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Discussion Paper No. 05-12

Planning or Propaganda? An Evaluation of Germany's Medium-term Budgetary Planning

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ZEW
Zentrum für Europäische Wirtschaftsforschung GmbH
Centre for European Economic Research

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Non-Technical Summary

In this paper, the forecasting quality and the driving forces of Germany's medium-term financial planning ("mittelfristige Finanzplanung" – "Mifrifi") are assessed. While medium-term budgetary planning has become obligatory for EU member countries through the surveillance procedures of the Maastricht Treaty and the Stability and Growth Pact, multi-annual budget plans have a much longer tradition in some EU member countries. In Germany, the medium-term financial planning was introduced at the end of the sixties. Since then, established by the *Stabilitäts- und Wachstumsgesetz* of 1967, the *Bund* gives a projection of fiscal developments extending four years into the future beyond the current budget year.

The resulting time series of budgetary projections offer a rich data set which enables the evaluation of the forecasting quality of medium-term fiscal planning in Germany and the identification of the driving economic and political factors behind these projections. Furthermore, it facilitates the search for the impact the Maastricht fiscal surveillance procedures had on pre-existing medium-term planning instruments in an important EMU member country.

A first unambiguous result from the analysis is that the German Bund's medium-term financial planning has so far failed to reach its normative objective. Mifrifi has not been very effective in making budgetary policy more predictable. The projections are heavily biased towards over-optimism. The nineties even have a more severe problem: Beyond the budgetary year for which a draft budget exists, the financial plan practically loses any value as a forecasting instrument, for horizons beyond t+1 there is no longer a systematic link between forecasts and realizations.

The bad forecasting performance of Mifrifi's projections and particularly the bias towards over-optimism does not come as a surprise in light of the political-economic and institutional factors discussed above. The financial plan offers a tempting opportunity for any government to use the projections in order to depict a bright fiscal future. Thus, the empirical results are in line with the presented theoretical reasoning on the time-inconsistency of unbiased governmental forecasts.

Based on an empirical model explaining the officially expected fiscal changes, the relevance of different political and institutional factors driving the financial planning can be identified. The findings do not support the simple election year hypothesis. Hence, the financial plan is not obviously being used as a propaganda tool in the context of national election campaigns. This could simply be due to the fact that rational voters do not pay attention to official forecasts which are not credible given well known governmental incentives.

However, the results hint towards the financial plan's use as a tactical national instrument in the context of the Maastricht Treaty's and the Stability Pact's

surveillance instruments. These EU rules' taking effect has influenced financial planning towards the depiction of favourable deficit trends. The Maastricht Treaty appears to have transformed Germany's budgetary planning, not into the direction of more credible and binding projections, but rather toward the production of less realistic and unduly favourable outlooks.

A standard policy conclusion in the presence of time-inconsistencies is the creation of credible institutions. These findings suggest that it is worthwhile reflecting this strategy also in the context of financial planning. If the responsibility for the production of the medium term financial planning is transferred towards independent institutions there should be chances for better projections.

Planning or propaganda? An evaluation of Germany's medium-term budgetary planning

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February 2005

Abstract

In Germany, the medium-term financial planning ("Mifrifi") was introduced at the end of the sixties. This study scrutinizes the experience of the German Bund with more than thirty years of financial planning. In the first step, the paper explores the potential normative and political-economic driving forces of fiscal projections. The following empirical part evaluates Mifrifi's forecasting quality with regard to expenditures, taxes and deficits. A model is tested relating the forecasted budgetary trends to economic, institutional and political-economic factors. The financial planning turns out to be ineffective in making budgetary policy more predictable. The projections are heavily biased towards over-optimism. The Maastricht Treaty appears to have transformed Germany's budgetary planning not into the direction of more credible and binding projections, but rather towards the production of less realistic and unduly favourable outlooks. The policy conclusion hints towards an independent institution taking over the responsibility for fiscal forecasts. Such an institution would not face the government's inherent problem being unable to promise in a credible way the production of unbiased forecasts.

JEL-Classification: H 61, H 87

Keywords: Mifrifi, budgetary planning, Stability and Growth Pact

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1 Introduction

Medium-term budgetary planning has become obligatory for EU member countries through the surveillance procedures of the Maastricht Treaty and the Stability and Growth Pact. On the national level, multi-annual budget plans have a much longer tradition in some EU member countries. In Germany, the *mittelfristige Finanzplanung* (medium-term financial planning, "Mifrifi") was introduced at the end of the sixties. Since then, established by the *Stabilitäts- und Wachstumsgesetz* of 1967, the *Bund* gives a projection of fiscal developments extending four years into the future beyond the current budget year.

The resulting time series of budgetary projections offer a rich data set which enables the evaluation of the forecasting quality of medium-term fiscal planning in Germany and the identification of the driving economic and political factors behind these projections. Furthermore, it facilitates the search for the impact the Maastricht fiscal surveillance procedures had on pre-existing medium-term planning instruments in an important EMU member country.[1]

To our knowledge, this study is the first to systematically scrutinise the experience of the German Bund with more than thirty years of Mifrifi using statistical and econometric approaches. A methodologically related paper is one by Strauch (et al., 2004) on the quality of budgetary forecasts in Europe in the form of stability and convergence programmes since 1991. However, apart from the inclusion of a much longer time series, our study is broader with regard to fiscal variables: While Strauch et al. (2004) focus exclusively on the budgetary balance we also look at expenditure and tax forecasts.

The following questions guide this paper's approach:

– How does the German Bund's medium-term planning perform in terms of forecasting power with regard to expenditures, taxes and the budgetary balance?

– Which objective economic and political-economic factors influence the planning?

– Did the Maastricht Treaty and the Stability and Growth Pact with its more binding surveillance practices have an identifiable impact on Mifrifi?

The analysis proceeds in the following way: In section 2 a short description of the multi-annual planning procedure is given together with a discussion of both normative and positive interpretations for this instrument's use. Section 3

[1] For an overview on multi-annual budgetary planning institutions in EU member countries see Hallerberg et al. (2001).

extensively analyses forecasting quality followed by the identification of the projections' driving forces in section 4. Section 5 concludes.

2 Mifrifi: procedures and potential motivations

The *Stabilitäts- und Wachstumsgesetz* (Act on Stability and Growth, § 9) obliges the Bund to put the annual budgetary process into a five year planning horizon framework. The financial plan is set up by the Federal Ministry of Finance and is determined by the government. The plan must be adjusted on an annual basis. Adjustments in the course of a year to new fiscally relevant circumstances are not being practiced. The five years refer to the budgetary years t to t+4. The financial plan is set up in year t together with the draft budget for t+1. For the first year t, it is based on a pre-determined and legally binding budget law. Nevertheless, even the figures referring to t have a forecasting character since significant deviation from the legislated budget are normal in the course of budget execution. For the second year t+1 the projections correspond to the draft budget starting its way through the legislative procedures. For the years t+2 through t+4 the projections are entirely indicative without posing any binding restrictions on the coming years' budgetary processes.

The budgetary forecasts over the whole planning period are detailed and include specific numbers not only for the sums of the budgetary balance, revenues and expenditures but also for numerous sub-components on both sides of the budget.

Normative motivation

The normative motivation for Mifrifi in Germany and comparable institutions in other countries is as follows (see, e.g., Tarschys, 2002): Multi-annual planning is to correct the short-sightedness of the annual budgetary procedure. By forcing the budgetary authorities to look at the medium term fiscal consequences of today's decisions, fiscal policy is intended to become more forward-looking and sustainable. Measures on the expenditure side with a lagged profile of the financial burden can be identified more easily. The same holds for measures on the revenue side which may have a "one-shot" or even a "boomerang"-character in the sense that revenue increases today are followed by even larger revenue losses in following years. In addition, the government's fiscal path shall become more predictable for tax payers and capital markets alike.

Clearly, these official motivations hint to problems that, with the prospective demographic development, are even more relevant today than during the late sixties when Mifrifi was first introduced. Nevertheless, it is not at all clear whether Mifrifi is properly applied in accordance with this normative point of view.

Political-economic motivations: biased projections in equilibrium

From a political-economic perspective, motivations very different from officially proclaimed ones are likely to be relevant for the use and execution of financial planning. Under the vote or popularity maximisation assumption, the government might be tempted to use non-binding financial planning as a marketing instrument for depicting a bright fiscal future in order to gain political support. Information asymmetries between the government and voters on the fiscal future do clearly exist. The consequence is that the government has a certain leeway to cheat voters about the country's fiscal future. In line with the insights on voting cycles, a particularly optimistic assessment of the budgetary future is to be expected before an election.

Even if rational voters understand these incentives and regard fiscal projections as biased this will not solve the problem: Unbiased fiscal forecasts are not time-consistent as long as fiscal projections have an impact on the government's popularity. Rational voters will then suspect a bias and thus, the government must react to this by giving over-optimistic projections. The resulting equilibrium implies distorted forecasts whose degree of bias is correctly assessed by rational voters. As a standard in this kind of reasoning, the time-inconsistency problem can only be overcome by handing the fiscal forecasts over to an independent third party. Only then the bias incentive can be overcome in a reliable way and the projections credibility be established.

Partisan approaches: preparing the field for government expansion/contraction

Partisan approaches hint to another possible mechanism. The government might use financial projections as a strategic tool to influence budgetary processes according to its ideological view on the future of the government. A left-wing government with a preference for the expansion of the government-sector may consciously depict a particularly optimistic picture about the future of public finance. By doing so it might hope to convince the public that a present expansion can be financed. A right-wing government with contrary preferences should use the projections in the opposite way: By depicting a particularly gloomy picture of the fiscal future it may try to lobby for budgetary cuts. In combination with the rational voter assumption similar equilibria would emerge as discussed in the preceding paragraph. In these equilibria, rational voters would anticipate the degree of bias correctly but, nevertheless, it would not be time-consistent for the government to produce unbiased projections.

Impact of Maastricht

With the Maastricht Treaty becoming effective on November the 1st, 1993, and the strengthening of the fiscal surveillance through the Stability and Growth Pact adopted in 1997, national medium-term financial planning is being executed within

a European framework. An important part of this surveillance is the presentation of national convergence or stability programmes which have a forecast horizon up to the year t+3.

From the national perspective, the character of pre-existing non-binding planning instruments, like the German Mifrifi, has been transformed by the Maastricht decisions. The budgetary forecasts - at least with regard to deficit projections - are no longer of a purely indicative nature. The quality and credibility of these forecasts matter for the assessment of whether a country has an excessive deficit or not and thus whether sanctions (no EMU entry before a country becomes an EMU member, sanctions of the Stability and Growth pact afterwards) are being applied.

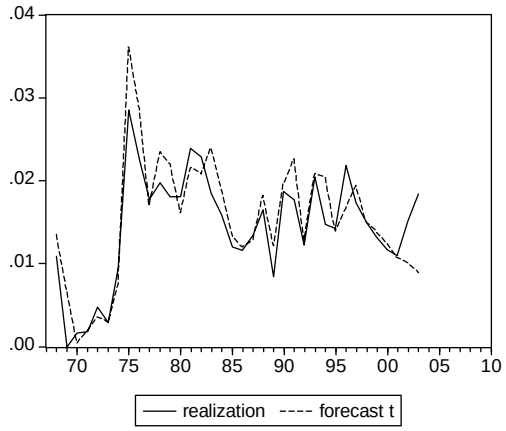
It can be argued that this transformation creates new incentives towards over-optimistic forecasts. In addition to the assessment of the current situation, the deficit perspective is an important evaluation criterion on which a member country being threatened by sanctions could try to defend itself by presenting excessively favourable outlooks.

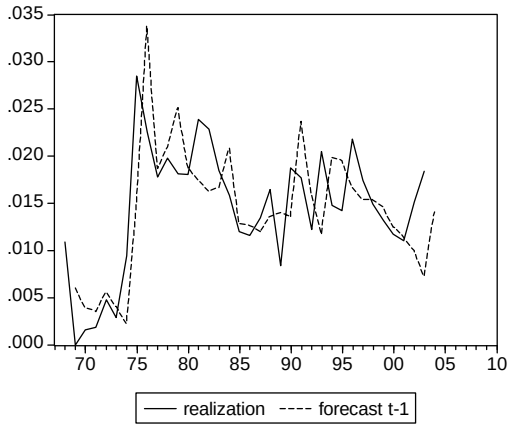
3 The forecasting power of Mifrifi's projections

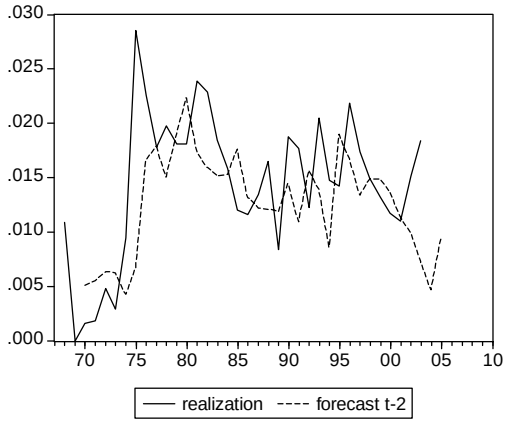
The first step of the empirical strategy, which looks for the true driving forces behind Germany's medium term budgetary plans, is to check these plans' forecasting accuracy. Mifrifi can only serve its official purpose to overcome short-sightedness and to make fiscal policy more predictable if the projections have a minimum degree of forecasting power.

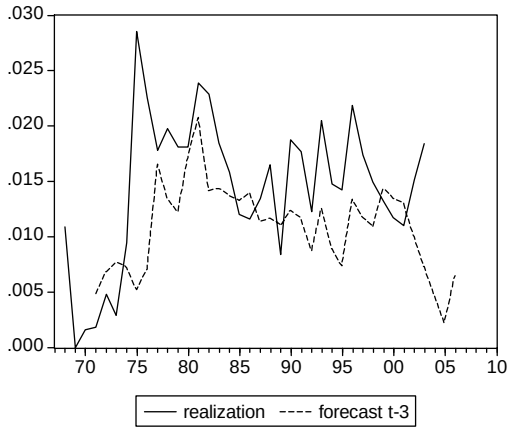
Figures 1-3 depict GDP-shares for realizations and Mifrifi forecasts (all horizons) of deficit, expenditures and taxes.

Figure 1: Mifrifi's deficit forecasts and realizations (GDP shares)









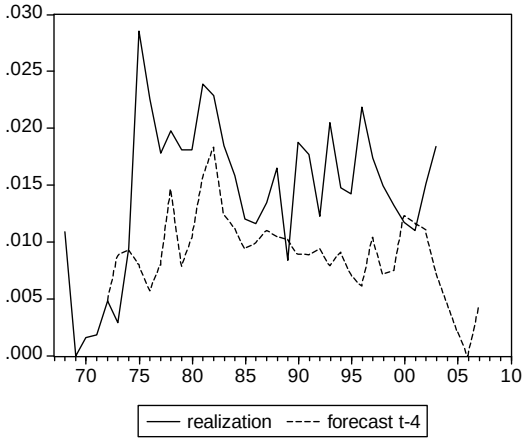
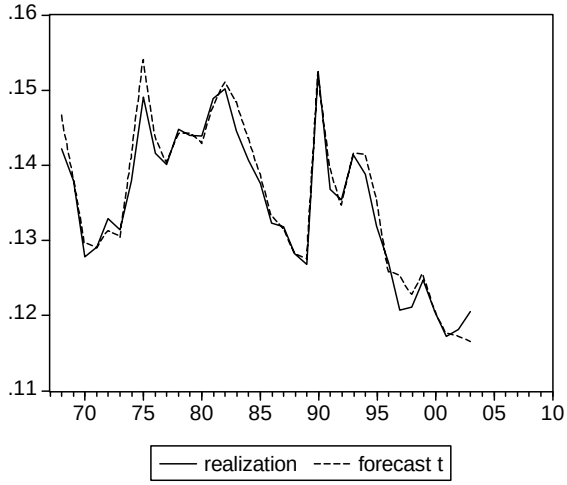
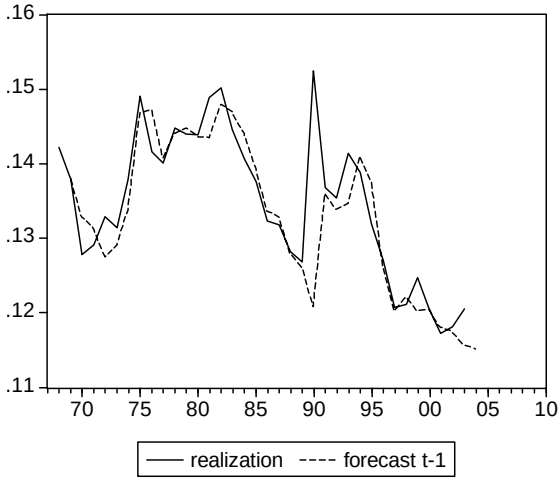
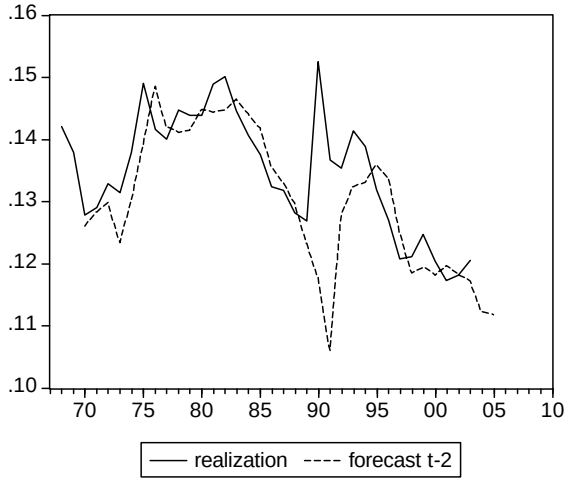
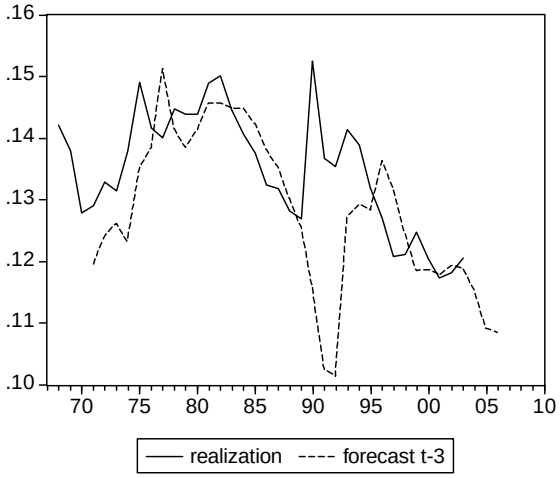


Figure 2: Mifrifi's expenditure forecasts and realizations (GDP shares)









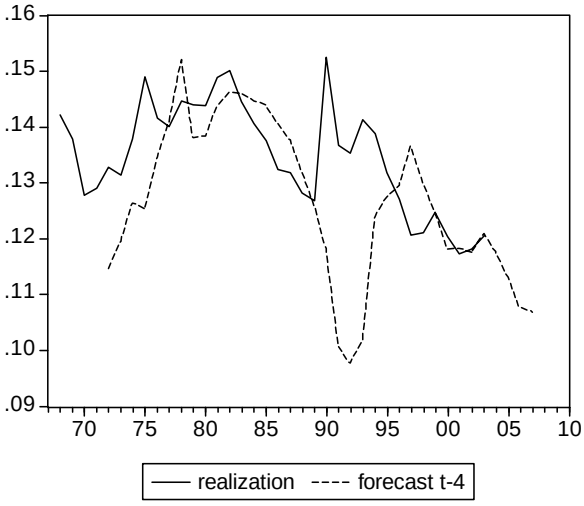
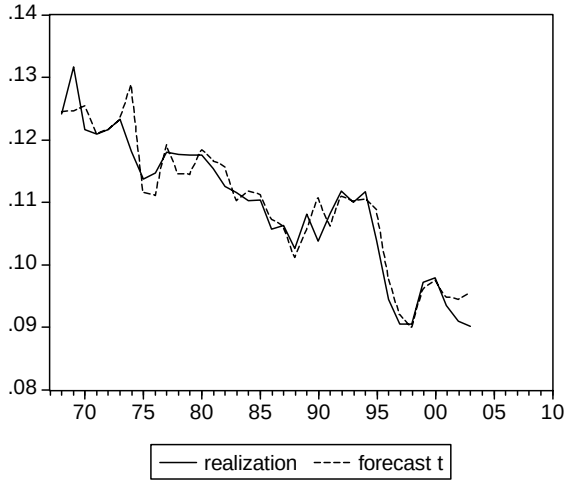
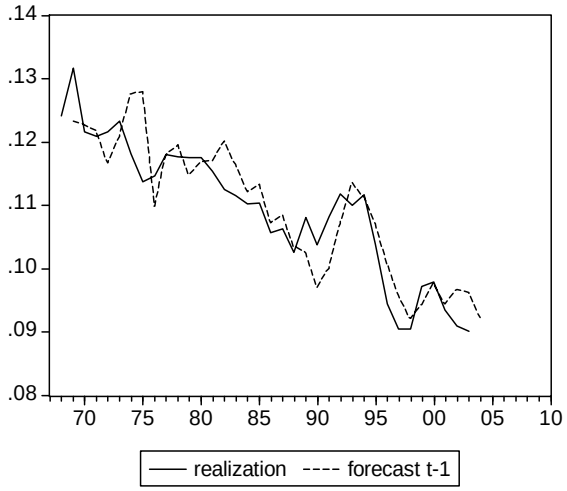
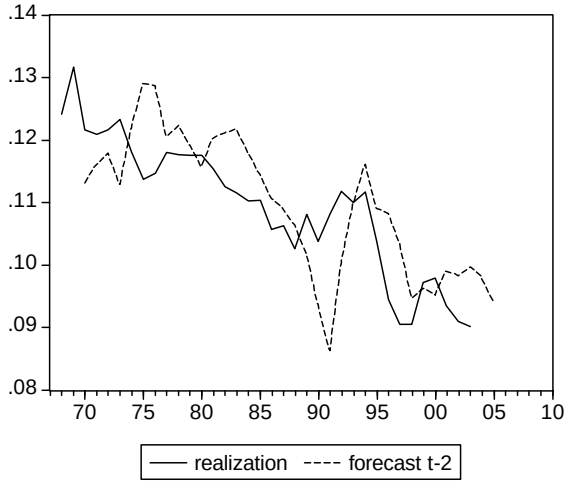
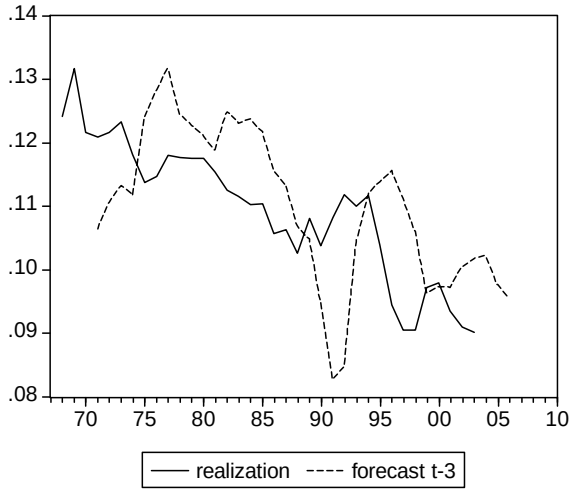


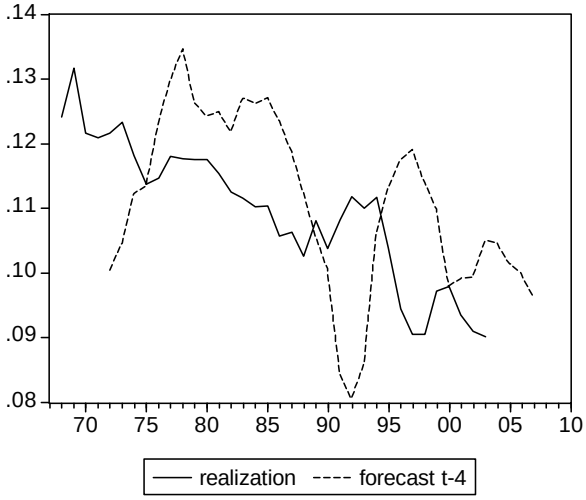
Figure 3: Mifrifi's tax forecasts and realizations (GDP shares)











The visual inspection reveals the expected divergence between realizations and forecasts which increases with the forecast horizon. This property could simply reflect the growing uncertainty and does on its own not speak against the forecasts' quality. Furthermore, there are visible impacts originating both from the first oil shock in the years 1973/74 and German unification. The oil shock induced a marked divergence between deficits realized and forecasted in the years 1975/76. German unification had a recognizable impact on the forecast error of taxes and expenditures in the early nineties which both materialized on substantially larger levels than forecasted in the years before.

The deficit series indicate a systematic bias towards over-optimism, which becomes particularly pronounced with regard to the long forecast horizons. Bad surprises are the rule, good surprises the rare exception: For the forecast horizon t+4, out of 32 yearly observations only 4 (1973, 1989, 2000 and 2001) show the deficit level materialized on a level lower than expected. It is worth stressing that deficit forecast errors related to the first couple of years of German unification are not outstanding in a long-run perspective. Over-optimism also characterizes the forecasts for tax revenues while the expenditure series appears less biased: Apart from the surprises associated with unification there is no visually recognizable systematic gap between forecasts and realizations.

In the following, more formal measures of forecast quality are presented: the mean error (ME), the Root Mean Squared Error (RMSE), and Theil's U which is defined as the ratio between the forecast's RMSE and the RMSE of a benchmark forecast. Here, the naïve forecast which is the forecasted variable's last realization is used as a benchmark. Each of these measures reveals specific aspects of forecast quality: The ME illustrates the sign and the extent of the forecast's long-run bias whereas the RMSE is a better measure for the degree of uncertainty. Theil's U is helpful because its absolute value is easily interpretable: A number below one shows that the financial plan's forecasts are without any additional value compared to the naïve forecast which is the last available realization.

Table 1: Forecast accuracy Mifrifi's deficit projections 1968-2003

			forecast horizon		
	t	t+1	t+2	t+3	t+4
			deficit-GDP-ratio		
ME	-0.0008	0.0003	0.0021	0.0040	0.0061
RMSE	0.0036	0.0054	0.0059	0.0069	0.0083
Theil's U	0.63	0.75	0.79	0.78	0.89
			expenditure-GDP-ratio		
ME	-0.0009	0.0012	0.0032	0.0048	0.0061
RMSE	0.0022	0.0061	0.0092	0.0125	0.0154
Theil's U	0.32	0.69	1.01	1.16	1.29
			tax-GDP-ratio		
ME	-0.0006	-0.0009	-0.0020	-0.0032	-0.0047
RMSE	0.0033	0.0050	0.0084	0.0120	0.0154
Theil's U	0.78	0.86	1.16	1.54	1.85

For the whole period 1968-2003 (table 1) the mean errors reveal that biases become substantial from the t+2 period onwards, i.e. as soon as the forecast horizon shifts beyond the last available draft budget. Both uncertainty (measured by the RMSE) and bias (measured by the ME) increase with the forecast horizon. The deficit-GDP-ratio tends to materialize 0.6 percentage points higher than forecasted with a four year horizon. Theil's U indicates that Mifrifi's forecasts are worthless for expenditures and taxes from the t+2 horizon onwards. In these cases the last realization is a better predictor than the financial plan's figures.

The calculations based on the whole sample period obscures differences between subperiods. Tables 2-4 separately indicate the financial plan's forecast quality in the seventies, eighties and the post-unification years.

Table 2: Forecast accuracy Mifrifi's deficit projections 1968-1980

				forecast horizon	
	t	t+1	t+2	t+3	t+4
			deficit-GDP-ratio		
ME	-0.0018	-0.0010	0.0019	0.0046	0.0072
RMSE	0.0038	0.0062	0.0075	0.0095	0.0107
Theil's U	0.54	0.63	0.67	0.71	0.69
			expenditure-GDP-ratio		
ME	-0.0010	0.0000	0.0025	0.0055	0.0084
RMSE	0.0023	0.0031	0.0053	0.0089	0.0122
Theil's U	0.40	0.37	0.64	0.91	1.08
			tax-GDP-ratio		
ME	0.0001	-0.0003	-0.0012	-0.0011	-0.0008
RMSE	0.0041	0.0060	0.0080	0.0102	0.0127
Theil's U	0.95	1.20	1.49	1.97	1.95

Table 3: Forecast accuracy Mifrifi's deficit projections 1980-1990

				forecast horizon	
	t	t+1	t+2	t+3	t+4
			deficit-GDP-ratio		
ME	-0.0009	0.0010	0.0011	0.0024	0.0047
RMSE	0.0026	0.0041	0.0043	0.0042	0.0057
Theil's U	0.53	0.85	0.78	0.66	0.82
			expenditure-GDP-ratio		
ME	-0.0007	0.0028	0.0028	0.0025	0.0018
RMSE	0.0016	0.0098	0.0109	0.0116	0.0113
Theil's U	0.19	1.05	1.11	1.02	0.96
			tax-GDP-ratio		
ME	-0.0010	-0.0010	-0.0026	-0.0059	-0.0099
RMSE	0.0026	0.0041	0.0065	0.0089	0.0120
Theil's U	0.86	1.34	1.46	1.72	1.88

Table 4: Forecast accuracy Mifrifi's deficit projections 1990-2003

				forecast horizon	
	t	t+1	t+2	t+3	t+4
			deficit-GDP-ratio		
ME	0.0003	0.0010	0.0026	0.0047	0.0069
RMSE	0.0038	0.0053	0.0052	0.0061	0.0082
Theil's U	0.76	0.99	1.26	0.98	1.59
			expenditure-GDP-ratio		
ME	-0.0007	0.0030	0.0060	0.0083	0.0101
RMSE	0.0023	0.0090	0.0132	0.0174	0.0208
Theil's U	0.25	0.87	1.31	1.52	1.68
			tax-GDP-ratio		
ME	-0.0015	-0.0007	-0.0011	-0.0017	-0.0027
RMSE	0.0031	0.0047	0.0097	0.0146	0.0182
Theil's U	0.68	0.63	1.04	1.44	1.80

For all sub-periods Mifrifi's forecasts tend to be too optimistic in the sense that deficits and expenditures materialize on higher levels and taxes on lower levels than expected. The extent of over-optimism differs. In the eighties, mean deficit and expenditure errors are substantially smaller compared to the seventies and nineties. The reverse holds for taxes where the eighties were a decade of particularly large forecast errors.

Judging on the basis of Theil's U, the financial plan performs the worst for taxes where beyond the horizon on t+1 the naïve forecast beats the financial plan for every sub-period. For expenditures, the official forecasts were of some informational content before 1980 but for the most part lost this property afterwards. In regard to deficits, there are substantial differences between sub-periods: While up to 1990 the financial plan beats the naïve forecast even at the longest forecasting horizon of t+4 this changes after 1990. In the years following 1990 the official deficit forecast is almost completely worthless: Even for the draft budget's forecasting horizon t+1 the last realization of the deficit is a better predictor than the financial plan's figures. Thus, the years following German unification, which also are the years under the new Maastricht fiscal rules, bring about a dramatic deterioration of deficit forecast quality.

More formal tests confirm both the poor forecasting power and the bias of the Bund's financial planning. The null hypothesis of an unbiased forecast can be tested with the help of equation (1):

$$R_t = \alpha + \beta F_t + u_t \qquad (1)$$

with R_t representing a variable's realization in period t and F_t the forecast relating to period t, and u_t being the error term. Unbiasedness implies $(\alpha,\beta) = (0,1)$. Tables 5-7 summarize the results of the corresponding regressions and F-tests for both the whole period and two sub-periods (pre- and post-1990).[2]

For all three fiscal variables R^2 indicates that after 1990 there is almost no link at all between forecasted variables and realizations providing even no justification to search for any bias in the forecasts.

For the years before 1990, the regressions have a certain explanatory power which is most pronounced for expenditures and weakest for taxes. For deficits and expenditures, the F-test reveals an increasing problem with biased forecasts after 1990.

[2] Chow-breakpoint tests (not reported) tend to confirm a structural break in equation (1) at the year 1990.

Overall the bias of forecasts is supported by this approach – in particular with regard to the longer-term forecasts: With the exception of expenditures pre-1990 the null of unbiasedness has to be rejected for all forecast horizons beyond t+2.

Table 5: Test for bias, deficit-GDP-ratio

	α	β	R^2	F-statistic	significance
		1968-2003			
t	0.003 (0.001)	0.773 (0.070)	0.78	6.63	0.004
t+1	0.005 (0.002)	0.670 (0.130)	0.45	3.30	0.050
t+2	0.060 (0.003)	0.698 (0.209)	0.26	3.40	0.046
t+3	0.009 (0.003)	0.587 (0.278)	0.13	9.31	0.001
t+4	0.012 (0.003)	0.388 (0.342)	0.04	21.87	0.000
		1968-1989			
t	0.001 (0.001)	0.826 (0.065)	0.89	7.78	0.004
t+1	0.003 (0.002)	0.784 (0.152)	0.58	1.03	0.375
t+2	0.003 (0.004)	0.864 (0.271)	0.36	0.79	0.470
t+3	0.007 (0.005)	0.703 (0.376)	0.07	2.62	0.100
t+4	0.008 (0.005)	0.750 (0.469)	0.13	6.59	0.005
		1990-2003			
t	0.010 (0.003)	0.382 (0.186)	0.26	5.58	0.019
t+1	0.016 (0.003)	0.020 (0.223)	0.00	10.28	0.003
t+2	0.016 (0.004)	-0.009 (0.298)	0.00	9.80	0.003
t+3	0.015 (0.005)	0.102 (0.415)	0.01	15.49	0.001
t+4	0.025 (0.004)	-1.007 (0.426)	0.32	52.30	0.000

Table 6: Test for bias, expenditure-GDP-ratio

	α	β	R^2	F-statistic	significance
		1968-2003			
t	0.009 (0.004)	0.926 (0.030)	0.96	7.29	0.002
t+1	0.027 (0.014)	0.805 (0.101)	0.66	2.59	0.090
t+2	0.056 (0.017)	0.570 (0.125)	0.41	8.07	0.002
t+3	0.085 (0.017)	0.379 (0.130)	0.21	16.04	0.000
t+4	0.106 (0.017)	0.227 (0.128)	0.09	24.41	0.000
		1968-1989			
t	0.015 (0.006)	0.888 (0.045)	0.95	7.37	0.004
t+1	0.010 (0.012)	0.929 (0.089)	0.85	0.32	0.732
t+2	0.031 (0.016)	0.785 (0.120)	0.70	2.47	0.113
t+3	0.062 (0.019)	0.566 (0.142)	0.48	6.29	0.009
t+4	0.090 (0.021)	0.365 (0.154)	0.26	10.55	0.001
		1990-2003			
t	0.007 (0.007)	0.938 (0.055)	0.96	1.35	0.295
T+1	0.036 (0.036)	0.736 (0.282)	0.36	1.26	0.318
T+2	0.100 (0.043)	0.239 (0.353)	0.04	4.45	0.036
t+3	0.152 (0.036)	-0.193 (0.300)	0.03	12.00	0.001
t+4	0.176 (0.028)	-0.395 (0.237)	0.19	24.44	0.000

Table 7: Test for bias, tax-GDP-ratio

	α	β	R^2	F-statistic	significance
			1968-2003		
t	-0.000 (0.006)	0.996 (0.053	0.91	0.62	0.547
t+1	0.009 (0.009)	0.908 (0.081)	0.79	1.21	0.312
t+2	0.037 (0.013)	0.643 (0.118)	0.48	5.82	0.007
t+3	0.067 (0.015)	0.366 (0.131)	0.20	13.66	0.000
t+4	0.089 (0.014)	0.168 (0.127)	0.06	25.31	0.000
			1968-1989		
t	0.019 (0.011)	0.833 (0.096)	0.79	1.52	0.243
t+1	0.034 (0.018)	0.695 (0.154)	0.52	2.45	0.110
t+2	0.073 (0.021)	0.350 (0.182)	0.17	8.73	0.002
t+3	0.102 (0.021)	0.100 (0.177)	0.02	17.97	0.000
t+4	0.121 (0.018)	-0.065 (0.147)	0.01	36.53	0.000
			1990-2003		
t	-0.001 (0.011)	0.999 (0.104)	0.89	1.76	0.214
t+1	-0.002 (0.021)	1.017 (0.205)	0.67	0.14	0.874
t+2	0.074 (0.030)	0.259 (0.299)	0.06	3.19	0.077
t+3	0.125 (0.023)	-0.255 (0.228)	0.09	15.46	0.000
t+4	0.143 (0.016)	-0.427 (0.155)	0.39	43.50	0.000

Finally, a less ambitious test of forecasting quality is applied which is related to the question on whether a forecast – even when it is associated with large mean errors – is at least a good predictor of a variable's direction of change. Table 8 presents the analysis of directional forecasts together with the chi-square test statistic associated with the null hypothesis that the forecast has no informational content regarding the direction of change (see Diebold and Lopez, 1996, for a description of this test).

Table 8's last column strongly supports the finding of over-optimism: decreases of deficits and expenditures are forecasted more often and decreases of taxes less often than they actually happen. Again, tax forecasts turn out to have the poorest properties: For taxes at forecasting horizons t+3 and t+4 more than half of the actual declines have come as a surprise. While for deficits and expenditures the share of correctly forecasted directions reaches on average more than three quarters, with increasing forecast horizons it drops at values of 50 per cent and below for taxes. The chi-square-test correspondingly shows that the financial plan does not even have an informational content for the trend of tax revenues beyond the draft budget's horizon. The results for deficits and expenditures are more favourable. In spite of the bias towards optimism, the forecasts of deficits (all horizons) and expenditures (horizons up to t+3) are helpful for assessing the direction of change.

Table 8: Mifrifi's directional forecasting power 1968-2003

	share correct predictions of direction	chi-square-statistic	significance	nb.predicted decreases/ nb. actual decreases
		deficit		
t	0.78	11.67	0.001	0.82
t+1	0.74	10.28	0.001	1.44
t+2	0.71	8.31	0.004	1.62
t+3	0.76	10.25	0.001	1.38
t+4	0.75	10.15	0.001	1.47
		expenditure		
t	0.92	24.08	0.000	1.04
t+1	0.83	16.15	0.000	1.30
t+2	0.76	9.95	0.002	1.32
t+3	0.79	9.91	0.002	1.15
t+4	0.66	2.26	0.130	1.16
		taxes		
t	0.75	9.97	0.002	0.77
t+1	0.69	3.73	0.053	0.88
t+2	0.53	0.40	0.539	0.65
t+3	0.42	0.00	1.000	0.46
t+4	0.34	1.15	0.283	0.46

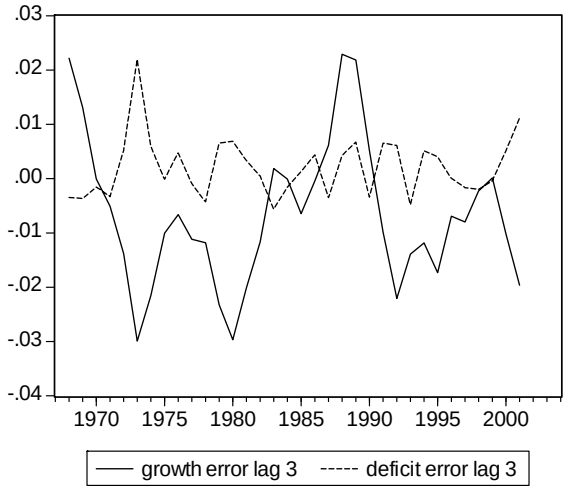
Through the assessment of forecasting quality, three central results emerge: First, a bias towards giving too optimistic projections characterizes forecasts of all fiscal variables over the whole period. Second, forecast quality is poorest for taxes and, third, the nineties are associated with forecast problems particularly regarding deficits.

4 Driving forces of budgetary forecasts

There are different possible approaches to search for the roots of over-optimism. One answer is related to growth errors. Obviously, there is a strong correlation between over-optimistic growth projections and fiscal forecast errors. Figure 4 illustrates the negative correlation between the growth error (calculated as the difference between the financial plan's underlying growth projection in period t and the actual realization of the growth rate, time horizon three years) and the deficit error. Over-optimism already characterizes the growth projection. For the three year forecast horizon the mean error in the growth forecast is -0.68 percentage points. Thus, the biased fiscal projections are partly driven by biased growth projections in addition to possibly erroneous assumptions in regard to growth elasticities of taxes, expenditures and deficits.

However, the idea of growth errors as a root of the problem is only one superficial answer. Independently, whether over-optimism is more related to growth forecasts or to the links between fiscal variables and growth, it exists and needs to be explained.

Figure 5: Growth and deficit error, lag 3



Therefore, the next analytical step looks deeper into the possible determinants of over-optimism and targets the substantiation of some of the factors discussed which are associated with political-economic and partisan reasoning and institutional changes related to the Maastricht Treaty.

For this purpose, we test a model for the explanation of the forecasted changes of fiscal variables. These forecasted changes are related to the economic and political-economic characteristics in the year when the forecast was being produced:

$$(2) \qquad (\hat{y}_t^{t+i} - y_{t-1}) = c + \alpha X_t + \beta (y_{t-1} - \hat{y}_{t-1}^{t-1}) + \gamma y_{t-1} + u_t$$

In equation (2), *y* stands for the ratio of the fiscal variable (deficit, tax, expenditure) to GDP. $\hat{y}_t^{t+i}$ is Mifrifi's forecast in t relating to the period t+i (with i = 0, 1, 2, 3, 4 corresponding to the periods covered by the financial plan). The forecasted change relative to the last known realization (left hand side) is regressed on a number of explanatory variables. The *5* x 1 vector X_t includes the following variables:

– EDUM: The election dummy is set at one (and zero otherwise) for the years where the financial plan is last before a regular election takes place. Note that 1982 has been coded as zero since the 1983 election following the collapse of the Schmidt government was not predictable during the spring of 1982 when the financial planning was undertaken. The variable is to reveal whether

governments use the financial plan as an election campaign opportunity to depict a bright fiscal future.

– PMDUM: The post-Maastricht dummy is set at one from 1994 onwards since 1994 was the first financial planning after the Maastricht Treaty took effect on the 1st of November, 1993.

– UNIFD: The unification dummy is set at one for the years 1990 to 1993 in order to control for the fiscal reactions to unification which could have impacted the projected fiscal changes in these years.

– CDUD: The dummy CDUD is set at one for the years 1983-1998 when the financial planning occurred under a government led by the conservative Christian Democrats and at zero for the other years with governments led by the Socialdemocrats. This variable measures a possible partisan effect.

– Growth (t-1): The most recent known growth rate is also included to measure the impact of the growth situation when the planning takes place.

Furthermore, the specification allows for a learning effect by including the most recent (lag 1) forecasting error $y_{t-1} - \hat{y}_{t-1}^{t-1}$ (FCERRLAG1) among the regressors. In order to account for mean reversion processes the forecasted variable's last realized level is included.

Standard unit root (ADF, Elliot-Rothenberg-Stock) and KPSS stationarity tests show that series included can be regarded as stationary so that regression results are not spurious. White heteroskedasticity tests did not indicate any divergence from the homoscedasticity assumption. However, Breusch-Godfrey Langrange multiplier tests (including a maximum number of six lags) hint towards autocorrelated residuals for some specifications. In these cases, Newey-West autocorrelation consistent estimators are employed (diagnostic tests are not reported).

Tables 9-11 summarize the results for the regressions all based on the complete sample years from 1969-2003.

Table 9: Regression results, dependent variable: forecasted change in deficit-GDP-ratio

	t	t+1	t+2	t+3	t+4
Estimation	OLS	OLS	Newey-West	Newey-West	OLS
C	0.017	0.017	0.012	0.009	0.006
	(0.004)***	(0.005)***	(0.003)***	(0.003)***	(0.003)**
UNIFD	0.007	0.006	0.002	-0.002	-0.003
	0.003**	(0.004)*	(0.002)	(0.002)	(0.002)*
EDUM	-0.003	-0.003	-0.002	-0.001	-0.001
	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)
PMDUM	-0.005	-0.003	-0.003	-0.003	-0.003
	(0.002)**	(0.002)	(0.002)*	(0.002)*	(0.001)**
CDUD	-0.002	-0.001	0.000	0.001	0.001
	(0.002)	(0.002)	(0.001)	(0.002)	(0.001)
Growth(-1)	-0.223	-0.165	-0.066	-0.016	0.044
	(0.064)***	(0.072)**	(0.048)	(0.047)	(0.041)
FCERRLAG1(-1)	-0.121	-0.094	0.010	0.041	0.037
	(0.327)	(0.372)	(0.145)	(0.147)	(0.209)
level deficit-GDP(-1)	-0.534	-0.748	-0.708	-0.768	-0.776
	(0.166)***	(0.189)***	(0.157)***	(0.149)***	(0.106)***
Nb. observations	35	35	35	35	35
significance F-test	0.01	0.01	0.00	0.00	0.00
R^2 adj.	0.31	0.31	0.54	0.67	0.78

***/**/*: significance level of 1%/5%/10%

Table 10: Regression results, dependent variable: forecasted change in tax-GDP-ratio

	t	t+1	t+2	t+3	t+4
Estimation	Newey-West	Newey-West	Newey-West	Newey-West	Newey-West
C	0.023	0.039	0.029	0.017	0.010
	(0.009)**	(0.013)***	(0.022)	(0.030)	(0.036)
UNIFD	0.001	0.002	0.008	0.014	0.020
	(0.001)	(0.002)	(0.004)**	(0.005)***	(0.005)***
EDUM	0.001	0.000	0.000	-0.001	-0.002
	(0.001)	(0.002)	(0.002)	(0.002)	(0.003)
PMDUM	-0.002	-0.006	-0.003	0.001	0.004
	(0.002)	(0.002)**	(0.004)	(0.006)	(0.007)
CDUD	-0.002	-0.005	-0.009	-0.011	-0.014
	(0.001)*	(0.001)***	(0.002)***	(0.003)***	(0.004)***
Growth(-1)	0.040	-0.040	-0.134	-0.201	-0.257
	(0.031)	(0.030)	(0.051)**	(0.073)**	(0.090)***
FCERRLAG1(-1)	0.145	0.205	-0.118	-0.192	-0.072
	(0.168)	(0.333)	(0.337)	(0.412)	(0.436)
level tax-GDP(-1)	-0.215	-0.318	-0.205	-0.077	0.012
	(0.079)**	(0.120)**	(0.195)	(0.249)	(0.294)
Nb. observations	35	35	35	35	35
sign. F-test	0.16	0.10	0.02	0.01	0.01
R^2 adj.	0.12	0.17	0.28	0.33	0.35

***/**/*: significance level of 1%/5%/10%

Table 11: Regression results, dependent variable: forecasted change in expenditure-GDP-ratio

	t	t+1	t+2	t+3	t+4
Estimation	OLS	OLS	OLS	OLS	OLS
C	0.068	0.065	0.038	0.027	0.013
	(0.021)***	(0.019)***	(0.023)	(0.032)	(0.037)
UNIFD	0.007	0.005	0.005	0.007	0.010
	(0.004)*	(0.003)	(0.004)	(0.006)	(0.007)
EDUM	0.001	0.000	-0.001	0.000	-0.001
	(0.002)	(0.002)	(0.003)	(0.004)	(0.004)
PMDUM	-0.009	-0.010	-0.006	-0.004	-0.001
	(0.003)***	(0.003)***	(0.004)*	(0.005)	(0.006)
CDUD	-0.003	-0.005	-0.009	-0.012	-0.015
	(0.002)	(0.002)**	(0.003)***	(0.004)***	(0.004)***
Growth(-1)	-0.148	-0.122	-0.104	-0.082	-0.056
	(0.061)**	(0.056)**	(0.069)	(0.093)	(0.108)
FCERRLAG1(-1)	-0.254	0.272	0.338	0.323	0.358
	(0.594)	(0.545)	(0.671)	(0.909)	(1.046)
level exp.-GDP(-1)	-0.455	-0.437	-0.256	-0.188	-0.099
	(0.145)***	(0.133)***	(0.163)	(0.221)	(0.254)
Nb. observations	35	35	35	35	35
sign. F-test	0.05	0.01	0.04	0.09	0.07
R^2 adj.	0.22	0.34	0.25	0.17	0.19

***/**/*: significance level of 1%/5%/10%

The deficit regression has the best fit for the model, not only with regard to the adjusted R^2 but also in the light of RESET specification tests indicating that the deficit specification are well specified at least for the time horizons t+2 to t+4. The deficit regression's fit increases with the forecasting horizon. Thus, the significant determinants of projected deficit changes are more influential in the longer-run horizons.

The first couple of years of unification show some non-surprising peculiarities in projected changes in the sense that for some horizons deficits, taxes and expenditures are seen to be affected in a positive way.

Deficit-GDP-forecasts for the current and the following budgetary year are 0.3 percentage points lower in election years ceteris paribus. However, this effect is insignificant at the 10 per cent level of significance. Insignificance of the election year dummy is found for all fiscal variables in all regressions. Alternative definitions of the election year dummy (e.g. comparing the last half of a legislative period with the first half) did not change this result.

In contrast to the election year dummy, the post-Maastricht dummy turns out to be significant for most of the deficit and expenditure forecast horizons: In the years since the Maastricht Treaty took effect, Mifrifi's projections have become more

optimistic in regard to the speed of deficit reduction. This deficit optimism associated with the years since 1994 is mainly based on an optimistic projection of falling expenditure levels and not on the perspective of rising tax ratios: In the tax equation, the Maastricht dummy is only significant for the t+1 horizon. The sign is negative which does not correspond to the envisaged deficit reduction.

There is no indication of a partisan effect in the deficit regressions. Differences between forecasted deficit changes produced under social-democratic or christian-democratic governments are insignificant. However, governments led by the two big German parties differ with high significance in almost all specifications for the tax and expenditure projections. Financial plans under christian-democratic governments tend to project smaller tax and expenditure ratios compared to social-democratic governments. The missing impact on the deficit projections can be interpreted in the following sense: Both political parties announce differing objectives for the size of governmental activity which leave their impact on expenditure and tax projections. At least in their financial plans, however, governments from both sides plan to realize fiscal changes in a financially neutral way, i.e. without an impact on the size of the deficit. Therefore, there is no indication that deficits projections are used in a tactical way in order to manipulate public acceptance for expenditure cuts or increases.

Smaller past growth rates tend to make financial planning less confident in the sense that forecasted deficits and expenditures become larger. However, this consequence is not lasting. The longer-run forecast horizons are no longer affected by the recent growth experience which hints to one of the deeper causes of the underlying forecast bias: A decline in the growth rate is treated by financial planners as a temporary phenomenon which has no long-run impact on medium-term forecasts of deficit or expenditures. This neglect of the recent growth perspective is most strongly revealed in the significant negative sign in the tax regressions where a growth decline leads to larger forecasted increases in the tax-GDP-ratio. This is consistent with the view that growth slowdowns are always temporal and tax ratios should, therefore, recover.

The lacking reaction of financial planning to new information is also demonstrated by the coefficient of the past forecast error which is insignificant in all regressions. No error correction mechanisms seem to exist; past errors do not result in recognizable reactions of new forecasts. This result is robust to different specifications of the forecast horizon for the error correction variable (not reported).

Mean reversion as part of the financial planners' model is strongly supported in the deficit regressions where the lagged deficit-GDP-level is highly significant. Large current deficits lead to large declines in the projected deficit path.

5 Conclusions

A first unambiguous result from the analysis is that the German Bund's medium-term financial planning has so far failed to reach its normative objective. Mifrifi has not been very effective in making budgetary policy more predictable. The projections are heavily biased towards over-optimism. The nineties even have a more severe problem: Beyond the budgetary year for which a draft budget exists, the financial plan practically loses any value as a forecasting instrument, for horizons beyond t+1 there is no longer a systematic link between forecasts and realizations.

The bad forecasting performance of Mifrifi's projections and particularly the bias towards over-optimism does not come as a surprise in light of the political-economic and institutional factors discussed above. The financial plan offers a tempting opportunity for any government to use the projections in order to depict a bright fiscal future. Thus, the empirical results are in line with the presented theoretical reasoning on the time-inconsistency of unbiased governmental forecasts. Nevertheless, our model for the explanation of expected fiscal changes does not support the simple election year hypothesis. Hence, the financial plan is not obviously being used as a propaganda tool in the context of national election campaigns. This could simply be due to the fact that rational voters do not pay attention to official forecasts which are not credible given well known governmental incentives.

However, the results hint towards the financial plan's use as a tactical national instrument in the context of the Maastricht Treaty's and the Stability Pact's surveillance instruments. These EU rules' taking effect has influenced financial planning towards the depiction of favourable deficit trends. The Maastricht Treaty appears to have transformed Germany's budgetary planning, not into the direction of more credible and binding projections, but rather toward the production of less realistic and unduly favourable outlooks.

It should be stressed that further research questions are worth addressing: In this analysis no particular attention was paid towards the exact channels over which the incentives of over-optimism feed into fiscal projections. A bias in budgetary forecasts can have two distinct reasons: biased growth projections and/or erroneous assumptions about the growth elasticities of taxes, expenditures and deficits. Biased growth projections are clearly part of the story but the uncertainty about elasticities can be expected to play a relevant role as well.

A standard policy conclusion in the presence of time-inconsistencies is the creation of credible institutions. These findings suggest that it is worthwhile reflecting this strategy also in the context of financial planning. If the responsibility for the

production of the medium term financial planning is transferred towards independent institutions there should be chances for better projections.

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