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Budgetary Forecasts in Europe – The Track Record of Stability and Convergence Programmes*

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RESUMEN
En este artículo analizamos el grado de cumplimiento de las predicciones presupuestarias y de crecimiento incluidas en los programas de estabilidad y crecimiento que los países miembros de la UE han elaborado en la última década. Encontramos diferencias entre países en el sesgo de las proyecciones presupuestarias. En un segundo paso estudiamos si este sesgo se puede explicar por factores económicos, políticos e institucionales. Nuestro análisis indica que la situación cíclica de la economía y el marco institucional para la elaboración del presupuesto son los principales determinantes del sesgo apuntado. Finalmente, los principales factores que afectan a las predicciones presupuestarias parecen ser el ciclo económico, la necesidad de convergencia antes de la UEM, y los ciclos electorales.

Palabras clave: Predicción de variables fiscales; evaluación predictiva; elaboración del presupuesto; Pacto de Estabilidad y Crecimiento.

ABSTRACT
We analyse the performance of budgetary and growth forecasts of all stability and convergence programmes submitted by EU member states over the last decade. Differences emerge for the bias in budgetary projections across countries. As a second step we explore whether economic, political and institutional factors can explain this pattern. Our analysis indicates that the cyclical position and the form of fiscal governance are major determinants of forecast biases. Projected changes in the budgetary position are mainly affected by the cycle, the need of convergence before EMU and by electoral cycles.

Keywords: Fiscal forecasting; forecast evaluation; budget processes; Stability and Growth Pact
JEL classification: C53, E17, H62.

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I. Introduction

Multiannual budget plans are a crucial element of modern budgeting, since they put the current budget into a medium-term perspective. In the European context, they have an additional function. The submission of multiannual budget programmes is a key element of the surveillance process installed at the European level through the Maastricht Treaty and the Stability and Growth Pact. Within this framework EU member states have the obligation to submit either convergence or stability programmes by the end of the year. The programmes are then scrutinised and assessed by the European Commission and the ECOFIN Council to detect budgetary imbalances that could imply risks for fiscal sustainability. This international monitoring exercise presents the cornerstone of the preventive arm of the European fiscal framework and the most important "soft incentive" for member states to hold their public finances on track.

Although the Commission and the ECOFIN assess the quality of each programme and its macroeconomic and budgetary projections in depth, they have not taken systematically stock of the performance of this instrument. This is the purpose of our study. We will evaluate the performance of budgetary and macroeconomic projections for all stability and convergence programmes over the last decade. The evaluation is, however, of interest beyond the specific institutional context of the surveillance process. The stability and convergence programmes together represent the first time where all European governments publicly announce their multi-annual budgetary projections. Several governments only started to proclaim multi-annual budgetary targets in the course of the Maastricht convergence process, or they adjusted their time horizon to the one requested for the programs. As such, the budgetary projections and underlying growth forecasts provide the first fairly homogeneous data set to analyse whether differences in projection pattern exist across European countries, and what political factors affect multi-annual budgetary plans.

The objective of our paper raises the issue as to whether the projections included in programmes are intended to be unconditional forecasts or rather the announcement of a political target. First, the Maastricht Treaty and the SGP set benchmarks for public finances, which established a fiscal target in its own right. This seems particularly relevant for the immediate run-up to EMU where accession largely depended on the achievement of the three percent deficit to GDP limit set in the Treaty.

Second, the political importance governments impart upon their budgetary figures in the stability and convergence programmes varies. The characteristics of the budgetary figures given in the programme may still range from a 'forecast', which is updated regularly and to which the government attaches barely any political importance, to a binding fiscal target. What political weight

the projection carries in a country depends upon the importance given to EU affairs by national policy-makers and what domestic commitments are involved in these fiscal plans. Multi-annual targets presented in national budgets or political documents may be purely indicative. Alternatively, they could appear in a coalition agreement or even appear as a binding budgetary law.

Finally, differences between national budgetary figures and programme data may have existed particularly during the initial years. Even today, there are various degrees of conceptual and institutional connectedness between national budget processes and the EU institutional set-up.[1] In recent year, there has been a greater harmonization of national and programme budget projections. The concepts used at each level may not be exactly the same, but the information content underlying the budgetary projections has become more similar.

This temporal effect implies that one has to control for the impact of the fiscal benchmarks enshrined in the Maastricht Treaty and the Stability and Growth Pact. Nonetheless, budgetary projections in stability and convergence programmes still allow us to address the question of whether institutional factors and political forces have an impact on budgetary forecasts. We can in turn derive more general findings. The more budgetary debates at the national and international level are linked and jointly expressed in these fiscal targets, the more valid conclusions can be derived for national budgeting in the future.

After an explanation of data pecularities and an overview at budgetary projections and growth forecasts, this study looks at some standard measures of forecast performance and tests of forecast biases and efficiency. The most robust evidence concerns national differences in the forecast bias as being too optimistic or overly cautious. Given this finding, we explore in the second part of the paper whether political and institutional factors explain the differences in forecast performance. We explore the impact or electoral cycles, output volatility, government constellations and fiscal governance structures. The main result is that the cyclical position and the form of fiscal governance are important determinants of biases in budgetary and GDP growth forecasts. In addition, we find evidence for a procyclical fiscal stance in projections and outcomes. Finally, the budgetary gap to the reference values, i.e. the convergence need, and upcoming elections lead to more restrictive fiscal projections, which are not necessarily matched with budgetary outcomes.

[1] The entity involved in the planing process, the accounting concepts and relevant budgetary rules may differ and the calendar for preparing the budget and the EU program may be badly syncronised. See Hallerberg et al. (2001) for a detailed presentation of national arrangements.

II. Budgetary and Growth Projections in Stability and Convergence Programs – Methodological Remarks and Data Description

II.1. Data Structure – Timing and Accounting Issues

This study analyses the forecasts of the budgetary balance and economic growth made in 126 stability and convergence programmes submitted by EU member states between 1991 and 2002. Over the years the format and the process of submitting the programmes has changed. The time table was less clear during the initial years. There was no requirement to submit yearly programmes, and the frequency at which member states submitted programmes varied widely, ranging from semi-annual updates to updates only every couple of years. The information content was also heterogeneous. Whereas some programmes included detailed information on macro-economic projections and policy measures, others provided only rough average forecasts of future developments with little indication of what specific policy measures were intended to achieve fiscal goals. Both, timetable and contents have been much standardised by the Stability and Growth Pact, and subsequently by the code of conduct which was released by the Monetary Policy Committee and endorsed by the ECOFIN Council. Currently, programmes are generally submitted at the turn of the year. The format suggested in the code of conduct comprises a set of sections, on the general economic policy strategy, macro-economic forecasts, budgetary projections, long-term developments etc., as well as a series of standardised tables, which should allow to evaluate projections.

Despite this development over time, it has been generally unproblematic to identify convergence and stability programmes and their starting year.[2] Since the purpose of the study is to look at forecast errors, we take the current year when the programme was released or approved as the starting date.[3] The convergence and stability programmes included in our data set and their dates of release (or submission) are depicted in Table 1. Almost all figures on public finances and macro-economic forecasts were taken from original programme documents. For a few cases, where the original document was not available to the authors, they were found in secondary sources, such as summary

[2] Our sample includes the up-date of the previous programme which Italy supplied together with the Loan Programme in November 1992. Some programmes were revised shortly after they had been submitted (e.g. the programme submitted by Germany in December 1996 was revised in February 1997) due to new data or a change in government. In these cases, only the revised version is included.

[3] When the date of release is not known, we use the date of submission to determine the start of the programme. However, since there is usually only a short period between these two dates, the difference is irrelevant. Some programmes were released in January instead of the end of the year. In these cases, we used the preceding calendar year as starting date.

presentations of the European Commission (1996, 1999)[4]. Data are missing only for one stability programme.[5]

Although the sample is fairly complete, the data bear some peculiarities. First, most programmes set forth several scenarios of future developments. Usually there is a baseline scenario and a more "optimistic" and/or a more "pessimistic" scenario. In some cases, however, there are two scenarios without any political weight or preference assigned to either one of them. In the former case we always include the baseline scenario in the sample, and in the latter case the more cautious scenario.[6]

Second, data in convergence and stability programmes were not necessarily based on a unified accounting concept before 1994. Thus figures may vary between countries due to differences in the accounting concepts. It would have been optimal to compare forecasts with actual outcomes as measured in each country and presented in subsequent programmes to cancel out these accounting differences. Yet this proved to be impossible due to the large amount of missing data, which would have excessively reduced the sample. Therefore, we use the Eurostat AMECO data set to compute actual output and fiscal outcome figures. In addition, the European system of accounts has changed from ESA79 to ESA95. Although all governments were obliged to report figures according to ESA standards at least from 1994 onwards, budgetary projections and reported outcomes have been subject to revisions. The official deadline for changing to the new accounting system was the beginning of 2000. Some countries had already reported budgetary and GDP figures according to the new standards before. Since we do not have complete knowledge of this change across all countries, we set the start of 1999 as the general change to ESA95 when chain-linking budgetary balances[7].

Finally, ESA95 has been revised occasionally to accommodate fiscal facts that needed clarification. The most important instance was the receipts from UMTS auctions for which no clear accounting

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4 European Economy - Supplement A (January 1996, March 1999)

5 The data for the programme submitted by Ireland in 1991.

6 This procedure is not unambiguous since it affects forecast performance. Regarding the first choice, it could be objected that any indication of an over-optimistic governmental stance showing up in the empirical analysis does not take into account that governments had also envisaged diverging, and particularly less favourable, outcomes. Although this is a valid argument, setting forth a *baseline* scenario indicates that the government considers this the most likely outcome, or at least it presents the scenario which should guide its policy. Therefore it is justified to use these figures as standard. Conversely, the latter choice may produce a bias through the inclusion of "cautious" scenarios. However, extrapolating different data, e.g., computing the mean of the different values set forth in the different scenarios, would have been equally questionable. This would assume that governments' expectations about future developments are distributed such that the mean value between the two values is the most likely outcome. Yet programmes neither clarify, whether the values in the programme actually present upper and lower bounds of government expectations, nor whether the distribution of expectations is skewed into one direction or another. Therefore, we prefer to stick to those figures actually set forth by the government.

rule was known in advance. In July 2000 it was decided that receipts, which are recorded as negative expenditures, had to be excluded from the budgetary projections in the programmes. Therefore we decided to compute all actual fiscal outcomes excluding UMTS proceeds and compare them to budgetary projections as expressed in the stability and convergence programmes. This does not imply a significant measurement error. While it is possible that projections before July 2000 might include these receipts, little was known at the time about the magnitude of revenues, and governments had generally not budgeted them in.

II.2. A Short Overview of the Convergence Process in the 1990s

The budgetary projections presented in convergence and stability programmes and the actual developments since the early 1990s in individual EU member states are presented in Figure 1. There are some interesting patterns of budgetary developments and projections. First the figures illustrate that most EU member states had to achieve significant fiscal consolidation to comply with the deficit limit set in the Maastricht Treaty. This was most obviously the case for the high-debt countries Belgium, Greece and Italy with deficit ratios close to or above 10% of GDP. In more recent years, particularly France, Germany, Italy and Portugal are facing difficulties in bringing actual balances close to the required medium-term position of a balanced budget.

Second, it shows that most countries faced problems in predicting turning points and economic downturns in particular. Forecasts in some countries, like Belgium, Portugal and Spain, did not reflect the downturn of the early 1990s. Few countries had predicted the recent budgetary downturn. Most forecasts started to being revised clearly downwards only in 2001.

Third, and most interestingly, forecasts in countries exhibit different patterns of accuracy and biases. Few countries predicted actual developments rather well. Other countries have either a more consistent cautious or optimistic bias over most of the time period. On the cautionary side we have two pattern. First, member states like Denmark, Sweden, the UK and partly the Netherlands predicted the speed of improvement in budgetary balances during the 1990s rather well, but kept a certain safety margin. Second, most notably Ireland, but also Finland and to a lesser extent the Netherlands, pursued a strategy of level adjustment. Ireland refused to project any budgetary consolidation in the course of the programmes released between 1994 and 2000, when the actual budgetary balance improved from –2.0% of GDP to 4.5% of GDP. All adjustments to bring projected developments in line with actual were done by shifting upwards the level of the budgetary

[7] We had to set the start of 1999 as starting date for the chain linking since actual budgetary outcomes were only reported according to the former definition until spring 1999, i.e. including final budget figures for 1998. In all subsequent editions, the former definition is only reported up to 1995.

balance for the current year when the programme was released. On the optimistic side, we find a few programmes showing a constant, optimistic forecast margin compared to outcomes, as e.g. in Italy in the early 1990s, the first French and Greek programme. But there is a more pronounced pattern of optimism regarding future fiscal consolidations, which eventually do not materialise. Most notably Germany, with the exception of the 1997-2000 period, belongs to this group. More recently France, Italy, Portugal and to a lesser extent Greece reveal a similar pattern.

III. Quality of Forecasts

III.1 Forecast Accuracy of Stability and Convergence Programmes

For a more accurate assessment of projections we compute the mean error (ME), the mean absolute error (MAE), and the root mean squared error (RMSE) of the programme forecasts of budget balances and economic growth. The forecast error e is defined as the actual value minus the forecasted value. Thus a negative sign indicates that one has overestimated the budgetary balance or growth and experienced a negative 'surprise', and a positive sign implies the opposite. The ME, MAE and RMSE are computed as follows,

$$ME = \frac{1}{N}\sum_{i=1}^{N} e_{i,t+h}, \quad MAE = \frac{1}{N}\sum_{i=1}^{N} \left| e_{i,t+h} \right|, \quad RMSE = \sqrt{\frac{1}{N}\sum_{i=1}^{N} e_{i,t+h}^{2}}$$

We use two specifications. First, N is the number of observations for each forecast horizon $t+h$ across programmes i. Later on, we compute these measures for all programmes i of a country over all forecast horizons up to $t+h$, such that $N=i \times h$.

We start by looking at these measures for different programme years since the difficulty of precisely forecasting economic growth and public finances increases with the forecasting horizon. The ME figures in Table 2 indicate that governments on average either predicted the budget surplus fairly well or that forecast errors were distributed equally around the actual value. ME are surprisingly close to zero with the largest deviation being 0.27 percent of GDP for the current year. This outcome is obviously the result of symmetrically distributed forecast errors as the MAEs indicate. The MAE increases from 0.82 for the current year to 1.30 for the three-year ahead forecasts. These figures reflect the increasing uncertainty of future budgetary outcomes. Since the RMSE is always larger than the MAE, a considerable proportion of forecast errors are large errors above one percentage point.

This picture changes somewhat, though not drastically, when we look at the budgetary forecast errors for the years 1998-2002. The ME shows the same trend but starting now from zero in the

current year and then declining to -0.4 in the third year ahead. This reflects the problem of predicting the economic and budgetary downturn in 2001-2, already apparent in Figure 1. However, it has to be taken into account that the number of observations is strongly reduced (n=27) and therefore may change considerably with newly incoming data. The results for the MAE and the RMSE remain identical, even thought the size of the absolute error has been smaller on average.

The finding of a neutralising distribution of forecast errors does not entirely carry over to growth forecasts (see Table 3). The ME is positive for the current year (0.27 percent of GDP), but then becomes increasingly negative for longer forecast horizons, amounting to 0.35% of GDP for the three year ahead forecast. The absolute values range from 0.80 in the current year to 1.17 in the upcoming year. Thereafter, the MAE decreases again below one percent of GDP. The RMSE indicates that some of these forecast errors are large. However, based on comparisons with forecast errors from international organisations, the overall accuracy of forecasts is satisfactory. These averages indicate that governments on average over-estimated the immediate future economic growth rate less than one percentage point. This is roughly of the same magnitude as those found for the current and coming year projections of international organizations. For example, Artis (1996:9) finds in his evaluation of World Economic Outlook forecasts that the MAE for current year and coming year forecasts is 0.65 respectively 1.17 for industrialised European countries. Keereman (1999:12-13), in an analysis of the Commission's forecasts, indicates a MAE of 0.53 respectively 0.94 for the aggregate European GDP growth rate.[8] Individual country errors vary between 0.56 and 1.60 for current year forecasts and 0.94 and 2.36 for next year's forecasts. Looking at the sub-period from 1998 to 2001 does not lead to qualitatively different conclusions taking into account the low number of observations for the longer projection horizons.

Until now we have analysed how forecast errors performed over the course of the programme. In light of the graphical presentation of the convergence process, another important aspect is whether forecast errors vary by country. Table 4 lists the ME, MAE and RMSE for each EU member state pooled over the entire forecast horizon. Looking at country performance for each projection horizon would have drastically reduced the number of observation, and might therefore not lead to reasonable results. Since the projection horizon is standardised to three years ahead according to the stipulations of the Stability and Growth Pact and censoring of data at the end of the sample period affects all countries similarly, we should not incur any systematic mistake when pooling observations over projection horizons. The caveat, mentioned above, on the different accounting

[8] Notice that here data are aggregated while they are pooled in Artis' and our analyisis.

concepts however is particularly relevant for this exercise since the main focus of the comparison is cross-sectional.

Keeping this in mind, we find that the projected deficits were considerably larger than the actual deficit, as measured by Eurostat, in Greece and Portugal (see Table 4). The ME for these countries is around minus one. They are followed by Italy, France and Germany with ME of –0.80, -0.49 and -0.31 respectively. Table 5 shows that the bias to underpredict the actual deficit prevailed in those countries beyond 1997. For the period 1998 to 2001, Greece, Portugal, Germany and Italy show relatively large MEs. France kept a ME of –0.6. In contrast, Sweden, Luxembourg and Finland on average projected a fiscal outcome considerably worse than the actual deficit. For these countries the ME ranges from 0.97 for Luxembourg to 0.35 for Sweden. These large ME reflect statistically signficant forecast biases in most cases.[9]

Countries from the two groups with the smallest and largest ME are also the cases with the largest MAE. The largest MAE has Greece (1.64 percentage points), closely followed by Ireland (1.63 percentage points), Luxembourg (1.61 percentage points), and Finland (1.34 percentage points). Belgium and France performed best, achieving a MAE of 0.47 respectively 0.61, i.e. roughly a third of the largest MAEs. The RMSE statistics largely confirm this picture. In the 1998-2001 sub-period, this picture changes somewhat with Portugal performing relatively weakly.

Looking at the forecast errors for economic growth we find some correlation with the quality of the budget projections. Those countries with the largest negative deviation of forecasts from actual deficits are also those with negative prediction errors for economic growth, implying an overly optimistic assessment, although these biases are not always statistically significant (see Table 5). The ME is –0.84 for Germany, -0.77 for Portugal, -0.73 for Italy, and –0.31 for Greece. At the other extreme, we find Ireland, Sweden, the UK and Finland. The Irish ME of 1.9 percentage points is by far the largest among those countries. Regarding the MAE, we find mostly countries with a cautionary bias among those having large forecast errors. For the 1998-2001 sub-sample the country ranking with regard to the ME is fairly similar. Here we also find Austria among the group of countries often overestimating growth. The MAE however is largest in Luxembourg, Ireland, Belgium and Portugal. There is hence only a partial correlation between forecast errors for economic growth and budgetary balances.

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[9] In line with Artis (1996) and Artis and Marcellino (2001), the following model is used to assess the biasedness of forecasts: $\varepsilon=\beta_0+\nu$. Here ε is the forecast error and ν the demeaned forecast error. Unbiasedness implies that $\beta_0 = 0$.[9] To compute the correct standard errors one has to account for the fact that the residuals may be serially correlated even for optimal forecasts. For an h-year ahead forecast error, innovations may follow an MA(h-1) process even for optimal forecasts (see Diebold 2000). Therefore, we use Newey-West standard errors whenever necessary.

Given the partial correlation of biases for budget balances and economic growth, an obvious question is to which extent to forecast errors for the budget balances have to be explained by the deviation of actual economic growth from predictions. In other words, we want to re-assess our previous findings for budgetary forecast errors net of the growth forecast error. One can do so by empirically estimating the elasticity of the budget balance with respect to GDP forecast errors. Simply regressing budgetary forecast errors on deviations of actual growth from projections yields the following result:

$$\underset{}{e_{balance}} = \underset{(0.74)}{0.07} + \underset{(8.66)}{0.59} \cdot e_{growth} + n$$

Numbers in parenthesis are t-statistics.[10] The estimate indicates that generally for each percentage point by which actual output growth exceeds forecasts, budgetary balances deviate 0.6 of a percentage point from budgetary plans. This is a sizable effect which lies above the normally assumed budgetary elasticity to output fluctuations of 0.5. However, it is clear that the above equation is a reduced form estimate which does not only capture the 'surprises' in macro-economic shocks, but also any systematic biases and endogenous effects.

III.2. The Information Efficiency of Forecasts - Efficiency and Forecast Encompassing Tests

Having assessed the bias of forecasts, we will now turn to two more dynamic aspects whether newly incoming and currently available information is used efficiently, and whether possible inefficiencies can help to explain above forecast biases. A test for the efficiency of forecasts is whether serial correlation goes beyond h-1. For this test, data have to be adjusted since occasionally two programmes were released in the same year. In the adjusted time series for h-year ahead forecasts, data from the last programme released in a given year are included. Given the structure of the data set and the delay with which some countries started to publish their convergence programmes, the time series are very short. For most countries complete data exist only from 1995 onwards. Table 6 depicts the t-statistics for lack of serial correlation based on the entire sample. It shows that budgetary forecasts going beyond the current year are not fully efficient. Interestingly, this is not the case for forecasts of GDP growth where we can only find a very weak indication of inefficiency for the projections related to the upcoming year. This again supports the notion that budgetary forecasts may follow a somewhat different logic and are more politically determined than by actual information on economic developments.

[10] The t-statistics are based on Newey-West standard errors allowing for a MA(3) process.

Another way of looking at the informational efficiency of forecasts is to examine whether they improve on either simple models or competing forecasts. In this context, comparison with forecasts from the European Commission are particularly interesting from an institutional perspective, since the Commission is the 'guardian of the Treaty' and has a prevailing role in the surveillance process. Therefore we apply a standard forecast encompassing test for the different forecast horizons to see whether programme forecasts encompass Commission projections or vice versa. Following Diebold (2000: 295), we estimate the following equation:

$$y_{it+h} = b_1 f_{it+h}^{p} + b_2 f_{it+h}^{ec} + e_{it} .$$

Y is the actual outcome, *f* are the *h* year-ahead forecasts released in a programme (*p*) or by the European Commission (*ec*) for country *i*. If $(\beta_1, \beta_2)=(1,0)$ it is said that the programme forecast encompasses the Commission forecast. For $(\beta_1, \beta_2)=(0,1)$, the opposite holds. For this exercise programme projections were matched with the European Commission forecast data being released closest to the date when the programme was published.[11]

Table 7 depicts the coefficient estimates and the F-statistic for the respective restriction on the coefficients. For economic growth, one can reject for all forecast horizons that coefficients are one, while it cannot be rejected with one partial exception that they are zero. The opposite holds for the Commission forecasts, which indicates that the information content of Commission forecasts actually encompasses programme projections. Budgetary forecasts provide the same picture. This would suggest that knowing Commission forecasts little can be gained by in additional information by looking at programme projections when assessing future fiscal developments in EU member states. This result is somewhat counterintuitive if the objective of governments were to minimise forecast errors. Generally one would assume that the information set available to the European Commission is a subset of the information accessible to the government. The government may have special confidential data bases and models and inside information on policy measures, whereas the European Commission possibly has to rely on information made available by the government or being public news. Under this assumption, our finding indeed indicates that governments could more efficiently make use of the available information in order to improve forecasts.

Given this result, the question is to which extent more efficient use of information could have lead to lower forecast biases for individual member states. Table 8 reports the results of a comparison of programme and European Commission MEs for each country. The ME for stability and convergence

[11] In case the release of a programme fell just in the middle of the time span between two forecast publications (usually April and November), the Commission forecast with the longer horizon is used.

programmes is reported again, since EC forecasts have a shorter horizon. This reduces the number of comparable observations and the size of the bias for several countries. The statistic used to determine whether the difference between forecast errors is statistically significant from each other is the Diebold-Mariano test statistic.[12] The table shows that the bias inherent in budgetary forecasts done by the Commission is smaller for more than half of the countries. The exceptions are Austria, Belgium, Spain, Finland, Luxembourg and Sweden. The difference is mostly statistically significant when the ME of the programmes exceeds the EC figure. Thus, the Commission seems to do considerably better in forecasting balances in France, the UK, Greece Ireland, and Italy. The picture is fairly similar for forecasts of GDP growth. The Commission also fairs better on the 'big' countries plus several smaller member states. The difference is statistically significant for Spain, Greece, Ireland, Italy and Portugal. In other words, making more efficient use of the information held by the Commission might have reduced budgetary forecast biases in some, but not in all cases.

IV. Political Economy Considerations

The previous section reviewed forecast errors for the budget balance and for economic growth. It considered errors both according to the programme horizon and according to country. The main conclusion from this section is that there is some variation of biases across countries. The challenge emerging from the previous standard analysis of forecast performance is to explain these cross country differences. In this section, we discuss three explanations in the political economy literature why forecast errors may vary—elections, forms of fiscal governance, and veto players. Since to our knowledge there is nothing like a 'comparative politics of budgetary projections' for European countries[13], these variables are selected based on the more general political economy literature of public finances.

[12] We use a specification without autocorrelation in the error structure. Since the test results are dependent on this assumption, they should be read with caution. However, given the structure of the data there is no obvious lag structure one could apply. The test statistic applies the modification suggested by Harvey et al. (1997) to account for size problem associated with the forecast horizon and the small number of observations. The significance of differences is reported based on the Student-t distribution as also suggested by Harvey et al. (ibid).

[13] There is however a small literature on the accuracy of revenue forecasts in the US states which includes institutional and political factors, such as the stringency of banaced budget requirements and the dominance of a political party (see Bretschneider et al. 1989; Cassidy et al. 1989). Von Hagen and Harden (1994) look at the impact of budget processes on forecast performance across EU countries. This variable will be discussed in more detail below.

IV.1. Institutions, Elections and Coalitions

European Institutional Framework

The European fiscal framework itself sets incentives for strategies of 'blame avoidance' (Weaver 1986) which could lead to forecast biases. There was a clear incentive during the accession process to signal the willingness and ability of joining EMU at an early stage. Countries with large deficits were hence inclined to forecast strong consolidation efforts. At the same time, accession also presented a strong incentive to actually comply with the reference values. Therefore the path towards the 3% deficit limit could be bumpier than anticipated, but eventually forecast errors could vanish. In a milder form the same incentive continue for those countries with remaining fiscal imbalances after 1997. Again, not projecting a sufficiently ambitious consolidation effort in order to achieve the required close to balance or in surplus position could have been read as a lack of commitment to the institutional fiscal framework underpinning monetary stability, and therefore caused some peer pressure. Conversely, not complying with projections similarly should have caused peer pressure. In case countries run the risk of an excessive deficit, this could have even formal procedural consequences leading from an early warning to the decision to fine a euro area country. By now, it is clear that at least the preventive arm of the fiscal framework has failed since Germany, France and Portugal are running excessive deficits. Others still maintained or reintroduced deficits not in line with the close to balance requirement, although not breaching the 3% limit. Whether this apparent 'lack of pressure for compliance' affects the overall forecast performance is not fully clear however, since the institutional framework was only put to a more serious test in 2002.

Elections

Elections may cause variations in forecasts as well as in forecast errors. There is some evidence that elections are occasions for voters to evaluate the performance of the current government. They reward incumbents when the economy is strong and punish incumbents when the economy is weak (Lewis-Beck 1988). Anticipating this, incumbents may take two different actions that would affect forecast errors. First, incumbent politicians may want to issue overly optimistic forecasts about the health of the economy and about the state of the budget balance. If voters believe those forecasts, they would think that the government is doing well. One would therefore predict that forecast errors would be overly optimistic in pre-election years. Such forecasts may also be overly optimistic, because the government seeks to boost the economy with a fiscal expansion before elections, which has not been anticipated in the multi-annual programme. This suggests that actual budget balances may be worse than when elections are not on the horizon. This pre-electoral boost exerts a possible

countervailing effect on forecast errors for growth. While governments might be tempted to issue overly optimistic growth forecasts, they are also more likely to meet those forecasts if they are initiating fiscal expansions.

Veto-Players

A second political economy factor concerns the number of party veto-players in a government. Tsebelis (1995; 2002) argues that increasing the ideological distance among coalition partners in parliamentary democracies makes change in policy less likely than under one party governments or under governments where the coalition partners share similar political views. For example, the coalition between the Conservatives and the Communists in Greece should have had difficulty agreeing on any policy changes because the parties differed so much from one another in their preferred policies. Conversely, a Labour government in the United Kingdom should have fewer problems agreeing upon changes to current policies. As a consequence of the difficulties that governments with greater ideological distance should face in engineering fiscal reforms, they may also be hampered in reacting to exogenous shocks. A related argument is that coalition governments are not simply more sticky, but that they should be less capable to agree on fiscal consolidations (see Alesina & Perotti 1995, Roubini & Sachs 1989).

The implication of this argument for the forecast error is not clear cut. If governments anticipate their reform capability correctly, they would not project major fiscal reforms or consolidations in the first place, or at least to a lesser extent than less diverse governments. In our sample, the Irish coalition government seems to perfectly represent this pattern of lack of ambition in fiscal consolidation. However, fiscal projections may be equally ambitious since government still want to signal competence to the electorate or compliance with the rules to other EU member states. They could then fall short in implementing their plans. In the first case budgetary forecast errors may not exhibit a clear bias, but they should vary with absolute GDP growth forecast errors, if the lack of reaction to exogenous shocks is the source of the problem. In the second case, forecast errors would either not be affected, if fiscal expansions or consolidations are equally weighted, or they could have a negative sign if the consolidation restraints prevail.

Budgetary Institutions

A third theoretical perspective focuses on forms of fiscal governance (see Hallerberg and von Hagen, 1999, Hallerberg 2003). The basic premise is that all governments face a common pool resource problem. That problem arises when policy makers do not fully internalise the social costs of spending. As a consequence they are inclined to incur higher spending and deficit levels than

would be socially optimal. A developing empirical literature finds that this is indeed the case for government systems having a fragmented budget process.[14] There are two solutions to the co-ordination failure inherent in the common pool resource problem, namely delegation and contracts. Governing parties can delegate decision-making and enforcement power to a central player in the budget game, usually the finance minister, who fully takes into account the financing costs of spending decisions. This form of fiscal governance functions well in one party systems and when parties do not face a competitive process of government formation after elections. The second form of governance, known as "contract approach" achieves internalisation through a co-ordinating bargaining process. In this case, political parties pre-commit themselves to budget figures at the outset or even before the actual planning process initiating the budget cycle. In practice, coalition agreements often amount to such fiscal contracts. The two forms of governance may be mixed under minority governments. In this case, a strong finance minister can centralize the process within the government, but in order to get the government's budget through parliament, the government negotiates fiscal contracts with key opposition parties.[15]

These forms of governance are relevant to our expectations about forecast errors. Fragmented governance structures are likely to result ceteris paribus in larger absolute forecast errors, and an overly optimistic forecast. Since the budget process is decentralized, there is less control over final spending levels which may be driven by internal and external factors. Moreover, the aggregation of spending pressures may lead to an asymmetric reaction to random shocks, i.e. large expansions when negative shocks to economic growth occur and no consolidation when positive shocks materialise. In contrast, commitment states are likely to be overly conservative. An unexpected drop in economic growth or a lower than expected budget balance will force a renegotiation of the fiscal contract under conditions when one or more parties will have to see their constituencies bear the burden of possible expenditure cuts and/or tax increases. To avoid this situation, coalition partners may build into their budgetary targets larger safety margins that make contract renegotiations less likely. Finally, delegation states should, on average, have forecasts that are not biased one way or the other. Since the finance minister can make adjustments in cases of exogenous economic shocks, there is no need to build in a safety margin.

[14] See among others the contributions in Poterba and von Hagen (1999), and Strauch and von Hagen (2001) for an overview.

[15] It should be noted that the data used in this study are largely based on in depth country studies (see Hallerberg 2004). Therefore, they trace more closely power relations among decision-makers and go beyond the characterization of the institutional setting used in other work (Hallerberg et al. 2003).

These arguments suggest that governments under contract or mixed forms of governance have an asymmetric loss functions. One well-known functional form of asymmetric loss is the 'quad-quad' function (see Elliott et al. 2003),

$$u(e) = \begin{cases} ae_j^2, & e \leq 0 \\ be_i^2, & e > 0 \end{cases}$$

E again indicates the forecast error. When $b/a < 1$, there is a higher loss from negative forecast errors, i.e. underprediction; otherwise overprediction is less desirable. Given the political economy of contract and mixed forms of governance, one would assume that governments under contract and mixed regimes tend to have a coefficient smaller than one. Following Artis and Marcellino (2001), we can determine the parameter value b/a for our sample assuming that forecasts are optimal given governments' loss function and setting $u(e)' = 0$.[16] Under this assumption the ratio of coefficients can be computed as $b/a = \sum e_i^2 / \sum e_j^2$.

Table 9 shows the coefficient for forecasts of budgetary balances and the prevailing type of fiscal governance in each country. The form of governance has been stable over the last decade for the majority of countries. France, Germany, the UK have been stable delegation states, and most countries representing contract states did not experience any change. In others, most notably Italy, Spain and Greece a shift has taken place from a fragmented system to a delegation regime. Only one country, Austria, has had various forms of governance. Countries with contract or mixed forms of governance predominantly show an asymmetry factor below one. The exception is Belgium, with a value of 2.5, which however is still a relatively equal weighting compared to several delegation states. Countries with fragmented and delegation forms of governance have mostly parameter values above one, indicating that they put relatively less weight on underprediction. The notable exceptions is the UK. France has an extreme value of 58.8.[17] This implies that there were few and small forecast errors, when France underpredicted its budgetary balance, while this scheme was much more equally weighted say in Germany (3.66).

[16] Elliot et al. (2003) present a GMM approach to directly estimate parameter values of the loss function. Unfortunately, the number of observations per country and forecast horizon is too small in our sample to replicate their analysis.

[17] We also computed the loss parameter for the 1998-2002 subsample. This did not lead to sensible parameter values for all countries, in particular the loss factor for Portugal was extremely large. We take this as an indication that the time period is too short, and results are too much shaped by the particular cyclical situation to lead to reliable parameters.

IV.2. Multivariate Analysis

We estimate the following simple model to analyse the impact of political and institutional factors:

$$f_{it} = a + b_1 X_{it} + g_2 P_{it} + e_{it}$$

f presents the fiscal variable under consideration for programme i at time t. For the forecast error this is the mean error, for the projected and actual fiscal stance these are annual observations. X is the vector of economic control variables, X={gap, volatility, conv}. *Gap* indicates the lagged output gap. This controls for the cyclical situation during the budgetary planning stage. Cyclical fluctuations create uncertainty about future developments and possible turning points. They may also induce a forecasting bias if people are tempted to expect better times in busts and are overly optimistic during booms. *Volatility* is the standard deviation of real GDP growth over the cycle. In line with the literature on European business cycles, we use 8 years to compute this measure (see Bouthevillain et al., 2001). Higher output volatility could lead to a cautious forecast bias if policy-makers are risk averse. Finally, *conv* indicates the convergence need, i.e. the distance between the actual balance and the 'benchmark' reference value at the time when the programme was released. *P* comprises the vector of political and institutional variables, P={elect, veto, commit, delegate, mixed}. *Elect* captures the pre-election year. The variable is operationalised as a continuous and not as a dummy variable, i.e. it captures the time span of the pre-electoral year falling on the calendar year when the election actually takes place and the preceding calendar year. *Veto* indicates the ideological complexion of government. *commit*, *delegate* and *mixed* capture the respective fiscal governance structure and they are operationalised as dummy variables. They can be considered fixed effects that capture the performance of these regimes relative to the fragmented structure, which is the default. ε is a random error. For forecast errors and the projected fiscal stance, we look at the political and institutional constellation when the programme was released. For the actual fiscal stance, we include the contemporaneous situation.

Our data constitute a cross-sectional time series data set, which is relatively small on the time and cross-sectional dimension, and where observations from programmes and their updates are clustered for individual countries. Moreover, some key variables such as the form of fiscal governance show little or almost no time variation for several countries. These features restrict clearly the econometric specification which we can apply. Under these conditions, fixed effects panel estimates for countries possibly yield unreliable estimates. Random effects estimates would be possible, but the Hausman test indicates that this specification would not be appropriate for all models and sub-periods.[18] We

[18] Test results are available from the authors upon request

decided therefore to use standard OLS without country effects. Robust standard errors allowing residuals to be correlated within countries are computed to accommodate the potential clustering of observations. The robustness of results is checked extensively by dropping individual countries from the sample to control for the impact of unobserved measurement errors or other factors affecting observations in a country. Cross-country correlation is largely attributable the common business cycle, which is captured by our model. Moreover, specification tests indicate serial correlation of residuals within programmes for the planned fiscal stance, as well as for the actual fiscal stance. Therefore, we include a lagged dependent variable in our specification.[19]

Table 10 presents the results for forecast errors of budgetary balances. The economic control variables explain 20% of the variance for entire sample period, but only 13% for the Stage III sub-period. Thus developments seem less linked to economic factors in the latter period. Over the entire decade, all variables turn out to be statistically significant at standard levels. Results indicate that a favourable cyclical position is associated with less positive or more negative forecast errors. In other words, booms may induce overly optimistic forecasts. Conversely, cyclical downturns reduce this bias or even lead to an overly cautious forecasting stance. This pattern could be the outcome of a turning point problem. Moreover, output volatility significantly affects forecast errors, i.e. governments in more volatile economies tend to have more cautious forecasts leading to positive errors. Finally, a positive coefficient for the convergence need would indicate a similar stance being related to the deviation from the reference values. But the latter two results loose statistical significance when we reduce the sample period and/or control for political variables.

Columns 3 and 4 show the estimates including political and institutional variables. The coefficients indicate that forecasts are more cautious in delegation, contract and mixed governance structures than in fragmented systems. The effect for the delegation system, however, is not statistically significant at the 10% level. The coefficients for contract and mixed governance structures – amounting to 1.47 and 1.34 are moreover significantly larger than the effect of delegation structures (0.68).[20] This finding would provide some support to the above mentioned hypotheses that contract and mixed states may face stronger incentives to issue cautionary forecasts due to the costs of re-negotiation. It should be noted that the effects of contract and mixed states loose statistical significance if Portugal is excluded from the sample. This is to be expected since Portugal comprises

[19] The previous efficiency test also indicate serial correlation across programmes. However, it should be noted that these statistics were computed for an adjusted dataset, where we only picked the last programme published per year and computed the serial correlation for a specific forecast horizon. In the exercised reported below we either look at average forecast values for each programme or all different forecast horizons jointly. Moreover, we do not delete specific programmes.

[20] For both cases F-stat=4.82 (p=0.03).

close to 50% of all observations with a fragmented budgetary process[21] and it is the only country maintaining a fragmented form of governance after 1996. Eliminating the country from the sample therefore reduces the estimated impact of other regimes and increases the standard errors, although the coefficients remain positive and large.[22] For the post-1997 period, the lesson remains the same. Coefficient estimates become even larger for commitment and mixed forms of governance. The coefficient for delegation regimes remains stable, but attains a 10% significance level due to the slightly lower variance.

With respect to GDP growth forecasts, the overall explanatory power of the model increases to 40% for the full sample period, but it remains relatively low, close to 10%, for the 1998 to 2002 sub-sample (see Table 11). The pattern emerging for the specification including only economic controls is similar to the results for budgetary balances reported above. The cycle seems to lead to more optimistic biases during booms. The estimate for the convergence need, again, is not robust when we use different sub-samples or a specification including political controls. Instead, the veto player variable and the commitment dummy become highly statistically significant. The estimated impact of ideologically more complex government structures is negative, while the coefficient for the commitment variable is positive. These findings are robust to changes in the sample if we look at the entire sample period. For the 1998-2002 sub-period, the positive coefficient for mixed regimes attains a 10% significance level. The positive coefficients are in line with the above-mentioned argument on the costs of breaking a contract. Interestingly, we found in a survey on budgetary institution that contract states tend to rely more on external sources, rather than the ministry of finance, for their macro-forecasts, and that these external forecasts are sometimes deliberately biased upon the request of the government (Hallerberg et al. 2001).

Above we also speculated that political and institutional factors have an impact on the expected and actual changes in budgetary balances. The key aspect is the extent to which governments want to signal their capability for fiscal adjustments and are actually able to implement fiscal strategies. A simple measure of the projected fiscal adjustment is the projected or actual change of the budgetary balance. The disadvantage of this measure is that it also includes changes due to economic growth and the operation of automatic stabilisers, and therefore is a bad measure of discretionary policy changes. The measurement of discretionary budgetary changes however raises a number of methodological issues, which are aggravated in our context due to our very restricted data set. In order to adjust budgetary balances for this impact we employ two approaches suggested in the

[21] To be exact 8 observations out of 18.

[22] The coefficients are 1.16 (p.=0.13) for the contract form of governance and 0.96 (p=0.21) for the mixed regime.

literature. First, we take as the fiscal stance the change in the budgetary balance if the growth rate would have been the same as in the previous year. More formally the fiscal stance *f* is defined as $f = \Delta s - e\Delta g$, where s is the balance, γ is the real GDP growth rate, ε the budgetary elasticity with respect to output growth, and Δ the first difference operator. Budgetary elasticities are taken from van den Noord (2000)[23]. This approach adapts Blanchard's (1990) measure using unemployment as a reference point, which is unfortunately not consistently available for stability and convergence programmes. As a second measure we define the fiscal stance as proposed by von Hagen et al. (2001). In order to extract the impact of growth on fiscal policy they define a neutral fiscal stance as one in which tax revenues remain constant as a share of GDP and real public spending is allowed to grow in line with taxes. The fiscal stance is then $f = \Delta s - gs$. The advantage of this measure is that it does not require the computation of a budgetary elasticity in order to single out the growth effect.

Table 12 presents the results for the projected change in the budgetary balance and the fiscal stance. Looking at those different measures and the entire sample sub-sample, the output gap, the convergence need and the electoral cycle come out as factors affecting budgetary projections. The estimate for the output gap again carries a negative sign indicating a relatively more ambitious consolidation pattern during bad times, and more expansionary policies during good times. This is in line with the empirical literature that finds a procyclical fiscal policy in industrialised countries and in Europe, even before the existence of an restrictive fiscal framework at the international level (see Galí and Perotti 2003; Hallerberg and Strauch 2002) However, it cannot be excluded that this is indeed a spurious relation that exists because of the timing of the political integration process and its coincidence with the business cycle. Which explanation holds, however, can only be clarified when more observations are available.

Turning to the convergence need, we find a negative coefficient indicating that the projected fiscal strategy is the more restrictive the larger the budgetary gap to the reference value. This is indeed what one would expect if governments want to signal their commitment to the fiscal institutional framework. Somewhat surprisingly the electoral variable carries a positive coefficient indicating that fiscal plans become tighter during election years. Arguably, this suggests that governments put a premium on 'getting their house in order' during the election year. Alternatively, governments want to tie in the fiscal options of their successor if they face only a small probability of re-election.[24]

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[23] The elasticity for Luxembourg is taken from Bouthevillain et al. (2001)

[24] The electoral effect does not fully pass the robustness check. Statitical significance of the coefficient rises above 10% when excluding some countries, but it stays close to that level below 20%. Thus, the indication that there may be indeed an impact of the entire sample period cannot be fully refuted.

Interestingly, the impact of the output gap as well as the convergence need vanishes when we look at the 1998-2002 sub-period. The estimated impact of the electoral cycle doubles for this subperiod for the total balance and the lenient definition of the fiscal stance. These findings are robust according to our standard robustness check. Overall, the results for the predicted fiscal development indicate that the convergence need and cyclical conditions plaid a major role during the convergence phase, whereas the projected fiscal path under EMU was more determined by electoral considerations and somewhat delinked from the cycle.

Table 13 depicts the results for the actual fiscal stance. To keep results comparable, we only used observations for which also projected changes in the budgetary balance were available. The most robust impact across the three different concepts and different sample periods can be found for the output gap and output volatility. To a lesser extent it also applies to the other variables, such as the convergence need, electoral years, the ideological composition of government or the delegation and mixed form of governance. In line with the previous estimates, the negative coefficient for output implies a procyclical fiscal stance. The coefficient, however, is much larger than for the projected fiscal stance, implying that a one percentage point increase in the output gap would lead to a fiscal expansion of about 0.4. Output volatility carries a sizeable positive coefficient indicating that countries were more able to pursue a restrictive fiscal policy if they have experienced an episode of high output volatility. Since output volatility is generally higher in small and fast growing economies, this finding can also be read as an indication that small countries are more able to engage in fiscal consolidation, or that governments there are more willing to do so.

With respect to the political and institutional variables, there is a weak indication of an electoral cycle. The coefficients indicate a sizeable impact of about one percentage point of GDP, but they are only weakly significant. However, even if they do not achieve strong significance, taking this together with the previous results would suggest that governments' fiscal policy is not necessarily less expansionary or more contractionary only because they promised this in stability and convergence programmes to signal fiscal prudence under EMU. The forms of fiscal governance again carry a positive coefficient, indicating higher consolidation capacity, for the entire sample period. When looking at the 1998 to 2002 sub-period, this effect essentially disappears since the estimated impact is strongly reduced. This implies that the form of fiscal governance was not a prime determinant of the amount of fiscal stringency relative to a fragmented form of fiscal governments during EMU.

V. Summary

In this study we evaluate the performance of budget and growth forecasts in convergence and stability programmes from 1991 to 2002. The analysis is subject to some methodological caveats, since accounting concepts differed across countries and changed over time, and the link between programmes and national budgetary targets became tighter over time. By now they are a well-established monitoring instrument where the announced fiscal projections are generally based on a common accounting framework, and they closely reflect budgetary targets at the national level.

It may yet be too early to draw any firm conclusions and caution is certainly warranted when interpreting the results. Nevertheless, the most prevailing finding of a set of standard descriptive statistics and tests to evaluate forecast errors is the variance of forecast biases across countries. Forecasts of budget surpluses and economic growth are marked by a cautionary or optimistic biases in different countries. The optimistic bias was more apparent during the Maastricht convergence process.

In the multivariate regression analysis we analysed whether political and institutional variables can explain these patterns when we control for the impact of macroeconomic conditions. We find that the cyclical position and the form of fiscal governance are important determinants of biases in budgetary and GDP growth forecasts. Looking at projected and actual budgetary changes, we find evidence for a procyclical fiscal stance, at least during the convergence phase until 1998. Moreover, the need for convergence to reach the budgetary reference value was associated with more restrictive fiscal projections in programmes starting before 1998, whereas electoral cycles plaid a stronger role thereafter. This is not the case for the actual fiscal stance.

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Appendix

Table 1: Convergence and Stability Programmes, 1991-2002

Country	Programme (Date of Release or Submission)
Austria	05/95, 05/96, 10/97, 11/98, 03/00,12/00,11/01
Belgium	06/92, 04/93, 03/94, 12/96, 12/98,12/99, 12/00, 11/01, 11/02
Denmark	02/94, 11/94, 03/96, 05/97, 10/98,12/99, 12/00, 02/02, 12/02
Spain	04/92, 07/94, 04/97, 12/98,01/00, 01/01, 12/01, 12/02
Finland	09/95, 09/96, 09/97, 09/98, 09/99, 09/00, 11/01, 11/02
France	10/93, 02/97, 12/98 , 01/00, 12/00, 12/01, 12/02
United Kingdom	05/93, 02/94, 03/95, 04/96, 03/97, 09/97, 12/98, 12/99, 12/00, 12/01, 12/02
Germany	10/91, 10/93, 02/97, 01/99, 12/99, 10/00, 12/01, 12/02
Greece	02/93, 06/94, 07/97, 06/98, 12/99, 12/00, 12/01, 12/02
Ireland	08/94, 05/97, 12/97, 12/98, 12/99, 12/00, 12/01, 12/02
Italy	10/91, 09/92, 06/97, 12/98, 12/99, 12/00, 11/01, 11/02
Luxembourg	02/99, 03/00, 12/00, 12/01, 01/03
Netherlands	04/92, 10/94, 12/96, 10/98, 11/99, 09/00, 10/01
Portugal	11/91, 11/93, 03/97, 12/98, 02/00, 01/01, 12/01, 01/03
Sweden	06/95, 11/95, 04/96, 09/96, 04/97, 09/97, 12/98, 11/99, 11/00, 11/01, 11/02

Table 2: Forecast Errors by Forecasting Horizon, 1991-2001

Programme Year	Obs	ME	MAE	RMSE
		Balance		
current	123	0.27**	0.82	1.22
1	110	0.22	1.08	1.44
2	94	0.08	1.23	1.74
3	69	0.01	1.30	1.87
		Growth		
current	120	0.28***	0.79	1.16
1	109	-0.12	1.17	1.79
2	92	-0.29	1.16	1.93
3	67	-0.35**	0.90	1.32

Table 3: Forecast Errors by Forecasting Horizon, 1998-2001

Programme Year	Obs	ME	MAE	RMSE
		Balance		
current	74	0.08	0.72	1.11
1	61	0.02	1.05	1.42
2	45	-0.24	1.24	1.61
3	27	-0.39	1.22	1.50
current	72	0.18	0.62	0.94
1	61	-0.32	1.35	1.89
2	46	-0.69	1.38	1.87
3	28	-1.17	1.01	1.42

Table 4: Forcasting Errors by Country, 1991-2002

Country	Obs	ME	MAE	RMSE
		Balance		
Austria	24	0.41***	0.66	0.80
Belgium	29	-0.009	0.47	0.67
Germany	26	-0.31	0.87	1.23
Denmark	30	0.62***	0.76	1.01
Spain	26	-0.03	1.20	1.72
Finland	26	0.75**	1.34	1.84
France	22	-0.49**	0.61	0.97
United Kingdom	38	1.00***	1.21	1.48
Greece	25	-1.20*	1.64	2.41
Ireland	23	0.47	1.63	2.17
Italy	26	-0.80***	1.10	1.47
Luxembourg	13	1.40*	1.61	2.33
Netherlands	21	0.25	0.91	1.04
Portugal	25	-0.95***	1.02	1.75
Sweden	42	1.03***	1.27	1.48
		Growth		
Austria	24	-0.09	0.98	1.19
Belgium	27	-0.19	0.93	1.32
Germany	26	-0.87***	0.76	1.48
Denmark	30	0.04	0.62	0.79
Spain	26	-0.27	0.67	1.23
Finland	26	0.22	1.27	1.61
France	21	-0.18	0.75	1.01
United Kingdom	33	0.23	0.52	0.91
Greece	25	-0.31	0.69	1.02
Ireland	23	1.90***	2.05	3.03
Italy	26	-0.72***	1.00	1.40
Luxembourg	13	-1.52***	3.44	3.75
Netherlands	23	0.04	0.94	1.38
Portugal	25	-0.76**	0.95	1.89
Sweden	40	0.42**	0.98	1.20

Table 5: Forecast Errors by Country, 1998-2002

Country	Obs	ME	MAE	RMSE
		Balance		
Austria	12	0.28	0.67	0.88
Belgium	14	0.19	0.28	0.33
Germany	14	-0.8	1.10	1.41
Denmark	14	0.10	0.35	0.43
Spain	14	0.58	0.81	1.00
Finland	14	0.91	1.33	1.75
France	14	-0.60	0.72	1.15
United Kingdom	14	0.68	0.98	1.13
Greece	14	-1.06	1.17	1.46
Ireland	14	-0.56	1.60	2.07
Italy	14	-0.72	0.94	1.14
Luxembourg	13	0.97	1.61	2.33
Netherlands	11	0.22	1.03	1.17
Portugal	13	-1.50	1.51	1.83
Sweden	18	0.35	0.89	1.07
		Growth		
Austria	12	-0.62	1.01	1.23
Belgium	14	-0.29	1.17	1.29
Germany	14	-0.93	1.14	1.47
Denmark	14	0.20	0.55	0.68
Spain	14	-0.16	0.27	0.72
Finland	14	-0.51	1.21	1.63
France	13	-0.31	0.68	1.02
United Kingdom	13	0.02	0.27	0.70
Greece	14	-0.21	0.36	0.52
Ireland	14	0.75	1.72	2.17
Italy	14	-0.67	0.95	1.25
Luxembourg	13	-1.52	3.44	3.75
Netherlands	13	-0.47	0.98	1.41
Portugal	13	-0.84	1.14	1.49
Sweden	18	0.16	1.03	1.24

Table 6: Test for Efficiency of Surplus and Growth Forecasts (by forecast horizon)

	Balance	**Growth**
Forecast horizon (year)	Efficiency Test *(adjusted data)*	Efficiency Test *(adjusted data)*
Current	0.36	2.85
1	6.10***	5.37*
2	6.00***	6.15
3	9.23***	2.99

Note: Asterisks indicate significance at a one (***), five (**) and ten (*) percent level. Numbers in parenthesis are t-statistics. T-statistics for the test $\beta=0$ are computed based on Newey-West standard errors allowing serial correlation of the order $t+h-1$. The efficiency test reports the LM Test statistic for serial correlation of order h for the respective $t+h$ forecast error.

Table 7: Test for Efficiency of Surplus and Growth Forecasts (by forecast horizon)

Horizon	**Programme**	**EC**
	Growth	
Current	0.38	0.72
	(β=1: 7.88***, β=0: 2.93*)	(β=1: 1.60, β=0: 10.82***)
1	-0.31	1.30
	(β=1: 11.57*** , β=0:0.67)	(β=1: 0.51 , β=0: 9.61***)
2	-0.36	1.20
	(β=1: 15.46*** , β=0: 1.09)	(β=1: 0.37, β=0: 13.55***)
	Balance	
Current	0.23	0.77
	(β=1: 37.12***, β=0: 3.32*)	(β=1: 3.13*, β=0: 36.22***)
1	0.31	0.67
	(β=1: 7.95***, β=0: 1.54)	(β=1: 1.87, β=0: 7.94***)
2	0.26	0.66
	(β=1: 6.71***, β=0: 0.82)	(β=1: 2.51, β=0: 9.79)

Note: Asterisks indicate significance at a one (***), five (**) and ten (*) percent level. Numbers in parenthesis are F-statistics.

Table 8: Mean Errors in Programmes vs. EC Forecasts, Diebold-Mariano Test

Country	Balance		Growth	
	Programmes	EC	Programmes	EC
Austria	0.21	0.37***	-0.20	-0.29
Belgium	0.03	0.08	-0.08	-0.28
Germany	-0.12	-0.03	-0.74	-0.61
Denmark	0.41	0.29	0.25	0.25
Spain	0.15	0.30	-0.20	-0.05**
Finland	0.53	0.75***	0.21	0.24
France	-0.43	-0.24**	-0.13	-0.01
United Kingdom	0.86	-0.02***	0.33	0.25
Greece	-1.34	-0.79***	-0.33	-0.02***
Ireland	0.55	-0.10***	1.89	1.38**
Italy	-0.58	-0.13***	-0.73	-0.55**
Luxembourg	1.61	1.68	-0.90	-0.89
Netherlands	0.30	0.19	0.08	-0.24*
Portugal	-0.83	-0.45*	-0.65	-0.31***
Sweden	0.81	1.00	0.28	0.22

Note: Asterisks indicate statistical significance at the 10 (*), 5 (**) and one (***) percent level. They are based on the modified Diebold-Mariano Statistic as proposed by Harvey et al. (1997) in order to account for forecast horizons larger than *h*+1 and small numbers. Given the structure of the EC forecasts, we use h=2 and the student t-distribution.

Table 9: Asymmetry of Loss Function for Budgetary Forecasts and Forms of Fiscal Governance (1991-2002)

Country	*b/a*	Form of Fiscal Governance
Austria	0.10	various
Belgium	**2.50**	**contract**
Germany	3.66	delegation
Denmark	**0.03**	**mixed**
Spain	2.37	various
Finland	**0.16**	**contract**
France	58.83	delegation
United Kingdom	0.04	delegation
Greece	12.12	fragmented, delegation
Ireland	**0.60**	**contract**
Italy	19.83	fragmented, delegation
Luxembourg	**0.22**	**contract**
Netherlands	**0.50**	**contract**
Portugal	9.87	fragmented
Sweden	**0.07**	**mixed**

Note: The values indicate the parameter values b/a as estimated for each country pooling errors over the entire forecast horizon. Data on the form of fiscal governance are taken from Hallerberg (2003).

Table 10: Forecast Errors – Budget Balance (OLS-Regression)

	1991-2002	1998-2002	1991-2002	1998-2002
constant	-0.16	-0.21	-0.92	-1.32
	(0.27)	(0.44)	(0.54)	(0.77)
output gap (lag)	-0.23***	-0.14**	-0.20**	-0.15**
	(0.07)	(0.07)	(0.07)	(0.06)
output volatility	0.24**	0.20	0.15	0.09
	(0.10)	(0.19)	(0.11)	(0.19)
convergence need	0.11**	0.23	-0.03	-0.15
	(0.05)	(0.15)	(0.07)	(0.22)
election			-0.16	0.05
			(0.35)	(0.30)
veto-player			0.89	0.20
			(0.84)	(1.23)
delegate			0.68	0.67*
			(0.40)	(0.37)
commit			1.47***	1.60**
			(0.49)	(0.65)
mixed			1.34***	1.57**
			(0.45)	(0.53)
Ad. R_sq	0.20	0.13	0.24	0.20
F-test	11.00***	4.58***	5.99***	3.23***
Nobs	122	73	122	73

Note: Asterisks indicate significance at a one (***), five (**) and ten (*) percent level.

Table 11: Forecast Errors – Economic Growth (OLS-Regression)

	1991-2002	1998-2002	1991-2002	1998-2002
constant	-0.32	-0.47	-0.18	-0.81**
	(0.31)	(0.36)	(0.22)	(0.32)
output gap (lag)	-0.31***	-0.22*	-0.32***	-0.22**
	(0.05)	(0.11)	(0.06)	(0.08)
output volatility	0.22	0.21	0.02	0.11
	(0.22)	(0.19)	(0.08)	(007)
convergence need	0.09*	0.09	0.008	-0.08
	(0.04)	(0.08)	(0.04)	(0.14)
election			0.21	0.48
			(0.39)	(0.35)
veto-player			-2.00**	-1.48
			(0.90)	(1.29)
delegate			0.06	0.31
			(0.14)	(0.26)
commit			1.30**	1.02
			(0.56)	(0.87)
mixed			0.31	0.74*
			(0.21)	(0.41)
Ad. R_sq	0.39	0.11	0.48	0.17
F-test	27.25***	4.13***	14.97***	2.85***
Nobs	123	74	123	74

Note: Asterisks indicate significance at a one (***), five (**) and ten (*) percent level.

Table 12: Projected Change in Budgetary Balance and Fiscal Stance (OLS Regression)

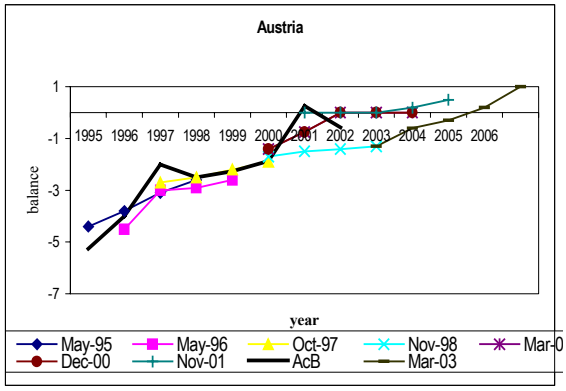
	Balance		Fiscal Stance (constant growth)		Fiscal Stance (lenient definition)	
	1991-2002	**1998-2002**	**1991-2002**	**1998-2002**	**1991-2002**	**1998-2002**
const	0.20	0.11	0.20	0.10	0.28	0.20
	(0.20)	(0.74)	(0.25)	(0.24)	(0.22)	(0.32)
fiscal stance (lag)	0.11*	-0.11	0.07	0.07	0.10	-0.11
	(0.06)	(0.08)	(0.06)	(0.07)	(0.06)	(0.08)
output gap (lag)	-0.07**	-0.09	-0.07**	-0.04	-0.08**	-0.10
	(0.03)	(0.07)	(0.03)	(0.08)	(0.03)	(0.07)
output volatility	0.02	-0.03	0.08	0.005	-0.02	-0.08**
	(0.05)	(0.03)	(0.05)	(0.05)	(0.05)	(0.03)
convergence need	-0.25***	-0.22	-0.23***	-0.17	-0.27***	-0.23
	(0.03)	(0.16)	(0.03)	(0.14)	(0.03)	(0.15)
election	0.26**	0.55**	0.23**	0.35	0.28*	0.57**
	(0.14)	(0.24)	(0.11)	(0.21)	(0.15)	(0.23)
veto-player	-0.20	0.40	-0.02	-0.14	-0.06	-0.32
	(0.28)	(0.35)	(0.36)	(0.34)	(0.31)	(0.38)
delegate	-0.13	-0.01	-0.22	-0.02	-0.17	-0.06
	(0.14)	(0.21)	(0.18)	(0.12)	(0.15)	(0.24)
commit	-0.12	0.06	-0.13	0.11	-0.19	-0.01
	(0.16)	(0.26)	(0.19)	(0.20)	(0.17)	(0.29)
mixed	0.13	0.17	0.05	0.23	0.04	0.10
	(0.18)	(0.28)	(0.24)	(0.28)	(0.16)	(0.29)
Ad. R_sq	0.64	0.34	0.57	0.09	0.70	0.42
F-test	31.78***	5.21***	22.55***	1.85**	39.87***	6.68***
Nobs	154	72	146	70	149	72

Note: Asterisks indicate significance at a one (***), five (**) and ten (*) percent level.

Table 13: Actual Change in Budgetary Balance and Fiscal Stance (OLS Regression)

	Balance		Fiscal Stance (constant growth)		Fiscal Stance (lenient definition)	
	1991-2002	**1998-2002**	**1991-2002**	**1998-2002**	**1991-2002**	**1998-2002**
const	-0.19*	-1.59*	-1.49*	-1.79*	-1.07	-1.40
	(0.69)	(0.89)	(0.78)	(0.96)	(0.68)	(0.88)
fiscal stance (lag)	-0.11	-0.27**	-0.22**	-0.44***	-0.09	-0.24*
	(0.09)	(0.12)	(0.10)	(0.13)	(0.09)	(0.13)
output gap (lag)	-0.45***	-0.39***	-0.01	-0.02	-0.37***	-0.40***
	(0.08)	(0.13)	(0.09)	(0.14)	(0.08)	(0.13)
output volatility	0.40**	0.88***	0.36*	0.81***	0.37**	0.81***
	(0.19)	(0.26)	(0.21)	(0.27)	(0.19)	(0.25)
convergence need	-0.14*	-0.38	-0.22**	-0.34	-0.15*	-0.40
	(0.08)	(0.29)	(0.09)	(0.32)	(0.08)	(0.30)
election	-0.53	-1.04*	-0.54	-0.87	-0.51	-1.00*
	(0.43)	(0.56)	(0.49)	(0.60)	(0.42)	(0.55)
veto-player	1.03	2.93	1.86	4.45	0.96	2.86**
	(1.06)	(1.35)	(1.22)	(1.44)	(1.04)	(1.33)
delegate	0.88*	0.38	1.13**	0.49	0.85*	0.30
	(0.48)	(0.63)	(0.55)	(0.68)	(0.47)	(0.62)
commit	0.66	-0.63	0.57	-1.09	0.64	-0.71
	(0.58)	(0.85)	(0.65)	(0.91)	(0.57)	(0.84)
mixed	1.30	1.08	1.69***	1.34	1.22**	0.93
	(0.56)	(0.76)	(0.63)	(0.81)	(0.55)	(0.74)
Ad. R_sq	0.25	0.24	0.08	0.21	0.38	0.23
F-test	4.77***	3.23***	1.91*	2.94***	5.36***	3.17***
Nobs	103	66	102	66	103	66

Note: Asterisks indicate significance at a one (***), five (**) and ten (*) percent level.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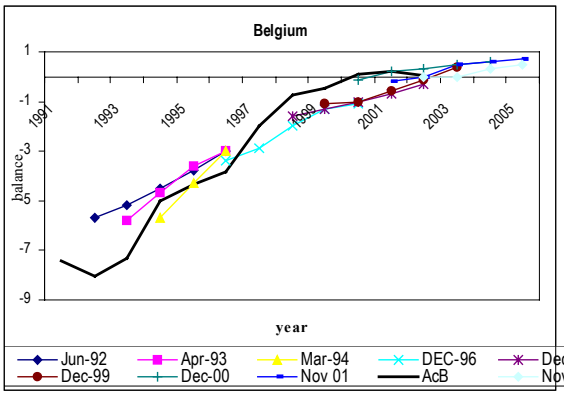
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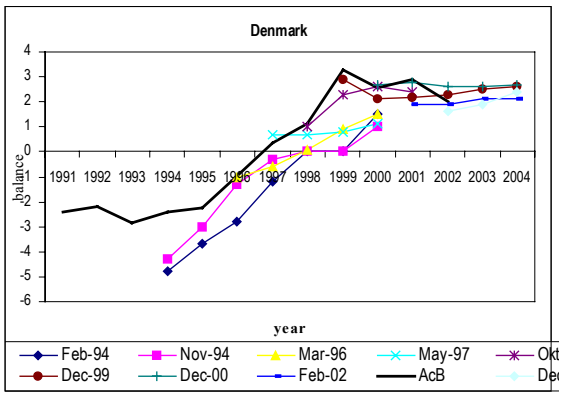
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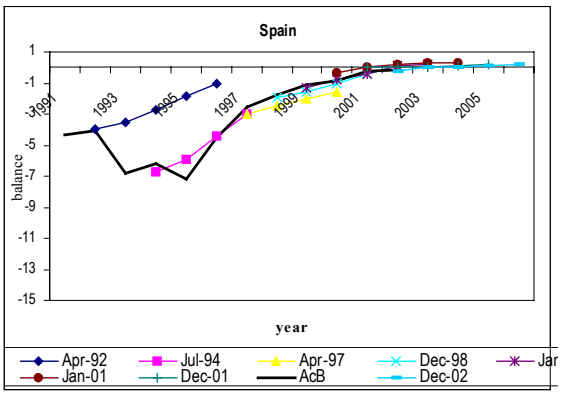
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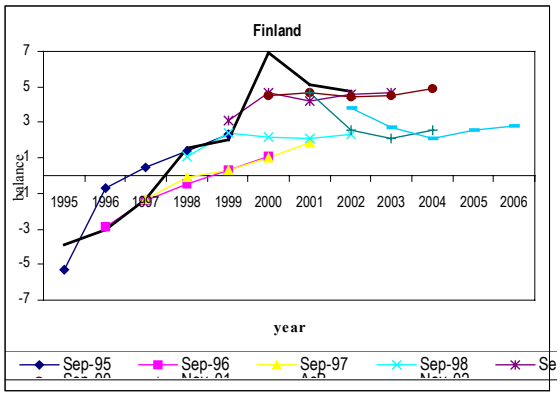
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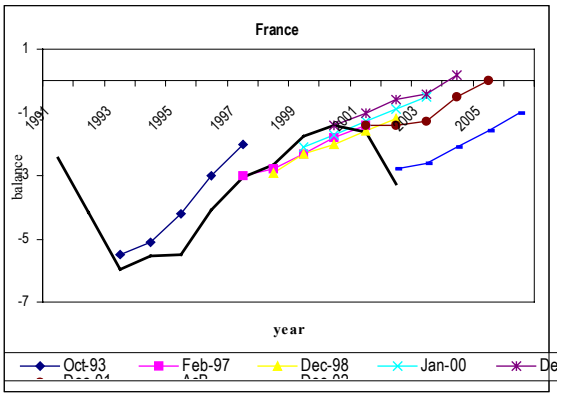
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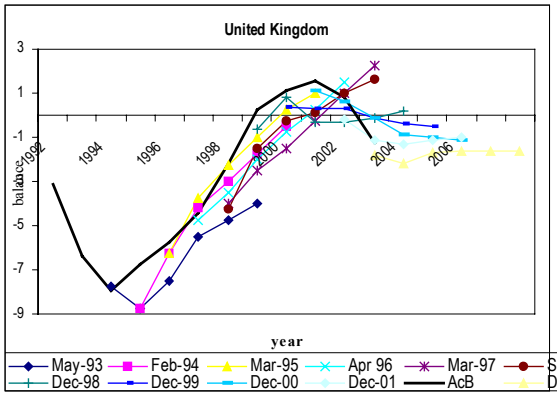
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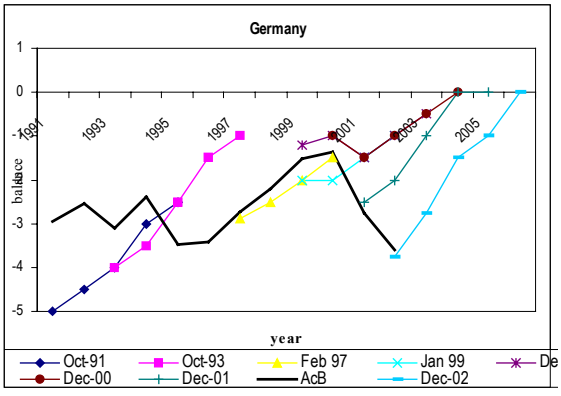
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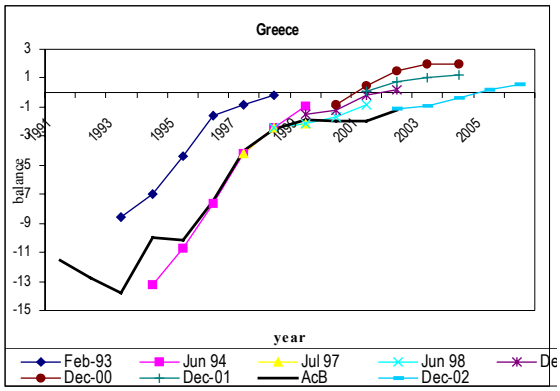
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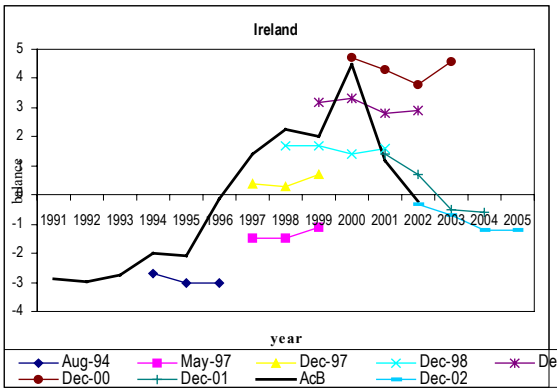
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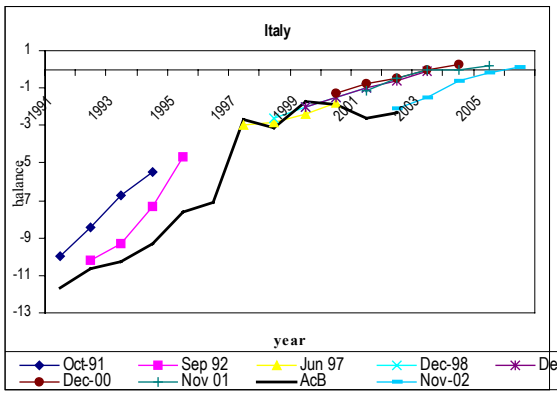
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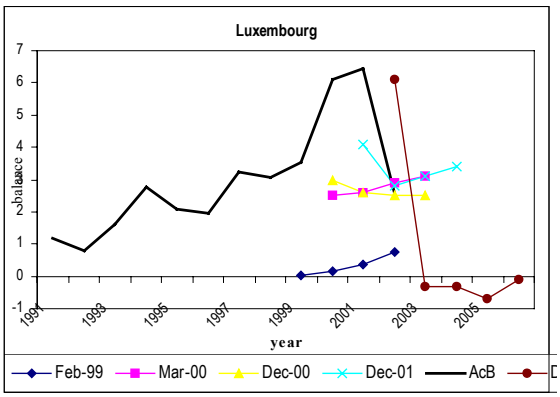
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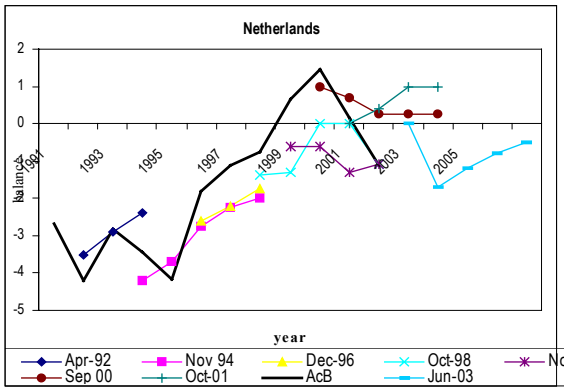
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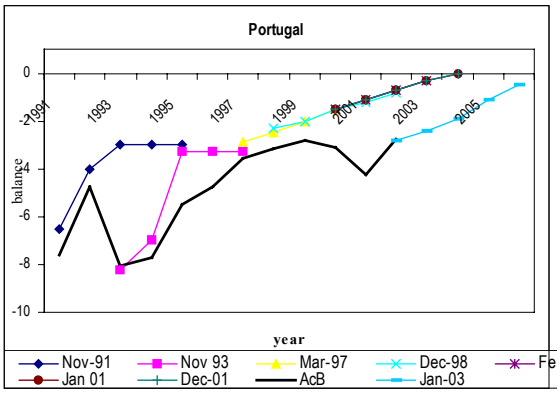
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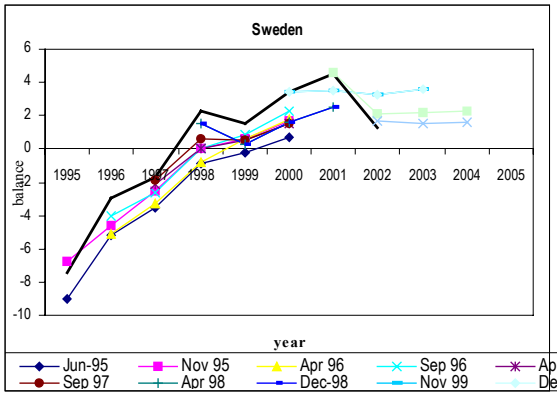
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