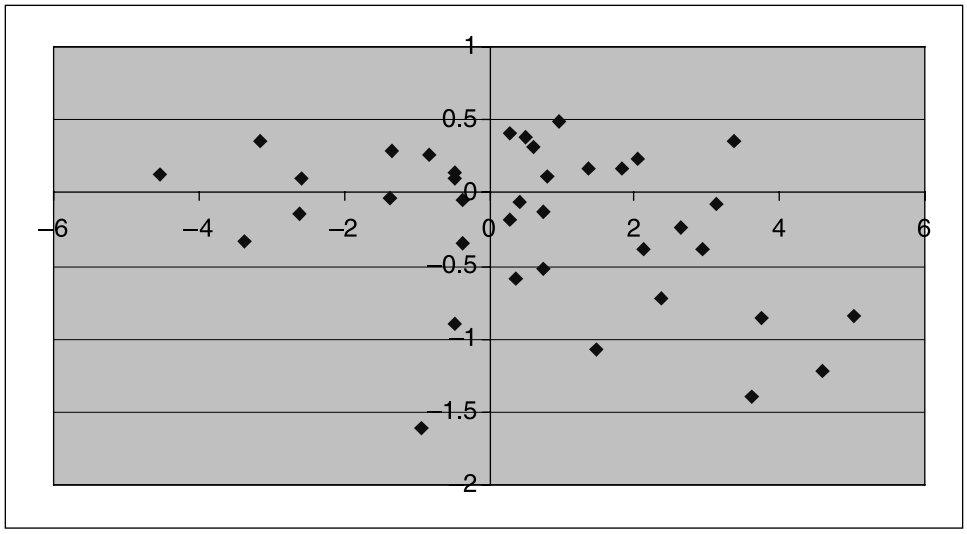

Figure 1. Scatter plot of cyclicality coefficients against output gap volatility

Note: Correlation is 0.41.

Source: Data from OECD *Economic Outlook* Database.

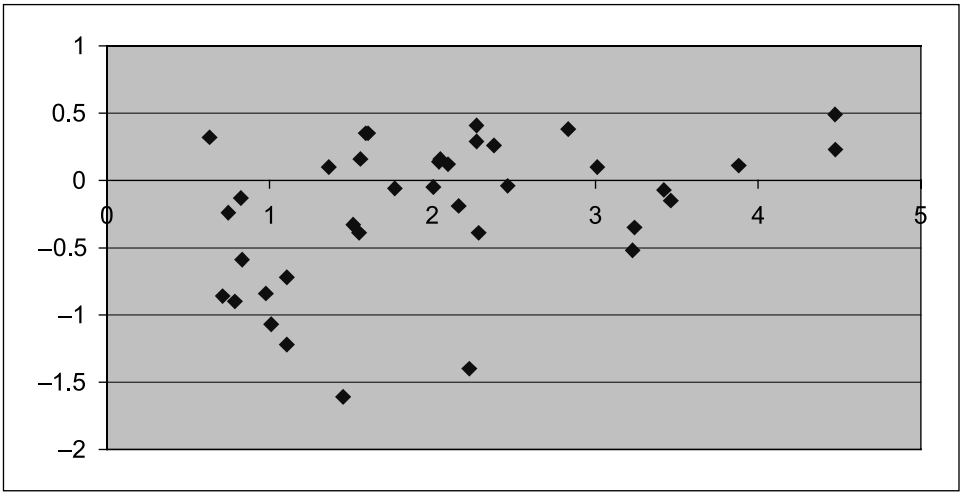

Figure 2. Scatter plot of cyclicality coefficients against average primary surplus

Note: Correlation is 0.36.

Source: Data from OECD *Economic Outlook* Database.

average primary surplus between BM and AM: a mean increase of 2.2 percentage points of GDP (the OECD average increase was 1.56 percentage points). Moreover, Figure 2 shows a significant negative correlation between the average primary surplus and the estimated cyclicality coefficient. In this way, to the extent that the Maastricht Treaty and the Stability and Growth Pact have facilitated fiscal adjustment (for example, by reducing the domestic political costs of debt reduction strategies), they may have indirectly also improved the cyclical performance of fiscal policy.

As the authors highlight, the trend in deficit reduction has also been evident in other major industrial countries. As such, it is clear that the EMU fiscal framework is not the only institutional mechanism that can deliver fiscal stabilization. However, just as the causes of the original debt accumulation differed across countries (e.g. between the US and Continental Europe), so it is natural that there was heterogeneity in how countries engaged in the fiscal adjustment process. Further research on establishing the appropriate counterfactual for the EMU countries (what would have happened without the Maastricht Treaty) would be very interesting.

Another significant result in this paper is that fiscal policy remains significantly less counter-cyclical in the EMU countries than in some other major industrial nations. Again, this may be consistent with the Maastricht Treaty and the Stability and Growth Pact (or the high debts that still persist in some EMU countries) constraining counter-cyclical policy to some degree. However, it may also reflect the lack of coordination among national fiscal policies in Europe: the effectiveness of a fiscal stimulus in any individual country is limited by the highly open nature of the individual European countries, such that the payoff to a more aggressive stabilization policy is limited. In this way, to the extent that output gaps among EMU

countries have a common component, the lack of an effective fiscal coordination mechanism (or a larger federal budget) may limit the capacity for counter-cyclical fiscal policy.

Regarding public investment, the authors note that, in contrast to the aggregate picture, public investment has not become more counter-cyclical AM relative to BM. It follows that the shift in aggregate fiscal cyclicality is attributable to some other component(s) of public spending. Lane (2002) found that the public sector wage bill played a key role in the cyclical behaviour of fiscal policy. It is interesting to speculate as to why public sector pay and/or employment may have turned more counter-cyclical in recent years. One possibility is that governments and taxpayers may have become more resistant to aggressive public-sector wage claims during boom times, in response to the large run-up in such spending during the 1970s and 1980s. Another is that the preferences of public sector unions have shifted in favour of greater stability over the cycle, moderating claims during expansions in order to protect incomes during downturns. A third is that the private-sector wage bill may have become more counter-cyclical, spilling over into a similar pattern in the government sector. Research on these questions would make for a potentially fruitful future project in this area.

Although the empirical work in this paper is quite extensive, I would have liked to see two more exercises. First, it would be interesting to allow the data to identify endogenously country-specific break points over the 1982–2001 period: in this way, it would be revealed whether the change in fiscal behaviour dates to the introduction of the Maastricht Treaty or to some other event. For instance, the change in fiscal behaviour in Ireland dates back to the much-studied adjustment undertaken in 1987 rather than being related to EMU.[13] Second, in line with my previous comments, it would also be informative to include interaction terms in the regression analysis: for instance, does the cyclicality coefficient vary with the level of output volatility or the level of the average fiscal surplus?

Finally, I concur with the authors' caveat that the evidence in this paper may not be relevant in predicting what would happen in the event of a large or sustained negative shock. Although the SGP does have an escape clause for large declines in output, it may be too cumbersome and retrospective in its procedures to permit an early and aggressive response to a major slump. The recent Japanese experience deserves close study in designing a new fiscal framework for Europe.

Wolfram F. Richter

University of Dortmund, CESifo and IZA

This paper is good news for the supporters of the Maastricht Treaty and the Stability and Growth Pact, or SGP. There have been widespread concerns that the SGP, instead of promoting stability and growth, would effectively achieve just the opposite.

[13] Favero and Monacelli (2003) identify 1987 as dating a shift in the US macroeconomic policy regime.

Instead of constraining overly active fiscal management, the SGP would keep participating countries from taking the measures needed to fight recessions and economic breakdowns. And instead of directing public policy towards growth, the SGP would curtail governments' scope of financing public investment. This is so as investment expenditures are often said to be among the first to be axed when budget deficits force governments to cut spending.

It may well be too early to make ultimate statements about the justification of such concerns. After all, SGP-based policy is still in its infancy and the excessive deficit procedure has not passed any hard test. However, Galí's and Perotti's paper shows that from today's perspective any such concerns are unwarranted. The authors find some evidence of mildly procyclical behaviour of government investment in EMU countries, but there is no evidence that the cyclical behaviour has changed in the period after Maastricht.

All this is good news, and it is reassuring to see that the results are robust and well substantiated. I have only two comments to make, one on the authors' motivation for their analysis, the other on the way the authors model budgetary policy. I start with the latter.

The authors use the (expected) output gap and the outstanding debt to explain the cyclically adjusted primary budget surplus. Of course these variables capture two objectives of budget policy, that of output stabilization and that of debt stabilization. Other plausible objectives, however, have not been studied as extensively by theories of budget policies, yet cannot be ignored when interpreting the empirical evidence. One is the political objective to cut down the government sector: it is hard to believe that deficits would have been reduced as much over the years as they have been reduced effectively without broad public consent to reduce government activity. Another is the objective to finance government investment, which I will address below.

As to motivation, the authors refer to critiques of SGP. It is true that many are critical of that policy framework; however, this may be motivated by concerns different to those suggested by Galí and Perotti. I agree that there had been concerns in the 1990s that too far-reaching co-ordination of national fiscal policies could prove to be a harmful straitjacket when fighting asymmetric shocks. However, I believe that this kind of critique has decreased and not increased over the years. The reasons are both theoretical and empirical. The empirical ones are the subject of the present paper. There is little, if any, empirical evidence corroborating the straightjacket hypothesis.

The theoretical evidence points in the same direction. A careful reading of the SGP indicates that it is medium-term oriented. The Resolution of the European Council of 17 June 1997 where it says that the member states 'commit themselves to respect the medium-term budgetary objective positions close to balance or in surplus set out in their stability or convergence programmes'. All that the SGP tries to do is to restrain overly active fiscal management. The underlying idea is that governments

should choose their medium-term targets and let automatic stabilizers play symmetrically over the business cycle (Buti, 2001). The only understandable concern would have to rely on the fear that adherence to a medium-term objective unduly hampers demand management in the short run. Whether this concern is effectively substantiated is, however, a very debatable subject.

The other concern motivating Galí and Perotti's work is even less justified by a reading of the SGP. It is the concern that compliance with the SGP could negatively affect public investment. To be frank, I have difficulties seeing this problem. The SGP makes a strict difference between expenditures for investment and expenditures for consumption. According to the SGP a necessary requirement for an excessive deficit is a government deficit that exceeds government investment expenditure. This is the so-called 'golden rule' of budget discipline. According to the golden rule public deficits raise a problem only if they exceed government investment. The rule is well anchored in the Basic Law for the Federal Republic of Germany (Article 115) and it has played a prominent role in the discussion surrounding the SGP. I cannot imagine that the excessive deficit procedure is brought against a member state that can justify deficits by investments. Since governments are aware of this provision I cannot see why the SGP should harm the propensity to invest. At most, the SGP could be said to hamper a policy of public investment that produces budget deficits in the future. If this outcome were to be feared I would rather put the quality of investment up to discussion before I would put any blame on the SGP.

To be fair, there is some discussion about the SGP which deserves to be taken seriously. But this discussion has a different focus. The focus is not that the SGP is too strict. The focus is instead that the SGP is incomplete. It is claimed to be incomplete insofar as it does not acknowledge the role of fiscal externalities. That might be a severe impediment to successfully coping with severe symmetric shocks. There are economists who see the world on the verge of an economic breakdown. If this assessment is correct, some co-ordinated fiscal policy by the world's leading economies may be the required remedy. The SGP, however, provides no basis for policy co-ordination and the Broad Economic Policy Guidelines are not legally binding (Directorate General, 2002). Hence Europe might have a constitutional problem. The available instruments for policy co-ordination might be insufficient to cope with exceptional challenges. However, the literature conveys no clear picture on this matter. It is a debatable subject whether Europe needs more closed forms of fiscal policy co-ordination.

Panel discussion

In reply to Philip Lane, Jordi Galí stated that the authors tried to address the Talvi–Vegh hypothesis by allowing for non-linear terms in the econometric specification, but found them to be insignificant.

David Miles thought that the results of the paper show that the SGP is malleable or ignored, so the results cannot necessarily be called good news. David Begg and Mike Artis pointed out that the results including the effects of automatic stabilizers are crucial if the total effect of fiscal policy is of interest, and felt that the distinction between the discretionary and automatic components is somewhat arbitrary. Ignazio Angeloni added that more attention needs to be paid to the automatic stabilizers of fiscal policy: if fiscal policy is more sustainable in the medium term, automatic stabilizers work better so that there is more scope for the discretionary part of fiscal policy.

David Begg pointed out that one benefit of counter-cyclical fiscal policy is to contain inflationary fears. In general, the endogeneity of output and inflation to the monetary policy regime change could be analysed in more depth. Mike Artis pointed out the similarity of the endogeneity problems in the paper with the literature investigating whether the ERM or EMS decreases inflation. The worldwide downward trend indicates that institutions, such as the SGP, may well be endogenous to deeper factors.

Ignazio Angeloni was not surprised by the better fit of Taylor rules in recent years, when exchange rate volatility is no longer present. Carlo Favero expressed concern with using the Taylor rule for the first part of the sample, when omitting variables such as exchange-rate volatility is not appropriate.

Karen Helene Midelfart Knarvik was intrigued by the common trend towards a counter-cyclical fiscal policy and the observed differences between EMU countries and the control groups. Concerning Norway she argued that tax reforms had facilitated counter-cyclical fiscal policy and she wondered whether this could also be the case for other countries.

Steve Cecchetti pointed out that measures of the net-present value of government liabilities would be a better measure of fiscal stance than current deficits, which can be manipulated by governments.

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