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TAX SMOOTHING DISCRETION VERSUS BALANCED BUDGET RULES IN THE PRESENCE OF POLITICALLY MOTIVATED FISCAL DEFICITS: THE DESIGN OF OPTIMAL FISCAL RULES FOR EUROPE AFTER 1992

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ABSTRACT

Tax Smoothing Discretion Versus Balanced Budget Rules in the Presence of Politically Motivated Fiscal Deficits: The Design of Optimal Fiscal Rules for Europe after 1992*

We analyse the arguments in favour and against binding fiscal rules such as those recently agreed by European countries as preconditions for participation in the third phase of the European Monetary Union. The evidence in the paper suggests that a number of EC countries are following unsustainable fiscal policies and that this 'deficits bias' may be partly due to political distortions. Binding balanced budget rules would eliminate the deficits bias that appears in the presence of such distortions, but would also prevent the use of potentially beneficial tax-smoothing budget deficits in response to transitory shocks. More flexible fiscal rules enforced by credible sanctions against deviant countries appear to be superior to rigid balanced-budget rules and discretionary equilibria.

JEL classification: E62, E63, F41, H62
Keywords: fiscal deficits, fiscal rules, political economy

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NON-TECHNICAL SUMMARY

The compatibility of a full monetary union in Europe (EMU) with independent and divergent fiscal policies of the member countries has become an important issue in the policy and academic debate concerning EMU. In 1989 the Delors Report made a strong case that a monetary union without fiscal convergence might be unstable and therefore recommended the imposition of binding fiscal rules to limit the size and financing of the fiscal deficits of the member countries. At the recent Maastricht summit, the EC countries agreed on a series of guidelines defining 'excessive' deficits and a set of 'flexible' fiscal preconditions for the participation of an EC country in the third phase of EMU. These conditions are a ratio of gross public debt to GDP below 60% and an overall fiscal deficit below 3% of GDP. Moreover, a series of financial sanctions against deviant countries were approved in case the deficits systematically deviate from these guidelines.

Implicit in the Maastricht fiscal guidelines is the idea that in the absence of such binding fiscal rules, the policies of some EC governments might be subject to a systematic bias towards budget deficits, which might have serious negative spillover effects on the other EC countries. The existence of such a 'structural deficit bias' suggests that there is a political distortion leading some governments to follow systematic policies of fiscal deficits in excess of what can be considered economically optimal. Therefore, behind the policy drive for fiscal rules is the idea that discretionary fiscal policy leads to 'excessive' or 'structural' deficits and that these fiscal deficits might be politically motivated. Moreover, such a political bias might lead governments to follow fiscal policies that are not consistent with the long-term solvency of the public sector and that might have serious consequences for the stability of the monetary union.

In this paper we analyse the arguments for and against the rigid fiscal guidelines agreed at Maastricht. We begin our analysis by considering whether the fiscal policies of the EC countries are sustainable in the long run. We perform formal tests of the solvency of the public sector for the EC countries: these tests suggest that problems of sustainability of the present path of fiscal policies are present in Greece, Italy and, to a lesser extent, in Belgium, Ireland and the Netherlands.

Tests of the solvency of the public sector for the EC countries seek to determine which EC countries might be on a unsustainable fiscal path. They examine whether the present value budget constraint of the public sector would be satisfied: (a) had the fiscal and financial policy in a given time period been pursued indefinitely? and (b) were the relevant features of the macroeconomic environment characterizing the sample period stable over time? The public sector is *solvent* when the present discounted value of future primary surpluses minus seigniorage revenue is at least equal to the value of the outstanding stock of net financial debt. Insolvency in this sense suggests that a change either in

the policy or in the relevant macroeconomic variables (growth, inflation, interest rate, demographic factors) *must* occur at some point in the future. Note that these tests refer to the *feasibility* rather than the *optimality* of the fiscal and financial policy. Also, they give no information about the time in which the necessary changes should occur.

Our test is based on the fact that the present-value budget constraint requires the expected value of discounted debt to be zero. Thus, if we discount the series of net debt back to some base period we can test whether the data generating process (DGP) describing the behaviour of this series over the sample period is covariance stationary *and* the unconditional mean of the process is zero (or non positive). Either a positive drift or a time trend will eventually imply insolvency. The test provides strong evidence against the sustainability of current policies in Italy. Belgian discounted debt also follows a non-stationary, non-trended process; this is evidence against solvency.

In principle, it is possible that the necessary steps towards a correction of the fiscal stance have already been undertaken in these countries within the sample period, but the test fails to detect their effects on the series of the discounted debt. Italy, however, has never achieved primary surpluses in the 1980s, so that the series of discounted debt is monotonically increasing. Real overall deficits are at around 4% of GDP at the end of the sample and even the *current* fiscal balance (net of public investment) shows deficits throughout the 1980s.

It should also be observed that both Italy and Belgium show large and often increasing current real fiscal deficits in the 1980s. In these two countries, despite the high public investment to GDP ratio, even the *current* balance of the general government is negative in the 1980s.

Given the large and persistent current fiscal deficit and a debt to GDP ratio around 100% in Italy, long-term fiscal insolvency is likely in the absence of a major shift in fiscal policy. The case of Belgium is, however, partly different. In the late 1980s, this country undertook a programme of fiscal adjustment that has led to significant primary surpluses. While the formal test suggests insolvency, it is likely that the test does not detect the structural change in Belgian fiscal policy that occurred in the last few years.

Test results for Greece and Ireland provide evidence for the presence of deterministic components in the DGP of discounted debt series, which is evidence against solvency. These two countries, however, differ significantly in their present fiscal outlook. Ireland started a major programme of fiscal adjustment and deficit reduction in the late 1980s, achieving significant primary surpluses and a reduction in the debt to GDP. Conversely, significant primary deficits persist in Greece, which suggests a serious solvency problem in that country.

Given the strong evidence of unsustainable fiscal policies in a number of EC countries and the rejection of optimizing models of fiscal policy-making, we suggest that one should look at political determinants of budget deficits. We present a brief survey of the theoretical literature on political biases in fiscal policy-making. From a theoretical point of view, there are at least four classes of political explanations of politically motivated fiscal deficits: first, 'public choice' models of deficits biases in democracy; second, models of political instability and decentralized government; third, models of strategic debt; and fourth, 'political business cycle' models.

Next, we present some empirical evidence on the political determinants of budget deficits by considering a panel data set for 14 industrial countries. We show that after controlling for the economic determinants of budget deficits, both government weakness and instability (measured by short-lived, multi-party coalition governments) and electoral factors (pre-election fiscal expansions) help to explain the behaviour of fiscal deficits in a large set of industrial countries.

Next, we move to a comparison of alternative fiscal rules when political uncertainty and polarization leads to a deficit bias. In the presence of shocks to output, a discretionary political equilibrium leads to 'excessive' political deficits but has the advantage of allowing governments to smooth (stabilize) tax rates and run budget deficits, something that is beneficial in the presence of transitory output shocks (such as a recession). Compared to this discretionary political equilibrium, a binding balanced budget rule will eliminate the political bias towards budget deficits.

This rigid rule, however, has a serious disadvantage: it does not allow the smoothing of taxes that is optimal in the presence of transitory shocks and which discretionary policy permits. Optimal taxation principles suggest that, as long as agents' utility is separable in consumption and leisure and the supply elasticity of labour is constant, a benevolent planner will follow a tax-smoothing rule with uniform tax rates over time. Transitory *negative* productivity shocks will lead to budget deficits and a build-up of public debt that will be repaid in periods of transitory *positive* productivity shocks. Therefore, in the presence of productivity shocks, the first-best policy rule followed by a social planner would be one of a fully state-contingent fiscal rule that allows tax-smoothing fiscal deficits and surpluses rather than a balanced budget.

The imposition of a rigid and binding balanced-budget rule in this framework lowers welfare: a transitory negative output shock will lead to a revenue loss at unchanged tax rates; the increase in tax rates required to balance the budget will distort the intertemporal labour and consumption decision of the agents and lead to a welfare loss. This loss will be increasing in the size of the transitory shock (or its variance in a stochastic set-up).

In the presence of output shocks, the optimal fiscal policy followed by a social planner would therefore be one of a full tax-smoothing rule, where fiscal deficits and surpluses are used to stabilize tax rates in the face of transitory shocks and no political biases occur. This full tax-smoothing policy rule would be first best and dominate both discretionary political equilibrium and the balanced-budget rule. Such a first-best cooperative equilibrium, however, might not be enforceable in a political equilibrium where political parties alternate in power and where the realization of the shock is subject to observational errors and potential cheating on the part of the ruling party. In this case, a second-best equilibrium might take the form of a fiscal rule with an escape clause (a flexible rule). Such a rule would impose a fiscal balance whenever the real output shock is below a certain threshold and allow for tax-smoothing fiscal deficits if the transitory disturbance is sufficiently large.

We also argue that in the presence of systematic uncertainty, reputational mechanisms might not be sufficient to enforce any of these alternative cooperative rules for fiscal discipline. We suggest that these rules should be monitored and enforced by an external agent (the EC or one of its organs such as the Commission). Moreover, a credible enforcement mechanism requires the use of explicit sanctions against countries that persist with fiscal policies that diverge from the commonly agreed fiscal rules.

We finally argue that the set of fiscal guidelines agreed at Maastricht do not correspond to the 'flexible rule with escape clause' cum 'effective sanctions' which our analysis suggests is desirable. The Maastricht guidelines are too rigid because they impose targets on the inflation-unadjusted and cyclically-unadjusted overall fiscal balances of the EC countries. At the same time, however, they are too loose because their implementation will be subject to a 'political' evaluation and will not be backed by effective sanctions.

We suggest that the political concerns about the negative consequences of a 'two-speed' EMU, which excluded countries such as Italy because of their deviant fiscal behaviour, explain the hybrid system of rigid but unrealistic fiscal guidelines backed by weak enforcement mechanisms and soft sanctions that the EC appears to have adopted.

1. Introduction.

As the EC countries are debating whether, when and how to move to a full monetary union (EMU), the compatibility of such a move with independent and divergent fiscal policies of the member countries has become an important issue.[1] While the experience of the EMS has shown that an exchange rate constraint might tie the hands of monetary authorities and lead to a convergence of monetary policies and inflation rates, one does not observe a similar convergence of the fiscal policies of the EC countries. Quite to the contrary, the period from 1979 to 1987 was characterized by a divergence of fiscal policies pursued by the member countries, with large budget deficits in a number of EC countries which, in the cases of Italy, Belgium, Ireland, Greece, Portugal and the Netherlands, led to a significant increase in the public debt to GDP ratio (see tables 1 and 2). Since 1987, the fiscal balances of a number of these countries have improved; significant primary surpluses in Belgium and Ireland have led to a reduction in the debt to GDP ratio in these countries. In Italy, Greece and the Netherlands, however, the fiscal adjustment in the last few years has not been sufficient to prevent further increases of this ratio.

In 1989, the Delors Report (1989) made a strong case that a monetary union without fiscal convergence might be unstable and therefore recommended the imposition of binding fiscal rules to limit policy makers' discretion in deciding the size and financing of fiscal deficits. More specifically, the Delors Report recommended the following "In the budgetary field, binding rules are required that would: firstly, impose effective upper limits on the budget deficits of individual member countries of the Community, although in setting these

limits the situation of each member country might have to be taken into consideration; secondly, exclude access to direct central bank credit and other forms of monetary financing while, however, permitting open market operations in government securities; thirdly, limit recourse to external borrowing in non-Community currencies". (Delors Report (1989), page 24; emphasis added).

Following the publication of the Delors Report the debate on the need for rigid fiscal rules in the EC and a coordination of fiscal policies has been very wide. There have been numerous proposals regarding specific fiscal rules and the nature of the "fiscal conditionality" required for the participation of member countries in a monetary union. The debate on "excessive" fiscal deficits, on the fiscal rules to impose on the member countries as well as on the sanctions to be imposed on deviant countries has been an important component of the discussion on the transition to full EMU[2].

Following the spirit of the Delors Report, serious consideration was given at the EC level to proposals recommending a rigid balanced budget rule for the current fiscal budget and limits on borrowing for capital expenditure purposes. In particular, the draft treaty presented by the Dutch in September 1991 (as well as previous draft treaties by Germany and France) stressed the obligation of member states not to run "excessive deficits" and suggested the use of sanctions in case this obligation is not met. One month later, a document by the Monetary Committee determined threshold-values defining "excessive" debt and deficit. These reference values were:

1. A gross debt to GDP ratio in excess of 60%;
2. Fiscal deficits in excess of 3% of GDP;

3. Budget deficits exceeding government investment expenditures.

The Monetary Committee also proposed a series of financial sanctions in case the deficits deviate from the trigger guidelines; these included the imposition of fines and the suspension of payments from the EC budget. Some countries, such as Belgium, also suggested the use of "political sanctions" such as a suspension of voting rights (see Woolley (1991)). Others, like Italy, expressed strong objections to a rigid and "mechanical" application of the Monetary Committee guidelines and did not favour drastic financial sanctions. The terms of this debate are found in the final version of the Maastricht Treaty, which on the one hand ratifies the strict guidelines suggested by the Monetary Committee in October 1991, and on the other hand establishes a set of rather mild sanctions against off-target countries to be decided according to "political" criteria. The procedure is as follows. The Commission establishes whether there is excessive debt or deficit in a member state and addresses its opinion to the Council. The latter, acting on a qualified majority, may make recommendations to the member state (not to be made public at first), establishing a deadline by which to take the necessary corrective steps. If by this time-limit no effective action is undertaken, the recommendations are made public and the member state is required to submit periodic reports about its adjustment efforts. *Finally*, if the fiscal imbalance persists, the Council *may* decide: a) to require the member state to publish additional information before issuing debt; b) to *invite* the European investment bank to reconsider its lending policy towards that state; c) to require the member state to make a non-interest bearing deposit with the Community or d) to impose a fine.

Behind the recommendations of the Delors Report, and therefore behind the terms of the Treaty, we find the idea that, in the absence of such binding fiscal rules, some of the EC governments might be subject to a systematic bias towards budget deficits and that this bias might have serious negative external effects on other EC countries.

It is also clear that if such a "structural deficit bias" exists, there must be some political distortion that leads some governments to follow systematic policies of fiscal deficits in excess of what can be considered economically optimal. If governments were benevolent optimizing agents, then binding fiscal rules might not be necessary: for example, fiscal deficits would occur as a result of tax-smoothing considerations and we would observe transitory fiscal deficits in the case of temporary decreases in output (as during recessions) or in periods of temporarily high fiscal spending.[3] Such tax-smoothing driven fiscal deficits would be economically sound, and if governments were running deficits on the basis of such considerations, there should be no need for rigid and binding fiscal rules.[4] Therefore, behind the debate regarding fiscal rules is the idea that discretionary fiscal policy leads to "excessive" or "structural" deficits and that these fiscal deficits might be politically motivated. Such a political bias might lead governments to follow fiscal policies that are not consistent with the long term solvency of the public sector and that might have serious negative effects on the stability of the monetary and economic union.[5]

This view of fiscal policy in Europe suggests the following questions:

1. Is the present path of fiscal policies of some EC countries incompatible with the long term solvency of the public sector ?

2. Is there evidence that these fiscal deficits (and unsustainable fiscal policies in some EC countries) are significantly determined by political distortions rather than by economic factors ?

3. If there is evidence of an important political bias in fiscal deficits, what are the benefits and the costs of rigid fiscal rules such as an EC rule requiring a current balanced budget?

4. In particular, how would the benefits of a binding balanced budget rule (in terms of eliminating the political bias of a discretionary fiscal policy-making) compare with the costs of not allowing tax-smoothing fiscal deficits in the presence of transitory output and spending shocks ?

5. Is there room for contingent and flexible rules that solve the distortions of the discretionary political equilibrium by imposing the discipline of fiscal balance in normal times and allow fiscal deficit financing in the presence of transitory real shocks ?

6. Would such rules (both the rigid budget balance and the flexible fiscal rule) be credible ? Should the EC have the role of monitoring their implementation and the power to enforce them ? And would sanctions be necessary to make the enforcement credible and effective?

7. Should participation in the EMU or the real integration process be made conditional on the adherence of the member countries to a particular fiscal behaviour?

8. What would be the consequence of "no entry unless fiscally sound" rules for the process of real and monetary integration in Europe? What would be the implications of a "two-speed" or "three-speed" or a "variable geometry" approach to integration?

In this paper, we would like to address these points

systematically. In section 2 of the paper, we start by looking at a simple accounting framework, making scenarios where countries which are currently off-target try to satisfy the fiscal guidelines established at Maastricht. Next, we will try to test whether the current fiscal policies of the EC countries are sustainable in the long run. We perform formal tests of the solvency of the public sector for the EC countries: these tests suggest that problems of sustainability of the present path of fiscal policies are present in Italy, Greece and, to a lesser extent, in Belgium, Ireland and the Netherlands. However, since these tests refer only to the feasibility rather than the optimality of fiscal and financial policy, evidence in favour of solvency does not necessarily imply that the solvent countries have followed optimal fiscal policies. For instance, the evidence in Roubini and Sachs (1989a, 1989b), Roubini (1991) and Cukierman, Edwards and Tabellini (1991) suggests that tax-smoothing models of fiscal policy, including the optimal seigniorage model for the inflation tax, are rejected for both developed and developing countries. In particular, transitory shocks to output and government spending fail to explain the movements of public debt in a large set of countries, while inflation rates do not appear to be correlated (or co-integrated) with tax rates.

Given that these optimizing theories of fiscal policy tend to be rejected, while there is some evidence of public sector insolvency in a number of EC countries, what can explain the large fiscal deficits and public debt accumulation observed in these countries? Recent theoretical and empirical literature suggests that one should look at political determinants of fiscal deficits. The idea that political distortions might affect fiscal policy-making is quite old but it is

only in recent years that these ideas have been formalized. In section 4 of the paper we present a brief survey of the theoretical literature on political biases in fiscal policy-making. From a theoretical point of view, there are at least four classes of political explanations of politically motivated fiscal deficits: 1. "public choice" models of deficits biases in democracy; 2. models of political instability and decentralized government; 3. models of strategic debt; 4. "political business cycle" models.

Next, in section 5 we present some empirical evidence on the political determinants of budget deficits. In particular, we show that both government weakness and instability (measured by short-lived multi-party coalition governments) and electoral factors (pre-election fiscal expansions) help to explain the behaviour of fiscal deficits in a large set of OECD countries.

In section 6, we move to a comparison of alternative fiscal rules when political uncertainty and polarization, as in Alesina and Tabellini (1990), leads to a deficit bias. In the presence of stochastic shocks to output, a discretionary political equilibrium leads to excessive deficits but allows governments to smooth tax rates in the presence of transitory output shocks. Compared to this discretionary political equilibrium, a binding balanced budget rule will avoid the political bias towards budget deficits. This rigid rule, however, will not allow the smoothing of taxes that is optimal in the presence of transitory shocks and is feasible in a discretionary equilibrium.

In the presence of output shocks, the optimal fiscal policy followed by a social planner would be one of full tax smoothing where fiscal deficits and surpluses stabilize tax rates in face of transitory

shocks. This fully state contingent tax-smoothing policy would be first best and dominate both discretionary political equilibrium and the balanced budget rule. Such a first best cooperative equilibrium, however, might not be enforceable in a political equilibrium where, in the presence of a shock, there exist observational errors as well as potential cheating on the part of the ruling governments. In this case, a second best equilibrium might take the form of a "fiscal rule with an escape clause" (a flexible rule). Such a rule would impose a fiscal balance whenever the real output shock is below a certain threshold and allows for tax-smoothing fiscal deficits if the transitory disturbance is large enough.

We also argue that, in the presence of systematic uncertainty, reputational mechanisms might not be sufficient to enforce any of these alternative cooperative rules of fiscal discipline. We suggest that these rules should be monitored and enforced by an external agent (the EC or one of its institutions, such as the Commission). However, a credible enforcement mechanism requires the use of explicit sanctions against undisciplined countries. We finally argue that the set of fiscal guidelines established by the Treaty of Maastricht do not match very well with the "flexible rule with escape clause" cum "effective sanctions" recommended in this paper.

In the concluding remarks, in section 7, we compare the flexible rules suggestcd in this paper with the fiscal guidelines recently adopted by the EC. We argue that such guidelines are too rigid because they impose targets on the inflation-unadjusted and cyclically-unadjusted overall fiscal balances of the EC countries. At the same time, however, they are too loose because their implementation

will be subject to a "political" evaluation and will not be backed by effective sanctions.

We finally argue that political concerns about the negative consequences of a "two-speed" EMU, from which countries like Italy would be excluded because of their deviant fiscal behaviour, explain the hybrid system of rigid but unrealistic fiscal guidelines backed by weak enforcement mechanisms and soft sanctions that appears to have been adopted by the EC.

2. Fiscal Arithmetics at Maastricht.

The set of fiscal guidelines established by the Treaty of Maastricht is *defined in terms of performance indicators*: the overall public deficit should not exceed 3% of GDP, and, if the debt to GDP ratio is above 0.6, the country should not fail to reduce it over time. Why these particular numbers? A 60% debt to gdp ratio happens to be the average value for the twelve Community members in 1990. If we then consider desirable for Europe to have a steady state growth rate of nominal income equal to 5%, say 3% real growth and 2% inflation, then the value of the deficit to gdp ratio which is consistent with this *long run* stationary equilibrium is exactly 3%. Nonetheless, a better answer to the question would try to give some theoretical justification or historical arguments to support the choice of 60 and 3, rather than any other number (or any number at all) as *short run strict guidelines* for national fiscal policy. In this section, we by-pass this set of issues and concentrate on a very simple, but important, exercise. By using the dynamic budget constraint of the government, we will build simple scenarios where off-target countries will try to adjust their fiscal

stance.

First, we will have a quick look at the government budget identity using the same definitions as they appear in the documents of the European Community. Consider

$$D_t = D_{t-1} + DEF_t \tag{2.1}$$

where D is *gross* nominal debt (*gross* means that it includes both monetary debt *and* public financial assets), valued at par; DEF is the overall deficit in nominal terms, which is the sum of the primary deficit (including investment expenditure) and the interest bill. Subscripts refer to time.

Dividing both sides of the identity by nominal GDP, and using lower case letters for expressing variables as ratio to GDP, we can write

$$d_t = \frac{d_{t-1}}{(1+g_t)(1+\pi_t)} + def_t \equiv \frac{d_{t-1}}{\phi_t} + def_t \tag{2.2}$$

where g and π denote the growth and the inflation rate respectively and $\phi_t \equiv (1+g_t)(1+\pi_t)$ is equal to one plus the rate of growth of nominal GDP.

Consider any country that is not currently meeting the Community's fiscal standards. As a starting point, take a debt to GDP ratio equal to 1, as well as a constant ϕ (the rate of growth of nominal income) equal to 7.5% (say, 5% inflation and 2.5% real growth). These figures are close to the cases of Italy, Belgium and Ireland.

The first experiment builds upon a rather mechanical implementation of Maastricht fiscal rules: we will trace the evolution of public debt

over time under the hypothesis of lowering the deficit to 3% of GDP by 1992 and keep it to this level in the years to come. The striking point in this exercise is that, even under the assumption of an immediate and complete adjustment of the government budget process, simple calculations show that the debt to GDP ratio will not hit the target of 60% before the year 2007. This date is obviously delayed if the growth of nominal income slows down, as an effect of the fiscal contraction on either inflation or real output growth, or both. In particular, if ϕ decreases too much (under 4.8%) the debt target will never be reached.

On the other hand, we may not expect a complete adjustment right away. For example, the deficit to GDP ratio may decrease over time according to some autoregressive process

$$(2.3) \qquad def_{t+1} = \Psi\, def_t + C$$

If Ψ=.8 this ratio would decrease approximately by 20% a year[6]. Let us take Italy as our reference country, posing an initial deficit to GDP ratio equal to 1. In this case, even if nominal output keep growing at 7.5%, it will now take until the year 2014 to meet the Community standards.

A striking point in these calculations is that nothing has been said about interest rates. This follows from the terms in which the fiscal targets are defined in the Maastricht Treaty, i.e., targets on the total deficit and total debt. If we break down total deficit as the sum of primary deficit (spending minus revenue) and interest bill, simple algebra shows that our identity can be written as

$$(3.4) \qquad def_t = pdef_t + \frac{i_t}{(1+\pi)(1+g)} d_{t-1}$$

where $pdef_t$ is the ratio of primary deficit to GDP and i_t denotes the nominal interest rate. For a nominal interest rate averaging around 9% (4% real, 5% inflation), we can trace the path of the *primary* deficit to GDP ratio along the adjustment process[7]. As a result, primary surpluses are quite large during the first few years (4.11% of GDP in 1992, 3.42% of GDP in 1993). Thus, high debt countries, where a large share of the fiscal balances consists of interest payments, would have to run large and persistent *primary* surpluses, in most cases well beyond their historical experience. Recall that the primary surplus includes the expenditure for capital formation, which in 1991 averages 3% of GDP in EC countries. If this pattern persists over time, a 3% upper limit to the *overall* deficit to GDP ratio is equivalent to a rigid balanced budget in terms of the *current* deficit.

To sum up, our simple exercise is that it is extremely unlikely that countries such as Italy, Ireland and Belgium will meet the fiscal prerequisites to the joining of the European Monetary Union by the deadline agreed upon in the Maastricht Treaty. Nonetheless, the terms in which Maastricht's fiscal standards are defined suggest a number of additional considerations, which we will discuss in the final section of this paper.

3. Tests of Public Sector Solvency for the EC countries: The Empirical Evidence.

In this section we will consider tests of the solvency of the

public sector for the EC countries. The objective is to verify whether and which EC countries might be on a unsustainable fiscal path, drawing on the empirical literature following the contribution of Hamilton and Flavin (1986) (see also Trehan and Walsh (1989), Wilcox (1989), Buiter and Patel (1990) and Corsetti and Roubini (1991)). Under the maintained hypothesis that a government solvency constraint must be imposed in the economy, the class of tests in this literature stems from the following idea: that is to verify whether the present value budget constraint of the public sector would be satisfied: a) had the fiscal and financial policy in a given time period been pursued indefinitely, *and* b) were the relevant features of the macro economic environment characterizing the sample period stable over time[8]. According to this approach, if solvency is not supported by empirical evidence, a change either in the policy or in the relevant macro economic variables (growth, inflation, interest rate, demographic factors) *must* occur at some point in the future. Note that these tests refer to the *feasibility* rather than the *optimality* of the fiscal and financial policy. Also, they give no information about the time in which the necessary changes should occur.

The empirical implications of the solvency constraint can be obtained as follows. The public sector is *solvent* when the present discounted value of future primary surpluses minus seigniorage revenue is at least equal to the value of the outstanding stock of net financial debt. Starting from the definition of the intertemporal budget constraint of the government, it is easy to show that solvency implies the following condition:

$$\lim_{i\to\infty} E_t \prod_{j=0}^{i} (1+\xi_{t+j})^{-1} D_{t+1+i} = 0. \tag{3.1}$$

where D_t now denotes the real value of total financial liabilities less foreign reserves evaluated in domestic currency and ξ_{t-1} is the real (*cum capital gains*) implicit interest rate on the net liabilities outstanding at the beginning of the period. This condition says that the public sector cannot be a net debtor in present-value terms, so that, ultimately, the stock of debt cannot grow at a rate higher than the interest rate on the debt. The crucial point is that *Ponzi schemes* in the form of systematic financing of the interest bill with additional borrowing are ruled out.

Our test (following Wilcox) builds on the fact that the present-value budget constraint requires the expected value of discounted debt to be zero in expectation. Thus, if we discount the series of net debt back to some base period, we can test whether the Data Generating Process (DGP) describing the behaviour of this series over the sample period is covariance stationary *and* the unconditional mean of the process is zero (or non positive). Either a positive drift or a time trend will eventually imply insolvency.

If non-stationarity of the process cannot be rejected, we have to consider two cases, depending on whether or not deterministic components also belong in the DGP of the series. A process with a unit root, but no drift or time trend is in principle compatible with both insolvency and a sort of *supersolvency* (i.e., in the limit, the government becomes a net creditor). However, when the unit root coexists with positive deterministic components in the DGP of the series, this will provide

some evidence against solvency.

Following a conservative (albeit arbitrary) approach to the interpretation of the test results, we consider the case of a non deterministic but non-stationary process as inconclusive. We will reject solvency only when a positive drift or time trend exists in addition to a unit root[9]. As far as the interpretation of the test is concerned, therefore, insolvency will follow from positive deterministic components in the DGP of the series of the discounted debt – but only in the absence of structural changes in the process at some point in the future.

The test concerns stationarity of the data-generating process of the series as well as the presence of deterministic components in it. Stationarity with or without deterministic components is tested by using the Phillips-Perron approach (Phillips and Perron 1987; Phillips 1987; Perron 1988). The details of the testing approach are described in a technical appendix to the paper but the approach basically relies on three different statistics ($Z(t_{\alpha_i})$, $Z(\Phi_2)$ and $Z(\Phi_3)$ to test for the presence of a unit root, a deterministic trend and a drift in the series for the discounted debt.

The sample consists of 10 EC countries.[10] The available OECD debt series are evaluated at par (rather than market) value, so that our analysis will reflect at least an important error of approximation. Results for the test are shown in table 3. These report the probability value at which each null hypothesis can be rejected. A brief scheme containing the corresponding null hypotheses is also reported at the end of each table. Tables 1 and 2 show the debt to GDP ratio and the

seigniorage-adjusted, inflation-adjusted deficit (overall and current, i.e. net of public investment[11]). The measure of the deficit in table 2 is obtained by first differencing the end of period stocks of net (gross) debt in real terms and by subtracting seigniorage revenue from the differenced series. Note that this definition of the real deficit has the advantage of purging the government interest bill of its inflation-related component. Our set of tests in table 3 are based on a measure of discounted debt.

We will begin with the two cases in which the results of the test are against solvency: Italy, Belgium, Greece and Ireland. The test provides strong evidence against the sustainability of current policies in Italy[12]. While $Z(t_{\alpha_3})$ does not reject the null hypothesis of a unit root, both $Z(\Phi_2)$ and $Z(\Phi_3)$ reject the joint null of a unit root *and* a zero time trend (*and* a zero drift for the second statistic). In the case of Italy, the estimated time trend is positive (the discounted debt is clearly trended upwards) suggesting a rejection of solvency.

Belgian discounted debt follows a non-stationary, non-trended process; both the statistics $Z(t_{\alpha_3})$ and $Z(\Phi_3)$ accept the corresponding null hypotheses. However, the statistic $Z(\Phi_2)$ suggests the presence of a deterministic drift, which is positive in the estimation. This is evidence against solvency.

In principle, it is possible that the necessary steps towards a correction of the fiscal stance have already been undertaken within the sample period, but the test fails to detect their effects on the series of the discounted debt. However, Italy has never achieved primary surpluses in the eighties, so that the series of discounted debt is

monotonically increasing. Real overall deficits are at around 4% of the GDP at the end of the sample and even the *current* fiscal balance (i.e. net of public investment) shows deficits throughout the 1980s (see table 2).

It should also be observed that both Italy and Belgium show large and often increasing current real fiscal deficits in the 1980's. In these two countries, despite the high public investment to GDP ratio, even the current balance of the general government is negative in the 1980s (see Table 2).

Given the large and persistent current fiscal deficit and a debt to GDP ratio around 100% in Italy, long term fiscal insolvency is likely in the absence of a major shift in fiscal policy. The case of Belgium is, however, partly different. In the late 1980's, this country undertook a program of fiscal adjustment that has led to significant primary surpluses. While the formal test suggests insolvency, it is likely that the test does not detect the structural change in Belgian fiscal policy that occurred in the last few years.

Test results for Greece and Ireland provide evidence for the presence of deterministic components in the DGP of discounted debt series. Evidence against solvency is available in the case of Greece and Ireland, where the $Z(\Phi_2)$ supports the presence of a non zero drift. Moreover, also the statistic $Z(\Phi_3)$ rejects the null suggesting the presence of a non-zero time trend in the DGP of the series, which results in this trend being positive in the estimation. These two countries, however, differ significantly in their present fiscal outlook. Ireland started a major program of fiscal adjustment and deficit reduction in the late 1980's, achieving significant primary

surpluses and a reduction in the debt to GDP. Conversely, significant primary deficits persist in Greece and suggest a serious solvency problem in that country.

The case of the Netherlands is interesting from the point of view of assessing the behaviour of the test in the presence of within-sample structural changes. The statistics in Table 3 suggest the presence of a non-zero deterministic drift if we exclude the last two years in the sample (1987 and 1988), when the government started a program of fiscal adjustment. However, the test statistics support a non-deterministic, non-stationary process when the full sample span is considered.

For the other two countries (Denmark and Spain) discounted debt appears to follow a drift-less and trend-less non-stationary process, providing no clear evidence against or in favour of solvency. In the case of Denmark, years of severe fiscal imbalances in the 1979 to 1984 period have been followed by a serious fiscal retrenchment and surpluses in current (overall) fiscal balances since 1984 (1985). After peaking to 34% of GDP the net debt to GDP ratio rapidly fell to 17.6% of GDP in 1988. The data for Spain also show current fiscal surpluses for all years except 1984 and 1985. Until 1983, the net financial public debt is negative (i.e. the government is a net financial creditor). Net debt has been very small since then (8.6% of GDP as of 1988). Therefore the sustainability of public debt does not appear to be an issue in the Spanish case.

For the three major EC countries (Germany, France and U.K), the discounted debt appears to follow a drift-less and trend-less non-stationary process. In this case supersolvency and insolvency are equally likely. Evidence for these countries should be interpreted as

inconclusive. However, additional information about the fiscal balances of these countries allows us to make some inferences.

For Germany, the data in Table 2 for the current fiscal balance show surpluses in most years in the sample, with the exceptions of 1975, 1980 and 1981. Moreover, while the German government became a net financial debtor in 1978, the debt to GDP ratio has stabilized around 10–13% since 1982 (see Table 1). This additional evidence would suggest that public sector solvency might not be an issue in the German case; however, it should be noted that our analysis is based on past trends and is not able to capture the potential implications of the recent German unification for the future fiscal balances of a United Germany.

In the case of the United Kingdom, the net debt to GDP ratio systematically falls from 116% in 1960 to 28.6% in 1989. The current fiscal balance is in surplus in all years between 1960 and 1989, with the exclusion of 1975, 1983 and 1984. The overall evidence is therefore quite consistent with public sector solvency in the U.K..

In the case of France, additional tests provide evidence in favour of the stationarity of the processes followed by the adjusted current balance (this is the test suggested by Trehan and Walsh (1988)). Moreover, Tables 1 and 2 show that France had current fiscal surpluses in all but 4 years in the last three decades, plus stable and low levels of the debt to GDP ratio in the 1980s (around 10–12%). The overall evidence would therefore suggest that the French public sector is solvent.

Finally, while the lack of data does not permit formal testing of Portugal public sector solvency, the evidence based on alternative indicators of sustainability such as those used by Blanchard (1990) and

Giovannini and Spaventa (1991) suggest that a fiscal problem might have also been present in Portugal. However, a pattern of persistent primary deficits and raising debt to GDP ratio seem to have been recently reversed (the debt to GDP ratio has been decreasing since 1989).

To summarize, among the EC countries, problems of sustainability of the present paths of fiscal policy appear to exist in Italy, Belgium, Ireland, the Netherlands and Greece[13]. These countries have in common a large debt to GDP ratio (close or above 100% in Italy, Belgium and Ireland). Only two of them, Ireland and Belgium, started a process of fiscal adjustment in the mid 1980s that has led to run significant primary surpluses and, in the case of Ireland, to a reduction of the debt to GDP ratio. Conversely, primary deficits still persist in the other three countries (their size is larger in Greece than in the Netherlands and Italy); this appears to be inconsistent with long term solvency.

4. Political determinants of budget deficits: a survey of the theory.

The previous section shows that the path of fiscal policy followed by many EC countries might not be consistent with long term solvency of their public sector. However, since the tests refer to the feasibility rather than the optimality of fiscal and financial policy, evidence in favour of solvency does not necessarily imply that the solvent countries have followed optimal fiscal policies. For instance, the evidence in Roubini and Sachs (1989a, 1989b), Roubini (1991) Cukierman, Edwards and Tabellini (1991) suggests that the tax smoothing view of fiscal policy-making and the optimal seigniorage model of the inflation tax are both rejected for developed as well as developing countries. In

particular, transitory shocks to output and government spending fail to explain the movements of public debt in a large set of countries and inflation rates do not appear to be correlated (or co-integrated) with tax rates.

Given that optimizing theories of fiscal policy tend to be rejected, while there is some evidence of insolvency for a number of EC countries, what can explain the large fiscal deficits and public debt accumulation observed in these countries ? Recent theoretical and empirical literature suggests that one should look at political determinants of fiscal deficits. In this section we present a brief survey of the theoretical literature on political biases in fiscal policy-making while in the next section we present the empirical evidence on this issue.

From a theoretical point of view, there are at least four classes of political explanations of politically motivated fiscal deficits: 1. "public choice" models of deficits biases in democracy; 2. models of political instability and decentralized government; 3. models of strategic debt; 4. "political business cycle" models. We will now briefly review these models.

4.1. Public choice models.

The idea that fiscal spending and budget deficits might be affected by political institutions is not new. The "public choice" school of Buchanan has been the leading proponent of the idea that, in the absence of constitutional constraints, governments in modern democracies have a bias towards overspending and fiscal deficits.[14] These traditional theories of a fiscal deficit bias in democratic societies have been

criticized for the weakness of some of their assumptions. In particular, in these models private agents (the electorate) are assumed to be backward looking and systematically unable to recognize the office motivations of the policy makers. On the other hand, governments and policy makers are not representing the preferences of private agents but are assumed to be malevolent Leviathans attempting to maximize revenues or deficit spending. Moreover, from an empirical point of view, the implications of this theory do not seem to be borne in the data. This approach implies that all democracies have a bias towards budget deficits but the evidence shows that only a subset of democracies appears to have a systematic tendency to run fiscal deficits. Moreover, fiscal deficits appear to be as widespread (if not more) among non-democratic regimes than in democratic ones.

4.2. Political instability and decentralized government models.

A number of authors have suggested that political instability and a decentralization of government spending decisions may be a source of unoptimal fiscal policy behaviour and an important cause of fiscal deficits.

Roubini and Sachs (1989a, 1989b) suggest that short duration multi-party coalition governments lead to fiscal deficits because it is difficult to enforce cooperation, in the presence of negative economic shocks, in a coalition setting. In fact, game theory suggests that cooperation is harder when the number of players is large (multi-party coalition governments) and when the horizon of the players is short and not repeated (short duration governments). The reasons why parliamentary multi-party coalition governments will have a hard time closing budget

deficits after adverse shocks is that the individual parties in the coalition will each veto spending cuts or tax increases that would impinge on their narrow constituencies, thereby frustrating the attempts of the executive branch to implement deficit reduction measures.

Tabellini (1991) stresses the importance of the decentralization of government fiscal decisions. When the decisions to spend and tax are decentralized among different agents (such as the ministers of a coalition government or between central, regional and local fiscal authorities), there may be an incentive to excessive government spending which is deficit financed.

Along similar lines stressing the lack of political cohesion, Alesina and Drazen (1991) explain the delay in fiscal adjustment in the presence of an unsustainable fiscal deficits as the result of a "war of attrition" between two different social classes. Here the conflict is about which social class will bear the tax burden of stabilization. The model implies that a greater dispersion in the income distribution and a lower degree of political cohesion will cause a delay in the expected date of stabilization and will therefore imply a greater and prolonged pre-stabilization period of fiscal imbalance and inflation.

From an empirical point of view, by using panel data on a sample of 15 OECD countries, Roubini and Sachs (1989a, 1989b) find that political instability (as proxied by various variables such as the type of government: single party majority, presidential, presidential with divided government, multi-party coalition, minority) or low average duration of the government leads to higher real-inflation-adjusted budget deficits. More recently, Grilli, Masciandaro and Tabellini (1991) have found similar evidence showing the effects of weak

government and short coalition duration on fiscal deficits.

4.3. Strategic debt models.

In a number of recent papers, the relation between political variables and budget deficits has been explained by looking at the role of partisan factors in economic policy-making. The origin of this literature is in Alesina's (1987) work on partisan effects in monetary policy but the same methodological approach has been applied to the issue of fiscal policy, domestic and foreign debt accumulation. These recent studies share a common theoretical background in that they assume heterogeneous agents (usually two types of agents) with different preferences about types of government spending or the inflation-unemployment trade-off. The political distortion is introduced by assuming that different political parties represent the preferences of these agents and that these parties come to power according to stochastic probabilities of reelection. The probability of the current government/party not being reelected affects the discount rate of the party by effectively shrinking the horizon of the policy maker (it increases its effective rate of time preference). In this political equilibrium, variables such as budget deficits or inflation rate diverge from the optimal value that they would obtain in the absence of the political distortion (i.e. if a benevolent social planner would supplant the two parties).

Alesina and Tabellini (1990) and Tabellini and Alesina (1990) show that the greater the probability of not being reelected *and* the degree of political/ideological polarization (the difference in preferences) of the two parties, the larger the budget deficit will be in a model where

the optimal policy is to run a budget balance in every period. The current government uses the level of public debt strategically, with the goal of tying the hands of successive governments with different fiscal policy objectives.[15]

Alesina and Tabellini (1989) consider the effects of political distortions on external debt and capital flight. They show that, in a model in which two types of government with conflicting distributional goals randomly alternate in office, "uncertainty over the fiscal policies of future governments generates private capital flight and small domestic investment. This political uncertainty also provides the incentives for current governments to overaccumulate external debt".

3.4. Political Business Cycle Models.

A last class of models stresses the electoral motivations of policy makers and suggests that fiscal policy might be too expansionary before elections. In particular, the "political business cycle" theory of Nordhaus (1975) suggests that office-motivated politicians will tend to follow expansionary monetary and fiscal policies before elections in order to maximize their reelection probabilities. This implies that one will observe excessive government spending, tax reductions, delays in tax increases and therefore fiscal deficits in electoral years.

This traditional PBC theory of a pre-electoral fiscal deficit bias in democratic societies has been criticized for the weakness of some of its assumptions. In particular, in this model private agents (the electorate) are assumed to be backward looking and systematically unable to recognize the office motivations of the policy makers.

More recently, several authors have reformulated the "political

business cycle" hypothesis of a pre-electoral fiscal deficit bias in models with rational agents. The rational political business cycle models of Rogoff (1990) and Rogoff and Sibert (1989) are recent examples of this approach. In these models, governments have the same utility function as private agents (i.e. they care about government spending in the same way as private agents do), but they are also "opportunistic". That is, governments care about winning elections, get welfare from being in power, and do not have "partisan" motivations. These papers share two basic ingredients: i) different governments are characterized by different degrees of competency; and ii) the government is more informed than the voters about its own level of competency.[16] In all of these models, the incumbent government has an incentive to "signal" its competence by engaging in pre-electoral manipulations of policy instruments.

In the Rogoff and Sibert (1989) paper, an equilibrium with signaling appears as follows: incumbents reduce taxes and/or increase spending before elections, to appear "competent", which is, able to reduce waste in the budget process. Needless to say, voters prefer competent governments to less competent ones. Pre-electoral deficits are monetized, but the effects of monetization on inflation and seigniorage are perceived by the voters only with a lag, thus after the election. Although voters are rational and aware of the policy makers' incentives, pre-electoral deficits for signaling purposes still occur.[17]

Rogoff (1990) presents a non-monetary model in which he focuses upon government spending on "consumption" (or transfers) and "investments." Signaling, in this model, takes the form of pre-electoral surges in immediately visible expenditures for

"consumption" or transfers and cuts in "investment" expenditure. Although the decrease in investment is harmful for both productivity and efficiency, these results are observable by voters only with lags. Thus, budget cycles take the form of distortions in the allocation of resources across public spending programs.

5. Political Determinants of Fiscal Deficits: the Empirical Evidence.

In this section we will consider empirically the effects of elections and political instability on fiscal deficits.[18] The theoretical literature surveyed in the previous section suggests several political determinants of fiscal deficits. On the one hand, both traditional and recent "rational" PBC models imply that we should observe fiscal deficits before elections. On the other hand, both strategic models of public debt and models of political instability and decentralized governments suggest that political instability and polarization (to be duly defined) may lead to high budget deficits.

In analyzing the effects of elections and political instability on fiscal deficits, one needs a structural model of budget deficits, in order to control for the economic determinants of budget deficits. We rely upon the structural model of budget deficits used by Roubini and Sachs (1989a) to study the effects of political instability on budget deficits. The specification of the model is consistent both with elements of optimizing approaches to fiscal deficits (such as the "tax smoothing" model of Barro (1979)) and with traditional Keynesian models of fiscal deficits. In fact, both theories imply that fiscal deficits are countercyclical: i.e. fiscal deficits will emerge during periods of recession and growth slowdown.

In addition to the tax smoothing considerations stressed by Barro (1979), the tendency towards deficits after a slowdown in growth, is exacerbated for two additional reasons. First, many major areas of public spending (e.g. unemployment compensation, social welfare expenditure, early retirement benefits, job retraining and subsidies for ailing firms) are inherently countercyclical, so that portions of government spending actually tend to rise automatically when growth slows down and unemployment increases. The second reason is the intentional implementation in some countries of Keynesian aggregate demand policies in the face of a growth slowdown: right or wrong, many governments reduce taxes or increase government spending during recessions.

As in Roubini and Sachs (1989a), we estimate a pooled cross-section time-series regression where the left-hand side variable is the annual deficit, measured as the change in the debt-GDP ratio, $d(b_{it})$.[19] The basic explanatory variables are: (1) the lagged deficit, $d(b_{it-1})$; (2) the change in the unemployment rate, $d(U_{it})$; (3) the change in the GDP growth rate, denoted d(yit); (4) the change in the real interest rate minus the growth rate, multiplied by the lagged debt-GDP ratio, $b_{it-1}*d(r_t - n_t)$ [20] ; (5) a dummy for political instability, polit, first used in Roubini and Sachs (1989a) (and to be described below); and (6) an electoral dummy ele_{it} to be defined below. The basic structure of the pooled regression model is the following (i denotes country, t denotes time, and d(x) denotes the change in variable x):

$$(5.1)\quad d(b_{it}) = a_0 - a_1 * d(b_{i,t-1}) + a_2 * d(U_{it}) + a_3 * d(n_{it}) +$$

$$+ a_4 * b_{it-1} * d(r_t - n_t) + a_5 * pol_{it} + a_6 * ele_{it} + v_{it}$$

where v_{it} is an error term. We expect the following: $0 < a_1 < 1$ (to allow for any slow adjustment and persistence of budget deficits); $a_2 > 0$ (since a rise in the unemployment rate raises government spending above its permanent value in the short term); $a_3 < 0$ (since a rise in GDP growth lowers government spending below its permanent value in the short term and may raise tax revenues); $a_4 > 0$ (since a rise in the real interest rate directly raises the real deficit, which if transitory should be accommodated by a temporary rise in the budget deficit).

Before introducing and discussing the political and electoral determinants of budget deficits, in column 1 of Table 5 we present the results of the regression when we include only the economic variables. This specification provides a rather successful account of the role of economic shocks in inducing budget deficits in the industrial countries. In particular, a rise in unemployment (denoted by DUB) raises the budget deficit; a rise in the debt- servicing cost (denoted by DRB) raises the budget deficit; and an acceleration of GDP growth (denoted by DGR) lowers the budget deficit, indicating that the deceleration of GDP growth after 1973 contributed to the rise in budget deficits. Note that the variable measuring this slowdown in growth is highly significant.[21] Finally, the lagged deficit (DBYL) enters with a coefficient of about 0.70, suggesting that about 70 percent of the lagged budget deficit persists to the next period.

In considering the effects of political variables on fiscal deficits we will consider both the role of elections and the effects of political instability and weak governments.

In order to test the hypothesis that governments manipulate fiscal policies before elections in order to maximize their reelection probabilities, in columns (3)–(5) we add to the basic regression a dummy ELE that takes value 1 in election years and zero otherwise. In constructing the variable ELE we need to consider that, since our data on deficits are on a yearly basis, the exact time of an election during a year might be important for assessing the effects of elections on fiscal deficits. More specifically, if an election occurs towards the end of the year t, we can expect that an opportunistic government would run a fiscal deficit during that year. However, if the election occurs towards the beginning of year t, it is more reasonable to assume that the fiscal expansion will occur in year t–1 so as to be timed with the early election time in year t. In practice, in constructing the variable ELE we assign value 1 to the dummy in the pre–electoral year t–1 if the election will occur in the first and second quarters of year t; while we assign value 1 in the electoral year t if the election occurs in the third or fourth quarter of year t. As an additional check on the model we also run regressions using a slightly different electoral dummy (ELX instead of ELE). ELX takes value 1 in the election year regardless of whether the election occurs in the first half of the year or the second half.

In order to consider the role of political instability and government weakness, we also add to the regression, in addition to the electoral variable, the political variable successfully used by Roubini and Sachs (1989a) to study the effect of government fragmentation on budget deficits. The hypothesis in that paper was that multi–party coalition governments, especially those with a short expected tenure,

are poor at reducing budget deficits. We therefore add to the regression the Roubini-Sachs index (denoted POLit for country i at time t) which measures the degree of political cohesion of the national government.[22]

The results of the estimations are shown in columns (2) - (4) in Table 4. Several different versions of the regression are shown, involving different ways of including the variables ELE and POL, either jointly or separately. In column (2), we introduce the political instability variable and, as in Roubini and Sachs (1989a), we find that (after controlling for the economic determinants of deficits) a greater degree of political instability (as proxied by the index POL) leads to higher budget deficits.[23] In column (3), we add our electoral dummy ELE to the regressors used in column (2); we find that, after controlling for the economic determinants, both POL and the electoral dummy, ELE, have the right sign and are statistically significant at the 5% confidence level. In other words, real fiscal deficits are higher in the year leading to an election. In column (4), we drop the POL variable and consider the effects of ELE only; we again find a statistically significant coefficient.

The effect of elections on budget deficits is significant both statistically and economically; the estimated coefficients on ELE in column (3) and (4) imply that, after controlling for other determinants of fiscal balances, real fiscal deficits will be higher in election years by more than 0.6 percent of GDP. We also ran the panel regressions in Table 4 using the electoral dummy ELX instead of ELE (ELX takes the value 1 in the election year regardless of whether the election occurs in the first half of the year or the second half). As

expected, ELX does not work as well as ELE, since this dummy variable does not correspond to the timing of elections. However, in these regressions ELX has the right sign and is statistically significant at the 10% confidence level. These results are available upon request.

In column (5), we investigate an interaction term of the electoral variable with the lagged deficit (termed DBYLELE), with the view that the speed of adjusting to an inherited level of the deficit, d(bit-1) might be lower in election years. When we introduce the interaction variable DBYLELE in column (5), we find that the sign is the expected positive one (deficits are more persistent in election years, i.e. the fiscal adjustment to past deficits is slower during election periods) but it is only borderline significant (the t-statistic is equal to 1.55).

To sum up, the above evidence suggests that, after controlling for the economic determinants of budget deficits, political factors significantly account for the fiscal policies of a large set of OECD countries: budget deficits are larger in elections years and in countries characterized by weak, short-duration multi-party coalition governments.[24]

6. A Comparison of Alternative Fiscal Rules: The Trade Off Between Tax Smoothing Discretion and Balanced Budget Rules in the Presence of Politically Motivated Fiscal Deficits.

In the previous sections, we have shown that a number of EC countries appear to be following unsustainable fiscal policies and that political factors might explain part of this bias toward budget deficits. Given the evidence on political biases in fiscal policy, what

are the potential benefits and costs of rigid fiscal rules such as the imposition of a balanced budged rule for the EC countries? In particular, how would the benefits of a binding balanced budget rule (in terms of eliminating the political bias of discretionary fiscal policy choices) compare with the costs of not allowing tax-smoothing fiscal deficits in the presence of transitory output and spending shocks ?

In this section, we will compare alternative fiscal rules by presenting some preliminary results of an analysis (Corsetti and Roubini (1991b)) that extends the model by Alesina and Tabellini (1990) to the case of productivity shocks, thus providing a rationale for tax-smoothing-motivated fiscal deficits (see Appendix I). In the model of Alesina and Tabellini (1990), agents have preferences over different types of public goods and the parties representing them alternate in power according to given reelection probabilities. In the discretionary political equilibrium, there will be a fiscal deficit bias: the government in power will spend only on the good preferred by the agent it represents and will run a budget deficit even if it would be socially optimal to have a balanced budget in every period. The current government will use the level of public debt strategically, in order to tie the hands of successive governments with different preferences for fiscal spending. The greater the probability of not being reelected *and* the greater the degree of political/ideological polarization (the difference in preferences over public goods) of the two parties, the larger the budget deficit will be. In the above setup, the first best policy followed by a benevolent social planner would be to spend in every period on both types of public goods and run a balanced budget in every period.

Since Alesina and Tabellini (1990) do not introduce stochastic shocks to productivity, a balanced budget is optimal in every period. [25] Suppose now that the productivity of labor is subject to shocks; how would the behaviour of a benevolent social planner differ? Optimal taxation principles suggest that, as long as agents' utility is separable in consumption and leisure and the supply elasticity of labor is constant, a benevolent planner will follow a tax smoothing rule with uniform tax rates over time. As in Barro (1979), transitory *negative* productivity shocks will lead to budget deficits and a buildup of public debt that will be repaid in periods of transitory *positive* productivity shocks. Therefore, in the presence of productivity shocks, the first best policy rule followed by a social planner would be one of a fully state contingent fiscal rule that allows tax-smoothing fiscal deficits and surpluses rather than a balanced budget.

The imposition of a rigid and binding balanced-budget rule in this framework lowers welfare: a transitory negative output shock will lead to a revenue loss at unchanged tax rates; the increase in tax rates required to balance the budget will distort the intertemporal labor and consumption decision of the agents and lead to a welfare loss. This loss will be increasing in the size of the transitory shock (or its variance in a stochastic setup). Compared to a discretionary political equilibrium, however, a binding balanced budget rule will avoid the political bias towards budget deficits that would occur in a discretionary political equilibrium where parties use the deficits for strategic purposes.

While fiscal policy discretion leads to a deficit bias, it also has some advantages. In particular, it allows the government in power to

smooth tax rates in the presence of real transitory shocks, something that is ruled out by the balanced budget rule. A welfare comparison between the discretionary political equilibrium and a rigid balanced budget rule would therefore not deliver unambiguous rankings: depending on the size of the productivity shock relative to the political biases in the system, a balanced budget rule (that avoids politically biased deficits) might be superior or inferior to a discretionary political equilibrium (that allows tax smoothing deficits).

A fully contingent tax-smoothing rule implemented by a benevolent social planner would support a first best allocation, dominating both a discretionary political equilibrium and the balanced budget rule. If there is no social planner and political parties alternate in power stochastically, this first best equilibrium might be sustained by a reputational mechanism only under quite unrealistic conditions. In fact, the real disturbance to labor productivity is usually not observed with certainty by agents: output is measured with delay and errors; moreover, it is often hard to assess whether the shock is transitory, in which case a fiscal imbalance is appropriate or whether the shock is permanent, in which case a real tax adjustment is required. Uncertainty about the size and nature of the shock implies that the incumbent government has a strong incentive to cheat: to announce that negative output shocks are large and transitory in order to run large deficits. Therefore the first best cooperative equilibrium might not be enforceable in a political equilibrium when the realization of the shock is subject to observational errors and potential cheating on the part of the ruling governments.

Given that a first best, fully state contingent fiscal rule is

impractical, a second best "fiscal rule with an escape clause" (a flexible rule) should be considered. Such a rule would impose a fiscal balance whenever the real shock is below a certain threshold level and allow for tax-smoothing fiscal deficits if the transitory disturbance is large enough. In other terms, under this rule only large recessions will trigger budget deficits while minor movements in economic activity would be matched by tax adjustments that maintain a budget balance. Such a rule with an escape clause might be superior both to a rigid balanced budget rule which does not allow tax smoothing *and* to a discretionary political equilibrium that results in excessive budget deficits; moreover, compared with a fully state contingent rule, the rule with an escape clause could be easier to monitor and enforce.

The discussion above regarding alternative fiscal rules leaves open a serious issue. Regardless of whether a balanced budget rule or a flexible rule with escape clauses is jointly chosen by the EC countries, what is the enforcement mechanism that will guarantee that this rule is actually implemented ? Are reputational forces enough to support such cooperative rules in a democratic institutional framework where different governments and parties alternate in power ? Alternatively, is it necessary that an external agent (the EC or one of its organs such as the Commission) be given the surveillance authority to monitor the implementation of these rules ? Moreover, would such external monitoring by the EC be enough or are explicit <u>sanctions</u> against fiscally deviant countries necessary to enforce fiscal discipline ? Finally, should the threat of sanctions go as far as making the participation of a member country to the third stage of the EMU conditional on the attainment of fiscal balance ? [26]

Game theory suggests that, in some circumstances, reputational forces might be enough to sustain a cooperative rule: if discount rates are not too large, if the benefits of cooperation are large and the additional short term benefits of cheating small, the above fiscal rules could be sustainable without the need for an external agent such as the EC to enforce them.

In reality the presence of systematic and unavoidable uncertainty is likely to weaken seriously these reputational forces[27]:

1. As discussed above, output shocks might be observed with delay and measurement errors.

2. There might be legitimate disagreements about the transitory or permanent nature of output and spending disturbances.

3. The distinction between current and capital expenditure (that is important for any rule regarding the current fiscal balance) or the size of the future liabilities of the public sector (as in the case of the liabilities of the social security system) is similarly subject to ambiguities.

4. As the U.S. experience with Gramm-Rudman targets shows, rigid fiscal targets can be circumvented by putting off-budget certain spending items (see for example the S&L bail-out and the FDIC refinancing cases).

5. Any general rule is by definition an incomplete contract that cannot cover the myriad of unanticipated contingencies that might occur in reality.

In the presence of such a systematic uncertainty, the reputational mechanisms for a fiscal discipline break down and <u>institutions</u> become necessary to monitor agreements, interpret rules, adjudicate

controversies, and enforce the agreed rules through sanctions against deviant agents. [28]

In this sense, the EC (or one of its organs such as the Commission) can play the enforcement role, providing external surveillance and monitoring of the fiscal balances of the member countries. The constant monitoring will strengthen the domestic incentives for fiscal discipline. However, such a surveillance would be tooth-less without the presence of explicit sanctions aimed at punishing deviant countries.

In this regard, the argument made against strong sanctions, i.e. that the discipline of the market will be enough to prompt fiscal discipline on the deviant countries, seems based more on wishful thinking than on an assessment of the incentives faced by the member countries. The market discipline in the form of high interest rates has not prevented members of the EC to continue unsustainable fiscal policies throughout the 1980s.

7. Concluding Remarks: An Evaluation of the EC Fiscal Guidelines.

In this paper we argued that a number of EC countries appear to be following unsustainable fiscal policies and that the divergence of fiscal policies in the EC might not be compatible in the long run with the process of monetary unification. We argued that these "excessive" fiscal deficits appear to be partly explained by political factors and that this "deficit bias" might be corrected by fiscal rules monitored and enforced by the EC.

In the presence of political biases towards deficits, we compared alternative fiscal rules. Binding balanced budget fiscal rules, while avoiding the political biases of discretionary fiscal policy-making,

have serious disadvantages in that they do not allow for beneficial tax-smoothing in the presence of transitory output shocks (recessions). Flexible rules that set balanced budget targets for normal cyclical conditions and allow deficit financing in the case of recessions appear to be superior both to rigid balanced budget rules and to "deficit biased" discretionary (political) equilibria. However, we argued that these rules are not likely to be supported by reputational mechanisms or market discipline alone. Rather, they should be supported by a system of clear and effective sanctions against deviant countries administered by the EC.

How do the fiscal guidelines recently proposed by the EC match with the flexible rule cum-effective-sanctions recommended in this paper ? The fiscal guidelines recommended by the Monetary Committee (a debt to GDP ratio below 60% and an overall fiscal deficit below 3% of GDP) appear to be very rigid and do not seem to be realistic. While the debt to GDP guideline is obviously unrealistic, at least in the short term, for many EC countries, the 3% deficit guideline makes even less sense.

In fact, this guideline refers to the nominal cum interest overall (current and capital) fiscal balance of the government. This does not appear to be a desirable fiscal target. First, a large component of interest payments in several EC countries represents a pure nominal than real interest burden; therefore, a fiscal guideline based on nominal cum interest deficits does not make sense as long as inflation rates among the EC countries are not yet equalized. Second, the component of interest payments that is real represents a very different fiscal burden for high debt versus low debt countries: even assuming equal real interest rates across the EC, this burden is twice as large for a

country with debt to GDP ratio of 100% relative to one with a 50% ratio. Therefore, the EC guideline requires a much heavier fiscal adjustment for countries with a large inherited public debt. Third, no consideration is given to the fact that the debt to GDP stabilizing budget balance is very different for countries with different real output growth rates. Fourth, the guideline does not correct for the cyclical component of fiscal deficits, i.e. does not leave any room for the tax-smoothing fiscal deficits suggested by the flexible rules discussed above. Finally, since the guideline includes both the current and capital account, it would force the member countries to run substantial primary surpluses (in the order of 5% of GDP for a highly indebted country such as Italy).

The realization that the present guidelines are unrealistic has led the EC countries to agree that they should be interpreted in a "political" way and that strong sanctions should be avoided. Such a "political" flexibility is, however, quite murky and far from the clearly defined flexible rules advocated above. Such rules suggest the use of targets for the primary balances rather than for the overall balances, they explicitly allow for clearly defined tax-smoothing deficits in case of recessions and would be enforced by a clear set of credible sanctions. Instead, the EC appears to have opted for unrealistic targets based on nominal, non-cyclically-adjusted, overall deficits only to allow for an ex-post "political" flexible evaluation supported by soft and ineffective sanctions.

The decision to follow a political *criterion* in the evaluation of the fiscal guidelines is clearly motivated by the concern that a rigid application of fiscal rules would result in a "two-speed" process of

monetary unification. The concern of the French and of the Commission is that a "two-speed" EMU, that would leave out Italy because of its fiscal imbalances, would be seriously flawed. In fact, the exclusion of Italy and the likely refusal of the United Kingdom to join a fully unified monetary union would imply that the EMU would turn out to be only "Deutsche Mark Area" enlarged to France. This political concern about the consequences of a "two-speed" EMU, however, might imply that fiscally divergent countries like Italy might face weakened incentives to correct their fiscal balances.

In conclusion, the political concerns about the negative consequences of a "two-speed" EMU, that would exclude countries like Italy because of their deviant fiscal behaviour, seems to explain the hybrid system of rigid but unrealistic fiscal guidelines backed by weak enforcement mechanisms and soft sanctions that appears to have been adopted by the EC.

Appendix I

This appendix sketches the model underlying the discussion in section 6. Consider a small open economy populated by N individuals with different preferences over two types of public goods, g and f, each maximizing

$$\text{(A1)} \qquad \varphi^i = U(c_0) + V(x_0) + a^i H(g_0) + (1-a^i)H(f_0) +$$

$$\frac{1}{R}\,[U(c_1) + V(x_1) + a^i H(g_1) + (1-a^i)H(f_1)]$$

subject to

$$\text{(A2)} \qquad c_0 = (1-x_0+\epsilon)(1-\tau_0) - b_0 + b_0^*$$

$$c_1 = (1-x_1-R\epsilon)(1-\tau_1) + R(b_0 - b_0^*)$$

where, for period 0 and 1, C is consumption, x is leisure, g and f are levels of spending on the two types of public goods, a^i is a parameter characterizing individual-specific preferences for good g, τ is a tax on labor income, b and b^* are public domestic debt and private foreign debt, respectively. R is the world interest rate, U(.), V(.) and H(.) are concave functions. The endowment is higher in period 0 by ϵ and lower in period 1 by $R\epsilon$, so that the present value of these two components is zero in present value from a social point of view. In other words, the resource constraint for this economy is

$$(A3) \qquad c_0+g_0+f_0 + \frac{1}{R}(c_1+g_1+f_1) = (1-x_0) + \frac{1}{R}(1-x_1)$$

where we have assumed that the private and the public goods are produced with the same technology. A social welfare function can be built by specifying a set of exogenously given, non-negative welfare weights ω_i, with $\sum_i^N \omega_i=1$, such that $\phi=\sum_i^N \omega_i \varphi^i$. Thus, the social planner problem will be that of maximizing ϕ subject to the first order conditions for problem (A1)-(A2) and the resource constraint (A3). Conditional on the specifications of the welfare weights ω_i, the solution to this problem will lead us to a traditional tax-smoothing result, where borrowing will offset a non-smooth income profile.

The construction of a political equilibrium follows Alesina and Tabellini (1990) in assuming that there exist a party in power which does not derive utility from spending on f and faces an exogenously given probability of re-election. By the same token, the second party does not derive utility from g. The party in office will maximize

$$(A4) \qquad E_0 \{U(c_0)+V(x_0)+a^i H(g_0) + \frac{1}{R}[U(c_1)+V(x_1)+Pa^i H(g_1)]\}$$

once again, subject to the FOC's for problem (A1)-(A2) and the resource constraint for the economy. For the sake of simplicity, suppose that the probability of re-election, P, is zero. While in power, the party will have an incentive to increase the amount of resources spent on the public good g. Given the intertemporal budget constraint, debt accumulated in the first period will be re-paid in the future, thus reducing spending on the public good f. Nonetheless, in the presence of

a temporary shock, the party in power will also have an incentive to smooth tax revenue, thus borrowing instead of changing tax rates. Total deficit will therefore be affected by two components: one reflecting the political bias, the other reflecting tax-smoothing. This second component motivates an argument in favor of discretionary fiscal policy.

A balanced-budget rule would add a constraint to the above problem in the form: b=0. From a social point of view, overspending on g will be avoided. However, it will now be impossible to smooth tax rates, as in the case of the social planner.

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Table 1

Net Debt to GDP Ratio

	GERMANY	FRANCE	UNITED KINGDOM	ITALY	BELGIUM	GREECE	IRELAND	NETHERLANDS	SPAIN	DENMARK	PORTUGAL
1960	-24.82	14.56	116.17	NA	59.17	NA	NA	NA	NA	NA	NA
1961	-26.37	10.81	109.96	NA	57.17	NA	NA	NA	NA	NA	NA
1962	-26.16	7.09	104.91	NA	54.47	NA	NA	NA	NA	NA	NA
1963	-24.10	4.79	98.44	NA	51.91	NA	NA	NA	NA	NA	NA
1964	-25.69	3.49	91.91	5.63	47.54	NA	NA	NA	NA	NA	NA
1965	-23.55	1.68	85.39	8.18	45.79	NA	NA	NA	NA	NA	NA
1966	-22.57	1.13	81.72	11.95	45.21	NA	NA	NA	NA	NA	NA
1967	-20.36	0.84	82.16	11.84	44.35	NA	NA	NA	NA	NA	NA
1968	-18.92	1.22	77.20	14.76	44.13	NA	NA	NA	NA	NA	NA
1969	-18.18	1.64	72.30	14.51	42.83	NA	NA	NA	NA	NA	NA
1970	-18.17	0.44	64.83	17.36	40.31	5.37	NA	42.68	-9.10	-9.24	NA
1971	-17.42	0.06	62.00	20.54	39.87	4.51	NA	41.22	-10.30	-11.48	NA
1972	-17.65	-3.68	55.95	24.98	37.54	4.97	45.47	38.83	-10.99	-14.56	NA
1973	-18.16	-3.69	47.43	24.85	36.10	2.52	42.05	36.19	-11.27	-17.14	NA
1974	-15.29	-3.10	45.70	23.05	34.28	2.66	47.26	34.70	-11.61	-18.22	NA
1975	-9.51	2.80	49.65	31.96	37.06	4.44	55.95	34.29	-11.64	-15.82	25.5
1976	-5.94	3.23	48.85	33.96	38.11	4.46	63.20	33.55	-11.66	-12.84	31.4
1977	-3.71	2.72	48.64	34.53	41.58	4.02	61.90	33.10	-9.82	-9.03	33.2
1978	-1.83	2.84	46.51	36.26	45.53	11.00	64.67	34.27	-9.08	-6.03	36.3
1979	0.57	2.83	41.76	37.51	50.39	10.96	70.48	35.99	-8.92	-2.10	41.0
1980	4.42	2.05	42.63	37.71	58.53	9.95	73.56	39.10	-6.72	3.39	37.1
1981	8.08	3.32	42.08	42.83	71.13	11.28	82.82	43.70	-3.40	12.73	46.6
1982	10.27	4.57	41.45	48.74	80.31	14.18	93.47	48.73	-0.65	22.89	50.0
1983	11.80	6.86	42.16	54.07	90.82	21.16	99.22	54.52	-5.83	30.81	56.0
1984	12.15	8.57	44.35	59.72	95.86	28.30	103.04	58.61	0.90	34.19	61.4
1985	12.78	9.51	43.17	65.89	103.44	39.41	107.50	61.92	6.80	27.55	69.5
1986	12.20	11.71	41.83	70.69	108.59	40.38	123.24	66.21	10.01	23.77	68.4
1987	13.00	11.53	38.42	74.47	113.71	44.62	125.30	66.69	7.66	18.83	71.6
1988	13.18	12.02	32.98	76.88	116.01	50.00	122.85	68.66	8.60	17.68	74.0
1989	11.51	12.47	28.64	NA	115.10	57.88	115.80	NA	NA	NA	71.2

Net debt is equal to gross debt minus the financial assets of the government. The debt figures are also net of base money. Gross debt (rather than net debt) figures have been used in the following cases: Greece, Ireland, Portugal and The Netherlands.

Table 2

INFLATION-ADJUSTED, SEIGNIORAGE-ADJUSTED DEFICIT (OVERALL AND CURRENT) (% OF GDP)

OVERALL DEFICIT

	GERMANY	FRANCE	UK	ITALY	BELGIUM	DENMARK	GREECE	IRELAND	NETHERLANDS	SPAIN	PORTUGAL
1961	-3.11	-3.58	-3.61	NA	0.20	NA	NA	NA	NA	NA	NA
1962	-1.41	-3.80	-2.89	NA	-0.83	NA	NA	NA	NA	NA	NA
1963	1.00	-2.55	-3.45	NA	-1.56	NA	NA	NA	NA	NA	NA
1964	-3.30	-1.44	-2.89	NA	-2.11	NA	NA	NA	NA	NA	NA
1965	0.42	-2.02	-4.43	2.18	-0.73	NA	NA	NA	NA	NA	NA
1966	-0.15	-0.86	-1.79	3.70	0.33	NA	NA	NA	NA	NA	NA
1967	2.11	-0.72	1.63	0.31	0.40	NA	NA	NA	NA	NA	NA
1968	0.19	-0.29	-3.05	2.92	0.70	NA	NA	NA	NA	NA	NA
1969	-0.80	-0.20	-4.66	-0.60	0.60	NA	NA	NA	NA	NA	NA
1970	-1.49	-1.71	-6.70	2.24	-0.84	NA	NA	NA	NA	NA	NA
1971	-0.63	-1.01	-2.07	2.27	-0.02	-2.78	-1.19	NA	-0.64	-2.46	NA
1972	-1.43	-4.43	-4.23	2.20	-1.38	-3.91	-1.49	NA	-1.61	-2.42	NA
1973	-1.94	-1.25	-6.59	-2.83	-1.68	-3.29	-4.80	-0.90	-1.50	-2.38	NA
1974	1.99	-0.82	-6.18	-4.01	-1.79	-1.44	-2.26	1.13	-0.87	-2.62	NA
1975	5.25	4.52	4.17	3.64	1.74	1.64	-0.39	6.67	-0.83	-1.94	NA
1976	2.66	-0.16	-0.36	-0.17	2.13	1.51	-1.81	7.10	0.77	-2.14	NA
1977	1.64	-1.05	0.22	-1.02	3.39	3.06	-2.31	2.52	0.12	-0.88	NA
1978	1.30	-0.45	-1.86	-0.37	4.42	2.36	4.03	4.07	1.87	-1.45	NA
1979	1.83	-0.61	-4.90	-0.69	5.28	3.31	-2.27	5.10	1.87	-1.70	NA
1980	3.37	-1.39	0.45	-0.92	8.80	4.93	-3.56	2.00	2.99	0.31	NA
1981	3.19	0.54	-0.78	2.69	10.09	8.47	-2.76	9.77	3.73	1.57	NA
1982	1.78	0.68	0.21	3.81	9.24	10.02	-0.86	12.25	5.01	0.95	NA
1983	1.54	1.76	2.11	4.58	10.00	8.25	2.88	6.26	6.28	-6.90	NA
1984	0.52	1.38	2.51	6.29	6.15	4.58	4.10	7.40	5.59	4.26	NA
1985	0.56	0.72	0.51	6.80	8.76	-5.46	8.17	5.75	5.13	3.69	NA
1986	-0.45	2.24	-0.56	5.74	7.75	-3.19	-0.71	16.34	5.94	1.96	NA
1987	0.89	-0.13	-2.37	5.01	7.24	-5.17	1.37	5.84	0.38	-2.87	NA
1988	0.40	0.66	-3.93	3.96	NA	-1.39	4.10	3.58	3.87	-0.05	NA
1989	-1.33	0.64	-2.42	4.07	NA	NA	NA	NA	NA	NA	NA

The "overall" inflation-adjusted, seigniorage-adjusted deficit is the first difference of the end-of-period stock of net (gross) debt in real terms minus seigniorage. The "current" deficit is the "overall" deficit minus government net investment.

Table 3

Testing for Solvency of the Public Sector in EC Countries: Test Results for the Series of Discounted General Government Net Interest-Bearing Liabilities

	$Z(a_3)$	$Z(t_{a_3})$	$Z(\Phi_2)$	$Z(\Phi_3)$
Belgium	<90	<90	>99	<90
France	<90	<90	<90	<90
Germany	<90	<90	<90	<90
Italy	<90	<90	>99	>99
United Kingdom	<90	<90	<90	<90
Denmark	<90	<90	<90	<90
Greece	<90	<90	>99	>99
Ireland	<90	<90	>99	>99
Netherlands	<90	<90	<90	<90
Spain	<90	<90	<90	<90

Regression Model: $y_t = \mu_3 + \beta(t - \frac{T}{2}) + \alpha_3 y_{t-1} + u_t^3$

Null hypotheses:

H_0: $a = 1$ for $Z(a)$ and $Z(t_a)$

H_0: $a = 1$ and $\beta = 0$ and $\mu = ?$ for $Z(\Phi_3)$

H_0: $a = 1$ and $\beta = 0$ and $\mu = 0$ for $Z(\Phi_2)$

Table 4

Panel Data Regression of Deficit with Political Variables
Dependent Variable: DBY

Regressors:	Equation (1)	Equation (2)	Equation (3)	Equation (4)	Equation (5)
Constant	-0.002 (-1.19)	-0.006 (-2.73)	-0.007 (-3.28)	-0.004 (-1.97)	-0.0037 (-1.98)
DBYL	0.74 (17.0)	0.71 (16.0)	0.72 (16.2)	0.74 (17.2)	0.70 (14.0)
DUB	0.23 (2.98)	0.18 (2.32)	0.19 (2.51)	0.24 (3.15)	0.24 (3.17)
DRB	0.56 (2.66)	0.61 (2.91)	0.56 (2.71)	0.51 (2.46)	0.50 (2.38)
DGR	-0.47 (-8.49)	-0.45 (-8.31)	-0.46 (-8.50)	-0.48 (-8.69)	-0.47 (-8.49)
DUJAP*	1.82 (1.46)	2.75 (2.16)	2.62 (2.07)	1.76 (1.42)	1.70 (1.38)
ELE	—	—	0.0065 (2.17)	0.0072 (2.41)	0.0063 (2.04)
POL	—	0.0042 (2.77)	0.0039 (2.57)	—	—
DBYLELE	—	—	—	—	0.13 (1.55)
R^2	0.65	0.66	0.67	0.66	0.66

t-statistics in parentheses

* The regressor DUJAP is a country specific dummy for DUB for Japan. This is the only country for which a country specific effect was found in the data: its positive estimate implies that an increase in Japanese unemployment has a much stronger effect on budget deficits than in any other countries. The results, however, do not depend in any way on the inclusion of this variable.

[1] Some of the recent contributions to the debate on fiscal convergence and EMU include Buiter and Kletzer (1990), Bovenberg, et al. (1990), Giovannini and Spaventa (1991), Glick and Hutchison (1990), Padoa Schioppa (1990), Van der Ploeg (1990) and Wyplosz (1990).

[2] For an detailed overview of this debate, see Woolley (1991).

[3] Of course, deficits might be optimal also for many other reasons that are not tax–smoothing related (see Buiter and Kletzer (1991) on this). In this paper, however, we will concentrate on tax smoothing arguments in favor of fiscal imbalances.

[4] A second class of arguments suggesting the benefits of fiscal coordination and/or fiscal discipline rules is based on "economic" rather than "political" externalities. Since government spending and fiscal deficits might spillover on other countries, discretionary fiscal policy might lead to "excessive" fiscal spending and/or deficits. We agree with Buiter and Kletzer (1991) and Giovannini and Spaventa (1991) that too much attention has been given in the literature to these arguments suggesting the need for fiscal coordination.on the basis of the economic externalities and international spillovers of non cooperative fiscal policies. We believe that a much stronger case for fiscal discipline can be made by considering that excessive deficits caused by political and structural biases might threaten the stability of the monetary union in the long run.

[5] The nature of these negative effects is varied but one of the main concerns of a number of EC countries is that an unsustainable fiscal policy by a member country leading to a fiscal crisis will force the others to a fiscal "bail–out" of the deviant country. Alternatively, a fiscal and financial crisis in one EC country could quickly spread to other countries and force the future EuroFed to inject excessive liquidity in the EC area and therefore create monetary and price instability. Germany has been especially concerned about this bail–out risk and introduced language in its draft of the treaty

stressing that the Community has no obligation to bail out the member states. However, many observers are concerned that,- regardless of formal or informal statements about a "no bail–out" rule, the Community would be hard pressed to intervene and support a member country in case excessive deficits would lead to a financial crisis and a risk of default.

[6] The parameter $\mathbf{C}$ is chosen in such a way as to make the process consistent with the desired long run value of d. In other words, the value of $\mathbf{C}$ is found by solving the dynamic equation of the debt to gdp ratio for the steady state,

$$\text{def} = \frac{\mathbf{C}}{1-\mathbf{f}}$$

and posing def=.03. For example, setting $\mathbf{f}$=.8 will make $\mathbf{C}$ equal to .006.

[7] In this simulation, we correct the debt figure to take into account that gross debt includes liabilities towards the Central Bank.

[8] The stability of the data generating process describing the series is really the key point in the construction of this class of tests. In our empirical analysis, the stability of the DGP will be taken as a maintained assumptions (for a discussion of the conceptual as well as technical aspects of this issues, see Corsetti and Roubini 1991). Weber carries out similar econometric work including an endogenous procedure to test for within sample structural breaks. For example, he shows that the series of net debt in Belgium does exhibit a break, so that there is no evidence of insolvency for this country.

[9] Since non–stationarity *per se* rules out (3.1) for a non–zero debt, other contributions to the literature consider it sufficient to rule out the hypothesis of solvency regardless of the presence of a deterministic components in the DGP (Wilcox 1989, Buiter and Patel 1990). However, this approach magnifies the power–related problems in the actual implementation of the test. In fact, given a small sample size, available tests for non–stationarity tend to accept the null hypothesis of a unit root too often.

[10] In the case of Portugal, the published time series for the stock of public debt is not long enough to permit us to test for solvency of the public sector.

[11] Net investment refers to general government gross capital formation minus depreciation.

[12] See also Corsetti (1991).

[13] It can also be observed that the results obtained in this section are broadly consistent with those obtained by using alterantive indicators of fiscal sustainability such as those used by Blanchard (1990) and Giovannini and Spaventa (1991).

[14] See Buchanan, Rowley and Tollison (1986) for a recent synthesis of this approach.

[15] See Persson and Svensson (1989) for a model with similar implications.

[16] In Cukierman and Meltzer (1987), different governments are characterized by differing abilities to forecast. In Rogoff and Sibert (1989) and Rogoff (1990) "competency" is referred to as the government's efficiency in reducing "waste" in the budget process. That is, more competent governments can produce more public goods for given fiscal revenues.

[17] To be precise, in Rogoff and Sibert (1988) the budget is always balanced, in the sense that the difference between spending and taxes is covered by seignorage.

[18] The results in this section partly draw on Roubini and Sachs (1989a) and Alesina, Cohen and Roubini (1991a) who present a more systematic analysis of the political determinants of budget deficits. Other recent empirical tests of political factors in fiscal policy making include Roubini and Sachs (1989b), Roubini (1991), Cukierman, Edwards and Tabellini (1991), Alesina, Cohen and Roubini (1991b) and Grilli Masciandaro and Tabellini (1991).

[19] The size of the sample in this section is limited by the availability of consistent OEC data on public debt (see Roubini and Sachs (1989)). The countries (and sample periods) included are as follows: Austria (1970–1985), Belgium (1960–1985), Canada (1961–1985), Denmark (1971–1985), France (1960–1985), Finland (1970–1985), Germany (1960–1985), Italy (1964–1985), the Netherlands (1970–1985), Norway (1970–1985), Sweden (1970–1985),

the United Kingdom (1960–1985), the United States (1960–1985).

[20] This variable is included to capture the effects of real interest rates shocks. For example, after 1979 the increase in world real interest rates, significantly and unexpectedly raised most governments' costs of debt servicing. One useful measure of the budgetary costs of higher interest rates is given by the debt to GDP ratio multiplied by the change in the differential between real interest rates and growth rates.

[21] Its magnitude suggests that each 1 percentage point slowdown in GDP growth initially raises the budget deficit relative to GDP by 0.45 percentage points. Since the average slowdown in growth was on the order of 3 percentage points, the impact of this effect was a growth of the budget deficit relative to GDP by more than 1 percent of GDP.

[22] The index is constructed as follows. It takes values: 0 in a one–party majority parliamentary government; or a presidential government, with the same party in the majority in the executive and legislative branches; 1 in a coalition parliamentary government with 2 coalition partners; or in a presidential government, with different parties in control of the executive and legislative branches; 2 in a coalition parliamentary government with 3 or more coalition partners; 3 in a minority parliamentary government. Details on the construction of the index for each particular country can be found in Roubini and Sachs (1989a).

[23] The magnitude of the coefficient on the POL variable, 0.004, signifies that the difference, ceteris paribus, between a majority government and a minority government ($p = 0$ versus $p = 3$), is 0.012, or 1.2 percentage points of added budget deficit per year.

[24] Alesina, Cohen and Roubini (1991a, 1991b) present a more systematic analysis of electoral effects on budget deficits.

[25] In the conclusions to the paper, Alesina and Tabellini (1990) outline the implications

of their model for the case of output shocks.

[26] This "no entry clause" (unless fiscally sound) has been suggested by Giovannini and Spaventa (1991) as a fiscal discipline incentive.

[27] On this point see the discussion in Weingast and Garrett (1991).

[28] Weingast and Garrett (1991) and Milgrom, North and Weingast (1990) stress this important role of institutions as a means to enforce cooperation.