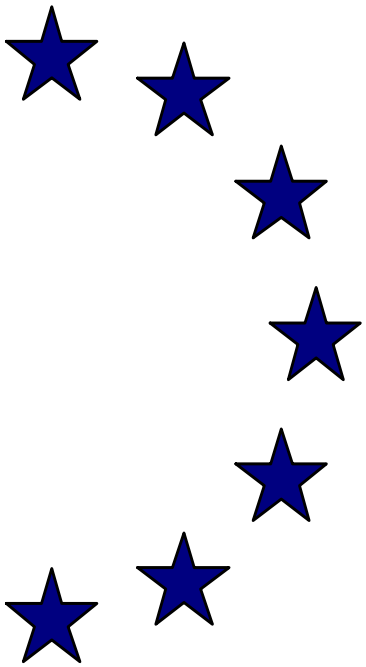
EUROPEAN ECONOMY

EUROPEAN COMMISSION

DIRECTORATE-GENERAL FOR ECONOMIC AND FINANCIAL AFFAIRS

ECONOMIC PAPERS



ISSN 1725-3187

http://europa.eu.int/comm/economy_finance

Number 234 November 2005

Economic forecasts and fiscal policy in the recently acceded Member States

by

Filip Keereman

Directorate-General for Economic and Financial Affairs

Economic Papers are written by the Staff of the Directorate-General for Economic and Financial Affairs, or by experts working in association with them. The "Papers" are intended to increase awareness of the technical work being done by the staff and to seek comments and suggestions for further analyses. Views expressed represent exclusively the positions of the author and do not necessarily correspond to those of the European Commission. Comments and enquiries should be addressed to the:

European Commission
Directorate-General for Economic and Financial Affairs
Publications
BU1 - -1/180
B - 1049 Brussels, Belgium

ECFIN/003608/05-EN

ISBN 92-894-8873-5

KC-AI-05-234-EN-C

Abstract

Forecast errors are large in the recently acceded Member States and the mistakes have a similar order of magnitude in the Commission services' forecasts, Consensus Forecasts and projections made by national authorities. The prediction mistakes cannot be attributed to bias or autocorrelation. Volatility in the economic developments and data revisions creating uncertainty on the state of the economy appear the main explanation for the difficulty to make good forecasts. Prediction mistakes for GDP growth lead to wrong projections for general government balances through the operation of the automatic stabilisers, but errors in the discretionary part of the government balance are the largest source of fiscal forecast mistakes. Growth forecast errors influence fiscal policy decisions.

Acknowledgements:

Comments and suggestions were received from L. Fau, A. Jevcak, V. Kovacs, M. Larch, M. Mora, M. Peternelj and M. Watson. Excellent research assistance was provided by Jean Nagant. Shortcomings and errors are only the responsibility of the author.

Table of contents

List of tables

List of figures

I. INTRODUCTION

As policy making and the implementation of decisions take time, forecasts can contribute to improve the quality of the measures taken. This is of particular relevance for fiscal policy where the budget is based on economic projections and as a consequence also the ensuing policy stance and eventually the actual level of the government balance. In order to make good policy or formulate appropriate advice, the forecasts should be as reliable as possible.

With the revision of the Stability and Growth Pact, the importance of high-quality economic forecasts has increased further. First, the medium-term objective for the government balance is among other things determined by the outlook for potential growth. Second, the requirement to make a greater fiscal adjustment effort in (projected) good times has gained prominence in the preventive arm of the Pact. Finally, under the corrective arm of the Pact, the adjustment path is now explicitly based on the economic outlook. The growth forecasts contained in the Council recommendation on the elimination of the excessive deficit are the reference against which unforeseeable growth developments are to be assessed (European Council (2005)). The Commission services' forecasts play a key role in this context.

The first objective of this note is to examine for the recently acceded Member States the accuracy of the economic forecasts produced by the Commission services and compare them with some available alternatives, like those produced by Consensus Forecasts, by the national authorities in the pre-accession economic programmes and in their successor the convergence programmes, as well with some naïve forecasts. The focus is on GDP growth and the government balance. The quality of the Commission services' forecasts for the new Member States is also compared with those for the old Member States (the latter has been extensively assessed by Keereman (1999)).

The second objective is to examine if the impact of the economic outlook and the associated forecast errors on the budgetary stance observed in the old Member States (Larch and Salto (2005), Martinez Mongay (2003)) is the same in the new Member States. More specifically, it will analysed if an optimistic assessment of the economic situation leads to an easier budgetary stance.

The recently acceded Member States went trough a painful transition process from a planned economy to a market economy which changed also the framework and statistical apparatus for economic analysis. In consequence, data availability and quality is not of the same standards as in other countries and comparability of data is hampered by definitional modifications. It makes forecasting difficult and the results presented in this note should be interpreted always with these transition issues in mind.

In the next section a brief account is given of the evolving approach to forecasting of the recently acceded Member States by the Commission services. The sample data used for the analysis is described in section III. The main characteristics of the forecast errors are given in section IV with a further quality check of the Commission services' projections in the following section. The size of the prediction mistake is related to volatility and data revision in section VI. The impact of forecast errors on fiscal policy is assessed in section VII. Section XIII summarises the main conclusions.

II. ECONOMIC FORECASTS FOR THE NEW MEMBER STATES AT THE COMMISSION

The European Commission has since long made macroeconomic forecasts. The focus is on the Member States of the European Union, the euro area and a few big countries (the United States, Japan), as well as some important international variables like the oil price, world trade and world GDP. The older the Member State, the longer and more comprehensive are the forecast series for that country. Already before accession on 1 May 2004, the European Commission started with economic predictions for the recently acceded Member States, but the coverage of the macroeconomic variables was not as wide as for the old Member States. Until end 1996, the recently acceded countries were not recognised as a group, but forecasts for GDP growth and international trade were made to feed world tables.

Country forecasts for Czech Republic, Estonia, Latvia, Lithuania, Hungary, Poland, Slovenia and Slovakia were published for the first time in October 1996 in European Economy – Supplement C "Economic Reform Monitor", which included also other countries (e.g. the future Member States Bulgaria and Romania). Cyprus and Malta were added in autumn 2000. The Supplements to European Economy were discontinued and from April 2002 "Enlargement Papers" contained the predictions for the 10 countries. From autumn 2003, forecasts for old and new Member States were published together in "European Economy" and the new Member States seized to be considered "external environment" for the European Union.

The approach to forecasting is basically the same as the one for the old Member States (described in Keereman (1999)), but less use is make of econometric models. There are two forecast rounds per year (spring and autumn) and also the time horizon is the same: forecasts are made for the current year and the next and in autumn an additional year is added. The focus is on annual predictions, but for inflation and GDP also quarterly profiles are made. For the recently acceded countries, the latter have been gradually included from autumn 2003 for the harmonised index of consumer prices and from spring 2004 for quarterly GDP.

Like of the old Member States, forecasts (box 2.1 in European Economy (European Commission, 2005a)) are made under the hypothesis of unchanged policies, which is of particular relevance for budgetary projections. Exchange rates are not forecast, but based of technical assumptions. Depending on the currency, its value is set in accordance with purchasing power parity[1] or as a function of the exchange rate regime to which it belongs. Interest rates are fixed to reflect the price stability objective of monetary policy.

III. MAIN CHARACTERISTICS OF THE SAMPLE DATA

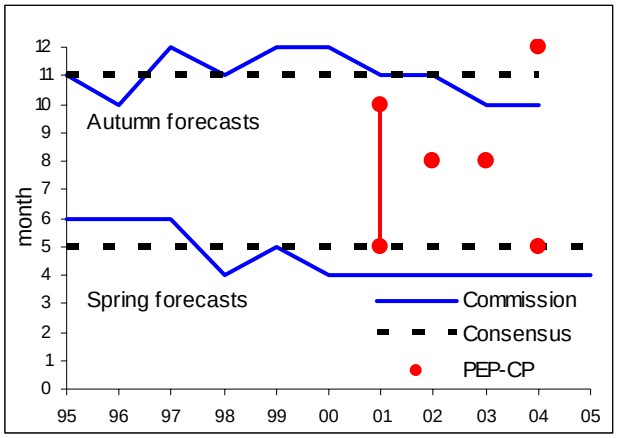
Compared to old Member States, there is less experience in economic forecasting for the recently acceded countries which went furthermore through a radical transformation process. Hence, time series are short and in the interpretation of the results more than the usual attention has to be paid to characteristics of the sample data with respect to timing, definitions, methodological changes, data revision and availability of information. This of particular relevance when comparing the Commission services' with Consensus Forecasts which is a private company and the national authorities represented by the pre-accession economic programmes and their successor the convergence programmes (PEP-CP).

[1] While the same hypothesis as for old Member States, catching up is usually associated with a real appreciation so that the use of purchasing power parity may unduly influence the forecast.

1. Quality of the statistics, forecasts and realisations

The selection of the series representing forecasts and outturns is not without importance as it might influence the size and the meaning of the forecast error (for a discussion see Keereman (1999)). In order to examine the sensitivity of the forecast performance with respect to the time horizon, two types of forecasts and their associated outturns are analysed. The current year forecast is concerned with the quality of the projection made in the beginning of the year (spring) for the same year, while the year ahead forecasts (made in autumn) deal with the following year.

Figure 1: Publication dates of the forecasts



Over time the forecast calendar of the Commission services has varied (see figure 1). In the mid nineties, the spring forecasts were released rather late, in June; recently, April was the month for the publication. The autumn forecasts were released between October and December. Consensus Forecasts are more regularly updated based on contributions from some 8 to 25, depending on the size of the country, forecast institutions, mainly from the private sector. The predictions are released in a bi-monthly publication. In this study, the forecasts are selected from the May and November releases. The first pre-accession economic programme was submitted in 2001 to the Commission between May and October and the next two were due in August. After Accession the first convergence programme was transmitted to the Commission in May 2004 and at the end of the year an update was available. In a forecast error comparison these timing difference have to be taken into account. In spring, for example, Consensus has an information advantage over the Commission services which should reduce the prediction mistake. The advantage is likely to be further accentuated by the lag between publication date (on which figure 1 is based) and the cut-of date for inclusion of information in the forecasts (see Annex A).

Following Kenen and Schwarz (1986) and Artis (1988, 1996), Keereman (1999) the realisation data for the current year forecasts ("first available estimates") are found in the Commission services' spring forecasts following the year to be forecast. The outturn data for the year ahead forecasts are taken from the Commission services' autumn forecasts following on the year to be forecast ("first settled estimates"). The use of first available estimates in the assessment of current year forecast accuracy is motivated by the greater attention usually attracted by first available estimates, compared to later revisions. Indeed, a quick evaluation is necessary if a policy reaction is required. The greater precision of the first settled estimates is an attractive feature and they have been used in the analysis of the year ahead forecasts.

The definition of the variables may shift over time. An important change has been the adaptation to the European System of National Accounts ("ESA95"). This could lead to a difference between projection and outturn which cannot be qualified as a forecast error. With respect to GDP growth, no attempt has been made to correct for this. The interpretation of the growth prediction error should not be too much affected to the extent that the methodological changes impacted mainly on the GDP level. Furthermore, by

selecting the outturn data from a release date which is not too distant from the moment the forecasts were produced, differences in statistical framework can be reduced. One should be aware, however, that the closer the realisation data are to the year to be forecast, the less reliable they are and the more subject to revision.

With respect to the general government balance as a percentage of GDP, definitional changes are more of a concern as they are likely to affect the ratio. A case in point is the treatment of the pension reform, which is different across countries and changed over time. In some countries (Slovakia, the Baltic States) the deficit increasing costs of establishing a mandatory fully funded pension scheme are accounted for in the official statistics, while in other countries (Poland) this is not the case. The Hungarian authorities choose to change the definition in 2005 and preferred to report their government balance excluding the cost of the pension reform[2]. This methodological change has been adjusted for by adding to the realisation data the estimated cost (0.9 % of GDP) of the pension reform.

Table 1: Main characteristics of the sample data

	CZ	EE	CY	LV	LT	HU	MT	PL	SI	SK	Pooled
GDP growth											
Commission											
Sample	95/04	95/04	01/04	95/04	95/04	95/04	01/04	95/04	95/04	95/04	-
No of obs.	10	10	4	10	10	10	4	10	10	10	88
Mean value	1.99	5.28	2.92	5.49	4.80	3.81	0.52	4.16	3.70	4.34	3.95
STD	2.13	3.27	1.08	2.75	3.79	1.29	1.04	1.96	0.87	1.74	1.99
Consensus											
Sample	95/04	98/04	na	98/04	98/04	94/04	na	94/04	95/04	95/04	-
No of obs.	10	7	na	7	7	11	na	11	10	10	73
PEP-CP											
Sample	01/04	01/04	01/04	01/04	01/04	01/04	01/04	01/04	01/04	01/04	-
No of obs.	4	4	4	4	4	4	4	4	4	4	40
Government balance as % of GDP											
Commission											
Sample	01/04	01/04	01/04	01/04	01/04	01/04	01/04	01/04	01/04	01/04	-
No of obs.	4	4	4	4	4	4	4	4	4	4	40
Mean value	-6.97	1.57	-4.28	-1.72	-2.00	-6.22	-7.00	-4.15	-2.18	-4.90	-3.79
STD	4.11	1.15	1.50	0.92	0.35	2.16	1.88	0.50	0.28	1.78	1.46
Consensus											
Sample	00/04	na	na	na	na	00/04	na	00/04	na	na	-
No of obs.	5	na	na	na	na	5	na	5	na	na	15
PEP-CP											
Sample	01/04	01/04	01/04	01/04	01/04	01/04	01/04	01/04	01/04	01/04	-
No of obs.	4	4	4	4	4	4	4	4	4	4	40

Sample and number of observations are based on current year errors; there is one observation less for the year ahead errors. Mean value and standard deviation (STD) are based on the year ahead outturn data.

2. Some descriptive statistics

Some elementary descriptive statistics concerning the sample (table 1) can be helpful in the interpretation of forecast errors, made by the Commission services (see also annex B), Consensus Forecasts and the national authorities. Availability of comparable data for the recently acceded countries is limited as their economies in the transition from a planned economy to a market economy went through a series of shocks. GDP forecasts by the Commission and Consensus Economics begin mostly in the mid nineties; only 4 years are available for the national authorities (based on the pre-accession economic programmes and their successor the convergence programmes). Predictions for government balances start only in 2000 or 2001 (Commission services, national authorities). In Consensus Forecasts public finance forecasts are limited to the three big new Member States and the

[2] Up to the March 2007 fiscal notification Eurostat permits to exclude the costs of the fully funded pension scheme from the government balance (STAT/04/30 of 2 March 2004 and STAT/04/117 of 23 September 2004).

definition of government is not comparable so that no further attention is paid to these predictions.

The mean value (MV) gives an idea about the order of magnitude of a variable. The more volatile a variable, the more difficult to forecast in general. A measure for this is the standard deviation (STD). Note, however, that variables can move in large swings producing a high value for the standard, but to the extent that the swing is regular, the increased difficulty to predict is questionable. An alternative measure for volatility would be the coefficient of variation, which divides the standard deviation by the mean value and thus reflects the relative size of the error. As the focus is on how many percentage points a growth rate or a deficit ratio has been over- or underestimated, the relevant concept is the simple standard deviation.

The fastest growth and the largest swings in it have been observed in the Baltic states, while Slovenia is the more stable economy (figure 2 and 3). The biggest government deficits have been observed in the four large central European countries and Malta, usually associated with large standard deviations but not in Poland.

IV. MAIN CHARACTERISTICS OF THE FORECAST ERRORS

1. The interpretation of the error statistics

The forecast error (e) is defined as the forecast (F) minus the realisation (R):

$$e = F - R$$

Hence, a positive error indicates overestimation of growth or the government balance; the latter is equivalent to underestimation of the deficit. The mean absolute error (MAE) gives a good idea of the average order of magnitude of the mistake as it avoids that positive and negative errors may offset each other which could give a flattering picture of forecast accuracy. The mean error (ME) gives the average over- or underestimation and it can be tested if it significantly different from zero.

The value of a forecast should not only be assessed in terms of its own errors, but compared to naïve or easily available alternatives. Two easily available alternatives are the "no change forecast" and the "average forecast". If these easily available alternatives perform systematically better than the Commission approach to forecasting, a straightforward improvement of the accuracy is offered.

The THEIL1-statistic is the ratio between the root mean squared error of the Commission services' forecast to the root mean squared error of the "no change forecast", while THEIL2 refers to the ratio between the root mean squared errors of the Commission services forecast and the "average forecast". The smaller the ratio the higher the quality of the Commission services' forecast compared to the naïve alternative. If the THEIL-statistics are large than one, the competing forecasts are better.

The Commission services' projections are also put against those of other forecasters, but here comparisons are less straightforward because of differences in the forecasting process or period covered (see section III and table 1).

Table 2: Main characteristics of forecast errors - GDP growth

	CZ	EE	CY	LV	LT	HU	MT	PL	SI	SK	Pooled
Current year											
Commission											
No of obs.	10	10	4	10	10	10	4	10	10	10	88
MAE	1.44	2.23	0.28	2.71	2.36	0.95	2.25	1.03	0.71	1.02	1.53
ME	0.80	-0.11	-0.03	-0.31	-0.44	-0.27	2.20	0.07	0.19	-0.98	-0.02
Signif α=0 (bias)	0.21	0.92	nr	0.76	0.68	0.49	nr	0.88	0.51	0.04	0.93
THEIL1	0.87	0.66	0.24	1.02	0.75	0.78	1.06	0.84	0.80	1.14	0.81
THEIL2	0.88	1.08	0.38	0.94	0.95	0.81	1.96	0.70	1.19	0.88	0.89
Consensus											
No of obs.	10	7	na	7	7	11	na	11	10	10	73
MAE	1.20	1.41	na	2.03	2.27	0.76	na	0.97	0.79	1.15	1.24
ME	0.51	0.24	na	-0.97	-0.13	-0.07	na	-0.18	0.35	-1.15	-0.16
Signif α=0 (bias)	0.37	0.75	na	0.25	0.92	0.83	na	0.64	0.23	0.01	0.43
PEP-CP											
No of obs.	4	4	4	4	4	4	4	4	4	4	40
MAE	0.70	0.65	0.38	1.50	1.45	0.77	1.56	0.62	0.88	0.68	0.92
ME	-0.20	-0.60	0.28	-1.50	-1.30	0.47	1.35	-0.02	0.38	-0.68	-0.18
Signif α=0 (bias)	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	0.36
Year ahead											
Commission											
No of obs.	9	9	4	9	9	9	4	9	9	9	80
MAE	1.68	2.67	1.08	2.98	3.11	1.17	2.88	1.19	1.02	1.02	1.87
ME	1.19	0.09	0.33	-1.62	-0.71	-0.06	2.88	0.37	0.27	-0.58	0.04
Signif α=0 (bias)	0.14	0.95	nr	0.16	0.63	0.91	nr	0.54	0.54	0.20	0.89
THEIL1	1.05	0.84	0.85	0.78	0.89	0.85	1.14	0.81	0.88	0.79	0.87
THEIL2	1.18	1.19	1.26	1.30	1.15	1.06	3.55	0.89	1.46	0.79	1.03
Consensus											
No of obs.	9	6	na	6	6	10	na	11	9	9	66
MAE	1.53	2.00	na	2.70	3.43	0.95	na	1.31	0.99	0.92	1.57
ME	1.09	0.03	na	-1.50	-0.30	-0.04	na	-0.19	0.23	-0.76	-0.12
Signif α=0 (bias)	0.15	0.98	na	0.22	0.89	0.92	na	0.70	0.56	0.04	0.66
PEP-CP											
No of obs.	3	3	3	3	3	3	3	3	3	3	30
MAE	1.17	0.43	1.80	1.67	2.30	1.23	2.10	0.70	1.27	0.77	1.34
ME	0.37	-0.17	1.80	-1.67	-2.30	0.90	2.10	0.03	0.80	-0.70	0.12
Signif α=0 (bias)	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	0.71

MAE: mean absolute error; ME: mean error; na: not available; nr: not relevant (not enough data).
Signif α=0: the significance level of the t-statistic for the coefficient α=0 in the regression $e = \alpha + \mu$ where e is the forecast error. Numbers above 0.05 indicate absence of bias at the 5 % significance level.

2. Forecast errors in GDP growth

Taken together the mean absolute error in the recently acceded countries is 1.53 % in the period 1995-2004 for forecasts made by the Commission services' in spring for the ongoing year ranging from 0.71 % in Slovenia to 2.71 % in Latvia (excluding Cyprus and Malta where the period covered is too different from the other countries, table 2). The mean absolute error for the ten as whole widens to 1.87 % for the year ahead forecasts. In general, there does not appear to be a significant bias in the prediction, except in Slovakia for the current year forecasts where growth was systematically underestimated except in 1999 and 2000 (figure 2). Underestimation was also generally observed in the Baltic states, in particular since 2000 (figure 2 and 3). By contrast, Czech and Maltese growth was considerably overestimated, but not significant in a statistical sense (table 2). The overestimation of Czech growth was mainly due to an incorrect assessment of the severity of the recession in 1997/98. It is a general observation (figure 2 and 3) that the largest GDP growth mistakes are made at turning points, in particular a recession is seen too mild (beside the Czech Republic in 1997/98, also the Baltic states in 1999).

Table 3: Main characteristics of forecast errors – Government balance as % of GDP

	CZ	EE	CY	LV	LT	HU	MT	PL	SI	SK	Pooled
					Current year						
Commission											
No of obs.	4	4	4	4	4	4	4	4	4	4	40
MAE	3.40	1.38	0.95	0.75	0.15	1.67	1.80	1.45	0.30	1.32	1.32
ME	-0.10	-1.38	0.65	-0.75	-0.15	1.67	1.45	-0.20	0.30	0.08	0.16
Signif α=0 (bias)	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	0.62
THEIL1	0.60	1.61	0.61	1.08	0.40	0.67	0.71	1.85	1.10	0.61	0.68
THEIL2	1.12	2.00	1.00	1.50	0.55	1.25	1.43	2.11	0.61	0.93	0.64
Consensus (not further examined due to lack of data)											
PEP-CP											
No of obs.	4	4	4	4	4	4	4	4	4	4	40
MAE	2.27	1.35	0.80	0.77	0.33	1.14	1.16	0.55	0.06	1.30	0.97
ME	1.12	-1.35	0.30	-0.42	-0.18	1.09	1.16	0.15	-0.06	0.25	0.21
Signif α=0 (bias)	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	0.37
					Year ahead						
Commission											
No of obs.	4	4	4	4	4	4	4	4	4	4	40
MAE	2.55	1.65	1.53	1.23	0.33	2.05	1.77	0.98	0.78	1.02	1.39
ME	0.65	-1.55	1.38	-0.83	-0.33	2.05	1.48	-0.43	0.78	0.08	0.33
Signif α=0 (bias)	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	0.31
THEIL1	0.86	1.20	1.08	0.95	0.57	1.18	1.1	1.69	0.98	0.68	0.99
THEIL2	0.97	2.07	1.71	1.62	1.42	1.55	1.42	2.31	3.72	0.83	0.66
Consensus (not further examined due to lack of data)											
PEP-CP											
No of obs.	3	3	3	3	3	3	3	3	3	3	30
MAE	3.60	2.23	2.20	1.53	0.27	2.70	2.31	0.33	0.70	1.08	1.70
ME	1.67	-2.23	2.20	-0.20	0.00	2.70	1.84	-0.13	0.70	0.39	0.69
Signif α=0 (bias)	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	0.11

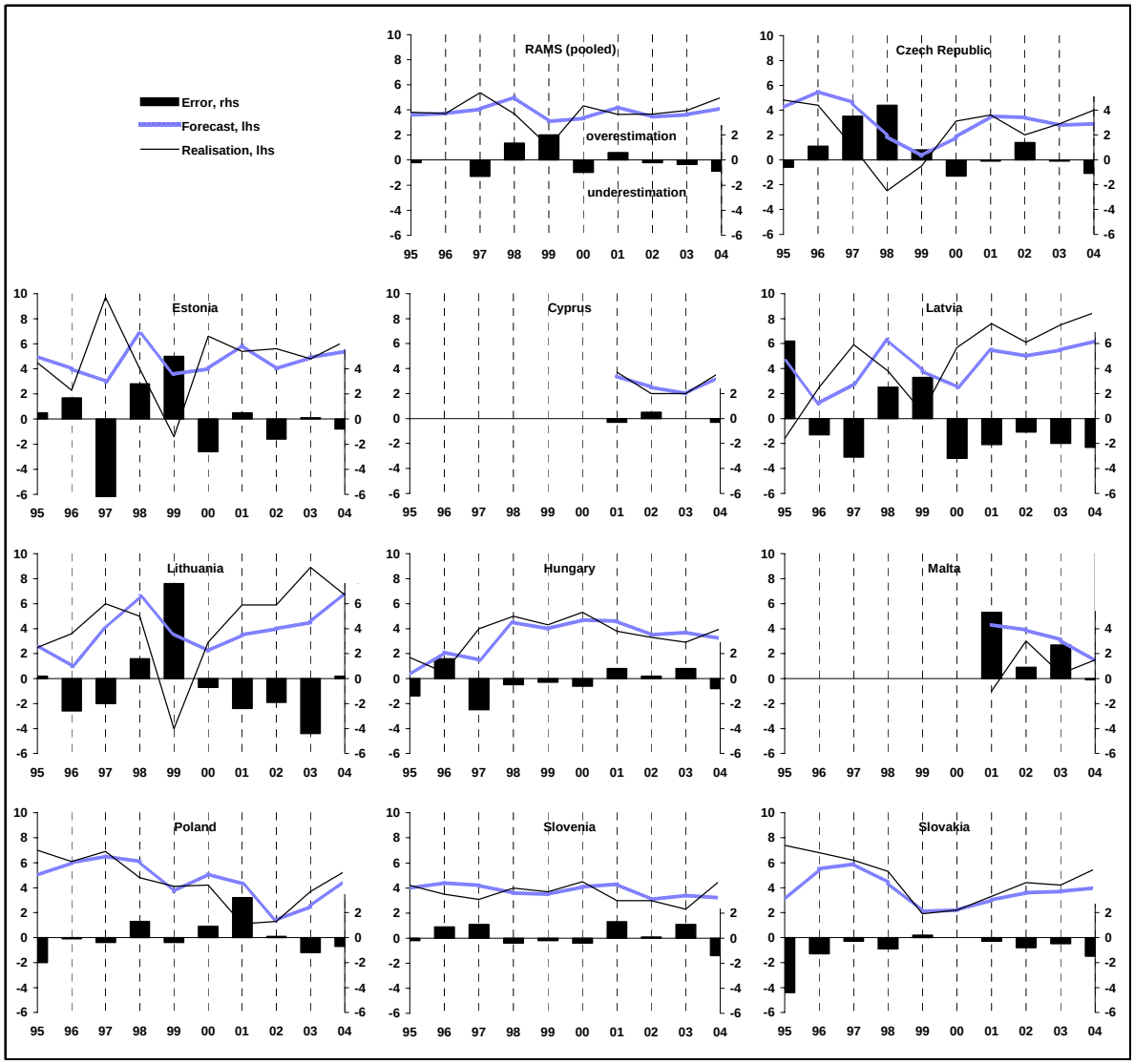
MAE: mean absolute error; ME: mean error; na: not available; nr: not relevant (not enough data).
Signif α=0: the significance level of the t-statistic for the coefficient α=0 in the regression $e = \alpha + \mu$ where e is the forecast error. Numbers above 0.05 indicate absence of bias at the 5 % significance level.
THEIL1&2: root mean squared error of Commission services' forecast divided by root mean squared error of naïve forecast (previous realisation and realised period average, respectively); numbers below 1 suggest superiority of Commission services' forecasts.

The Commission services' forecasts perform on the whole better than naïve alternatives, but not a lot. In some cases (Czech Republic, Latvia, Malta, Slovakia) extrapolating last year's growth (Theil1) is better than forecasts based on the Commission services' approach. The quality of naïve alternatives improves with the lengthening of the forecast horizon as less information is available. Using the average growth rate as the year ahead forecast (Theil2), would even have outperformed the Commission services for the ten countries as a whole. It should be realised, however, that predictions based on the average growth rate are not as naïve as it looks like, because the average growth rate is calculated ex post. Hence, it is a projection too, with estimating difficulties akin to potential growth calculations.

Compared to Consensus Forecasts, the Commission services' prediction errors are in general larger, but they remain of a similar order of magnitude. It should be expected that Consensus Forecasts, which does not produce its own forecasts but calculates the average of forecasts made available by others, performs better. Indeed, because of the law of large numbers, it is difficult to systematically beat the average (OECD (2000) versus Batchelor (2001), mimeo available in 2000). Furthermore, the forecasts by Consensus are published in May and November, which is somewhat later than the Commission services and this, considering also the time lag between production and release of the forecasts, gives Consensus an information advantage (see figure 1). Finally, the forecasting method may be part of the explanation. For some variables, the Commission services use technical assumptions (e.g. exchange rates) or work with the unchanged-policy assumption (e.g.

fiscal stance). To the extent that the contributors to Consensus Forecasts, for the larger part private market analysts, make true forecasts, the comparison is likely to be in its favour.

Figure 2: Real GDP growth – current year

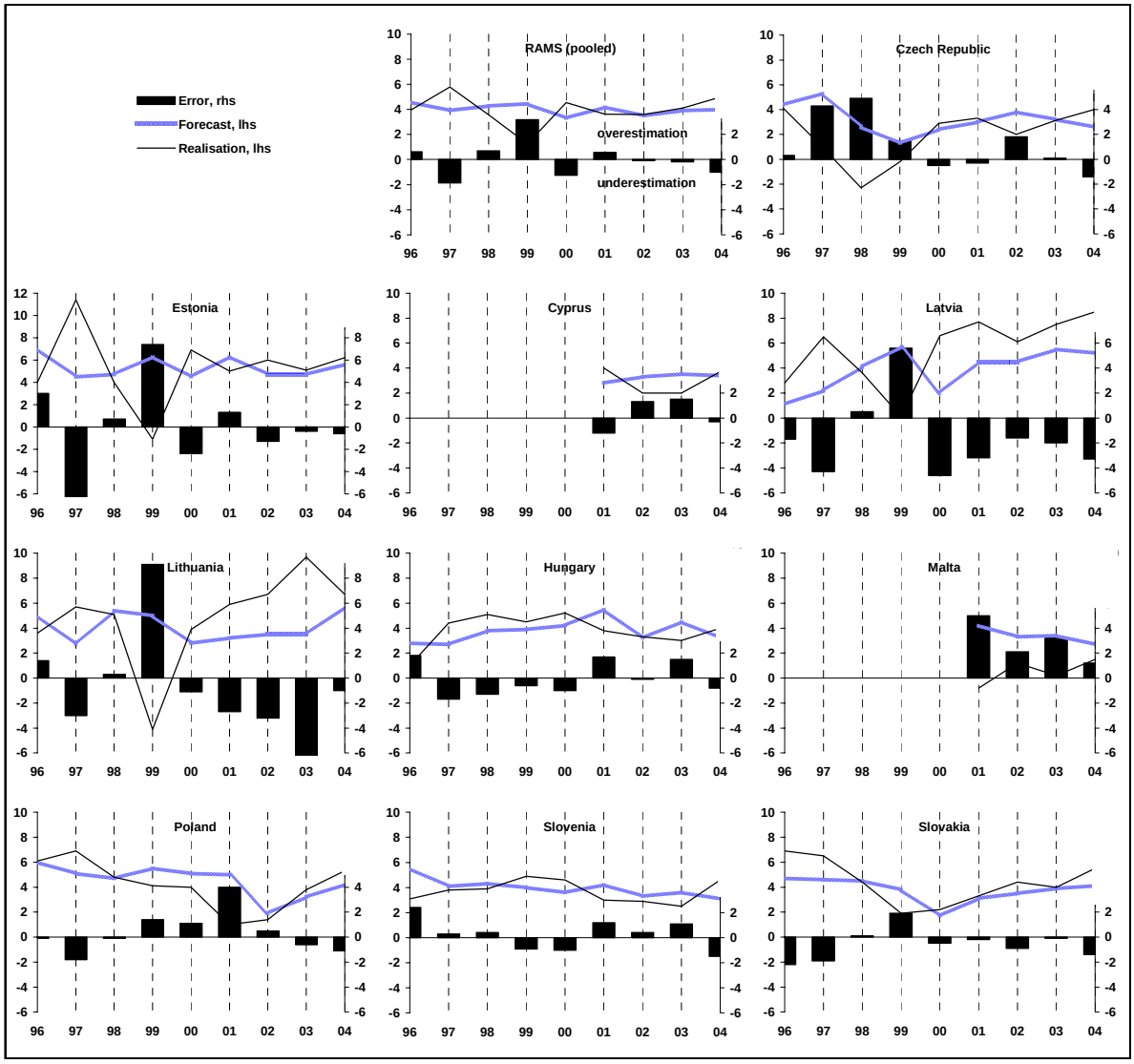


The pre-accession economic programmes and their successor the convergence programmes cover the period 2001-2004 and the GDP forecast errors are smaller than in the Commission services' projections and Consensus Forecasts. The period covered is, however, very different and this should be borne in mind when making a comparison.

3. Forecast errors in the general government balance

Due to data revisions, changes in definitions (see table 4) and the short period covered, the error statistics for the general government balances should be interpreted with cautious and do not necessarily present a good guide to the size of future errors. On the whole the prediction mistake is relatively large, with a mean absolute error of 1.32 % of GDP for the current year and 1.39 % of GDP for the year ahead.

Figure 3: Real GDP growth – year ahead



The biggest error has been noted in the Czech Republic, but this is largely due to a methodological change. Imputations of state guarantees (about 7 % of GDP) have been included in the 2003 government balance in 2004, which was an unknown obligation at the moment of the forecast. Similarly a large mistake was made in Hungary in 2002 when at the end of that year, debt assumptions and a reclassification (about 3 % of GDP) affected the government balance. Debt assumptions in 2003 (about 3.2 % of GDP) related to the ship yards restructuring influenced the fiscal error in Malta. To a minor extent (0.2 % of GDP), a reclassification of government funds affected the Slovene accounts in 2003. More one-off operations took place in the new Member States (see table 4), which did not directly affect the projection error as defined here (realisation data are taken from the spring or autumn forecasts of the following year), but they created difficult forecast circumstances.

There does not appear to be a bias in the government balance forecasts, but here one is not on firm grounds because the sample is very small. In general, the government balance was underestimated in the Baltic states and Poland, while overestimated in Malta, Cyprus and Hungary (or in other words the deficit was underestimated, given the definition of the

forecast error, in these 3 Member States); in the other countries one remained closer to the observed result.

Table 4: Government accounts: major one-off operations in the recently acceded Member States

% of GDP	2001	2002	2003	2004	**Main characteristic of operation** (underlined bold numbers are affecting the forecast error; +: deficit reducing)
Czech Republic	-2.0				Classification of CKA (Czech Consolidation Agency) into general government
			-6.0		Imputation of a state guarantee in favour of CSOB (Czechoslovak Commercial Bank) for the bad debts of IPB (Investment and Post Bank) which it tool over
			-0.8		Imputation of a state guarantee in favour of CSOB to cover Slovakia's debt towards CSOB (related to debt under the previous regime); on 24.12.04 Czech Republic won an international arbitration proceeding reversing the deficit impact (see also Slovakia)
				-0.5	Capital injection to Aero (state-owned company) linked to the exit of Boeing
				-0.8	Imputation of capital transfer related to guarantees for the banking sector granted in the mid-1990s (reclassified to 1997)
Lithuania			0.6	1.0	Restitution of confiscated real estate and lost rouble savings
Hungary		**-3.0**			Debt assumption of State Railway Company and Privatisation Agency; classification of state companies into general government
			-1.0		VAT reimbursement (change from cash to accruals accounting)
				-0.7	13th month of public salaries not shifted to 2005
Malta			**-3.2**		Debt assumption related to ship yard restructuring
Slovenia	-0.2	-0.2	**-0.2**		Inclusion of Capital Fund (financing part of PAYG pension) and Restitution Fund (reimbursement of confiscated property) into general government
	-1.1				Payments by Restitution Fund
			-0.7		Exclusion of financial assets of Agency for Payments (enterprises) after discontinuation
Slovakia				(-1.9)	On 24.12.04 Slovakia lost an international arbitration proceeding (year of deficit increase uncertain); see Czech Republic
		-2.1			Debt cancellations of the Russian federation and developing countries

The Commission services' predictions compare favourably to naïve forecasts based on extrapolating the recent government balance (Theil1 less than 1, table 3), but the difference is small, in particular for the year ahead. Naïve forecasts for the 10 recently acceded Member States as a whole based on the average deficit in the group (Theil2) are also less good than those made by the Commission services. However, at the country level, using the average government balance generally appears to result in better forecast than those provided by the Commission services. The same consideration applies as in the case of the GDP forecasts, namely that predictions based on the average are not that naïve, because at the moment the forecast has to be produced, the average is unknown. Hence, the pooled Theil2 statistic is probably the more relevant so that there is value in the Commission services' budgetary forecasts.

A comparison with the pre-accession economic programmes and their successor the convergence programmes is difficult because of differences in timing. The national authorities made their forecasts after the Commission services' (pre-accession economic programmes in August 2001-03 and convergence programmes in August and end 2004/beginning 2005). The better result for the national authorities in the case of the current year forecast errors, has to be seen in the light of their information advantage. Similarly, different information sets are part of the explanation why for the year ahead forecasts the Commission services do better.

V. FURTHER EXAMINATION OF THE COMMISSION SERVICES 'FORECASTS

In predicting the economy of the recently acceded Member States, large errors are made by the three forecasters assessed in the previous section. In this section the question will be addressed if there is unexploited information in the past prediction mistakes committed by the Commission services which could be used to improve its projections.

1. Absence of persistence of forecast errors

Absence of correlation between prediction errors is a desirable property. It means that once an error is made, it does not feed into the next forecast. It disappears or the next error bears no relation to previous mistakes. If a systematic relation between errors would exist, it could be exploited to improve the forecast.

Table 5: Absence of persistence in the Commission forecast errors

	GDP growth											Gov. balance as % of GDP
	CZ	**EE**	**CY**	**LV**	**LT**	**HU**	**MT**	**PL**	**SI**	**SK**	**Pooled**	**Pooled**
Current year												
Signif ρ_1=0	0.12	0.22	nr	0.98	0.46	0.08	nr	0.58	0.19	0.29	0.53	0.67
Signif ρ_2=0	0.08	0.17	nr	0.08	0.34	0.09	nr	0.62	0.41	0.55	0.16	0.73
Year ahead												
Signif ρ_1=0	0.18	0.22	nr	0.77	0.63	0.51	nr	0.28	0.74	0.46	0.37	0.98
Signif ρ_2=0	0.23	0.21	nr	0.19	0.65	0.69	nr	0.53	0.92	0.39	0.23	0.91

nr: not relevant (not enough data). The country detail for the government balance is not given due to insufficient data.
The test for serial correlation is based on the Ljung-Box Q statistic, which is asymptotically distributed as χ^2. The significance level of the null hypothesis of absence of autocorrelation up to two lags is reported. Numbers above 0.05 indicate no serial correlation at the 5 % significance level.

The null hypothesis of no serial correlation among the forecast errors can be tested with the Ljung-Box Q-statistic. The significance levels of absence of correlation up to two orders, are reported in table 5. Serial correlation among forecast errors is not significant, neither for GDP growth nor for the government balance, always bearing in mind the limitations of the data sample.

2. Efficiency of the Commission services' forecasts

Forecasts are efficient if all information available in the data is used. Weak efficiency can be tested with the realisation-forecast equation

$$R = \alpha + \beta F + \mu$$

where the null hypothesis is

$$H_o: \alpha = 0 \text{ and } \beta = 1$$

If α is significantly different form zero and β significantly different from unity, the forecast is correlated with the forecast error and the forecast can be improved exploiting this information. In table 6 both the probability values for the restrictions imposed on the coefficients separately (t-test) and jointly (F-test) are given.

Bearing in mind the small data set, the Commission services' forecasts appear efficient in the sense that there is no easy way to reduce the admittedly sometimes very large errors made in particular years. Even for the year ahead prediction mistakes in GDP growth, where the test statistics suggest correlation between the forecast and the forecast error, using this information will still produce a large error as implied by the weak explanatory power of the estimated equation (low R^2). The yearly government balances are forecast in a satisfactorily efficient way according to a pooled estimation.

Table 6: Efficiency of the Commission forecasts

	GDP growth											Gov. balance as % of GDP
	CZ	**EE**	**CY**	**LV**	**LT**	**HU**	**MT**	**PL**	**SI**	**SK**	**Pooled**	**Pooled**
Current year												
α	-0.48	5.41	nr	1.91	1.63	1.32	nr	0.38	3.48	0.81	0.84	0.14
Signif α=0	0.76	0.24	nr	0.54	0.56	0.19	nr	0.81	0.14	0.59	0.21	0.82
β	0.90	-0.14	nr	0.63	0.69	0.67	nr	0.90	0.03	1.04	0.79	1.08
Signif β=1	0.82	0.23	nr	0.58	0.64	0.24	nr	0.76	0.12	0.91	0.19	0.58
Signif α=0, β=1	0.47	0.47	nr	0.82	0.83	0.39	nr	0.94	0.22	0.15	0.42	0.76
R^2	0.34	0.00	nr	0.11	0.13	0.45	nr	0.51	0.00	0.50	0.22	0.59
DW	1.04	2.49	nr	1.21	1.56	2.54	nr	1.36	2.06	0.91	1.78	2.11
Year ahead												
α	0.57	15.80	nr	5.07	8.80	2.42	nr	0.53	4.79	-0.80	2.46	0.23
Signif α=0	0.80	0.03	nr	0.09	0.12	0.27	nr	0.83	0.03	0.68	0.01	0.72
β	0.45	-1.96	nr	0.11	-0.98	0.37	nr	0.80	-0.27	1.37	0.37	1.16
Signif β=1	0.43	0.03	nr	0.19	0.13	0.27	nr	0.70	0.03	0.47	0.01	0.32
Signif α=0, β=1	0.26	0.07	nr	0.16	0.27	0.51	nr	0.77	0.06	0.35	0.03	0.36
R^2	0.06	0.33	nr	0.00	0.09	0.07	nr	0.27	0.05	0.54	0.03	0.58
DW	1.07	1.66	nr	1.49	1.41	1.54	nr	1.18	1.27	1.76	1.55	2.19

nr: not relevant (not enough data). The country detail for the government balance is not given due to insufficient data.
α and β: coefficients in the regression $R = \alpha + \beta F + \mu$
Signif (.): significance level of the t-statistic (single test) or F-statistic (joint test) of the null hypothesis; numbers above 0.05 indicate that the null hypothesis can be accepted at the 5 % significance level..

VI. VOLATILITY AND DATA REVISION

Although the Commission services' forecasts for the recently acceded countries meet the basic quality requirements, the prediction errors remain large as well as those of Consensus Forecasts and the national authorities. In search for an explanation, the volatility of the economy and data revisions in the new Member States appear to make forecasting particularly difficult resulting in big mistakes.

1. Relative importance of bias and volatility

With a decomposition of the mean squared error (MSE)

$$\text{MSE} = \frac{1}{n}\sum (F - R)^2$$

one can have an idea of the relative importance of bias and volatility in the prediction mistake (table 7). The systematic part of the mean squared error is the bias (the mean forecast error) and it should be as small as possible. The other parts of the mean squared error are related to volatility and are more difficult to avoid. The variance component is zero if the standard deviation of the series is correctly forecast. The covariance component is zero if the correlation coefficient is one implying that the shape and turning points are perfectly predicted.

From table 7 it appears that instability in the underlying series accounts for the larger part of the GDP forecast errors: in general, more than 75 % of the growth forecast error, both in the current year and in the year ahead, can be attributed to volatility. Malta, where GDP growth has been considerable overestimated in the short period for which data are available (figure 2 and 3), is a notable exception. With respect to government balances, the mean plays a more prominent role in the total mean squared error. However, the sample for government balances is particularly small which dampens the variance.

Table 7: Theil's decomposition of the mean squared forecast error

(% of total error)	CZ	EE	CY	LV	LT	HU	MT	PL	SI	SK	Pooled
GDP growth											
Current year											
Mean	16.5	0.1	0.6	1.0	1.9	5.4	53.5	0.3	5.0	38.1	12.2
Variance	15.4	30.0	57.4	24.7	25.3	0.0	1.4	8.8	9.0	12.8	18.5
Co-variance	68.1	69.9	42.0	74.3	72.8	94.6	45.1	91.0	86.0	49.1	69.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Year ahead											
Mean	37.8	0.2	15.9	17.5	2.4	0.1	89.2	10.5	17.9	13.7	20.5
Variance	11.5	34.9	23.4	7.2	39.0	9.5	1.3	14.8	2.2	35.0	17.9
Co-variance	50.8	64.9	60.7	75.3	58.6	90.5	9.5	74.7	79.9	51.3	61.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Government balance as % of GDP											
Current year											
Mean	0.1	61.6	26.8	68.2	64.3	56.4	36.5	1.3	85.7	0.2	40.1
Variance	30.9	6.5	15.6	4.3	21.2	24.0	35.7	16.9	0.1	57.5	21.3
Co-variance	69.0	31.9	57.5	27.5	14.5	19.6	27.9	81.7	14.2	42.3	38.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Year ahead											
Mean	31.9	43.6	42.6	21.2	44.1	52.7	66.3	5.4	95.5	5.5	40.9
Variance	32.3	13.1	15.3	18.8	37.4	8.0	8.9	94.6	2.4	63.7	29.5
Co-variance	35.8	43.3	42.1	59.9	18.4	39.4	24.8	0.0	2.1	30.8	29.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Decomposition of the mean squared error (MSE):

$$MSE = \underbrace{\left[\frac{1}{n}\sum F - \frac{1}{n}\sum R\right]^2}_{\text{Mean}} + \underbrace{\left[\frac{1}{n}\sum (F-\bar{F})^2 - \frac{1}{n}\sum (R-\bar{R})^2\right]}_{\text{Variance}} + \underbrace{\left[2(1-CORR)\left(\frac{1}{n}\sum (F-\bar{F})^2\right)\left(\frac{1}{n}\sum (R-\bar{R})^2\right)\right]}_{\text{Covariance}}$$

$\bar{F}, \bar{R}$: average forecast and realisation, respectively; *CORR*: correlation coefficient

2. Forecast error and volatility in old and recently acceded Member States

On the whole the quality of the GDP forecasts made by the Commission services for the old Member States is much better than for the countries that joined the European Union on 1 May 2004 (table 8):

- The mean absolute error observed in 1995-2004 is about double in size (0.72 % versus 1.53 % for current year forecasts and 0.99 % versus 1.87 %). For the European Union as an aggregate the mean absolute error is only 0.36 % for the current year forecast and 0.59 % for the year ahead forecast (an improvement from 0.53 % and 0.82 %, respectively, in the period 1969-1997[3], Keereman (1999)).
- The smallest mean forecast error is observed in the old Member States (Spain) and the largest in the new countries (Latvia, Lithuania).
- The largest overestimation occurred in a new Member State (Czech Republic), but the bias was not significant contrary to the, albeit smaller, overestimation in Italy (current year) or Germany (year ahead). However, the largest underestimation occurred in an old Member State (Ireland) and the bias was significant.
- Compared to naïve alternatives (Theil1&2), the Commission services' forecasts represent a clear value added for the old Member States (Ireland is an outlier), while in the case of the new Member States one can make less convincingly this argument.

[3] The composition of the European Union changed so that the two samples are not totally comparable.

The volatility of the economy appears to make forecasting more difficult. Larger standard deviations in GDP growth are indeed associated with big mean absolute errors. Linked to the transition process and the ongoing structural change, the economy of the recently acceded Member States is more volatile and more difficult to predict. Slovenia had the lowest mean absolute error, but taking into account volatility, the performance of Slovakia and Poland is relatively better. In the Baltic states the size of the forecast errors is very large, but appears acceptable from the perspective of volatility.

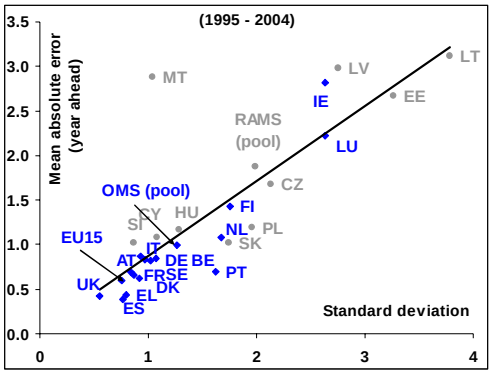
To the extent that the economy of the new Member States over time stabilises, it can also be expected that forecasting will become easier.

Table 8: Forecast errors and volatility in old and recently acceded Member States

GDP growth (1995 - 2004)	**EU15** Average	**EU15** Pooled	**RAMS** Pooled	**EU15** Minimum[a]	**RAMS** Minimum[a]	**EU15** Maximum[a]	**RAMS** Maximum[a]
Current year							
No of obs.	10	150	88	150	80[a]	150	80 [a]
MAE	0.36	0.72	1.53	0.28 (ES)	0.71 (SI)	2.17 (IE)	2.71 (LV)
ME	0.16	-0.04	-0.02	-1.41 (IE)	-0.98 (SK)	0.45 (IT)	0.80 (CZ)
Signif α=0 (bias)	0.31	0.62	0.93	0.05	0.04	0.02	0.21
THEIL1	0.47	0.66	0.81	0.43 (ES)	0.66 (EE)	0.85 (EL)	1.14 (SK)
THEIL2	0.61	0.50	0.89	0.47 (ES)	0.70 (PL)	0.94 (UK)	1.19 (SI)
Year ahead							
No of obs.	10	150	80	150	72[a]	150	72 [a]
MAE	0.59	0.99	1.87	0.39 (ES)	1.02 (SI,SK)	2.82 (IE)	3.11 (LT)
ME	0.37	0.01	0.04	-2.22 (IE)	-1.62 (LV)	0.75 (DE)	1.19 (CZ)
Signif α=0 (bias)	0.11	0.91	0.89	0.02	0.16	0.01	0.14
THEIL1	0.70	0.86	0.87	0.58 (UK,ES)	0.78 (LV)	1.20 (IE)	1.05 (CZ)
THEIL2	1.01	0.69	1.03	0.63 (PT)	0.79 (SK)	1.30 (IE)	1.46 (SI)
Stand. deviation	0.76	1.27	1.99	0.55 (UK)	0.87 (SI)	2.63 (LU,IE)	3.79 (LT)

[a] : Minimum and maximum calculated without Cyprus and Malta for which only 4 observations are available.
MAE: mean absolute error; ME: mean error; Standard deviation: based on the year ahead outturn data.
Signif α=0: the significance level of the t-statistic for the coefficient α=0 in the regression $e = \alpha + \mu$ where e is the forecast error. Numbers above 0.05 indicate absence of bias at the 5 % significance level.
THEIL1&2: root mean squared error of Commission services' forecast divided by root mean squared error of naïve forecast (previous realisation and realised period average, respectively); numbers below 1 suggest superiority of Commission services' forecasts.

Figure 4: Volatility and GDP forecast error



3. Data revision

An economy may be difficult to predict, not only because of underlying volatility, but also because the data do not reflect well reality as it is costly and takes time to gather the statistics. Furthermore, there are methodological changes which can directly affect the calculation of the prediction error[4], but more generally, add also to the information gap. With other words, the information set on which the forecasts are made is incomplete. It makes the analysis flawed, forecasts error-prone and it can contribute to a higher volatility of the economy, because wrong decisions have been made by policy makers and economic agents. The degree of data revision can be used as an indicator of the information gap or the difficulty to know what is really going on.
The data revision between the first estimate (spring +1) and first settled estimate (autumn t + 1) is not negligible as measured by the mean absolute revision (table 9). However, the

[4] To the extent that methodological revisions take place between the moment the forecast are made and the release of the outturn data, the prediction error is directly affected. However, by minimising the distance between prediction moment and the publication of the realisation data (in this study: the year following on the year to be forecast), one reduces the risk that definitional changes distort the forecast error.

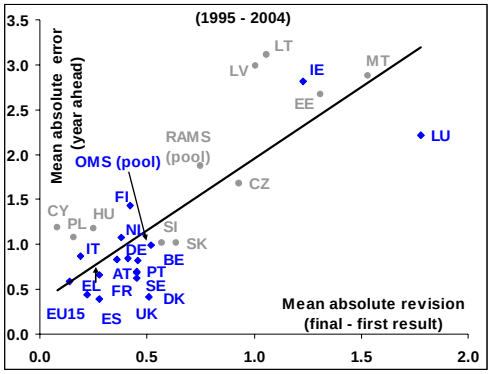
revision is not significant at the 5 % level. There is little difference between the recently acceded Member States and the old Member States: the mean absolute GDP growth revision is about 0.30 percentage point and there is a small (non-significant) upward revision of about 0.08 percentage point.

Table 9: Data revision in old and recently acceded Member States

GDP growth (1995 – 2004)	**EU15** Average	**EU15** Pooled	**RAMS** Pooled	**EU15** Minimum	**RAMS** Minimum	**EU15** Maximum	**RAMS** Maximum
First available estimate (spring t + 1) compared to first settled estimate (autumn t + 1)							
No of obs.	10	150	90	150	80[a]	150	80 [a]
MAR	0.12	0.28	0.27	0.01 IT	0.05 PL	1.27 IE	0.67 EE
MR	-0.02	0.07	0.08	-0.05 DE	-0.07 SK	0.45 IE	0.27 EE
Signif α=0	0.71	0.16	0.13	0.44	0.50	0.40	0.39
First available estimate (spring t + 1) compared to "final" data (July 2005)							
No of obs.	10	150	90	150	80[a]	150	80 [a]
MAR	0.14	0.52	0.75	0.19 IT	0.08 PL	1.78 LU	1.31 EE
MR	0.08	0.22	0.38	-0.20 DE	-0.45 SK	0.67 LU	1.31 EE
Signif α=0	0.30	0.00	0.00	0.19	0.09	0.37	0.00

[a]: Minimum and maximum calculated without Cyprus and Malta for which only 5 observations are available.
MAR: mean absolute revision; MR: mean revision (+: upward revision).
Signif α=0: the significance level of the t-statistic for the coefficient α=0 in the regression $r = \alpha + \mu$ where r is the data revision. Numbers above 0.05 indicate absence of revision at the 5 % significance level.

Figure 5: Information gap and GDP forecast error



Over time large data revisions can occur suggesting that an information gap may exist at the moment the forecasts have to be made, contributing to the prediction mistake. The upward revision between the first available and the "final" data is significant in a pooled regression and larger in the new Member States (0.22 and 0.38 percentage point, respectively). The recently acceded countries are also characterised by a bigger mean absolute revision. Taken together, the mean absolute revision for the new countries is 0.75 versus 0.52 percentage points for the old Member States; the mean absolute revision in Luxemburg is, however, larger than in Estonia.

With the improvement of the data quality and greater timeliness in the availability of the statistics, it is likely that data revisions can be reduced leading quicker to a clearer picture of the state of the economy so that also predictions mistakes could decline.

VII. THE IMPACT OF FORECAST ERRORS ON FISCAL POLICY

Large forecast errors for GDP growth are made in the recently acceded countries. In this section the relation between GDP growth and government balance prediction mistakes is assessed and in what direction does the causality run. It is attempted also to find out to what extent growth surprises influence the government balance beyond the operation of the automatic stabilisers, with other words, if forecast errors affect discretionary fiscal policy.

1. Relation between GDP forecast errors and government balance errors

It is difficult to know in which direction goes the causality: do GDP forecast errors cause prediction mistakes in the government balance or is it the other way around ? In the absence of sufficient data for a formal statistical test of Granger-causality, a more judgmental approach has to be followed (Artis, 1999). If one assumes that the causality runs from GDP to public finances, the operation of the automatic stabilisers and the fiscal authorities' reaction function should determine the transmission mechanism. In the event of an adverse unexpected shock (producing overestimation of GDP), the automatic

stabilisers will induce a deterioration of the fiscal account (leading to an underestimation of the government deficit). The operation of the automatic stabilisers may be complemented by a discretionary easing of fiscal policy which would further worsen the deficit. Given the definition of the prediction mistake used here (forecast minus realisation) and of the government balance (a deficit enters with a negative sign), it would imply a positive relation between GDP forecast errors and government balance forecast errors.

On the other hand, in a Keynesian framework where fiscal policy influences demand, causality can run from government deficit to GDP. In this case, unexpected government spending (underestimation of the deficit, in other words overestimation of the government balance) boosts demand (underestimation of GDP) and the relation between forecast errors on the government balance and GDP growth should be negative[5].

The correlation coefficients between GDP and government deficit forecast errors (table 10) suggest that automatic stabilisers seem to govern the relation between GDP and deficit[6] (similar to the situation in the old Member States, see Keereman (1999)). A majority of positive correlation coefficients are observed, which are on the whole rather small inviting for prudence in the interpretation of the results, also bearing in mind the small sample.

Table 10: Error correlation between GDP growth and government balance

CZ	EE	CY	LV	LT	HU	MT	PL	SI	SK	Pooled
Current year (8/10)										
0.18	-0.01	0.50	0.58	-0.29	0.09	0.47	0.77	0.06	0.03	0.24
Year ahead (7/10)										
0.26	0.47	0.78	0.85	-0.83	-0.40	0.27	0.89	0.84	-0.25	0.29

Between brackets: number of positive correlations on total, pool excluded

Within the automatic stabilisers framework, a negative correlation coefficient can also be rationalised. It would mean that the underestimation of the government balance is not proportional to the underestimation of the growth. This could happen if the operation of the automatic stabilisers proved to be weaker than when implicitly assumed at the moment when the forecasts were produced or if fiscal policy became easier than forecast and this effect dominated the operation of the automatic stabilisers. Thus, the good growth surprises since 2000 (underestimation of growth) in Lithuania and Slovakia (see figures 2 and 3) were accompanied by an underestimation of the government balance which was too small because automatic stabilisers functioned differently and/or the policy stance eased[7]. Similarly, the growth disappointment in Hungary (see figures 2 and 3) in 2001 and 2003 was not matched by a proportional overestimation of the government balance which could be related to weaker automatic stabilisers and/or a tighter budget so that fiscal consolidation proceeded[8].

---

[5] A negative correlation can also appear for technical reasons as the GDP forecast error enters the calculation of the government balance error expressed in terms of GDP. The explanation of the correlation is then of a technical nature and not based on an economic relationship. Overestimation of nominal GDP will lower the GDP ratio suggesting underestimation of the government balance.

[6] It should be stressed that correlations do not say anything on the direction of causation. If some form of causality is suggested, this is based on other considerations (i.e. an economic model).

[7] This behaviour justified the recommendation addressed to both countries on 5 July 2004 to use better than expected budget revenues for deficit reduction (Council opinion on the first Lithuanian convergence programme, Council recommendation on the elimination of the Slovakian excessive deficit). See website on the Stability and Growth Pact maintained by the Directorate-General for Economic and Financial Affairs:

http://europa.eu.int/comm/economy_finance/about/activities/sgp/main_en.htm

[8] Progress in consolidation fell, however, short of what was required under the 5 July 2004 Council recommendation (Council decision of 18 January 2005 that Hungary had not taken effective action).

2. Impact of GDP forecast errors on government balance errors

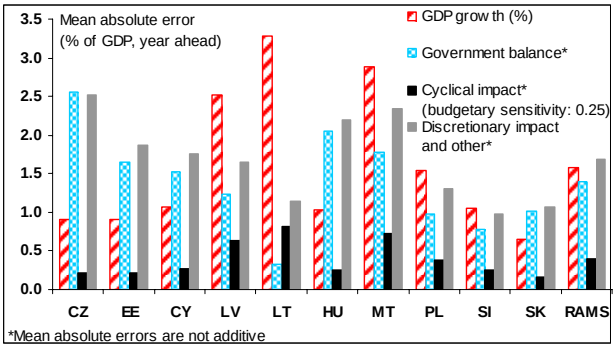
While in the previous section it was attempted to establish the direction of causality between growth and budgetary forecast errors, here the impact is estimated assuming that the basic causality runs from the business cycle to the budget.

The government balance is equal to the structural balance and the part of the balance which is sensitive to the cycle. If the budgetary sensitivity (σ) does not change over the forecast, the size of the cyclical fiscal forecast error (ε) can be estimated as follows[9]:

$\varepsilon_t = \sigma(F_t - R_t)$ with $(F_t - R_t)$: the GDP growth forecast error

Preliminary estimates (European Commission (2005b)) suggest a budgetary sensitivity to the cycle of 0.25 on average in the case of the new Member States which is much lower than the updated sensitivity of 0.50 for old Member States. It permits to approximately calculate an order of magnitude for the cyclical and discretionary part in the fiscal forecast error. The period covered is 2001-2004 which is very short and characterised by the new Member States' adoption process of the ESA95 accounting rules. The errors committed during this learning period are not necessarily a good guide for the future.

Figure 6: Estimate of the cyclical dimension in the fiscal forecast error (2001-2004)



For the new Member States as a whole, the cyclical part represents about 1/4 (0.4 % of GDP) of the discretionary error in the Commission services' forecasts (about 1.6 % of GDP, see figure 6) or about 20 % of the total fiscal forecast error. There are, however, notable differences among countries. In the Czech Republic, Malta and Hungary, countries with large fiscal forecast errors, mistakes in the discretionary fiscal sphere are more important. However, not everything can be attributed to misjudging the fiscal stance or unforeseen discretionary policy measures. Methodological changes play also a role as was the case in the Czech Republic where a 7 % of GDP government guarantee was included in the deficit in 2003. Large growth mistakes have been made in Lithuania and Latvia with correspondingly a bigger share of the total fiscal forecast error explained by cyclical factors. Also in Malta and Poland growth surprises had a large impact on the fiscal forecast errors.

3. Discretionary fiscal policy and forecast errors

The impact of the forecast error $(F_t - R_t)$ on the desired fiscal stance (S^*_t with * indicating a desired level) can be highlighted as follows:

$S^*_t = \gamma + \theta(F_t - R_t)$

[9] For a similar approach but with a view to determine the structural part of the fiscal forecast error in order to calculate a safety margin with respect to the 3 % of GDP deficit ceiling under the Stability and Growth Pact, see Artis and Buti (2000).

Underlying this equation is a fiscal policy reaction function with the usual arguments of output stabilisation and budgetary consolidation. Examples of such reaction functions can be found with Larch and Salto (2005), Ballabriga and Martinez-Mongay (2003) and Bohn (1998), who analysed budgetary policy in some old Member or the US. Larch and Salto (2005) examined the consequences of prediction mistakes around potential growth; in this paper the focus is on wrong projections for actual output. Variables like the output gap, the deficit target or previous year's debt typically enter the equation and are here represented by γ for simplicity and because the focus is on the impact (θ) of the forecast error on the fiscal stance.

In which direction goes the impact of the growth forecast error ($\theta > 0$ or $\theta < 0$)? It depends on the strongest component in the reaction function: output stabilisation or budgetary consolidation:

- If the policy rule is to realise a desired output growth, a foreseen too strong acceleration is counteracted by a tightening of the fiscal stance. An overestimation of growth ($F_t - R_t > 0$) will sharpen the restrictive stance, leading to a positive coefficient ($\theta > 0$).
- With budgetary consolidation the main preoccupation of the authorities, an overestimation of growth ($F_t - R_t > 0$) will lead to an easier budgetary stance, because the deficit target is assumed to be met thanks to good economic activity. This suggests a negative coefficient ($\theta < 0$).

As tightening policy is often costly in social and political terms, there may be a bias in the growth projections so that the cycle can be blamed if the policy goal is missed. The bias will be different depending on the policy goal. Systematic overestimation of growth would be the behaviour if budgetary consolidation is the declared policy objective. With systematic underestimation of growth, one avoids to tighten when output stabilisation is important. With respect to the recently acceded countries, this study did not find any significant bias (see table 2), but the forecast errors are large.

In order to come to an empirical verification of the impact of forecast errors, a partial adjustment mechanism is introduced, reflecting that in the present period only a part of the desired adjustment is realised, because of inertia in the implementation of fiscal policy:

$$S_t - S_{t-1} = \lambda (S^*_t - S_{t-1}) \qquad 0 < \lambda < 1$$

The quicker the adjustment, the larger is the parameter λ.

Substituting the policy reaction function into the adjustment mechanism, gives an equation ready to estimate the influence of the forecast error on the fiscal stance:

$$S_t = \alpha + \beta (F_t - R_t) + \delta S_{t-1} \qquad \alpha = \lambda\gamma + \lambda\theta (R_t - R^*_t) \qquad \beta = \lambda\theta \qquad \delta = 1 - \lambda$$

As in Ballabriga and Martinez-Mongay (2003) the fiscal stance is represented by the primary balance. A better alternative would be to use the cyclically adjusted primary balance as in Larch and Salto (2005), but data limitations prevent to do so for the new Member States. Hence, some cyclical response may still be reflected in the equation, so that part of the deterioration of the primary balance is attributed to a policy action, while only the automatic stabilisers are at work. This type of wrong attribution should be smaller than in the old Member States, because, as already indicated in the previous section, preliminary estimates for budgetary sensitivities suggest smaller values in the recently acceded countries compared to the old Member States. It means a larger part of the actual

government balance in the new Member States is explained by discretionary government action.

Table 11: Prediction errors and the fiscal stance

	Commission services' prediction errors (year ahead)											Nat. auth. pred. errors
	CZ	**EE**	**CY**	**LV**	**LT**	**HU**	**MT**	**PL**	**SI**	**SK**	**Pooled**	**Pooled**
No of obs	9	9	4	9	9	7	4	9	6	9	75	30
α	-5.72	0.38	nr	-1.12	-1.82	-0.25	nr	-0.43	nr	-3.26	-0.78	-0.74
Signif α=0	0.05	0.33	nr	0.02	0.00	0.81	nr	0.30	nr	0.07	0.00	0.13
β	0.46	-0.47	nr	-0.63	-0.29	-0.60	nr	0.01	nr	0.19	-0.33	-0.49
Signif β=0	0.47	0.00	nr	0.00	0.00	0.54	nr	0.96	nr	0.82	0.00	0.05
δ	-0.27	0.53	nr	0.75	-0.18	0.43	nr	0.49	nr	-0.06	0.39	0.44
Signif δ=0	0.46	0.04	nr	0.01	0.28	0.29	nr	0.11	nr	0.86	0.00	0.01
R^2	0.11	0.80	nr	0.85	0.87	0.44	nr	0.38	nr	0.02	0.34	0.32
DW	1.90	1.30	nr	1.33	1.90	2.30	nr	1.69	nr	1.52	1.70	2.02

nr: not relevant (not enough data). The country detail for the government balance is not given due to insufficient data.
α, β and δ: coefficients in the regression $S_t = \alpha + \beta (F_t - R_t) + \delta S_{t-1} + \mu$
Signif (.): significance level of the t-statistic of the null hypothesis; numbers below 0.05 indicate that the coefficient is significantly different from 0 at the 5 % level.

For the recently acceded Member States as a group, there is some evidence (table 11) that budgetary consolidation is the prime concern to the authorities as reflected in the negative coefficient for the forecast error, assuming that the coefficient is the same as the one for the deviation between the actual budget and the target. That result for the group as a whole, observed both in the Commission services' forecasts and those of the national authorities, is mainly due to the behaviour of the Baltic states. In the four larger central European countries, the positive sign (except Hungary) with the prediction error would indicate that there is some attention paid to output stabilisation to the detriment of budgetary consolidation. The concern with the cycle is not significant and making bad growth forecasts had less important consequences for the fiscal stance. However, in these countries the budgetary outcome was heavily influenced by discretionary measures related to debt assumptions and the role of the growth forecast errors is likely to be underestimated.

In the Baltic states the growth forecast errors appear to matter and the observed underestimation led to a tighter fiscal policy in order to ensure meeting the deficit target. From this point of view, the underestimation of growth in these countries by the Commission services was a "good" error in the sense that it added fiscal restraint. One should, however, not conclude that the fiscal stance was tight enough or appropriate because the deficit target may have been unambitious resulting in insufficient output stabilisation. Extrapolation into the future of this benign experience with growth underestimation, is also unwarranted to the extent that output stabilisation takes over from budgetary consolidation as the prominent policy objective. Growth underestimation could then lead to an easing of fiscal policy with the risk of overheating in the context of the strongly growing Baltic economies. It adds to the risks stemming from incorrectly estimating the degree of budgetary restriction because some strongly growing revenues in the boom phase (e.g. capital gains or turnover taxes), are in fact not structural in nature (Jaeger and Schuknecht (2004)).

VIII. CONCLUSION

The accuracy of projections for the recently acceded Member States has been examined in the period 1995 - 2004. The focus was on the Commission services' forecasts for GDP growth and the general government balance as % of GDP. In order to have a better perspective on the quality of the Commission services' forecasts, a comparison was made with Consensus Forecasts, projections by the national authorities (represented by the pre-accession economic programmes and the convergence programmes) and predictions made by the Commission services for old Member States. The main findings, which have to be interpreted with care due to the limited data set, are as follow:

- Prediction mistakes for the recently acceded Member States are large and widen with the length of the projection horizon. The mean absolute forecast error by the Commission services for GDP growth in the recently acceded Member States is about 1.5 % (pooled average) in predictions made in spring for the ongoing year (current year forecast), ranging from 0.7 % in Slovenia to 2.71 % in Latvia. The mean absolute error widens to 1.9 % on average for growth predictions made in autumn for the following year (year ahead forecasts).
- These growth forecast errors are of the same order of magnitude as those made by other forecasters. The mistakes with Consensus Forecasts are smaller, which have to seen in the light of differences in timing and forecasting approach. Similar considerations, but in particular, the limitation of the sample to a more recent period explain the better performance of the national authorities. Compared to the Commission services' forecasts for old Member States, the mistakes are about double as large.
- The mean absolute forecast error (pooled average) made by the Commission services for the general government balance in the recently acceded Member States is 1.3 % of GDP in the current year (1.4 % of GDP in the year ahead forecast), with wide variations across countries. The national authorities make similar mistakes.
- The projections pass in general the conventional tests of absence of bias, efficiency and no persistence in the forecast errors. Growth is usually underestimated by the examined forecasters, though not significantly in a statistical sense, in the Baltic states, Hungary (to a minor extent) and Slovakia (sometimes statistically significant). In the five other recently acceded Member States, there was a tendency to overestimate growth, which was relatively strong in the Czech Republic and Malta. With respect to the government balance, it was generally overestimated (not statistically significant) in the Baltic states and Poland, while underestimating was the tendency in Malta, Cyprus and Hungary with the three other countries closer to the observed result.
- The Commission services forecasts are in general also better than a naïve extrapolation of last year's outcome or taking the average as the forecast. Hence, there is no easy way to reduce the admittedly large forecast errors for the new Member States.
- Volatility and data revisions creating uncertainty about the state of the economy in the 10 new countries appear to be the main reasons for the lower forecast performance. Taking this into account, the large forecast errors in the Baltic states look normal and the errors in Polish and Slovak GDP forecasts are below what could be expected based on the level of volatility in their economies. With the recently more stable economic developments and improved data quality, the future looks brighter.

Forecast errors in the general government balance are related to growth mistakes through the operation of the automatic stabilisers. An unexpected growth shortfall will lead to an unanticipated widening of the government balance because lower than foreseen growth reduces revenues and increases expenditure. However, the largest source for fiscal forecast errors are unanticipated budgetary measures and methodological changes. They represent about 80 % of the total error, leaving 20% for the cyclical part.

Although in general, the growth forecast errors are not intentional as there is absence of bias in the national authorities' projections as well as in those of the Commission services, the mistakes are big, potentially leading to wrong policy decisions. This was, however, not verified in the sample under examination. Overall, growth forecast errors in the recently acceded Member States impacted significantly on the fiscal stance, but this result was mainly due to the Baltic states, where growth underestimation contributed to fiscal restraint or less fiscal stimulus and, from that point of view, was a "good" error. In the other countries, the fiscal stance did not appear to be influenced by growth forecast errors in an important way as discretionary measures and methodological changes dominated the picture.

Extrapolation into the future of the benign experiences with growth forecast errors is unwarranted because the period on which the analysis was based is short and probably atypical. In particular, growth underestimation has to be watched in the context of the strongly growing Baltic economies. Growth underestimation is a prudent approach when budgetary consolidation is the prominent policy objective, but to the extent that output stabilisation takes over, growth underestimation could lead to setting a too easy fiscal policy with the risk of overheating.

1. BIBLIOGRAPHY

Artis, M (1988), "How accurate is the World Economic Outlook? A post mortem on short-term forecasting at the International Monetary Fund", Staff Studies for the World Economic Outlook (Washington, D.C.: International Monetary Fund, July).

Artis, M. (1996), "How accurate are the IMF's short-term economic forecasts? Another examination of the World Economic Outlook", *IMF Working Paper*, WP/96/89, August.

Artis, M. and M. Buti (2000), "Close to balance or in surplus - a policy maker's guide to the implementation of the Stability and growth Pact", *Journal of Common Market Studies*, No. 38-4, 563-91, November.

Artis, M. and M. Marcelino (1999), "Fiscal forecasting: the track record of the IMF, OECD and EC", *Centre for Economic Policy Research Discussion Paper*, No. 2206.

Ballabriga, F. and C. Martinez-Mongay (2003), "Has EMU shifted monetary and fiscal policy ?", in M. Buti (ed.), *Monetary and fiscal policies in EMU, interactions and coordination*, Cambridge University Press, Cambridge.

Batchelor, R. (2001), "How useful are the forecasts of intergovernmental agencies? The IMF and OECD versus the consensus," *Applied Econometrics*, No. 33, p 225-35.

Bohn, H. (1998), "The behaviour of US public debt and deficits", *Quarterly Journal of Economics*, No. 113, p 949-63.

European Commission (2005a), "Spring 2005 economic forecasts", *European Economy*, No 2.

European Commission (2005b), "Public finances in EMU 2005", *European Economy*, No 3.

European Council (2005), Presidency conclusions of the Brussels European Council of 23-24 March 2005 on improving the implementation of the Stability and Growth. Available from: http://ue.eu.int/ueDocs/cms_Data/docs/pressData/en/ec/84335.pdf.

Larch, M. and M. Salto (2005), "Fiscal rules, inertia and discretionary policy", *Applied Economics*, No. 37, p 1135-46.

Jaeger, A. and L. Schuknecht (2004), Boom-bust phases in asset prices and fiscal policy behaviour", *IMF Working Paper*, WP/04/54, April.

Keereman, F. (1999), "The track record of the Commission forecasts", *Economic Papers*, No. 137 (European Commission, Directorate-General for Economic and Financial Affairs).

Kenen, P. and A. Schwarz (1986), "An assessment of macroeconomic forecasts in the International Monetary Fund's World Economic Outlook", *Working Papers in International Economics* (Princeton University, International Finance Section).

OECD (2000), "OECD economic projections: response to a City University Business School study", News Release 20 October. Available from: http://www1.oecd.org/media/release/nw00-105a.htm.

Theil, H. (1966), “Applied economic forecasting”, North-Holland Publishing, Amsterdam.

ANNEX A: DATA SOURCES

The table lists from 1995 the available short-term macroeconomic projections made by the Commission services for the recently acceded Member States, classified by publication date and indicates where the data for the analysis of the forecast accuracy are taken from. When available the cut-off date for inclusion of information in the forecasts is mentioned as well as the date of the press conference.

Publication date	Publication[a] name	Current year forecast	Current year outturn	Year ahead forecast	Year ahead outturn	Cut-off date	Press conference[b]
1995 Spring	Not published	1995					
Autumn	Not published			1996			
1996 No 1, May	European Economy - Supplement C	1996	1995				
No 3, October	European Economy - Supplement C			1997	1995		
1997 No 2, June	European Economy - Supplement C	1997	1996				
No 4, December	European Economy - Supplement C			1998	1996		
1998 No 2, April	European Economy - Supplement C	1998	1997				
No 4, November	European Economy - Supplement C			1999	1997		
1999 No 2, May	European Economy - Supplement C	1999	1998				
No 4, December	European Economy - Supplement C			2000	1998		
2000 No 2, May	European Economy - Supplement C	2000	1999				
No 4, December	European Economy - Supplement C			2001	1999		November, 22
2001 No 2, April	European Economy - Supplement C	2001	2000				April, 25
No 4, November	European Economy - Supplement C			2002	2000		November, 21
2002 No 9, April	European Economy - Enlargement Papers	2002	2001			April, 12	April, 24
No 12, November	European Economy - Enlargement Papers			2003	2001	November, 4	November, 13
2003 No 15, April	European Economy - Enlargement Papers	2003	2002			March, 28	April, 8
No 5/2003	European Economy			2004	2002	October, 20	October, 29
2004 No 2/2004	European Economy	2004	2003			March, 29	April, 7
No 5/2004	European Economy			2005	2003	October, 18	October, 26
2005 No 2/2005	European Economy	2005	2004		2004	March, 16	April, 4

[a]: In the beginning, there were no separate forecasts for the new Member States. The bigger recently acceded countres were covered to the extent there were an input for some world aggregates (GDP, international trade). In European Economy-Enlargement Papers the coverage was larger. Public finance forecasts are available from end 2000. From end 2003, forecasts for old and new Member States were jointly published in European Economy.
[b]: From 29 October 2003 joint press release with old Member States.

ANNEX B: DATA SET

Table B.1: Real GDP growth rate

Current year	Czech Rep.		Estonia		Cyprus		Latvia		Lithuania		Hungary		Malta		Poland		Slovenia		Slovakia		RAMS	
	F	R	F	R	F	R	F	R	F	R	F	R	F	R	F	R	F	R	F	R	F	R
1995	4.2	4.8	5.0	4.5			4.6	-1.6	2.7	2.5	0.3	1.7			5.0	7.0	4.0	4.2	3.0	7.4	3.6	3.8
1996	5.5	4.4	4.0	2.3			1.2	2.5	1.0	3.6	2.1	0.5			6.0	6.1	4.4	3.5	5.5	6.8	3.7	3.7
1997	4.6	1.1	3.0	9.7			2.8	5.9	4.0	6.0	1.5	4.0			6.5	6.9	4.2	3.1	5.9	6.2	4.1	5.4
1998	1.9	-2.5	6.8	4.0			6.3	3.8	6.6	5.0	4.5	5.0			6.1	4.8	3.6	4.0	4.4	5.3	5.0	3.7
1999	0.3	-0.5	3.6	-1.4			3.8	0.5	3.6	-4.0	4.0	4.3			3.7	4.1	3.5	3.7	2.1	1.9	3.1	1.1
2000	1.8	3.1	4.0	6.6			2.5	5.7	2.2	2.9	4.7	5.3			5.1	4.2	4.1	4.5	2.2	2.2	3.3	4.3
2001	3.5	3.6	5.9	5.4	3.4	3.7	5.5	7.6	3.5	5.9	4.6	3.8	4.3	-1.0	4.3	1.1	4.3	3.0	3.0	3.3	4.2	3.6
2002	3.4	2.0	4.0	5.6	2.5	2.0	5.0	6.1	4.0	5.9	3.5	3.3	3.9	3.0	1.4	1.3	3.1	3.0	3.6	4.4	3.4	3.7
2003	2.8	2.9	4.9	4.8	2.0	2.0	5.5	7.5	4.5	8.9	3.7	2.9	3.1	0.4	2.5	3.7	3.4	2.3	3.7	4.2	3.6	4.0
2004	2.9	4.0	5.4	6.2	3.4	3.7	6.2	8.5	6.9	6.7	3.2	4.0	1.4	1.5	4.6	5.3	3.2	4.6	4.0	5.5	4.1	5.0
Year ahead	**Czech Rep.**		**Estonia**		**Cyprus**		**Latvia**		**Lithuania**		**Hungary**		**Malta**		**Poland**		**Slovenia**		**Slovakia**		**RAMS**	
	F	**R**	**F**	**R**	**F**	**R**	**F**	**R**	**F**	**R**	**F**	**R**	**F**	**R**	**F**	**R**	**F**	**R**	**F**	**R**	**F**	**R**
1995																						
1996	4.4	4.1	7.0	4.0			1.1	2.8	5.0	3.6	2.8	1.0			6.0	6.1	5.5	3.1	4.7	6.9	4.6	4.0
1997	5.3	1.0	4.5	11.4			2.2	6.5	2.7	5.7	2.7	4.4			5.1	6.9	4.1	3.8	4.6	6.5	3.9	5.8
1998	2.6	-2.3	4.7	4.0			4.1	3.6	5.4	5.1	3.8	5.1			4.7	4.8	4.3	3.9	4.5	4.4	4.3	3.6
1999	1.3	-0.2	6.3	-1.1			5.7	0.1	5.0	-4.1	3.9	4.5			5.5	4.1	4.0	4.9	3.8	1.9	4.4	1.3
2000	2.4	2.9	4.5	6.9			2.0	6.6	2.8	3.9	4.2	5.2			5.1	4.0	3.6	4.6	1.7	2.2	3.3	4.5
2001	3.0	3.3	6.3	5.0	2.8	4.0	4.5	7.7	3.2	5.9	5.5	3.8	4.2	-0.8	5.0	1.0	4.2	3.0	3.1	3.3	4.2	3.6
2002	3.8	2.0	4.7	6.0	3.3	2.0	4.5	6.1	3.5	6.7	3.2	3.3	3.3	1.2	1.9	1.4	3.3	2.9	3.5	4.4	3.5	3.6
2003	3.2	3.1	4.7	5.1	3.5	2.0	5.5	7.5	3.5	9.7	4.5	3.0	3.4	0.2	3.2	3.8	3.6	2.5	3.9	4.0	3.9	4.1
2004	2.6	4.0	5.6	6.2	3.4	3.7	5.2	8.5	5.7	6.7	3.2	4.0	2.7	1.5	4.2	5.3	3.1	4.6	4.1	5.5	4.0	5.0

General notes:
The source for the forecasts (F) and realisations (R) is given in annex A.
RAMS: unweighted average.

Table B.2: General Government deficit (% of GDP)

Current year	Czech Rep.		Estonia		Cyprus		Latvia		Lithuania		Hungary		Malta		Poland		Slovenia		Slovakia		RAMS	
	F	R	F	R	F	R	F	R	F	R	F	R	F	R	F	R	F	R	F	R	F	R
2001	-9.4	-5.5	0.1	0.2	-3.2	-3.0	-1.9	-1.7	-1.8	-1.7	-3.3	-4.3	-5.6	-7.0	-3.1	-5.6	-1.1	-1.3	-5.4	-5.5	-3.5	-3.5
2002	-6.7	-6.5	0.1	1.3	-2.6	-3.5	-2.8	-2.5	-1.8	-1.8	-4.9	-9.1	-5.5	-6.1	-6.3	-4.2	-1.3	-1.8	-5.0	-7.7	-3.7	-4.2
2003	-6.3	-12.9	-0.5	2.6	-4.0	-6.3	-2.9	-1.8	-1.9	-1.7	-4.9	-5.9	-5.2	-9.7	-4.2	-4.1	-1.5	-1.8	-5.3	-3.6	-3.7	-4.5
2004	-5.9	-3.0	0.7	1.8	-4.6	-4.2	-2.2	-0.8	-2.8	-2.5	-4.9	-5.4	-5.9	-5.2	-6.0	-4.9	-1.7	-1.9	-4.1	-3.3	-3.7	-2.9
Year ahead	**Czech Rep.**		**Estonia**		**Cyprus**		**Latvia**		**Lithuania**		**Hungary**		**Malta**		**Poland**		**Slovenia**		**Slovakia**		**RAMS**	
	F	**R**	**F**	**R**	**F**	**R**	**F**	**R**	**F**	**R**	**F**	**R**	**F**	**R**	**F**	**R**	**F**	**R**	**F**	**R**	**F**	**R**
2001	-4.8	-5.2	0.7	0.5	-3.3	-3.0	-2.8	-1.6	-2.5	-1.9	-3.0	-4.1	-6.3	-7.0	-2.8	-3.9	-1.3	-2.5	-5.5	-5.4	-3.2	-3.4
2002	-7.6	-7.1	0.1	0.9	-2.5	-3.5	-2.2	-3.0	-1.8	-1.7	-3.6	-9.2	-4.7	-6.2	-5.1	-3.9	-1.2	-2.3	-5.0	-7.2	-3.4	-4.3
2003	-6.6	-12.6	-0.3	3.1	-2.1	-6.4	-2.5	-1.5	-1.9	-1.9	-5.7	-6.2	-5.3	-9.6	-4.5	-3.9	-1.3	-2.0	-4.8	-3.7	-3.5	-4.5
2004	-6.3	-3.0	-0.4	1.8	-3.7	-4.2	-2.7	-0.8	-3.1	-2.5	-4.4	-5.4	-5.8	-5.2	-5.9	-4.9	-1.8	-1.9	-4.0	-3.3	-3.8	-2.9

Notes on government balance:
Hungary: 2004(R) + 0.9 corresponding to reclassification of pension reform cost.