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ABSTRACT

Fifty Years of Fiscal Planning and Implementation in the Netherlands*

Using real-time data from the annual budget over the period 1958-2009, we explore the planning and realization of fiscal policy in the Netherlands. Our key findings are the following. First, planned surpluses are on average unbiased, although they are overoptimistic during the first half of the sample and too pessimistic during the second half of the sample. The latter is the result of cautious real-time revenue estimates by the Dutch Ministry of Finance during this period. Second, real growth projections by the official Dutch forecasting agency are unbiased. This contrasts with the experience of the EU as a whole where biased growth projections represent an important source of fiscal slippage. Third, general economic conditions and the state of the public finances are important determinants of both fiscal plans and their implementation. Fourth, this is also the case for political and institutional factors. Expenditure overruns are partly related to political factors, whereas cautious revenue forecasts relate to the institutional setting. In particular, the most recent regime of the "trend-based budget policy" has worked well for fiscal discipline in the Netherlands.

JEL Classification: E6 and H6
Keywords: fiscal implementation, fiscal planning, institutional factors, political factors and real-time data

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1. Introduction

The last ten years have seen a revival of interest in research on fiscal policy. Much of the research effort has gone into estimating fiscal reaction functions to infer the behavior of the fiscal authorities (e.g., see Galí and Perotti, 2003, Lane, 2003, Wyplosz, 2006, and Debrun and Kumar, 2007; for an overview, see Golinelli and Momigliano, 2008). The estimation of fiscal reaction functions is usually based on the latest figures available for the sample period under consideration. However, using fiscal outcomes for this purpose does not necessarily provide the most accurate picture of how the fiscal authorities behave. Actual fiscal policymaking takes place in different stages and at each stage the fiscal decision maker has only limited information available about the current economic and budgetary conditions. Moreover, each stage of the budgetary process may be affected by its own determinants. Beetsma *et al*. (2009) explore those determinants for a panel of EU countries over the period 1998 – 2007 using data from the so-called Stability and Convergence Programs (SCPs) of Europe's Stability and Growth Pact (SGP).

In this article we will explore the determinants of fiscal plans and of the deviations during implementation from those plans for the Netherlands. Both these stages are analysed using real-time data. The advantage of using real-time information is that our data is as close as possible to the data that was available to the policymakers at the moments they had to take their decisions about the future budget and its actual implementation. An analysis based on those data is most informative about the policymakers' behaviour and can provide useful insights into the role of fiscal institutions in promoting fiscal discipline.

The main differences of the current analysis with Beetsma *et al*. (2009) are the following. First, we focus on only one country, but over a much longer period from the late fifties until now. An advantage of focussing on a single country is that we do not need to make strong assumptions about cross-country homogeneity in relations between dependent and independent variables that underlie most panel data analyses on fiscal reaction functions. Second, we use data directly from the official Dutch budget. The advantage is that we capture directly the (published) views of the policymakers about the real-time economic conditions and fiscal stance. Obviously, these views may be biased for political reasons.

An analysis of the public budget and its information content is important because policymakers tend to regard the budget as "the single most important policy document of

governments, where policy objectives are reconciled and implemented in concrete terms" (OECD, 2002). Budget credibility matters because realistic projections coincide with better fiscal outcomes (Beetsma *et al*, 2009), and because it allows private agents to react to unbiased signals about the fiscal policy stance (Perri, 2009). To explore the information content of the public budget one should investigate planning and implementation jointly. Both stages are subject to different incentives and constraints, implying that the implementation may differ substantially from the original plan.

Our main results are the following. First, planned surpluses are on average unbiased, although they are overoptimistic during the first half of the sample and too pessimistic during the second half of the sample. These findings can be attributed to an overspending relative to plan during the first sub-period and the generation of more tax revenues than planned during the second sub-period. Second, real growth projections by the official Dutch forecasting agency (the "Centraal Planbureau", henceforth referred to as "CPB") are unbiased. This contrasts the experience of the EU as a whole, where biased growth projections represent an important source of fiscal slippage (see Beetsma *et al*., 2009). Third, general economic conditions and the state of the public finances are important determinants of both fiscal plans and their implementation. Higher expected growth and higher public debt lead to more austere budgetary plans. However, more austere plans produce larger shortfalls from the planned balance during the implementation phase. The same holds for a better initial balance, while the opposite is the case for unexpectedly high growth. Fourth, and somewhat in contrast to Beetsma *et al*. (2009), political factors are important determinants of both plans and implementation. The planned balance is lower in an election year, when the government is more left wing and when the parliament is more fractionalised as indicated by the number of parties. Implementation is better in an election year and when the government is of a stronger type (roughly speaking, when it consists of fewer parties and has a more comfortable majority). Most of the political variables operate on the expenditure side of the budget, in line with political theories of expenditure bias. The better adherence to plans during the second half of our sample suggests that the most recent regime of "trend-based budget policy" has worked quite well for the Netherlands in this regard. This is the case even when we add the crisis year 2009 to our sample.

Several recent studies have explored fiscal plans and implementation errors. To have enough observations these contributions all take a panel data perspective exploring a cross-country sample of EU or OECD countries over a relatively short period of time. Von Hagen

(2008) studies deviations of *ex-post* data from fiscal plans and explores in particular the role of fiscal governance and fiscal rules for the quality of the plan. Analogous to earlier work on fiscal reaction functions, Forni and Momigliano (2004), Cimadomo (2007), Marinheiro (2008), Lewis (2009), Pina (2009) and Beetsma and Giuliodori (2010) investigate the cyclicality of fiscal policy in the planning and implementation stages, producing rather widely diverging conclusions. Our current focus on a single country over a relatively long period should be conducive to drawing more definitive conclusions on the behavior of policymakers in the two stages of the fiscal process, and addressing the role of changing the institutional setting for the budgetary process. Finally, Brück and Stephan (2006) and Pina and Venes (2007) explore the political determinants of forecast errors in fiscal policy, while controlling for economic variables.

The plan of this paper is as follows. Section 2 discusses the dataset, while Section 3 describes the budgetary policy regimes in the Netherlands during our sample period. In Section 4 we elaborate on the two stages of the budgetary process and explore the decomposition of actual budgetary outcomes into plans and implementation errors. Section 5 presents the regression analysis in which we try to explain both plans and implementation errors in terms of their economic, political and institutional determinants. Finally, Section 6 concludes the main body of the paper.

2. The data

The main source of data is the Dutch government budget ("*Miljoenennota*"), which contains the government's official economic and budgetary projections for the coming year, as well as the corresponding figures for the current and past year(s). It is presented on the third Tuesday of September each year, after which it is debated in Parliament. After the Parliament has approved it, possibly subject to modifications requested by the Parliament, it becomes official law. Real-time data are collected from vintages after World War II until now, that is over the period 1945-2009.[1] The second data source is the *Comparative Political Data Set* (CPDS) constructed by Armingeon *et al*. (2010). This data set covers political variables for 23 OECD countries, including the Netherlands, over the period 1960-2008. The CPDS code book was

[1] The budget has been published on paper since 1906. Before that, it was since 1806 presented in *speech* (Postma, 2006). However, the information contained in the pre-1945 period is very fragmented and hardly comparable across vintages.

used to extend the data to match the economic and fiscal data sample used here. Inflation figures (and, as an additional check, also other macroeconomic figures) in real time were taken from the CPB (CPB, 1945-2009).

After close inspection of the raw data, several outliers were excluded. Before 1958, some unexplained and very large revisions occurred in the budget balance, revenues and expenditures. Given their size of around 8% of national income, we concluded that it was unreasonable to assume that these were caused by new fiscal information. Their most likely sources constitute financial transactions or changes in the definition of the variables under consideration. To avoid complications in our analysis we decided to exclude the period before 1958. Hence, we use the 1958 – 2009 annual vintages of the *Miljoenennota*. Our key variable, the total balance over GDP ratio (*BAL*), is constructed by linking the two headline figures of the budget balance, which are the so-called financial balance ratio for the vintages 1958-2000 and the budget balance ratio constructed according to the EU rules for the vintages 2001-2009. A more elaborate description of the complete data set is found in Appendix A.

3. Budgetary policy regimes in the Netherlands

Over our sample period, we can distinguish three different fiscal policy regimes. In our regression analysis below, we will capture these by specific regime dummies. The 1950s were characterised by Keynesian anti-cyclical fiscal policy in which the role of the Minister of Finance was not so pronounced. This policy proved to be difficult to carry out in practice and it lost its relevance with the ongoing integration of the Dutch economy in the world economy. As a result, a more forward-looking view was adopted through the "structural budgeting policy", which was based on expectations of high economic growth, implying room for expenditure increases. This regime (indicated by dummy *DUM_R1*) characterizes our sample over the period 1958-1982. This period featured a further expansion of the Dutch welfare state, with matching public expenditures on social welfare and health care.[2] Budgeting took place according to a top-down approach. Overall expenditure was determined first, after which every spending minister could request his part. However, the growing complexity of the public finances led to a decentralisation of the budgeting process,

[2] In 1950 public spending was 28.9% of GDP, in 1970 it was 44.1%, while it peaked in 1983 at 60.9%.

accompanied by a strengthening of accountability and transparency to ensure sufficient discipline. The first oil shock in 1973 and the resulting economic stagnation led to a deterioration of the public finances. After a long decline, the public debt started rising again. After the second oil shock, the 1980s became a period of fiscal contraction. The period 1983-1993, captured by the dummy *DUM_R2*, was the regime of the "actual deficit norm", during which policy was targeting the actual balance. The public spending and deficit ratios started to shrink, although public debt continued to rise for some time to reach a peak of 78% of GDP in 1993. The targeting of the actual balance led to frequent policy changes due to revisions in the real-time estimates of the balance. While this approach helped to reduce uncertainty in the public balance, the associated policy changes also produced unrest in the public administration.

From 1994 onwards the budgeting process has been guided by a "trend-based budget policy". It combines expenditure ceilings with a deliberately cautious mid-term perspective, a strict separation of the expenditure and revenue side of the budget and the concentration of budgetary decisions at a single moment in time in Spring. During this period, indicated by the dummy *DUM_R3*, further reforms in the budgeting process were introduced, which were aimed at increasing accountability and transparency. Spending ministers became individually responsible for their programmes and use of resources, hopefully leading to smaller common pool problems. In the meantime, the EU Treaty had been signed and its debt and deficit restrictions became relevant for entry into the EMU. Finally, the year 2000 marks the start of a more formal and public control of annual fiscal planning, in which every third Wednesday of May the government has to explain its deviations from the original budget for the previous, completed fiscal year. Unfortunately, public and media attention to the event have been low, in particular in comparison with the presentation of the budgets themselves.

4. Decomposition into plans and implementation errors

In this section, first we briefly describe the sources of biases in fiscal plans, after which we present the formal decomposition of the (first-release) budgetary outcome into a planned surplus and an implementation error. Finally, we report summary statistics for both stages of the decomposition.

4.1. The two stages of the budgeting process

The budget summarizes how the government will achieve specific policies that it promises to the voters, how it will finance those policies and, therefore, how fiscally disciplined it will appear. However, it is also the result of negotiations between different coalition parties and different spending ministers within the cabinet. These negotiations are intended to balance the many conflicting demands on the budget. In practice, there are different ways in which these demands can be reconciled, so that political agreement can be reached on the budget. For example, the outcomes of planned expenditure cuts may be overly optimistic in order to *ex ante* create more room for fiscal manoeuvre. Moreover, too optimistic growth and revenue projections create room for manoeuvre on the expenditure side of the budget while still allowing for a healthy projection of the budget balance. This way the budget plan can be used to hide trade-offs between policy objectives (for example, meeting short-term spending objectives versus achieving sustainability). In other words, politicians may try to present a budget that makes them appear fiscally disciplined, while at the same time responding to the many urgent spending needs of society.

Policy trade offs that are hidden at the planning stage are likely to produce tensions during the implementation stage when different objectives need to be met at the same time. However, because the budget represents the parliamentary consent for the government's spending and tax plans and, as such, it has become part of the law, the question arises as to what room the government has to deviate from the original budget during the implementation stage. The OECD questionnaire on budgeting practices and procedures (OECD, 2008) shows that the Dutch government is allowed to increase both mandatory and discretionary spending after the legislature has approved the budget.[3] This suggests that the Dutch government has room for departing from its original plans and this may reduce the information content of the budget for the eventual fiscal outcomes. Nevertheless, the scope for expenditure overruns may have been limited after the introduction of expenditure ceilings in 1994. However, deviations from the original budget may not only arise from hidden trade-offs that manifest themselves during the implementation stage, they may result from unforeseen economic

[3] Specifically, the answer to the question "Q.51.a.1. Increase mandatory spending – is it possible?" reads "Yes, with restrictions" and to question "Q.51.a.2. Increase mandatory spending – does it require any approval?" reads "It requires legislative approval after the fact". The answer to question "Q.51.b.1. Increase discretionary spending – is it possible?" reads "Yes, with some restrictions" and the answer to question "Q.51.b.2. Increase discretionary spending – does it require any approval?" reads "It requires legislative approval after the fact".

developments, possibly due to biases in the growth projections underlying the national budgets.

4.2 Decomposition of outcomes in plans and implementation errors

The realized outcome of the budget balance ratio can be decomposed into the original plan and a deviation from the plan (the "implementation error"):

$$\underbrace{BAL_t^t}_{\text{Outcome}} = \underbrace{BAL_t^{t-1}}_{\text{Plan}} + \underbrace{\left(BAL_t^t - BAL_t^{t-1}\right)}_{\text{Implementation Error}} \tag{1}$$

A superscript on a variable denotes the vintage (year) in which it is published, while the subscript denotes the year to which the observation refers. For example, BAL_t^{t-1} is the balance over GDP ratio planned in September of year *t-1* for year *t*, BAL_t^t is the so-called first-release outcome for year *t* released in September of year *t* and BAL_{t-1}^t is the revised figure for year *t-1* released in September of year *t*.

While decomposition (1) is done for the government's overall balance, we can perform a completely analogous decomposition for expenditures (*EXP*) and revenues (*REV*) as shares of GDP. Precisely, we can write:

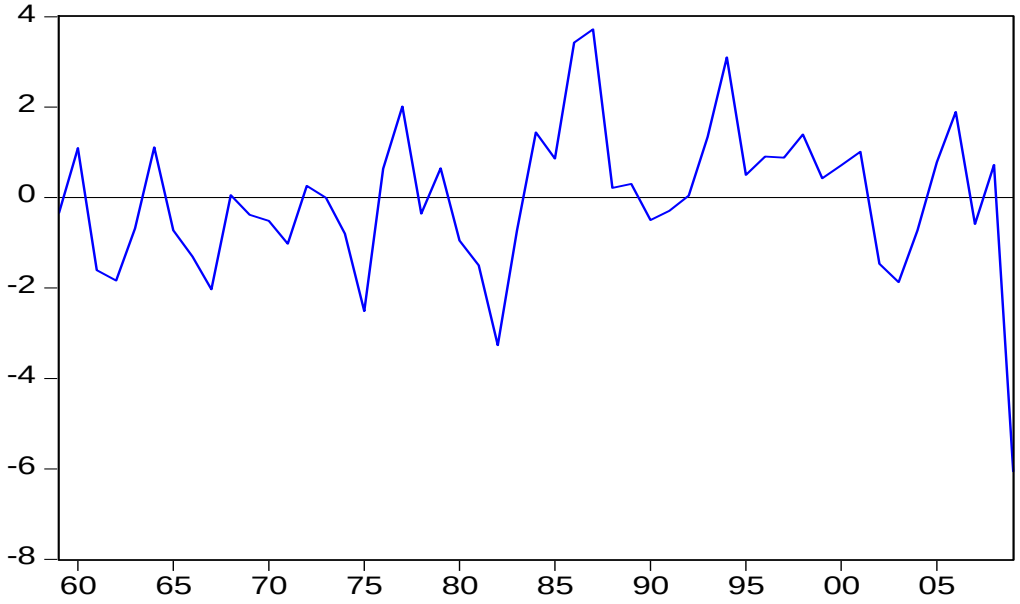
$$\begin{aligned} &BAL_t^t = BAL_t^{t-1} + \left(BAL_t^t - BAL_t^{t-1}\right) = \\ &\left[REV_t^{t-1} + \left(REV_t^t - REV_t^{t-1}\right)\right] - \left[EXP_t^{t-1} + \left(EXP_t^t - EXP_t^{t-1}\right)\right]. \end{aligned} \tag{2}$$

In our analysis, we will be interested in the planned balance and the deviation of the first-release outcome from the planned balance, as well as the revenues and spending components of those deviations. First-release data are of particular interest, because they are closest to the information set available to policymakers when they deviate from their plans and so are most informative about the behaviour of policymakers. Further, although those data are still preliminary and subject to subsequent revisions, they form the starting conditions for the forthcoming fiscal plans, and the basis for the evaluation of the implementation of the previous fiscal plans.[4]

[4] Since the early 2000s this has become a standard practice in the assessment by the European Commission of the national Stability and Convergence Programmes.

Figure 1 depicts the implementation errors in the balance, i.e. the term $\left(BAL_t^t - BAL_t^{t-1}\right)$, over the period 1959-2009. The figure shows that the errors tend to be rather large in absolute magnitude, suggesting that planning is not very accurate. Given the exceptional circumstances resulting from the economic and financial crisis, in most of what follows we consider the sample period 1959-2008 and treat the year 2009 separately. Indeed, this year is characterised by a very substantial shortfall (more than 6% of GDP) of the actual balance from the originally planned balance. The average implementation error over the period 1959-2008 is not significantly different from zero, as shown in Table 1 in the column of the total error (*TE*). However, if we split this period into two periods of 25 years, we see that during the first sub-period (1959-1983) the actual balance falls short of the plan by 0.6% of GDP on average, while the opposite is the case for the second sub-period (1984-2008) when the actual balance exceeds its planned value by 0.7% of GDP on average. The difference between the two sub-periods may not be too surprising given the substantial differences in economic circumstances (the recession vanishing after the second oil price hike) and fiscal frameworks. Table 1 also reports the primary balance ratio (*PBAL*). Qualitatively and quantitatively the results are the same for this measure.

Figure 1: Implementation Error in the Budget Balance over Output Ratio



Note: The error is the deviation of the first-release outcome from the plan. The sample period is 1959-2009.

An important question is which side of the budget (revenues or expenditures) drives the implementation errors in the overall budget. Table 1 splits the total error in the balance into a total error for revenues and a total error for expenditures. Interestingly, while the total error in the balance over the entire sample period is close to zero, the outcomes of both expenditures and revenues exceed their planned values on average by 0.5% of GDP. In other words, a lack of spending discipline in the implementation phase is balanced by higher-than-planned revenues. If we inspect the split for the two sub-periods, we see that the systematic shortfall of the actual surplus from its planned value during the first sub-period can be ascribed to higher-than-planned spending, while the overachievement relative to the planned balance during the second sub-period is caused by higher-than-planned revenues on average. Spending errors have shrunk to much lower values on average during this sub-period. Excluding net interest payments, and so looking at the primary expenditure ratio (*PEXP*), we arrive at the same conclusions.

Table 1 also reports the decomposition of the total implementation error *TE* into a base effect *BE* (i.e., a revision of the initial balance), a nominal growth effect *GE*, a denominator effect *DE* due to the growth of nominal income and a residual effect *RE*, according to the following formula (see Appendix B for the derivation):

$$TE = BE + GE - DE + RE \tag{3}$$

The base effect *BE* contains new information on the starting position of the fiscal stance and therefore represents a positive or negative fiscal surprise to the government when fiscal measures are implemented. It captures the part of the forecast error being due to the difference between the revised outcome for the previous year of a variable and last year's first-release outcome of the variable in question. It may differ from zero for two reasons. First, last year's nominal GDP may differ from what was estimated. Second, last year's nominal spending or revenues level may differ from its previous estimate. The growth effect *GE* constitutes the part of the surprise in budgetary adjustment that arises from deviations of nominal revenue or expenditure growth from their planned values. Those deviations may arise for various reasons, for example because of unexpected macroeconomic developments and overambitious planning (European Commission, 2007). In the case of revenues,

deviations of tax elasticities from their expected values may also play a role.[5] The denominator effect *DE* arises from projection errors in nominal output growth. If growth turns out to be higher than projected, both the revenue and expenditure ratios will fall short of their targets. However, because both ratios are moved in the same direction the denominator effects in the spending and revenue ratios largely cancel, which implies that the denominator effect in the balance is generally small. Finally, the residual component *RE* is usually small, as it is a second-order term formed by the product of growth rates. It will not receive any further attention.

The total error in the balance is to a substantial extent driven by the base effect, which is always positive and, moreover, sizable (0.3% of GDP for the second sub-period and 0.5% of GDP for the first sub-period). In other words, part of the plan is achieved through a positive revision of the balance in the previous period. This finding seems puzzling at first sight, because data revisions are expected to be zero on average (Jacobs and Van Norden, 2006). However, real-time estimates are generated by the Ministry of Finance, while the realised outcomes over previous years are produced by the Central Bureau of Statistics (CBS), an institution that is independent from the government.[6] The Ministry may have a strategic incentive to report a prudent estimate for the balance, in order to limit additional expenditure pressures from spending ministries (observe the large and positive growth effect in expenditures). This effect may be the strongest on the revenues side, given that the Ministry has a substantial margin for discretion in estimating revenues in real time. On the expenditures side, the room for manoeuvre is more limited, given that the Ministry depends on expenditure estimates by the spending departments.[7]

Considering the entire sample period, the growth effect essentially offsets the base effect. The growth effect in the balance is the result of higher than anticipated nominal spending growth minus higher than anticipated nominal revenue growth. Nominal revenue growth rates on average exceed their planned values by 0.4%. However, this beneficial effect on the implementation of the planned balance is more than offset by the growth effect in

[5] Of course, spending elasticities may also differ from their predicted values. However, this is unlikely to be a substantial source of the growth effect, because spending elasticities are usually relatively small in absolute terms.

[6] Until 2003, the CBS received its budget from the Ministry of Economic Affairs, but was generally considered to be *de facto* independent in the construction and publication of its statistics. Since 2004, the CBS is also an autonomous administrative authority that executes its tasks independently.

[7] Systematically positive base effects explain why, for the sample as a whole, the implemented *change* in the balance falls short of the planned change, while the *level* of the balance is on target on average. This indicates that it is important to account for base effects when modelling implementation errors, as we will do in Section 5.

spending, which is on average 0.7% higher than planned. The sample split shows that the growth effect in the balance is on average negative and large (-1.0%) during the first sub-period and positive (but smaller, 0.4%) on average during the second sub-period. In the first sub-period, it is essentially driven by spending being higher than anticipated, while in the second sub-period it is the result of both expenditures and revenues being higher than anticipated, but with the latter dominating.

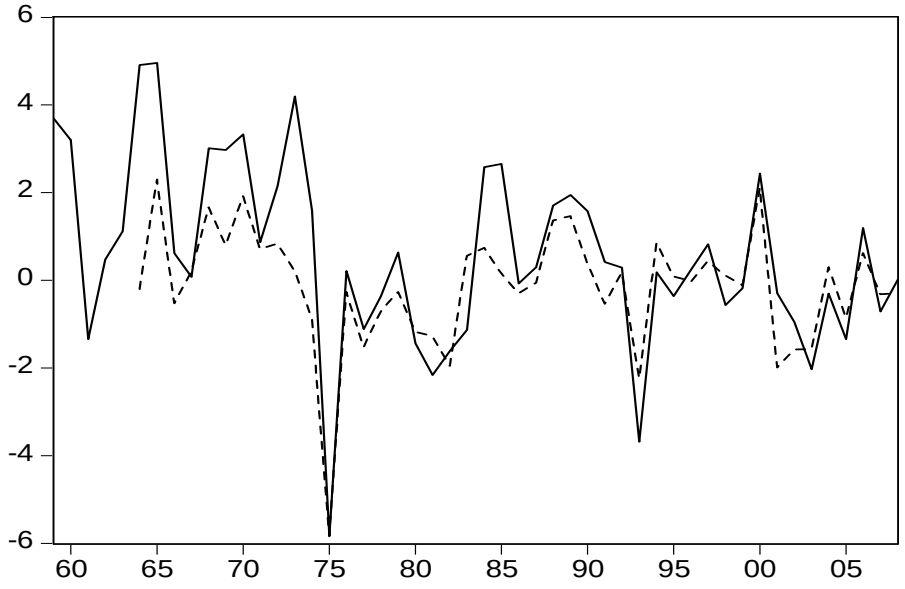
Table 1: Decomposition of Implementation Errors

Full Sample: 1959-2008					
	TE	*BE*	*GE*	*DE*	*RE*
BAL	0.05 (0.21)	0.40*** (0.11)	-0.32* (0.17)	-0.01 (0.008)	-0.04*** (0.01)
REV	0.55*** (0.21)	0.26 (0.16)	0.39** (0.15)	0.10 (0.07)	0.007 (0.009)
EXP	0.50** (0.20)	-0.14 (0.16)	0.70*** (0.12)	0.11 (0.08)	0.05*** (0.01)
PEXP	0.54*** (0.20)	-0.10 (0.16)	0.70*** (0.12)	0.10 (0.07)	0.06*** (0.01)
PBAL	0.02 (0.20)	0.36*** (0.11)	-0.31* (0.17)	-0.0004 (0.004)	-0.04*** (0.01)
Sub-sample: 1959-1983					
	TE	*BE*	*GE*	*DE*	*RE*
BAL	-0.59** (0.24)	0.49*** (0.17)	-0.99*** (0.18)	-0.0004 (0.009)	-0.09*** (0.02)
REV	0.23 (0.31)	0.46 (0.29)	-0.06 (0.14)	0.14 (0.10)	-0.02 (0.01)
EXP	0.82** (0.34)	-0.03 (0.28)	0.93*** (0.15)	0.15 (0.11)	0.07*** (0.02)
PEXP	0.83** (0.34)	-0.01 (0.27)	0.91*** (0.16)	0.14 (0.10)	0.06*** (0.02)
PBAL	-0.60** (0.23)	0.47*** (0.17)	-0.98*** (0.18)	-0.007 (0.01)	-0.08*** (0.02)
Sub-sample: 1984-2008					
	TE	*BE*	*GE*	*DE*	*RE*
BAL	0.72** (0.28)	0.30** (0.13)	0.39* (0.21)	-0.02 (0.01)	0.01 (0.01)
REV	0.90*** (0.26)	0.06 (0.11)	0.86*** (0.23)	0.05 (0.10)	0.04*** (0.009)
EXP	0.18 (0.19)	-0.24 (0.15)	0.47** (0.17)	0.07 (0.11)	0.02*** (0.008)
PEXP	0.23 (0.18)	-0.20 (0.15)	0.47** (0.18)	0.06 (0.10)	0.03*** (0.008)
PBAL	0.66** (0.28)	0.26* (0.13)	0.39* (0.21)	-0.01 (0.01)	0.01 (0.01)

Notes: The error is the deviation of the first-release outcome from the plan. All variables are expressed in percent of GDP. (*) denotes significance at the 10% level, (**) at the 5% level and (***) at the 1% level. *TE* = Total Error; *BE* = Base Effect; *GE* = Growth Effect; *DE* = Denominator Effect; *RE* = Residual Effect. Notice that $TE = BE + GE - DE + RE$. Rounding errors may prevent exact adding up of these individual effects to the total error. The year 2001 is excluded because of a definition change of the budget balance and its components.

One could imagine that the implementation errors in fiscal policy are at least partly the result of prediction errors in economic activity. Figure 2 depicts the errors in both nominal and real output growth. For nominal growth, these are defined as $y_t^t - y_t^{t-1} = \left(Y_t^t - Y_{t-1}^t\right)/Y_{t-1}^t - \left(Y_t^{t-1} - Y_{t-1}^{t-1}\right)/Y_{t-1}^{t-1}$, where Y is the nominal GDP. To calculate real output growth figures we use the real-time GDP deflator. Realised (first-release) nominal output growth on average exceeds its projection by a significant 0.58% points (see Table 2). This figure is largely driven by the under-projection of nominal growth during the first half of the sample. Given that the errors in real growth are slightly negative on average (though not significant) this demonstrates that the under-projection in nominal growth during the first sub-period is due to higher than expected inflation. This is not surprising given the impact of the oil price shocks on inflation in the seventies and the beginning of the eighties. The absence of a significant bias in real growth projections, in particular during the second half of the sample, contrasts with Beetsma *et al*. (2009), who find that real growth projections incorporated in the EU Stability and Convergence Programs have on average been too optimistic. In this regard, the CPB has done relatively well in its projections. However, while unbiased, deviations between outcomes and projections are often rather substantial.

Figure 2: Errors in Nominal and Real Output Growth



Notes: The solid line is the error in nominal output growth. The dashed line is the error in real output growth. Real output growth figures are only available since 1963.

Table 2: Errors in Nominal and Real Output Growth

	1959-2008	1959-1983	1984-2008
Nominal	0.58*	0.92*	0.23
	(0.30)	(0.51)	(0.29)
Real	-0.14	-0.27	-0.04
	(0.21)	(0.39)	(0.21)

Notes: (*), (**) and (***) denote significance at, respectively the 10%, 5% and 1% level. Real output growth figures are only available since 1963.

5. Determinants of plans and errors

This section digs deeper into the determinants of fiscal plans and the implementation errors. We discuss first the general regression frameworks for both stages, followed by an analysis of the determinants of the fiscal plans. Finally, we investigate the determinants of the implementation errors and discuss our findings.

5.1. General regression framework

We use regression analysis to try and explain plans and implementation errors on the basis of three broad groups of determinants: economic, political and institutional. The general regression model for the planned balance is:

$$BAL_t^{t-1} = \beta_0 + \beta_1 ECON_t^{t-1} + \beta_2 POL_{t-1} + \beta_3 INS_{t-1} + \varepsilon_{t-1}, \qquad (4)$$

where *ECON* groups the real-time economic and budgetary conditions, *POL* the political determinants and *INS* the institutional factors that may be of relevance at the planning stage. These latter variables are captured by the dummies we introduced to distinguish the different fiscal policy regimes. Examples of economic and budgetary determinants are economic growth forecasts and current debt ratios. Political and institutional variables concern the year in which the fiscal stance was planned, that is year *t-1*. Our political variables capture the severity of different kinds of political distortions. In fact, there are two major ways in which political distortions may lead to budgetary pressures. The first channel is through "size

fragmentation". This type of fragmentation leads to common pool problems and complicates the agreement on corrective fiscal measures. The original version of the common pool problem (Shepsle and Weingast, 1981) features a spending bias, but not necessarily a deficit bias. Later contributions focus on how common pool problems may result in higher deficits via the voracity effect (Tornell and Lane, 1999, and Lane, 2003) or attrition wars (Alesina and Drazen, 1991). The second channel is through "time fragmentation". More political instability through more frequent government changes (implying shorter expected tenure) or a larger degree of political polarisation effectively raises the rate at which the government discounts the future. Hence, it cares less about the future consequences of higher deficits.

Our political variables can be grouped into three categories: electoral variables, partisanship or political colour variables and political fragmentation variables. The electoral variables are a dummy *ELEC* for an election year and a dummy *GOVCHAN* indicating the change of government. As a proxy for partisanship we use the Schmidt index, which is constructed from figures on the political colour of the parties in government. This is the variable *GOVPARTY*. A higher value denotes a more left-wing composition of cabinet parties. We will also use the variable *GOVGAP*, which is the change in *GOVPARTY* from last year to this year. Finally, we measure fragmentation by the type of government *GOVTYPE*, which ranges from a single-party-majority (least fragmented) to multi-party minority and caretaker governments (most fragmented). Other proxies for fragmentation in one form or the other are the number of parties in cabinet (*FRAGCAB*) and parliament (*FRAGPARL*), and the electoral (*RAEELE*) and legislative (*RAELEG*) fractionalisation of the party system (see Appendix A for more details).

Analogous to the specification of the planning stage, our general specification for the implementation error is

$$BAL_t^t - BAL_t^{t-1} = \gamma_0 + \gamma_1 ECON_t^t + \gamma_2 POL_t + \gamma_3 INS_t + \upsilon_t . \qquad (5)$$

Also for this stage of the fiscal process, we explore the role of economic and budgetary conditions (*ECON*), such as real-time output growth surprises and base effects, political factors (*POL*) and institutional factors (*INS*), the latter captured again by the regime dummies.

5.2. Analysis of the planning stage

Table 3 reports the results of the estimation of equation (4) for the planned balance. Column (1) considers only economic and budgetary determinants. Experimentation suggested serial correlation in the errors and a negative outlier for the planned balance in 1976. In fact, the budget for 1976 was dominated by strong concerns about the economy. According to Notenboom (2002), it was based on an assumed real trend growth rate of national income of 3.75%. However, in August 1975 the CPB revised its trend growth projection downwards to a range of 3.0 to 3.25% and the government decided to include three billion guilders of extra spending in the budget for 1976. This package came on top of stimulus measures that had already been included. Including cyclical items planned expenditures increased by no less than 24% relative to the 1975 budget.[8] The exceptional discretionary response in the 1976 budget leads us to include the dummy *DUM76* for this specific year. It turns out to be significantly negative and large in size. Moreover, the problems with serial correlation vanish.

The initial (period *t-1*) balance BAL_{t-1}^{t-1} enters with a positive and large coefficient, which may not be too surprising, given the persistence in budgetary outcomes that we tend to observe in practice. The lagged implementation error, $BAL_{t-1}^{t-1} - BAL_{t-1}^{t-2}$, is significant with a large and negative coefficient. An increase in the implementation of the previous plan by 1% of GDP lowers the planned balance for the coming year by almost 0.5% of GDP. More implementation of the previous plan may lead to complacency on the side of the policymakers and, hence, to a less ambitious plan for the coming period. The initial public debt exerts an expected positive effect. Specifically, an increase in the debt ratio by 1%-point raises the planned balance by 0.04%-point, a moderate but significant number. Hence, the roughly 45% of GDP rise in the public debt from the mid-seventies to the mid-nineties would have led to a ceteris paribus increase in the public balance by 1.8% of GDP. As was shown by Bohn (1998), long-run sustainability of the public debt requires an improvement in the primary balance in response to higher debt, no matter how small this improvement is. Of course, the sustainability question cannot be directly answered here, since this regression is based on the overall balance rather than the primary balance (see below). Further, a foreseen increase in economic growth by one percentage point raises the planned improvement in the

[8] Notenboom (2002, p. 125).

balance by a statistically significant amount of 0.3% points.[9] In view of the potential feedback of planned fiscal improvements onto economic growth, we instrument projected economic growth with current output growth and current oil price growth.

Column (2) of Table 3 includes the growth rate of the oil price into the regression.[10] Movements in the oil price are potentially important for at least two reasons. One is that a change in the oil price acts as a supply shock. The other is that the Netherlands are a large producer of natural gas, while the price of gas is linked to the oil price. While a rise in the oil price causes stagflation in non-energy producing countries, which in turn results into a deterioration of the public budget, in the Netherlands higher oil prices also lead to more government revenues.

Up until the early 1980s, both the oil price and gas revenues were on an increasing path. During this period of 'Dutch disease', the increases in gas revenues were mostly used to cover increasing expenditures (Wellink, 1987), thereby masking the underlying fiscal problems that were the result of the oil shocks. After the early 1980s, both the oil price and gas revenues went on a declining path until the end of the 1990s. All else equal, this deteriorated the fiscal position. Especially after 1994, the budgetary treatment of the gas revenues changed. A fixed percentage (of 41.5% since 1999) became earmarked for productive investment. Moreover, the introduction of expenditure rules and the strict separation of expenditure and revenue developments since 1994 in principle limited the scope for strong policy reactions. However, a recent evaluation points out that the oil price increases that occurred in recent years coincided with upward revisions in the expenditure ceilings. This occurred since the expenditure ceilings are raised with the '*Prijs nationale bestedingen*', which, owing to its higher sensitivity to the oil price, rose more than the price of actual government expenditure (Ministry of Finance, 2010). Hence, expenditure increases in times of rising oil prices are still possible. In line with this, Wierts and Schotten (2008) find a statistically significant negative response of the non-gas primary balance to changes in gas revenues for the whole period since the early 1970s (based on *ex-post* data). The

[9] Projected economic growth is a combination of projected potential growth and the projected change in the output gap. Hence, the coefficient of the projected growth rate cannot be interpreted as a measure of the sensitivity of the budget to the economic cycle. However, we decided to enter the projected growth rate rather than the projected change in the output gap as an independent variable, because the change in the output gap is not directly observable.

[10] Oil price projections are available from the CPB only from 1982 and onwards. Therefore, in our regression we include the current oil price growth rate $OILD_{t-1}^{t-1} = \left(OIL_{t-1}^{t-1} - OIL_{t-2}^{t-1}\right) / OIL_{t-2}^{t-1}$.

estimates reported in Column (2) of Table 3 indicate that the current growth in the oil price has no statistically significant effect on fiscal planning over the whole sample. Given that the planned balance also contains the government's proceeds from gas sales, this suggests an offsetting policy response, in line with what Wierts and Schotten (2008) find.

In Column (3) we drop the growth rate of the oil price and include the dummies *DUM_R2* and *DUM_R3* for the sub-periods 1983-1993 and 1994-2009, respectively. As mentioned, these dummies are intended to capture differences in fiscal regime over time, although they may be picking up any systematic difference in fiscal performance over time that is not captured by the other explanatory variables. We do not include a separate dummy for the first sub-period 1959-1982. Hence, the coefficients of *DUM_R2* and *DUM_R3* capture the average difference in the planned balance relative to the first sub-period. While the other coefficients remain essentially unchanged, both dummies are insignificant.

This conclusion changes with the introduction of political variables in Column (4). While the effects of the economic variables are essentially unchanged (except that coefficient on debt becomes insignificant), now *DUM_R3* enters with a positive coefficient that is significant at the 10% level. Holding everything else equal, the ambition under the "trend-based budget policy" is a 2% point higher balance than under the initial regime of "structural budget policy".

From each of our three groups of political variables we included the one that fitted the equation best. In an election year governments are less ambitious in trying to improve the future financial situation, possibly because they want to convey that they will carry out promises of more spending or reduced taxes made during the election campaign. In an election year the planned balance is roughly half a percentage point lower. An increase in *GOVPARTY*, that is the budget is presented by a more left-wing oriented government, also reduces the planned balance. Also this result may not be surprising, as more left-wing governments are generally perceived to give relatively higher priority to additional spending than to keeping deficits under control. An increase in the number of parties in parliament *FRAGPARL* weakens budgetary ambition. The likely reason is that with more fractionalisation in parliament the government has to be more generous in terms of planned spending or tax reductions to secure the necessary parliamentary support for the budget law.

Table 3: Determinants of the Planning Stage

	Dependent variable:						
	BAL_t^{t-1}						$PBAL_t^{t-1}$
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Constant	-3.98** (1.60)	-3.82** (1.52)	-4.50*** (1.50)	-1.64 (1.79)	-2.65 (1.66)	-2.53 (1.49)	-2.27 (1.47)
DUM76	-4.32*** (0.78)	-4.28*** (0.75)	-4.36*** (0.85)	-3.99*** (0.64)	-3.75*** (0.41)	-3.74*** (0.38)	-3.64*** (0.34)
Initial balance: BAL_{t-1}^{t-1}	0.87*** (0.11)	0.88*** (0.11)	0.80*** (0.10)	0.60*** (0.17)	0.79*** (0.12)	0.80*** (0.11)	0.67*** (0.11)
Lagged error: $BAL_{t-1}^{t-1} - BAL_{t-1}^{t-2}$	-0.45*** (0.13)	-0.45*** (0.13)	-0.43*** (0.15)	-0.28*** (0.11)	-0.35*** (0.10)	-0.35*** (0.10)	-0.32*** (0.10)
Initial debt: $DEBT_{t-1}^{t-1}$	0.040*** (0.013)	0.039*** (0.013)	0.051* (0.026)	0.025 (0.018)	0.046** (0.020)	0.044** (0.017)	0.052** (0.02)
Expected output growth: y_t^{t-1}	0.32** (0.13)	0.30*** (0.12)	0.33** (0.14)	0.64** (0.25)	0.46*** (0.14)	0.45*** (0.12)	0.36*** (0.09)
Current oil price growth: $OILD_{t-1}^{t-1}$		0.0029 (0.0091)			-0.013 (0.0086)	-0.013 (0.0085)	-0.010 (0.007)
$ELEC_{t-1}$				-0.49* (0.25)	-0.55** (0.25)	-0.56** (0.25)	-0.52** (0.24)
$GOVPARTY_{t-1}$				-0.69** (0.31)	-0.38** (0.18)	-0.37** (0.16)	-0.23* (0.13)
$FRAGPARL_{t-1}$				-0.37*** (0.12)	-0.17** (0.079)	-0.17** (0.077)	-0.14* (0.071)
DUM_R2			-0.58 (1.05)	0.84 (0.99)			
DUM_R3			-0.16 (0.90)	2.04* (1.17)			
(DUM_R2+DUM_R3) $*OILD_{t-1}^{t-1}$					0.029*** (0.0091)	0.031*** (0.0093)	0.026*** (0.0078)
Estimation method	IV	IV	IV	IV	IV	IV	IV
R^2	0.935	0.937	0.936	0.944	0.954	0.954	0.960
DW	1.87	1.89	1.79	2.57	2.30	2.36	2.26
LM 1st order (*p-value*)	0.06 (0.80)	0.03 (0.86)	0.47 (0.49)	7.29*** (0.007)	2.30 (0.13)	2.25 (0.13)	1.24 (0.26)
LM 2nd order (*p-value*)	0.33 (0.84)	0.21 (0.90)	1.92 (0.38)	12.12*** (0.002)	2.35 (0.31)	2.28 (0.32)	1.30 (0.52)
Sample period (t = …)	1960-2008	1960-2008	1960-2008	1960-2008	1960-2008	1960-2009	1960-2009
N	49	49	49	49	49	50	50

Notes: Heteroskedasticity and serial correlation consistent standard errors are in brackets below the point estimates, where (*), (**) and (***) denote significance at, respectively, the 10%, 5% and 1% levels. We have defined $y_t^{t-1} = \left(Y_t^{t-1} - Y_{t-1}^{t-1}\right) / Y_{t-1}^{t-1}$ and $OILD_{t-1}^{t-1} = \left(OIL_{t-1}^{t-1} - OIL_{t-2}^{t-1}\right) / OIL_{t-2}^{t-1}$, where Y is the nominal GDP in billions and OIL is the price of oil. The instruments for y_t^{t-1} are $y_{t-1}^{t-1} = \left(Y_{t-1}^{t-1} - Y_{t-2}^{t-1}\right) / Y_{t-2}^{t-1}$ and $OILD_{t-1}^{t-1}$, when the latter is not included directly as an independent variable. Further, R^2 = un-centred R-square; DW = Durbin-Watson statistic; LM = Breusch-Godfrey 1st (2nd) order serial correlation LM test, which is distributed as a χ^2 with 1 (2) degrees of freedom under the null hypothesis of no serial correlation; and N = number of observations. In Column (7) the dependent variable is the planned *primary* balance. For consistency, the initial *primary* balance and the lagged error of the *primary* balance are used as independent variables.

The coefficients of the economic variables are essentially unaltered compared to those in the previous column, except for the coefficient on the public debt, which becomes insignificant. However, this regression suffers from serial correlation in the residuals. Hence, we searched further for a proper specification. In Column (5), we drop the regime dummies as entering directly into the regression, but we inter-act them with the growth rate of the oil price, the idea being that due to a potential tendency towards more discipline in the second sub-period an increase in revenues linked to energy prices is to a larger extent used to improve the budget.[11] The interaction term is highly significant. In particular, the rising oil price after the turn of the century may have improved the planned budget. We also include the current growth rate of the oil price directly, but it is insignificant (though not far from significance). The finding of a significant interaction term in combination with the absence of any response when oil growth is entered directly (recall Column (2)) marks a significant shift in the response to changing oil prices between the first and second sub-period. However, this shift may have been partly offset during implementation phase by favourable terms-of-trade effects, as mentioned already. Finally, compared with the preceding regression in Column (4), the coefficient estimates of the political and economic variables are qualitatively unchanged, except that the coefficient of public debt is significant again.

In Column (6) we add the crisis year 2009 to the sample. The estimates are hardly affected. This is also the case when in Column (7) we repeat the regression of Column (6) but replace the balance with the primary balance both for the dependent and the independent variables. In particular, one observes that the coefficient of the public debt is significant, suggesting that the government tried to follow a policy of stabilizing the long-run debt level.

5.3. Analysis of the implementation stage

We turn now to the analysis of the determinants of fiscal implementation error. Table 4 reports the results for the different cases of regression equation (5). Inspection of the residuals of our specifications exhibited an outlier in 1993. Hence, we decided to include the dummy *DUM93,* which is one in 1993 and zero otherwise. Its inclusion considerably improves the fit and its coefficient is always large and significantly positive. Column (1)

[11] We also ran a regression in which we included $DUM\_R2*OILD_{t-1}^{t-1}$ and $DUM\_R3*OILD_{t-1}^{t-1}$ separately. However, the estimated coefficients of these variables were of similar magnitude and not statistically different from each other.

shows that the coefficient of the lagged dependent variable is significant, but small in size. A better initial balance at the moment that the plan is made leads to better adherence to the plan. However, a larger planned balance weakens adherence to the plan. In particular, a one-percent of GDP increase in the planned balance reduces implementation by almost half a percent of GDP. Further, the regression controls for the base effect. In particular, the update of the initial balance, $BAL_{t-1}^{t} - BAL_{t-1}^{t-1}$, enters with a highly significant coefficient of almost 0.8. The decomposition in equation (3) showed that the base effect is one of the components of the implementation error. By controlling for the base effect in this way, the regression is essentially trying to account for the determinants of the final three terms in the decomposition. Because the denominator and residual effects are small, this amounts to the regression trying to explain the growth effect of the implementation error in the balance, while controlling for the base effect.[12] Finally, we include the unanticipated component of economic growth. To deal with the potential problem of reverse causation, we instrument this variable with economic growth in the previous period and oil price growth in both the previous and the current period. A positive growth surprise produces more tax revenues than anticipated and improves adherence to planned budgetary improvement. However, somewhat surprisingly, the growth surprise is not significant in this specification.

Figure 1 suggests that (apart from the final year 2009) adherence to the original plan was systematically better during the second sub-period than during the first sub-period. Hence, we include the regime dummies *DUM_R2* and *DUM_R3* in the regression. Column (2) reports the estimates for this case. The lagged dependent variable loses significance, while the coefficient on the unexpected growth change doubles and becomes highly significant. While the coefficient on *DUM_R2* is insignificant, the coefficient on *DUM_R3* is positive, highly significant and large: adherence to the planned budget improves by about 1.3% of GDP on average during the period from 1994 and onward. In other words, the regime of the "trend-based budget policy" has worked relatively well in this regard.

[12] Beetsma *et al*. (2009) define the implementation error as the deviation of the actual *change* from the originally planned *change* in the balance. In Appendix A of their article, they show that this measure of the implementation error is proportional to the growth effect of the total error in the *level* of the balance.

Table 4: Determinants of the Implementation Stage

	Dependent variable:					
	$BAL_t^t - BAL_t^{t-1}$					$PBAL_t^t - PBAL_t^{t-1}$
	(1)	(2)	(3)	(4)	(5)	(6)
Constant	-0.93***	-1.70***	-1.80***	-0.79*	-1.05**	-0.63
	(0.23)	(0.25)	(0.32)	(0.44)	(0.49)	(0.47)
DUM93	2.27***	3.43***	3.55***	3.55***	3.79***	3.90***
	(0.66)	(0.64)	(0.72)	(0.72)	(0.72)	(0.72)
Lagged dependent: $BAL_{t-1}^{t-1} - BAL_{t-1}^{t-2}$	0.19*	0.10				
	(0.10)	(0.09)				
Initial balance: BAL_{t-1}^{t-1}	0.27*	0.18	0.22	0.26	0.24	0.29*
	(0.14)	(0.15)	(0.16)	(0.17)	(0.18)	(0.14)
Planned balance: BAL_t^{t-1}	-0.46***	-0.46***	-0.48***	-0.51***	-0.53***	-0.57***
	(0.10)	(0.12)	(0.12)	(0.13)	(0.14)	(0.13)
Base effect balance: $BAL_{t-1}^t - BAL_{t-1}^{t-1}$	0.77***	0.70***	0.70***	0.81***	0.83***	0.80***
	(0.16)	(0.15)	(0.15)	(0.13)	(0.14)	(0.13)
Unexpected output growth: $y_t^t - y_t^{t-1}$	0.15	0.38***	0.32***	0.35***	0.41**	0.37**
	(0.12)	(0.11)	(0.10)	(0.13)	(0.16)	(0.15)
$ELEC_t$				0.71**	0.78**	0.89**
				(0.33)	(0.34)	(0.34)
$GOVGAP_t$				0.22	0.21	0.25
				(0.20)	(0.22)	(0.24)
$GOVTYPE_t$				-0.44***	-0.41***	-0.38***
				(0.11)	(0.12)	(0.12)
DUM_R2		0.18	0.37	0.20	0.08	0.93**
		(0.44)	(0.52)	(0.47)	(0.49)	(0.39)
DUM_R3		1.32***	1.50***	1.21***	1.22***	1.59***
		(0.24)	(0.30)	(0.28)	(0.38)	(0.46)
Estimation method	IV	IV	IV	IV	IV	IV
R^2	0.608	0.672	0.618	0.742	0.770	0.752
DW	1.80	1.98	1.81	1.84	1.88	1.85
LM 1st order	0.61	0.01	0.29	0.05	0.03	0.02
(*p-value*)	(0.44)	(0.97)	(0.59)	(0.82)	(0.85)	(0.89)
LM 2nd order	1.05	1.95	1.27	1.30	1.74	0.63
(*p-value*)	(0.59)	(0.37)	(0.53)	(0.52)	(0.42)	(0.73)
Sample period (t = …)	1960-2008	1960-2008	1959-2008	1959-2008	1959-2009	1959-2009
N	49	49	50	50	51	51

Notes: Heteroskedasticity and serial correlation consistent standard errors are in brackets below the point estimates, where (*), (**) and (***) denote significance at, respectively, the 10%, 5% and 1% levels. We define $y_t^t = \left(Y_t^t - Y_{t-1}^t\right)/Y_{t-1}^t$, where Y is the nominal GDP in billions. The instruments for $y_t^t - y_t^{t-1}$ are $y_{t-1}^t = \left(Y_{t-1}^t - Y_{t-2}^t\right)/Y_{t-2}^t$, $OILD_{t-1}^t = \left(OIL_{t-1}^t - OIL_{t-2}^t\right)/OIL_{t-2}^t$ and $OILD_t^t = \left(OIL_t^t - OIL_{t-1}^t\right)/OIL_{t-1}^t$. Further, R^2 = un-centred R-square; DW = Durbin-Watson statistic; LM = Breusch-Godfrey 1st (2nd) order serial correlation LM test distributed as a χ^2 with 1 (2) degrees of freedom under the null hypothesis of no serial correlation; N = number of observations. In column (6) the dependent variable is the error in the *primary* balance. For consistency, the initial *primary* balance, planned *primary* balance, and base effect in the *primary* balance are used as independent variables. Notice that the base effect in the balance is not exactly the base effect as derived in Appendix B, but a very close approximation, as growth rates of nominal spending, revenues and income may differ.

In Column (3) we drop the lagged dependent variable from the regression and leave it out for the remainder of the analysis. The other coefficient estimates are essentially unchanged. Column (4) adds the political variables to the regression. Again, we take the best-fitting variable from each group. In particular, we find that elections have a positive and rather strong effect. We do not have any obvious explanation for this result, except that an incumbent government (before the election) might want to demonstrate that it is able to stick to its original plan or that a new or re-appointed government is far enough from the next election to not fear any electoral consequences of following a tight fiscal policy. Moreover, a tight policy now may create room for fiscal relaxation towards the end of the tenure. A shift in the political colour of the government, as captured by *GOVGAP* has no consequences for the adherence to the original plan. However, not surprisingly, a weaker government as captured by an increase in *GOVTYPE* produces weaker adherence to the planned balance. As before, the coefficients of the other variables (except for the constant) remain basically unchanged.

In Column (5) we include the year 2009 into our sample. Reassuringly for our specification, the estimates are essentially unaffected. Only the constant exhibits a (non-significant) drop, which is not surprising given the large unpredicted fall in the balance of 2009. Finally, in Column (6) we repeat the regression of Column (5), but replace the balance with the primary balance both for the dependent and the independent variables. Also now, all coefficient estimates (except that for the coefficient on *DUM_R2*) and test results remain unaffected.

5.4. Analysis of the implementation errors in expenditures and revenues

In this subsection we explore further the sources of the implementation errors in the budget balance by separately investigating the implementation errors in revenues and expenditures. The difference between these errors is the error in the balance – see equation (2).

All regressions will include the (positive and significant) dummy *DUM01* for the year 2001. In 2001 we switch from using "total revenues" and "total expenditures", which refer to the central government, to using "EMU total revenues" and "EMU total expenditures", which refer to the general government – see the Appendix A for more details. Participation in the Euro area imposed new reporting requirements on the government. Because the resulting shifts in reported revenues and expenditures roughly offset each other, the balance is

unaffected in 2001, which explains why so far we have not included a dummy for this year.

Column (1) of Table 5 presents the baseline regression for the implementation error of the expenditures.[13] The lagged dependent variable, initial expenditure and planned expenditure are all statistically insignificant. The base effect, which is the revision of the previous spending level, enters with the expected positive coefficient of close to one. Unexpected output growth also is statistically significant with the expected negative sign. Higher growth leads to a lower expenditure share of GDP through an increase in its denominator (captured by *DE* in equation (3)) and a relatively small decrease in its numerator due to a reduction in the cyclically-sensitive part of spending (in particular, a reduction in unemployment transfers).

In Column (2) we introduce the implementation error in revenues as an independent variable. The rationale for including this variable is that unexpected increases in revenues introduce budgetary slack, which politicians may use for a discretionary spending increase. However, the variable is statistically insignificant and therefore we drop it in our further regressions.[14] Column (3) enters the regime dummies. While the coefficients of both dummies are estimated positively, they are insignificant.

In Column (4) we drop the dummies and include the political variables, where from each group of political variables the best-fitting one is included. The best-fitting political variables turn out to be the same ones as in the regression for the balance. The dummy for elections is significant and indicates that in an election year expenditure is about 0.4% of GDP smaller than in other years. A weaker government as captured by an increase in the variable *GOVTYPE* produces higher spending. This is in line with common pool theories that point to expenditure biases as a result of political fragmentation. In Column (5) we add the year 2009 to the sample. The coefficient estimates remain essentially the same. The only noticeable difference is an even smaller coefficient on unexpected output growth, which is consistent with the huge counter-cyclical fiscal stimulus implemented in 2009 as a result of the financial crisis. Moreover, the positive effect on expenditure of a left-ward shift of the government, as captured by *GOVGAP*, now becomes statistically significant. The final column, Column (6), repeats the regression in Column (5) for the implementation error in the

[13] In the expenditure error regressions, we also include a dummy *DUM90* to control for a large spike in the residuals for the year 1990 and eliminate some serial correlation problems. The introduction of this dummy, however, does not materially affect the estimates of the other coefficients.

[14] We also checked for the role of the implementation error in revenues by instrumenting it with its base effect and the same instruments we used for the output growth surprise. The resulting coefficient turned out to be

primary expenditure ratio. While the significance in some instances changes, the differences in the coefficient estimates are generally small in magnitude.

Table 6 reports the results of the regression for the implementation error of revenues.[15] Column (1) shows that initial revenues and the base effect enter positively and are significant. Moreover, more ambitious revenue forecasts decrease adherence to plan. In Column (2) we include the regime dummies. They enter with large positive and highly significant coefficients, indicating that, relative to their planned values, the outcomes for revenues were substantially higher during the second half of the sample. The introduction of the regime dummies also has consequences for the coefficient estimates of the other variables. The dummy for 2001 becomes substantially larger and highly significant. The effects of initial revenues, planned revenues and the base effect become smaller but remain statistically significant. In Column (3) we add the expenditure error, but this variable does not have any statistically significant effect.[16] The negative effect of a surprise in economic growth now becomes significant. Apparently, the negative effect via the denominator of the revenues ratio more than offsets the positive effect via the numerator that is the result of the cyclical sensitivity of revenues. In Column (4) we add our political variables. Only *GOVGAP* is significant and its positive coefficient suggests that a larger shift towards the left of the colour of the government leads to higher revenues. Adding the year 2009 to our sample leaves the results essentially unchanged, except that the growth surprise and *GOVGAP* lose their significance.

statistically insignificant.

[15] Because the regression residuals suffered from serial correlation and we found no other way to remove it, we modeled the disturbance term as an autoregressive process of order two.

[16] Also in this specification, we instrumented the error in expenditure with its base effect and the same instruments we used for the output growth surprise. The resulting coefficient is always statistically insignificant.

Table 5: Determinants of Expenditures Error

	Dependent variable:					
	$EXP_t^t - EXP_t^{t-1}$					$PEXP_t^t - PEXP_t^{t-1}$
	(1)	(2)	(3)	(4)	(5)	(6)
Constant	2.88*** (0.42)	3.00*** (0.41)	3.09*** (0.65)	2.28*** (0.59)	2.59*** (0.75)	2.04*** (0.72)
DUM90	2.91*** (0.20)	2.84*** (0.28)	2.71*** (0.22)	2.47*** (0.24)	2.44*** (0.31)	2.46*** (0.32)
DUM01	2.33* (1.16)	1.85 (1.24)	2.88*** (1.07)	2.43** (0.95)	2.40** (0.95)	2.54** (1.06)
Lagged dependent: $EXP_{t-1}^{t-1} - EXP_{t-1}^{t-2}$	0.025 (0.098)	0.031 (0.019)	0.028 (0.021)	0.038** (0.018)	0.037 (0.023)	0.020 (0.020)
Initial expenditure: EXP_{t-1}^{t-1}	-0.004 (0.063)	-0.016 (0.066)	-0.025 (0.047)	-0.020 (0.040)	-0.020 (0.051)	0.001 (0.056)
Planned expenditure: EXP_t^{t-1}	-0.062 (0.061)	-0.055 (0.062)	-0.050 (0.045)	-0.047 (0.040)	-0.050 (0.048)	-0.059 (0.055)
Base effect expenditure: $EXP_{t-1}^t - EXP_{t-1}^{t-1}$	0.91*** (0.07)	0.84*** (0.09)	0.88*** (0.06)	0.89*** (0.06)	0.88*** (0.06)	0.89*** (0.07)
Unexpected output growth: $y_t^t - y_t^{t-1}$	-0.35*** (0.07)	-0.38*** (0.05)	-0.36*** (0.08)	-0.36*** (0.06)	-0.45*** (0.10)	-0.39*** (0.07)
Revenue error: $REV_t^t - REV_t^{t-1}$		0.08 (0.09)				
$ELEC_t$				-0.37** (0.16)	-0.46*** (0.17)	-0.51*** (0.18)
$GOVGAP_t$				0.23 (0.14)	0.32** (0.15)	0.25* (0.14)
$GOVTYPE_t$				0.25** (0.11)	0.21* (0.11)	0.25* (0.14)
DUM_R2			0.33 (0.41)	0.34 (0.37)	0.33 (0.47)	0.11 (0.45)
DUM_R3			0.06 (0.39)	0.11 (0.32)	0.14 (0.41)	-0.02 (0.43)
Estimation method	IV	IV	IV	IV	IV	IV
R^2	0.960	0.959	0.961	0.968	0.960	0.957
DW	1.59	1.49	1.56	1.78	1.55	1.49
LM 1st order (*p-value*)	2.10 (0.15)	3.28* (0.07)	2.40 (0.12)	0.62 (0.43)	2.26 (0.13)	3.20* (0.07)
LM 2nd order (*p-value*)	2.65 (0.27)	4.22 (0.12)	3.30 (0.19)	1.66 (0.44)	2.80 (0.25)	3.24 (0.18)
Sample period (t = …)	1960-2008	1960-2008	1960-2008	1960-2008	1960-2009	1960-2009
N	49	49	49	49	50	50

Notes: See *Notes* to Table 4. In Column (6) the dependent variable is the *primary* expenditure error. For consistency, the lagged error in the *primary* expenditure, the initial *primary* expenditure, the planned *primary* expenditure and the base effect of the *primary* expenditure error are used as independent variables.

Table 6: Determinants of Revenues Error

	(1)	(2)	(3)	(4)	(5)
Constant	-0.26 (0.50)	0.90** (0.39)	1.04** (0.41)	1.59*** (0.55)	1.55** (0.65)
DUM01	2.03 (3.00)	3.79*** (1.33)	3.82*** (1.18)	2.65** (1.08)	2.61** (1.03)
Lagged dependent: $REV_{t-1}^{t-1} - REV_{t-1}^{t-2}$	-0.001 (0.025)	0.007 (0.012)	0.010 (0.019)	0.043** (0.016)	0.046* (0.023)
Initial revenues: REV_{t-1}^{t-1}	0.47*** (0.11)	0.24*** (0.07)	0.23*** (0.07)	0.20*** (0.07)	0.19** (0.08)
Planned revenues: REV_t^{t-1}	-0.46*** (0.11)	-0.28*** (0.06)	-0.27*** (0.06)	-0.25*** (0.06)	-0.24*** (0.07)
Base effect revenues: $REV_{t-1}^{t} - REV_{t-1}^{t-1}$	0.85*** (0.15)	0.74*** (0.07)	0.75*** (0.12)	0.81*** (0.06)	0.82*** (0.06)
Unexpected growth change: $y_t^t - y_t^{t-1}$	0.02 (0.11)	-0.10 (0.06)	-0.13** (0.05)	-0.16*** (0.05)	-0.10 (0.08)
Expenditure error: $EXP_t^t - EXP_t^{t-1}$			-0.02 (0.11)		
$ELEC_t$				-0.03 (0.16)	0.13 (0.21)
$GOVGAP_t$				0.29** (0.12)	0.20 (0.15)
$GOVTYPE_t$				-0.18 (0.13)	-0.15 (0.15)
DUM_R2		1.49*** (0.28)	1.51*** (0.31)	1.38*** (0.31)	1.50*** (0.31)
DUM_R3		0.75** (0.23)	0.78** (0.24)	0.74*** (0.27)	0.79*** (0.29)
Estimation method	IV	IV	IV	IV	IV
R^2	0.940	0.971	0.972	0.975	0.968
DW	2.02	2.12	2.08	1.70	1.89
LM 1st order (*p-value*)	2.85* (0.09)	0.82 (0.36)	0.40 (0.53)	1.35 (0.25)	0.11 (0.74)
LM 2nd order (*p-value*)	4.38 (0.11)	0.94 (0.63)	0.62 (0.73	1.36 (0.51)	0.13 (0.94)
Sample period (t = …)	1962-2008	1962-2008	1961-2008	1961-2008	1961-2009
N	47	47	47	47	48

Notes: See *Notes* to Table 4. The residuals of all regressions are modelled as an autoregressive process of order two.

5.5. Discussion of our findings

Overall, we may conclude that the good performance in the actual balance relative to its planned value during the second sub-period seems to a large extent driven by the higher than planned revenues during this sub-period. Whereas political variables mostly have an impact

on the expenditure errors, institutional variables – as captured by the different dummies - seem to matter for the revenue side of the budget. This suggests a process of learning inside the Ministry of Finance. In the rather fragmented political landscape of The Netherlands, expenditure biases by the spending ministries are a natural part of the political budgeting process, especially when the government is of a weaker type. It seems as if there has been a response by the Ministry of Finance to counter the effect of expenditure pressures on the budget balance by moving towards more cautious projections of revenues.

Regressions for the budget balance indicate that the introduction of "trend-based budgeting" can be considered a remarkable event in Dutch public finances. It coincided with a level shift in the adherence to plans of no less than 1.3% of GDP.

"Trend-based budgeting" operated as follows after Finance Minister Zalm took office in 1994. First, the expenditure ceilings ensured that planned expenditure cuts were largely implemented, so that the size of the government decreased. Second, cautious budgeting produced systematic revenue windfalls, especially after economic growth took off during the second half of the 1990s. Due to the strict separation between the expenditure and revenue side of the budget, revenue windfalls were not to be used for additional expenditure. Until 1998 revenue windfalls were used partly for improving the budget balance and partly for tax reductions.[17] At the same time, anecdotic evidence suggests that Minister Zalm carefully used his information advantage on the degree of caution in real time revenue forecasts. During the budget process, it seemed that he was often able to find some 'additional' money that could be used to smooth the political negotiations. Overall, we conclude that all the elements in the system – i.e. the expenditure ceilings, cautious growth assumptions and the separation of expenditure and revenues - worked together to cushion expenditure biases and overachieve relative to the targets on the budget balance during the second half of the 1990s.

However, over time the system of cautious budgeting came increasingly under pressure as the other players in the battle for resources learned how it operated. As a result, the margin of caution in the growth forecasts (with its obvious effect on revenue projections) was reduced from 0.5% of GDP during 1993-1994 to 0.25% of GDP in 2001, and completely abandoned after 2006. Hence, the budget projections are now based on a neutral economic scenario by the CPB.

[17] After 1998, the automatic stabilizers were strengthened as all windfalls and shortfalls went into the budget balance as long as a signal margin for the budget deficit was not reached.

6. Conclusions

In this paper we have explored Dutch fiscal policy in real time over the past five decades. In particular, we investigated the determinants of the two stages of fiscal policy, planning and implementation. Such use of real-time data should be particularly informative about the behaviour of the fiscal authorities and the role of the fiscal framework in promoting fiscal discipline.

We found that planned surpluses are on average unbiased, although they are overly optimistic during the first half of our sample and overly pessimistic during the second half of the sample. Further, as regards to the determinants of the fiscal plans and their implementation, we find that general economic conditions, the state of the public finances and political factors are all important determinants. The better adherence to plans during the second part of our sample suggests that the "trend-based budget policy", followed since 1994, appears to have worked quite well for the Netherlands. Of course, one needs to be careful in drawing strong conclusions in this regard, as there may have been factors other than the fiscal regime that produce systematic differences in fiscal performance over the various parts of our sample. Deeper investigation into the behaviour of the components of the budget shows that the improvement in implementation during the second half of our sample comes from the revenues side of the budget.

Beetsma *et al* (2009) find that the main sources of fiscal slippage in the EU are expenditure overruns and optimistic growth projections. The results of this paper show how The Netherlands has managed to counterbalance or overcome these sources of bias. Results show that nominal expenditure is higher than planned in The Netherlands during the whole of the sample. Expenditure overruns are related to political factors, in line with common pool models. To alleviate these spending pressures governments may on purpose have projected unduly low revenues levels, which on average have been exceeded during the implementation phase. Moreover, growth projections by the independent CBP are unbiased on average. This contrasts with the experience of many other EU countries where growth forecasts are produced by the Ministry of Finance, and constitute a systematic source of fiscal slippage during the implementation stage.

There is a broad consensus that fiscal surveillance at the European level has not worked well. During its short life, the Stability and Growth Pact has not been able to prevent

numerous violations to the 3% of GDP deficit limit. At this moment, most EU countries are subject to the Excessive Deficit Procedure. However, the degree to which the 3% limit is violated and the sustainability of the public finances is threatened varies across countries. Those differences may at least partly be attributable to differences in national fiscal arrangements, as Beetsma *et al*. (2009) suggest. Indeed, the most effective road to fiscal discipline is likely to be national reform of institutions. European rules appear to lack legitimacy, which should not be the case for reform that takes place on a voluntary basis at the national level. A crucial element in an effective national fiscal framework is to have independent forecasting institutions like the CPB in the Netherlands – see Jonung and Larch (2006) and the recent plea in Calmfors *et al*. (2010). Independent forecasting should be conducive to creating confidence in the financial markets, because published figures are surrounded by less uncertainty. Moreover, the existence of independent forecasting and statistical bureaus will force governments to engage in true consolidation rather than fudges when the balance deteriorates.

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Appendix A: Data Sources and Description of Variables

This Appendix provides the definition and construction details of the variables used in the paper. Most of the raw data are collected from different vintages of the *Budget Memorandum* (or *"Miljoenennota"*) which is published by the Ministry of Finance on the third Tuesday of September preceding the budget year. For the post-2000 period, data are *also* taken from the *Stability Programme* (or "*Stabiliteitsprogramma*") submitted by the Ministry of Finance to the European Commission in December preceding the budget year. Additional economic indicators are collected from the Macro Economic Exploration (*Macro Economische Verkenning*, henceforth "MEV") of the CPB, which are published in September. The political variables are from the *Comparative Political Data Set* (CPDS), numbers I and III, constructed by Armingeon *et al*. (2010), supplemented by self-constructed figures for the years 1958, 1959 and 2009 (CPDS-I covers 1960-2007, while CPDS-III covers 1990-2008).

Fiscal Variables

Data from the *Miljoenennota* of the vintages 1958-2000:

FB Financial Balance

The financial balance ("*financieringssaldo*") is the difference between the total revenues (TR) and expenditures (TE) of the *central* government. This includes financial transactions and thus approximates closely the annual change of the central government's gross debt.
The financial balance equals the total balance ("*begrotingssaldo*") minus the re-payment of debt ("*aflossing van de staatsschuld*")

DEBT Gross National Debt

This is the total of all outstanding debt of the *central* government.

TR Total Revenues

TR is the sum of all revenues of the *central* government.

TE Total Expenditures

TE is the sum of all spending by the *central* government, *minus* the gross repayment of

national debt.

IP **Interest Payments**

This is the gross amount of interest payments on national debt.

Data from the *Miljoenennota* and the *Stability Programme* of the vintages 2001-2009:

EB **EMU Balance**

The EMU balance is the difference between the total revenues (ETR) and expenditures (ETE) of the *general* government (central government, social security, health care and local authorities, and autonomous administrative authorities). Financial transactions such as loans and purchasing public property should in principle not affect the EMU balance.

EDEBT **EMU Debt**

The EMU debt is the total of all outstanding loans of the *general* government.

ETR **EMU Total Revenues**

This is the sum of all revenues of the *general* government.

ETE **EMU Total Expenditures**

This is the sum of all spending of the *general* government.

EIP **EMU Interest Payments**

This is the gross amount of interest payments on EMU *consolidated* debt.

Economic Variables

NNI **Net National Income**

NNI (reported in nominal terms) is the total of consumption, investments, government purchases and net exports of a country's residents, *minus* indirect taxes and depreciations. This measure of overall economic performance was in use and published in the *Miljoenennota* until 1994.

GDP **Nominal Gross Domestic Product**

GDP (reported in nominal terms) in the market value of all final goods and services produced within the borders of a nation in a year. It thus also includes foreign companies vested within the borders (i.e. *domestic* product). It has been in use and published in the *Miljoenennota* since about 1992.

GDPD **GDP Deflator Inflation**

The GDP deflator inflation is collected from the MEV and available since 1963.

Constructed Variables Used in the Analysis

Y **Nominal GDP**

The nominal GDP series is constructed by extending backwards the level of GDP with the level of NNI, on the basis of the *average* ratio of NNI/GDP over the period 1992-1994, during which both variables were published. Notice that the MEV started publishing GDP growth since 1963. In the overlapping period (1963-1994), NNI growth reported in the *Miljoenennota* and GDP growth from the MEV are almost identical (the correlation coefficient equals 0.998 for both current and forecasted growth).

BAL **Budget Balance over GDP**

This variable is constructed by linking the two headline figures of the budget balance, that is, FB from the vintages 1958-2000 and EB from the vintages 2001-2009. The denominator is the constructed nominal GDP.

REV **Total Revenues over GDP**

This variable is constructed by linking TR from the vintages 1958-2000 and ETR from the vintages 2001-2009. The denominator is the constructed nominal GDP.

EXP **Total Expenditures over GDP**

This variable is constructed by linking TE from the vintages 1958-2000 and ETE from the vintages 2001-2009. The denominator is the constructed nominal GDP.

PBAL **Primary Budget Balance over GDP**

This variable is defined as the sum of interest payments over GDP and the budget balance over GDP, *BAL*. The interest-payment series is constructed by linking IP from the vintages 1958-2000 and EIP from the vintages 2001-2009. The denominator is the constructed nominal GDP.

PEXP **Primary Expenditure over GDP**

This variable is defined as total expenditures over GDP ratio *minus* interest payments over GDP. The latter series is constructed by linking IP from the vintages 1958-2000 and EIP from the vintages 2001-2009. The denominator is the constructed nominal GDP.

DEBTY **Debt over GDP**

This variable is constructed by linking the two figures for the debt ratio, that is, DEBT from the vintages 1958-2000 and EDEBT from the vintages 2001-2009. The denominator is the constructed nominal GDP.

OILD **Oil Price Inflation**

For lagged and current oil price inflation over the pre-1982 period, we use *ex-post* data from http://inflationdata.com/Inflation/Inflation_Rate/Historical_Oil_Prices_Table.asp. Lagged, current and forecasted oil price inflation over the period since 1982 are collected from the MEV. The full-sample series for both lagged and current oil price inflation are obtained by linking the corresponding sub-sample series from these two sources. Incidentally, for the period of overlap (i.e., since 1982) the series for lagged inflation from the two sources are very highly correlated, as are the series for current inflation.

Political Variables

Elections and Changes in Governments

ELEC

The dummy is 1, if there is a general election in the year, and 0, otherwise.

GOVCHAN

Number of government changes in the year. Termination of government due to (a) elections, (b) resignation of the Prime Minister, (c) dissension within government, (d) lack of parliamentary support, or (e) intervention of the Head of State.

Government Ideology

GOVPARTY

Cabinet composition (Schmidt-Index) on a scale from 1 to 5, where 1 is hegemony of right-wing (and centre) parties, 2 is dominance of right-wing (and centre) parties, 3 is balance of power between left and right, 4 is dominance of social-democratic and other left parties and 5 is hegemony of social-democratic and other left parties.

GOVGAP

Ideological gap between new and old cabinet (*GOVGAP* = Δ*GOVPARTY*).

Government and Parliament Fractionalization

GOVTYPE

Type of government ranging from 1 to 6, where 1 is single party majority government, 2 is minimal winning coalition, 3 is surplus coalition, 4 is single party minority government, 5 is multi party minority government and 6 is caretaker government (temporary).

FRAGCAB

Number of parties in cabinet.

RAEELE

Index of *electoral* fractionalization of the party system. Electoral fractionalization is based on a formula calculated on the basis of the share of *votes* of the party and the number of parties.

RAELEG

Index of *legislative* fractionalization of the party system. Legislative fractionalization is based on a formula calculated on the basis of the share of the *seats* of the party and the

number of parties.

FRAGPARL

Number of parties in parliament.

Institutional Variables

DUM_R1 **"Structural budget policy"**

This dummy equals 1 for the period 1958-1982, 0 otherwise.

DUM_R2 **"Actual deficit norm"**

This dummy equals 1 for the period 1983-1993, 0 otherwise.

DUM_R3 **"Trend-based budget policy"**

This dummy equals 1 for the period 1994-2009, 0 otherwise.

Appendix B: Decomposition of Implementation Error

Consider the variable *x*, which can be either *REV* (revenues as share of GDP) or *EXP* (government spending as share of GDP). We can decompose the (total) implementation error $TE = x_t^t - x_t^{t-1}$ as follows:

$$
\begin{aligned}
&\left(x_t^t - x_t^{t-1}\right) \\
&= x_{t-1}^t \frac{1+g_{x,t}^t}{1+y_t^t} - x_{t-1}^{t-1} \frac{1+g_{x,t}^{t-1}}{1+y_t^{t-1}} \\
&= \left(x_{t-1}^t - x_{t-1}^{t-1}\right) \frac{1+g_{x,t}^{t-1}}{1+y_t^{t-1}} + x_{t-1}^t \left(\frac{1+g_{x,t}^t}{1+y_t^t} - \frac{1+g_{x,t}^{t-1}}{1+y_t^{t-1}} \right) \\
&= \underbrace{\frac{1+g_{x,t}^{t-1}}{1+y_t^{t-1}} \left(x_{t-1}^t - x_{t-1}^{t-1}\right)}_{\text{Base Effect } (BE)} + \underbrace{\frac{x_{t-1}^t}{\left(1+y_t^t\right)\left(1+y_t^{t-1}\right)} \left(g_{x,t}^t - g_{x,t}^{t-1}\right)}_{\text{Growth Effect } (GE)} \\
&- \underbrace{\frac{x_{t-1}^t}{\left(1+y_t^t\right)\left(1+y_t^{t-1}\right)}}_{\text{Denominator Effect } (DE)} \left(y_t^t - y_t^{t-1}\right) + \underbrace{\frac{x_{t-1}^t \left(g_{x,t}^t y_t^{t-1} - g_{x,t}^{t-1} y_t^t\right)}{\left(1+y_t^t\right)\left(1+y_t^{t-1}\right)}}_{\text{Residual Effect } (RE)}
\end{aligned}
$$

Here, $g_{x,t}^{t-1}$ is the planned growth rate in the level (in euro's) of nominal revenues (if *x* = *REV*) or the level of nominal spending (if *x* = *EXP*) between periods *t-1* and *t*. Further, $g_{x,t}^t$ is corresponding actual growth rate over the same period as measured end of period *t*. Finally, y_t^{t-1} is the projected nominal income growth rate and y_t^t is the actual nominal income growth rate. The residuals are generally very small. On the basis of this decomposition of the components, and ignoring the residual effects, we can construct the resulting decomposition of the implementation error of the balance as:

$$
\begin{aligned}
& BAL_t^t - BAL_t^{t-1} \\
& = \left(REV_t^t - REV_t^{t-1} \right) - \left(EXP_t^t - EXP_t^{t-1} \right) \\
& \simeq \underbrace{\frac{1+g_{REV,t}^{t-1}}{1+y_t^{t-1}} \left(REV_{t-1}^t - REV_{t-1}^{t-1} \right) - \frac{1+g_{EXP,t}^{t-1}}{1+y_t^{t-1}} \left(EXP_{t-1}^t - EXP_{t-1}^{t-1} \right)}_{\text{Base effect (BE)}} \\
& + \underbrace{\frac{REV_{t-1}^t \left(g_{REV,t}^t - g_{REV,t}^{t-1} \right) - EXP_{t-1}^t \left(g_{EXP,t}^t - g_{EXP,t}^{t-1} \right)}{\left(1+y_t^t \right) \left(1+y_t^{t-1} \right)}}_{\text{Revenue/Expenditure growth effect (GE)}} \\
& - \underbrace{\frac{\left(y_t^t - y_t^{t-1} \right)}{\left(1+y_t^t \right) \left(1+y_t^{t-1} \right)} \left(REV_{t-1}^t - EXP_{t-1}^t \right)}_{\text{Denominator effect (DE)}}
\end{aligned}
$$

The denominator effect of the balance is essentially a “second-order” term and is also generally small (e.g. a growth projection mistake of 1% and a revised deficit of 3% imply that this term is equal to 0.0003).