

# Budgeting versus implementing fiscal policy in the EU\*

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## ABSTRACT

Using real-time data from Europe's Stability and Convergence Programs, we explore how fiscal plans and their implementation in the EU are determined. We find that (1) implemented budgetary adjustment falls systematically short of planned adjustment and this shortfall increases with the projection horizon, (2) variability in the eventual fiscal outcomes is dominated by the implementation errors, (3) there is a limited role for "traditional" political variables, (4) stock-flow adjustments are more important when plans are more ambitious, and (5), most importantly, both the ambition in fiscal plans and their implementation benefit from stronger national fiscal institutions. We emphasise also the importance of credible plans for the eventual fiscal outcomes.

## 1. Introduction

Research on fiscal policy has regained popularity in recent years. A growing literature estimates fiscal reaction functions using data on fiscal outcomes. However, *actual* fiscal policymaking takes place in different stages and each stage of the budgetary process is affected by its own determinants. In this paper we shall explore the factors determining fiscal policy in the European Union (EU) countries in its different stages. Von Hagen and Harden (1995) describe a full budget cycle as consisting of four steps: the planning process in government, the adoption of the Annual Budget Law by the parliament, implementation and

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ex-post control. We ignore the last step, while we take the first two steps together as the *budgeting* (or *planning*) stage. To the best of our knowledge, our approach of systematically and simultaneously exploring fiscal policy in its various stages is new.

While policymakers regard the budget as “the single most important policy document of governments, where policy objectives are reconciled and implemented in concrete terms” (OECD, 2002), the literature has paid scant attention to the empirical modeling of the planning stage, an omission that we will try to address in this paper. Moreover, it is important for the budget to be credible because “A lack of credibility increases the likelihood of *overshooting the deficit target or increasing the level of arrears*. This can arise from pressures created by over-optimistic revenue forecasts and under-budgeting of non-discretionary expenditures (e.g. utilities, salaries, entitlement payments). It can also arise from non-compliance in budget execution (e.g. revenue leakages or unbudgeted expenditures).” (World Bank, 2005, p.66). To assess the credibility of the planning process it is important to investigate planning and implementation jointly. Both stages are subject to different incentives and constraints, implying that implementation may differ from plans.

When forming their plans governments are under political pressure to be ambitious in terms of fiscal discipline as well as generous to the various groups in the voting population. Hence, there are several reasons why plans may differ from realised fiscal outcomes. The macro-economic scenario may unfold differently than foreseen in the plan, possibly as a result of over-optimistic predictions of economic growth (see also Jonung and Larch, 2006, and Milesi-Ferretti and Moriyama, 2006). Further, fiscal plans may be distorted by the need to comply with ex-ante fiscal rules that require fiscal discipline only in terms of plans but not in terms of outcomes. This is, in particular, the case for the so-called Stability and Convergence Programs (SCPs) of Europe’s Stability and Growth Pact (SGP). These Programs contain fiscal and macro-economic projections for the year ahead, based on the national annual budget, as well as for the medium run. The projections should be consistent with (roughly) attaining budget balance in the medium run. Finally, when it comes to implementation, discipline often requires hurting specific groups with spending cuts or tax increases. Obviously, resistance from these groups may obstruct the execution of the fiscal plans. Also, and related, political instability and elections may hamper adherence to the plans. However, we expect that institutions that strengthen the link between fiscal planning and implementation (in particular, medium term budgetary frameworks) should bring the two stages closer together through better planning, better implementation or both. We shall

explore the role of those institutions both at the national and supranational level.

The second major contribution of this paper is that we employ *real-time* budgetary and macro-economic data. Real-time data have initially been used for monetary policy analysis by Orphanides (1997), while only recently researchers have started to use such data for fiscal policy analysis (e.g. Forni and Momigliano, 2004, Cimadomo, 2007 and Giuliadori and Beetsma, 2008). Our real-time data are the budgetary plans and the so-called *first-release* data, which are the figures over the current year published towards the end of the current year. Our data come from the SCPs submitted by the EU countries for the years 1998 - 2007 as part of their obligations towards the SGP.

Compared with *ex-post* (i.e., latest available or *revised*) data, used by the majority of related papers estimating fiscal policy reaction functions, real-time data have two major advantages. First, these are the data that are as close as possible to the information sets of the policymakers when they form their plans and when they implement their actual policies. We model fiscal plans based on the information that was available to the policymakers themselves at the moment they constructed their plans. Using the first-release data we also model the implementation stage on the basis of new information becoming available in *real-time* during the year the implementation takes place. Hence, also in our study of this stage we remain as close as possible to the actual information set of the policymakers. Ex-post data, by contrast, are usually the result of revisions on the basis of new information (for example, on potential output growth) that becomes available (long) after the decision moments have passed. Hence, ex-post data may include more information than the authorities had when they formed their policies. This carries a potential for wrong inference about their behaviour. Moreover, ex-post data may differ from the real-time data available to policymakers because construction methodologies change as time passes. Second, our real-time data from the SCPs are also the data on which the (first) judgment about fiscal policy is based, for the planning stage by both the national parliaments and the ECOFIN and for the implementation stage by the ECOFIN. This contrasts with the data from international organisations such as the OECD and the IMF, which are often used in fiscal policy studies but which are “filtered”.

We explore the role of the macroeconomic and related determinants – such as output growth, the debt ratio, the excessiveness of a deficit in the EU context and the persistence of the fiscal instrument – of fiscal policy reaction functions as estimated in many articles. For the planning stage we find that a more favourable initial budget leads to less ambitious plans, while a (larger) excessive deficit or better growth projections lead to more ambitious plans.

Implementation of the plan is better if the initial budgetary situation is worse, the original plan is less ambitious and past adherence to the plan is better. Also, not surprisingly, positive output growth surprises facilitate adherence to plans.

With the macroeconomic and related variables included as controls, we shall further explore the role of political factors, such as those that lead to common pool problems and government myopia, for fiscal policy in the two stages. The empirical literature has shown that political variables affect both public deficits and the components of the public budget (e.g. Perotti and Kontopoulos, 2002). While we do find a role for politics, in particular for variables capturing government turnover and ideological shifts, it does not seem to be as important as is sometimes claimed in other work (as, for example, in Fabrizio and Mody, 2006, for recent EU entrants).

Besides exploring the determination of the overall balance in its different stages, we shall investigate how its components, public spending and revenues, are determined at both the planning and the implementation stages of the fiscal process. Also here we analyse the role of macroeconomic and political factors. The split into the components of the overall budget provides additional insight into why governments often deviate so much from their original plans. Our investigation indicates that most of the “action” (i.e., the shortfall of implementation from planned adjustment) is in government spending.

There is evidence from the literature (e.g., Von Hagen and Wolff, 2006) that in order to meet the EU deficit criteria countries have resorted to “creative accounting” resulting in so-called stock-flow adjustments (differences between debt accumulation and deficits). For example, the accumulation of revenue arrears or payments of expenditure in advance may increase the debt ratio (recorded on a cash basis) but not the deficit ratio (recorded on an accrual basis). Moreover, financial assets can be sold in order to reduce the gross debt ratio without influencing the budget balance (Buti et al., 2006). Hence, observed deficits may not give a complete picture of a country’s adherence to fiscal discipline. We find that more ambitious plans lead to more unplanned stock-flow adjustment at the implementation stage, consistent with the idea that governments try to limit implementation errors with more creative accounting.

As a final step in our analysis we explore the role of national fiscal institutions for fiscal policy in each of its two stages. The split into the two stages also has the advantage that the effect of improvements in national institutions can be more accurately estimated, because these institutions may affect the two stages differently. The strength of national fiscal

institutions is measured by the presence and strength of a potential medium-term budgeting framework (*MTBF*) and of numerical fiscal rules (*FISRUL*). A number of contributions have explored the role of those institutions for fiscal outcomes using ex-post data. Employing real-time data, and controlling for the relevant economic and political determinants, we find that higher scores on the *MTBF* index and on the *FISRUL* index are associated with both more ambitious plans for budgetary improvement and with better adherence to those plans.

The remainder of this paper is structured as follows. Section 2 discusses its relation with the literature. Section 3 elaborates on the potential trade-offs in setting plans and choosing the eventual outcomes, followed by our decomposition of fiscal outcomes into plans and implementation errors and the presentation of summary statistics for the two stages of the fiscal process. Section 4 estimates the determination of planned budgetary adjustment and implementation errors. Section 5 investigates the determinants of the components of the budget, while Section 6 explores the role of stock-flow adjustment as a way to mitigate implementation errors. Section 7 studies the effectiveness of national arrangements for fiscal discipline, while Section 8 discusses the policy implications of our analysis. Finally, Section 9 concludes this paper.

## **2. Related literature**

Our analysis connects to several recent strands in the literature. The first is the literature that estimates fiscal rules using ex-post data. However, it ignores that in reality budgeting takes place in distinct phases. An early contribution to this literature is Bohn (1998). He explores how U.S. fiscal policy reacts to output gaps and government debt. A number of subsequent contributions, such as Favero (2003), Balassone and Francese (2004) and Annett (2006), have estimated fiscal policy rules for a broader set of countries, in particular for the EU or the OECD. The focus of those analyses has mostly been the cyclical response of fiscal policy (the cyclically-adjusted deficit or its components) to the business cycle. Golinelli and Momigliano (2008) provide an overview of this literature. Fiscal policy is often found to have reacted pro-cyclically to output gap movements. See, for example, Galí and Perotti (2003) and Wyplosz (2006) for the Eurozone and Lane (2003) and Debrun and Kumar (2007) for the OECD.

Recently, a new literature has emerged that uses real-time data (sometimes in

combination with ex-post data) to explore the behaviour of the fiscal authorities. Such analysis has been made possible only recently through the availability of sufficient data. Most datasets start in 1994 or 1995. Forni and Momigliano (2004) estimate fiscal policy rules by relating ex-post fiscal indicators to real-time data on output gaps. They find that the fiscal stance is relaxed in response to adverse cyclical conditions or a lower ex-post debt level. In explaining planned fiscal stances, Cimadomo (2007) finds that fiscal policy is particularly counter-cyclical during an economic boom. Giuliadori and Beetsma (2008) extend the set up of Cimadomo (2007) by linking individual countries' planned fiscal stances to the average planned stance of the other countries in the sample. They find strong positive co-movements of planned fiscal policy, which suggests potential peer pressure in fiscal planning.

A third strand of related literature addresses the accuracy of fiscal forecasting of international organisations such as the IMF, the OECD and the EC (e.g. Artis and Marcellino, 2001, and Brück and Stephan, 2006). The summary statistics in these contributions show little evidence of systematic forecast biases. The forecasts of international organisations are however “filtered” in the sense that they are based on independent growth projections, and only take those measures into account that are likely to be implemented in practice. Hence, the goal of producing unbiased forecasts is attached a high weight in the objective functions of these institutions. The data that we use are of a different nature, given that we use the fiscal plans from the national budget laws. Contrary to most related studies, however, Strauch et al. (2004), Annett (2006), Moulin and Wierdsma (2006) and Von Hagen (2008) do use data from the SCPs. Pina and Venes (2007) use data on SGP Excessive Deficit Procedure notifications.

The final strand of the literature to which this paper relates explores the role of the political and institutional determinants of fiscal policy. Controlling for economic determinants and using ex-post data, Fabrizio and Mody (2006) explore the role of political determinants and the quality of fiscal institutions in determining the fiscal outcomes for the prospective EU member states over the period 1997-2003. Institutional quality is captured by an index based on the quality of the budgeting process in the planning (preparation), authorisation and implementation stages of fiscal policy. The authors conclude that contemporary politics is more important than economic circumstances and that it matters through government fragmentation and ideology. More inclusiveness (voter participation) appears to undermine fiscal discipline. However, fiscal profligacy is strongly affected by the quality of the budgeting process. Looking at expenditures and revenues separately, they find

that a higher-quality budgeting process is associated with lower expenditures. Also using ex-post data, Debrun et al. (2008) focus on the role of *national* fiscal rules for fiscal outcomes. They also find that politics matters for the fiscal outcomes, but its role is primarily confined to variables capturing time fragmentation (government stability and electoral budget cycles), rather than those that capture size fragmentation (common pool problems due to government fragmentation and related to district magnitude) – see Box 1. Importantly, they conclude “that stronger and more encompassing fiscal rules tend to encourage higher cyclically adjusted primary balances, after taking into account other factors potentially affecting fiscal behaviour.” They establish that balanced budget and debt rules have a strong and significant effect, while this is not the case for expenditure rules. Brück and Stephan (2006) and Pina and Venes (2007) explore the political determinants of forecast errors in fiscal policy, while controlling for economic variables. Goemminne et al. (2008) analyse the determinants of local government tax revenue forecast errors from the Flemish municipalities. Closest in spirit to our paper is Von Hagen (2008) who explores the effect of institutional factors (the form of fiscal governance and the tightness of fiscal rules) on implementation errors. However, his analysis differs in a number of substantial ways from ours. He does not model the planning stage, nor does he address the role of political variables. Further, he constructs implementation errors as the deviations of fiscal plans from the ex-post (rather than first release) observed figures. Also, his sample period is shorter.

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### **BOX 1: political distortions and budgetary discipline**

Budgetary pressures from political distortions may arise in two major ways. The first source of bias is “size fragmentation”, which results in common pool problems and makes it more difficult to agree on corrective fiscal measures. While the original version of the common pool problem analysed in Shepsle and Weingast (1981) produces a spending bias (and not necessarily a deficit bias), more recent analyses explain how the common pool problem may lead to a deteriorating budget. A surplus may give rise to a “voracity effect” (Tornell and Lane, 1999, and Lane, 2003), in which each party tries to grab as much as possible of the surplus, as otherwise other parties will appropriate those resources. Political fragmentation may also cause an “attrition war” (Alesina and Drazen, 1991) that produces persistent deficits in spite of the fact that everyone agrees that budgetary reform is needed.



### ***3.1. A conceptual framework***

#### *3.1.1. The budgeting stage*

The budgeting (or planning) stage is probably the most crucial moment in the annual parliamentary cycle, which is subject to intense coverage and interest by the press and the general public. The budget can be seen as a summary of how the cabinet will achieve specific policies that it promises to the voters (e.g. expenditure on health care, education, pensions, and so on), how it will finance those policies, and therefore how fiscally disciplined it will appear. Obviously, the budget is also the result of negotiations between different coalition parties and different spending ministers within the cabinet. These negotiations are aimed at balancing many conflicting demands on the budget. National and supranational fiscal rules may request a prudent development for the budget balance and/or expenditure and revenue. Different spending ministers and political parties may have different strategic objectives on how to spend the common pool of tax resources. The prime minister and the minister of finance may want to avoid an increase in taxation, and may act as guardians of the budget constraint; at least insofar it influences their perceived chances for re-elections. Resolving all these conflicting objectives can be a challenging process. Therefore, the rules and procedures that govern the budget process have evolved in such a way that they facilitate the process of conflict resolution. For those directly involved, it is common to trade off the probability that an agreement can be reached against the desirability of the result from a purely economic perspective.

In practice there are several options for balancing conflicting demands at the budgeting stage, with the aim of reaching political agreement on the budget. For example, the outcomes of planned expenditure cuts may be overestimated, so that ex ante more room for fiscal manoeuvre is created. Moreover, overly optimistic growth and revenue projections create room for manoeuvre on the expenditure side of the budget while avoiding a deterioration in the projection for the budget balance.

What emerges from this discussion is, first, that existing trade-offs between the objectives of fiscal policy (for example, sustainability versus short-term spending objectives) may have been hidden in the annual budget law. Politicians may want to use the budget to appear fiscally disciplined, while also responding to the many urgent specific policy needs of society. As such, the trade-offs will only become fully visible during the implementation stage. Second, it may be that the goal of producing unbiased forecasts would receive little

weight during the budget negotiations, given that politicians are already overburdened with balancing many conflicting demands.

### *3.1.2. The implementation stage*

If incentives indeed exist for hiding policy trade-offs during the budgeting stage, then tensions will obviously arise during the implementation stage when these trade-offs will become visible. For example, if the proceeds from expenditure cuts fall short of what was planned, then both the expenditure ratio and the budget balance would show a less favourable development than anticipated in the budget law. However, the annual budget is not merely a fiscal projection, but it actually represents parliamentary approval for implementing expenditure and tax policies as they have been laid down in the law. This raises the question on the legal room for manoeuvre for deviating from the budget law. Investigation of the results from an OECD questionnaire (OECD, 2008) on budgeting practices and procedures shows that all EU countries for which this information is available (and in any case all countries that were EU member before 2004) allow the government to increase mandatory spending once the budget has been approved by the legislature. Moreover, the vast majority of the countries in this sample also allow for an increase in discretionary spending after budget approval. Another cause for departing from the budget law emerges when the economic scenario unfolds differently than foreseen, possibly as a result of biases in the growth projections underlying the national budgets.

An important question is why budgetary planning often seems to receive more attention than implementation (for example, fiscal rules frequently focus more on planning than on implementation). One reason may be that governments generally find it difficult to stick to their plans. To avoid being exposed as incompetent or profligate, politicians may have an interest in suppressing attention to and discussion of the implementation phase of the budget. If necessary, governments are quick to blame worse than expected outcomes on “bad luck” rather than unrealistic budget plans. Our systematic decomposition of fiscal outcomes into plans and implementation and the available information on the underlying macroeconomic scenario allow us to explore the role of unanticipated economic developments in deviations from the plans.

In concluding this part, we draw attention to two crucial distinctions that follow from the decomposition that will be at the centre of our discussion, as indicated in Table 1. First, in explaining observed fiscal adjustment, we will make a distinction between fiscal plans

contained in the annual budget law (one-year ahead projections) and medium-term fiscal projections that lack a clear legal status (two- and three-years ahead projections). Our hypothesis is that the plans in the annual budget law contribute more to any observed fiscal adjustment than plans contained in projections further ahead. Second, in explaining observed fiscal adjustment, we distinguish between the planning and implementation stage of fiscal policy. On the basis of previous studies (e.g. Moulin and Wiertz, 2006, and Von Hagen, 2008) we expect fiscal projections to be used strategically implying that implementation errors are not unbiased. In addition to providing more systematic evidence on this issue, we are most of all interested in the size and variability of the implementation errors relative to planned adjustment, so that we can evaluate the information content of the annual budget law in relation to the observed fiscal adjustment.

**Table 1: Plans and implementation**

Period ahead	Plan	Implementation
1	Annual Budget Law	Implementation of Budget Law
2	Projection	Implementation of Projection
3	Projection	Implementation of Projection

### 3.2. Decomposition of actual fiscal adjustment in plans and implementation errors

Actual budgetary adjustment, measured by the change in the budget surplus  $s$  in percent of GDP, can be decomposed as follows:<sup>1,2</sup>

$$\left(s_{t+i}^{t+i} - s_{t+i-1}^{t+i}\right) = \left(s_{t+i}^t - s_{t+i-1}^t\right) + \left[\left(s_{t+i}^{t+i} - s_{t+i-1}^{t+i}\right) - \left(s_{t+i}^t - s_{t+i-1}^t\right)\right], i = 1, 2, 3 \quad (1)$$

where a *superscript* indicates the year of publication of the figure, while a *subscript* refers to the year to which the figure applies. For example,  $s_{t+i}^t$  is the surplus of year  $t+i$  forecasted in November/December year  $t$ ;  $s_t^t$  is the surplus of year  $t$  estimated in November/December

<sup>1</sup> Variables are always measured at the country level. However, for convenience throughout the paper we do not include a country index in the notation. In the sequel, the surplus  $s$  is assumed to be in percent of GDP. The same will be the case for revenues  $\tau$  and government spending  $g$ .

<sup>2</sup> We explore actual rather than cyclically adjusted balances because the former tend to be the focus of policymakers and the public, especially also in connection with the enforcement of fiscal rules. However, in our analysis we control for the economic cycle.

year  $t$ ;<sup>3</sup> and  $s_t^{t+i}$  is the surplus of year  $t$  as published in November/December year  $t+i$ .<sup>4</sup> Hence, the left-hand side of (1) measures the actual budgetary improvement between years  $t+i-1$  and  $t+i$ , based on the available information towards the end of year  $t+i$ . The first term on the right-hand is the corresponding budgetary improvement as *planned* towards the end of year  $t$ , while the term in square brackets is the deviation of the actual budgetary improvement from the originally planned improvement. This term will be labelled the (*implementation*) *error*. Taking a real time perspective, we ask to what extent observed fiscal adjustment – the left-hand side of equation (1) – can be explained by fiscal planning and the implementation of those plans.

One of the potential hazards in studying budgetary adjustment is that the data may come from different data releases. Hence, subsequent budgetary figures may differ in the way they are constructed. However, because (the components of) the three terms  $(s_{t+i}^{t+i} - s_{t+i-1}^{t+i})$ ,  $(s_{t+i}^t - s_{t+i-1}^t)$  and  $[(s_{t+i}^{t+i} - s_{t+i-1}^{t+i}) - (s_{t+i}^t - s_{t+i-1}^t)]$  in (1) are in differences for given releases, this problem should be substantially reduced (for example, methodological changes that affect the construction of  $s_{t+i}^{t+i}$  should also affect the construction of  $s_{t+i-1}^{t+i}$  and thus (largely) cancel out when differences are taken). This is one of the reasons for studying the determinants of changes in surpluses rather than the levels of the surpluses. The other reason is that with the adoption of the SGP, countries have committed themselves to striving for medium-term budget balance or surplus, an equilibrium situation that in most cases has not been achieved yet. Hence, also for this reason, it may be most appropriate to study planned budgetary changes (rather than levels) and deviations from those changes.

Another advantage of the decomposition in (1) is that it measures planned adjustment and implementation errors over the last year of the projection horizon, rather than over the entire projection horizon. The combined projections at  $t$  for the different projection horizons provide us with planned adjustments and implementation errors for each of the individual three years ahead.

### 3.3. Summary statistics

We now present summary statistics for our decomposition (1) into plans and errors.

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<sup>3</sup> This will still be an “estimate”, because the figure is published before the year is finished and it may be subject to further revision.

### 3.3.1. Budgeting versus implementation: sample averages

Table 2 presents means and variances of the changes in the surpluses and the components of those changes (see equation (1)) computed over all available observations in the sample. We do this for the forecasting horizons of  $i = 1, 2$  and 3 years. We also report the corresponding figures for a split of the surplus into government expenditures and revenues. The figures are for the EU-14, that is, the set of countries (minus Luxemburg) that were already EU members before the wave of new entrants in 2004. We focus on this group of countries, because the time dimension of the data in the analysis below is too small for the other EU members. Further, because we want to compute average implementation errors, the projection horizon cannot go beyond 2007 and, hence, the number of observations shrinks as  $i$  increases.

A number of interesting observations can be made. First, planned budgetary adjustment is always positive and increases with the projection horizon. By contrast, the implementation error is always significantly negative and increasing in absolute magnitude as the projection horizon increases. The negative implementation errors dominate the positive planned adjustment, thereby producing negative actual adjustment.

Which side of the budget does the implementation “bias” come from? To answer this question, we turn to the split of the surplus in spending and revenues. Planned revenue changes are negative at any horizon, while the implementation error in revenues is always positive, but only significant at the one-year horizon. Planned revenue changes dominate the implementation errors and, hence, the outcomes for revenue changes are on average negative. The main action is in expenditures, however. For any year into the future, expenditures are planned to be cut. However, the implementation error is always positive, highly significant and substantial. Moreover, it is increasing in the horizon. Hence, governments are increasingly ambitious in cutting spending the further they project ahead, while in the implementation they fail by an ever-larger margin. The increase in the implementation error may not be surprising, as one-year ahead projections are covered by the annual budget law while this is not the case for projections further out. Hence, we may expect the scrutiny of one-year ahead projections to be tighter than for long-horizon projections. Overambition at longer projection horizons apparently is perceived not to be very costly.

Countries seem to plan a “win-win” strategy: expenditure is reduced more than revenue, so that there is a simultaneous improvement of the budget balance and a reduction

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<sup>4</sup> The latter is a revised figure, but it may not yet be the definitive figure, depending on how large  $i$  is.

of the tax burden. The implementation errors show that both expenditure and revenues turn out to be higher than planned, while the actual outcomes show very little change on average. A possible explanation is that since expenditure is not reduced as planned, there is less room to reduce revenues, which may be planned to achieve a given target for the budget balance.

In a further search for the sources of the implementation errors, it may be instructive to also study the projections and prediction errors in real GDP growth (where  $y_{t+1}^v$  will denote GDP *growth* between  $t$  and  $t+1$  as calculated from data from vintage  $v$ ). At all horizons GDP growth is projected too optimistically with an overprojection error that is increasing in the horizon and always highly significant.

When spending plans are based on too optimistic projections for GDP, and given the low elasticity of spending with respect to changes in the business cycle, the actual spending ratio is likely to exceed the planned ratio when GDP turns out to be worse than projected. However, Wierts (2008) demonstrates that this denominator effect tends to be small on average implying that the failure to implement planned spending cuts is not so much due to overoptimism about economic activity, but more due to overambitious planning. Note that we would a priori not expect to see mistakes in growth projections to produce corresponding implementation biases in taxes, because taxes are highly elastic with respect to activity changes. If activity falls behind its projection, also taxes fall behind their projection and the movement in the tax ratio is at least dampened.

It is interesting to see whether specific (groups of) countries are responsible for the systematic deviations of the implementation errors from zero, or whether all countries behave more or less similarly in this regard. Therefore, Additional Appendix A reports the results of the regressions of the implementation errors on country dummies. As far the adjustment of the overall budget is concerned, an overwhelming majority of the countries shows an underperformance in terms of implementation, although in many instances the average error is not significant due to the low number of observations per country. The frequency at which significance occurs rises with the distance to the year in which the projection is made.<sup>5</sup> As far as spending is concerned, almost all countries implement smaller spending reductions than planned. At a one-year horizon, four averages are significant, while for two or three years ahead significance occurs in nine instances.<sup>6</sup>

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<sup>5</sup> All instances of significance arise from too little budgetary adjustment compared to the plan.

**Table 2: Summary statistics for outcomes, plans and implementation errors in EU-14**

	surplus change			spending change			revenues change			GDP growth		
	<i>1 year ahead</i>											
	actual	planned	error	actual	planned	error	actual	planned	error	actual	projected	error
mean	-0.04	0.12	-0.15** (0.07)	-0.13	-0.43	0.30*** (0.08)	-0.16	-0.29	0.14** (0.07)	2.51	2.71	-0.19** (0.09)
st.dev	1.06	0.70	0.81	1.02	0.70	0.84	0.96	0.75	0.72	1.62	1.20	1.02
N	125	125	125	118	118	118	119	119	119	125	125	125
	<i>2 years ahead</i>											
	actual	planned	error	actual	planned	error	actual	planned	error	actual	projected	error
mean	-0.11	0.24	-0.35*** (0.10)	-0.13	-0.60	0.47*** (0.09)	-0.22	-0.34	0.12 (0.08)	2.45	2.82	-0.37*** (0.12)
st.dev	1.07	0.45	0.98	1.03	0.47	1.00	0.92	0.52	0.87	1.59	0.98	1.29
N	111	111	111	105	105	105	105	105	105	111	111	111
	<i>3 years ahead</i>											
	actual	planned	error	actual	planned	error	actual	planned	error	actual	projected	error
mean	-0.22	0.29	-0.51*** (0.11)	-0.01	-0.56	0.55*** (0.10)	-0.20	-0.27	0.06 (0.08)	2.22	2.83	-0.61*** (0.10)
st.dev	1.07	0.31	1.01	0.95	0.42	0.97	0.90	0.37	0.81	1.38	0.93	1.16
N	97	97	97	91	91	91	91	91	91	97	97	97

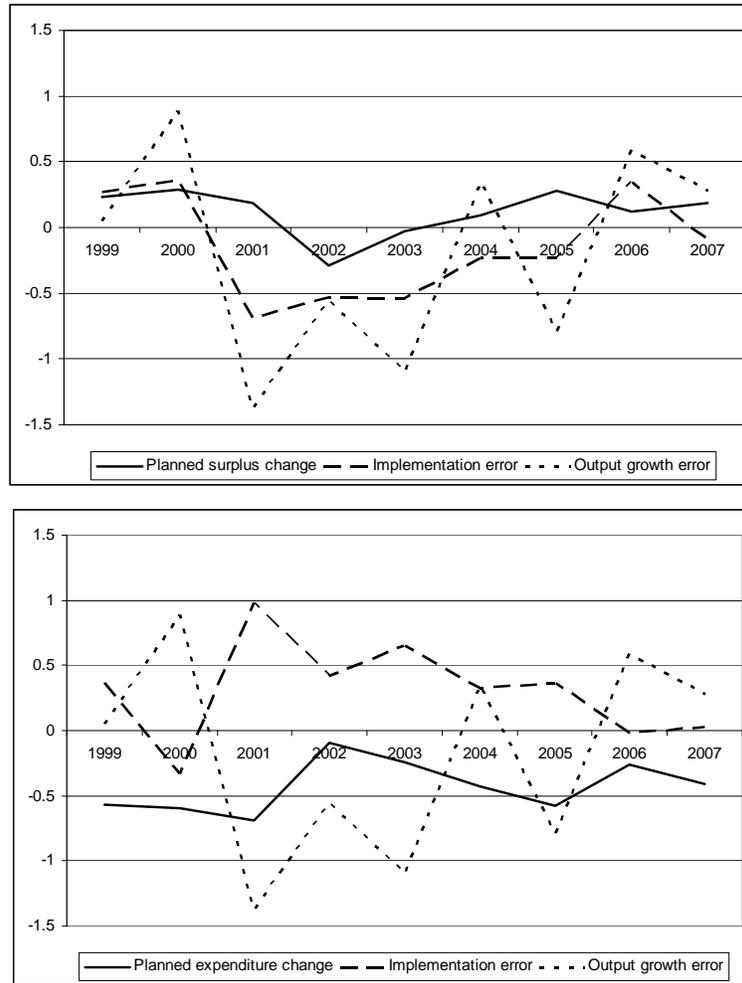
*Notes:* Surpluses ( $s$ ), spending ( $g$ ), revenues ( $\tau$ ) and GDP growth are in percent of GDP. Hence, all means and standard deviations are in percentage points of GDP. Further, “st.dev” = standard deviation; “N” = number of observations. In brackets we show the standard error of the constant in the regression of the original error on a constant and country fixed effects. The standard error computed in this way is robust against potential non-normality of the implementation errors, but always turns out to be virtually identical to the standard error underlying the standard t-test. Next, \* = significance at the 10% level; \*\* = significance at the 5% level; \*\*\* = significance at the 1% level. Finally, to provide some examples of the link to the formal notation: “surplus change 1 year ahead actual” =  $s_{t+1}^{t+1} - s_t^{t+1}$ , “surplus change 1 year ahead planned” =  $s_{t+1}^t - s_t^t$ , “surplus change 1 year ahead error” =  $s_{t+1}^{t+1} - s_{t+1}^t - s_t^{t+1} - s_t^t$ , “surplus change 2 years ahead actual” =  $g_{t+2}^{t+2} - g_{t+1}^{t+2}$ , and “GDP growth 1 year ahead actual” =  $y_{t+1}^{t+1}$ .

### 3.3.2. Budgeting versus implementation: period averages

This subsection compares plans and implementation errors on a period-by-period basis, thus taking averages over countries. We confine ourselves to one-period ahead forecasts. The top panel of Figure 1 shows planned surplus changes and the corresponding implementation errors together with the differences between actual and projected GDP growth, while the bottom panel of Figure 1 shows the analogous figure for government expenditures.

<sup>6</sup> All instances of significance occur when spending cuts are too small compared to the plan.

**Figure 1: Period averages.**



*Note:* all lines are in percentage points of GDP.

Clearly, given that its implementation error is mostly negative, actual budgetary adjustment falls short of planned adjustment in most years. Only during the boom years 2000 and 2006, when output growth substantially exceeds its projection, is there more budgetary adjustment than projected. Government expenditures follow a corresponding, but even more extreme pattern. Expenditure cuts exceed the projected spending cut only in 2000, while the implementation error is roughly zero in 2006 and 2007. In all the other years, planned spending cuts exceed realised spending cuts. Further, there seems to be some indication that implementation errors are getting smaller (in absolute value) towards the end of the sample period. However, a first look at preliminary data for 2008 indicates that the impact of the economic crisis leads to a substantial increase in the implementation errors.

### 3.3.3. Budgeting versus implementation: variance decomposition

According to (1), the variance of the actual budgetary adjustment can be decomposed into the covariance with its planned adjustment plus the covariance with its implementation error. Changes in expenditures and revenues can be correspondingly decomposed.

Table 3 shows that the main contribution to the variability in the outcomes is caused by its covariance with the implementation errors. This is the case for surpluses, government spending as well as revenues. Moreover, the relative dominance of the covariance with the implementation errors tends to increase rather strongly with the projection horizon, which suggests that at horizons beyond one year plans are rather uninformative about the eventual fiscal outcomes.

**Table 3: (Co-) variances without and with demeaning for EU-14**

	Without demeaning				With demeaning		
	1 yr ahead	2 yrs ahead	3 yrs ahead		1 yr ahead	2 yrs ahead	3 yrs ahead
<b>surplus change</b>							
	actual				actual		
actual	1.12	1.15	1.14		1.03	1.05	1.01
planned	0.48	0.19	0.11		0.38	0.12	0.07
error	0.64	0.96	1.03		0.65	0.93	0.94
<b>spending change</b>							
	actual				actual		
actual	1.04	1.06	0.90		0.79	0.82	0.67
planned	0.41	0.14	0.06		0.22	0.05	0.02
error	0.63	0.93	0.83		0.56	0.77	0.65
<b>revenues change</b>							
	revenues change				revenues change		
actual	0.92	0.85	0.81		0.71	0.64	0.60
planned	0.49	0.18	0.14		0.28	0.09	0.10
error	0.44	0.67	0.67		0.43	0.55	0.51

Notes: see Table 2. Further, rounding errors may prevent exact adding up of covariances to the variance of the outcomes.

## 4. Determinants of planned and implemented budgetary adjustment

### 4.1. The regression framework

We analyse the plans and implementation errors using separate regressions. In view of the

limited number of observations per country, a panel analysis is unavoidable.<sup>7</sup> Obviously, this assumes homogeneity in the relationship between fiscal policy and its determinants in each of the two stages. EU membership requires quite a substantial degree of similarity among the countries and should help to support this assumption. However, we also control for potential heterogeneity by including country-fixed effects. Another potential econometric obstacle is measurement error. For both fiscal stages we estimate relationships in real-time, where we try to approximate the information sets of the policymakers when they take their decisions. Hence, any potential measurement error concerns the deviation of our dataset from the policymakers' datasets (and *not* the accuracy with which our data approximate the eventual outcomes of variables such as output). However, precisely because we observe our data in real time, such measurement error should be small and it should in any case be much smaller than in the case of fiscal rules estimated with ex-post data that capture the policymaker's information set poorly.

The determinants of both stages can be classified into three broad groups: economic, political and institutional. High deficits and overspending are often attributed to political factors, which may affect both the planning and the implementation stage. For example, specific interest groups may resist the planning of spending cuts, but they may also resist the execution of such plans. To fight the lack of fiscal discipline and allow the ECB to pursue an independent monetary policy, the EU has adopted the SGP – see Box 2. Institutions also include national arrangements to promote fiscal discipline. We will explore their role in Section 7. We expect the impact of the preventive arm of the SGP (the SCPs – see Box 2) to show up in the planning stage. Governments are under pressure from the European Commission and the ECOFIN Council to put forward programs that depict a path towards the country's medium-term objective (MTO). We also expect the corrective arm of the SGP to have an influence during the planning stage. A larger difference between the current deficit and the 3% limit should induce governments to plan for a lower future deficit (to avoid sanctions).

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<sup>7</sup> Our sample includes the maximum amount of data that are available. The total number of degrees of freedom (taking into account the fixed effects) will be between 80 and 100, depending on the specific regression under consideration. This number should be enough to provide reasonably reliable results; dropping a year from our sample does not materially affect our results and, hence, suggests that adding more observations to our sample should not have any serious effects on our findings except that the significance of our estimates would increase.

\*\* \*\* \*\* \*\* \*\*

**BOX 2: The SGP before and after its revision**

While the EU Treaty includes a so-called Excessive Deficit Procedure (EDP) with reference values for deficits (3% of GDP) and debt (60% of GDP), some countries felt that this would not be sufficient guarantee for fiscal discipline and this fear led to the creation of the SGP in 1997.<sup>8</sup> The SGP consists of two arms. One is the regulation “on speeding up and clarifying the implementation of the excessive deficit procedure”. This is its “corrective arm” and it makes the EDP operational by specifying the time schedule and various criteria applied in the procedure. The other is the regulation “on the strengthening of surveillance of budgetary positions and the surveillance and coordination of economic policies”. This is the “preventive arm” and it aims at preventing excessive deficits by requiring countries to strive for a budget that is close to balance or in surplus in the medium run. As part of this regulation, each year the euro area members are obliged to submit a “Stability Programme”, in which they project their budgetary path for the coming years and the policies that support this path. EU countries that are not (yet) part of the euro area must submit similar “Convergence Programmes”. The European Commission assesses the programmes and provides recommendations on their content, after which the ECOFIN Council gives its opinion.

In the Spring of 2005, after repeated enforcement failure, the SGP was revised. This revision was partly aimed at discouraging pro-cyclical fiscal behaviour, by requiring budgetary adjustment to be judged in terms of its implications for the cyclically adjusted balance, net of one-off items and temporary measures. Further, public debt and sustainability now receive greater emphasis, as is also the case for structural reforms, including pension reforms. In operational terms, the medium-term objective (MTO) for budget balance at the end of the Stability and Converge Programme period was made country-specific, ranging from a minimum of -1% of GDP for low-debt and high-potential-growth countries to budget balance or surplus for high-debt or low-potential-growth countries. As long as a country has not yet reached its MTO, it should achieve an annual reduction in its cyclically adjusted deficit, net of one-off and temporary measures, of at least 0.5% of GDP as a benchmark.

\*\* \*\* \*\* \*\*

As discussed in Section 3, the effects of ‘surprises’ in the economic scenario should show up

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<sup>8</sup> For more details, see Eichengreen and Wyplosz (1998).  
19

at the implementation stage. These may be true surprises, for example a completely unforeseen slowdown in the world economy. However, surprises may also be the result deliberate mistakes in economic projections. Also, the need to get parliamentary approval may distort plans. For similar reasons one can imagine fiscal institutions (both at the national and the supranational level) to matter for the implementation errors. Existing evidence for the US suggests that ex-ante fiscal rules institutionalise fiscal surprises by distorting the planning process. In particular, they imply unrealistically disciplined fiscal plans, which then produce larger deviations of outcomes from the original plan.<sup>9</sup> For all these reasons, plans may have an effect on the implementation errors.

Based on the preceding discussion, we estimate regressions of the following format for the planned surplus increases, respectively their implementation errors,

$$(s_{t+1}^t - s_t^t) = f.e. + \beta_x x_{t+1}^t + \beta_p pol_t + error_t, \quad (2)$$

$$(s_{t+1}^{t+1} - s_t^{t+1}) - (s_{t+1}^t - s_t^t) = f.e. + \gamma_s (s_{t+1}^t - s_t^t) + \gamma_x (x_{t+1}^{t+1} - x_{t+1}^t) + \gamma_p pol_{t+1} + error_{t+1}. \quad (3)$$

where ‘*f.e.*’ stands for “fixed effects” (possibly both country- and time-fixed effects),<sup>10</sup>  $x$  is a vector that captures relevant macroeconomic variables as well as the role of the SGP,<sup>11</sup> and  $pol$  is a set of political variables. If plans are over-ambitious and therefore on average governments fail to implement them, we expect  $\gamma_s$  to be negative. Further, through the variables in  $(x_{t+1}^{t+1} - x_{t+1}^t)$  we can explore how implementation errors are linked to new information (becoming available between  $t$  and  $t+1$ ) on the economy in period  $t+1$ . For example, suppose that  $x$  is the GDP growth rate. Then,  $(x_{t+1}^{t+1} - x_{t+1}^t)$  is the deviation of the actual GDP growth rate between  $t$  and  $t+1$  from the projected GDP growth rate between  $t$  and  $t+1$ .

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<sup>9</sup> See Inman (1996, p. 14) on the US experience with ex ante rules: “*With ex ante budget balance rules state officials appear to overestimate revenues and underestimate expenditures to ensure budget balance at the beginning of the fiscal year, only to discover to their ‘surprise’ that projections are not realised*”. According to Inman (1996), monitoring and enforcement are crucial for promoting ex-post compliance with fiscal rules. Poterba (1996) summarises that out of the 44 states that must submit a balanced budget, 37 are also required to enact a balanced budget. Therefore, the fiscal rules in the remaining 7 states can be considered as weak.

<sup>10</sup> In the regression for plans, country-fixed effects control for potential country-specific systematic biases (such as over-optimism). Time-fixed effects control for any time-varying biases that are common across all countries.

<sup>11</sup> Some of the variables included in  $x$  in (2) will be values of these variables for the year  $t$ .

Our regression framework does not assume that governments have perfect control over the surplus, nor its components, in particular tax revenues. Government discretion may to a large extent be limited by the effects of the relevant explanatory variables that are included. Specifically, by controlling for the business cycle, we will implicitly allow budgetary adjustment to a large extent to be determined by economic developments beyond the control of the government. Nevertheless, governments have at least partial control over the budget and in particular also over tax revenues.<sup>12</sup> For example, they can affect tax revenues via both tax rates and tax bases. Although tax rates are generally perceived as more important determinants of revenues, also tax bases can be affected by policy as a recent tightening of enforcement in Italy has shown. Clearly, enforcement is a variable that is largely under control of the government.

#### **4.2. The planning stage**

Columns (1) – (3) of Table 4 present the estimates of the fiscal plan (2) for various sets of economic determinants  $x$  when we constrain  $\beta_p = 0$ .<sup>13</sup> The choice of  $x$  is largely guided by the literature. We use instrumental variables estimation, because planned budgetary adjustments may affect one or more of the variables on the right-hand side. In particular, we might expect the planned budgetary contraction to feedback to projected output growth. Hence, we always instrument this variable with the estimated output growth rate  $y'_t$  over the preceding period.

Consider first the regression in Column (1). The estimated current surplus  $s'_t$  has a strong negative effect on the planned surplus correction, in line with the idea that the more favourable is the estimated current state of the public finances, the less need is there for a future adjustment. Specifically, a worsening of the initial budget by 1% point of GDP raises planned adjustment by 0.4% point of GDP. Further, we include an “SGP” variable, which has been used in similar formats in, e.g., Forni and Momigliano (2004). It is defined as  $SGP'_t \equiv (DEF'_t - 3\%)$ , if  $DEF'_t > 3\%$  and zero otherwise. Here,  $DEF = -s$  is the deficit-GDP

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<sup>12</sup> The shocks in the regression equations capture components of the budget that are under the government’s control, assuming that all relevant explanatory variables are included. A growing literature following in particular Blanchard and Perotti (2002) now tries to identify discretionary tax and spending shocks.

<sup>13</sup> Using panel AR-1 regressions (both with and without fixed effects) we have established that there is neither serial correlation in the regression residuals of equation (2), nor in any of the regression equations introduced below. We also have checked the exogeneity of the instruments in all our regressions by regressing the residuals on the instruments not finding significance in any of the cases.

ratio. Hence,  $SGP_t^t$  is positive only when the country currently has an excessive deficit according to the Treaty definition. The rationale for including this variable in the regression is that in the presence of an excessive deficit a country needs to plan a correction in order to avoid sanctions at a later stage. Obviously, the more excessive is the deficit, the larger the correction needs to be. The results show that governments indeed obey this prediction. The coefficient on  $SGP_t^t$  is positive and significant; a current excessive deficit of 1% point of GDP produces an extra planned surplus increase of 0.2% point of GDP. We have also included the estimated debt level  $d_t^t$  as a motive for the sustainability of the public finances. However, contrary to what is found in many contributions on fiscal rules estimated with ex-post data this variable seems irrelevant here.

We consider also other potential determinants of the planned surplus correction. Not surprisingly, a projected positive output growth rate  $y_{t+1}^t$  has a strong positive effect on the planned budgetary improvement. In particular, a 1% point increase in the projected output growth rate raises planned budgetary adjustment by almost 0.5% points of GDP.<sup>14</sup> The overall effect captures the automatic and discretionary effects of the business cycle on the surplus change, as well as the possible effects of a projected change in potential output. Further, we added the projected change in the general price level (projected inflation rate)  $INFL_{t+1}^t$ , which we instrument with the estimated inflation rate over the current year,  $INFL_t^t$ . It exerts a positive, though insignificant, effect on the surplus correction.<sup>15</sup> The positive coefficient on projected inflation (measured through the GDP deflator) is in line with higher expected inflation eroding the real cost of servicing the public debt to the extent that the higher expected inflation is not reflected in a higher nominal interest rate. For example, in the euro-area nominal interest rates are roughly equal across countries and respond to the average euro-area inflation rate. Projected inflation may also reduce the real value of expenditures that are planned in nominal terms. Given its insignificance and the fact that its presence leaves the other coefficient estimates virtually unchanged, we will drop projected inflation from the ensuing regressions. Though not reported in Table 4, we also estimated expanded versions of the regression in Column (1) in which we included the spending, respectively

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<sup>14</sup> The European Commission (2005a) estimates the EU-15 (including Luxemburg) average sensitivity of the overall budget at 0.49. However, this number is obtained using output gaps and, as a result, is not fully comparable with our estimates.

<sup>15</sup> With OLS estimation the coefficient of the projected inflation rate drops to 0.15 and becomes close to significance at 10% level. Our instrument for projected inflation may simply be too weak to produce a

revenue, ratio in year  $t$  as measure of the size of the government. The idea is that with a larger government budgetary adjustment may be easier (there is more “slack” in the budget or more flexibility for making cuts). However, neither of the two ratios were significant, while, moreover, the estimates of the other coefficients were unchanged.

Column (2) of Table 4 drops the projected inflation rate, because it is insignificant (it keeps the debt ratio because the latter is included in most studies of fiscal reaction functions). The estimates of the remaining coefficients are essentially unchanged. Next, Column (3) drops the estimated current surplus  $s_t'$ . The coefficient on  $SGP_t'$  increases substantially. This is not surprising, because  $s_t'$  picks up the same effect as  $SGP_t'$ , although for a wider range of initial budgetary positions. The sensitivity with respect to the output growth forecast drops somewhat. Given the apparent importance of the initial surplus in explaining planned adjustment, we take Column (2) rather than Column (3) as our baseline specification.

While governments may be more concerned with the total surplus than with the primary surplus, the latter is probably more directly under their control. Therefore, we also estimate our baseline regression for the projected primary surplus adjustment, where as a regressor we include the period- $t$  primary surplus ( $sp$ ) instead of the period- $t$  actual surplus. The results are reported in Column (6) of Table 4 and do not materially differ from those in Column (2). Hence, we keep the latter as our baseline when we next consider the role of political factors.

Column (4) of Table 4 extends our baseline regression for the economic determinants with all the political variables available over the entire sample period. Only,  $GOV\_NEW_t$ , a dummy for whether there has been a change in the party composition of the government, comes out (positively) significant, suggesting that a new government on average plans to tighten the budget by an additional 0.3% of GDP. One reason may be that a new government initially wants to show its credentials in terms of budgetary discipline. The effects of the initial surplus, debt and the projected output growth rate on planned budgetary adjustment are unchanged. The coefficient on  $SGP_t'$  falls and becomes insignificant. This may be explained by the fact that in about half of the cases with a positive value of  $SGP_t'$  the government composition was also changed. Column (5) of Table 4 drops the insignificant political variables from the regression.<sup>16</sup> The coefficient estimates of the remaining variables are

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significantly positive effect in the IV regression.

<sup>16</sup> We would also obtain this specification if we add the political variables one-by-one to the specification in

essentially unaffected, except that  $SGP_t^i$  slightly increases and returns to significance. We take this equation as our baseline for the planning stage when we include political variables. Overall we can conclude that at the planning stage there is a role for political factors, but it appears to be rather limited.

**Table 4: Determinants of the planning stage**

	Dependent variable:					
	$s_{t+1}^i - s_t^i$					$sp_{t+1}^i - sp_t^i$
	(1)	(2)	(3)	(4)	(5)	(6)
$s_t^i$	-0.40*** (0.052)	-0.39*** (0.054)		-0.40*** (0.057)	-0.40*** (0.052)	
$sp_t^i$						-0.36*** (0.057)
$SGP_t^i$	0.20* (0.11)	0.26*** (0.098)	0.63*** (0.097)	0.14 (0.10)	0.16* (0.094)	0.29*** (0.11)
$d_t^i$	0.0005 (0.0071)	-0.0031 (0.0071)	0.013 (0.0082)	0.0006 (0.008)	-0.0007 (0.0068)	-0.016 (0.0098)
$y_{t+1}^i$	0.46*** (0.11)	0.54*** (0.096)	0.36*** (0.12)	0.56*** (0.11)	0.53*** (0.093)	0.59*** (0.11)
$INFL_{t+1}^i$	0.21 (0.18)					
$ELECT_{t+1}$				-0.009 (0.091)		
$GOV\_NEW_t$				0.30*** (0.10)	0.31*** (0.096)	
$GOV\_CHAN_t$				0.083 (0.091)		
$GOV\_TYPE_t$				-0.006 (0.049)		
$NMC_t$				0.001 (0.011)		
$NPC_t$				0.02 (0.048)		
$GOVPARTY_t$				0.015 (0.036)		
$GOV\_GAP_t$				0.067 (0.051)		
Estimation method	IV	IV	IV	IV	IV	IV
Fixed Effects	Y	Y	Y	Y	Y	Y
Time Effects	Y	Y	Y	Y	Y	Y
R <sup>2</sup>	0.64	0.62	0.44	0.63	0.65	0.62
Sample period (t = ...)	1998-2007	1998-2007	1998-2007	1998-2007	1998-2007	1998-2007
N	138	138	138	137	138	133

Notes: The dependent variables are in percentage-points of GDP, while  $s_t^i$ ,  $sp_t^i$ ,  $SGP_t^i$ ,  $d_t^i$  and  $y_{t+1}^i$  are all in percent of GDP and  $INFL_{t+1}^i$  is in percent. Further,  $ELECT_{t+1}$  is a dummy of value one (zero) in case of a (no)

Column (2) of Table 4 (see Additional Appendix B) and retain those variables that turn out to be significant.

election,  $GOV\_NEW_t$  is a dummy of value one (zero) in case of a (no) change in the party composition of the government,  $GOV\_CHAN_t$  is the number of changes of government in year  $t$ ,  $GOV\_TYPE_t$  is the type of government from single party majority (value is 1) to caretaker (value is 6),  $NMC_t$  is number of cabinet ministers,  $NPC_t$  is number of parties in cabinet,  $GOVPARTY_t$  is cabinet composition from hegemony of right-wing parties (value is 1) to hegemony of left-wing parties (value is 5), and  $GOV\_GAP_t = \Delta GOVPARTY_t$  is the ideological gap of the new cabinet minus the old one, hence ranges from -4 to 4. Also available are the variables  $GOV\_RIGHT_t$ ,  $GOV\_CENT_t$  and  $GOV\_LEFT_t$  which denote, respectively, right-wing, centre and left-wing parties as a percentage of total cabinet posts. Together, these variables are well captured by the variable  $GOVPARTY_t$  and, hence, they are not separately included. Heteroskedasticity and serial correlation consistent standard errors are in brackets below the point estimates, \* = significance at the 10% level, \*\* = significance at the 5% level, \*\*\* = significance at the 1% level. The instruments are  $y_t^i$  for  $y_{t+1}^i$  and  $INFL_t^i$  for  $INFL_{t+1}^i$ . Further,  $N$  = number of observations.

### 4.3. Implementation errors

Column (1) of Table 5 reports a general specification with only economic explanatory variables. We include the lagged implementation error to control for the possibility of longer-run budgetary commitments that are hard to correct (possibly for political reasons) in the direction of the plans set out by governments. The term may also control for potential “learning effects”, caused by the possibility that large previous implementation errors make governments more cautious in their plans. There appears to be persistence, though quantitatively it is rather small. We also include the initial surplus  $s_t^i$  to control for the overall need to implement a budgetary tightening. A worsening of the initial budget by 1% of GDP raises adherence to the plan by one-third of a percentage point of GDP. A more ambitious fiscal plan  $s_{t+1}^i - s_t^i$  implies weaker adherence to the plan. The magnitude is an additional shortfall of 0.3% points of GDP for an extra planned adjustment of 1% of GDP. Further, we control for the past realised fiscal outcome  $s_t^i - s_{t-1}^i$ . A larger budgetary improvement over the past year by 1% point of GDP predicts a reduced adherence to planned adjustment by a quarter of a percentage point of GDP, suggesting a potential fatigue in budgetary adjustment. The coefficient of the unexpected change in the SGP variable has the expected positive sign,<sup>17</sup> assuming that an unforeseen worsening of the excessiveness of the previous year’s deficit is met with further fiscal adjustment. However, the coefficient is insignificant. Expanding the specification with the initial size of the public sector as measured by the government spending or revenues share of GDP also has no effects on the

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<sup>17</sup> The variable is defined as  $SGP_t^{t+1} - SGP_t^t$ , where  $SGP_t^{t+1} \equiv (DEF_t^{t+1} - 3\%)$ , if  $DEF_t^{t+1} > 3\%$ , and zero otherwise.

results. Either measure is insignificant. Hence, to save space these results are not reported in Table 5.

We include the unexpected component of output growth as an independent variable. We instrument this variable to account for potential feedback effects from the fiscal implementation stage. Not surprisingly, an unexpected increase in the growth rate leads to quite a strong improvement in implementation relative to plans. In particular, if the economy's growth rate exceeds its projection by 1% point, this leads to an unplanned extra budgetary improvement of 0.4% of GDP. This sensitivity is marginally smaller than the one found at the planning stage. Finally, the difference between realised and projected inflation is estimated with a significantly positive coefficient, suggesting that the adherence to adjustment plans may benefit from the erosion of real debt servicing costs and the real value of planned spending.

Column (2) of Table 5 drops the unexpected change in the SGP variable from the regression in Column (1). The remaining coefficient estimates remain essentially unchanged, except that the coefficient on the lagged dependent variable now becomes significant because it increases marginally. In Column (3) we drop the lagged implementation error, so that the specification ceases to be dynamic. Quantitatively, the coefficient estimates hardly change, which suggests also that any potential bias introduced by making the model dynamic cannot be too serious. In the remainder we keep the specification in Column (2) as the baseline one for the economic determinants of the implementation error.

Column (4) of Table 5 extends Column (2) with all the political variables available over the entire sample period. Only the change in the party composition of the government,  $GOV\_GAP_{t+1}$ , is significant. Adding the political variables individually to the baseline economic specification (see Table B1 in Additional Appendix B), only the election dummy  $ELECT_{t+1}$ , the number of government changes  $GOV\_CHAN_{t+1}$ , and the change in the party composition of the government are significant. Including these three variables jointly, the election dummy ceases to be significant and is, therefore, dropped from the regression reported in Column (5) of Table 5. A change in government in a year reduces budgetary adjustment by more than 0.4% points of GDP, while a shift in  $GOV\_GAP_t$  from -3 to 3 (that is, the ideological shift from right to left over the maximum possible range covered in the sample) reduces budgetary adjustment by approximately one percentage point of GDP. The inclusion of the political variables does not lead to changes in the effects of the economic determinants, except that now the unprojected inflation change ceases to be significant

(although it remains close to significance). Summarising, we do find a role for political variables in the implementation stage as well, although it is not overwhelming. In the sequel, as our baseline regression with political variables included, we shall take the one in Column (5) of Table 5.

**Table 5: Determinants of implementation errors**

	Dependent variable: $\left[ \left( s_{t+1}^{t+1} - s_t^{t+1} \right) - \left( s_{t+1}^t - s_t^t \right) \right]$				
	(1)	(2)	(3)	(4)	(5)
$\left( s_t^t - s_{t-1}^t \right)$	0.22	0.23*		0.23*	0.23*
$-\left( s_t^{t-1} - s_{t-1}^{t-1} \right)$	(0.14)	(0.14)		(0.12)	(0.12)
$s_t^t$	-0.32*** (0.098)	-0.32*** (0.098)	-0.22** (0.089)	-0.29*** (0.10)	-0.30*** (0.09)
$s_{t+1}^t - s_t^t$	-0.28* (0.16)	-0.28* (0.16)	-0.23 (0.15)	-0.31* (0.16)	-0.34** (0.15)
$s_t^t - s_{t-1}^t$	-0.24** (0.12)	-0.25** (0.12)	-0.24** (0.11)	-0.27** (0.12)	-0.26** (0.11)
$SGP_t^{t+1} - SGP_t^t$	0.64 (0.70)				
$y_{t+1}^{t+1} - y_{t+1}^t$	0.43*** (0.14)	0.43*** (0.14)	0.38*** (0.13)	0.43*** (0.13)	0.45*** (0.12)
$INFL_{t+1}^{t+1} - INFL_{t+1}^t$	0.27* (0.14)	0.29* (0.15)	0.26* (0.14)	0.22 (0.14)	0.19 (0.12)
$ELECT_{t+1}$				-0.14 (0.21)	
$GOV\_NEW_{t+1}$				-0.23 (0.18)	
$GOV\_CHAN_{t+1}$				-0.28 (0.18)	-0.43*** (0.12)
$GOV\_TYPE_{t+1}$				-0.01 (0.09)	
$NMC_{t+1}$				0.03 (0.021)	
$NPC_{t+1}$				0.02 (0.09)	
$GOVPARTY_{t+1}$				0.007 (0.07)	
$GOV\_GAP_{t+1}$				-0.21** (0.10)	-0.17** (0.08)
Estimation method	IV	IV	IV	IV	IV
Fixed Effects	Y	Y	Y	Y	Y
Time Effects	Y	Y	Y	Y	Y
R <sup>2</sup>	0.36	0.35	0.34	0.44	0.46
Sample period ( $t+1 = \dots$ )	2000-2007	2000-2007	1999-2007	2000-2007	2000-2007
N	111	111	125	111	111

Notes: see the notes to Table 4. The new variables are in %-points of GDP. We instrument  $y_{t+1}^{t+1} - y_{t+1}^t$  with the GDP-weighted average of this variable over all *other* countries in the sample and  $y_t^{t+1}$ . We instrument  $INFL_{t+1}^{t+1} - INFL_{t+1}^t$  with the GDP-weighted average of this variable over all *other* countries in the sample

and  $INFL_t^{t+1}$ .

## 5. Determinants of the components of the budget

This section digs deeper into the determinants of budgetary adjustment by investigating what explains the adjustment in public spending and revenues in the two stages of the fiscal process. This may provide additional guidance as regards to which variables should be most closely monitored in order to promote fiscal discipline. The summary statistics presented in Section 3 suggest that the systematic biases in the surplus projections seem to arise mainly from corresponding biases in spending projections, which increase with the projection horizon. Moreover, the fact that both spending and revenues turn out to be higher than planned suggests that the two may be interrelated. We estimate again regressions of the format in (2) and (3).

### 5.1. Planned adjustment in the budget components

Preliminary investigation indicates that planned revenue changes have important consequences for planned spending and vice versa, with coefficients that tend to be close to unity. Moreover, in each regression initial revenues and expenditures are estimated with almost equal coefficients but of the opposite sign. This suggests a regression framework that resembles an error correction model in which taxes and spending are co-integrated. Our time series are too short to formally test for co-integration.<sup>18</sup> However, on the basis of the findings we just described, we include the initial total balance as an independent variable in the model. Further, in order to deal with potential endogeneity of projected output growth and planned revenue adjustment for planned spending (and vice versa), we instrument these variables.

As for the expenditure equation (Column (1), Table 6) we see that planned revenue enters with a highly significant coefficient close to one, while the “error correction” term also enters with a strong effect, indicating that a positive budget of 1% produces a 0.4% increase in planned government spending. As before, public debt does not play any role, while a projected 1% point increase in output growth implies an additional planned reduction in

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<sup>18</sup> Studies that use ex post data suggest that expenditure and revenues are integrated of the order one in the EU. See Afonso and Rault (2007).

spending of 0.57% points of GDP. The revenue equation (Column (3), Table 6) is essentially the mirror image of the spending equation, with the “error correction” term implying a planned fall in revenues if the current budget is more favourable and planned spending entering with a unit coefficient. Further, the SGP variable implies higher planned revenues if the deficit is more excessive, while the reaction to higher output growth is positive and of essentially the same absolute magnitude as in the planned spending equation. The implied consequences of an increase in projected output growth for the overall budget are computed by solving the planned spending and revenues equations as a system of simultaneous equations and subtracting the calculated sensitivity of planned spending with respect to projected output growth from that of planned revenues (see Additional Appendix C). This yields a value of 0.50, which is only slightly lower than the estimate reported in Column 4 of Table 4.

As before in the case of a planned surplus improvement, from our set of political variables only a change in government ( $GOV\_NEW_t$ ) plays a role. It leads to a budgetary contraction via both planned spending and planned revenue. The overall effect (see Additional Appendix C) is an estimated 0.23%-point planned improvement in the budget, somewhat lower than the effect estimated in Column (5) of Table 4. Dropping  $GOV\_NEW_t$  (not reported) the estimates of all the other variables remain unaffected, except that the coefficient of the SGP variable would become significant in both the spending and revenue equation, implying that a deficit that is more excessive leads to a larger planned cut in spending and planned increase in revenues. Again, the number of non-zero observations for SGP is too small to clearly distinguish its effects from those of  $GOV\_NEW_t$ .

**Table 6: Determinants of plans and implementation errors in the budget components**

	Dependent variable:			
	$g_{t+1}^t - g_t^t$	$(g_{t+1}^{t+1} - g_t^{t+1}) - (g_{t+1}^t - g_t^t)$	$\tau_{t+1}^t - \tau_t^t$	$(\tau_{t+1}^{t+1} - \tau_t^{t+1}) - (\tau_{t+1}^t - \tau_t^t)$
	(1)	(2)	(3)	(4)
$\tau_t^t - g_t^t (=s_t^t)$	0.41*** (0.15)	0.23*** (0.084)	-0.44*** (0.066)	-0.15 (0.096)
$g_{t+1}^t - g_t^t$		-0.34** (0.15)	1.04*** (0.30)	0.22 (0.18)
$(g_{t+1}^{t+1} - g_t^{t+1}) - (g_{t+1}^t - g_t^t)$				0.65*** (0.11)
$\tau_{t+1}^t - \tau_t^t$	0.95*** (0.33)	0.19 (0.15)		-0.23 (0.16)
$(\tau_{t+1}^{t+1} - \tau_t^{t+1}) - (\tau_{t+1}^t - \tau_t^t)$		0.79*** (0.15)		
$SGP_t^t$	-0.15 (0.10)		0.15 (0.11)	
$d_t^t$	0.0001 (0.0097)		-0.001 (0.010)	
$y_{t+1}^t$	-0.57*** (0.19)		0.58*** (0.14)	
$y_{t+1}^{t+1} - y_{t+1}^t$		-0.36*** (0.13)		0.22* (0.12)
$INFL_{t+1}^{t+1} - INFL_{t+1}^t$		-0.23 (0.14)		0.059 (0.14)
$GOV\_NEW_t$	-0.25** (0.11)		0.25** (0.12)	
$ELECT_{t+1}$		0.29** (0.13)		
$GOV\_CHAN_{t+1}$				-0.22* (0.12)
$GOV\_GAP_{t+1}$		0.19*** (0.073)		-0.17** (0.074)
Estimation method	IV	IV	IV	IV
Fixed Effects	Y	Y	Y	Y
Time Effects	Y	Y	Y	Y
R <sup>2</sup>	0.59	0.51	0.62	0.26
Sample period (t+1 = ...)	1998-2007	1999-2007	1998-2007	1999-2007
N	129	118	128	118

Notes: see the notes to Tables 4 and 5. The dependent variables,  $g_{t+1}^t - g_t^t$  and  $\tau_{t+1}^t - \tau_t^t$  are in percentage points of GDP. We instrument  $y_{t+1}^t$  with  $y_t^t$ , and  $g_{t+1}^t - g_t^t$  ( $\tau_{t+1}^t - \tau_t^t$ ) with, respectively,  $g_t^t$  ( $\tau_t^t$ ) and  $g_t^t - g_{t-1}^t$  ( $\tau_t^t - \tau_{t-1}^t$ ). Further, we instrument  $(\tau_{t+1}^{t+1} - \tau_t^{t+1}) - (\tau_{t+1}^t - \tau_t^t)$ ,  $(g_{t+1}^{t+1} - g_t^{t+1}) - (g_{t+1}^t - g_t^t)$ ,  $y_{t+1}^{t+1} - y_{t+1}^t$  and  $INFL_{t+1}^{t+1} - INFL_{t+1}^t$  with, respectively,  $\tau_t^{t+1}$ ,  $g_t^{t+1}$ ,  $y_t^{t+1}$  and  $INFL_t^{t+1}$  and, for each of these explanatory variables, also with the GDP-weighted average of the same variable over all *other* countries in the sample. In a few instances the real-time observations for revenues or spending were missing. In those cases, we inserted the realised value obtained from later SCsPs.

## 5.2. Implementation adjustment in budget components

Also for this case we report our preferred specifications – see Columns (2) and (4) of Table 6. The coefficient on the initial budget  $\tau'_i - g'_i$  is (positively) significant only for the implementation errors in spending, although it comes close to significance in the revenues regression. Overall, taking into account the positive effect on planned spending, but holding constant changes in revenues in both fiscal stages, a 1% of GDP improvement in the initial budget raises actual spending by (0.41 plus 0.23 is) roughly 0.6% of GDP. The corresponding reduction in revenues is also about 0.6% of GDP. Revenue adjustment errors matter for spending adjustment errors, although on a less than a one-for-one basis, and vice versa.<sup>19</sup> With an unexpected improvement in revenues, spending can be raised further relative to its plan and vice versa. Consistent with what we found for the analysis of the overall budget, more ambitious plans to cut spending worsen adherence to those plans, while the same is the case for more ambitious plans to raise revenues, although in the latter case the relevant coefficient is insignificant. A larger increase in planned revenues reduces the incentive to adhere to a planned spending reduction, while a larger increase in planned spending implies a larger increase in tax revenues relative to its plan. Both effects are insignificant, however. An unplanned increase in economic growth helps in meeting a planned spending cut with a sensitivity of about one-third in absolute value.<sup>20</sup> It also helps to produce a larger increase in tax revenues than planned, although the sensitivity is roughly halved in this case. The overall effect of an unplanned 1% point increase in economic growth is a 0.35% point improvement in the implemented (relative to the planned) surplus increase (see Additional Appendix C). This is close to the estimate reported in Column 3 of Table 5, which, because of the absence of a lagged dependent variable,<sup>21</sup> corresponds most closely to the regressions reported in Table 6. Finally, an unexpected increase in inflation also helps in achieving a planned spending cut with a sensitivity that is slightly larger than 0.2 in absolute value. This estimate is almost significant. The overall budgetary improvement of a 1% point surprise inflation

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<sup>19</sup> Because the adjustment errors of the two budget components are endogenous we instrument them.

<sup>20</sup> Because unplanned budgetary contractions or expansions may have consequences for output growth that were not anticipated when the projections were made we also instrument output growth surprise.

<sup>21</sup> The lagged dependent variables were omitted from the implementation stage regressions in Table 6, because these terms were insignificant and we would have lost another year of observations. This is more problematic for the analysis of the budget components than for that of the surplus, because the number of observations of the budget components is smaller.

increase is 0.19% point, which is same number as that in the final column of Table 5, but slightly lower than that in Column 3 of Table 5.

The role of politics is very much in lines with our earlier findings for the overall budget analysis. We limit ourselves to reporting our preferred specification in which we retain only those political variables that are significant. Both period  $t+1$  being an election year and a leftward ideological shift of the government produce larger spending increases than planned. Further, both a change in government and a left-ward shift in government lead to smaller revenues increases than planned. The combination of an election and a change in government produces an extra budgetary deterioration of 0.3% of GDP (see Additional Appendix C). A leftward shift in government over the maximum right-left span observed in the sample adds a further worsening of more than 1.2% of GDP to that. The latter figure comes close to what we found on the basis of the regression in Table 5. However, the overall budgetary effect of a change in government is estimated to be a lot smaller now.

## **6. Stock-flow adjustments**

It has been documented that under the pressure of the EU fiscal rules, both during the run-up to EMU and after the unification, countries have resorted to “creative accounting” in order to keep their official deficits low. Von Hagen and Wolff (2006) find evidence that the EU fiscal rules have to some extent resulted in stock flow adjustments (i.e., increases in debt that cannot be explained by the budget balance). Buti et al. (2006), however, highlight that large and persistence stock flow adjustments are not necessarily indicative of creative accounting. For example, a country may run extra surpluses that result into an accumulation of social security funding without lowering the gross public debt as calculated by Eurostat. This route has been followed by Finland over recent years. Nevertheless, part of the SFA may reflect creative accounting, insofar as it exploits differences in the cash and accrual recording bases of transactions, or represents financial injections that substitute for subsidies (as mentioned in the Introduction).

Creative accounting and recurrent stock flow adjustment have given rise to substantial data revisions over the past years. Our real-time data set is therefore particularly suited for investigating stock flow adjustment, as it measures statistical discrepancies when they first

arise. We conjecture that pressure on countries to fulfill their budgetary plans may induce them to resort to creative measures that suppress official deficits but that nevertheless lead to increases in public debt. To clarify this, we can write:

$$d_t^v = \left( \frac{1}{1 + \gamma n_t^v} \right) d_{t-1}^v - s_t^v + sfa_t^v,$$

where, as before,  $d$  is the (gross, or EMU) debt-GDP ratio,  $\gamma n$  is *nominal* GDP growth between  $t-1$  and  $t$  and  $sfa$  denotes the amount of stock flow adjustment. Further, the case of  $v=t-1$  corresponds to plans and the case of  $v=t$  corresponds to the implementation stage. Using our data on debt and surpluses, we can construct from the preceding equation outcomes, plans and implementation errors in the level of stock flow adjustment.

Table 7 presents the relevant averages. The average value for  $sfa_t^t$  is almost one percent of GDP. This may be an indication that countries have been running higher surpluses or lower deficits in order to accumulate assets, in particular for their social security funds. Also, the average stock flow adjustment implicit in fiscal plans is positive in all three cases: debt is expected to increase more or decrease less than can be expected on the basis of projections for the budget balance. As far as the implementation errors are concerned, only the one-year ahead error is positive and significant. We have also explored the outcomes, plans and implementation errors of stock flow adjustment for individual countries. Results differ quite substantially across countries – they are available upon request, but for lack of space we do not report them here.

**Table 7: Averages of stock flow adjustment outcomes, plans and errors for the EU-14**

	$sfa_t^t$	$sfa_{t+1}^t$	$sfa_{t+1}^{t+1} - sfa_{t+1}^t$	$sfa_{t+2}^t$	$sfa_{t+2}^{t+2} - sfa_{t+2}^t$	$sfa_{t+3}^t$	$sfa_{t+3}^{t+3} - sfa_{t+3}^t$
Mean	0.94*** (0.10)	0.74*** (0.072)	0.23*** (0.10)	0.81*** (0.067)	0.063 (0.12)	0.90*** (0.076)	-0.13 (0.14)
N	138	138	124	138	110	137	96

*Notes:* see notes to Table 4. Further,  $sfa_t^t$  and  $sfa_{t+1}^t$  are in percent of GDP, while  $sfa_{t+1}^{t+1} - sfa_{t+1}^t$  is in percentage points of GDP. Hence, figures for means and standard deviations are in percent of GDP or in percentage points of GDP in the case of differences. In brackets we show the standard error of the constant (estimated equal to the mean) in the regression of the variable in the top on a constant and country fixed effects.

For the stock-flow adjustments we can estimate models similar to those estimated

before. Table 8 reports results for the planned stock flow adjustment in Column (1) and its implementation error in Column (2). To save space we report only the specifications (having explored the role of all variables used before) where we retain those variables that are significant at the 15% level. As regards the regression for the plan, the estimated current stock flow adjustment  $sfa_t^t$  appears significant though the coefficient is rather small, while the initial debt level exerts a negative effect suggesting that governments use stock flow adjustment to avoid further increases in debt when the debt is already relatively high.<sup>22</sup> Projected output growth has a positive effect, possibly because when governments expect more favourable growth, they plan to accumulate more assets, for example for social security.

**Table 8: Regressions for stock-flow adjustments**

	Dependent variable:	
	$sfa_{t+1}^t$	$sfa_{t+1}^{t+1} - sfa_{t+1}^t$
	(1)	(2)
$sfa_t^t$	0.16** (0.073)	
$sfa_{t+1}^t$		-0.48*** (0.13)
$s_{t+1}^t - s_t^t$		0.46** (0.21)
$d_t^t$	-0.019 (0.013)	
$y_{t+1}^t$	0.17 (0.12)	
$SGP_t^{t+1}$		-0.34 (0.23)
$GOVPARTY_{t+1}$		0.15** (0.073)
Estimation method	OLS	OLS
Fixed Effects	Y	Y
Time Effects	Y	Y
$R^2$	0.53	0.22
Sample period ( $t+1 = \dots$ )	1998-2007	1999-2007
N	138	124

Notes: see notes to Tables 4, 5 and 7.

The regression for the implementation error shows that half of the planned stock flow adjustment is undone at the implementation stage. Further, a 1% point of GDP increase in planned budgetary adjustment produces an unplanned 0.5% point of GDP increase in stock

<sup>22</sup> Similarly, countries with low debt may build up financial assets instead of running down debt.

flow adjustment; possibly, the more ambitious those plans are, the more governments may resort to (unplanned) creative accounting to limit the implementation error in budgetary adjustment. The SGP variable in the previous period exerts a somewhat surprising (although insignificant) negative effect. We have also inter-acted the planned budgetary adjustment with the initial budgetary situation to see whether more ambitious plans have a stronger effect on the stock flow adjustment error when the budget is in a worse starting position. The interaction term was insignificant, however. Further, we have included the budgetary adjustment implementation error as an independent variable, but also this variable came out insignificantly. As far as our political variables are concerned, only  $GOVPARTY_{t+i}$  is significant at the implementation stage, suggesting that more left-wing governments are more inclined to resort to unplanned SFA.

## 7. The role of national fiscal institutions

To preserve the allocation and distributive roles of fiscal policy, national measures to address the deficit bias focus on improvements in fiscal governance. These may take place in several ways. One is to enhance the accountability of fiscal policymakers (the objective of so-called Fiscal Responsibility Acts) in particular through enhancing transparency. Further, (part of) fiscal policy can be delegated to an independent body, budget procedures may be improved, the delivery of macroeconomic projections can be delegated to independent institutions, numerical rules can be devised that set targets or ceilings for fiscal aggregates and there is the possibility to adopt medium-term budgetary frameworks (*MTBF*) – see Box 3.

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### **BOX 3: national institutional remedies to fiscal profligacy**

A number of countries have adopted institutional measures at the national level to limit deficit biases. Those national measures should be seen as complementary to the EU fiscal rules, as the latter were never intended to replace the former. Many countries have adopted numerical fiscal rules in the 1990s and the beginning of this century. Kopits and Symanski (1998) define a fiscal rule as “a permanent constraint on fiscal policy, expressed in terms of a summary indicator of fiscal performance.” As regards to the national fiscal rules, we can

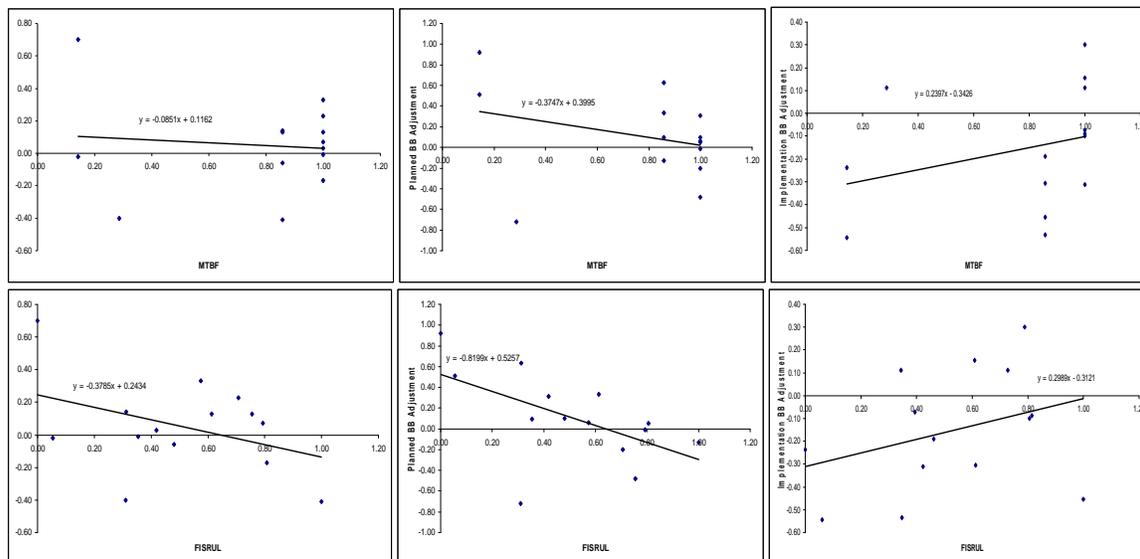
distinguish balanced budget rules, expenditure rules, revenue rules and debt rules. Table 4.1 in Wierds (2008) summarizes the various rules per country. European Commission (2006) and Debrun et al. (2008) calculate a fiscal rule index (*FISRUL*) per country, which combines the strength and coverage of all rules in force. Those rules may apply to the various government sectors (general, central, regional, local and social security). Strength is determined on the basis of five criteria: (1) the statutory or legal base of the rule (with a constitutional one where there is no margin for adjusting objectives achieving the highest score); (2) the nature of the body in charge of monitoring the rule (the highest score assigned in the case of an independent authority or the national parliament); (3) the nature of the body in charge of enforcing the rule (again, the highest score for an independent authority or the national parliament); (4) the enforcement mechanism (highest score in the case of automatic corrections and sanctions in case of non-compliance); and (5) the degree of media visibility. The strength score of each rule is weighed by the share of general government finances covered. Finally, the weighted scores are aggregated over all rules in place, while if more than one rule applies to the same general government sub-sector the weights of all these rules except the strongest are halved. Inspection of the existing rules (Wierds, 2008) shows that the institutional basis is mostly a political agreement, while external monitoring and enforcement are lacking, implying that the rules are largely self-enforced.

Countries may also set up an *MTBF*. An *MTBF* can be defined as “an institutional device allowing fiscal authorities to extend the horizon for fiscal policymaking beyond the annual budgetary calendar.” (see European Commission, 2007a, p.152). The *MTBF* captures the procedures for the preparation, execution and monitoring of multi-annual budget plans and should be distinguished from fiscal rules, which set targets for important budgetary aggregates (either on an annual or multi-annual basis). European Commission (2007a, p.162-163) computes an *MTBF* index on the basis of five criteria: (1) the existence of a national *MTBF* (with the highest score for an *MTBF* that covers the entire government); (2) connectedness between the multi-annual budgetary targets and the preparation of the annual budget (with the highest score for a framework that cannot be altered as time passes); involvement of the national parliament (the highest score is when a vote is required); (4) existence of coordination mechanisms prior to setting the medium-term budgetary targets (with the highest score for ex ante coordination among all levels of general government); and (5) monitoring and enforcement (the highest score for regular monitoring and well-defined actions in response to deviations from plans).



implementation errors.

**Figure 2: Budget outcomes, plans and errors against national institutional indices**



*Note:* The vertical axis in each graph is measured in %-points of GDP. The first, second and third columns depict, respectively, the actual outcome, the plan and the implementation error against fiscal institutions. The first and second lines correspond to, respectively, the medium-term budgeting framework index (*MTBF*) and the fiscal rule index (*FISRUL*). Each point in the figures corresponds to averages over time for a country. Only the relation between planned adjustment and *FISRUL* is significant.

In the sequel, we will be most interested in the distinct roles of fiscal institutions in the two fiscal policy stages.

Our variables capturing national institutions show little time variation. In particular, *MTBF* is completely time invariant, whereas *FISRUL* is almost or completely time invariant for more than half of the countries in our sample. This means that these variables can reasonably be assumed exogenous in our context. However, this also implies that including them in our regressions with country-fixed effects is unfeasible (in the case of *MTBF*) or leads to unreliable results, while including them in a regression without fixed effects may be too restrictive as they would be assumed to pick up all time-invariant factors.<sup>23</sup> Therefore, we again compute averages over time for each country of each institutional index and explore how these averages relate to the fixed effects from our earlier regressions.

We shall first assess the role of national institutions on the planning stage. Table 9

<sup>23</sup> When *FISRUL* is added as an explanatory variable to the baseline regression of the planning stage, it turns out to be far from significance and it leaves the estimated fixed effects unchanged. However, when *FISRUL* is added to the baseline regression of the implementation stage, it gets close to significance at the 10% level and with a point estimate identical to the one reported in Table 9 below. The estimated fixed effects from this

reports the coefficients of regressions of those fixed effects on our national indices, while Figure 3 shows the corresponding graphs. The fixed effects are from the regression reported in Column (5) of Table 4, thus including the political factors. Importantly, once we control for the potential indirect effects of fiscal institutions through other determinants of the fiscal plans, the relationship between those plans and fiscal institutions switches from negative (Figure 2) to significantly positive (Figure 3). An increase in the *MTBF* index over the maximum available range among our EU-14 countries (from 0.14 for Greece and Portugal to 1.00 for the Netherlands, for example), implies an additional planned tightening of the budget by 1.10% point of GDP. The corresponding figure for a maximum increase in *FISRUL* (from 0 for Greece to 1.00 for the U.K.) is 1.22% point of GDP. A potential explanation for the observed switch in the relationships is that weak institutions produce large fiscal imbalances that result in ambitious plans for correction, as our estimates in Table 4 suggest.<sup>24</sup> Controlling for this indirect effect via initial fiscal balances (as captured by the initial surplus and the SGP variable) would then tilt the relationship between planned adjustment and institutional strength. Using instead the fixed effects of the regression that excludes the political factors (Column (2), Table 4) leaves the figures virtually unchanged.

**Table 9: Direct relationship between fiscal stages and national institutions**

	Planning		Implementation	
	Dependent: f.e. Column (5), Table 4; also political variables included		Dependent: f.e. Column (5), Table 5; also political variables included	
Constant	-1.00** (0.41)	-0.63* (0.36)	-0.74* (0.43)	-0.60* (0.34)
<i>MTBF</i>	1.28** (0.48)		0.93* (0.51)	
<i>FISRUL</i>		1.22* (0.59)		1.12** (0.57)

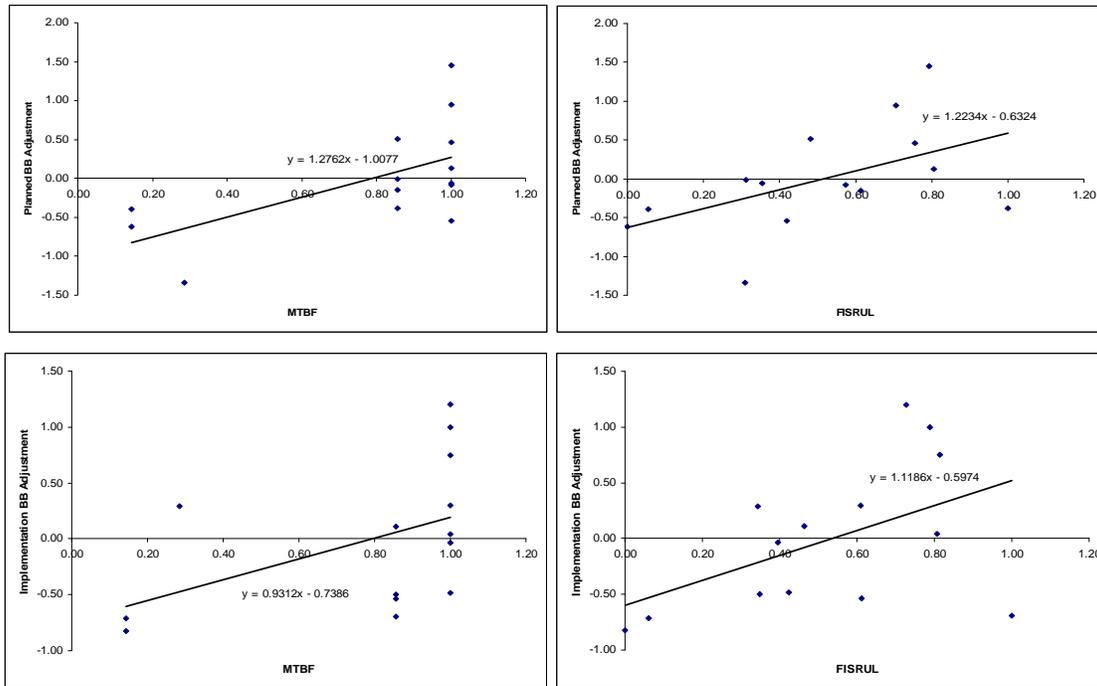
*Note:* see notes to Table 4. The dependent variable is measured in %-points of GDP, while *MTBF* and *FISRUL* are measured on a 0-1 scale, with 1 representing the highest degree of tightness of the institutional arrangement.

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regression are uncorrelated with *FISRUL*.

<sup>24</sup> More detailed regression analysis suggests that there is an additional indirect effect of weak institutions via

**Figure 3: Direct relationship between fiscal stages and national institutions**



*Notes:* The vertical axis in each graph is measured in %-points of GDP. The left (right) panel in the top half depicts planned adjustment against *MTBF* (*FISRUL*). The fixed effects are from the regression in Column (5) in Table 4. The left (right) panel in the bottom half depicts the implementation error against *MTBF* (*FISRUL*). Here, the fixed effects are from the regression in Column (5) in Table 5.

Next, we explore how national institutional factors affect implementation errors. Table 9 reports the linear regressions of the fixed effects from the regression in Column (5) of Table 5 on our indices for national fiscal institutions. Running the same set of regressions on the fixed effects from Column (2) of Table 5, which excludes political variables yields very similar results that are not reported. The relationships are significant and substantially stronger than the unconditional ones depicted in Figure 2, and suggest that tighter national fiscal arrangements as captured by *MTBF* and *FISRUL* encourage countries to adhere to planned budgetary adjustments.<sup>25</sup> An increase in the *MTBF* index over the maximum available range among our EU-14 countries reduces the shortfall from the plan by 0.83% of GDP, while the corresponding figure for an maximum increase in *FISRUL* is 1.12% point of GDP.

We have conducted a number of extensions for which we do not report the results

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more optimistic output growth forecasts to (as Table 4 indicates) larger planned budgetary adjustment.

<sup>25</sup> Visual inspection shows that the United Kingdom appears to be somewhat of an outlier. Dropping this country from the sample, the positive relation between the fiscal rule index and adherence to plans strengthens. This is also the case if we drop all three non-EMU countries.

here. First, we have also included *MTBF* and *FISRUL* simultaneously in our regressions for the fixed effects from the planning and implementation stages. The coefficients are always positive but insignificant due to the high correlation between *MTBF* and *FISRUL* (the correlation coefficient equals 0.74). Second, Additional Appendix D reports the relationship between national arrangements and the fixed effects from the regressions for the components of the budget. We find that at the planning stage stronger fiscal institutions produce more adjustment towards discipline via *both* sides of the budget, spending and revenues. For the case of the implementation errors, the effect of stronger national institutions is less evident. Nevertheless, all signs of the regression coefficients are as expected: tighter institutions promote discipline both by producing a larger spending reduction relative to what was planned and a larger revenue increase relative to the planned increase. Third, as far as the relation between errors in stock flow adjustment and national fiscal arrangements is concerned, our results (reported in the Additional Appendix E) provide some tentative indication that tighter institutions induce governments to resort less to unplanned SFA.

As a first robustness check on the findings discussed in this paragraph, we explore the relationships between the fixed effects from our regressions in Column (5) of Tables 4 and 5 and our national fiscal institutions indices, while controlling for a dummy that indicates whether fiscal governance follows a “delegation” approach (value is 1) or not (value is 0), as described by Von Hagen and co-authors in their various contributions to this literature – see Box 3. We report the figures for this robustness check in Additional Appendix F. According to Von Hagen (2008), the countries characterized by a delegation approach are Austria, France, Germany, Greece, Italy, Spain and the UK. Interestingly, the relationships between the delegation dummy and both planned budgetary adjustment and the corresponding implementation error are negative, although only the second relationship is significant. This suggests that delegation countries are less ambitious in both planning and implementation.<sup>26</sup> However, one should be careful in interpreting this finding. In particular, the split into delegation and non-delegation is quite similar to that between large and small EU countries. For example, large countries may feel less restrained in deviating from their plans because they are better able to avert criticism from their EU partner countries. If we add the delegation dummy to the regressions reported in Table 9, the relationships with *MTBF*

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<sup>26</sup> The latter finding corresponds to Von Hagen’s (2008) result that delegation produces overly optimistic budgetary projections, although one needs to be careful in making this comparison, because he uses ex-post data to compute the projection errors.

become even stronger, while those with *FISRUL* weaken slightly, although it remains significant at 10% level in both stages (see Additional Appendix F).

A second robustness check is based on the possibility that national fiscal institutions may not only affect average plans and implementation, but they may also influence the responses of plans and implementation to their political determinants. After all, national fiscal arrangements are often designed to provide politicians with incentives to be fiscally disciplined and to adhere to their plans. In Additional Appendix G we extend our previous regressions for the two fiscal stages to include interaction terms between our national institutional indices and our political variables. The coefficient estimates on the non-political variables are essentially unchanged. This is also the case for the relationship between the fixed effects of these regressions and our national institutional indices (although it weakens in the case of implementation, possibly because the interaction terms pick up some of the direct effects of the institutions).

## **8. Policy implications**

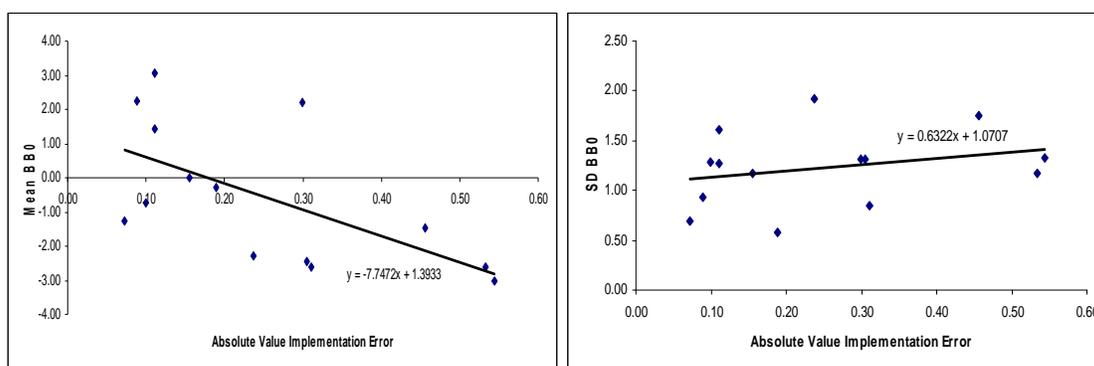
### ***8.1 Fiscal credibility matters***

Our analysis has been motivated by the premise that budget credibility is conducive to aggregate fiscal discipline.<sup>27</sup> As a check, Figure 4 depicts for each country the average (over time) budget balance and its standard deviation against the corresponding average absolute value of the implementation error. The figure suggests that more credible fiscal plans (i.e., plans resulting in smaller absolute implementation errors) are associated with better budget balances as well as with more stable budget balances. Over long periods one might expect this to result in lower and more stable interest rates, which in turn benefit the economy over the longer run.

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<sup>27</sup> Moreover, World Bank (2005) suggests that budget credibility also improves the strategic allocation of resources and efficient service delivery. These effects are outside the scope of our analysis.

**Figure 4: Budget balances and absolute size of implementation errors**



*Notes:* The vertical axis in each graph is measured in %-points of GDP. That of the left panel is the average budget balance and that of the right panel the standard deviation of the budget balance. Each point in the graphs corresponds to a given country with the relevant statistic computed over the sample period.

Our results show systematic biases in fiscal planning, and that fiscal implementation more than offsets the effect of planned fiscal consolidation on fiscal outcomes. While unanticipated implementation errors may (partly) result from a limited ability to forecast the future economy, our findings suggest that implementation errors are far from unpredictable. Lagged implementation errors, the initial budget balance, lagged fiscal outcomes, (systematic) errors in the growth projections and the budgetary plans themselves all help to predict current implementation errors.

It is our conjecture that a lack of budgetary credibility is most likely the result of political incentives to present budgets that are acceptable to broad groups in society, while at the same time trying to be consistent with fiscal discipline. The inconsistency of the two goals is often only exposed in the implementation stage. However, while fiscal plans draw a lot of attention from the parliament, international organizations and the media, implementation receives much less attention. Moreover, when analyzing the credibility of single annual budgets in isolation, it may be difficult to distinguish between the impact of overoptimistic planning and the impact of incidental factors that occur during implementation. As a consequence, if systematic deviations from plans remain hidden, and deviations from plans carry little political cost, then the incentive to present plans that reflect the *actual* intentions of the government becomes weak.

Incentives for producing biased fiscal plans may be exacerbated by fiscal rules that only need to be obeyed on an *ex ante* basis. The overview of institutional features of national fiscal rules in European Commission (2006, p 184-188) shows that for exactly half of the

total of 60 national fiscal rules described, there is ‘*no predetermined action*’ in case of non-compliance. Moreover, the preventive arm of the SGP obliges countries to present in their SCPs an adjustment path towards (country-specific) budgetary positions of (roughly) close to balance or in surplus. At the same time, the corrective arm of the SGP applies only to excessive deficits, and does not punish deviations from adjustment paths towards fiscal balance. Such rules may produce incentives for compliance in terms of fiscal plans, but contain little cost for deviations that occur during implementation.

## **8.2 Initiatives for reform**

In order to improve fiscal credibility and accountability, several policy initiatives have been taken in recent years at the national and international level. In May of each year since 2000, the “National Accountability Day” in the Netherlands is devoted to an ex-post assessment of the adherence to the budget that was presented for the *previous* year (including policy objectives that relate to specific items on the budget). However, media attention is generally low, possibly because (i) there is no evidence for systematic fiscal biases in The Netherlands; (ii) the relevant budget was presented too long ago and by-gones may be considered by-gones; (iii) the ad hoc nature of a debate on a single annual budget, where there is ample scope to ascribe deviations to incidental factors; (iv) the level of technical detail of the debate and failure to focus on key political issues.<sup>28</sup> For other OECD countries, we have not even been able to find information about the existence of similar accountability days.

At the international level, the European Commission has taken initiatives to make growth assumptions and fiscal planning more credible. Concerning the former, we have seen that part of the systematic component of the implementation error is due to over-optimistic growth forecasts (a phenomenon commonly found in the related literature). Based on the figures in Tables 2 and 5, the associated deterioration of the actual surplus relative to the plan is 0.09% on an annual basis.<sup>29</sup> In search for improvement, European Commission (2005b) investigates whether institutional characteristics of the forecasting process matter. It finds that all countries with independent forecasting institutions show unbiased growth forecasts

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<sup>28</sup> In his speech on Accountability Day in 2008, the Dutch Finance Minister Bos noted to his regret that over the years the debate had become more technical and less political. See [http://www.minfin.nl/Actueel/Toespraken/Wouter\\_Bos/2008/05/Toespraak\\_aanbieding\\_Financieel\\_Jaarverslag\\_2007](http://www.minfin.nl/Actueel/Toespraken/Wouter_Bos/2008/05/Toespraak_aanbieding_Financieel_Jaarverslag_2007)

<sup>29</sup> This is the product of the average overprojection of growth of 0.19% (Table 2) and the coefficient of 0.45 in Column (5) of Table 5.

(i.e. Belgium, The Netherlands and Austria), and that biased forecasts are found in some (but not all) of the countries in which the Ministry of Finance is responsible for producing the growth forecasts. Hence, the conclusion is that “...one way to reduce the optimism bias in official growth forecasts...is delegation to a body that is protected against political pressures” (EC, 2005b, p. 125; see also Jonung and Larch, 2006, on the case for independent forecasting institutions). However, given that the competence for policy action regarding national fiscal institutions is at the national level, a compromise solution could only be reached on growth assumptions during the reform of the SGP in 2005. First, the preventive arm of the SGP states that SCPs shall contain information on – inter alia – the main assumptions about expected economic developments, while the Commission shall assess whether or not these assumptions are credible. Second, The Code of Conduct (CoC) on the format and content of SCPs states that SCPs should be based on realistic and cautious macroeconomic forecasts (EC, 2005c). At the same time, however, it also recognizes that Member States are free to base their SCPs on their own projections (EC, 2005c, p. 12). Overall, while pressures for producing realistic growth forecasts have increased somewhat, there remains scope at the national level to base the budget on growth projections that suffer from political optimism.

On the credibility of fiscal planning, the CoC (EC, 2005c, p. 14) states that SCPs should show how developments have compared with the budgetary targets in the previous programmes. When applicable, they should explain in detail the reasons for the deviations from these targets. Moreover, when substantial deviations occur, the SCPs should mention whether measures are taken to rectify the situation. In addition, the European Commission has stepped up fiscal surveillance on fiscal credibility, as announced in the EC Communication on the effectiveness of the preventive arm of the SGP (EC 2007b, p. 9): “When assessing SCPs, the Commission will strengthen its analysis of the track record in respecting the budgetary targets of the previous SCPs, focusing on developments in government expenditure.” As a result, since the 2007/2008 round of SCPs, Commission assessments contain information on the sources of deviations from fiscal targets of the previous year.<sup>30</sup> A decomposition is made that attributes differences between plans and outcomes to: (i) a base effect resulting from a different starting position from what was projected in the previous programme; (ii) the impact of expenditure/ revenue growth being

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30 Programme assessments and Council opinions can be found at [http://ec.europa.eu/economy\\_finance/sg\\_pact\\_fiscal\\_policy/fiscal\\_policy528\\_en.htm](http://ec.europa.eu/economy_finance/sg_pact_fiscal_policy/fiscal_policy528_en.htm).

higher/lower than targeted ex ante; (iii) a denominator effect that captures the difference that is related to differences in GDP growth; and (iv) a residual term. The main conclusions on the sources of budgetary differences are also reflected in the opinions of the ECOFIN Council on the SCPs.

These efforts highlight increased policy attention for budget credibility. In fact, from the outset a structural impact of the EU fiscal framework has been that it requires comparable fiscal data across countries (both projections and outcomes), which in turn allow analysis on the credibility of budgeting across countries. From our perspective, however, we doubt whether the effect of innovations in fiscal surveillance will be strong enough to truly counteract the political incentives for a fiscal planning bias. The key question concerns the political costs of deviating from fiscal plans. We propose two complementary routes of policy reform to increase these costs.

First, at the national level, it is the task of the Courts of Auditors to check if budgets have been implemented correctly. In line with this mandate, these institutions could start using econometric evidence based on longer time series of fiscal data from the national budget process. Depending on the findings, this could lead to recommendations for improving the credibility of the national fiscal planning process. This could help to put findings for slippages in a single year (which may be due to a coincidence) into context, inform the political debate in national Parliaments, and increase to some extent the political costs of systematic biases. Likewise, at the international level, the increasing length of the time series available on the basis of the SCPs allows the Commission to complement its current approach, which concentrates on single SCPs at any moment, with country specific analysis over longer time horizons. It may then move beyond indicating the source of fiscal slippage in a single year, and start issuing recommendations regarding the need to improve the credibility of fiscal planning (possibly including the underlying macro-economic assumptions). Such initiatives may help to increase the political costs of systematic fiscal slippages, by making them transparent, and re-directing a lack of credibility to the political decision-making level.

Second, incentives for implementation according to plans may be improved by putting matching levels of enforcement of fiscal rules and *MTBFs* during planning and implementation. For the SGP this would imply either (i) softening the legal obligation to show planned fiscal consolidation towards medium term objectives by default, and leave

more room for basing fiscal plans on actual intentions; or, preferably, (ii) to keep the present rules, but make ex-post deviations from plans politically more costly. Concerning the national level, the *FISRUL* and *MTBF* indices have been developed to capture incentives for compliance that we are interested in, e.g. given their focus on monitoring and enforcement during implementation. Our results suggest that higher scores on the *MTBF* and *FISRUL* indices are associated with both more ambitious plans for fiscal adjustment, as well as more implementation relative to the plan. Based on the estimates in the middle and right panels of Table 9 and Column (5) of Table 5, the effect of a maximum improvement in the *MTBF* index from 0 to 1 is an additional budgetary adjustment of almost 1.8% of GDP per annum, while the corresponding number of an identical improvement in the *FISRUL* index is about 1.9%.<sup>31</sup> These are large effects and one should be careful in attaching too much weight to them, given the limited number of countries in our sample. Nevertheless, our estimates are indicative of potentially substantial gains in budgetary discipline resulting from adopting an appropriate *MTBF* or tight national fiscal rules.

## 9. Conclusions

In this paper we have explored the determinants of the two stages of fiscal policy, planning and implementation. This approach differs from the standard approach of exploring the determinants of the overall fiscal outcomes through the use of fiscal reaction functions. The distinction between the two stages is important for several reasons. First, the determinants of the two stages may be different. Second, the planning stage may affect the implementation stage. In particular, we find that more ambitious plans produce larger implementation errors. Moreover, the ambition of plans increases with the length of the horizon for which the plan is made. Overambitious plans undermine implementation, thereby undermining confidence in policymakers, and eventually result in worse fiscal outcomes. Finally, we may gain additional insight into the effectiveness of fiscal institutions at the various stages of the fiscal process.

Another advantage of our approach is that we use real-time data, rather than ex-post data. The former help us to capture more accurately the information sets on which the

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<sup>31</sup> These (rounded) numbers are computed as  $1.28 \cdot (1 - 0.34) + 0.93 = 1.77$  and  $1.22 \cdot (1 - 0.34) + 1.12 = 1.93$ .

policymakers' decisions in both stages are based. Moreover, our real-time data are the data on which governments are judged by the parliament and the ECOFIN at the planning and implementation stages.

Our analysis points to a number of conclusions. First, implemented budgetary adjustment falls systematically short of planned adjustment and the implementation shortfall increases with the projection horizon. Second, the variability in the eventual fiscal outcomes is dominated by the implementation errors. As a result, a general increase in attention by policymakers, parliaments and the media to the enforcement of plans seems warranted. This in turn should reduce strategic (i.e., biased) planning and, hence, makes plans more credible, which is important given that the budget is generally considered the most important policy document of the government. The importance of presenting accurate plans was confirmed by the suggested relationship between the size of the implementation errors and the average budget balances and their standard deviations. Third, we find that more ambitious plans lead to more stock-flow adjustment relative to what was planned, consistent with the idea that governments try to limit implementation errors with more creative accounting. Fourth, our results suggest political factors do play a role in determining fiscal policy in its two stages, but their role is limited. In particular, changes in government and ideological shifts to the left undermine implementation. Our fifth, and possibly most important, finding is that, controlling for other factors, both planned budgetary adjustment and adherence to those plans are positively related to the strength of national fiscal institutions in the form of a strong medium-term budgetary framework or tight numerical fiscal rules. Hence, improving fiscal governance at the national level is effective at promoting fiscal discipline.

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## **Appendix: the data and their sources**

Our data are obtained from several sources:

1. The fiscal data and part of the macroeconomic data, both the projections and the realizations, are from the EU's SCPs. These are published in November or December each year since 1998 and are available from the European Commission website.
2. Political data are from various sources, where we have updated the variables in cases where this was possible with reasonable effort:
  - Comparative Political Dataset
  - European Journal of Political Research
3. We also employ various institutional data.
  - Data on numerical fiscal rules used in Debrun et al. (2008), as updated by the EU Working Group on the Quality of Public Finances, who obtained these data from questionnaires to experts at Finance Ministries.
  - Data on the *MTBFs* constructed by the European Commission, also on the basis of surveys, discussed in its EU Public Finance Report in 2007, and updated by the EU Working Group on the Quality of Public Finances.
  - European Journal of Political Research

## Additional Appendix

### A: Average implementation errors at the individual country level

**Table A1: Average implementation errors at the individual country level**

	$(s_{t+1}^{t+1} - s_t^{t+1})$ $-(s_{t+1}^t - s_t^t)$	$(s_{t+2}^{t+2} - s_{t+1}^{t+2})$ $-(s_{t+2}^t - s_{t+1}^t)$	$(s_{t+3}^{t+3} - s_{t+2}^{t+3})$ $-(s_{t+3}^t - s_{t+2}^t)$	$(g_{t+1}^{t+1} - g_t^{t+1})$ $-(g_{t+1}^t - g_t^t)$	$(g_{t+2}^{t+2} - g_{t+1}^{t+2})$ $-(g_{t+2}^t - g_{t+1}^t)$	$(g_{t+3}^{t+3} - g_{t+2}^{t+3})$ $-(g_{t+3}^t - g_{t+2}^t)$	$(\tau_{t+1}^{t+1} - \tau_t^{t+1})$ $-(\tau_{t+1}^t - \tau_t^t)$	$(\tau_{t+2}^{t+2} - \tau_{t+1}^{t+2})$ $-(\tau_{t+2}^t - \tau_{t+1}^t)$	$(\tau_{t+3}^{t+3} - \tau_{t+2}^{t+3})$ $-(\tau_{t+3}^t - \tau_{t+2}^t)$
AT	-0.072 (0.18)	-0.31 (0.28)	-0.29 (0.24)	0.27 (0.23)	0.48 (0.31)	0.44*** (0.15)	0.18 (0.20)	0.19 (0.36)	0.10 (0.24)
BE	-0.19 (0.12)	-0.35*** (0.13)	-0.43*** (0.11)	0.12 (0.19)	0.14 (0.25)	0.17 (0.26)	-0.013 (0.17)	-0.14 (0.27)	-0.32 (0.27)
DE	-0.31 (0.29)	-0.52 (0.33)	-0.43 (0.35)	0.37 (0.27)	0.49* (0.29)	0.29 (0.27)	0.061 (0.26)	-0.031 (0.22)	-0.14 (0.32)
DK	-0.089 (0.18)	-0.35* (0.18)	-0.30 (0.30)	-0.19 (0.16)	-0.30 (0.19)	-0.30 (0.22)	-0.24 (0.15)	-0.64*** (0.18)	-0.59** (0.24)
EL	-0.24 (0.27)	-0.014 (0.48)	0.050 (0.56)	0.35 (0.37)	0.20 (0.61)	0.12 (0.56)	0.11 (0.31)	0.014 (0.34)	0.32 (0.40)
ES	0.16 (0.12)	0.050 (0.21)	-0.13 (0.26)	0.11 (0.10)	0.27** (0.14)	0.36** (0.17)	0.24** (0.12)	0.30*** (0.11)	0.24** (0.10)
FI	0.11 (0.35)	-0.063 (0.48)	-0.86** (0.38)	0.35 (0.30)	0.12 (0.36)	0.49 (0.40)	0.40** (0.20)	0.10 (0.26)	-0.36** (0.17)
FR	-0.31* (0.18)	-0.46** (0.19)	-0.61*** (0.23)	0.63** (0.26)	0.64*** (0.24)	0.66*** (0.24)	0.30 (0.21)	0.17 (0.14)	0.019 (0.15)
IE	0.11 (0.49)	-0.33 (0.53)	-1.14** (0.56)	0.25 (0.43)	1.02** (0.46)	1.66*** (0.46)	0.067 (0.42)	0.71* (0.41)	0.59 (0.37)
IT	-0.53*** (0.19)	-0.53 (0.34)	-0.46 (0.35)	0.81*** (0.30)	0.91*** (0.33)	1.03** (0.41)	0.27* (0.16)	0.42* (0.25)	0.57*** (0.20)
LU	-1.50*** (0.56)	-2.10*** (0.64)	-2.43*** (0.76)	1.55** (0.76)	2.09** (0.97)	2.07* (1.21)	-0.43 (0.36)	-0.11 (0.38)	-0.40 (0.43)
NL	-0.10 (0.19)	-0.30* (0.17)	-0.41* (0.22)	0.20 (0.27)	1.03*** (0.22)	0.87*** (0.26)	0.18 (0.21)	0.70* (0.40)	0.57 (0.37)
PT	-0.54 (0.35)	-0.54 (0.49)	-0.66 (0.56)	0.46 (0.32)	1.20*** (0.35)	1.00*** (0.31)	0.20 (0.25)	0.63 (0.38)	0.31 (0.37)
SE	0.30 (0.20)	-0.41 (0.38)	-0.76* (0.39)	-0.011 (0.27)	-0.000 (0.31)	0.29 (0.33)	0.31 (0.19)	-0.40 (0.28)	-0.50** (0.20)
UK	-0.46** (0.23)	-0.74*** (0.23)	-0.64** (0.32)	0.43* (0.23)	0.67*** (0.19)	0.70** (0.30)	-0.20 (0.28)	-0.071 (0.27)	0.35 (0.40)

*Notes:* Figures for means are in percent; standard errors are reported underneath the means. Because the variances of the implementation errors differ across countries, the estimations are based on weighted least squares. Further, \* = significance at the 10% level; \*\* = significance at the 5% level; \*\*\* = significance at the 1% level. Country codes: AT = Austria, BE = Belgium, DE = Germany, DK = Denmark, EL = Greece, ES = Spain, FI = Finland, FR = France, IE = Ireland, IT = Italy, LU = Luxemburg, NL = Netherlands, PT = Portugal, SE = Sweden, UK = United Kingdom.

## B: Political variables

**Table B1: Coefficient estimates of political variables in Budgeting and Implementation Stages**

			(1)	(2)
Political variable	Description	Source	Plan	Implement.
<i>Captures possibility of losing office</i>				
$ELECT_t$	Dummy is 1, if election in $t$ , and 0, otherwise	EJPR	-0.089 (0.089)	-0.44*** (0.14)
$GOV\_NEW_t$	New party composition of cabinet (0 = no change; 1 = change over last year)	CPDS + update	0.31*** (0.096)	-0.23 (0.17)
$GOV\_CHAN_t$	Number of changes of government in year $t$	CPDS + update	0.13 (0.08)	-0.46*** (0.12)
<i>Captures support for government</i>				
$GOV\_TYPE_t$	Type of govt. from single party majority (low) to caretaker (high)	CPDS + update	-0.021 (0.052)	-0.02 (0.09)
<i>Captures party fragmentation of government</i>				
$NMC_t$	Number of members of cabinet	EJPR	0.0064 (0.010)	0.009 (0.022)
$NPC_t$	Number of parties in cabinet	EJPR	0.050 (0.046)	-0.002 (0.098)
<i>Captures left-right orientation of government</i>				
$GOV\_RIGHT_t$	Right-wing parties as % of total cabinet posts	CPDS + update	0.0004 (0.001)	0.004 (0.003)
$GOV\_CENT_t$	Centre parties as % of total cabinet posts	CPDS + update	-0.003 (0.002)	-0.002 (0.004)
$GOV\_LEFT_t$	Left-wing parties as % of total cabinet posts	CPDS + update	0.0008 (0.001)	-0.001 (0.002)
$GOVPARTY_t$	Cabinet composition right (low) – left (high)	CPDS + update	0.018 (0.034)	-0.06 (0.06)
$GOV\_GAP_t$	Ideological gap new cabinet minus old one ( $\Delta GOVPARTY_t$ )	CPDS + update	0.056 (0.049)	-0.19** (0.085)

Notes: Columns (1) and (3) report the coefficient of the political variables added one-by-one to the baseline specification of the planning (Table 4, Column (2)) and implementation stages (Table 5, Column (2)). Heteroskedasticity and serial correlation consistent standard errors are in brackets below the point estimates, \* = significance at the 10% level, \*\* = significance at the 5% level, \*\*\* = significance at the 1% level.

## C: Overall budget sensitivities based on estimates of budget components

We can write the relevant system in the format:

$$g = \alpha_1 \tau + \beta_1 y + \gamma_1 q$$

$$\tau = \alpha_2 g + \beta_2 y + \gamma_2 q$$

where  $g$ ,  $\tau$ ,  $y$  and  $q$  are variables and  $q$  is a set of additional controls, such as  $GOV\_NEW_t$ . Solving this system yields:

$$g = \frac{\beta_1 + \alpha_1 \beta_2}{1 - \alpha_1 \alpha_2} y + \frac{\gamma_1 + \alpha_1 \gamma_2}{1 - \alpha_1 \alpha_2} q \quad \text{and} \quad \tau = \frac{\beta_2 + \alpha_2 \beta_1}{1 - \alpha_1 \alpha_2} y + \frac{\gamma_2 + \alpha_2 \gamma_1}{1 - \alpha_1 \alpha_2} q$$

For the case of the *planning* stage regressions, we have  $g = g'_{t+1} - g'_t$ ,  $\tau = \tau'_{t+1} - \tau'_t$ ,  $y = y'_{t+1}$  and  $q$  is  $GOV\_NEW_t$  and other variables. Hence, using  $s'_{t+1} - s'_t = (\tau'_{t+1} - \tau'_t) - (g'_{t+1} - g'_t)$ , we have

$$s'_{t+1} - s'_t = \frac{\beta_2(1 - \alpha_1) + \beta_1(\alpha_2 - 1)}{1 - \alpha_1 \alpha_2} y'_{t+1} + \frac{\gamma_2(1 - \alpha_1) + \gamma_1(\alpha_2 - 1)}{1 - \alpha_1 \alpha_2} (GOV\_NEW_t).$$

Further,  $\alpha_1 = 0.950216$ ,  $\alpha_2 = 1.043289$ ,  $\beta_1 = -0.566935$ ,  $\beta_2 = 0.579731$ ,  $\gamma_1 = -0.247417$ ,  $\gamma_2 = 0.254578$ . Substituting these numbers yields (rounded):

$$s'_{t+1} - s'_t = 0.50 y'_{t+1} + 0.23 (GOV\_NEW_t).$$

For the case of the *implementation* stage regressions, we have  $g = (g^{t+1} - g^{t+1}) - (g'_t - g'_t)$ ,  $\tau = (\tau^{t+1} - \tau^{t+1}) - (\tau'_t - \tau'_t)$ ,  $y = y^{t+1} - y^{t+1}$  and  $q$  is a vector containing  $INFL^{t+1}_t - INFL'_t$ ,  $GOV\_GAP_t$ ,  $ELECT_t$  and  $GOV\_CHAN_t$ . Further,  $\alpha_1 = 0.790892$ ,  $\alpha_2 = 0.654104$ ,  $\beta_1 = -0.360515$ ,  $\beta_2 = 0.215703$ ,  $\gamma_{1,INFL} = -0.231214$ ,  $\gamma_{2,INFL} = 0.059139$ ,  $\gamma_{1,GOVGAP} = 0.190010$ ,  $\gamma_{2,GOVGAP} = -0.174765$ ,  $\gamma_{1,ELECT} = 0.293178$ ,  $\gamma_{2,ELECT} = 0$ ,  $\gamma_{1,GOVCHAN} = 0$  and  $\gamma_{2,GOVCHAN} = -0.218736$ . Using  $(s^{t+1} - s^{t+1}) - (s'_{t+1} - s'_t) = [(\tau^{t+1} - \tau^{t+1}) - (\tau'_t - \tau'_t)] - [(g^{t+1} - g^{t+1}) - (g'_t - g'_t)]$  and substituting, we obtain:

$$(s^{t+1} - s^{t+1}) - (s'_{t+1} - s'_t) = 0.35(y^{t+1} - y^{t+1}) + 0.19(INFL^{t+1}_t - INFL'_t) - 0.21(GOV\_GAP_t) - 0.21ELECT_t - 0.09(GOV\_CHAN_t)$$

## D: Relation of fiscal components with national fiscal institutions

**Table D1: Relation of fiscal components with national fiscal institutions**

	Spending plans		Revenue plans	
	Dependent: f.e. Column (1), Table 6		Dependent: f.e. Column (3), Table 6	
Constant	1.12 (0.43)	0.69* (0.37)	-1.17 (0.46)	-0.71 (0.38)
<i>MTBF</i>	-1.40** (0.51)		1.44** (0.54)	
<i>FISRUL</i>		-1.32* (0.63)		1.31* (0.68)
	Spending implementation errors		Revenue implementation errors	
	Dependent: f.e. Column (2), Table 6		Dependent: f.e. Column (4), Table 6	
Constant	0.42 (0.40)	0.37 (0.31)	-0.20 (0.24)	-0.15 (0.20)
<i>MTBF</i>	-0.55 (0.47)		0.28 (0.29)	
<i>FISRUL</i>		-0.72 (0.52)		0.31 (0.33)

Notes: the dependent variable is measured in %-points of GDP, while *MTBF* and *FISRUL* are measured on a 0 – 1 scale, with 1 representing the highest degree of tightness of the institutional arrangement.

## E: Relationship SFA and national fiscal institutions

	Dependent variable: average of $sfa_{j,t+1}^{t+1} - sfa_{j,t+1}^t$		Dependent variable: fixed effect of regression Column (2), Table 8	
Constant	0.78** (0.30)	0.71*** (0.23)	0.93 (0.55)	0.58 (0.46)
<i>MTBF</i>	-0.69* (0.36)		-1.17* (0.65)	
<i>FISRUL</i>		-0.90** (0.39)		-1.08 (0.77)

Notes: the dependent variable is measured in %-points of GDP, while *MTBF* and *FISRUL* are measured on a 0 – 1 scale, with 1 representing the highest degree of tightness of the institutional arrangement.

## F: Relationship between fiscal stages and institutions including delegation

	Planning			Implementation		
	Dependent: f.e. Column (5), Table 4; also political variables included			Dependent: f.e. Column (5), Table 5; also political variables included		
Constant	0.25 (0.25)	-0.78* (0.37)	-0.36 (0.40)	0.38 (0.20)	-0.42 (0.31)	-0.15 (0.32)
<i>MTBF</i>		1.37*** (0.42)			1.06** (0.35)	
<i>FISRUL</i>			1.10* (0.59)			0.92* (0.47)
<i>DEL</i>	-0.51 (0.36)	-0.60** (0.27)	-0.41 (0.33)	-0.78** (0.29)	-0.84*** (0.23)	-0.70** (0.26)

Notes: see notes to Table 4. The dependent variable is measured in %-points of GDP, while *MTBF* and *FISRUL* are measured on a 0-1 scale, with 1 representing the highest degree of tightness of the institutional arrangement. *DEL* takes the value 1 (0) if the country follows (does not follow) a delegation approach.

## G: Interactions national fiscal institutions with other explanatory variables

**Table G1: Determinants of the planning stage**

	Dependent variable: $s_{t+1}^t - s_t^t$	
	(1)	(2)
$s_t^t$	-0.40*** (0.055)	-0.41*** (0.055)
$SGP_t^t$	0.25*** (0.097)	0.24** (0.097)
$d_t^t$	-0.0024 (0.0071)	-0.0026 (0.0072)
$y_{t+1}^t$	0.54*** (0.098)	0.56*** (0.098)
$GOV\_GAP_t$	-0.10 (0.09)	-0.09 (0.07)
$MTBF * GOV\_GAP_t$	0.21* (0.11)	
$FISRUL_t * GOV\_GAP_t$		0.31** (0.15)
Estimation method	IV	IV
Fixed Effects	Y	Y
Time Effects	Y	Y
R <sup>2</sup>	0.62	0.62
Sample period ( $t = \dots$ )	1998-2007	1998-2007
N	138	138

Notes: See the notes to Table 4. Recall that *MTBF* is time invariant, while *FISRUL* shows little time variation. Interactions with *FISRUL* are based on its period- $t$  value, although the estimates would have been virtually identical had we used their averages across periods for the interaction terms.

**Table G2: Relation of fiscal components with national fiscal institutions**

	Dependent: f.e. Column (1), Table G1		Dependent: f.e. Column (2), Table G1	
Constant	-1.03** (0.41)	-0.60 (0.35)	-1.07** (0.42)	-0.63 (0.37)
<i>MTBF</i>	1.31** (0.48)		1.35** (0.50)	
<i>FISRUL</i>		1.17* (0.60)		1.21* (0.63)

Notes: the dependent variable is measured in %-points of GDP, while *MTBF* and *FISRUL* are measured on a 0 – 1 scale, with 1 representing the highest degree of tightness of the institutional arrangement.

**Table G3: Determinants of implementation errors**

	Dependent variable: $\left[ \left( s_{t+1}^{t+1} - s_t^{t+1} \right) - \left( s_{t+1}^t - s_t^t \right) \right]$
	(1)
$\left( s_t^t - s_{t-1}^t \right)$ $-\left( s_t^{t-1} - s_{t-1}^{t-1} \right)$	0.23** (0.11)
$s_t^t$	-0.31*** (0.086)
$s_{t+1}^t - s_t^t$	-0.41*** (0.15)
$s_t^t - s_{t-1}^t$	-0.29** (0.11)
$y_{t+1}^{t+1} - y_{t+1}^t$	0.46*** (0.12)
$INFL_{t+1}^{t+1} - INFL_{t+1}^t$	0.20* (0.12)
$GOV\_CHAN_{t+1}$	-1.47*** (0.49)
$GOV\_GAP_{t+1}$	-0.37* (0.20)
$MTBF^*$ $GOV\_CHAN_{t+1}$	1.20** (0.52)
$MTBF^*$ $GOV\_GAP_{t+1}$	0.28 (0.22)
Estimation method	IV
Fixed Effects	Y
Time Effects	Y
R <sup>2</sup>	0.51
Sample period ( $t+1 = \dots$ )	2000-2007
N	111

Notes: See notes to Table 5. Further, interaction terms with *FISRUL* are not significant and, hence, have not been included.

**Table G4: Relation of fiscal components with national fiscal institutions**

	Dependent: f.e. Column (1), Table G3	
Constant	-0.52 (0.44)	-0.48 (0.34)
<i>MTBF</i>	0.65 (0.52)	
<i>FISRUL</i>		0.90 (0.57)

Notes: the dependent variable is measured in %-points of GDP, while *MTBF* and *FISRUL* are measured on a 0 – 1 scale, with 1 representing the highest degree of tightness of the institutional arrangement.