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The accuracy of the European Commission's
forecasts re-examined

Laura González Cabanillas and Alessio Terzi



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By Laura González Cabanillas and Alessio Terzi

Abstract

This paper analyses the Commission's forecast track record, by building on previous analyses conducted at the end of the 1990s (Keereman, 1999) and updated just before the beginning of the economic and financial crisis (Melander et al, 2007). The extension of the observation period to 2011 allows a first analysis of forecast accuracy during the years of the economic and financial crisis. Beyond this most recent development, this update also includes a comparison of forecast errors in all past recession and non-recession periods. For the first time, the track-record analysis includes the Member States which joined the European Union in 2004 and 2007. Moreover, the accuracy analysis was expanded to encompass also short-term GDP growth forecasting. As in previous exercises, a comparative analysis of the forecasts by the European Commission, IMF and OECD is carried out.

Over the full timespan, forecasts for the EU and euro area are found to be generally unbiased. The same holds true for the outlook for most Member States, largely confirming earlier results. Moreover, the Commission services track record appears generally in line with that of the OECD, IMF and Consensus Economics, and in some cases better. Finally, while the analysis points to a limited impact of the crisis on the accuracy of the Commission's current-year forecasts, a significant deterioration of the accuracy of year-ahead projections is found. This applies in particular for the forecasts of GDP, investment, inflation and the government budget balance, due mainly to larger forecast errors in the recession year 2009, which by all standards proved exceptional and unanticipated by institutional and market forecasters.

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The views expressed in this paper are personal and should not be attributed to the European Commission. Corresponding author: Laura González Cabanillas, DG ECFIN, European Commission; email: laura.gonzalez.cabanillas@ec.europa.eu

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1. INTRODUCTION

Economic forecasts are widely used as a basis for economic policy analysis and decision-making. This calls for a regular assessment of forecasting performance. In recognition of the importance of providing high-quality predictions, the Commission's forecasting performance was first examined by Keereman in 1999, with an update carried out by Melander et al. in 2007.¹ Both studies concluded that the Commission's forecasts 'dispose of a reasonable track record'.

The macroeconomic environment has changed considerably since the 2007 update. The euro-area and EU economies entered the Great Recession of 2008-2009. Therefore, the *first* aim of this paper is to look at whether the ex-post accuracy of the Commission's fully-fledged forecasts has changed in recent years. This is done by comparing the forecast errors in the observation period 1969-2007 and those for the whole period until 2011, thus including the 2008-2009 crisis years. The *second* aim is to include a forecast accuracy analysis for the Member States which joined the European Union in 2004 and 2007. The *third* aim is to expand the analysis to short-term GDP growth forecasting. Finally, the *fourth* aim is to compare the Commission's and other international institutions' forecasting performance.

It should be noted upfront that macroeconomic forecasts are conditioned by the assumptions adopted regarding the development of exogenous factors. In particular the assessment of world GDP and trade is crucial. The oil price baseline assumption also represents an important variable for all forecasts. Moreover, for budgetary policy, the European Commission uses a no-policy change assumption. Only those policy measures that are known in sufficient detail are taken into account. This may have a particular impact on the forecast errors. Conclusions on the forecast accuracy must therefore be drawn with due care.²

The remainder of the paper is structured as follows: section 2 discusses the variables, data and aggregates used in the analysis, while section 3 recalls the main definitions and summary statistics. The results for the extended observation period and the impact of the business cycle on forecasting performance are presented in sections 4 and 5. Section 6 presents the first analysis of Commission forecast errors for new Member States. Sections 7 and 8 present error persistence and bias tests. Section 9 analyses the accuracy of the Commission's quarterly GDP forecasts, whereas section 10 compares the track record of the Commission with that of other institutional forecasters. Finally, section 11 concludes.

¹ See Keereman, F. (1999) and Melander et al. (2007).

² Keereman, F. (2003) showed that the European Commission's external assumptions were formulated in a reasonably accurate way.

2. VARIABLES AND DATA

Six forecast variables are reviewed: real GDP growth, inflation, the general government balance, total investment, the unemployment rate and the current account-to-GDP ratio. To facilitate comparability over time, these variables have been chosen and processed in a similar manner as in the previous two studies. The choice of *real GDP growth*, *inflation* and the *general government balance* reflects the importance of these variables for economic analysis in general; *total investment* is included as it is the most volatile demand component; while the *unemployment rate* and the *current-account balance* are assessed in view of their significance for the policy debate.

In terms of selecting forecast and outturn data, the approach adopted here is the same as that used in the earlier studies. The *current-year forecast* is concerned with the quality of the outlook carried out at the beginning of the year for that year, while the *year-ahead forecast* deals with the following year. Current-year forecasts are taken from the Commission's spring forecasts, whereas year-ahead forecasts come from the autumn forecasts. An assessment of t+2 forecasts which are added each autumn has not been carried out to date, but could be envisaged for the future. Turning to the outturn data, realisations for the current year forecasts are the so-called 'first available estimates' presented in the spring forecast of the subsequent year (i.e. the outcome for year t is taken from the spring forecast in t+1). Realisations for the year-ahead forecasts are the so-called 'first settled estimates' presented in the autumn forecast following the year to be forecast (i.e. the outturn for year t+1 is taken from the autumn forecast in year t+2).

On the basis of this approach, the forecast errors are computed up to 2011 for the current and year-ahead outlook (as outturn data for 2012 are not yet available).

In contrast to the two previous studies, this update examines the Commission's track record for the 27 Member States, including recently-acceded Member States. It also analyses the EU and euro-area aggregates. As new countries have subsequently joined both the EU and the euro area, these aggregates have changed somewhat since previous studies were conducted. The EU aggregate now covers the EU25 for the period 2004-2006 and the EU27 from 2007 on, while the euro area includes Slovenia from 2007, Malta and Cyprus from 2008, Slovakia from 2009 and Estonia in 2011. The forecasts and outturns always refer to the aggregate at the time of the forecast.

3. DEFINITIONS AND SUMMARY STATISTICS

The forecast error is defined as follows:

$$e_{t,t} = y_{t,t} - y_t \text{ for the current year}$$

and

$$e_{t+1,t} = y_{t+1,t} - y_{t+1} \text{ for the year ahead}$$

where $y_{t,t}$ and $y_{t+1,t}$ are the forecasts made at t for period t and $t+1$ respectively; y_t is the realisation for year t ; and y_{t+1} is the realisation for year $t+1$.

In addition, the summary statistics used to measure forecasting performance in the previous studies are drawn upon again in this paper. These are recalled below.

- The *mean error* (ME) refers to the average difference between the forecast and the outturn. It is only a rough indicator of quality as positive and negative errors can offset each other, thereby limiting the size of the error. The ME is however a pointer to a possible bias in the forecast. More formally,

$$ME = \frac{1}{T} \sum_{t=1}^T e_{t,t} \text{ for the current year}$$

and

$$ME = \frac{1}{T} \sum_{t=1}^T e_{t+1,t} \text{ for the year ahead.}$$

- The *mean absolute error* (MAE) is the average absolute difference between the forecast and the outturn. Negative errors are treated as positive ones meaning that errors can no longer cancel each other out. The MAE is thus a more accurate measure of the average forecast error than the ME. Formally,

$$MAE = \frac{1}{T} \sum_{t=1}^T |e_{t,t}| \text{ for the current year}$$

and

$$MAE = \frac{1}{T} \sum_{t=1}^T |e_{t+1,t}| \text{ for the year ahead.}$$

- The *root mean squared error* (RMSE) is a measure of the relative size of the forecast error. It takes into account the fact that large forecast errors are usually considered more harmful than small differences. Formally,

$$RMSE = \sqrt{\frac{1}{T} \sum_{t=1}^T e_{t,t}^2} \text{ for the current year}$$

and

$$RMSE = \sqrt{\frac{1}{T} \sum_{t=1}^T e_{t+1,t}^2} \text{ for the year ahead}$$

4. RESULTS OF ACCURACY TESTS

This section examines whether the accuracy of the Commission's economic forecasts has changed since the start of the Great Recession in 2008. This is done by comparing the forecast accuracy in the observation period 1969-2007 and that of the whole period until 2011. Summary statistics of forecast errors for real GDP growth, inflation and the general government balance-to-GDP ratio are presented in Tables 1-3. Those for the pre-crisis period (1969-2007) are displayed in italics. The tables for the remaining variables are provided in Annex A.

4.1. REAL GDP GROWTH

While the addition of four years has only a small effect on the error statistics for current-year forecasts, it has a more substantial influence for the year-ahead outlook. As can be seen from Table 1, the average forecast error for real GDP growth for the current year - as measured by the *ME* - has increased marginally for the EU as a whole (+0.01 pp.), and decreased somewhat for the euro-area aggregate (-0.03 pp.). A deterioration in forecasting performance is however evident at the aggregate level for the year-ahead outlook (+0.08 pp. for the EU and +0.30 pp. for the euro area), which implies that during the crisis years forecasts have on average exceeded outturns. For the current-year forecast, mean errors at Member-State level are mostly small, and roughly as often positive as negative. They are somewhat larger and more often positive for the year-ahead forecast, which could suggest a bias. However, the more formal analysis in section 8 below does not support the existence of a bias, with the exception of the forecasts for Italy.

Table 1: Forecast errors for GDP

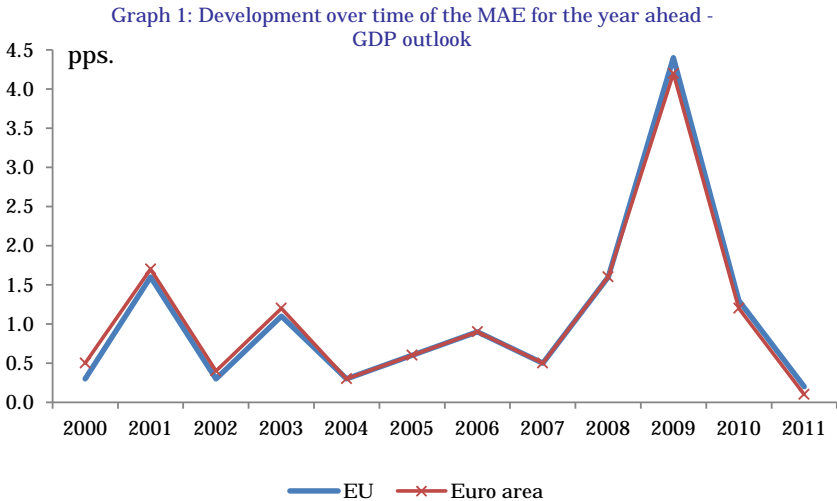
(Summary statistics for pre-crisis period displayed in italics below)

pps.	Sample*	ME				MAE				RMSE			
		current year		year ahead		current year		year ahead		current year		year ahead	
Belgium	69/11	-0.08	<i>-0.08</i>	0.24	<i>0.21</i>	0.68	<i>0.69</i>	1.14	<i>1.11</i>	0.83	<i>0.85</i>	1.53	<i>1.50</i>
Denmark	73/11	0.24	<i>0.15</i>	0.38	<i>0.17</i>	0.73	<i>0.66</i>	1.08	<i>0.94</i>	0.95	<i>0.86</i>	1.50	<i>1.21</i>
Germany	69/11	0.00	<i>0.06</i>	0.33	<i>0.31</i>	0.83	<i>0.82</i>	1.32	<i>1.22</i>	1.13	<i>1.11</i>	1.76	<i>1.62</i>
Ireland	73/11	-0.43	<i>-0.57</i>	-0.38	<i>-0.76</i>	1.63	<i>1.60</i>	2.32	<i>2.16</i>	2.00	<i>1.93</i>	2.86	<i>2.56</i>
Greece	81/11	0.08	<i>-0.15</i>	0.33	<i>-0.15</i>	0.79	<i>0.67</i>	1.20	<i>0.85</i>	1.06	<i>0.86</i>	1.74	<i>1.19</i>
Spain	86/11	-0.14	<i>-0.22</i>	0.07	<i>-0.16</i>	0.53	<i>0.54</i>	0.90	<i>0.76</i>	0.73	<i>0.75</i>	1.25	<i>1.02</i>
France	69/11	0.03	<i>0.04</i>	0.35	<i>0.28</i>	0.55	<i>0.55</i>	0.87	<i>0.84</i>	0.72	<i>0.73</i>	1.21	<i>1.17</i>
Italy	69/11	0.42	<i>0.41</i>	0.76	<i>0.65</i>	0.85	<i>0.86</i>	1.33	<i>1.23</i>	1.17	<i>1.19</i>	1.84	<i>1.70</i>
Luxembourg	69/11	-0.47	<i>-0.65</i>	0.09	<i>-0.14</i>	1.47	<i>1.42</i>	2.09	<i>1.99</i>	1.99	<i>1.92</i>	2.75	<i>2.66</i>
Netherlands	69/11	-0.01	<i>-0.04</i>	0.07	<i>-0.03</i>	0.69	<i>0.71</i>	1.13	<i>1.07</i>	0.88	<i>0.91</i>	1.46	<i>1.34</i>
Austria	95/11	-0.05	<i>0.05</i>	0.30	<i>0.16</i>	0.52	<i>0.51</i>	1.01	<i>0.75</i>	0.66	<i>0.69</i>	1.44	<i>0.96</i>
Portugal	86/11	0.14	<i>0.20</i>	0.44	<i>0.32</i>	0.72	<i>0.66</i>	1.02	<i>0.90</i>	0.88	<i>0.84</i>	1.27	<i>1.14</i>
Finland	95/11	0.16	<i>-0.11</i>	0.32	<i>-0.29</i>	1.25	<i>1.06</i>	1.86	<i>1.31</i>	1.55	<i>1.37</i>	2.79	<i>1.58</i>
Sweden	95/11	-0.05	<i>-0.06</i>	0.31	<i>0.14</i>	0.94	<i>0.66</i>	1.39	<i>0.82</i>	1.33	<i>0.87</i>	1.99	<i>1.04</i>
United Kingdom	73/11	0.07	<i>-0.01</i>	0.35	<i>0.21</i>	0.68	<i>0.67</i>	1.13	<i>1.03</i>	0.87	<i>0.87</i>	1.48	<i>1.35</i>
European Union	69/11	0.10	<i>0.09</i>	0.37	<i>0.29</i>	0.50	<i>0.49</i>	0.95	<i>0.85</i>	0.71	<i>0.71</i>	1.37	<i>1.21</i>
Euro area	98/11	0.13	<i>0.16</i>	0.50	<i>0.20</i>	0.40	<i>0.36</i>	1.02	<i>0.69</i>	0.55	<i>0.51</i>	1.47	<i>0.83</i>

Looking at a more telling estimate of the forecast error, the *MAE*, the error for the EU aggregate has remained largely unchanged for the current-year outlook (at 0.50 pp.) but has increased slightly (+0.04

pp. to 0.40 pp.) for the euro-area aggregate. For the year ahead, it has increased significantly for both aggregates, but particularly for the euro area (+0.10 pp. for the EU and +0.33 pp. for the euro area). The MAE for the year ahead now stands at broadly 1 pp. for both aggregates. Similarly, the *RMSE* points to almost unchanged forecast errors for the current-year forecast and an increase in the forecast errors for the year-ahead outlook for both the EU (+0.16 pp.) and euro area (+0.64 pp.).

The deterioration in the year-ahead forecast stems from the sizeable forecast errors in the recession year 2009 (see Graph 1). This is not unexpected given the speed at which the crisis spread and deepened. Section 5 will further analyse the forecasting performance in recession periods compared to non-recession periods.



It should be noted that in these comparisons, the changes in error statistics are more sizeable for the euro-area aggregate than for the EU. This is largely explained by the shorter sample size that pertains to the euro area, i.e., recent years have a greater weight in the calculation of the overall error for the euro area, thus making more of a difference.

At the Member State level, unaltered forecast errors for the current year and a deterioration in GDP forecasting performance for the year-ahead are also evident.³ Graph 2 shows the MAE for the 1969-2007 period and for the whole period (1969-2011) for the 15 pre-2004 Member States for the current year forecasts. Graph 3 depicts the MAEs for the year ahead. For the current year, forecast errors have remained largely unchanged when adding the new observations. The exceptions are Greece, Finland and Sweden. In the case of Greece, the larger deterioration is expected to be linked to the exceptionally high uncertainty since 2008. For Finland and Sweden, this is largely explained by the short sample size that pertains to these countries. For the year-ahead forecast, the deterioration is

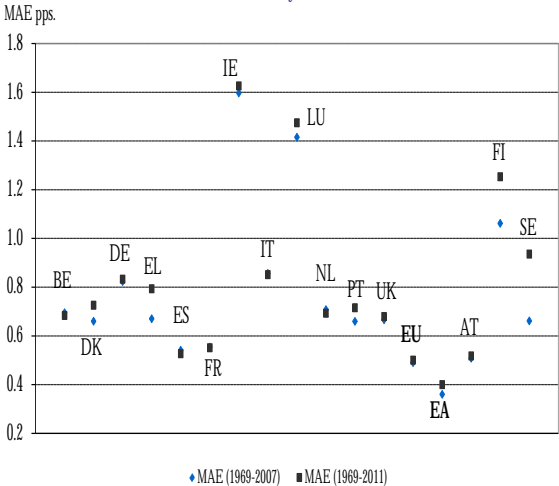
³ Only the 15 pre-2004 Member States are considered here to allow comparison with the results of previous studies. Section 6 examines the 12 Member States that acceded in 2004 and 2007.

broad-based across Member States, but it is significantly more marked (above 0.3 pp.) in the same group of countries; i.e Greece, Sweden and Finland.

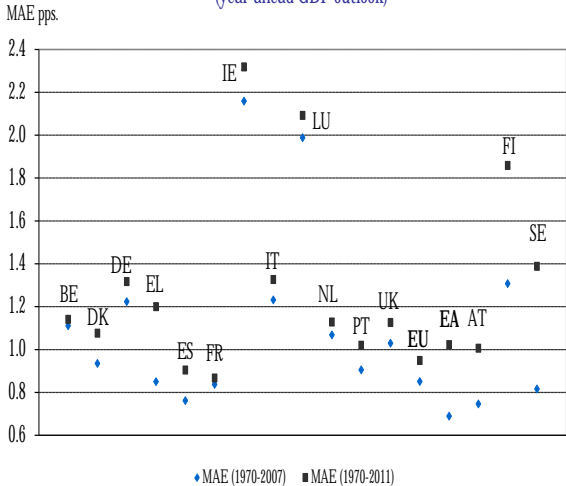
It is also noteworthy that differences remain sizeable across Member States, with some of the smaller countries continuing to exhibit larger errors, particularly Ireland and Luxembourg (above 1 pp. for the current year and close or above 2 pps. for the year ahead). In contrast, Spain, France and Austria show the highest forecast accuracy both for the current and year-ahead forecasts.

While there are many reasons for forecast errors that go beyond the ability of the forecaster - ranging from data availability and quality to the realism of the external assumptions adopted - the volatility of GDP appears to be of particular relevance in some small open economies, in particular Ireland, Finland and Luxembourg. As Graphs 4 and 5 illustrate, the more volatile GDP (measured by the standard deviation of the realisations over the full sample period), the more difficult it appears to be to predict future developments which, in general, leads to greater forecast errors.

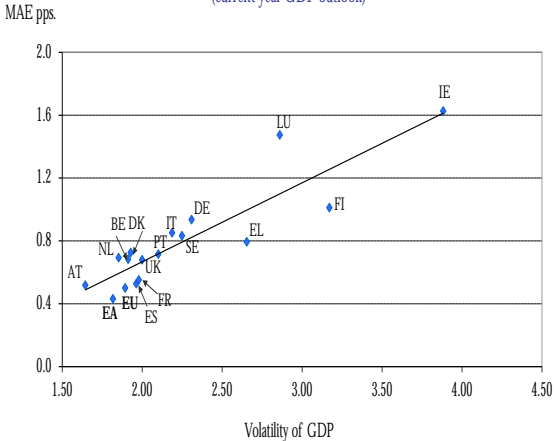
Graph 2: MAE unchanged for most Member States, worsened in a few (current-year GDP outlook)



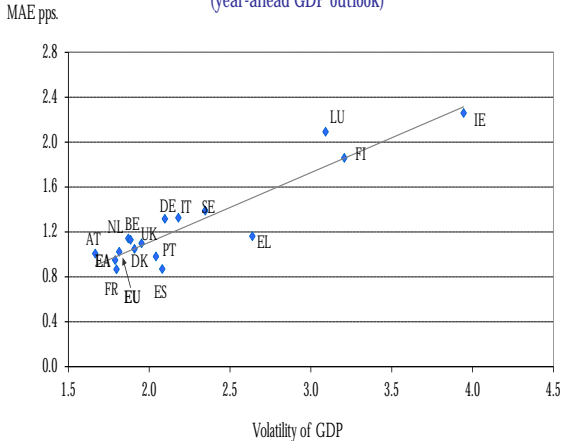
Graph 3: MAE worsened in all Member States (year-ahead GDP outlook)



Graph 4: MAE generally larger when volatility is high (current year GDP outlook)



Graph 5: MAE generally larger when volatility is high (year-ahead GDP outlook)



4.2. INFLATION (PRICE DEFLATOR OF PRIVATE CONSUMPTION)

To allow for comparability with earlier studies, the annual rate of change in the price deflator of private consumption is used. Extending the observation period to 2011 leads to a deterioration in the inflation forecasting performance for the year ahead for the euro area (see Table 2). For the EU and euro-area aggregates, the *ME*, *MAE* and *RMSE* have only marginally changed for the current-year outlook. For the year ahead, the *ME* declined slightly to -0.10 pp. for the euro area. This may suggest a certain tendency to underestimate inflation in the year-ahead forecasts for several Member States, though less than in the past. The *MAE* and *RMSE* point to a significant increase in the forecast error for the euro area (+0.29 pp. for the *MAE* and +0.50 pp. for the *RMSE*), which is almost entirely driven by the forecast error in 2009. As in the case of GDP, the shorter sample for the euro area and therefore the greater weight of 2009 errors in the calculations of the overall error, explain why the forecast deterioration is larger than for the EU aggregate.

Table 2: Forecast errors for inflation (price deflator of private consumption)

(Summary statistics for pre-crisis period displayed in italics below)

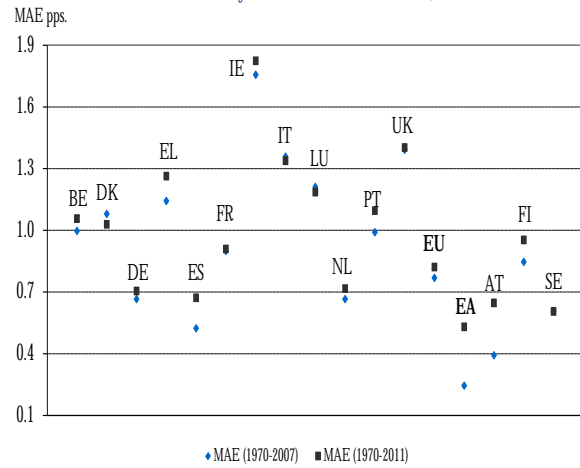
pps.	Sample*	ME				MAE				RMSE			
		current year		year ahead		current year		year ahead		current year		year ahead	
Belgium	69/11	-0.04	<i>-0.01</i>	-0.02	<i>-0.01</i>	0.54	<i>0.54</i>	1.06	<i>1.00</i>	0.68	<i>0.69</i>	1.56	<i>1.53</i>
Denmark	73/11	-0.19	<i>-0.19</i>	-0.35	<i>-0.37</i>	0.53	<i>0.55</i>	1.03	<i>1.08</i>	0.69	<i>0.71</i>	1.75	<i>1.84</i>
Germany	69/11	0.07	<i>0.09</i>	0.01	<i>0.02</i>	0.31	<i>0.30</i>	0.70	<i>0.67</i>	0.42	<i>0.40</i>	0.90	<i>0.86</i>
Ireland	73/11	0.07	<i>-0.02</i>	-0.14	<i>-0.33</i>	0.96	<i>0.94</i>	1.82	<i>1.76</i>	1.30	<i>1.30</i>	2.73	<i>2.65</i>
Greece	81/11	-0.09	<i>-0.04</i>	-0.65	<i>-0.65</i>	0.81	<i>0.82</i>	1.26	<i>1.14</i>	1.19	<i>1.23</i>	1.93	<i>1.88</i>
Spain	86/11	-0.27	<i>-0.27</i>	-0.39	<i>-0.39</i>	0.45	<i>0.42</i>	0.67	<i>0.52</i>	0.60	<i>0.55</i>	0.91	<i>0.73</i>
France	69/11	0.04	<i>0.03</i>	-0.32	<i>-0.36</i>	0.42	<i>0.44</i>	0.91	<i>0.90</i>	0.63	<i>0.66</i>	1.42	<i>1.43</i>
Italy	69/11	-0.11	<i>-0.15</i>	-0.96	<i>-1.07</i>	0.61	<i>0.64</i>	1.34	<i>1.36</i>	0.88	<i>0.91</i>	2.34	<i>2.42</i>
Luxembourg	69/11	-0.03	<i>0.03</i>	-0.16	<i>-0.18</i>	0.51	<i>0.50</i>	1.19	<i>1.21</i>	0.68	<i>0.66</i>	1.55	<i>1.59</i>
Netherlands	69/11	0.01	<i>-0.04</i>	0.21	<i>0.15</i>	0.41	<i>0.39</i>	0.72	<i>0.67</i>	0.58	<i>0.53</i>	1.02	<i>0.89</i>
Austria	95/11	0.00	<i>0.09</i>	0.14	<i>0.18</i>	0.40	<i>0.43</i>	0.65	<i>0.39</i>	0.46	<i>0.47</i>	0.97	<i>0.53</i>
Portugal	86/11	-0.31	<i>-0.41</i>	-0.56	<i>-0.80</i>	0.56	<i>0.55</i>	1.10	<i>0.99</i>	0.74	<i>0.72</i>	1.79	<i>1.64</i>
Finland	95/11	-0.06	<i>-0.14</i>	0.12	<i>0.20</i>	0.45	<i>0.46</i>	0.95	<i>0.85</i>	0.50	<i>0.52</i>	1.15	<i>1.04</i>
Sweden	95/11	-0.06	<i>-0.03</i>	0.42	<i>0.45</i>	0.36	<i>0.32</i>	0.61	<i>0.61</i>	0.44	<i>0.38</i>	0.71	<i>0.74</i>
United Kingdom	73/11	0.05	<i>0.14</i>	-0.32	<i>-0.22</i>	0.76	<i>0.74</i>	1.40	<i>1.39</i>	1.18	<i>1.19</i>	2.15	<i>2.20</i>
European Union	69/11	0.00	0.02	-0.23	-0.22	0.30	0.30	0.82	0.77	0.43	0.43	1.31	1.30
Euro area	98/11	-0.05	-0.07	-0.10	-0.16	0.19	0.15	0.53	0.24	0.26	0.20	0.81	0.31

Unaltered forecast errors for the current year and a slight deterioration in the accuracy of inflation forecasting for the year-ahead are also evident at the Member State level. As Graphs 6 and 7 illustrate, errors continue to differ across Member States, though this difference is less marked than for GDP.

Graph 6: MAE unchanged in most Member States
(current-year inflation outlook)



Graph 7: MAE deteriorated for almost all Member States
(year-ahead inflation outlook)



4.3. GENERAL GOVERNMENT BALANCE (IN PERCENT OF GDP)

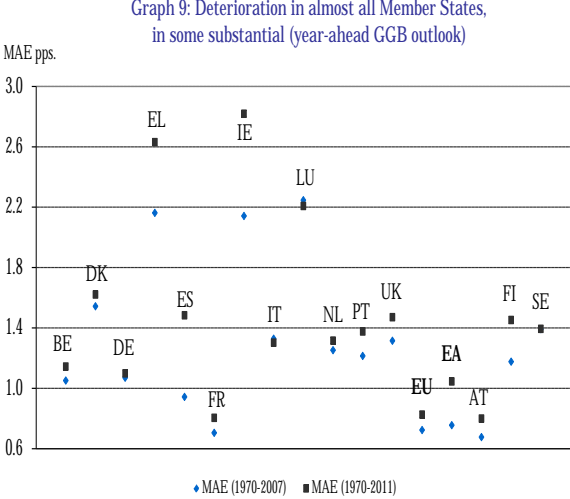
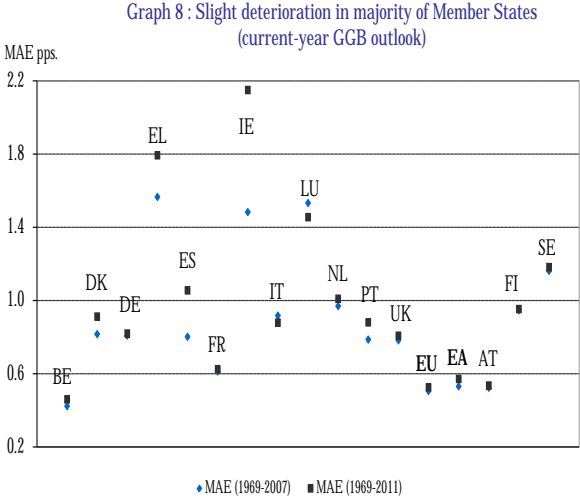
The *ME* for the general government balance-to-GDP ratio (see Table 3) decreased for the current-year forecast, particularly for the euro area (from -0.21 pp. to -0.07 pp.). For the year ahead, the results are more mixed with the *ME* increasing from 0.06 pp. to 0.15 pp. for the EU but decreasing for the euro area, from -0.22 pp. to 0.18 pp. (this is largely explained by the small size of the euro-area sample). Looking at the *MAE* and *RMSE*, the average forecast errors for the general government balance appear to have increased marginally for both the EU and euro-area aggregates for the current-year outlook. For the year ahead, as in the case of GDP and inflation forecasting, extending the observation period to 2011 leads to a deterioration in the long-term forecasting performance for both the EU and euro area. The deterioration is, however, more significant in the euro area (+0.29 pp. for the *MAE* and +0.61 pp. for the *RMSE*).

Table 3: Forecast errors for general government balance

(Summary statistics for pre-crisis period displayed in italics below)

pps.	Sample*	ME				MAE				RMSE			
		current year		year ahead		current year		year ahead		current year		year ahead	
Belgium	69/11	0.13	<i>0.10</i>	0.35	<i>0.31</i>	0.46	<i>0.42</i>	1.14	<i>1.05</i>	0.65	<i>0.60</i>	1.60	<i>1.47</i>
Denmark	73/11	-0.21	<i>-0.13</i>	-0.08	<i>-0.05</i>	0.91	<i>0.82</i>	1.62	<i>1.54</i>	1.29	<i>1.19</i>	2.01	<i>1.93</i>
Germany	69/11	-0.27	<i>-0.21</i>	-0.16	<i>-0.18</i>	0.82	<i>0.81</i>	1.10	<i>1.07</i>	0.99	<i>0.98</i>	1.37	<i>1.32</i>
Ireland	73/11	0.50	<i>-0.36</i>	0.77	<i>-0.15</i>	2.15	<i>1.48</i>	2.82	<i>2.14</i>	3.94	<i>1.86</i>	4.00	<i>2.53</i>
Greece	81/11	0.84	<i>0.50</i>	1.41	<i>0.88</i>	1.79	<i>1.57</i>	2.63	<i>2.16</i>	2.53	<i>2.05</i>	3.66	<i>2.68</i>
Spain	86/11	0.30	<i>-0.03</i>	0.64	<i>0.01</i>	1.06	<i>0.80</i>	1.48	<i>0.94</i>	1.46	<i>1.05</i>	2.37	<i>1.30</i>
France	69/11	-0.06	<i>-0.06</i>	0.10	<i>0.04</i>	0.62	<i>0.61</i>	0.80	<i>0.71</i>	0.84	<i>0.84</i>	1.16	<i>1.00</i>
Italy	69/11	0.14	<i>0.15</i>	0.42	<i>0.41</i>	0.88	<i>0.92</i>	1.30	<i>1.33</i>	1.30	<i>1.35</i>	1.67	<i>1.70</i>
Luxembourg	69/11	-0.75	<i>-0.74</i>	-1.33	<i>-1.38</i>	1.46	<i>1.53</i>	2.21	<i>2.25</i>	1.81	<i>1.88</i>	2.52	<i>2.57</i>
Netherlands	69/11	-0.35	<i>-0.36</i>	-0.10	<i>-0.25</i>	1.01	<i>0.97</i>	1.32	<i>1.25</i>	1.24	<i>1.19</i>	1.71	<i>1.51</i>
Austria	95/11	-0.26	<i>-0.17</i>	-0.36	<i>-0.46</i>	0.54	<i>0.52</i>	0.80	<i>0.68</i>	0.67	<i>0.66</i>	0.98	<i>0.81</i>
Portugal	86/11	-0.21	<i>-0.35</i>	0.18	<i>-0.16</i>	0.88	<i>0.79</i>	1.38	<i>1.21</i>	1.15	<i>1.02</i>	1.98	<i>1.57</i>
Finland	95/11	-0.45	<i>-0.61</i>	-0.43	<i>-0.78</i>	0.95	<i>0.95</i>	1.45	<i>1.18</i>	1.12	<i>1.14</i>	2.01	<i>1.43</i>
Sweden	95/11	-1.03	<i>-1.08</i>	-1.06	<i>-1.21</i>	1.18	<i>1.16</i>	1.39	<i>1.39</i>	1.37	<i>1.32</i>	1.63	<i>1.55</i>
United Kingdom	73/11	0.06	<i>0.03</i>	0.41	<i>0.33</i>	0.81	<i>0.78</i>	1.47	<i>1.31</i>	1.08	<i>1.05</i>	1.86	<i>1.60</i>
European Union	69/11	-0.07	<i>-0.11</i>	0.15	<i>0.06</i>	0.53	<i>0.51</i>	0.83	<i>0.72</i>	0.64	<i>0.62</i>	1.12	<i>0.88</i>
Euro area	98/11	-0.07	<i>-0.21</i>	0.18	<i>-0.22</i>	0.57	<i>0.53</i>	1.05	<i>0.76</i>	0.67	<i>0.64</i>	1.50	<i>0.89</i>

On an individual country basis, the results are similar, with only a slight increase in average forecast errors for the current year and a more marked deterioration for the year ahead. As depicted on Graphs 8 and 9, the largest increase in year-ahead forecast errors concern Ireland, Greece, Spain and Finland.



4.4. UNEMPLOYMENT RATE

Turning to the outlook for the unemployment rate, the forecast errors are in general found to be smaller than those of the previously analysed variables since here a less volatile level is forecast but not a growth rate (GDP, inflation) or a balance (deficit, current account). Extending the observation period to 2011 leads to broadly unchanged average forecast errors for the current-year outlook for both the EU and euro area (see Annex A). For the year-ahead forecast, in terms of the MAE and the RMSE, a small deterioration of the forecast accuracy is detected in the case of the euro area, but not of the EU.

Almost unchanged long-term average errors for the current-year forecasts are also evident at the Member State level. For the year ahead, the largest increase in forecast errors are found in Spain and Portugal, where the rise in unemployment in the period 2008-2011 has been larger than projected.

4.5. CURRENT ACCOUNT

Looking at the *ME*, *MAE* and *RMSE* for the EU, both the average current and year-ahead forecasts have remained roughly unchanged compared to the pre-crisis period errors (Annex A). For the euro area, the *MAE* and *RMSE* have slightly increased for the current year while they have slightly decreased for the year ahead. The *ME* for the euro area decreased for the current year to 0.06 pp. but remained broadly unchanged at 0.28 pp. for the year-ahead forecast.

Among Member States, the largest increase in forecast error is found in Finland for the year ahead forecast.

4.6. TOTAL INVESTMENT

Lastly, the forecast errors for total investment (annual changes in gross fixed capital formation in real terms) are generally larger than those for the previously analysed variables. This is the result of the high volatility of the investment growth. The forecast error for total investment measured by the ME remained broadly stable for the current year but decreased for the euro area (see Annex A). The mean errors remain large, i.e. 0.6 pp. for the EU forecast and 0.7 pp. for the euro area. For the year-ahead outlook, the ME for both the EU and euro area increased significantly, to 0.90 pp. for the EU and 1.6 pp. for the euro area. At the Member State level, mean errors for the year ahead are large and more often positive than negative, which could suggest that there is a tendency to overestimate investment growth.

According to the MAE, the forecast errors for total investment for the EU and euro-area aggregates have remained broadly unchanged for the current year outlook. For the year ahead, a significant deterioration in the forecast accuracy is found for both the EU and euro area.

At the country level, the MAE ranges from 1.4 pps. for the forecast for France to more than 4 pps. in Greece for the current-year outlook. For both forecast years (current and year ahead), a substantial increase in the forecast error was noted in the case of Greece. For the year ahead, the largest increases in MAE (above 0.5 pp.) were recorded in Greece, Finland, Sweden and the UK.

5. FORECASTING PERFORMANCE IN RECESSIONS AND NON RECESSIONS

Turning to the impact of the business cycle on forecasting performance, Tables 4 and 5 present summary statistics for GDP forecast errors in recessions and non-recessions. The term *recession* covers the years 1974-1975, 1980-1982, 1992-1993, 2001, 2003, 2008-2009 and 2011. These broadly correspond to the periods of recession and slow growth identified by the Centre for Economic Policy Research (CEPR) for the euro area⁴. For consistency, but also because of data constraints, this definition is used as a proxy for recessionary periods in the Member States that are not part of the euro area (the UK, Denmark and Sweden) and in the EU as a whole⁵.

⁴ In November 2012, the Euro Area Business Cycle Dating Committee of the CEPR has identified four euro area recessions (1974Q3-1975Q1, 1980Q1-1982Q3, 1992Q1-1993Q3, 2008Q1-2009Q2 and 2011Q4 to date), one period of slow growth (2001q2-2001q4) and one prolonged pause (2003q1-2003q2).

⁵ An alternative approach would be to use the 'technical' definition of a recession, namely two quarters of negative growth. However, for many Member States a sufficiently long time series of quarterly GDP data is unavailable.

Table 4: Forecast errors for GDP (Recession)

pps.	ME		MAE		RMSE	
	current year	year ahead	current year	year ahead	current year	year ahead
Belgium	0.38	1.78	0.80	1.92	1.01	2.37
Denmark	0.97	1.65	1.17	1.72	1.39	2.14
Germany	0.68	2.00	1.10	2.13	1.47	2.68
Ireland	0.80	2.08	1.67	2.89	2.17	3.53
Greece	1.02	1.83	1.16	2.00	1.46	2.56
Spain	0.51	1.60	0.63	1.60	0.77	1.97
France	0.54	1.53	0.68	1.55	0.93	1.86
Italy	0.90	1.84	1.00	2.14	1.20	2.60
Luxembourg	0.98	2.66	1.64	3.01	2.22	3.89
Netherlands	0.69	1.60	0.96	1.62	1.18	2.08
Austria	0.32	1.50	0.76	1.90	0.93	2.36
Portugal	0.80	1.70	1.26	1.70	1.33	1.90
Finland	1.90	3.28	1.90	3.28	2.26	4.61
Sweden	1.02	2.14	1.10	2.38	1.38	2.89
United Kingdom	0.24	1.51	1.03	1.66	1.21	2.09
European Union	0.65	1.81	0.73	1.81	1.04	2.27
euro area	0.58	1.76	0.58	1.76	0.73	2.22

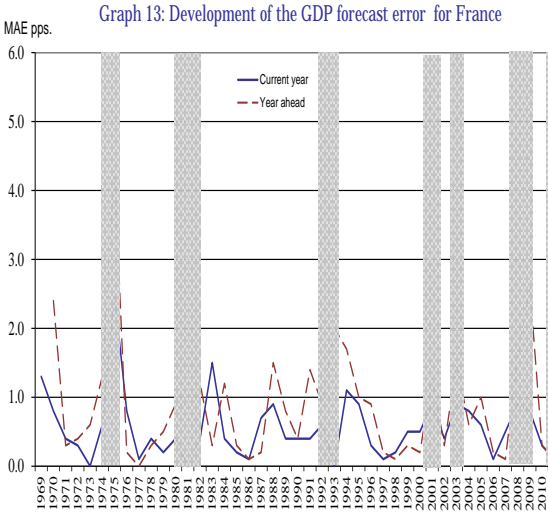
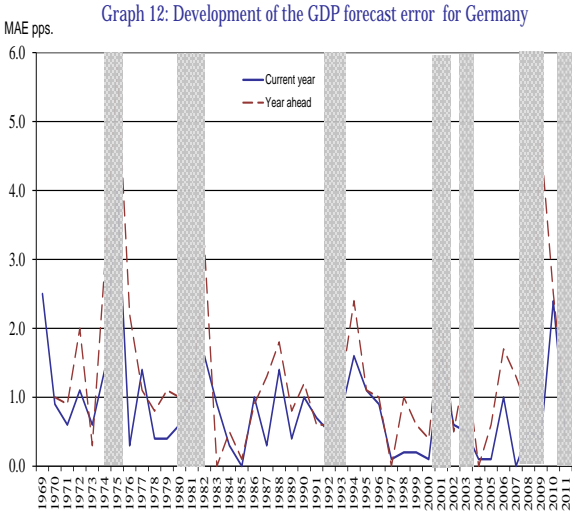
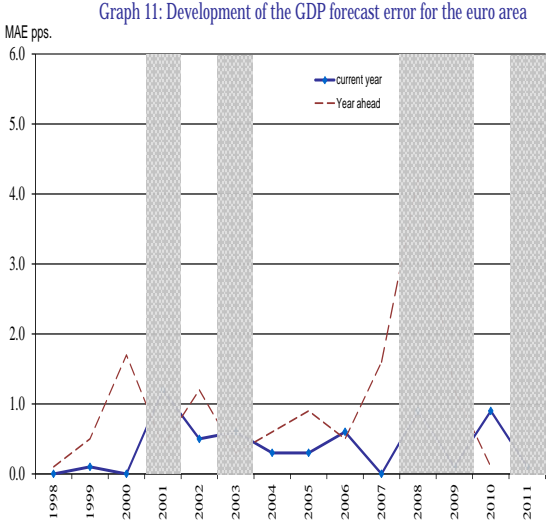
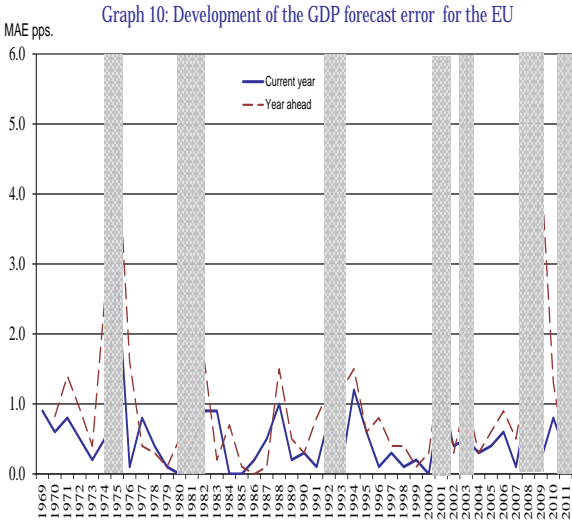
Tables 4 and 5 confirm the initial presumption that GDP growth forecasts are less accurate in a recessionary environment. As expected, the forecast error for the EU and euro-area aggregates during recessions – whether measured by the *ME*, *MAE* or *RMSE* – is considerably larger than in non-recessionary periods. For example, the *MAE* for the current year forecast for the aggregates is almost twice as high when the economy is in recession than when it is not. The difference is even more significant for the year-ahead outlook – in this case, the *MAEs* for the EU and euro area are three times larger during recessions. The picture is broadly similar at the Member-State level.

Table 5: Forecast errors for GDP (Non recession)

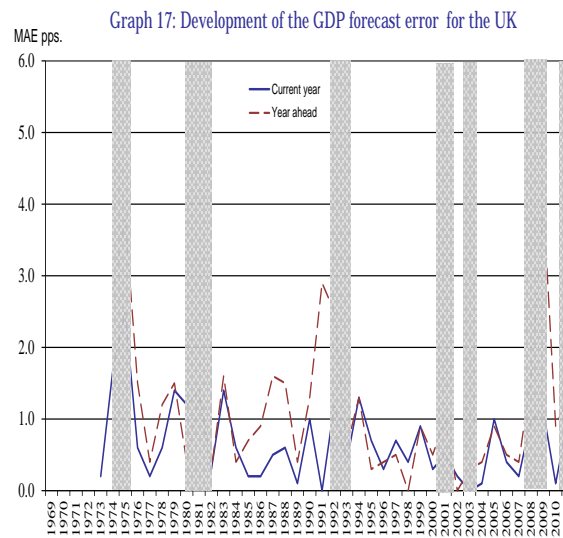
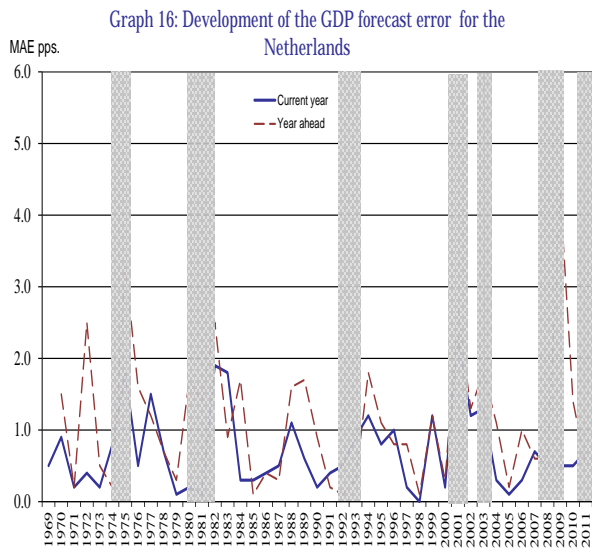
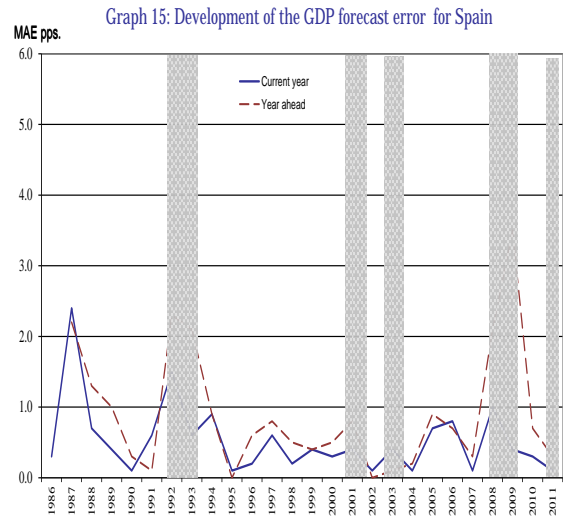
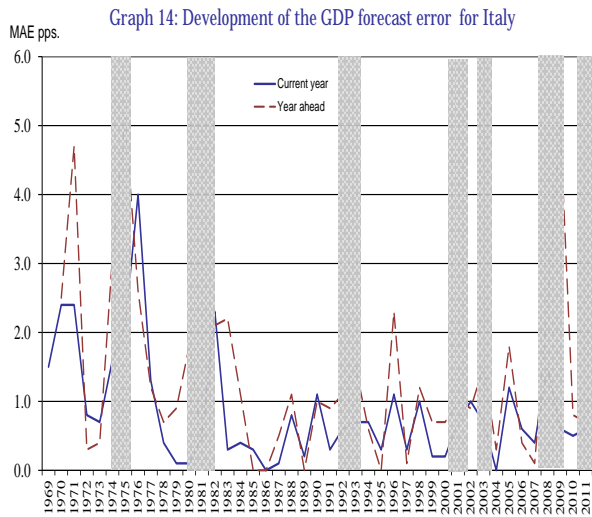
pps.	ME		MAE		RMSE	
	current year	year ahead	current year	year ahead	current year	year ahead
Belgium	-0.26	-0.38	0.64	0.83	0.76	1.01
Denmark	-0.08	-0.20	0.53	0.78	0.66	1.09
Germany	-0.27	-0.34	0.73	0.99	0.96	1.20
Ireland	-0.97	-1.51	1.61	2.05	1.92	2.49
Greece	-0.31	-0.21	0.65	0.91	0.85	1.31
Spain	-0.38	-0.52	0.49	0.63	0.71	0.82
France	-0.17	-0.13	0.50	0.59	0.62	0.81
Italy	0.23	0.33	0.79	1.00	1.15	1.42
Luxembourg	-1.02	-0.94	1.41	1.73	1.89	2.14
Netherlands	-0.28	-0.54	0.59	0.93	0.74	1.11
Austria	-0.20	-0.20	0.42	0.63	0.51	0.79
Portugal	-0.11	-0.04	0.52	0.76	0.64	0.91
Finland	-0.57	-0.92	0.98	1.27	1.14	1.47
Sweden	-0.50	-0.46	0.87	0.98	1.31	1.45
United Kingdom	-0.01	-0.19	0.53	0.88	0.66	1.09
European Union	-0.11	-0.20	0.41	0.61	0.52	0.76
euro area	-0.12	-0.29	0.30	0.56	0.42	0.65

One reason for the poorer forecasting performance in recessions is the difficulty in predicting turning points. Another is that GDP forecasts tend to be overly optimistic in a recessionary environment as shown by the across-the-board positive ME in Table 4⁶.

In order to compare the Commission's forecasting performance during the current crisis with that of past recessions, the following graphs show the development of the absolute GDP forecast error over time for the EU, the euro area and the largest economies. Recession periods are shaded.



⁶ In contrast, in a non-recessionary environment, GDP forecasts tend to be overly pessimistic for all Member States (except Italy), particularly for Ireland, Luxembourg and Finland (see Table 5).

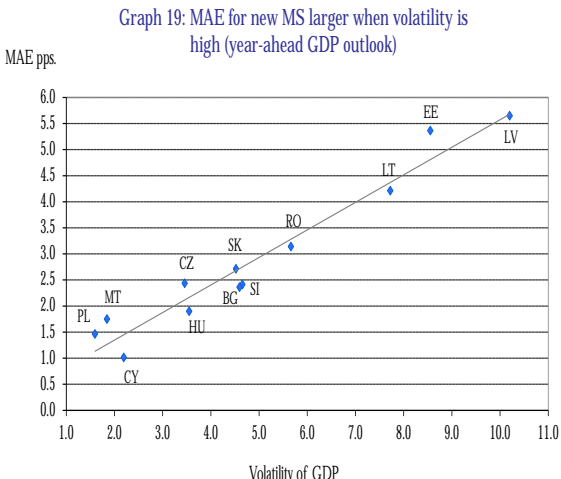
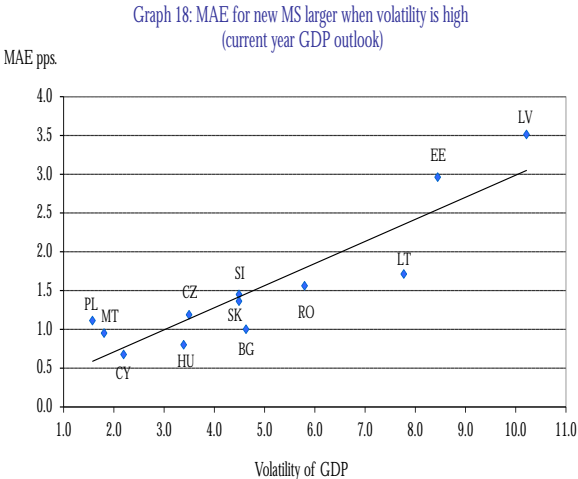


The illustrations presented in Graphs 10-17 indicate that forecast errors are typically larger in and around economic recessions. They also show that forecasting performance during recessionary periods has generally improved over time for the current year outlook, at both the aggregate and larger Member State level. For the year-ahead forecasts, the errors for 2008, and in particular 2009, suggest the opposite. The errors for 2009 for the EU and the larger Member States are broadly of the same order of magnitude as those of the 1975 recession, which in terms of output losses is the closest to the latest crisis.

6. FORECAST ERRORS FOR THE NEW MEMBER STATES

This section extends the analysis of forecast errors to the twelve Member States that joined the EU in 2004 and 2007. This is the first European Commission published analysis of forecast errors for these countries. The sample consists of 11 observations. Although, given the small number of data points involved, the robustness of the results obtained for the latter countries is still limited, it was deemed appropriate to start looking at the accuracy of these forecasts, with the prospect of expanding the dataset in the years to come. Here, forecast errors for only three variables are commented: real GDP growth, inflation and general government balance-to-GDP ratio. They are compared to the average error of the 15 old Member states over the same time period (2004-2011). Table 4 presents summary statistics for forecast errors (*MAE* and *RMSE*) for the three variables for the new Member States, for the old Member States as well as for the EU and euro-area aggregates.

Judging from Table 6, for GDP, the forecast errors - as measured by the *MAE* and *RMSE*- for the period 2004-2011 are in general larger for the New Member States than for the average of old Member States. This is true for both the current and year-ahead forecasts. The only exceptions are Cyprus for both forecast years, Hungary for the current year and Poland for the year ahead forecast. It is also noteworthy that differences are sizeable across new Member States. Forecast errors are the highest in Estonia, Latvia and Lithuania (above 1.7 pp. for the current year and above 4 pps. for the year ahead). In contrast, Poland, Malta and Cyprus show the highest forecast accuracy both for the current and year-ahead forecasts. The volatility of GDP appears to be also of particular relevance in explaining forecast errors in the case of new Member States (Graphs 18 and 19).



For inflation, similar conclusions can be drawn. The forecast errors are in general larger for the new Member States than for the average of old Member States for both forecast years. However, the difference in forecast accuracy is less marked than for GDP. The only countries for which forecast errors are smaller than the average error of old Member States are Poland for the current year forecast and Hungary for the year-ahead forecast. Forecast errors are the highest in Latvia, Bulgaria and Estonia.

Forecast accuracy for the general government balance is found to be on average similar for new and old Member States according to the MAE for both current and year-ahead forecast years. Measured by the RMSE, the forecast error is on average lower in new Member States. Forecast accuracy is the highest in Slovenia, Slovakia and Malta.

Table 6: Forecast errors for GDP, inflation and deficits: old and new Member States

pps.	Sample	GDP				Inflation				General government balance			
		MAE		RMSE		MAE		RMSE		MAE		RMSE	
		current year	year ahead	current year	year ahead	current year	year ahead	current year	year ahead	current year	year ahead	current year	year ahead
Belgium	04/11	0.65	1.14	0.69	1.41	0.50	1.23	0.58	1.46	0.59	1.41	0.74	1.94
Denmark	04/11	0.84	1.45	1.12	2.17	0.30	0.38	0.38	0.49	1.51	1.96	1.80	2.30
Germany	04/11	0.61	1.55	0.96	2.08	0.26	0.63	0.40	0.89	0.73	1.18	0.92	1.52
Ireland	04/11	1.35	2.23	1.93	3.37	0.83	1.66	1.07	2.49	4.88	5.31	7.82	7.18
Greece	04/11	1.06	2.00	1.44	2.61	0.55	1.25	0.65	1.63	2.10	3.84	3.38	5.46
Spain	04/11	0.44	1.09	0.55	1.53	0.49	0.91	0.64	1.13	1.66	2.69	2.08	3.72
France	04/11	0.51	0.81	0.59	1.16	0.31	0.58	0.40	0.91	0.49	1.04	0.59	1.58
Italy	04/11	0.68	1.44	0.80	2.10	0.30	0.69	0.38	0.96	0.40	0.90	0.46	1.18
Luxembourg	04/11	1.54	2.23	2.02	2.74	0.48	0.73	0.67	0.96	1.11	1.94	1.37	2.21
Netherlands	04/11	0.45	1.21	0.49	1.72	0.44	0.79	0.69	1.36	1.40	1.64	1.56	2.43
Austria	04/11	0.46	1.28	0.50	1.80	0.36	0.91	0.44	1.27	0.53	0.86	0.62	1.06
Portugal	04/11	0.70	1.18	0.85	1.44	0.51	0.99	0.67	1.75	1.15	1.75	1.38	2.61
Finland	04/11	1.63	2.36	1.76	3.63	0.38	1.08	0.41	1.23	0.95	1.84	1.06	2.55
Sweden	04/11	1.38	2.08	1.74	2.67	0.34	0.55	0.45	0.58	1.20	1.50	1.45	1.79
United Kingdom	04/11	0.61	1.25	0.74	1.67	0.60	0.85	0.84	1.21	0.69	1.63	0.93	2.40
Av. 15 old MS		0.86	1.55	1.08	2.14	0.44	0.88	0.58	1.22	1.29	1.97	1.74	2.66
Slovenia	04/11	1.45	2.51	1.95	4.15	0.96	1.31	1.15	1.71	0.49	1.51	0.62	2.09
Slovakia	04/11	1.36	2.73	1.52	3.91	0.55	1.40	0.74	1.69	0.95	1.43	1.15	2.20
Cyprus	04/11	0.68	1.01	0.96	1.72	0.66	0.90	0.83	1.28	1.78	2.16	2.39	3.13
Malta	04/11	0.95	1.75	1.20	2.12	0.88	1.05	0.96	1.27	0.78	1.03	1.19	1.31
Czech Republic	04/11	1.19	2.46	1.30	3.22	0.51	0.95	0.58	1.25	1.43	1.88	1.68	2.30
Estonia	04/11	2.96	5.28	3.36	6.41	0.96	2.26	1.11	2.79	1.74	2.48	1.95	2.76
Latvia	04/11	3.51	5.65	4.12	7.36	2.44	3.36	2.92	3.68	1.46	3.15	1.65	3.47
Lithuania	04/11	1.71	4.21	2.08	5.97	1.00	1.64	1.23	1.89	1.20	2.00	1.61	2.50
Hungary	04/11	0.80	1.90	0.92	2.88	0.63	0.75	0.66	0.90	1.30	2.38	1.62	3.57
Poland	04/11	1.11	1.46	1.41	1.59	0.43	1.11	0.46	1.25	1.08	1.35	1.17	1.98
Bulgaria	07/11	1.00	2.36	1.60	4.26	1.66	2.90	2.16	3.38	1.50	2.68	1.84	3.65
Romania	07/11	1.56	3.14	1.81	5.41	1.42	1.92	1.68	2.72	1.70	1.50	1.99	2.28
Av. 12 new MS		1.52	2.87	1.85	4.08	1.01	1.63	1.21	1.98	1.28	1.96	1.57	2.60
European Union	04/11	0.48	1.23	0.57	1.77	0.19	0.70	0.28	0.99	0.53	1.15	0.62	1.75
Euro area	04/11	0.40	1.18	0.52	1.70	0.10	0.65	0.27	0.98	0.46	1.14	0.62	1.76

7. PERSISTENCE OF FORECAST ERRORS

It is important to ensure that once a forecast error is made, it does not feed into the next forecast. As a first check for correlation in the forecast errors, we present autocorrelation coefficients up to three lags (see Appendix B). Their significance is tested using the Ljung-Box test. A p-value below 0.05 indicates that the null hypothesis of absence of autocorrelation in the forecast errors is rejected at the 5% level of significance. Results were compared with those obtained in 2007, when the latest similar study was conducted (at the time without the new Member States).

Overall, autocorrelation of forecast errors is not a major issue in the Commission forecasts. At the EU and euro-area level, there are no cases of persistence in forecast errors for the current year outlook. The results for the year-ahead forecast are somewhat less satisfactory for the EU where serial correlation was noted for investment, unemployment and the current account, an issue that was already identified in 2007. In contrast to 2007, no serial correlation is found for inflation.

Looking at Member States, for the current-year forecasts, serial correlation is largely absent in the old Member States, with the exception of the unemployment forecasts for Luxembourg and Portugal and the current account projections for Luxembourg and the Netherlands. The forecasts for German investment also show persistence of forecast errors. The serial correlation that existed back in 2007 for Portuguese GDP forecasts seems to have been resolved. Among the new Member States, serial correlation is found for GDP forecasts for Cyprus and Estonia. For inflation, serial correlation is found in Lithuania and Hungary. Results also show for Cyprus persistence of forecast errors for investment.

For year-ahead forecasts, some more instances of error persistence can be identified. In particular, for GDP, forecast errors are now significantly correlated for up to two periods for both Greece and Ireland, whereas this was not the case up to 2007. Some country forecasts contain autocorrelation for inflation (Denmark, Germany, Ireland, Luxembourg, UK, Austria and Hungary), government balance (Denmark and Ireland), unemployment (Belgium, Denmark, Germany, Greece, Spain, Ireland, Italy, Portugal, UK, Slovakia, Malta and Hungary) and the current account (Belgium, Greece, Spain, Luxembourg and the Netherlands).

8. TEST FOR BIAS IN THE FORECASTS

Forecasts from public national or international institutions are often suspected of being too optimistic.⁷ This section summarises tests for bias in the Commission's projections. One important finding of the original forecast accuracy study was the absence of bias in the Commission's short-term forecasts.

The presence of bias is tested by running the following simple regression:

$$e_{t,t} = \alpha + \varepsilon_t \text{ for the current year (1)}$$

and

$$e_{t+1,t} = \alpha + \varepsilon_{t+1} \text{ for the year ahead (2)}$$

where ε is assumed to be a zero-mean normally distributed error term. The null hypothesis $H_0 : \alpha=0$ is then tested with a t-test. A p-value below 0.05 would imply the occurrence of a bias.

Looking at the results for the six variables, some instances of bias can be detected but overall the Commission's forecasts for the EU, euro area and Member States do not appear overly optimistic. Table 7 presents the test results for GDP, inflation and general government balances. Detailed results for all six variables are presented in Appendix C.

As regards GDP, there appears to be no bias for the EU and euro area as a whole. Although the p-value is clearly lower for the year-ahead forecast, particularly for the EU, it is still above the threshold where a bias would be statistically significant at the 5% level. At the Member State level, Italy is the only country to have a systematic bias that is statistically significant. This bias already existed in 2007. Italian GDP is overestimated by 0.42 pp. for the current year and 0.76 pp. for the year t+1. It is noteworthy though that the bias which was found in the previous study for Luxembourg for the current-year forecast, does not appear statistically significant once the observation period has been extended. This test was run for the first time for the new Member States. Results show no bias for these countries for the GDP outlook.⁸

At the aggregated level, the inflation outlook appears unbiased. At the Member State level, the situation has remained broadly unchanged compared to the 2007 study. Forecasts for Spain and Portugal continue to underestimate inflation by 0.27 pp. and 0.31 pp., respectively for the current year. For the year ahead, Spanish inflation is underestimated by 0.39 pp. while for Portugal, the bias has disappeared once the observation period has been extended. Italy continues to display a significant bias in underestimating the year-ahead inflation outlook with 0.96 pp. In contrast, forecasts for

⁷ See for instance Frankel and Schreger (2012)

⁸ Krkoska, Libor and Utku Teksoz (2009) also concluded that European Commission forecasts for GDP growth for the new Member States were unbiased.

Sweden continue to overestimate inflation for the year-ahead forecast (0.42 pp.). Among the new Member States, forecasts for Latvia seem to significantly underestimate inflation for both forecast years (-2.44 pps. and -2.91 pps. respectively).

Table 7: Forecast errors for GDP, inflation and deficits - Tests for unbiasedness

	GDP				Inflation				General government balance			
	current year		year ahead		current year		year ahead		current year		year ahead	
	α	Signif. $\alpha = 0$	α	Signif. $\alpha = 0$	α	Signif. $\alpha = 0$	α	Signif. $\alpha = 0$	α	Signif. $\alpha = 0$	α	Signif. $\alpha = 0$
European Union	0.10	0.36	0.37	0.08	0.00	0.94	-0.23	0.25	-0.07	0.45	0.15	0.40
Euro area	0.13	0.40	0.50	0.23	-0.05	0.49	-0.10	0.67	-0.07	0.71	0.18	0.67
Belgium	-0.08	0.54	0.24	0.31	-0.04	0.71	-0.02	0.94	0.13	0.21	0.35	0.16
Denmark	0.24	0.11	0.38	0.12	-0.19	0.08	-0.35	0.22	-0.21	0.33	-0.08	0.83
Germany	0.00	0.98	0.33	0.23	0.07	0.31	0.01	0.92	-0.27	0.07	-0.16	0.45
Ireland	-0.43	0.19	-0.38	0.42	0.07	0.75	-0.14	0.75	0.50	0.44	0.77	0.24
Greece	0.08	0.69	0.33	0.30	-0.09	0.68	-0.65	0.06	0.84	0.07	1.41	0.03*
Spain	-0.14	0.33	0.07	0.78	-0.27	0.02*	-0.39	0.03*	0.30	0.30	0.64	0.18
France	0.03	0.79	0.35	0.06	0.04	0.69	-0.32	0.15	-0.06	0.64	0.10	0.58
Italy	0.42	0.02*	0.76	0.01*	-0.11	0.41	-0.96	0.01*	0.14	0.48	0.42	0.11
Luxembourg	-0.47	0.13	0.09	0.84	-0.03	0.81	-0.16	0.52	-0.75	0.01*	-1.33	0.00*
Netherlands	-0.01	0.95	0.07	0.76	0.01	0.92	0.21	0.19	-0.35	0.07	-0.10	0.71
Austria	-0.05	0.78	0.30	0.41	0.00	1.00	0.14	0.56	-0.26	0.10	-0.36	0.13
Portugal	0.14	0.44	0.44	0.08	-0.31	0.03*	-0.56	0.12	-0.21	0.36	0.18	0.65
Finland	0.16	0.69	0.32	0.65	-0.06	0.64	0.12	0.69	-0.45	0.10	-0.43	0.40
Sweden	-0.05	0.88	0.31	0.54	-0.06	0.56	0.42	0.01*	-1.03	0.00*	-1.06	0.00*
United Kingdom	0.07	0.63	0.35	0.15	0.05	0.78	-0.32	0.36	0.06	0.72	0.41	0.18
Slovenia	0.35	0.64	0.94	0.55	-0.16	0.72	0.46	0.48	-0.21	0.37	0.31	0.70
Slovakia	-0.64	0.26	-0.14	0.93	0.15	0.60	0.35	0.59	0.28	0.54	0.60	0.48
Cyprus	0.10	0.79	0.51	0.44	-0.11	0.73	0.05	0.92	-0.22	0.81	-0.24	0.85
Malta	-0.45	0.32	0.05	0.95	0.23	0.54	0.22	0.65	0.05	0.91	0.02	0.96
Czech Republic	-0.36	0.47	0.21	0.87	0.01	0.96	0.62	0.17	-1.00	0.09	-0.75	0.39
Estonia	-0.04	0.98	1.11	0.66	-0.49	0.24	-0.36	0.74	-0.66	0.37	-1.32	0.19
Latvia	-0.19	0.91	1.13	0.69	-2.44	0.01*	-2.91	0.01*	-0.69	0.27	-0.77	0.56
Lithuania	0.11	0.89	0.64	0.78	-0.60	0.18	-0.89	0.20	0.25	0.69	-0.15	0.88
Hungary	0.25	0.48	1.08	0.32	-0.13	0.62	-0.35	0.30	0.05	0.94	-0.57	0.68
Poland	-0.69	0.18	-0.36	0.56	-0.20	0.24	-0.19	0.70	-0.23	0.62	0.05	0.95
Bulgaria	0.80	0.31	1.76	0.42	-0.98	0.37	-1.02	0.56	0.70	0.46	2.32	0.18
Romania	0.80	0.38	2.54	0.35	0.10	0.91	-0.92	0.51	0.78	0.44	1.45	0.15

As regards general government balances, the EU and euro-area aggregates display no bias. Luxembourg and Sweden, however, both continue to show a tendency for a relatively sizeable underestimation for both forecast years (-0.75 pp. and -1.33 pps. for Luxembourg and -1.03 pps. and -1.06 pps. for Sweden, respectively for the current and year-ahead forecasts). One additional country, Greece, now displays a tendency to systematically overestimate the government balance in the year-ahead forecast (1.41 pps.). No bias for the new Member States is found for the general government balance.

When forecasting the general government balance, the European Commission uses the no-policy change assumptions. Only those policy measures that are known in sufficiently detail are taken into account. This may have a particular impact on the forecast errors and bias of the year-ahead forecasts.

Turning to the most volatile demand component, investment, there is a tendency to overestimate investment growth for the EU (by 0.61 pp. and 0.90 pp.), respectively for the current and year ahead outlook, but not for the euro area. Investment growth tends to be overestimated in Greece and Italy in both the current-year and the year-ahead outlook (+2.20 pps. and 2.82 pps. in Greece; 1.15 pps. and 1.78 pps. in Italy respectively). Among the new Member States, a bias in investment growth is also found in the case of Hungary for the year ahead (+5.32 pps.).

As regards unemployment, the aggregate forecast is unbiased for the EU but biased for the euro area for the current-year forecast. Euro-area unemployment rates appear to be overestimated by 0.16 pp. Also, in Ireland a bias in the unemployment outlook is found for the current-year forecast (+0.31 pp.) while for the year-ahead forecast, the bias has disappeared once the observation period has been extended. Malta is the only new Member State for which a bias is found for the current year (0.44 pp.).

For the current-account outlook, the situation deteriorated somewhat in so far that three more countries now display a tendency to systematically under or overestimate the current account for the current or the year ahead (which was not the case in the 2007 report). For Germany the balance is underestimated by 0.28 pp. for the current year, while for Italy and Portugal it is overestimated by 0.50 pp. and 0.94 pp. respectively for the year-ahead outlook. Greece continues to display a significant bias in overestimating the current account balance outlook for both forecast years. No bias for the new Member States is found for the current account balance.

9. ACCURACY OF QUARTERLY GDP GROWTH FORECASTS

An accurate assessment of the state of the economy in real-time, i.e. for the current quarter, is important to have a good basis for the forecast. For the EU and euro-area aggregates, the first estimates of quarterly GDP are released by Eurostat about 45 days after the end of the quarter it covers. Meanwhile higher frequency indicators can be used to produce a timely now-cast of current quarter growth.

The spring forecast, published around the beginning of May, includes a "back-casting" exercise for GDP for the first quarter (Q1) and a "now-casting" exercise for the second quarter (Q2). For the autumn forecast exercise, usually published early-November, the back-casting concerns the third quarter (Q3) and the now-casting the fourth quarter (Q4). With the release of the flash estimates for GDP of Q1 and Q3 only a few days after the publication of the spring and autumn Commission forecasts respectively, quarterly forecasting accuracy is of great importance.

This section examines the accuracy of back-casting and now-casting for EU Member States for each of the four quarters. The forecast data for Q1 and Q2 of each year are taken from the respective spring forecast, while the forecasts for Q3 and Q4 are taken from the autumn forecasts. Actual realisations for Q1 and Q2 in year t are taken from the autumn forecast of year t while realisations for Q3 and Q4 in year t are taken from the spring forecast of year $t+1$.

Table 8 shows the unweighted average of the MAE⁹ across the old 15 Member States (except Greece, Ireland and Luxembourg) for the four quarters for the years 2000-12.¹⁰ The errors refer to the difference between the q-o-q GDP growth forecast and the outturn. As expected, the Commission performs better when back-casting than now-casting, with the average error in Q1 and Q3 lower than the average errors in Q2 and Q4.

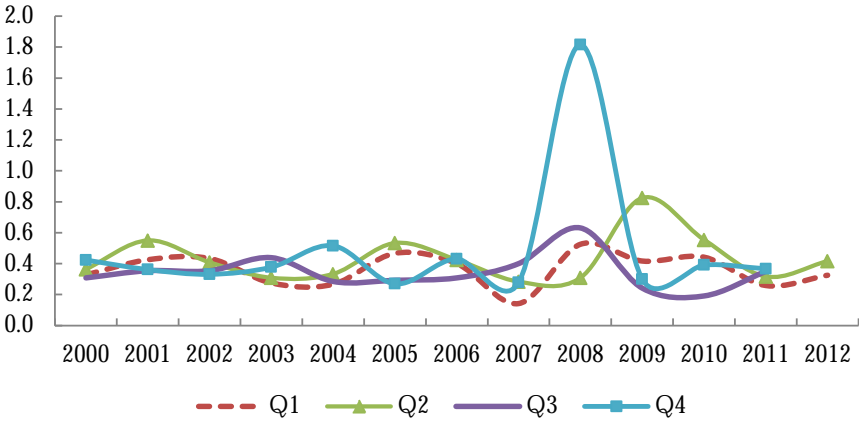
⁹ Note that the MAEs presented here are calculated across Member States, i.e., not across observations for single Member States as in the preceding sections.

¹⁰ For the evolution in time of quarterly forecast accuracy, new Member States have not been considered as their quarterly data is very limited (generally starting in 2007).

Table 8: Unweighted average of Quarterly Mean Absolute Error across old EU Member States (2000Q1 – 2012Q2)

pps.	MAE			
	Spring Forecast		Autumn Forecast	
	Q1	Q2	Q3	Q4
2000	0.33	0.36	0.31	0.42
2001	0.43	0.55	0.35	0.36
2002	0.43	0.41	0.35	0.33
2003	0.28	0.31	0.44	0.38
2004	0.27	0.33	0.28	0.52
2005	0.47	0.53	0.29	0.27
2006	0.40	0.43	0.31	0.43
2007	0.14	0.28	0.40	0.28
2008	0.53	0.31	0.63	1.82
2009	0.42	0.83	0.24	0.30
2010	0.44	0.55	0.19	0.39
2011	0.26	0.32	0.35	0.37
2012	0.33	0.42	:	:
Average	0.36	0.43	0.35	0.49

Graph 20: Development of the MAE of quarterly GDP growth forecasts for the 4 quarters



As can be seen in Graph 20, the forecast accuracy deteriorated substantially between 2008Q4 and 2009Q2, at a time of heightened economic volatility. The largest forecast errors were recorded in 2008Q4 and 2009Q2, which correspond to the "now-casting" exercise of the respective autumn 2008 forecast and the spring 2009 forecast. Since then, quarterly MAEs have been heading back to their pre-crisis levels (about 0.3-0.4 pp.).

Table 9 depicts the MAE by Member States for each of the four quarters for the period 2000Q1-2012Q1. For the EU and euro-area aggregates, back-casting is more accurate than now-casting, in line with the results above. Moreover, forecast accuracy is higher for Q3 than Q1 in both regions. Caution

should however be applied when interpreting these results, as the autumn forecast document has sometimes been published in late November, with a cut-off date after the release of Eurostat's Q3 flash estimates. The second quarter stands out as the less accurate quarter for both aggregates.

Table 9: Quarterly Mean Absolute Error, by Member State (2000Q1-2012Q2)

pps.	MAE					
	Sample*	Spring Forecast		Sample*	Autumn Forecast	
		Q1	Q2		Q3	Q4
Belgium	13	0.23	0.40	12	0.19	0.38
Germany	13	0.32	0.38	12	0.16	0.40
Estonia	7	1.33	1.46	7	1.41	1.79
Ireland	:	:	:	:	:	:
Greece	:	:	:	:	:	:
Spain	13	0.15	0.14	12	0.08	0.23
France	13	0.15	0.40	12	0.22	0.22
Italy	13	0.27	0.28	12	0.18	0.44
Cyprus	8	0.33	0.14	7	0.36	0.53
Luxembourg	:	:	:	:	:	:
Malta	:	:	:	:	:	:
Netherlands	13	0.46	0.38	12	0.33	0.43
Austria	13	0.28	0.30	12	0.29	0.22
Portugal	12	0.48	0.49	12	0.48	0.65
Slovenia	4	1.73	0.78	3	0.60	0.73
Slovakia	5	2.42	1.18	5	0.46	0.78
Finland	13	0.78	1.07	12	0.53	0.68
Euro area	13	0.21	0.28	12	0.10	0.23
Bulgaria	6	1.38	0.78	5	0.72	0.74
Czech Republic	7	0.86	0.52	6	0.37	0.68
Denmark	13	0.52	0.89	11	0.65	0.62
Latvia	7	1.21	0.90	5	0.84	1.06
Lithuania	4	2.05	1.30	6	0.63	1.18
Hungary	7	0.57	0.45	6	1.35	0.53
Poland	7	0.31	0.52	6	0.35	0.63
Romania	5	0.82	0.48	4	0.35	1.43
Sweden	13	0.50	0.22	12	0.40	0.58
United Kingdom	13	0.22	0.28	12	0.20	0.36
EU	13	0.17	0.26	12	0.08	0.23

* Expressed in number of data points rather than annual interval

10. COMPARING GDP FORECAST ERRORS WITH THOSE OF OTHER INTERNATIONAL INSTITUTIONS

This section compares the track record of the Commission with that of other institutions, namely the OECD, IMF, Consensus Economics and the ECB (in this case only for the euro-area aggregate). This is done by comparing the forecast errors for GDP growth of the other institutions with those of the Commission.

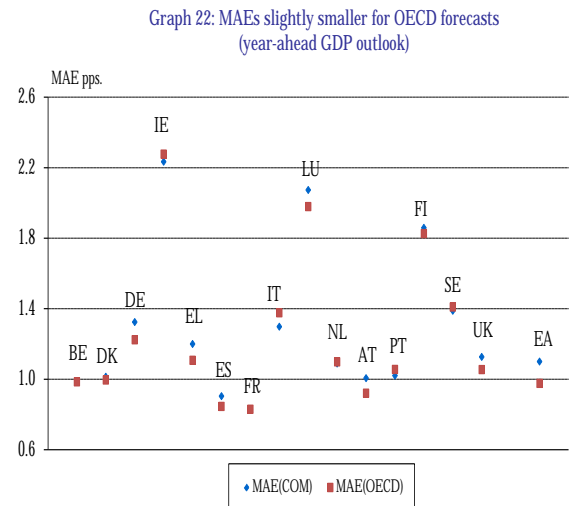
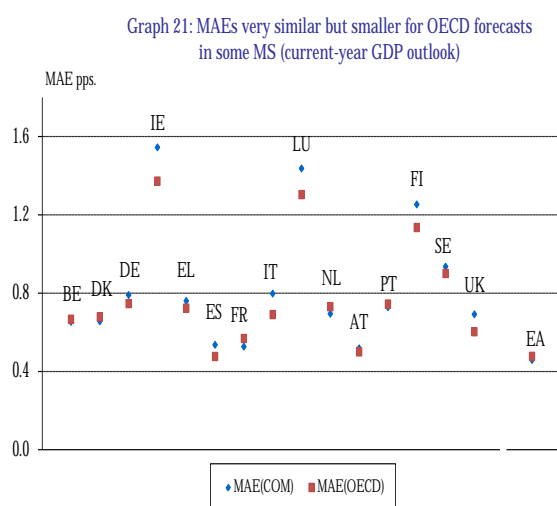
Forecast and realisation data for the other institutions has been collected and compiled in the same way as for the Commission. The current-year and year-ahead forecasts from the OECD come respectively from the June and the December OECD Economic Outlook. The IMF forecasts are taken from the April and October World Economic Outlook. The Consensus forecast means refer to the April and October reports. The forecasts from the ECB are taken from the March ECB Staff macroeconomic projections and the September projections. The outturn data is the same as the one described in Section 2.

10.1. COMPARISON OF FORECASTING PERFORMANCE ACROSS INSTITUTIONS

Turning to the comparison of forecast errors, graphs 21-28 present the *MAE* statistic for the various institutions, compared with the Commission forecast for both the current and year-ahead forecasts. A complete set of summary statistics is provided in Annex D. Forecasts for the same years have been selected so that the Commission's forecasts cover the same timeframe as those of the other forecasters.

10.1.1. Commission versus OECD

Beginning with the *OECD* comparison, Graphs 21 and 22 show in general very similar MAEs for the current year forecasts, except for Ireland, Luxembourg and Finland for which the Commission's MAEs are found significantly larger (more than 0.1 pp. difference). For the year ahead, the OECD seems to perform slightly better than the Commission for most Member States, particularly for Germany, Luxembourg and the euro-area aggregate. To some extent, this could be explained by the timing factor, in that the OECD's Economic Outlook is published in December, i.e. a month later than the autumn forecast. It therefore allows incorporating further information such as Q3 GDP Flash Estimate. This does not mechanically reduce the forecast error for the year ahead, but it permits a better assessment of the carry-over to apply to the year-ahead forecast.

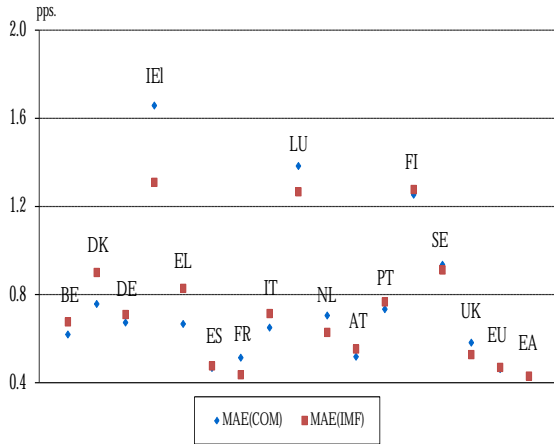


For the new Member States, the forecast errors are also larger for the outlook prepared by the Commission when compared to the OECD for both the current and the year ahead (see Annex D). This is true for the four new Member States covered by the OECD (Slovakia, Czech Republic, Hungary and Poland), except for Hungary for the current year, where the errors are similar to those of the Commission.

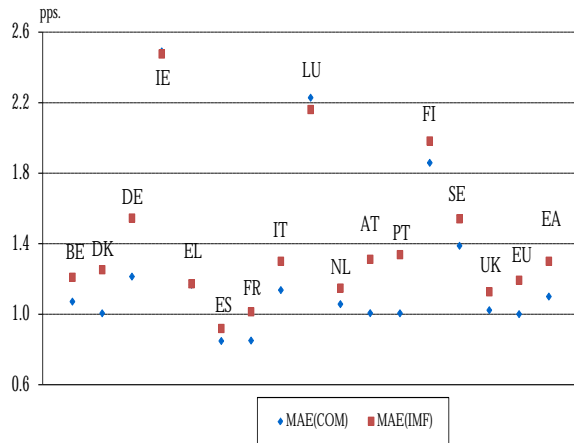
10.1.2. Commission versus IMF

Looking next at the Commission's forecast accuracy relative to that of the *IMF* (Graphs 23-24), results are mixed for the current-year forecast. While for some Member States, the Commission clearly outperforms the IMF (i.e. Denmark and Greece), for others (i.e. Ireland and Luxembourg), it is the IMF that outperforms the Commission. For the EU and euro-area aggregates, the forecast accuracy is similar. For the year ahead, the Commission's forecasts display smaller errors than the IMF's in all Member States, excluding Luxembourg. This holds true also when looking at the EU and euro-area aggregates. However, it should be noted that the different cut-off dates for the two forecasters might contribute to this result. In particular, the Commission's autumn publication is released roughly a month later than the IMF's, allowing the former to take into account further observations of high-frequency indicators.

Graph 23: Mixed performance, either COM or IMF outperforms (current-year GDP outlook)

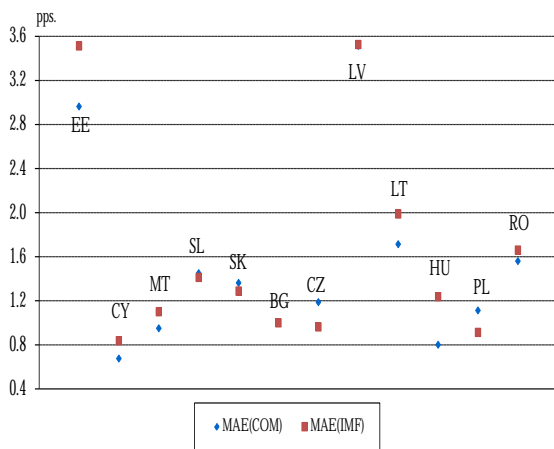


Graph 24: MAE larger for IMF forecasts (year-ahead GDP outlook)

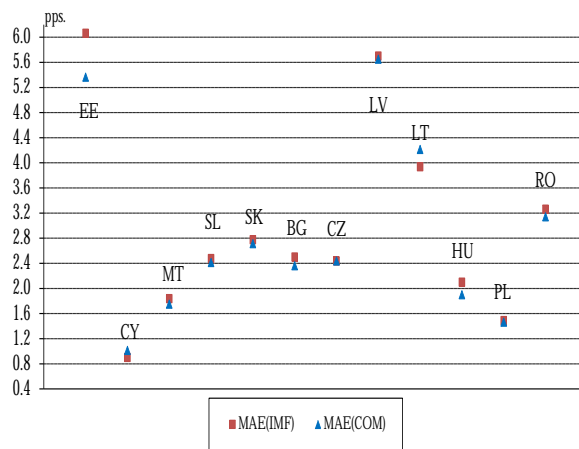


For the new Member States, the errors for the current year seem larger for the forecasts prepared by the IMF, except for Czech Republic and Poland. For the year ahead, forecast errors are broadly similar, except for Estonia for which the Commission clearly outperforms the IMF (Graphs 25 and 26).

Graph 25: MAEs for NMS generally larger for IMF forecasts (current-year GDP outlook)

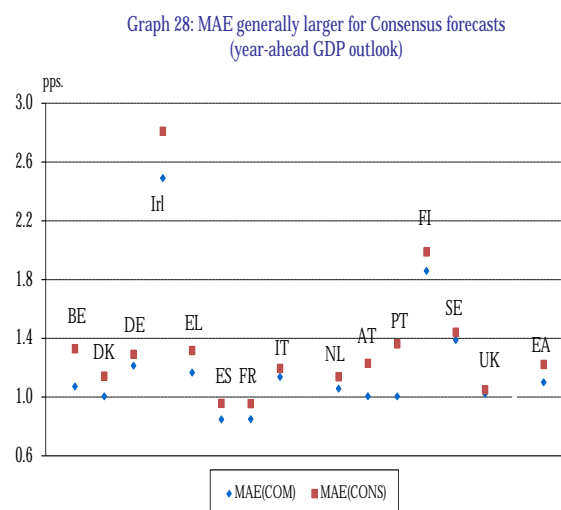
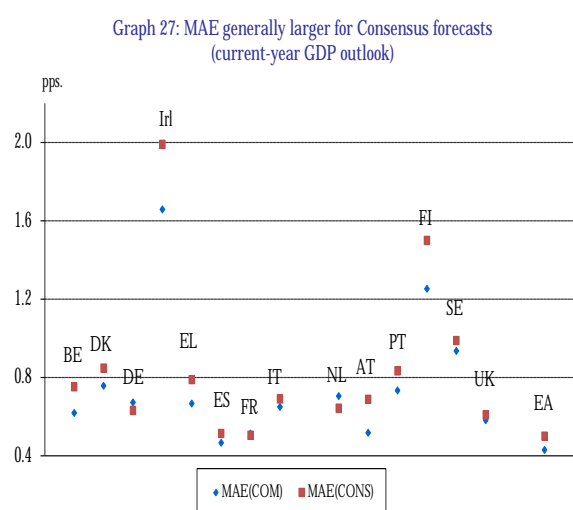


Graph 26: MAEs for NMS very similar (year-ahead GDP outlook)



10.1.3 Commission versus Consensus

The errors associated with the Commission's forecasts are smaller than those of *Consensus* in all Member States analysed for both the current and year-ahead forecasts (Graph 27 and 28).¹¹ The only exception are the Netherlands, where Consensus forecast errors appear slightly smaller for the current-year outlook. In terms of timing, the October Consensus report is used to better coincide with the Commission cut-off date. The Consensus report is usually published around mid-October and the Commission cut-off date for the autumn forecast is usually around 22-24 October. Therefore, timing should not play a large role in explaining the differences in forecast accuracy. One could speculate that the coordinated approach of the Commission forecasts, combining bottom-up forecasts with central guidance and consistency checks, produces more accurate results than the averaging of various forecasters' projections by Consensus.



10.1.4. Commission versus ECB

In order to establish a rough comparison between the accuracy of the Commission's GDP forecasts and the ones released by the *ECB* in its Monthly Bulletin, the mid-point of the ECB staff macroeconomic projection bracket was taken, for both the current year and year ahead for the period 2001-2011. This exercise could be run only for the euro-area aggregate, as the ECB does not release individual Member States' forecasts. As can be seen in Table 10, for the current year, the forecast accuracy is very similar. For the year ahead, the Commission's forecast error appears lower than the ECB's. The different cut-off dates obviously play an important role, as the Commission's autumn publication is released two months later than the ECB's September Staff projections.

¹¹ Due to data availability, the comparison of forecasting performance with Consensus is limited to the 15 old Member States.

Table 10: Mean Absolute Error of GDP forecasts, COM and ECB

MAE						
	<i>Current Year</i>			<i>Year Ahead</i>		
	COM	ECB	Difference	COM	ECB	Difference
EA	0.50	0.46	0.04	1.15	1.26	-0.10

10.2. COMPARISON OF FORECASTING PERFORMANCE SINCE THE CRISIS

Section 4 showed that the extension of the observation period to include 2008-2011 led to a deterioration of the accuracy of Commission forecasts, particularly for the year-ahead projections, due to larger errors in and around recessions. In order to compare forecasting performance across institutions since the beginning of the crisis, the sample is reduced to the period 2008-2011. Annex E presents the MAE statistic for the various institutions, compared with the Commission forecast for both the current and year-ahead forecasts.

For the current year forecast, the comparison with the OECD shows mixed performance, with either the Commission or OECD outperforming. For the euro-area aggregate, the Commission's forecast error appears lower (0.5 pp. compared to 0.7 pp. for the OECD). Relative to that of the IMF, the Commission's forecast accuracy is generally lower for the crisis period. Compared to Consensus, the Commission's forecast errors appear lower, except for Portugal, France, Germany and Ireland.

For the year-ahead forecast, the conclusions remain similar to those for the full sample period. The Commission's forecasts continue to outperform those of the IMF and Consensus but not those of the OECD, which remain more accurate.

Overall, the deterioration in forecasting during the crisis period is not limited to the Commission forecasts but also applies to the other institutions. Moreover, this deterioration does not seem to have been more pronounced in the case of the Commission.

11. CONCLUSIONS

This paper updates the previous assessment of the Commission forecast's track record from 2007, by extending the observation period to 2011 to also take into account the forecasts and outcomes for the crisis years 2009-2011. The track record of six variables is assessed: real GDP growth, inflation, general government balance (in % of GDP), the unemployment rate, the current account (in % of GDP) and total investment. To ensure comparability to the greatest degree possible, data has been processed in a similar manner compared to the previous studies. Moreover, this paper also expands the track record analysis to the twelve Member States which joined the European Union in 2004 and 2007. The paper also includes for the first time an analysis of the accuracy of selected quarterly GDP forecasts (since 2000).

The extension of the observation period to include 2009-2011 points to a limited impact of the crisis on the long-term accuracy of current-year forecasts. However, a significant deterioration of the accuracy of year-ahead projections is found, mainly due to larger forecast errors in the recession year 2009, which by all standards proved exceptional and unanticipated by forecasters. Larger forecast errors are typical in and around recession years. This suggests the decomposition of forecast errors as an important avenue for further analysis. In the context of the crisis, this could in particular shed light on the role that the interest-rate assumptions and the assumption of unchanged fiscal policy play for explaining forecast errors.

The accuracy of forecasts is found to be substantially lower for new Member States, which generally exhibit more economic volatility, than for old Member States over the period 2004-2011. This is true for both GDP and inflation and for both forecast years. For the general government balance, however, forecast accuracy is found to be on average similar, if not better in new Member States.

A test for the persistence of forecast errors was carried out to investigate systematic correlation between prediction errors. It shows that at the EU and euro-area level, there are no cases of persistence in forecast errors for the current-year outlook. The results for the year-ahead forecasts are somewhat less satisfactory for the EU, where serial correlation is noted for investment, unemployment and the current account. At the Member State level, serial correlation is largely absent in the old Member States, with the exception of a few smaller countries for the unemployment and current account forecasts. Among the new Member States, serial correlation was found for GDP forecasts for Cyprus and Estonia.

Confirming the previous analysis, there is no evidence of a bias in the forecast for the EU and euro-area aggregates, thus no systematic over- or underestimation can be detected in the Commission's forecast. At the Member State level, Italy is the only country among the old Member States to have a

systematic and statistically significant bias. This bias already existed in 2007. Results showed no bias for the new Member States for the GDP outlook.

The analysis of the accuracy of quarterly forecasts over the period 2000Q1-2012Q2 shows the largest forecast errors occurring between 2008Q4 and 2009Q2, at a time of heightened economic volatility. Since then, quarterly mean absolute errors have been heading back to their pre-crisis levels (0.3-0.4 pp.). The analysis also shows that the Commission generally performed better in terms of back-casting than now-casting, with the average error in Q1 and Q3 lower than the average errors in Q2 and Q4. This was however not the case for the new Member States in the spring forecasts as Q1 tended to display larger errors than Q2.

The Commission's track record has been similar to that of the OECD, IMF and Consensus Economics. Overall, it appears that the Commission projections scores better than the forecasts released by Consensus and the IMF. For the latter, this may partly reflect the timing of the forecast, with the Commission having an informational advantage. In contrast, the Commission's forecasts do not appear to perform as well as those of the OECD, especially for the year ahead. However, this could partly be explained by the fact that the OECD released its forecast on average one month later (whereas the IMF issued its forecasts earlier than the Commission).

The comparison of forecasting performance across institutions since the beginning of the crisis shows that the deterioration in forecast accuracy was a common phenomenon. Moreover, this deterioration does not seem to have been more pronounced in the case of the Commission.

Overall, the Commission forecasts continue to dispose a reasonable track record. In order to further reduce forecast errors, European Commission staff is constantly developing new forecasting capacities and tools.

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Annex A

Table A1: Forecast errors for unemployment

(Summary statistics for pre-crisis period displayed in italics below)

pps.	Sample*	ME				MAE				RMSE			
		current year		year ahead		current year		year ahead		current year		year ahead	
Belgium	69/11	0.06	<i>0.02</i>	0.30	<i>0.24</i>	0.48	<i>0.47</i>	0.83	<i>0.83</i>	0.61	<i>0.62</i>	1.12	<i>1.12</i>
Denmark	73/11	-0.07	<i>-0.03</i>	-0.16	<i>-0.01</i>	0.52	<i>0.52</i>	1.03	<i>0.98</i>	0.80	<i>0.82</i>	1.30	<i>1.25</i>
Germany	69/11	0.08	<i>0.03</i>	0.11	<i>0.04</i>	0.36	<i>0.33</i>	0.74	<i>0.73</i>	0.52	<i>0.50</i>	1.03	<i>1.02</i>
Ireland	73/11	0.31	<i>0.32</i>	0.34	<i>0.54</i>	0.61	<i>0.61</i>	1.05	<i>0.99</i>	0.85	<i>0.86</i>	1.52	<i>1.41</i>
Greece	81/11	-0.08	<i>0.03</i>	-0.42	<i>-0.29</i>	0.70	<i>0.64</i>	1.18	<i>1.14</i>	0.98	<i>0.91</i>	1.50	<i>1.45</i>
Spain	86/11	0.12	<i>0.34</i>	-0.13	<i>0.25</i>	0.69	<i>0.63</i>	1.38	<i>1.23</i>	0.88	<i>0.81</i>	1.76	<i>1.54</i>
France	69/11	0.05	<i>0.04</i>	0.04	<i>0.04</i>	0.31	<i>0.32</i>	0.56	<i>0.58</i>	0.42	<i>0.43</i>	0.72	<i>0.75</i>
Italy	69/11	0.05	<i>0.04</i>	0.05	<i>0.10</i>	0.70	<i>0.72</i>	0.97	<i>1.02</i>	1.08	<i>1.11</i>	1.47	<i>1.53</i>
Luxembourg	69/11	0.06	<i>0.03</i>	0.03	<i>-0.04</i>	0.37	<i>0.32</i>	0.48	<i>0.39</i>	0.50	<i>0.42</i>	0.67	<i>0.49</i>
Netherlands	69/11	0.24	<i>0.24</i>	0.23	<i>0.25</i>	0.61	<i>0.65</i>	1.00	<i>1.07</i>	1.06	<i>1.10</i>	1.43	<i>1.49</i>
Austria	95/11	0.09	<i>-0.07</i>	0.14	<i>0.08</i>	0.35	<i>0.27</i>	0.53	<i>0.49</i>	0.49	<i>0.39</i>	0.76	<i>0.73</i>
Portugal	86/11	0.17	<i>0.29</i>	0.00	<i>0.30</i>	0.57	<i>0.57</i>	1.04	<i>0.92</i>	0.71	<i>0.71</i>	1.38	<i>1.24</i>
Finland	95/11	0.15	<i>0.06</i>	0.27	<i>0.35</i>	0.39	<i>0.35</i>	0.58	<i>0.48</i>	0.53	<i>0.49</i>	0.84	<i>0.67</i>
Sweden	95/11	-0.11	<i>-0.22</i>	-0.12	<i>-0.19</i>	0.58	<i>0.68</i>	1.04	<i>1.04</i>	0.84	<i>0.93</i>	1.19	<i>1.18</i>
United Kingdom	73/11	0.06	<i>0.06</i>	0.09	<i>0.09</i>	0.27	<i>0.28</i>	0.56	<i>0.57</i>	0.32	<i>0.32</i>	0.78	<i>0.81</i>
European Union	69/11	0.05	0.05	0.07	0.10	0.24	0.24	0.52	0.52	0.33	0.33	0.73	0.74
Euro area	98/11	0.16	0.20	0.08	0.22	0.24	0.22	0.42	0.36	0.29	0.27	0.49	0.39

Table A2: Forecast errors for the current account balance

(Summary statistics for pre-crisis period displayed in italics below)

pps.	Sample*	ME				MAE				RMSE			
		current year		year ahead		current year		year ahead		current year		year ahead	
Belgium	69/11	0.03	<i>0.01</i>	-0.05	<i>-0.05</i>	1.01	<i>0.87</i>	1.35	<i>1.28</i>	1.42	<i>1.13</i>	1.68	<i>1.63</i>
Denmark	73/11	-0.14	<i>0.05</i>	-0.04	<i>0.23</i>	0.87	<i>0.76</i>	1.63	<i>1.55</i>	1.14	<i>0.97</i>	2.17	<i>2.14</i>
Germany	69/11	-0.28	<i>-0.27</i>	-0.28	<i>-0.28</i>	0.64	<i>0.63</i>	1.02	<i>0.96</i>	0.82	<i>0.82</i>	1.33	<i>1.27</i>
Ireland	73/11	-0.16	<i>-0.23</i>	0.10	<i>0.16</i>	1.26	<i>1.33</i>	1.96	<i>2.08</i>	1.79	<i>1.87</i>	2.64	<i>2.76</i>
Greece	81/11	0.93	<i>0.97</i>	1.38	<i>1.20</i>	1.59	<i>1.46</i>	1.98	<i>1.81</i>	2.12	<i>2.05</i>	2.48	<i>2.33</i>
Spain	86/11	0.17	<i>0.36</i>	0.22	<i>0.42</i>	0.82	<i>0.81</i>	1.18	<i>1.24</i>	1.05	<i>1.03</i>	1.54	<i>1.54</i>
France	69/11	0.03	<i>0.07</i>	0.01	<i>0.03</i>	0.56	<i>0.53</i>	0.75	<i>0.76</i>	0.68	<i>0.64</i>	0.93	<i>0.94</i>
Italy	69/11	0.20	<i>0.16</i>	0.50	<i>0.44</i>	0.74	<i>0.73</i>	1.21	<i>1.22</i>	0.90	<i>0.91</i>	1.62	<i>1.66</i>
Luxembourg	69/11	:	:	:	:	:	:	:	:	:	:	:	:
Netherlands	69/11	-0.02	<i>-0.11</i>	-0.07	<i>-0.17</i>	1.06	<i>1.04</i>	1.50	<i>1.38</i>	1.38	<i>1.37</i>	1.85	<i>1.72</i>
Austria	95/11	-0.08	<i>-0.31</i>	-0.31	<i>-0.58</i>	0.79	<i>0.80</i>	1.16	<i>1.06</i>	1.04	<i>1.07</i>	1.51	<i>1.44</i>
Portugal	86/11	0.25	<i>0.25</i>	0.94	<i>1.07</i>	1.27	<i>1.33</i>	1.74	<i>1.81</i>	1.83	<i>1.94</i>	2.33	<i>2.42</i>
Finland	95/11	-0.01	<i>-0.18</i>	0.14	<i>-0.38</i>	1.44	<i>1.41</i>	1.62	<i>1.31</i>	1.67	<i>1.62</i>	1.87	<i>1.52</i>
Sweden	95/11	-0.29	<i>-0.32</i>	-0.74	<i>-0.74</i>	0.76	<i>0.94</i>	1.43	<i>1.40</i>	0.94	<i>1.07</i>	1.74	<i>1.69</i>
United Kingdom	73/11	-0.19	<i>-0.16</i>	0.01	<i>0.06</i>	0.79	<i>0.75</i>	1.00	<i>0.98</i>	0.98	<i>0.95</i>	1.46	<i>1.49</i>
European Union	69/11	-0.04	-0.04	0.07	0.06	0.31	0.32	0.50	0.50	0.40	0.41	0.67	0.67
Euro area	98/11	0.06	0.15	0.28	0.27	0.51	0.43	0.56	0.64	0.62	0.52	0.71	0.76

Table A3: Forecast errors for investment growth*(Summary statistics for pre-crisis period displayed in italics below)*

pps.	Sample*	ME				MAE				RMSE			
		current year		year ahead		current year		year ahead		current year		year ahead	
Belgium	69/11	-0.19	<i>-0.07</i>	0.63	<i>0.74</i>	2.20	<i>2.28</i>	3.18	<i>3.26</i>	2.83	<i>2.92</i>	4.51	<i>4.67</i>
Denmark	73/11	0.46	<i>0.20</i>	0.89	<i>0.49</i>	3.64	<i>3.75</i>	5.10	<i>5.15</i>	4.57	<i>4.71</i>	6.50	<i>6.58</i>
Germany	69/11	0.76	<i>1.03</i>	0.90	<i>0.87</i>	2.26	<i>2.29</i>	3.22	<i>3.23</i>	2.91	<i>2.95</i>	3.97	<i>3.91</i>
Ireland	73/11	1.13	<i>0.68</i>	1.67	<i>0.66</i>	3.78	<i>3.47</i>	5.98	<i>5.48</i>	4.90	<i>4.38</i>	7.30	<i>6.65</i>
Greece	81/11	2.20	<i>1.05</i>	2.82	<i>1.26</i>	4.16	<i>3.30</i>	4.80	<i>3.54</i>	5.71	<i>4.38</i>	6.10	<i>4.10</i>
Spain	86/11	0.12	<i>-0.14</i>	0.50	<i>-0.24</i>	2.19	<i>2.25</i>	3.22	<i>2.80</i>	2.69	<i>2.74</i>	4.12	<i>3.49</i>
France	69/11	0.32	<i>0.30</i>	0.71	<i>0.64</i>	1.40	<i>1.44</i>	1.91	<i>1.88</i>	1.84	<i>1.90</i>	2.49	<i>2.46</i>
Italy	69/11	1.15	<i>1.15</i>	1.78	<i>1.52</i>	2.53	<i>2.52</i>	3.04	<i>2.80</i>	3.42	<i>3.46</i>	3.97	<i>3.65</i>
Luxembourg	69/11	-0.46	<i>-0.87</i>	-0.66	<i>-1.23</i>	3.30	<i>3.28</i>	5.70	<i>5.52</i>	4.18	<i>4.19</i>	7.37	<i>7.10</i>
Netherlands	69/11	-0.14	<i>-0.04</i>	-0.39	<i>-0.56</i>	2.62	<i>2.50</i>	3.15	<i>3.08</i>	3.24	<i>3.14</i>	3.95	<i>3.78</i>
Austria	95/11	0.21	<i>0.74</i>	0.78	<i>0.59</i>	1.99	<i>2.05</i>	2.58	<i>2.18</i>	2.44	<i>2.47</i>	3.31	<i>2.65</i>
Portugal	86/11	0.46	<i>0.40</i>	1.60	<i>0.86</i>	3.23	<i>3.39</i>	4.04	<i>3.77</i>	3.92	<i>4.10</i>	5.06	<i>4.71</i>
Finland	95/11	1.58	<i>1.45</i>	1.71	<i>1.42</i>	2.93	<i>2.82</i>	4.29	<i>3.69</i>	3.73	<i>3.80</i>	5.81	<i>5.04</i>
Sweden	95/11	0.41	<i>0.78</i>	1.38	<i>1.12</i>	3.21	<i>3.18</i>	4.38	<i>3.79</i>	3.84	<i>3.59</i>	5.40	<i>4.27</i>
United Kingdom	73/11	0.61	<i>0.51</i>	0.85	<i>0.43</i>	2.27	<i>2.13</i>	3.35	<i>2.85</i>	2.78	<i>2.63</i>	4.30	<i>3.61</i>
European Union	69/11	0.61	0.59	0.90	0.64	1.25	1.21	2.02	1.78	1.69	1.69	2.88	2.44
Euro area	98/11	0.72	0.85	1.60	1.04	1.24	1.21	2.38	1.87	1.67	1.74	3.37	2.51

Annex B

Table B1: Persistence in current-year forecast error
(Results from the original study of 2007 displayed in *italics* below)

	Belgium		Denmark		Germany		Greece		Spain		France		Ireland	
GDP	2012	2007	2012	2007	2012	2007	2012	2007	2012	2007	2012	2007	2012	2007
p_1	0.15	<i>0.20</i>	0.12	<i>0.05</i>	0.05	<i>0.01</i>	0.28	<i>0.06</i>	0.33	<i>0.31</i>	0.18	<i>0.20</i>	-0.04	<i>0.02</i>
Signif $p_1=0$	0.31	<i>0.20</i>	0.43	<i>0.74</i>	0.71	<i>0.94</i>	0.10	<i>0.76</i>	0.08	<i>0.14</i>	0.23	<i>0.20</i>	0.80	<i>0.91</i>
p_2	0.04	<i>0.07</i>	0.08	<i>0.13</i>	0.12	<i>0.16</i>	0.18	<i>0.07</i>	-0.06	<i>0.02</i>	0.01	<i>0.03</i>	0.12	<i>0.11</i>
Signif $p_2=0$	0.58	<i>0.40</i>	0.65	<i>0.69</i>	0.65	<i>0.57</i>	0.15	<i>0.89</i>	0.20	<i>0.33</i>	0.49	<i>0.43</i>	0.72	<i>0.80</i>
p_3	-0.11	<i>-0.18</i>	-0.02	<i>0.02</i>	0.03	<i>0.03</i>	0.06	<i>0.01</i>	-0.12	<i>-0.08</i>	-0.09	<i>-0.10</i>	0.06	<i>0.02</i>
Signif $p_3=0$	0.64	<i>0.37</i>	0.83	<i>0.86</i>	0.83	<i>0.77</i>	0.26	<i>0.97</i>	0.30	<i>0.49</i>	0.61	<i>0.55</i>	0.85	<i>0.93</i>
Inflation														
p_1	0.05	<i>0.10</i>	-0.03	<i>-0.01</i>	0.01	<i>0.06</i>	0.11	<i>0.09</i>	-0.27	<i>-0.28</i>	-0.11	<i>-0.11</i>	-0.20	<i>-0.28</i>
Signif $p_1=0$	0.73	<i>0.54</i>	0.83	<i>0.97</i>	0.92	<i>0.71</i>	0.53	<i>0.63</i>	0.15	<i>0.17</i>	0.45	<i>0.49</i>	0.20	<i>0.09</i>
p_2	0.09	<i>0.08</i>	-0.10	<i>-0.07</i>	-0.11	<i>-0.14</i>	-0.17	<i>-0.16</i>	-0.06	<i>0.02</i>	0.09	<i>0.09</i>	-0.04	<i>0.01</i>
Signif $p_2=0$	0.79	<i>0.73</i>	0.77	<i>0.92</i>	0.77	<i>0.63</i>	0.48	<i>0.62</i>	0.33	<i>0.39</i>	0.62	<i>0.67</i>	0.43	<i>0.23</i>
p_3	-0.23	<i>-0.29</i>	-0.12	<i>-0.12</i>	-0.21	<i>-0.29</i>	0.11	<i>0.10</i>	0.18	<i>0.23</i>	-0.04	<i>-0.06</i>	-0.06	<i>-0.02</i>
Signif $p_3=0$	0.39	<i>0.25</i>	0.76	<i>0.86</i>	0.46	<i>0.22</i>	0.60	<i>0.74</i>	0.35	<i>0.36</i>	0.79	<i>0.82</i>	0.61	<i>0.40</i>
Government balance														
p_1	0.16	<i>0.21</i>	0.23	<i>0.23</i>	0.04	<i>-0.01</i>	0.14	<i>0.04</i>	0.07	<i>-0.06</i>	0.05	<i>0.05</i>	0.19	<i>-0.06</i>
Signif $p_1=0$	0.30	<i>0.20</i>	0.16	<i>0.20</i>	0.76	<i>0.95</i>	0.41	<i>0.84</i>	0.69	<i>0.78</i>	0.71	<i>0.74</i>	0.22	<i>0.70</i>
p_2	-0.08	<i>-0.03</i>	0.05	<i>0.13</i>	-0.17	<i>-0.21</i>	0.05	<i>0.23</i>	0.03	<i>0.29</i>	-0.15	<i>-0.13</i>	0.20	<i>-0.08</i>
Signif $p_2=0$	0.51	<i>0.43</i>	0.35	<i>0.33</i>	0.46	<i>0.40</i>	0.68	<i>0.46</i>	0.91	<i>0.35</i>	0.55	<i>0.66</i>	0.20	<i>0.83</i>
p_3	0.02	<i>0.08</i>	-0.13	<i>-0.17</i>	-0.18	<i>-0.21</i>	-0.07	<i>0.02</i>	0.01	<i>-0.03</i>	0.06	<i>0.11</i>	0.03	<i>-0.14</i>
Signif $p_3=0$	0.72	<i>0.58</i>	0.43	<i>0.35</i>	0.37	<i>0.29</i>	0.81	<i>0.66</i>	0.98	<i>0.55</i>	0.71	<i>0.71</i>	0.36	<i>0.77</i>
Investment														
p_1	0.28	<i>0.23</i>	0.19	<i>0.16</i>	0.31	<i>0.26</i>	0.13	<i>-0.08</i>	0.35	<i>0.39</i>	0.03	<i>0.04</i>	0.10	<i>0.15</i>
Signif $p_1=0$	0.05	<i>0.15</i>	0.23	<i>0.35</i>	0.04*	<i>0.10</i>	0.46	<i>0.69</i>	0.06	<i>0.06</i>	0.82	<i>0.81</i>	0.51	<i>0.36</i>
p_2	0.02	<i>-0.03</i>	0.04	<i>0.04</i>	0.12	<i>0.08</i>	0.02	<i>0.01</i>	-0.03	<i>0.01</i>	-0.18	<i>-0.18</i>	-0.01	<i>-0.12</i>
Signif $p_2=0$	0.16	<i>0.35</i>	0.46	<i>0.62</i>	0.08	<i>0.22</i>	0.75	<i>0.92</i>	0.17	<i>0.17</i>	0.45	<i>0.51</i>	0.80	<i>0.50</i>
p_3	-0.25	<i>-0.32</i>	-0.27	<i>-0.24</i>	-0.08	<i>-0.12</i>	0.19	<i>0.20</i>	-0.03	<i>-0.01</i>	0.01	<i>0.00</i>	-0.35	<i>-0.26</i>
Signif $p_3=0$	0.08	<i>0.09</i>	0.20	<i>0.37</i>	0.15	<i>0.31</i>	0.59	<i>0.72</i>	0.31	<i>0.32</i>	0.66	<i>0.72</i>	0.12	<i>0.26</i>
Unemployment														
p_1	0.24	<i>0.20</i>	-0.22	<i>-0.26</i>	0.18	<i>0.27</i>	0.17	<i>0.10</i>	0.26	<i>0.04</i>	-0.17	<i>-0.19</i>	-0.18	<i>-0.16</i>
Signif $p_1=0$	0.10	<i>0.20</i>	0.15	<i>0.11</i>	0.22	<i>0.08</i>	0.33	<i>0.60</i>	0.16	<i>0.83</i>	0.24	<i>0.23</i>	0.25	<i>0.35</i>
p_2	0.18	<i>0.17</i>	0.05	<i>0.03</i>	-0.05	<i>0.12</i>	0.09	<i>0.12</i>	0.20	<i>0.06</i>	-0.07	<i>-0.08</i>	0.10	<i>0.11</i>
Signif $p_2=0$	0.12	<i>0.24</i>	0.33	<i>0.28</i>	0.45	<i>0.17</i>	0.54	<i>0.70</i>	0.21	<i>0.94</i>	0.45	<i>0.43</i>	0.42	<i>0.51</i>
p_3	0.27	<i>0.28</i>	-0.08	<i>-0.09</i>	-0.08	<i>-0.17</i>	-0.12	<i>-0.09</i>	0.04	<i>-0.03</i>	-0.02	<i>-0.05</i>	0.02	<i>0.04</i>
Signif $p_3=0$	0.05	<i>0.10</i>	0.47	<i>0.42</i>	0.59	<i>0.19</i>	0.63	<i>0.81</i>	0.36	<i>0.99</i>	0.66	<i>0.62</i>	0.62	<i>0.70</i>
Current Account														
p_1	-0.23	<i>0.08</i>	0.21	<i>0.05</i>	-0.04	<i>0.01</i>	-0.06	<i>-0.09</i>	0.31	<i>0.34</i>	-0.01	<i>0.04</i>	0.12	<i>0.11</i>
Signif $p_1=0$	0.13	<i>0.62</i>	0.17	<i>0.75</i>	0.77	<i>0.97</i>	0.74	<i>0.66</i>	0.10	<i>0.11</i>	0.92	<i>0.81</i>	0.42	<i>0.51</i>
p_2	0.01	<i>-0.10</i>	0.02	<i>-0.02</i>	-0.07	<i>-0.14</i>	-0.13	<i>-0.24</i>	0.16	<i>0.19</i>	0.08	<i>-0.03</i>	0.03	<i>-0.02</i>
Signif $p_2=0$	0.31	<i>0.74</i>	0.38	<i>0.95</i>	0.85	<i>0.68</i>	0.69	<i>0.39</i>	0.17	<i>0.17</i>	0.88	<i>0.95</i>	0.72	<i>0.79</i>
p_3	0.11	<i>0.08</i>	0.06	<i>0.14</i>	-0.02	<i>-0.13</i>	-0.01	<i>0.11</i>	-0.06	<i>-0.05</i>	0.08	<i>0.11</i>	-0.20	<i>-0.23</i>
Signif $p_3=0$	0.42	<i>0.82</i>	0.55	<i>0.84</i>	0.95	<i>0.69</i>	0.87	<i>0.51</i>	0.31	<i>0.31</i>	0.91	<i>0.91</i>	0.49	<i>0.47</i>

Note: The test for serial correlation is based on the Ljung-Box Q statistic, which is asymptotically distributed as χ^2 . Autocorrelation coefficients up to three lags as well as their significance are reported.

*Numbers below 0.05 indicate a probability of serial correlation greater or equal to 95%

Table B1: Persistence in current-year forecast error (continued)

(Results from the original study of 2007 displayed in italics below)

	Italy		Luxembourg		Netherlands		Portugal		UK		European Union		Euro area	
GDP	2012	2007	2012	2007	2012	2007	2012	2007	2012	2007	2012	2007	2012	2007
p ₁	-0.14	<i>-0.13</i>	0.23	<i>0.27</i>	0.15	<i>0.18</i>	0.28	<i>0.42</i>	-0.18	<i>-0.21</i>	-0.07	<i>-0.06</i>	0.03	<i>0.02</i>
Signif p ₁ =0	0.33	<i>0.40</i>	0.12	<i>0.09</i>	0.30	<i>0.26</i>	0.13	<i>0.04*</i>	0.24	<i>0.20</i>	0.65	<i>0.72</i>	0.90	<i>0.95</i>
p ₂	-0.10	<i>-0.08</i>	-0.17	<i>-0.16</i>	0.09	<i>0.10</i>	0.18	<i>0.30</i>	-0.07	<i>-0.08</i>	-0.02	<i>0.05</i>	-0.23	<i>-0.09</i>
Signif p ₂ =0	0.48	<i>0.62</i>	0.15	<i>0.14</i>	0.49	<i>0.43</i>	0.20	<i>0.04*</i>	0.45	<i>0.39</i>	0.89	<i>0.90</i>	0.61	<i>0.94</i>
p ₃	0.21	<i>0.21</i>	-0.13	<i>-0.25</i>	-0.02	<i>-0.03</i>	-0.09	<i>-0.15</i>	0.06	<i>0.01</i>	-0.07	<i>-0.09</i>	-0.18	<i>-0.58</i>
Signif p ₃ =0	0.31	<i>0.41</i>	0.21	<i>0.09</i>	0.69	<i>0.63</i>	0.32	<i>0.07</i>	0.62	<i>0.60</i>	0.92	<i>0.90</i>	0.66	<i>0.13</i>
Inflation														
p ₁	0.17	<i>0.17</i>	0.09	<i>0.03</i>	-0.05	<i>-0.12</i>	0.21	<i>0.24</i>	0.06	<i>-0.01</i>	0.10	<i>0.11</i>	-0.30	<i>-0.14</i>
Signif p ₁ =0	0.24	<i>0.28</i>	0.53	<i>0.41</i>	0.73	<i>0.45</i>	0.26	<i>0.25</i>	0.70	<i>0.96</i>	0.51	<i>0.48</i>	0.21	<i>0.64</i>
p ₂	-0.13	<i>-0.13</i>	0.02	<i>0.06</i>	-0.10	<i>-0.05</i>	0.21	<i>0.33</i>	0.22	<i>0.24</i>	0.11	<i>0.13</i>	-0.27	<i>-0.38</i>
Signif p ₂ =0	0.34	<i>0.40</i>	0.81	<i>0.66</i>	0.74	<i>0.72</i>	0.27	<i>0.14</i>	0.34	<i>0.35</i>	0.60	<i>0.54</i>	0.23	<i>0.35</i>
p ₃	-0.22	<i>-0.22</i>	0.14	<i>0.04</i>	-0.05	<i>-0.07</i>	0.01	<i>0.04</i>	0.09	<i>0.08</i>	-0.22	<i>-0.24</i>	0.19	<i>0.02</i>
Signif p ₃ =0	0.22	<i>0.27</i>	0.70	<i>0.82</i>	0.87	<i>0.83</i>	0.46	<i>0.26</i>	0.47	<i>0.51</i>	0.34	<i>0.30</i>	0.30	<i>0.55</i>
Government balance														
p ₁	-0.21	<i>-0.21</i>	-0.24	<i>-0.25</i>	0.00	<i>0.01</i>	0.19	<i>0.21</i>	0.25	<i>0.26</i>	0.10	<i>0.09</i>	0.24	<i>0.28</i>
Signif p ₁ =0	0.16	<i>0.19</i>	0.13	<i>0.14</i>	0.98	<i>0.96</i>	0.30	<i>0.30</i>	0.11	<i>0.12</i>	0.50	<i>0.56</i>	0.33	<i>0.34</i>
p ₂	0.00	<i>0.02</i>	-0.11	<i>-0.09</i>	-0.03	<i>0.03</i>	-0.10	<i>0.22</i>	-0.06	<i>0.00</i>	-0.20	<i>-0.12</i>	-0.43	<i>-0.30</i>
Signif p ₂ =0	0.37	<i>0.41</i>	0.24	<i>0.30</i>	0.98	<i>0.97</i>	0.51	<i>0.33</i>	0.25	<i>0.30</i>	0.30	<i>0.63</i>	0.11	<i>0.34</i>
p ₃	-0.09	<i>-0.09</i>	0.04	<i>0.02</i>	-0.19	<i>-0.14</i>	-0.08	<i>0.01</i>	-0.05	<i>-0.05</i>	-0.19	<i>-0.16</i>	-0.35	<i>-0.32</i>
Signif p ₃ =0	0.50	<i>0.54</i>	0.40	<i>0.49</i>	0.60	<i>0.83</i>	0.67	<i>0.53</i>	0.41	<i>0.47</i>	0.25	<i>0.58</i>	0.08	<i>0.29</i>
Investment														
p ₁	-0.02	<i>0.00</i>	0.28	<i>0.27</i>	0.02	<i>0.08</i>	0.08	<i>0.16</i>	0.13	<i>0.21</i>	0.17	<i>0.21</i>	0.26	<i>0.33</i>
Signif p ₁ =0	0.90	<i>0.99</i>	0.06	<i>0.09</i>	0.89	<i>0.60</i>	0.67	<i>0.44</i>	0.40	<i>0.20</i>	0.25	<i>0.18</i>	0.28	<i>0.26</i>
p ₂	-0.28	<i>-0.27</i>	-0.09	<i>-0.11</i>	0.10	<i>0.12</i>	0.13	<i>0.15</i>	-0.30	<i>-0.18</i>	-0.22	<i>-0.17</i>	-0.33	<i>-0.43</i>
Signif p ₂ =0	0.16	<i>0.23</i>	0.14	<i>0.19</i>	0.77	<i>0.65</i>	0.70	<i>0.56</i>	0.11	<i>0.25</i>	0.17	<i>0.22</i>	0.20	<i>0.15</i>
p ₃	0.09	<i>0.09</i>	-0.06	<i>-0.17</i>	-0.25	<i>-0.28</i>	-0.04	<i>-0.12</i>	-0.20	<i>-0.32</i>	-0.15	<i>-0.19</i>	-0.17	<i>-0.47</i>
Signif p ₃ =0	0.25	<i>0.35</i>	0.25	<i>0.21</i>	0.32	<i>0.25</i>	0.85	<i>0.66</i>	0.09	<i>0.08</i>	0.19	<i>0.20</i>	0.29	<i>0.07</i>
Unemployment														
p ₁	-0.18	<i>-0.19</i>	-0.34	<i>-0.42</i>	-0.19	<i>-0.19</i>	0.39	<i>0.34</i>	-0.21	<i>-0.25</i>	0.19	<i>0.20</i>	-0.03	<i>0.57</i>
Signif p ₁ =0	0.22	<i>0.24</i>	0.03*	<i>0.02*</i>	0.20	<i>0.23</i>	0.03*	<i>0.11</i>	0.18	<i>0.13</i>	0.21	<i>0.20</i>	0.90	<i>0.05</i>
p ₂	-0.05	<i>-0.06</i>	0.07	<i>0.28</i>	-0.06	<i>-0.05</i>	0.28	<i>0.23</i>	-0.02	<i>0.02</i>	0.01	<i>0.09</i>	-0.55	<i>0.07</i>
Signif p ₂ =0	0.44	<i>0.47</i>	0.09	<i>0.01*</i>	0.41	<i>0.46</i>	0.03*	<i>0.14</i>	0.41	<i>0.32</i>	0.45	<i>0.38</i>	0.06	<i>0.15</i>
p ₃	0.08	<i>0.06</i>	0.02	<i>-0.02</i>	0.06	<i>0.06</i>	0.12	<i>0.10</i>	-0.31	<i>-0.30</i>	-0.01	<i>-0.08</i>	0.28	<i>-0.14</i>
Signif p ₃ =0	0.58	<i>0.65</i>	0.18	<i>0.03*</i>	0.58	<i>0.64</i>	0.06	<i>0.24</i>	0.11	<i>0.13</i>	0.66	<i>0.52</i>	0.06	<i>0.25</i>
Current Account														
p ₁	-0.02	<i>-0.03</i>	-0.37	<i>-0.36</i>	0.30	<i>0.17</i>	0.01	<i>0.00</i>	0.02	<i>-0.02</i>	-0.12	<i>-0.12</i>	-0.09	<i>-0.04</i>
Signif p ₁ =0	0.87	<i>0.86</i>	0.02*	<i>0.03*</i>	0.05*	<i>0.29</i>	0.95	<i>0.99</i>	0.92	<i>0.92</i>	0.42	<i>0.48</i>	0.72	<i>0.88</i>
p ₂	-0.16	<i>-0.18</i>	0.00	<i>-0.01</i>	-0.25	<i>-0.12</i>	-0.09	<i>-0.06</i>	-0.20	<i>-0.13</i>	-0.15	<i>-0.12</i>	-0.43	<i>-0.54</i>
Signif p ₂ =0	0.56	<i>0.54</i>	0.05	<i>0.10</i>	0.03*	<i>0.42</i>	0.88	<i>0.95</i>	0.41	<i>0.71</i>	0.45	<i>0.58</i>	0.16	<i>0.14</i>
p ₃	-0.01	<i>-0.01</i>	0.04	<i>0.04</i>	-0.37	<i>-0.12</i>	0.11	<i>0.10</i>	-0.15	<i>-0.10</i>	-0.11	<i>-0.10</i>	0.21	<i>0.09</i>
Signif p ₃ =0	0.76	<i>0.74</i>	0.11	<i>0.19</i>	0.00*	<i>0.51</i>	0.89	<i>0.95</i>	0.43	<i>0.78</i>	0.54	<i>0.68</i>	0.21	<i>0.26</i>

Note: The test for serial correlation is based on the Ljung-Box Q statistic, which is asymptotically distributed as χ^2 . Autocorrelation coefficients up to three lags as well as their significance are reported.

*Numbers below 0.05 indicate a probability of serial correlation greater or equal to 95%

Table B1: Persistence in current-year forecast error (continued)
(Results from the original study of 2007 displayed in italics below)

	Austria		Sweden		Finland		Slovenia		Slovakia		Cyprus		Malta	
GDP	2012	2007	2012	2007	2012	2007	2012	2007	2012	2007	2012	2007	2012	2007
p_1	0.18	<i>0.12</i>	-0.03	<i>-0.01</i>	-0.16	<i>-0.18</i>	0.08		0.17		-0.58		-0.19	
Signif $p_1=0$	0.43	<i>0.64</i>	0.89	<i>0.96</i>	0.46	<i>0.49</i>	0.78		0.57		0.05*		0.52	
p_2	0.04	<i>0.02</i>	-0.39	<i>-0.50</i>	-0.18	<i>0.04</i>	0.04		-0.13		0.08		-0.44	
Signif $p_2=0$	0.72	<i>0.90</i>	0.19	<i>0.14</i>	0.53	<i>0.78</i>	0.95		0.76		0.14		0.22	
p_3	-0.19	<i>-0.37</i>	-0.25	<i>-0.33</i>	-0.13	<i>-0.34</i>	0.00		-0.12		0.14		-0.05	
Signif $p_3=0$	0.68	<i>0.44</i>	0.19	<i>0.12</i>	0.65	<i>0.46</i>	0.99		0.85		0.24		0.39	
Inflation														
p_1	0.17	<i>0.13</i>	-0.22	<i>-0.12</i>	-0.01	<i>-0.03</i>	-0.15		-0.03		-0.13		-0.27	
Signif $p_1=0$	0.45	<i>0.61</i>	0.32	<i>0.66</i>	0.95	<i>0.91</i>	0.62		0.92		0.66		0.37	
p_2	-0.06	<i>-0.22</i>	0.18	<i>0.21</i>	-0.03	<i>-0.23</i>	-0.35		-0.11		-0.47		-0.11	
Signif $p_2=0$	0.72	<i>0.59</i>	0.44	<i>0.64</i>	0.99	<i>0.66</i>	0.39		0.92		0.21		0.62	
p_3	0.16	<i>0.11</i>	-0.16	<i>-0.21</i>	-0.09	<i>0.09</i>	-0.07		-0.43		0.11		0.00	
Signif $p_3=0$	0.75	<i>0.74</i>	0.53	<i>0.64</i>	0.98	<i>0.80</i>	0.59		0.36		0.34		0.81	
Government balance														
p_1	-0.13	<i>-0.19</i>	-0.04	<i>0.49</i>	-0.27	<i>-0.49</i>	-0.17		0.23		-0.16		0.03	
Signif $p_1=0$	0.57	<i>0.48</i>	0.86	<i>0.06</i>	0.22	<i>0.06</i>	0.56		0.43		0.58		0.91	
p_2	-0.07	<i>-0.19</i>	-0.19	<i>-0.20</i>	-0.06	<i>0.23</i>	-0.10		-0.23		-0.31		-0.26	
Signif $p_2=0$	0.80	<i>0.59</i>	0.67	<i>0.13</i>	0.45	<i>0.11</i>	0.79		0.52		0.45		0.62	
p_3	-0.03	<i>-0.08</i>	-0.09	<i>-0.39</i>	-0.26	<i>-0.24</i>	0.04		0.04		0.16		-0.23	
Signif $p_3=0$	0.93	<i>0.76</i>	0.80	<i>0.08</i>	0.37	<i>0.15</i>	0.92		0.72		0.57		0.62	
Investment														
p_1	0.10	<i>0.13</i>	0.10	<i>0.29</i>	0.06	<i>0.18</i>	0.53		-0.25		-0.60		-0.08	
Signif $p_1=0$	0.64	<i>0.62</i>	0.65	<i>0.27</i>	0.79	<i>0.50</i>	0.07		0.40		0.04*		0.78	
p_2	0.03	<i>-0.18</i>	-0.20	<i>-0.49</i>	-0.16	<i>-0.07</i>	-0.05		-0.19		0.36		-0.01	
Signif $p_2=0$	0.89	<i>0.68</i>	0.60	<i>0.08</i>	0.72	<i>0.77</i>	0.20		0.55		0.05		0.96	
p_3	0.02	<i>-0.31</i>	-0.24	<i>-0.50</i>	0.26	<i>0.05</i>	-0.36		-0.01		-0.18		0.11	
Signif $p_3=0$	0.97	<i>0.48</i>	0.49	<i>0.02*</i>	0.54	<i>0.90</i>	0.15		0.76		0.09		0.96	
Unemployment														
p_1	0.17	<i>-0.11</i>	0.35	<i>0.39</i>	-0.03	<i>-0.15</i>	-0.09		0.14		0.08		-0.32	
Signif $p_1=0$	0.45	<i>0.68</i>	0.12	<i>0.14</i>	0.90	<i>0.57</i>	0.76		0.64		0.79		0.28	
p_2	0.05	<i>-0.26</i>	-0.01	<i>0.08</i>	-0.13	<i>-0.15</i>	-0.18		-0.38		-0.15		-0.47	
Signif $p_2=0$	0.73	<i>0.55</i>	0.30	<i>0.31</i>	0.83	<i>0.71</i>	0.77		0.34		0.82		0.13	
p_3	0.13	<i>0.15</i>	-0.28	<i>-0.29</i>	-0.20	<i>-0.42</i>	-0.20		-0.31		-0.18		0.38	
Signif $p_3=0$	0.80	<i>0.66</i>	0.24	<i>0.28</i>	0.73	<i>0.28</i>	0.76		0.29		0.83		0.09	
Current Account														
p_1	-0.05	<i>0.11</i>	-0.35	<i>-0.19</i>	-0.30	<i>0.02</i>	0.10		0.26		-0.47		-0.04	
Signif $p_1=0$	0.83	<i>0.67</i>	0.11	<i>0.47</i>	0.17	<i>0.94</i>	0.72		0.38		0.12		0.89	
p_2	0.38	<i>0.42</i>	0.25	<i>-0.07</i>	-0.05	<i>0.32</i>	-0.29		0.25		-0.20		-0.44	
Signif $p_2=0$	0.21	<i>0.23</i>	0.15	<i>0.74</i>	0.38	<i>0.44</i>	0.54		0.45		0.22		0.27	
p_3	0.13	<i>-0.05</i>	-0.27	<i>-0.23</i>	0.04	<i>0.08</i>	-0.22		-0.16		0.13		0.25	
Signif $p_3=0$	0.32	<i>0.39</i>	0.14	<i>0.68</i>	0.58	<i>0.62</i>	0.57		0.57		0.35		0.30	

 Note: The test for serial correlation is based on the Ljung-Box Q statistic, which is asymptotically distributed as χ^2 . Autocorrelation coefficients up to three lags as well as their significance are reported.

*Numbers below 0.05 indicate a probability of serial correlation greater or equal to 95%

Table B1: Persistence in current-year forecast error (continued)

(Results from the original study of 2007 displayed in italics below)

	Czech Rep		Estonia		Latvia		Lithuania		Hungary		Poland		Bulgaria		Romania	
GDP	2012	2007	2012	2007	2012	2007	2012	2007	2012	2007	2012	2007	2012	2007	2012	2007
p_1	0.22		0.45		0.34		0.12		0.10		-0.31		-0.48		-0.24	
Signif $p_1=0$	0.45		0.13		0.25		0.69		0.74		0.30		0.16		0.49	
p_2	-0.01		-0.42		-0.43		-0.51		-0.38		-0.22		-0.06		-0.50	
Signif $p_2=0$	0.75		0.10		0.15		0.16		0.36		0.42		0.36		0.18	
p_3	-0.10		-0.61		-0.41		-0.23		-0.30		0.40		0.06		0.22	
Signif $p_3=0$	0.86		0.01*		0.09		0.21		0.32		0.24		0.55		0.23	
Inflation																
p_1	-0.32		-0.29		0.12		-0.61		0.39		-0.42		0.27		-0.60	
Signif $p_1=0$	0.28		0.33		0.69		0.04*		0.18		0.16		0.42		0.08	
p_2	-0.14		-0.48		-0.02		0.50		-0.28		-0.25		-0.36		0.21	
Signif $p_2=0$	0.49		0.13		0.92		0.02*		0.25		0.24		0.34		0.16	
p_3	-0.13		0.34		-0.25		-0.29		-0.64		0.30		-0.29		-0.08	
Signif $p_3=0$	0.64		0.12		0.77		0.03*		0.02*		0.23		0.31		0.29	
Government balance																
p_1	0.11		0.15		-0.03		0.11		0.07		-0.20		0.01		-0.21	
Signif $p_1=0$	0.71		0.61		0.92		0.72		0.82		0.50		0.97		0.54	
p_2	-0.24		-0.53		-0.26		-0.13		-0.38		0.27		-0.65		-0.50	
Signif $p_2=0$	0.63		0.13		0.64		0.84		0.38		0.49		0.08		0.19	
p_3	0.20		-0.24		-0.27		-0.30		0.11		-0.24		-0.05		0.18	
Signif $p_3=0$	0.67		0.18		0.56		0.63		0.55		0.50		0.17		0.28	
Investment																
p_1	-0.19		0.30		0.20		0.08		-0.36		-0.52		0.25		0.19	
Signif $p_1=0$	0.53		0.31		0.50		0.78		0.23		0.08		0.45		0.58	
p_2	0.27		-0.23		-0.08		-0.48		0.02		-0.07		-0.16		-0.57	
Signif $p_2=0$	0.51		0.42		0.76		0.21		0.48		0.20		0.65		0.13	
p_3	0.09		-0.47		-0.36		-0.01		-0.16		0.34		-0.36		-0.22	
Signif $p_3=0$	0.69		0.15		0.47		0.37		0.60		0.17		0.37		0.18	
Unemployment																
p_1	-0.24		-0.08		0.11		0.39		0.07		-0.02		0.31		-0.31	
Signif $p_1=0$	0.42		0.78		0.70		0.19		0.82		0.94		0.37		0.36	
p_2	-0.34		-0.28		-0.51		0.13		-0.43		-0.12		-0.13		-0.37	
Signif $p_2=0$	0.33		0.58		0.16		0.38		0.28		0.90		0.60		0.30	
p_3	-0.01		-0.07		-0.35		-0.31		-0.41		0.25		-0.44		0.27	
Signif $p_3=0$	0.53		0.76		0.13		0.33		0.15		0.75		0.23		0.29	
Current Account																
p_1	-0.19		-0.07		0.09		-0.17		-0.18		-0.25		0.16		-0.18	
Signif $p_1=0$	0.53		0.81		0.77		0.57		0.55		0.40		0.64		0.60	
p_2	-0.09		-0.28		-0.21		-0.24		-0.56		-0.32		-0.41		-0.46	
Signif $p_2=0$	0.78		0.58		0.72		0.58		0.10		0.35		0.34		0.26	
p_3	-0.20		-0.33		-0.41		-0.27		0.19		-0.14		-0.19		0.02	
Signif $p_3=0$	0.77		0.41		0.34		0.52		0.16		0.49		0.43		0.44	

Note: The test for serial correlation is based on the Ljung-Box Q statistic, which is asymptotically distributed as χ^2 . Autocorrelation coefficients up to three lags as well as their significance are reported.

*Numbers below 0.05 indicate a probability of serial correlation greater or equal to 95%

Table B2: Persistence in year-ahead forecast error
(Results from the original study of 2007 displayed in italics below)

	Belgium		Denmark		Germany		Greece		Spain		France		Ireland	
GDP	2012	2007	2012	2007	2012	2007	2012	2007	2012	2007	2012	2007	2012	2007
p_1	0.11	<i>0.17</i>	0.17	<i>0.08</i>	-0.08	<i>-0.07</i>	0.41	<i>-0.01</i>	0.31	<i>0.34</i>	0.03	<i>0.01</i>	0.36	<i>0.30</i>
Signif $p_1=0$	0.47	<i>0.30</i>	0.26	<i>0.62</i>	0.57	<i>0.68</i>	0.02*	<i>0.95</i>	0.11	<i>0.11</i>	0.84	<i>0.94</i>	0.02*	<i>0.07</i>
p_2	-0.06	<i>0.00</i>	-0.05	<i>-0.13</i>	-0.21	<i>-0.14</i>	0.13	<i>-0.36</i>	-0.08	<i>0.01</i>	-0.10	<i>-0.06</i>	0.11	<i>0.18</i>
Signif $p_2=0$	0.72	<i>0.58</i>	0.51	<i>0.66</i>	0.31	<i>0.64</i>	0.05*	<i>0.16</i>	0.25	<i>0.27</i>	0.78	<i>0.93</i>	0.05*	<i>0.11</i>
p_3	0.05	<i>0.05</i>	-0.15	<i>-0.07</i>	-0.07	<i>-0.04</i>	0.14	<i>0.22</i>	-0.12	<i>-0.03</i>	-0.11	<i>-0.11</i>	0.10	<i>0.15</i>
Signif $p_3=0$	0.86	<i>0.75</i>	0.50	<i>0.79</i>	0.46	<i>0.81</i>	0.08	<i>0.16</i>	0.36	<i>0.45</i>	0.77	<i>0.89</i>	0.09	<i>0.16</i>
Inflation														
p_1	0.21	<i>0.30</i>	-0.32	<i>-0.31</i>	0.31	<i>0.48</i>	0.20	<i>0.35</i>	-0.10	<i>0.12</i>	0.11	<i>0.14</i>	0.32	<i>0.37</i>
Signif $p_1=0$	0.15	<i>0.06</i>	0.04*	<i>0.06</i>	0.04*	<i>0.00*</i>	0.25	<i>0.07</i>	0.59	<i>0.57</i>	0.45	<i>0.38</i>	0.04*	<i>0.03*</i>
p_2	-0.07	<i>-0.02</i>	0.02	<i>0.01</i>	0.20	<i>0.25</i>	0.17	<i>0.19</i>	-0.22	<i>-0.18</i>	0.02	<i>0.03</i>	-0.13	<i>-0.10</i>
Signif $p_2=0$	0.32	<i>0.17</i>	0.12	<i>0.18</i>	0.05*	<i>0.00*</i>	0.32	<i>0.11</i>	0.41	<i>0.57</i>	0.75	<i>0.66</i>	0.09	<i>0.08</i>
p_3	-0.11	<i>-0.20</i>	0.21	<i>0.21</i>	-0.08	<i>-0.12</i>	0.01	<i>-0.01</i>	0.09	<i>0.01</i>	0.10	<i>0.10</i>	-0.23	<i>-0.27</i>
Signif $p_3=0$	0.41	<i>0.16</i>	0.11	<i>0.17</i>	0.09	<i>0.01*</i>	0.52	<i>0.22</i>	0.57	<i>0.77</i>	0.79	<i>0.74</i>	0.07	<i>0.05</i>
Government balance														
p_1	0.06	<i>0.15</i>	0.40	<i>0.48</i>	-0.01	<i>-0.04</i>	0.27	<i>0.44</i>	0.26	<i>0.31</i>	0.17	<i>0.28</i>	0.48	<i>0.29</i>
Signif $p_1=0$	0.70	<i>0.35</i>	0.01*	<i>0.01*</i>	0.97	<i>0.79</i>	0.12	<i>0.02*</i>	0.17	<i>0.14</i>	0.24	<i>0.08</i>	0.00*	<i>0.08</i>
p_2	-0.07	<i>0.03</i>	0.03	<i>0.08</i>	-0.36	<i>-0.32</i>	-0.01	<i>0.13</i>	-0.02	<i>0.32</i>	-0.11	<i>0.00</i>	0.14	<i>-0.22</i>
Signif $p_2=0$	0.83	<i>0.63</i>	0.05*	<i>0.02*</i>	0.05	<i>0.13</i>	0.30	<i>0.05</i>	0.38	<i>0.11</i>	0.38	<i>0.22</i>	0.01*	<i>0.09</i>
p_3	0.07	<i>0.12</i>	-0.21	<i>-0.21</i>	-0.09	<i>-0.01</i>	0.04	<i>0.25</i>	-0.08	<i>-0.09</i>	-0.08	<i>0.05</i>	-0.08	<i>-0.23</i>
Signif $p_3=0$	0.90	<i>0.69</i>	0.05*	<i>0.03*</i>	0.10	<i>0.25</i>	0.48	<i>0.05</i>	0.55	<i>0.20</i>	0.52	<i>0.38</i>	0.01*	<i>0.08</i>
Investment														
p_1	0.13	<i>0.13</i>	0.19	<i>0.14</i>	0.24	<i>0.31</i>	0.40	<i>0.12</i>	0.28	<i>0.29</i>	0.22	<i>0.23</i>	0.23	<i>0.07</i>
Signif $p_1=0$	0.40	<i>0.43</i>	0.22	<i>0.39</i>	0.11	<i>0.05</i>	0.02*	<i>0.52</i>	0.14	<i>0.17</i>	0.14	<i>0.15</i>	0.13	<i>0.68</i>
p_2	0.11	<i>0.12</i>	0.00	<i>0.02</i>	-0.09	<i>-0.03</i>	0.03	<i>-0.26</i>	-0.10	<i>-0.10</i>	-0.24	<i>-0.19</i>	0.03	<i>-0.06</i>
Signif $p_2=0$	0.54	<i>0.54</i>	0.47	<i>0.69</i>	0.23	<i>0.15</i>	0.07	<i>0.31</i>	0.29	<i>0.35</i>	0.09	<i>0.17</i>	0.32	<i>0.86</i>
p_3	-0.16	<i>-0.20</i>	-0.19	<i>-0.12</i>	-0.15	<i>-0.10</i>	0.14	<i>0.00</i>	-0.35	<i>-0.44</i>	-0.32	<i>-0.34</i>	-0.14	<i>-0.11</i>
Signif $p_3=0$	0.49	<i>0.40</i>	0.38	<i>0.73</i>	0.26	<i>0.23</i>	0.12	<i>0.50</i>	0.11	<i>0.07</i>	0.02*	<i>0.04*</i>	0.36	<i>0.85</i>
Unemployment														
p_1	0.41	<i>0.42</i>	0.41	<i>0.35</i>	0.50	<i>0.54</i>	0.36	<i>0.33</i>	0.51	<i>0.53</i>	0.13	<i>0.15</i>	0.57	<i>0.70</i>
Signif $p_1=0$	0.01*	<i>0.01*</i>	0.01*	<i>0.04*</i>	0.00*	<i>0.00*</i>	0.04*	<i>0.08</i>	0.01*	<i>0.01*</i>	0.39	<i>0.35</i>	0.00*	<i>0.00*</i>
p_2	0.11	<i>0.14</i>	0.07	<i>0.00</i>	0.24	<i>0.26</i>	-0.20	<i>-0.21</i>	0.18	<i>0.13</i>	0.02	<i>0.00</i>	0.41	<i>0.41</i>
Signif $p_2=0$	0.02*	<i>0.02*</i>	0.03*	<i>0.12</i>	0.00*	<i>0.00*</i>	0.06	<i>0.12</i>	0.02*	<i>0.04*</i>	0.68	<i>0.65</i>	0.00*	<i>0.00*</i>
p_3	0.23	<i>0.21</i>	-0.12	<i>-0.15</i>	0.05	<i>0.02</i>	-0.21	<i>-0.20</i>	-0.04	<i>-0.05</i>	-0.09	<i>-0.11</i>	0.22	<i>0.23</i>
Signif $p_3=0$	0.02*	<i>0.03*</i>	0.05	<i>0.16</i>	0.00*	<i>0.00*</i>	0.06	<i>0.14</i>	0.04*	<i>0.09</i>	0.78	<i>0.72</i>	0.00*	<i>0.00*</i>
Current Account														
p_1	0.41	<i>0.51</i>	0.14	<i>0.04</i>	0.09	<i>0.17</i>	0.33	<i>0.20</i>	0.38	<i>0.43</i>	0.22	<i>0.16</i>	-0.12	<i>-0.14</i>
Signif $p_1=0$	0.01*	<i>0*</i>	0.38	<i>0.83</i>	0.56	<i>0.30</i>	0.06	<i>0.30</i>	0.04*	<i>0.04*</i>	0.14	<i>0.34</i>	0.44	<i>0.40</i>
p_2	-0.04	<i>0.04</i>	-0.28	<i>-0.38</i>	-0.24	<i>-0.17</i>	0.10	<i>-0.02</i>	0.10	<i>0.12</i>	0.07	<i>-0.07</i>	0.02	<i>0.01</i>
Signif $p_2=0$	0.02*	<i>0.01*</i>	0.14	<i>0.08</i>	0.24	<i>0.32</i>	0.14	<i>0.59</i>	0.11	<i>0.11</i>	0.30	<i>0.58</i>	0.74	<i>0.70</i>
p_3	-0.04	<i>-0.14</i>	-0.01	<i>0.01</i>	-0.06	<i>-0.11</i>	0.35	<i>0.09</i>	-0.16	<i>-0.16</i>	0.12	<i>0.11</i>	-0.01	<i>0.00</i>
Signif $p_3=0$	0.06	<i>0.01*</i>	0.26	<i>0.16</i>	0.38	<i>0.43</i>	0.04*	<i>0.73</i>	0.16	<i>0.17</i>	0.38	<i>0.66</i>	0.89	<i>0.87</i>

Note: The test for serial correlation is based on the Ljung-Box Q statistic, which is asymptotically distributed as χ^2 . Autocorrelation coefficients up to three lags as well as their significance are reported.

*Numbers below 0.05 indicate a probability of serial correlation greater or equal to 95%

Table B2: Persistence in year-ahead forecast error (continued)

(Results from the original study of 2007 displayed in italics below)

	Italy		Luxembourg		Netherlands		Portugal		UK		European Union		Euro area	
GDP	2012	2007	2012	2007	2012	2007	2012	2007	2012	2007	2012	2007	2012	2007
p_1	0.07	<i>0.10</i>	0.10	<i>0.07</i>	-0.02	<i>0.04</i>	0.09	<i>0.22</i>	0.17	<i>0.25</i>	-0.04	<i>-0.02</i>	-0.12	<i>-0.44</i>
Signif $p_1=0$	0.63	<i>0.53</i>	0.51	<i>0.65</i>	0.89	<i>0.82</i>	0.64	<i>0.30</i>	0.26	<i>0.13</i>	0.81	<i>0.91</i>	0.62	<i>0.16</i>
p_2	-0.33	<i>-0.33</i>	-0.16	<i>-0.16</i>	0.13	<i>0.20</i>	0.03	<i>0.28</i>	-0.04	<i>-0.04</i>	-0.24	<i>-0.21</i>	-0.28	<i>0.18</i>
Signif $p_2=0$	0.07	<i>0.09</i>	0.44	<i>0.54</i>	0.66	<i>0.45</i>	0.95	<i>0.23</i>	0.52	<i>0.32</i>	0.25	<i>0.41</i>	0.44	<i>0.30</i>
p_3	0.08	<i>0.12</i>	-0.13	<i>-0.15</i>	-0.16	<i>-0.15</i>	-0.06	<i>-0.11</i>	-0.20	<i>-0.28</i>	-0.08	<i>-0.04</i>	-0.23	<i>-0.44</i>
Signif $p_3=0$	0.14	<i>0.14</i>	0.48	<i>0.53</i>	0.56	<i>0.47</i>	0.95	<i>0.35</i>	0.39	<i>0.16</i>	0.38	<i>0.61</i>	5.00	<i>0.14</i>
Inflation														
p_1	0.19	<i>0.18</i>	0.47	<i>0.52</i>	0.17	<i>0.28</i>	0.36	<i>0.53</i>	0.38	<i>0.39</i>	0.28	<i>0.37</i>	-0.36	<i>-0.19</i>
Signif $p_1=0$	0.19	<i>0.26</i>	0.00*	<i>0.00*</i>	0.27	<i>0.08</i>	0.05	<i>0.01*</i>	0.01*	<i>0.02*</i>	0.06	<i>0.02*</i>	0.15	<i>0.53</i>
p_2	0.13	<i>0.11</i>	0.11	<i>0.13</i>	0.06	<i>0.15</i>	-0.03	<i>0.00</i>	-0.05	<i>-0.06</i>	-0.08	<i>-0.08</i>	-0.16	<i>-0.06</i>
Signif $p_2=0$	0.29	<i>0.42</i>	0.01*	<i>0.00*</i>	0.49	<i>0.13</i>	0.15	<i>0.04*</i>	0.05*	<i>0.06</i>	0.14	<i>0.06</i>	0.28	<i>0.81</i>
p_3	-0.21	<i>-0.25</i>	-0.17	<i>-0.20</i>	-0.04	<i>0.01</i>	-0.02	<i>-0.03</i>	-0.10	<i>-0.11</i>	-0.16	<i>-0.19</i>	0.05	<i>-0.40</i>
Signif $p_3=0$	0.21	<i>0.22</i>	0.01*	<i>0.01*</i>	0.68	<i>0.25</i>	0.29	<i>0.10</i>	0.10	<i>0.11</i>	0.17	<i>0.06</i>	0.46	<i>0.40</i>
Government balance														
p_1	0.09	<i>0.11</i>	0.11	<i>0.16</i>	0.23	<i>0.38</i>	0.18	<i>0.16</i>	0.14	<i>0.26</i>	0.07	<i>0.10</i>	0.09	<i>0.14</i>
Signif $p_1=0$	0.55	<i>0.49</i>	0.47	<i>0.34</i>	0.12	<i>0.02*</i>	0.34	<i>0.46</i>	0.38	<i>0.12</i>	0.65	<i>0.55</i>	0.73	<i>0.65</i>
p_2	-0.17	<i>-0.12</i>	-0.19	<i>-0.16</i>	-0.01	<i>-0.09</i>	-0.20	<i>-0.07</i>	-0.16	<i>-0.15</i>	-0.30	<i>-0.22</i>	-0.37	<i>-0.29</i>
Signif $p_2=0$	0.43	<i>0.59</i>	0.36	<i>0.40</i>	0.29	<i>0.05</i>	0.36	<i>0.72</i>	0.33	<i>0.20</i>	0.12	<i>0.31</i>	0.27	<i>0.53</i>
p_3	-0.07	<i>-0.09</i>	0.10	<i>0.11</i>	-0.30	<i>-0.23</i>	-0.19	<i>-0.20</i>	-0.16	<i>-0.16</i>	-0.09	<i>0.05</i>	-0.29	<i>-0.32</i>
Signif $p_3=0$	0.59	<i>0.71</i>	0.49	<i>0.52</i>	0.08	<i>0.04*</i>	0.36	<i>0.65</i>	0.27	<i>0.24</i>	0.20	<i>0.48</i>	0.24	<i>0.41</i>
Investment														
p_1	0.07	<i>0.12</i>	0.13	<i>0.13</i>	0.22	<i>0.30</i>	0.25	<i>0.33</i>	0.02	<i>0.19</i>	0.17	<i>0.26</i>	0.10	<i>0.28</i>
Signif $p_1=0$	0.65	<i>0.45</i>	0.36	<i>0.41</i>	0.15	<i>0.07</i>	0.19	<i>0.12</i>	0.90	<i>0.25</i>	0.25	<i>0.10</i>	0.70	<i>0.36</i>
p_2	-0.28	<i>-0.35</i>	0.23	<i>0.36</i>	0.03	<i>0.07</i>	0.07	<i>0.09</i>	-0.25	<i>-0.30</i>	-0.31	<i>-0.33</i>	-0.37	<i>-0.45</i>
Signif $p_2=0$	0.14	<i>0.06</i>	0.19	<i>0.05</i>	0.35	<i>0.17</i>	0.40	<i>0.26</i>	0.27	<i>0.10</i>	0.06	<i>0.03*</i>	0.28	<i>0.19</i>
p_3	0.01	<i>-0.01</i>	-0.19	<i>-0.29</i>	-0.28	<i>-0.29</i>	0.00	<i>-0.08</i>	-0.30	<i>-0.53</i>	-0.28	<i>-0.33</i>	-0.28	<i>-0.49</i>
Signif $p_3=0$	0.27	<i>0.14</i>	0.17	<i>0.03</i>	0.12	<i>0.07</i>	0.61	<i>0.42</i>	0.09	<i>0.00*</i>	0.02*	<i>0.01*</i>	0.26	<i>0.07</i>
Unemployment														
p_1	0.49	<i>0.50</i>	0.20	<i>0.37</i>	0.25	<i>0.26</i>	0.46	<i>0.31</i>	0.20	<i>0.22</i>	0.51	<i>0.59</i>	0.01	<i>0.20</i>
Signif $p_1=0$	0.00*	<i>0.00*</i>	0.22	<i>0.03*</i>	0.10	<i>0.11</i>	0.02*	<i>0.14</i>	0.21	<i>0.20</i>	0.00*	<i>0.00*</i>	0.97	<i>0.51</i>
p_2	0.12	<i>0.13</i>	-0.13	<i>0.07</i>	-0.19	<i>-0.20</i>	0.30	<i>0.33</i>	-0.31	<i>-0.34</i>	0.17	<i>0.22</i>	-0.15	<i>-0.24</i>
Signif $p_2=0$	0.00*	<i>0.01*</i>	0.33	<i>0.09</i>	0.11	<i>0.12</i>	0.01*	<i>0.10</i>	0.06	<i>0.05</i>	0.00*	<i>0.00*</i>	0.82	<i>0.57</i>
p_3	-0.15	<i>-0.16</i>	-0.13	<i>-0.16</i>	-0.11	<i>-0.10</i>	0.04	<i>0.06</i>	-0.33	<i>-0.36</i>	0.06	<i>0.09</i>	-0.02	<i>-0.27</i>
Signif $p_3=0$	0.01*	<i>0.01*</i>	0.40	<i>0.13</i>	0.18	<i>0.20</i>	0.03*	<i>0.19</i>	0.02*	<i>0.01*</i>	0.00*	<i>0.00*</i>	0.94	<i>0.52</i>
Current Account														
p_1	0.16	<i>0.15</i>	0.07	<i>0.06</i>	0.34	<i>0.35</i>	0.27	<i>0.30</i>	0.00	<i>-0.02</i>	0.27	<i>0.27</i>	0.15	<i>0.32</i>
Signif $p_1=0$	0.27	<i>0.34</i>	0.67	<i>0.73</i>	0.02*	<i>0.03*</i>	0.15	<i>0.15</i>	0.99	<i>0.89</i>	0.07	<i>0.09</i>	0.57	<i>0.30</i>
p_2	-0.23	<i>-0.24</i>	-0.44	<i>-0.45</i>	-0.18	<i>-0.09</i>	-0.20	<i>-0.19</i>	-0.04	<i>0.04</i>	-0.13	<i>-0.11</i>	-0.56	<i>-0.46</i>
Signif $p_2=0$	0.18	<i>0.22</i>	0.03*	<i>0.04*</i>	0.04*	<i>0.08</i>	0.19	<i>0.24</i>	0.97	<i>0.97</i>	0.13	<i>0.19</i>	0.07	<i>0.15</i>
p_3	-0.17	<i>-0.18</i>	0.03	<i>0.02</i>	-0.32	<i>-0.25</i>	-0.38	<i>-0.46</i>	-0.13	<i>-0.12</i>	-0.38	<i>-0.45</i>	-0.30	<i>-0.51</i>
Signif $p_3=0$	0.18	<i>0.22</i>	0.07	<i>0.10</i>	0.01*	<i>0.06</i>	0.05	<i>0.04*</i>	0.86	<i>0.90</i>	0.01*	<i>0.01*</i>	0.07	<i>0.05</i>

Note: The test for serial correlation is based on the Ljung-Box Q statistic, which is asymptotically distributed as χ^2 . Autocorrelation coefficients up to three lags as well as their significance are reported.

*Numbers below 0.05 indicate a probability of serial correlation greater or equal to 95%

Table B2: Persistence in year-ahead forecast error (continued)

(Results from the original study of 2007 displayed in italics below)

	Austria		Sweden		Finland		Slovenia		Slovakia		Cyprus		Malta	
GDP	2012	2007	2012	2007	2012	2007	2012	2007	2012	2007	2012	2007	2012	2007
p_1	-0.12	<i>-0.28</i>	-0.09	<i>-0.27</i>	-0.08	<i>-0.14</i>	0.05		-0.02		-0.32		-0.07	
Signif $p_1=0$	0.58	<i>0.29</i>	0.69	<i>0.30</i>	0.72	<i>0.60</i>	0.88		0.94		0.28		0.82	
p_2	-0.24	<i>0.10</i>	-0.29	<i>-0.09</i>	-0.16	<i>0.07</i>	-0.17		-0.22		-0.06		-0.39	
Signif $p_2=0$	0.47	<i>0.53</i>	0.37	<i>0.55</i>	0.71	<i>0.84</i>	0.80		0.72		0.54		0.31	
p_3	-0.29	<i>-0.31</i>	-0.25	<i>-0.41</i>	-0.14	<i>-0.33</i>	-0.12		-0.14		0.06		-0.31	
Signif $p_3=0$	0.33	<i>0.40</i>	0.32	<i>0.24</i>	0.70	<i>0.51</i>	0.88		0.81		0.73		0.31	
Inflation														
p_1	-0.19	<i>0.02</i>	0.11	<i>0.27</i>	0.01	<i>0.26</i>	-0.05		-0.34		-0.22		-0.44	
Signif $p_1=0$	0.40	<i>0.94</i>	0.62	<i>0.30</i>	0.98	<i>0.32</i>	0.87		0.25		0.47		0.13	
p_2	-0.50	<i>-0.63</i>	0.09	<i>0.07</i>	-0.11	<i>0.16</i>	-0.37		0.01		-0.03		0.32	
Signif $p_2=0$	0.05*	<i>0.04*</i>	0.81	<i>0.56</i>	0.88	<i>0.49</i>	0.39		0.52		0.76		0.16	
p_3	0.21	<i>-0.02</i>	-0.03	<i>0.03</i>	-0.24	<i>-0.24</i>	-0.24		-0.21		-0.06		-0.26	
Signif $p_3=0$	0.07	<i>0.10</i>	0.93	<i>0.76</i>	0.66	<i>0.49</i>	0.43		0.56		0.89		0.19	
Government balance														
p_1	-0.13	<i>-0.14</i>	-0.03	<i>0.21</i>	-0.11	<i>-0.10</i>	-0.11		0.12		0.04		0.10	
Signif $p_1=0$	0.55	<i>0.60</i>	0.90	<i>0.43</i>	0.64	<i>0.70</i>	0.71		0.68		0.90		0.74	
p_2	-0.35	<i>-0.35</i>	-0.25	<i>-0.29</i>	-0.23	<i>0.08</i>	-0.18		-0.34		-0.32		-0.32	
Signif $p_2=0$	0.22	<i>0.33</i>	0.51	<i>0.37</i>	0.50	<i>0.89</i>	0.74		0.43		0.50		0.48	
p_3	0.01	<i>0.05</i>	-0.17	<i>-0.08</i>	-0.15	<i>-0.13</i>	-0.04		0.08		-0.16		-0.19	
Signif $p_3=0$	0.39	<i>0.52</i>	0.58	<i>0.56</i>	0.60	<i>0.91</i>	0.89		0.62		0.62		0.56	
Investment														
p_1	0.01	<i>-0.01</i>	-0.13	<i>0.11</i>	-0.02	<i>0.05</i>	0.17		-0.22		-0.35		-0.17	
Signif $p_1=0$	0.95	<i>0.97</i>	0.56	<i>0.67</i>	0.92	<i>0.86</i>	0.56		0.46		0.23		0.57	
p_2	-0.53	<i>-0.30</i>	-0.23	<i>-0.44</i>	-0.36	<i>-0.29</i>	-0.04		-0.27		0.23		-0.08	
Signif $p_2=0$	0.05	<i>0.48</i>	0.47	<i>0.20</i>	0.25	<i>0.51</i>	0.83		0.47		0.34		0.81	
p_3	-0.02	<i>0.11</i>	-0.08	<i>-0.29</i>	0.02	<i>-0.08</i>	-0.25		0.05		-0.17		0.15	
Signif $p_3=0$	0.11	<i>0.65</i>	0.65	<i>0.20</i>	0.43	<i>0.69</i>	0.71		0.67		0.46		0.85	
Unemployment														
p_1	-0.10	<i>0.04</i>	0.22	<i>0.44</i>	-0.15	<i>0.29</i>	-0.47		0.44		0.07		-0.59	
Signif $p_1=0$	0.65	<i>0.89</i>	0.33	<i>0.10</i>	0.50	<i>0.27</i>	0.11		0.13		0.82		0.05*	
p_2	-0.12	<i>-0.11</i>	-0.22	<i>0.04</i>	-0.22	<i>-0.51</i>	-0.10		-0.28		-0.24		0.12	
Signif $p_2=0$	0.76	<i>0.90</i>	0.38	<i>0.25</i>	0.49	<i>0.07</i>	0.27		0.19		0.66		0.12	
p_3	-0.02	<i>-0.08</i>	0.00	<i>-0.25</i>	-0.10	<i>-0.44</i>	0.25		-0.54		-0.31		0.16	
Signif $p_3=0$	0.91	<i>0.96</i>	0.58	<i>0.27</i>	0.65	<i>0.03*</i>	0.30		0.05*		0.50		0.20	
Current Account														
p_1	0.17	<i>0.49</i>	0.07	<i>0.19</i>	0.05	<i>0.21</i>	-0.21		-0.18		-0.06		0.08	
Signif $p_1=0$	0.44	<i>0.06</i>	0.74	<i>0.48</i>	0.83	<i>0.42</i>	0.49		0.54		0.84		0.79	
p_2	-0.16	<i>0.13</i>	0.02	<i>0.14</i>	-0.06	<i>0.19</i>	0.02		-0.19		-0.23		-0.25	
Signif $p_2=0$	0.56	<i>0.16</i>	0.94	<i>0.67</i>	0.94	<i>0.54</i>	0.78		0.65		0.68		0.63	
p_3	0.22	<i>-0.04</i>	-0.04	<i>-0.01</i>	-0.13	<i>-0.02</i>	-0.04		0.30		-0.29		-0.16	
Signif $p_3=0$	0.52	<i>0.29</i>	0.98	<i>0.85</i>	0.92	<i>0.74</i>	0.92		0.51		0.55		0.72	

Note: The test for serial correlation is based on the Ljung-Box Q statistic, which is asymptotically distributed as χ^2 . Autocorrelation coefficients up to three lags as well as their significance are reported.

*Numbers below 0.05 indicate a probability of serial correlation greater or equal to 95%

Table B2: Persistence in year-ahead forecast error (continued)

(Results from the original study of 2007 displayed in italics below)

	Czech Rep		Estonia		Latvia		Lithuania		Hungary		Poland		Bulgaria		Romania	
GDP	2012	2007	2012	2007	2012	2007	2012	2007	2012	2007	2012	2007	2012	2007	2012	2007
p_1	0.14		0.42		0.31		-0.01		-0.14		-0.29		-0.41		-0.17	
Signif $p_1=0$	0.64		0.16		0.30		0.98		0.65		0.33		0.23		0.62	
p_2	-0.12		-0.32		-0.37		-0.40		0.01		-0.47		-0.21		-0.51	
Signif $p_2=0$	0.82		0.18		0.23		0.35		0.90		0.14		0.37		0.20	
p_3	-0.21		-0.52		-0.32		-0.12		-0.16		0.12		0.10		0.09	
Signif $p_3=0$	0.78		0.05		0.20		0.51		0.89		0.25		0.54		0.33	
Inflation																
p_1	-0.04		-0.20		-0.46		-0.38		-0.76		-0.08		-0.07		-0.65	
Signif $p_1=0$	0.89		0.50		0.12		0.19		0.01*		0.79		0.85		0.05	
p_2	0.07		-0.44		-0.16		-0.01		0.44		-0.37		-0.43		0.23	
Signif $p_2=0$	0.95		0.23		0.25		0.43		0.01*		0.39		0.34		0.12	
p_3	-0.29		-0.01		0.05		0.22		-0.21		0.11		-0.03		-0.10	
Signif $p_3=0$	0.70		0.39		0.43		0.47		0.02*		0.56		0.53		0.21	
Government balance																
p_1	0.04		0.20		0.28		0.14		0.05		0.17		-0.14		-0.12	
Signif $p_1=0$	0.90		0.50		0.35		0.63		0.86		0.56		0.68		0.73	
p_2	-0.31		-0.48		-0.46		-0.23		-0.18		-0.25		-0.50		-0.57	
Signif $p_2=0$	0.52		0.18		0.16		0.62		0.80		0.55		0.22		0.14	
p_3	0.11		-0.35		-0.36		-0.26		0.00		-0.01		0.09		0.09	
Signif $p_3=0$	0.68		0.14		0.12		0.57		0.93		0.75		0.36		0.26	
Investment																
p_1	-0.18		0.37		0.41		0.13		0.24		0.25		-0.17		0.02	
Signif $p_1=0$	0.53		0.22		0.17		0.67		0.42		0.40		0.62		0.94	
p_2	-0.11		-0.30		-0.35		-0.52		-0.12		-0.64		-0.25		-0.57	
Signif $p_2=0$	0.76		0.26		0.17		0.15		0.66		0.05*		0.62		0.15	
p_3	0.04		-0.53		-0.48		-0.16		0.16		-0.39		-0.03		-0.03	
Signif $p_3=0$	0.90		0.07		0.06		0.24		0.74		0.03*		0.81		0.28	
Unemployment																
p_1	-0.11		0.06		0.15		0.30		-0.08		0.39		0.48		-0.62	
Signif $p_1=0$	0.70		0.83		0.61		0.31		0.79		0.18		0.16		0.07	
p_2	-0.39		-0.37		-0.27		-0.29		-0.71		0.07		-0.27		0.22	
Signif $p_2=0$	0.33		0.39		0.54		0.34		0.03*		0.40		0.24		0.14	
p_3	-0.07		-0.09		-0.25		-0.37		0.24		-0.13		-0.49		0.00	
Signif $p_3=0$	0.52		0.58		0.52		0.22		0.05		0.55		0.07		0.27	
Current Account																
p_1	0.20		0.34		0.29		0.13		-0.08		-0.25		0.23		-0.08	
Signif $p_1=0$	0.51		0.25		0.32		0.66		0.78		0.40		0.50		0.81	
p_2	0.11		-0.43		-0.35		-0.61		-0.51		-0.56		-0.44		-0.57	
Signif $p_2=0$	0.74		0.15		0.26		0.08		0.17		0.09		0.26		0.15	
p_3	-0.07		-0.39		-0.35		-0.18		0.06		0.40		-0.23		0.08	
Signif $p_3=0$	0.88		0.10		0.20		0.13		0.31		0.06		0.30		0.27	

Note: The test for serial correlation is based on the Ljung-Box Q statistic, which is asymptotically distributed as χ^2 . Autocorrelation coefficients up to three lags as well as their significance are reported.

*Numbers below 0.05 indicate a probability of serial correlation greater or equal to 95%

Annex C

Table C1: Bias in current-year forecast error

(Results from the original study of 2007 displayed in italics below)

	Belgium		Denmark		Germany		Greece		Spain		France		Ireland	
GDP	2012	2007	2012	2007	2012	2007	2012	2007	2012	2007	2012	2007	2012	2007
α	-0.08	<i>-0.13</i>	0.24	<i>0.13</i>	0.00	<i>0.09</i>	0.08	<i>-0.12</i>	-0.14	<i>-0.20</i>	0.03	<i>0.03</i>	-0.43	<i>-0.57</i>
p-value $\alpha=0$	0.54	<i>0.42</i>	0.11	<i>0.49</i>	0.98	<i>0.62</i>	0.69	<i>0.50</i>	0.33	<i>0.26</i>	0.79	<i>0.83</i>	0.19	<i>0.10</i>
Adjusted sample size	43		39		43		31		26		43		39	
Inflation														
α	-0.04	<i>-0.02</i>	-0.19	<i>-0.18</i>	0.07	<i>0.10</i>	-0.09	<i>-0.11</i>	-0.27	<i>-0.28</i>	0.04	<i>0.04</i>	0.07	<i>0.01</i>
p-value $\alpha=0$	0.71	<i>0.89</i>	0.08	<i>0.16</i>	0.31	<i>0.14</i>	0.68	<i>0.70</i>	0.02*	<i>0.02*</i>	0.69	<i>0.74</i>	0.75	<i>0.96</i>
Adjusted sample size	43		39		43		31		26		43		39	
Government balance														
α	0.13	<i>0.12</i>	-0.21	<i>-0.10</i>	-0.27	<i>-0.16</i>	0.84	<i>0.54</i>	0.30	<i>0.05</i>	-0.06	<i>-0.06</i>	0.50	<i>-0.33</i>
p-value $\alpha=0$	0.21	<i>0.27</i>	0.33	<i>0.67</i>	0.07	<i>0.32</i>	0.07	<i>0.23</i>	0.30	<i>0.85</i>	0.64	<i>0.68</i>	0.44	<i>0.32</i>
Adjusted sample size	41		35		43		30		26		43		38	
Investment														
α	-0.19	<i>0.09</i>	0.46	<i>0.33</i>	0.76	<i>1.08</i>	2.20	<i>1.42</i>	0.12	<i>-0.10</i>	0.32	<i>0.32</i>	1.13	<i>0.53</i>
p-value $\alpha=0$	0.66	<i>0.88</i>	0.54	<i>0.70</i>	0.09	<i>0.03*</i>	0.03*	<i>0.10</i>	0.83	<i>0.88</i>	0.26	<i>0.32</i>	0.15	<i>0.50</i>
Adjusted sample size	43		39		43		31		26		43		39	
Unemployment														
α	0.06	<i>0.02</i>	-0.07	<i>-0.02</i>	0.08	<i>0.03</i>	-0.08	<i>0.00</i>	0.12	<i>0.36</i>	0.05	<i>0.02</i>	0.31	<i>0.34</i>
p-value $\alpha=0$	0.50	<i>0.89</i>	0.57	<i>0.90</i>	0.33	<i>0.69</i>	0.67	<i>0.98</i>	0.49	<i>0.06</i>	0.46	<i>0.76</i>	0.02*	<i>0.03*</i>
Adjusted sample size	43		39		43		31		26		42		39	
Current Account														
α	0.03	<i>0.03</i>	-0.14	<i>0.01</i>	-0.28	<i>-0.20</i>	0.93	<i>0.68</i>	0.17	<i>0.37</i>	0.03	<i>0.05</i>	-0.16	<i>-0.30</i>
p-value $\alpha=0$	0.90	<i>0.88</i>	0.44	<i>0.97</i>	0.03*	<i>0.13</i>	0.02*	<i>0.05*</i>	0.42	<i>0.13</i>	0.79	<i>0.68</i>	0.58	<i>0.37</i>
Adjusted sample size	41		39		41		30		26		41		39	

α : coefficient in regression (1). P-value | $\alpha=0$ denote p-values for the $\alpha=0$ t-test.

*Numbers below 0.05 indicate the probability of a bias with a probability greater or equal to 95%.

Table C1: Bias in current-year forecast error (continued)

(Results from the original study of 2007 displayed in italics below)

	Italy		Luxembourg		Netherlands		Portugal		UK		European Union		Euro area	
GDP	2012	2007	2012	2007	2012	2007	2012	2007	2012	2007	2012	2007	2012	2007
α	0.42	<i>0.43</i>	-0.47	<i>-0.63</i>	-0.01	<i>-0.02</i>	0.14	<i>0.24</i>	0.07	<i>0.01</i>	0.10	<i>0.11</i>	0.13	<i>0.28</i>
p-value $\alpha=0$	0.02*	<i>0.03*</i>	0.13	<i>0.05*</i>	0.95	<i>0.92</i>	0.44	<i>0.23</i>	0.63	<i>0.95</i>	0.36	<i>0.37</i>	0.40	<i>0.15</i>
Adjusted sample size	43		43		43		26		39		43		14	
Inflation														
α	-0.11	<i>-0.14</i>	-0.03	<i>0.02</i>	0.01	<i>-0.04</i>	-0.31	<i>-0.41</i>	0.05	<i>0.17</i>	0.00	<i>0.02</i>	-0.05	<i>-0.08</i>
p-value $\alpha=0$	0.41	<i>0.38</i>	0.81	<i>0.83</i>	0.92	<i>0.70</i>	0.03*	<i>0.01*</i>	0.78	<i>0.44</i>	0.94	<i>0.74</i>	0.49	<i>0.35</i>
Adjusted sample size	43		43		43		26		39		43		14	
Government balance														
α	0.14	<i>0.15</i>	-0.75	<i>-0.65</i>	-0.35	<i>-0.30</i>	-0.21	<i>-0.29</i>	0.06	<i>0.03</i>	-0.07	<i>-0.08</i>	-0.07	<i>-0.11</i>
p-value $\alpha=0$	0.48	<i>0.51</i>	0.01*	<i>0.05*</i>	0.07	<i>0.12</i>	0.36	<i>0.22</i>	0.72	<i>0.86</i>	0.45	<i>0.44</i>	0.71	<i>0.66</i>
Adjusted sample size	43		38		43		26		39		43		14	
Investment														
α	1.15	<i>1.16</i>	-0.46	<i>-0.84</i>	-0.14	<i>0.04</i>	0.46	<i>0.55</i>	0.61	<i>0.66</i>	0.61	<i>0.65</i>	0.72	<i>1.11</i>
p-value $\alpha=0$	0.03*	<i>0.05*</i>	0.48	<i>0.24</i>	0.77	<i>0.94</i>	0.56	<i>0.58</i>	0.17	<i>0.16</i>	0.01*	<i>0.02*</i>	0.11	<i>0.11</i>
Adjusted sample size	43		43		43		26		39		43		14	
Unemployment														
α	0.05	<i>0.01</i>	0.06	<i>0.01</i>	0.24	<i>0.24</i>	0.17	<i>0.31</i>	0.06	<i>0.08</i>	0.05	<i>0.03</i>	0.16	<i>0.20</i>
p-value $\alpha=0$	0.75	<i>0.97</i>	0.43	<i>0.93</i>	0.14	<i>0.19</i>	0.24	<i>0.06</i>	0.22	<i>0.17</i>	0.33	<i>0.62</i>	0.03*	<i>0.01*</i>
Adjusted sample size	43		37		43		26		39		43		14	
Current Account														
α	0.20	<i>0.15</i>	0.41	<i>0.43</i>	-0.02	<i>-0.05</i>	0.25	<i>0.26</i>	-0.19	<i>-0.18</i>	-0.04	<i>-0.03</i>	0.06	<i>0.24</i>
p-value $\alpha=0$	0.17	<i>0.34</i>	0.63	<i>0.66</i>	0.93	<i>0.83</i>	0.49	<i>0.59</i>	0.24	<i>0.29</i>	0.52	<i>0.64</i>	0.74	<i>0.25</i>
Adjusted sample size	41		39		41		26		93		41		14	

α : coefficient in regression (1). P-value | $\alpha=0$ denote p-values for the $\alpha=0$ t-test.

*Numbers below 0.05 indicate the probability of a bias with a probability greater or equal to 95%.

Table C1: Bias in current-year forecast error (continued)

(Results from the original study of 2007 displayed in italics below)

	Austria		Sweden		Finland		Slovenia		Slovakia		Cyprus		Malta	
GDP	2012	2007	2012	2007	2012	2007	2012	2007	2012	2007	2012	2007	2012	2007
α	-0.05	<i>0.15</i>	-0.05	<i>-0.09</i>	0.16	<i>0.16</i>	0.35		-0.64		0.10		-0.45	
p-value $\alpha=0$	0.78	<i>0.50</i>	0.88	<i>0.73</i>	0.69	<i>0.70</i>	0.64		0.26		0.79		0.32	
Adjusted sample size	17		17		17		8		8		8		8	
Inflation														
α	0.00	<i>0.13</i>	-0.06	<i>-0.01</i>	-0.06	<i>-0.11</i>	-0.16		0.15		-0.11		0.23	
p-value $\alpha=0$	1.00	<i>0.41</i>	0.56	<i>0.94</i>	0.64	<i>0.52</i>	0.72		0.60		0.73		0.54	
Adjusted sample size	17		17		17		8		8		8		8	
Government balance														
α	-0.26	<i>-0.09</i>	-1.03	<i>-1.16</i>	-0.45	<i>-0.47</i>	-0.21		0.28		-0.22		0.05	
p-value $\alpha=0$	0.10	<i>0.67</i>	0.00*	<i>0.00*</i>	0.10	<i>0.16</i>	0.37		0.54		0.81		0.91	
Adjusted sample size	17		17		17		8		8		8		8	
Investment														
α	0.21	<i>0.99</i>	0.41	<i>1.22</i>	1.58	<i>2.14</i>	1.61		0.45		1.54		9.63	
p-value $\alpha=0$	0.73	<i>0.23</i>	0.67	<i>0.31</i>	0.08	<i>0.07</i>	0.58		0.64		0.55		0.05	
Adjusted sample size	17		17		17		8		8		8		8	
Unemployment														
α	0.09	<i>-0.12</i>	-0.11	<i>-0.29</i>	0.15	<i>0.03</i>	0.25		0.43		-0.22		0.44	
p-value $\alpha=0$	0.47	<i>0.36</i>	0.60	<i>0.36</i>	0.25	<i>0.87</i>	0.18		0.31		0.46		0.04*	
Adjusted sample size	17		17		17		8		8		8		8	
Current Account														
α	-0.08	<i>-0.23</i>	-0.29	<i>-0.36</i>	-0.01	<i>-0.05</i>	0.09		0.19		1.66		-0.25	
p-value $\alpha=0$	0.77	<i>0.51</i>	0.22	<i>0.28</i>	0.98	<i>0.92</i>	0.89		0.86		0.29		0.86	
Adjusted sample size	17		17		17		8		8		8		8	

α : coefficient in regression (1). P-value | $\alpha=0$ denote p-values for the $\alpha=0$ t-test.

*Numbers below 0.05 indicate the probability of a bias with a probability greater or equal to 95%.

Table C1: Bias in current-year forecast error (continued)

(Results from the original study of 2007 displayed in italics below)

	Czech Rep		Estonia		Latvia		Lithuania		Hungary		Poland		Bulgaria		Romania	
	2012	2007	2012	2007	2012	2007	2012	2007	2012	2007	2012	2007	2012	2007	2012	2007
GDP																
α	-0.36		-0.04		-0.19		0.11		0.25		-0.69		0.80		0.80	
p-value $\alpha=0$	0.47		0.98		0.91		0.89		0.48		0.18		0.31		0.38	
Adjusted sample size	8		8		8		8		8		8		5		5	
Inflation																
α	0.01		-0.49		-2.44		-0.60		-0.13		-0.20		-0.98		0.10	
p-value $\alpha=0$	0.96		0.24		0.01*		0.18		0.62		0.24		0.37		0.91	
Adjusted sample size	8		8		8		8		8		8		5		5	
Government balance																
α	-1.00		-0.66		-0.69		0.25		0.05		-0.23		0.70		0.78	
p-value $\alpha=0$	0.09		0.37		0.27		0.69		0.94		0.62		0.46		0.44	
Adjusted sample size	8		8		8		8		8		8		5		5	
Investment																
α	1.63		0.94		0.90		2.21		2.69		0.40		5.38		2.24	
p-value $\alpha=0$	0.24		0.79		0.81		0.44		0.18		0.83		0.32		0.74	
Adjusted sample size	8		8		8		8		8		8		5		5	
Unemployment																
α	0.32		1.77		0.41		0.31		-0.10		0.76		-0.38		0.64	
p-value $\alpha=0$	0.15		0.32		0.35		0.46		0.58		0.07		0.62		0.07	
Adjusted sample size	8		8		8		8		8		8		5		5	
Current Account																
α	-0.25		0.05		0.41		0.50		-0.16		-0.34		-1.50		-1.10	
p-value $\alpha=0$	0.69		0.96		0.66		0.81		0.89		0.48		0.61		0.34	
Adjusted sample size	8		8		8		8		8		8		5		5	

α : coefficient in regression (1). P-value | $\alpha=0$ denote p-values for the $\alpha=0$ t-test.

*Numbers below 0.05 indicate the probability of a bias with a probability greater or equal to 95%.

Table C2: Bias in year-ahead forecast error

(Results from the original study of 2007 displayed in italics below)

	Belgium		Denmark		Germany		Greece		Spain		France		Ireland	
GDP	2012	2007	2012	2007	2012	2007	2012	2007	2012	2007	2012	2007	2012	2007
α	0.24	<i>0.21</i>	0.38	<i>0.18</i>	0.33	<i>0.31</i>	0.33	<i>-0.11</i>	0.07	<i>-0.13</i>	0.35	<i>0.30</i>	-0.38	<i>-0.76</i>
p-value $\alpha=0$	0.31	<i>0.49</i>	0.12	<i>0.53</i>	0.23	<i>0.36</i>	0.30	<i>0.66</i>	0.78	<i>0.62</i>	0.06	<i>0.13</i>	0.42	<i>0.10</i>
Adjusted sample size	42		38		42		30		25		42		38	
Inflation														
α	-0.02	<i>0.01</i>	-0.35	<i>-0.39</i>	0.01	<i>0.01</i>	-0.65	<i>-0.69</i>	-0.39	<i>-0.41</i>	-0.32	<i>-0.37</i>	-0.14	<i>-0.33</i>
p-value $\alpha=0$	0.94	<i>0.96</i>	0.22	<i>0.25</i>	0.92	<i>0.93</i>	0.06	<i>0.09</i>	0.03*	<i>0.01*</i>	0.15	<i>0.13</i>	0.75	<i>0.50</i>
Adjusted sample size	42		38		42		30		25		42		38	
Government balance														
α	0.35	<i>0.35</i>	-0.08	<i>0.01</i>	-0.16	<i>-0.09</i>	1.41	<i>0.97</i>	0.64	<i>0.16</i>	0.10	<i>0.07</i>	0.77	<i>-0.08</i>
p-value $\alpha=0$	0.16	<i>0.17</i>	0.83	<i>0.98</i>	0.45	<i>0.67</i>	0.03*	<i>0.09</i>	0.18	<i>0.60</i>	0.58	<i>0.69</i>	0.24	<i>0.87</i>
Adjusted sample size	41		35		42		30		25		42		38	
Investment														
α	0.63	<i>0.90</i>	0.89	<i>0.85</i>	0.90	<i>1.15</i>	2.82	<i>1.67</i>	0.50	<i>-0.21</i>	0.71	<i>0.73</i>	1.67	<i>0.57</i>
p-value $\alpha=0$	0.37	<i>0.26</i>	0.41	<i>0.48</i>	0.15	<i>0.08</i>	0.01*	<i>0.03*</i>	0.55	<i>0.81</i>	0.06	<i>0.08</i>	0.16	<i>0.65</i>
Adjusted sample size	42		38		42		30		25		42		38	
Unemployment														
α	0.30	<i>0.23</i>	-0.16	<i>-0.01</i>	0.11	<i>0.05</i>	-0.42	<i>-0.38</i>	-0.13	<i>0.30</i>	0.04	<i>0.02</i>	0.34	<i>0.58</i>
p-value $\alpha=0$	0.08	<i>0.23</i>	0.45	<i>0.98</i>	0.49	<i>0.78</i>	0.12	<i>0.21</i>	0.72	<i>0.43</i>	0.75	<i>0.86</i>	0.17	<i>0.02*</i>
Adjusted sample size	41		38		41		30		25		41		38	
Current Account														
α	-0.05	<i>-0.05</i>	-0.04	<i>0.19</i>	-0.27	<i>-0.19</i>	1.37	<i>0.86</i>	0.22	<i>0.42</i>	0.01	<i>-0.04</i>	0.10	<i>0.08</i>
p-value $\alpha=0$	0.86	<i>0.88</i>	0.91	<i>0.63</i>	0.19	<i>0.38</i>	0.01*	<i>0.02*</i>	0.49	<i>0.27</i>	0.96	<i>0.82</i>	0.81	<i>0.88</i>
Adjusted sample size	41		38		41		30		25		41		38	

α : coefficient in regression (2). P-value | $\alpha=0$ denote p-values for the $\alpha=0$ t-test.

*Numbers below 0.05 indicate the probability of a bias with a probability greater or equal to 95%.

Table C2: Bias in year-ahead forecast error (continued)

(Results from the original study of 2007 displayed in italics below)

	Italy		Luxembourg		Netherlands		Portugal		UK		European Union		Euro area	
GDP	2012	2007	2012	2007	2012	2007	2012	2007	2012	2007	2012	2007	2012	2007
α	0.76	<i>0.70</i>	0.09	<i>-0.08</i>	0.07	<i>0.02</i>	0.44	<i>0.41</i>	0.35	<i>0.25</i>	0.37	<i>0.34</i>	0.50	<i>0.46</i>
p-value $\alpha=0$	0.01*	<i>0.01*</i>	0.84	<i>0.86</i>	0.76	<i>0.94</i>	0.08	<i>0.14</i>	0.15	<i>0.31</i>	0.08	<i>0.09</i>	0.23	<i>0.18</i>
Adjusted sample size	42		42		42		25		38		42		13	
Inflation														
α	-0.96	<i>-1.11</i>	-0.16	<i>-0.18</i>	0.21	<i>0.15</i>	-0.56	<i>-0.83</i>	-0.32	<i>-0.23</i>	-0.23	<i>-0.23</i>	-0.10	<i>-0.17</i>
p-value $\alpha=0$	0.01*	<i>0.01*</i>	0.52	<i>0.51</i>	0.19	<i>0.33</i>	0.12	<i>0.03*</i>	0.36	<i>0.58</i>	0.25	<i>0.31</i>	0.67	<i>0.21</i>
Adjusted sample size	42		42		42		25		38		42		13	
Government balance														
α	0.42	<i>0.46</i>	-1.33	<i>-1.27</i>	-0.10	<i>-0.19</i>	0.18	<i>-0.04</i>	0.41	<i>0.37</i>	0.15	<i>0.12</i>	0.18	<i>0.03</i>
p-value $\alpha=0$	0.11	<i>0.11</i>	0.00*	<i>0.00*</i>	0.71	<i>0.46</i>	0.65	<i>0.91</i>	0.18	<i>0.21</i>	0.40	<i>0.44</i>	0.67	<i>0.93</i>
Adjusted sample size	42		37		42		25		38		42		13	
Investment														
α	1.78	<i>1.57</i>	-0.66	<i>-1.25</i>	-0.39	<i>-0.50</i>	1.60	<i>0.99</i>	0.85	<i>0.67</i>	0.90	<i>0.79</i>	1.60	<i>1.80</i>
p-value $\alpha=0$	0.00*	<i>0.01*</i>	0.57	<i>0.31</i>	0.52	<i>0.45</i>	0.12	<i>0.39</i>	0.23	<i>0.31</i>	0.04*	<i>0.05</i>	0.09	<i>0.07</i>
Adjusted sample size	42		42		42		25		38		42		13	
Unemployment														
α	0.05	<i>0.06</i>	0.03	<i>-0.08</i>	0.23	<i>0.24</i>	0.00	<i>0.32</i>	0.09	<i>0.12</i>	0.07	<i>0.10</i>	0.08	<i>0.23</i>
p-value $\alpha=0$	0.82	<i>0.82</i>	0.81	<i>0.34</i>	0.30	<i>0.37</i>	0.99	<i>0.31</i>	0.50	<i>0.41</i>	0.54	<i>0.43</i>	0.59	<i>0.17</i>
Adjusted sample size	41		36		41		25		38		41		13	
Current Account														
α	0.50	<i>0.43</i>	-0.40	<i>-0.86</i>	-0.07	<i>-0.07</i>	0.94	<i>1.10</i>	0.01	<i>-0.01</i>	0.07	<i>0.04</i>	0.28	<i>0.37</i>
p-value $\alpha=0$	0.04*	<i>0.14</i>	0.80	<i>0.65</i>	0.81	<i>0.82</i>	0.04*	<i>0.06</i>	0.98	<i>0.96</i>	0.48	<i>0.72</i>	0.25	<i>0.29</i>
Adjusted sample size	41		32		41		25		38		41		11	

α : coefficient in regression (2). P-value | $\alpha=0$ denote p-values for the $\alpha=0$ t-test.

*Numbers below 0.05 indicate the probability of a bias with a probability greater or equal to 95%.

Table C2: Bias in year-ahead forecast error (continued)

(Results from the original study of 2007 displayed in italics below)

	Austria		Sweden		Finland		Slovenia		Slovakia		Cyprus		Malta	
GDP	2012	2007	2012	2007	2012	2007	2012	2007	2012	2007	2012	2007	2012	2007
α	0.30	<i>0.36</i>	0.31	<i>0.22</i>	0.32	<i>-0.07</i>	0.94		-0.14		0.51		0.05	
p-value $\alpha=0$	0.41	<i>0.22</i>	0.54	<i>0.52</i>	0.65	<i>0.89</i>	0.55		0.93		0.44		0.95	
Adjusted sample size	17		17		17		8		8		8		8	
Inflation														
α	0.14	<i>0.21</i>	0.42	<i>0.45</i>	0.12	<i>0.32</i>	0.46		0.35		0.05		0.22	
p-value $\alpha=0$	0.56	<i>0.21</i>	0.01*	<i>0.05</i>	0.69	<i>0.37</i>	0.48		0.59		0.92		0.65	
Adjusted sample size	17		17		17		8		8		8		8	
Government balance														
α	-0.36	<i>-0.44</i>	-1.06	<i>-1.16</i>	-0.43	<i>-0.53</i>	0.31		0.60		-0.24		0.02	
p-value $\alpha=0$	0.13	<i>0.08</i>	0.00*	<i>0.01*</i>	0.40	<i>0.17</i>	0.70		0.48		0.85		0.96	
Adjusted sample size	17		17		17		8		8		8		8	
Investment														
α	0.78	<i>0.94</i>	1.38	<i>1.80</i>	1.71	<i>2.17</i>	4.46		-0.34		1.60		6.37	
p-value $\alpha=0$	0.35	<i>0.29</i>	0.31	<i>0.20</i>	0.24	<i>0.19</i>	0.24		0.94		0.52		0.21	
Adjusted sample size	17		17		17		8		8		8		8	
Unemployment														
α	0.14	<i>0.00</i>	-0.12	<i>-0.24</i>	0.27	<i>0.35</i>	-0.03		0.31		-0.38		0.16	
p-value $\alpha=0$	0.46	<i>1.00</i>	0.68	<i>0.53</i>	0.19	<i>0.10</i>	0.94		0.64		0.39		0.54	
Adjusted sample size	17		17		17		8		8		8		8	
Current Account														
α	-0.31	<i>-0.38</i>	-0.73	<i>-0.64</i>	0.13	<i>-0.20</i>	0.64		0.86		2.11		0.74	
p-value $\alpha=0$	0.42	<i>0.35</i>	0.08	<i>0.24</i>	0.78	<i>0.67</i>	0.51		0.33		0.22		0.62	
Adjusted sample size	17		17		17		8		8		8		8	

α : coefficient in regression (2). P-value | $\alpha=0$ denote p-values for the $\alpha=0$ t-test.

*Numbers below 0.05 indicate the probability of a bias with a probability greater or equal to 95%.

Table C2: Bias in year-ahead forecast error (continued)

(Results from the original study of 2007 displayed in italics below)

	Czech Rep		Estonia		Latvia		Lithuania		Hungary		Poland		Bulgaria		Romania	
	2012	2007	2012	2007	2012	2007	2012	2007	2012	2007	2012	2007	2012	2007	2012	2007
GDP																
α	0.21		1.11		1.13		0.64		1.08		-0.36		1.76		2.54	
p-value $\alpha=0$	0.87		0.66		0.69		0.78		0.32		0.56		0.42		0.35	
Adjusted sample size	8		8		8		8		8		8		5		5	
Inflation																
α	0.62		-0.36		-2.91		-0.89		-0.35		-0.19		-1.02		-0.92	
p-value $\alpha=0$	0.17		0.74		0.01*		0.20		0.30		0.70		0.56		0.51	
Adjusted sample size	8		8		8		8		8		8		5		5	
Government balance																
α	-0.75		-1.32		-0.77		-0.15		-0.57		0.05		2.32		1.45	
p-value $\alpha=0$	0.39		0.19		0.56		0.88		0.68		0.95		0.18		0.15	
Adjusted sample size	8		8		8		8		8		8		5		5	
Investment																
α	3.31		2.61		1.41		1.87		5.32		1.32		9.02		3.64	
p-value $\alpha=0$	0.14		0.63		0.81		0.74		0.02*		0.57		0.34		0.71	
Adjusted sample size	8		8		8		8		8		8		5		5	
Unemployment																
α	0.31		-0.87		-0.05		-0.13		-0.50		0.97		-0.68		0.64	
p-value $\alpha=0$	0.41		0.42		0.97		0.91		0.06		0.10		0.40		0.16	
Adjusted sample size	8		8		8		8		8		8		5		5	
Current Account																
α	0.00		-0.15		0.04		0.07		-0.55		-0.20		-2.55		-2.48	
p-value $\alpha=0$	1.00		0.95		0.99		0.97		0.59		0.79		0.58		0.22	
Adjusted sample size	8		8		8		8		8		8		5		5	

α : coefficient in regression (2). P-value | $\alpha=0$ denote p-values for the $\alpha=0$ t-test.

*Numbers below 0.05 indicate the probability of a bias with a probability greater or equal to 95%.

Annex D

Table D1: Comparison of Commission and other forecasts - current year																	
	Belgium	Denmark	Germany	Ireland	Greece	Spain	France	Italy	Luxembourg	Netherlands	Austria	Portugal	Finland	Sweden	United Kingdom	EU	Euro area
Full sample																	
Sample	75/11	75/11	71/11	75/11	81/11	86/11	71/11	71/11	81/11	75/11	95/11	86/11	95/11	95/11	73/11		99/11
No of obs. (COM)	37	37	41	37	31	26	41	41	31	37	17	26	17	17	39	:	13
No of obs. (OECD)	37	37	41	37	31	26	41	41	31	37	17	26	17	17	39	:	13
ME(COM)	0.02	0.20	0.03	-0.51	0.08	-0.14	0.08	0.34	-0.65	0.03	-0.05	0.14	0.16	-0.05	0.07	:	0.14
ME(OECD)	0.02	-0.09	0.00	-0.37	0.06	-0.13	0.13	0.10	-0.30	-0.10	-0.09	0.04	0.08	-0.01	0.15	:	0.11
MAE(COM)	0.65	0.66	0.79	1.54	0.76	0.54	0.53	0.80	1.44	0.69	0.52	0.73	1.25	0.94	0.69	:	0.46
MAE(OECD)	0.67	0.68	0.75	1.37	0.72	0.48	0.57	0.69	1.30	0.73	0.50	0.74	1.14	0.90	0.60	:	0.48
RMSE(COM)	0.81	0.84	1.08	1.92	1.03	0.74	0.70	1.11	1.99	0.89	0.66	0.90	1.55	1.33	0.88	:	0.59
RMSE(OECD)	0.80	0.83	0.91	1.70	1.04	0.68	0.81	0.99	1.65	0.85	0.62	0.95	1.49	1.31	0.82	:	0.58
Smaller sample																	
	91/11	91/11	90/11	91/11	94/11	91/11	90/11	90/11	94/11	91/11	95/11	91/11	95/11	95/11	90/11		99/11
No of obs. (COM)	21	21	22	21	18	21	22	22	19	21	17	21	17	17	22	13	13
No of obs. (CONSENSUS)	21	21	22	21	18	21	22	22	:	21	17	21	17	17	22	:	9
No of obs. (IMF)	21	21	22	21	18	21	22	22	19	21	17	21	17	17	22	13	13
ME(COM)	0.07	0.29	-0.21	-0.75	0.10	0.00	0.13	0.44	-0.24	0.05	-0.05	0.32	0.16	-0.05	0.17	0.17	0.14
ME(CONS)	0.14	0.58	-0.23	-1.07	-0.06	0.03	0.18	0.45	:	0.03	-0.02	0.52	-0.09	0.02	0.19	:	0.00
ME(IMF)	0.00	0.15	-0.18	-0.52	0.15	0.04	0.13	0.40	-0.41	-0.01	-0.04	0.36	-0.10	-0.17	0.18	-0.01	0.05
MAE(COM)	0.62	0.76	0.67	1.66	0.67	0.47	0.51	0.65	1.38	0.70	0.52	0.73	1.25	0.94	0.58	0.46	0.43
MAE(CONS)	0.75	1.14	0.63	1.99	0.79	0.51	0.50	0.69	:	0.64	0.69	0.83	1.50	0.99	0.61	:	0.50
MAE(IMF)	0.68	0.90	0.71	1.31	0.83	0.48	0.44	0.71	1.27	0.63	0.55	0.77	1.28	0.91	0.53	0.47	0.43
RMSE(COM)	0.75	0.96	0.89	2.04	1.00	0.59	0.60	0.75	1.76	0.88	0.66	0.90	1.55	1.33	0.71	0.57	0.53
RMSE(CONS)	0.88	2.11	0.89	2.54	1.12	0.69	0.62	0.83	:	0.83	0.80	1.10	1.92	1.31	0.77	:	0.54
RMSE(IMF)	0.81	1.08	0.97	1.66	1.26	0.63	0.57	0.84	1.55	0.81	0.65	0.98	1.55	1.39	0.68	0.52	0.48

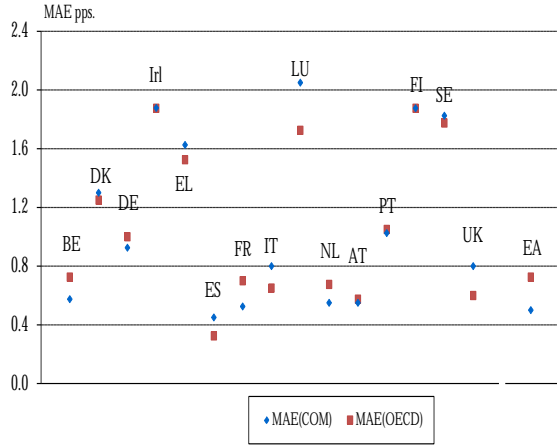
	Estonia	Cyprus	Malta	Slovenia	Slovakia	Bulgaria	Czech Republic	Latvia	Lithuania	Hungary	Poland	Romania
Sample	04/11	04/11	04/11	04/11	04/11	07/11	04/11	04/11	04/11	04/11	04/11	07/11
No of obs. (COM)	8	8	8	8	8	5	8	8	8	8	8	5
No of obs. (OECD)	:	:	:	:	8	:	8	:	:	8	8	:
No of obs. (IMF)	8	8	8	8	8	5	8	8	8	8	8	5
ME(COM)	-0.04	0.10	-0.45	0.35	-0.64	0.80	-0.36	-0.19	0.11	0.25	-0.69	0.80
ME(OECD)	:	:	:	:	-0.70	:	-0.26	:	:	0.36	-0.46	:
ME(IMF)	-0.14	0.04	-0.35	0.46	-0.44	0.72	-0.51	0.10	0.16	0.59	-0.81	0.58
MAE(COM)	2.96	0.68	0.95	1.45	1.36	1.00	1.19	3.51	1.71	0.80	1.11	1.56
MAE(OECD)	:	:	:	:	1.00	:	0.86	:	:	0.81	0.96	:
MAE(IMF)	3.51	0.84	1.10	1.41	1.29	1.00	0.96	3.53	1.99	1.24	0.91	1.66
RMSE(COM)	3.36	0.96	1.20	1.95	1.52	1.60	1.30	4.12	2.08	0.92	1.41	1.81
RMSE(OECD)	:	:	:	:	1.17	:	1.06	:	:	0.91	1.15	:
RMSE(IMF)	3.86	1.07	1.39	1.97	1.56	1.48	1.13	4.22	2.54	1.45	1.16	1.87

Table D3: Comparison of Commission and other forecasts - year ahead																	
	Belgium	Denmark	Germany	Ireland	Greece	Spain	France	Italy	Luxembourg	Netherlands	Austria	Portugal	Finland	Sweden	United Kingdom	EU	Euro area
Full sample																	
Sample	76/11	76/11	71/11	76/11	82/11	87/11	71/11	71/11	82/11	76/11	95/11	87/11	95/11	95/11	74/11		
No of obs. (COM)	36	36	41	36	30	25	41	41	30	36	17	25	17	17	38	:	13
No of obs. (OECD)	36	36	41	36	30	25	41	41	30	36	17	25	17	17	38	:	12
ME(COM)	0.13	0.28	0.36	-0.61	0.33	0.07	0.41	0.72	-0.25	0.08	0.30	0.44	0.32	0.31	0.35	:	0.50
ME(OECD)	0.16	0.08	0.25	-0.68	0.23	0.04	0.30	0.40	-0.20	0.04	0.17	0.56	0.14	0.28	0.19	:	0.51
MAE(COM)	0.99	1.01	1.32	2.23	1.19	0.90	0.83	1.30	2.08	1.09	1.01	1.02	1.86	1.39	1.13	:	1.10
MAE(OECD)	0.99	1.00	1.22	2.28	1.10	0.85	0.83	1.38	1.98	1.10	0.92	1.05	1.83	1.41	1.06	:	0.98
RMSE(COM)	1.27	1.45	1.77	2.77	1.72	1.25	1.16	1.82	2.58	1.39	1.44	1.27	2.79	1.99	1.48	:	1.52
RMSE(OECD)	1.29	1.34	1.66	2.74	1.56	1.12	1.20	1.86	2.56	1.39	1.25	1.32	2.72	1.94	1.49	:	1.32
Smaller sample																	
	91/09	91/09	90/09	91/09	94/09	91/09	90/09	90/09	94/09	91/09	95/09	91/09	95/09	95/09	90/09		
No of obs. (COM)	21	21	22	21	18	21	22	22	18	21	17	21	17	17	22	13	13
No of obs. (CONSENSUS)	21	21	22	21	18	21	22	22	:	21	17	21	17	17	22	:	8
No of obs. (IMF)	21	21	22	21	18	21	22	22	18	21	17	21	17	17	22	13	13
ME(COM)	0.35	0.50	0.22	-0.95	0.42	0.29	0.51	0.89	-0.20	0.16	0.30	0.68	0.32	0.31	0.53	0.49	0.50
ME(CONS)	0.47	0.45	0.25	-1.09	0.42	0.39	0.54	0.85	:	0.29	0.29	1.00	0.01	0.38	0.55	:	0.43
ME(IMF)	0.41	0.34	0.55	-0.74	0.34	0.42	0.70	1.03	-0.03	0.45	0.30	0.97	0.35	0.26	0.66	0.53	0.55
MAE(COM)	1.07	1.00	1.21	2.49	1.16	0.85	0.85	1.14	2.23	1.06	1.01	1.00	1.86	1.39	1.03	1.02	1.10
MAE(CONS)	1.33	1.14	1.29	2.81	1.31	0.96	0.95	1.20	:	1.14	1.23	1.36	1.99	1.44	1.05	:	1.22
MAE(IMF)	1.21	1.25	1.55	2.48	1.16	0.92	1.01	1.30	2.17	1.15	1.31	1.33	1.98	1.54	1.13	1.19	1.30
RMSE(COM)	1.32	1.54	1.58	3.19	1.77	1.22	1.10	1.55	2.76	1.44	1.44	1.28	2.79	1.99	1.41	1.50	1.57
RMSE(CONS)	1.62	1.70	1.69	3.66	1.98	1.36	1.26	1.56	:	1.52	1.70	1.74	2.93	2.14	1.53	:	1.80
RMSE(IMF)	1.52	1.71	1.94	3.09	1.82	1.28	1.39	1.64	2.66	1.59	1.63	1.75	2.86	2.26	1.61	1.63	1.64

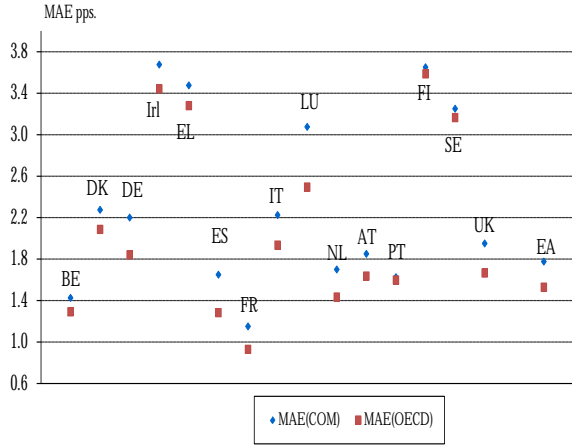
Table D4: Comparison of Commission and other forecasts - year ahead												
	Estonia	Cyprus	Malta	Slovenia	Slovakia	Bulgaria	Czech Republic	Latvia	Lithuania	Hungary	Poland	Romania
Smaller sample												
Sample	04/11	04/11	04/11	04/11	04/11	07/11	04/11	04/11	04/11	04/11	04/11	07/11
No of obs. (COM)	8	8	8	8	8	5	8	8	8	8	8	5
No of obs. (OECD)	:	:	:	:	8	:	8	:	:	8	8	:
No of obs. (IMF)	8	8	8	8	8	5	8	8	8	8	8	5
ME(COM)	1.20	0.51	0.02	1.04	-0.15	1.76	0.24	1.13	0.64	1.08	-0.36	2.54
ME(OECD)	:	:	:	:	-0.01	:	0.22	:	:	0.83	-0.61	:
ME(IMF)	0.45	0.65	0.06	1.08	0.29	1.30	0.01	0.95	0.81	1.23	-0.44	2.22
MAE(COM)	5.28	1.01	1.75	2.51	2.73	2.36	2.46	5.65	4.21	1.90	1.46	3.14
MAE(OECD)	:	:	:	:	2.46	:	2.18	:	:	1.87	1.29	:
MAE(IMF)	5.98	0.90	1.86	2.58	2.76	2.50	2.46	5.70	3.94	2.10	1.49	3.26
RMSE(COM)	6.41	1.72	2.12	4.15	3.91	4.26	3.22	7.36	5.97	2.88	1.59	5.41
RMSE(OECD)	:	:	:	:	3.50	:	2.75	:	:	2.55	1.45	:
RMSE(IMF)	7.12	1.67	2.26	4.32	4.08	4.29	3.18	7.39	6.08	3.33	1.62	5.43

Annex E

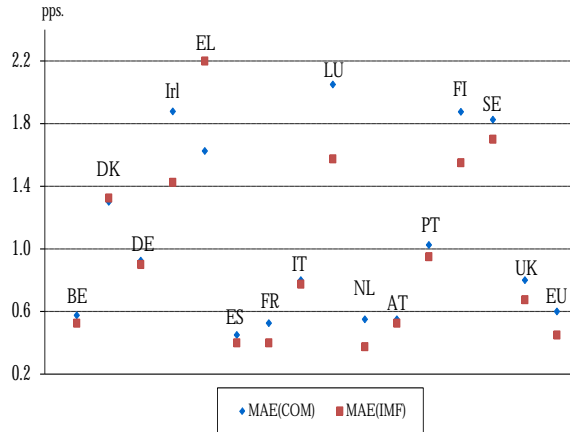
Graph E1: Mixed performance, either COM or OECD outperforms (current-year GDP outlook)



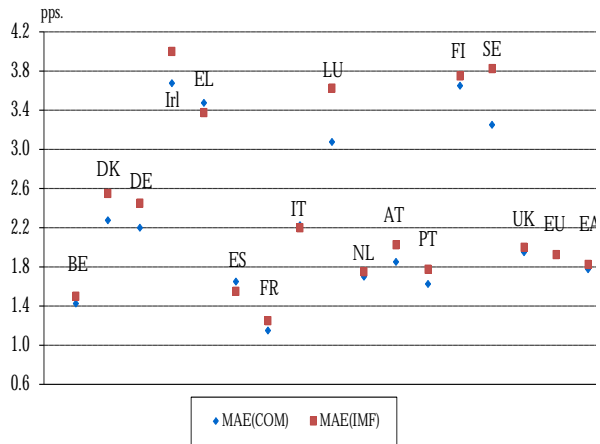
Graph E2: MAEs smaller for OECD forecasts (year-ahead GDP outlook)



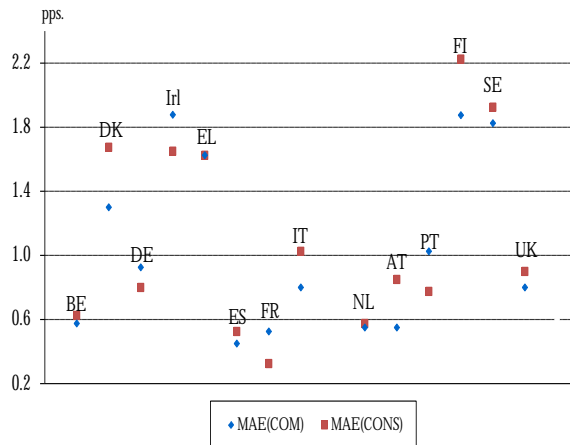
Graph E3: MAE smaller for IMF forecasts (current-year GDP outlook)



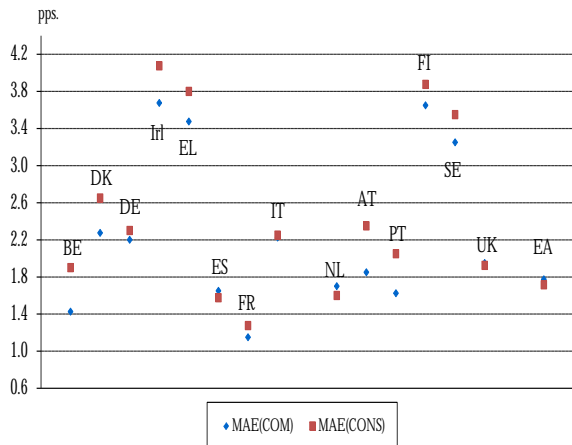
Graph E4: MAE larger for IMF forecasts (year-ahead GDP outlook)



Graph E5: MAE generally larger for Consensus forecasts (current-year GDP outlook)



Graph E6: MAE generally larger for Consensus forecasts (year-ahead GDP outlook)





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