Which Agency and Which Period is The Best? Analyzing National and International Fiscal Forecasts in Italy

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ABSTRACT
Economic forecasts taken into account during the European Semester are getting an increasing role in macroeconomic policy decisions. The main motivation for this paper is to analyse the performance of national, international and private agencies in forecasting the government deficit as a ratio to GDP for Italy from 1992 to 2012. Extending the existing methodology and using an innovative database, this paper finds that the accuracy of the forecasts depend on the month in which the forecasts are realized and on the nature of the institution making the economic forecasts (i.e. public or private).

Keywords: deficit, forecast accuracy, fiscal forecasting, forecast comparison.

JEL classification: G12, C14, E43, E62, G12, H62, H63

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1. Introduction

1.1 European Semester

Deficit forecasts are playing an increasing role in macroeconomic policy decisions. The central point of “sustainability” is mentioned in the Stability and Growth Pact of 1997 that carries the Maastricht provisions through to the operation of the Monetary Union itself, reinforcing the “excessive deficit procedure” set out in the Treaty.

Recently, the economic crisis has revealed a clear need for stronger economic coordination and governance at the EU level.

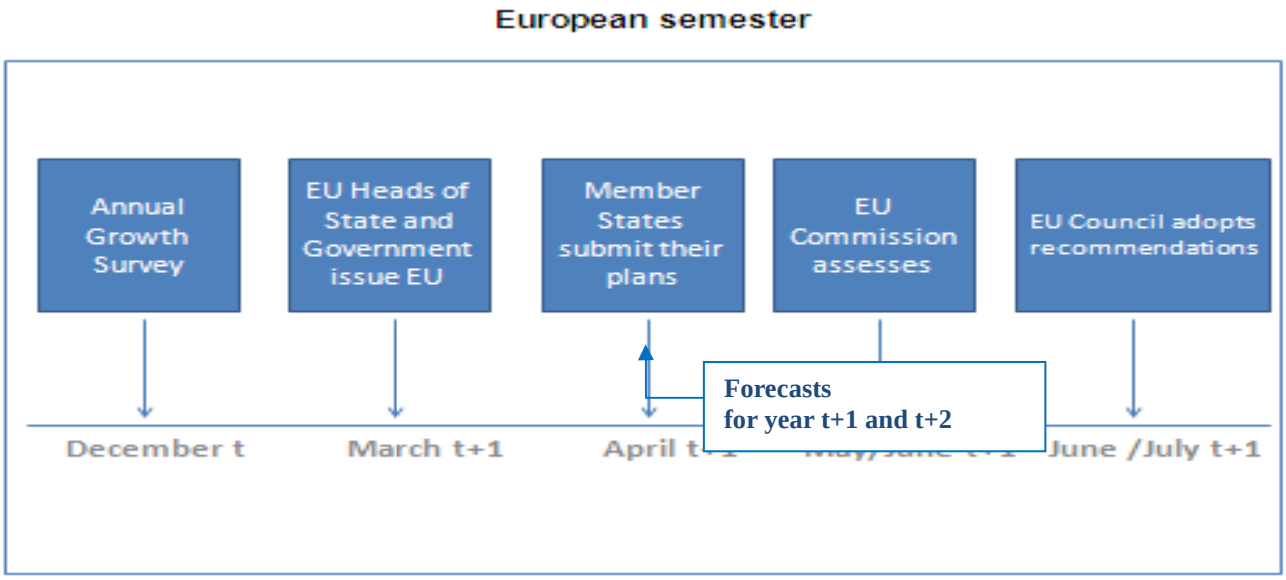
From a point of view of coordination at the EU level, before now, discussions between the EU and Member States on economic priorities and structural reforms were taking place through different processes. Reports were issued separately and decisions spread across the year with no clear synergies or linkages.

Towards this end, in the margins of the European Council meeting on 1-2 March 2012, 25 European leaders signed the Treaty on Stability, Coordination and Governance (TSCG) aimed at strengthNational3ng fiscal discipline and introducing stricter surveillance within the euro area, in particular by establishing a "balanced budget rule". These include the so-called “six pack” to upgrade the Stability and Growth Pact to a new Treaty incorporating the “fiscal compact” which requires that the decisions and recommendations taken by European Council are now not more based on outcomes but on forecasts.

Therefore the European Commission set up a yearly cycle of economic policy coordination called the European Semester. Each year the European Commission undertakes a detailed analysis of EU Member States' programmes of economic and structural reforms and provides them with recommendations for the next 12-18 months.

The European Semester means the EU and the euro zone will coordinate ex-ante their budgetary and economic policies in line with both the Stability and Growth Pact and the Europe 2020 strategy. The European Semester starts when the Commission adopts its Annual Growth Survey, usually towards the end of the year, which sets out EU priorities for the coming year to boost growth and job creation. In March, EU Heads of State and Government issue EU guidance for national policies on the basis of the Annual Growth Survey. In April, Member States submit their plans for sound public finances (Stability or Convergence Programmes), reforms and measures and show their own forecasts to the Commission. In May/June, the Commission compares the forecasts made by the EU during the Annual Growth Survey and the forecasts made by the Member States, and it assesses the plans as well as the convergence between forecasts and provides country-specific recommendations as appropriate. Finally, at the end of June or in early July, the

European Council formally adopts the country-specific recommendations.



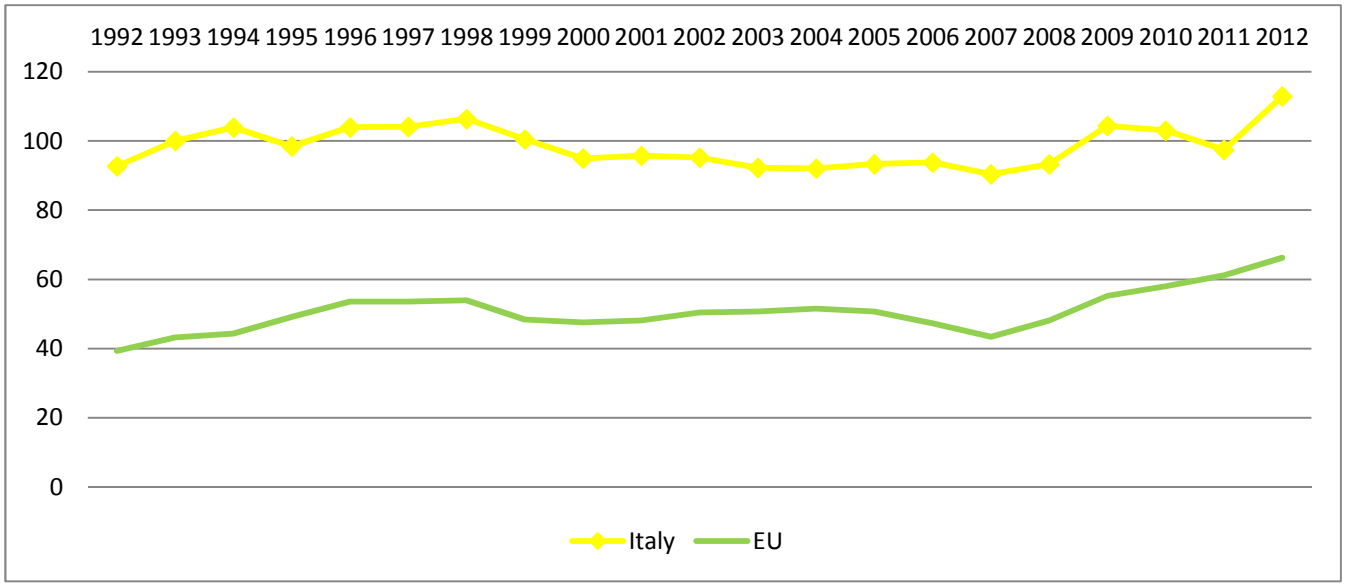
Before the Treaty on Stability, the EU would retroactivity make recommendations to the Member States to resolve deficit issues that had already occurred. With the European Semester, the EU has a way of ex-ante evaluating the Member State's plans for sound public finance and can therefore anticipate any deficit issues and make their recommendations early enough so that the Member States can adjust their plans and make reforms accordingly.

1.2 Italy in EU context

The new procedure explained previously, is particularly helpful, to take preventative measures, for countries which have a very high level of debt and deficit as a percentage of GDP. One of these countries is Italy.

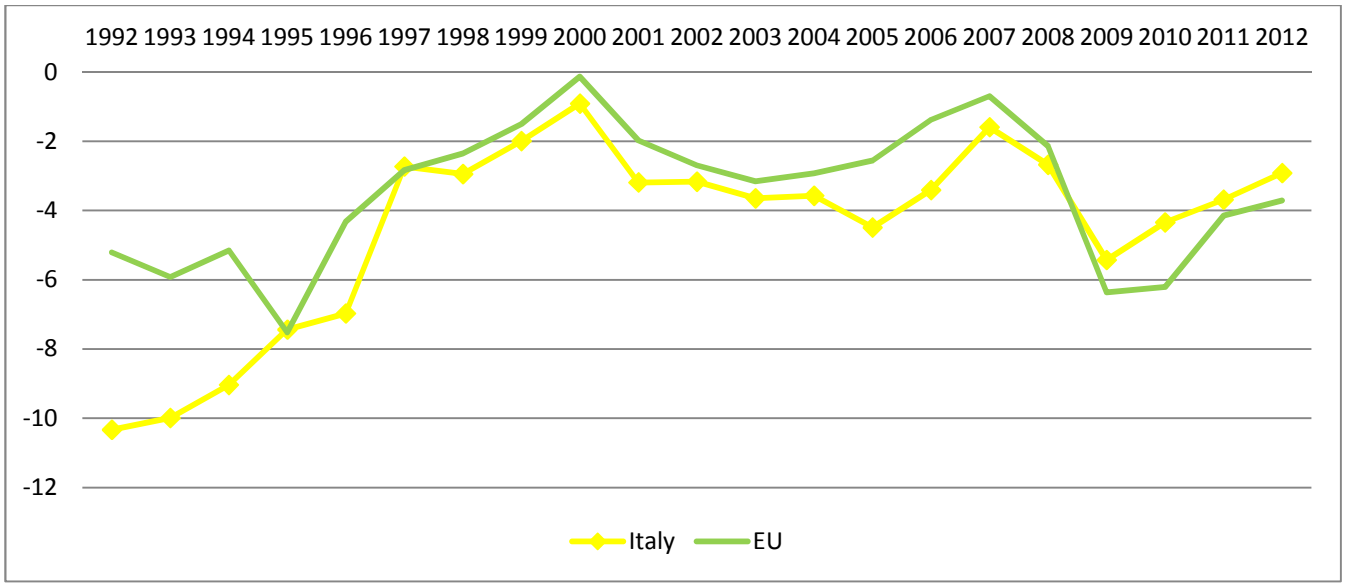
The attention of policy makers on Italy is explained by the history of public debt shown in Figure 1. As it shows, Italian public debt has been over 100% of GDP for the last twenty years. During the years 1994-1996, the debt went over 120%, then decreased from 1997-2007 and then increased again in 2008 until the present period. Another variable to take into account is the public deficit which was 3.9% of GDP in 2011. As shown in Figure 2, from 1992 to 1996 the deficit was very high but it had decreased by 2000. After 2001 it began to increase again until 2007and then began decreasing from 2010 until today.

Figure 1. Debt as a percentage of GDP in Italy



Source: OECD

Figure 2. Deficit as a percentage of GDP in Italy



Source: OECD

Italy´s increasingly high debt levels and unbalanced economic deficit record, shown in Figures 1 and 2, could be remedied through improved ex-ante economic forecasts for the short and long term. In order to improve the forecasts, it is necessary to conduct an ex-post analysis of the forecasts undertaken at a national level and discover any discrepancies between the forecasts and what actually occurred. For this purpose, in this paper I analyse the extent of the discrepancies and when these aforementioned discrepancies occured in Italy from 1992 to 2012. It would be helpful for economic policy makers to know which agencies (public or private) had more accurate deficit forecasts and in which months of the year. These two factors could be taken into account as a benchmark by the European Union when making country specific policy decisions.

To achieve this, I analyse the fiscal forecast data of international, private and public national organizations. I conduct two types of analysis: an individual examination and a more general investigation. In the first type of analysis, I submit the forecasts for Italy to numerous tests for accuracy to detect which organization is the best forecaster and in which part of the year are better results published. In the second type of analysis, I consider the forecasts as a whole and I test unbiasedness and correlations. I focus on the works of Artis and Marcellino (1998 and 2001) in terms of deepNational3ng the analysis of Italy, using a new, original database and taking different, numerous forecasters into account.

The evidence shows that private forecasters are frequently more accurate than national and international forecasters. Despite this fact, it can conclude that all forecasters are unbiased and efficient (free of serial correlation) with the exception of National2tain months.

This paper is organized as follows: In the next section, I describe the international and national forecast records for both public and private agencies. In section 3, the forecasts are submitted individually to tests of accuracy and compared with current year and year ahead forecasts. In Section 4, I econometrically test the unbiasedness and serial correlation of the forecasts taken as a whole and I provide our conclusion in Section 5.

2. Describing fiscal forecasts

2.1 Data

In this section I describe the series representing real data and forecasts of the variable gross deficit ratios from 1992 to 2012.

With regard to the realised data, I used the registered deficit/GDP d_t for time t and d_{t+1} for time t+1 from the OECD's database. With regard to forecasts, I consider "current year forecast" d_f as the forecast of deficit/GDP ratio computed during year t for the same year, and "year-ahead forecast" d_g as the forecast of deficit/GDP ratio computed during year t for the year t+1.

To compare d_t with d_f and d_{t+1} with d_g I used forecast records from databases composed by different sources:

From private sources, I take into account five forecasters (National1, National2, National3, National4, National5) (NATIONAL6). from the database *The Consensus Economics Forecasts,* a monthly survey of professional economists' deficit forecasts. These five forecasters are selected out of the twenty four present in the database because they meet the data requirements necessary. This database is used as a proxy for fiscal expectations for every months in which private forecasts are available. However, out of the twelve months of the year, we selected only four (May, June, October and December) because these were the only months in which at least one agency, whether national or international, published data. By using these four months, we are able to compare the performance of each forecaster.

With regard to international sources, I consider forecasts made by the three most important organizations: OECD IMF and UE. Also, I consider the forecasts by the national source: Italian Ministry of Economy and Finance .Generally speaking, these agencies produce projections twice a year (spring and autumn) but in different months. Table 1 shows in what months different agencies publish their forecasts. As shown, the OECD publishes its forecasts twice a year in June and December for both df and dg, in the OECD Economic Outlook. Meanwhile IMF forecasts are published in the IMF's World Economic Outlook and forecast of European Commission, (Keereman1999), are released in May (d_f) and in October (d_g).

Furthermore, publication of national record of forecasts of the Italian Ministry of Economy and Finance are included in the document "Economic and Financial Planning Document (DPEF) " from 1992 to 1997 and "Forecast and Planning Report (RPP)" from 1998 to 2011. The forecasts are produced in October, July and June for both d_f and d_g.

Table. 1 The time perspective of fiscal forecast data 1992-2012

Month	Current Year Forecast d_f	Year ahead Forecast d_g
May	UE	UE
	IMF	IMF
June	OECD	OECD
October	MEF	MEF
	UE	UE
	IMF	IMF
December	OECD	OECD

Source: Our elaborations on official databases.
Note: National6 projections are published as follow: 1992-1995 July, 1996-1997 June, 1998-2012 October. OECD projections are published in December during 1992-2011

2.2 "Current year forecast" (d_f) and "year-ahead forecast" (d_g)

Figure 1 shows d_f and d_g for every single forecaster. Figures 2 through 6 show d_f and d_g for the months in which they were made available by the forecasters.

From Figures 8 through 12 it is shown that current year forecasts are always closer to realised deficit at year t than when compared to the year ahead forecast with the realised deficit at year t+1. Despite this, d_f and d_g follow the same pattern. This may indicate that the additional information gained from the addition of another month is indeed useful in forecasting the deficit ratio.

Additional information provided by these figures comes from the fact that when the series d_f and d_g are above or under the series of real data this determines if there are overpredictions or underpredictions. So from an economic point of view, overprediction is when the deficit is better than expected, while underprediction is the opposite. Notice that in the official publications the deficit is defined as a negative value.

For example, as shown by Figure 8 of each forecasters, d_f and d_g follow the same behaviours. The graphics show a comparison for current year and year ahead forecasts and indicate that the former are smaller than the latter for all countries. In particular the figures show that both d_f and d_g have the same pattern in terms of predictions. For example for both d_f and d_g, National1, ovepredicted until 2001 and then starts to underpredict. The same change is registered by the EU and National6 that seem to be very close to real data until 2001 and then they start to overpredict. National5, OECD, National3 and National6 overpredict until 2006-2007 and from this point, they start to underpredict. National4and National2 seem to always overpredict. In this case it means that these agencies tend to do the same structural and correlated errors.

In general, as it is shown by Figures 8 to 12, the pattern of d_f and d_g for every month is that the forecasters are very close to real data or overpredict until 2000-2001 when the overprediction is very strong perhaps due to government changes as Table 2 shows. It is possible that the forecasters underestimated the consequence of so many different policies. From the data, they follow the same behavior until 2006-2007 and then begin to underpredict.

Table 2: Changes in Government Legislature from 1992 to 20013

Government	**Legislature**
Amato *	28.06.1992 - 28.04.1993
Ciampi *	28.04.1993 - 10.05.1994
Berlusconi **	10.05.1994 - 17.01.1995
Dini *	17.01.1995 - 17.05.1996
Prodi *	17.05.1996 - 21.10.1998
D'Alema *	21.10.1998 - 22.12.1999
D'Alema *	22.12.1999 - 25.04.2000
Amato *	25.04.2000 - 11.06.2001
Berlusconi II **	11.06. 2001-23.04.2005
Berlusconi III **	23.04.2005-17.05.2006
Prodi II *	17.05.2006-6.05.2008
Berlusconi IV **	8.05.2008 -16.11.2011
Monti tec	16.11.2011-27.04.2013
Letta *	from 28.04.2013

Source: our elaboration.

Note: * red underlines left-wing parties, ** blue underlines right-wing parties and violet technical parties and tec, technical government

3. Forecast analysis methodology

3.1 Assessing forecast error

In this section I describe the techniques used to assess the quality of forecasts. There are some forecasters who make more accurate analyses than others. I define the term "forecast error" as the difference between the actual deficit d_t at time t and the actual deficit d_{t+1} at time t+1 and the forecasted value d_f at time t and d_g at time t+1:

$$e_f = d_t - d_f \quad (1)$$

$$e_g = d_{t+1} - d_g \quad (2)$$

I compute many accuracy statistics through the measures of aggregate forecast errors e_t, where this is either e_f or e_g:

- ME mean error

$$ME = 1/n \sum e_t \quad (3)$$

Following the Keerman (1999) approach the mean error is equal to the mean forecast minus the realized average. The limit of this measure is that the quality of the forecast as positive and negative errors can offset each other and thus reduce the size of the error. The mean absolute error takes this into account.

- MSE Mean squared error

$$MSE = 1/n \sum e_t^2 \quad (4)$$

While with the mean error positive and negative deviations of the projection from the actual data can cancel out, this is not the case with the MSE.A MSE of zero, meaning that there is perfect accuracy, is the ideal, but is practically never possible. I can say that the model with the smallest MSE is generally the most accurate.

- MAD Mean absolute deviation

$$MAD = 1/n \sum |e_t| \quad (5)$$

The mean absolute deviation is a measure of dispersion. It measures by how much the values in the projections are different from their actual outcome. Since the absolute value is used, this prevents deviations with opposite signs cancelling each other out.

- RMSE root mean squared error of expected budget deficits in terms of GDP:

$$RMSE = \sqrt{MSE} \quad (6)$$

Large errors are usually considered more harmful than small differences between forecasts and real data. To penalize large mistakes, a root mean squared error (RMSE)

can be used. For example, since RMSEs for same-year forecasts are much lower than those for year-ahead forecasts, this shows a lower accuracy for longer-horizon forecasts. The RMSE is frequently used as a measure of the difference between values predicted and the values actually observed. These individual differences are also called residuals and the RMSE serves to aggregate them into a single measure of predictive power. When the RMSE strike is large, this shows a lower level of accuracy.

- THEIL Theil's inequality coefficient:

$$T = \frac{RMSE_{e_t}}{RMSE_{AR(1)}} \qquad (7)$$

The value of a forecast should not only be appreciated in terms of its own errors, but compared to others as well. The THEIL indicator compares each forecast with a naïve no-change forecast. For example, in the case of five-year averages, this means that the average of the past five years is taken as the benchmark forecast for the outcome in the following five-year period. The Theil coefficient will take the value 1 under the naïve forecasting method. Values less than 1 indicate greater forecasting accuracy than the naïve forecasts while values greater than 1 indicate the opposite.

3.2 Accuracy of Forecast errors

As regards forecasting accuracy of error year ahead (e_g) and error current year (e_f), measured by ME (Figure 3a and 3b), MSE (Figure.4a and 4b), RMSE (Figure 5.a and 5.b), MAD (Figure 6.a and 6.b), Theil's index (Figures show from 7.a to 7.b.).

These figures allow us to compare the statistical value for each forecaster with respect to the month the forecast was published. Note that the numbers above the bars represent the order of the months: 1 for May, 2 for June, 3 for October, 4 for December.

Results founded are consistent with the existing literature. A comparison of MSE, MAD, and RMSE for current year and year ahead forecasts indicate that the former are smaller than the latter for all agencies. As regard of the published month, the accuracy of forecasts improves as the year goes on. It can be observed, as a whole, that the accuracy of the forecasters improves from May to December which is understandable given the fact that more complete information about public finance is available in December than in May. The exception is National2 where the forecast in May is more accurate than for June. This may be due to the factoring in of changes in the legislature which normally occurs in the end of April and May as is shown in Table 2. It is possible that National2gives more weight to political factors than the other forecasters when they make their public finance predictions.

Main results shown by the MSE, MAD and RMSE register that the best performance is by private sector forecasters. It can be observed that private sector forecasts are more accurate than the national and international forecasters. Indeed, there is a sizable cross-forecaster variation: for every month e_f and e_g, the best performance is National2.

The errors e_f as show by ME (fig 3.a), all forecasters underpredict in mean except National2, National1, National5 and IMF. With regard to MSE (fig 4.a), RMSE (fig 5.a) and MAD (fig 6.a) the best performance is the National2and December is the month when forecasts tend to be most accurate.

For e_g, as shown by ME (fig 3.b), all forecasters underpredict in mean except National2, National5 and EU in October and IMF in June and October. The values of the MSE (Fig 4.b), RMSE (Fig 5.b) and MAD (Fig 6.b) show that in December, National2is the best forecaster followed by National1 for the months of October, June and May.

Figure 3.a Error f: ME – Current Year

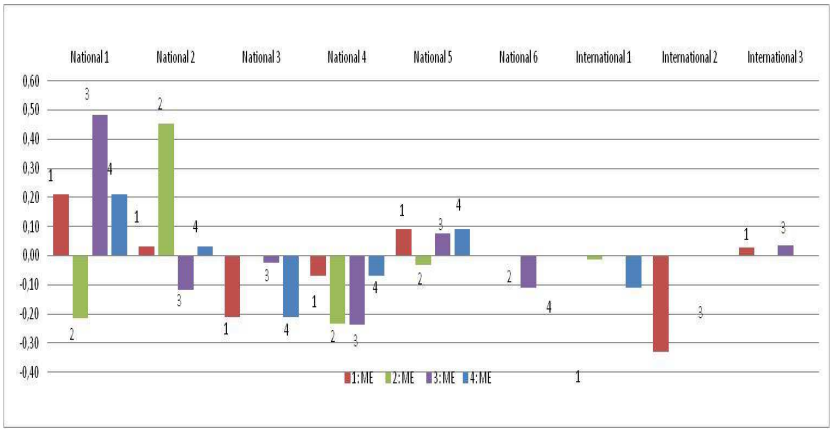


Figure 3b Error f: ME – Year Ahead

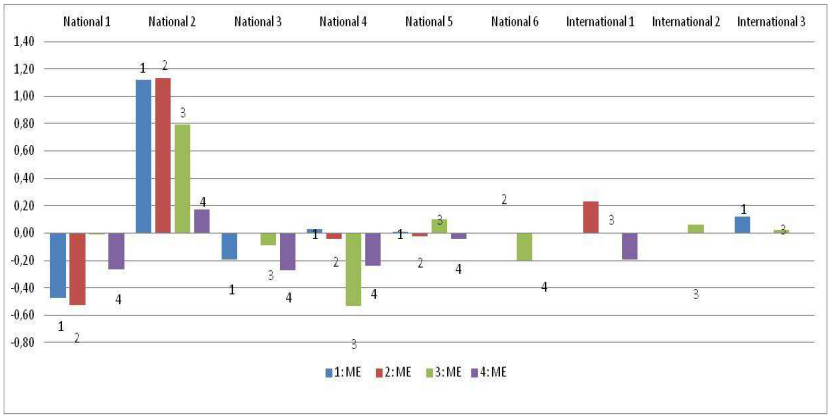


Figure 4.a Error f: MSE - Current Year

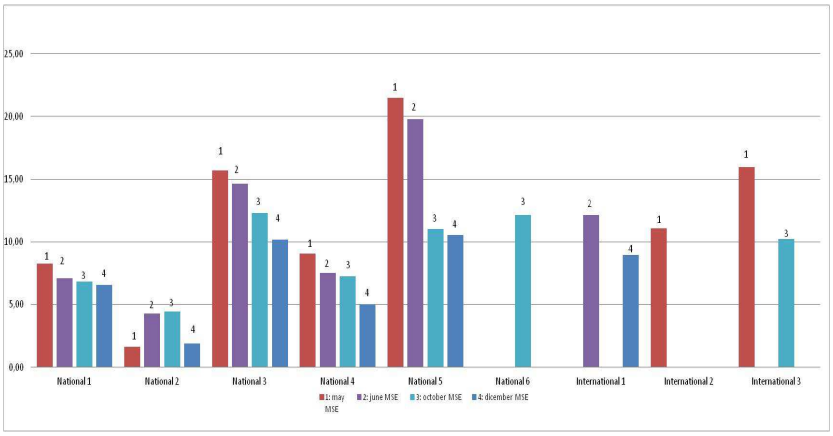


Figure 4.b Error g: MSE – Year Ahead

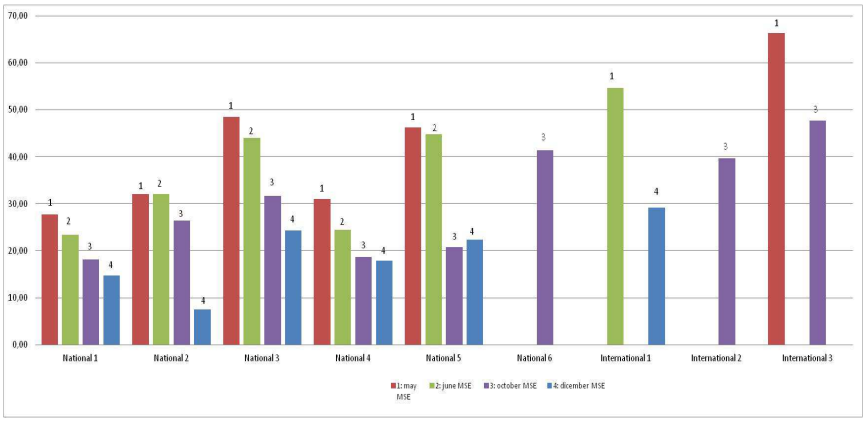


Figure 5.a Error f: RMSE – Current Year

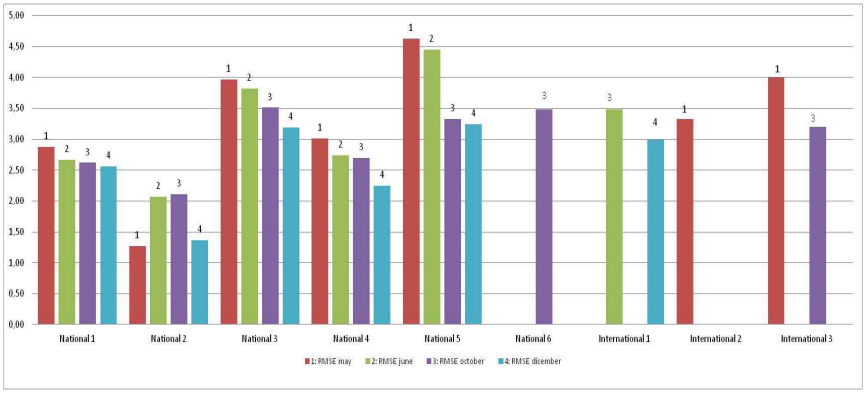


Figure 5.b Error g: RMSE – Year Ahead

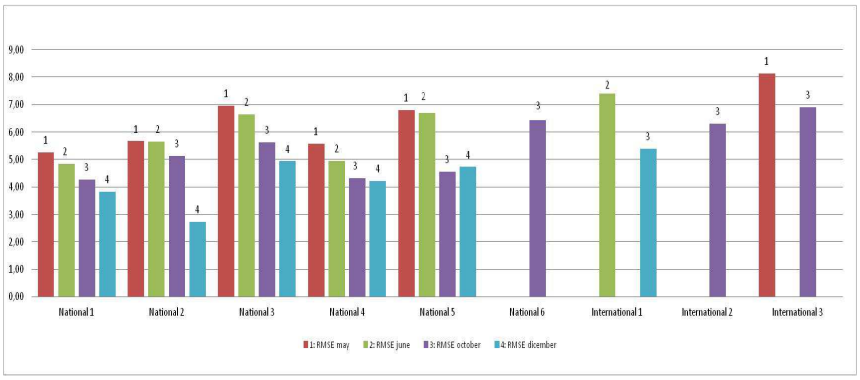


Figure 6.a Error f: MAD – Current Year

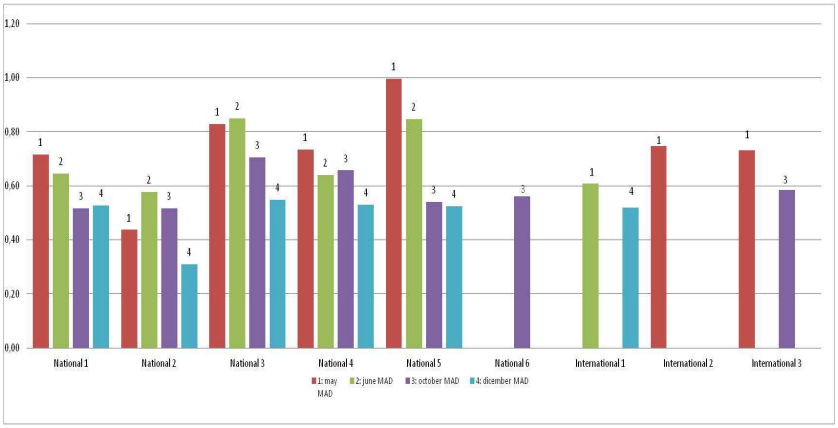


Figure 6.b Error g: MAD – Year Ahead

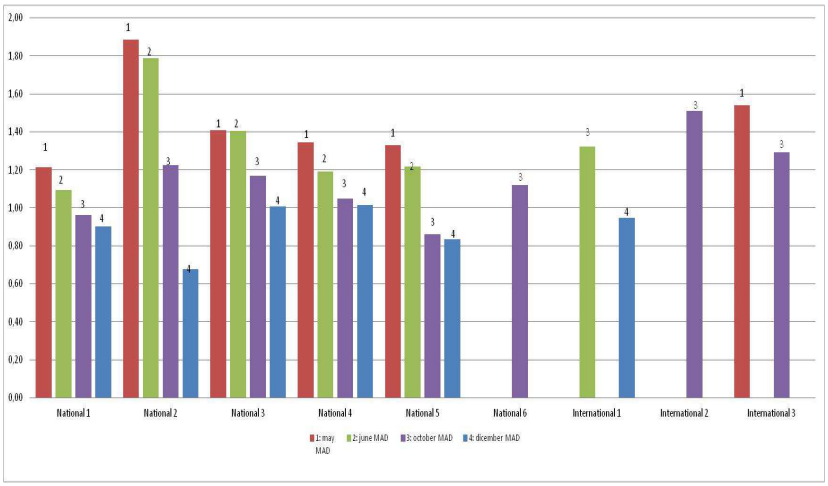


Figure 7.a Error f: Theil's Index – Current Year

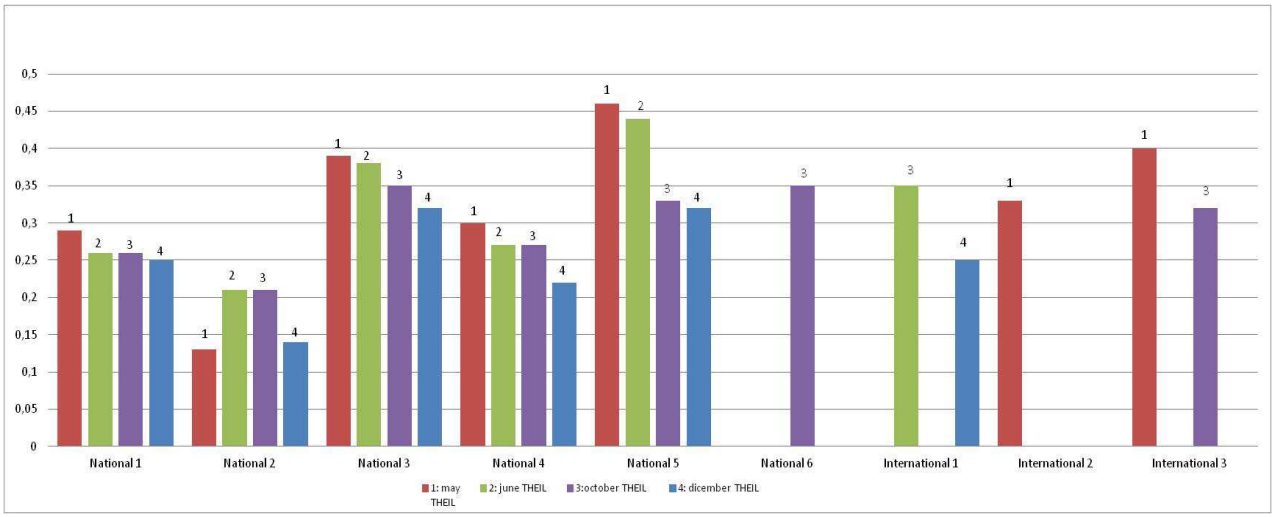
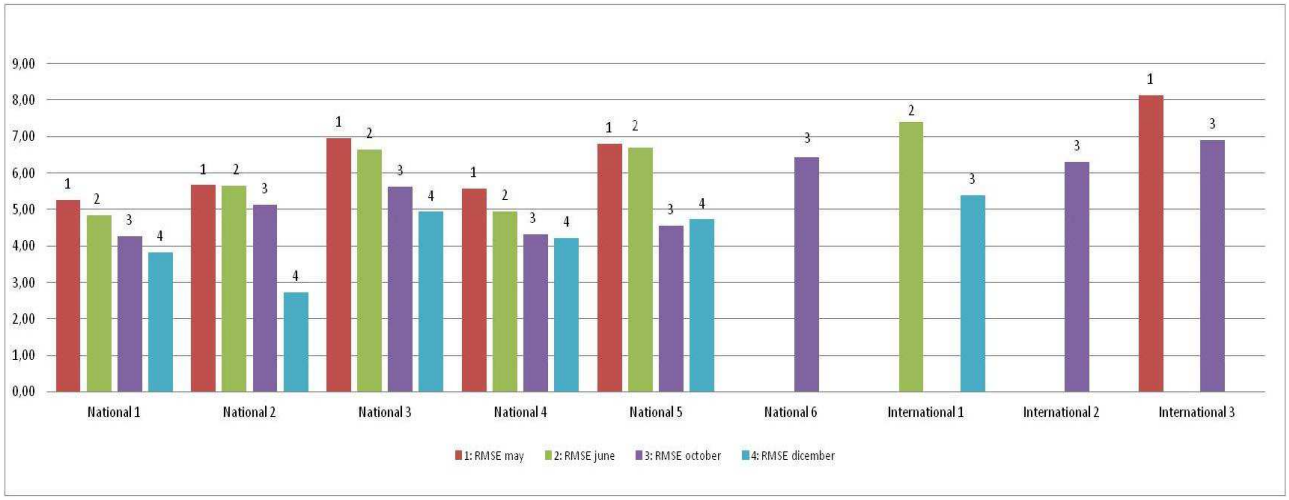


Figure 7.b Error g: Theil's Index – Year Ahead



Finally, Figures 7a and 7b show the Theil´s Index results for current year and year ahead forecasts. Following the work of Artis and Marcellino (1998 and 2001), I compare the forecasts of all forecasters with those of the naïve AR(1) model. I compute the RMSE for AR(1) and compare this with the RMSE for the others forecasters. The Theil statistic is

used to compare whether the forecasters are more accurate than the forecast of the naïve model. If the Theil values are smaller than one, this indicates that the forecasters outperform the random walk forecast on the basis of the RMSE. The results indicate that the RMSE of forecasters are better than the naïve AR(1) model. It indicate that the RMSE of forecasters are better than the AR(1) model.

These results are the same as those shown in in Artis and Marcellino (1998) and Keereman (1999) who find that in general statistics are smaller than one, implying that the forecast errors made with the forecasters are smaller than those obtained with the naïve alternative.

4. Bias in forecasts

4.1 Method

In this section I consider all forecasts for variables d_f and d_g both individually and as a whole for the selected months. To achieve this, I compute a model where I formally analyze the unbiasedness and serial correlation of the forecasts given by the following equations:

$$d_t = \alpha_0 + \alpha_1 d_f + \mu \quad (8)$$

$$d_{t+1} = \alpha_0 + \alpha_1 d_g + \mu \quad (9)$$

I test unbiasedeness with the Wald test. This test is used to verify the assumptions made on coefficients for regressions. In this case I want to check whether the sufficient condition and $\alpha_0 = 0$ and $\alpha_1 = 1$.

Where d_t and d_{t+1} the real value registered by the official OECD records and d_f *and* d_g are respectively the current forecast and year ahead forecast. The term μ is an error term that under the null hypothesis of unbiasedness coincides with the forecast error (Clements and Hendry 1997). Holden and Peel (1990) also showed that this condition is sufficient but not necessary for unbiasedness, and suggested that the condition $\beta_0 = 0$ be included in the regression:

$$e_f = \beta_0 + \upsilon_h \quad (10)$$

$$e_g = \beta_0 + \upsilon_h \quad (11)$$

Where e_f and e_g are the error terms and υ_h is the demeaned forecast error. As it is well known, weak efficiency requires that the forecast errors be uncorrelated across time (Clements and Hendry 1997).

4.2 Results

As mentioned above, the agencies are analyzed both as a whole and individually. Tables 2 through Table 5 show the results for the agencies taken as a whole and Tables 6 through 10 show the results for the agencies taken individually. Below is a breakdown of these results.

For the agencies taken as a whole:

Table 2 shows the results about the relationship between the actual OECD data from their official database and the variables d_f and d_g. For d_g and d_f, the model seems to indicate a strict relationship between these variables and the actual data. For e_f and e_g, there does not always appear to be a significant relationship between these two variables and the real data.

To analyze unbiasedness and uncorrelation, I perform different tests for each month. The Wald test is used to test the sufficient condition on the hypothesis that the coefficient of (8) and (9) are $\alpha_0 = 0$ and $\alpha_0 = 1$ and to test the necessary condition on the hypothesis that the coefficient of (10) is $\beta_0 = 0$. The Lagrange Multiplier (LM) tests for lack of first and second order autocorrelation in the forecast errors.

The main result is that for each month, the null hypothesis of unbiasedness for both df and dg is accepted (Table 3) but it is rejected for e_f and e_g (with the exception of October and June). Serial correlation (Table 4) is rejected in December and June but is accepted in October and May. In the case of both unbiasedness and uncorrelation, the forecasts and the forecast error are good parameters to explain the real data.

Table 3. Efficiency in regressions of deficit forecast

Month	(8)	(9)
May	0.91**	0.87**
June	0.88**	0.92**
October	0.90 **	0.93**
December	0,92**	0,98**

Source: our elaborations

** indicate that the null hypothesis of $\alpha_0 = 0$ and $\alpha_1 = 1$ can be accepted at 5% level

Table 4. Bias in Deficit Forecast Errors

Month	(10)	(11)
December	-0,02**	-0,06**
October	-0.007**	-0.004**
May	-0.09**	-0.02**
June	-0.02**	-0.08**

Source: our elaborations . * and ** indicate presence of bias at 1% and 5% level

Table 5: Wald Test and LM test in the forecast errors

Wald test – Prob. F-statistic		
Month/variable	(8)	(9)

October	0.00**	0.00**
May	0.00**	0.00**
June	0.01*	0.00**
December	0,01*	0,00**

Breusch-Godfrey Serial Correlation LM Test – Prob. F-statistic				
Month/variable	(8)	(9)	(10)	(11)
December	0,52**	0,98**	0,44**	0,35**
October	0.60**	0.39**	0.24**	0.001*
May	0.23**	0.41**	0.07**	0.02*
June	0.77**	0.44**	0.40**	0.04*

Source: Our elaborations.

Wald test: The high probability values indicate the null hypothesis that $\alpha_0 = 0$ and $\alpha_1 = 1$ cannot be rejected. Restrictions are linear in coefficients.

Lagrange Multiplier test: for lack of first and second order autocorrelation in the forecast. Null hypothesis of no correlation

For the agencies taken individually:

As we can see in Tables 6, the tests performed using the existing methodology show that *each agency* (with some exceptions) respects the econometric conditions when analyzed individually. As shown by the tables, if we look at each test in detail we can see that for the test of efficiency the forecasts variables are statistically significant for each month and each agency. When we test for unbiasedness, we found that the errors are efficient in all the samples with the exception for NATIONAL2 error g in May and in June. The Wald test showed that forecasts respect the coefficient restrictions with two exceptions for the month of June: National1´s year ahead forecast and NATIONAL2´s current year forecasts. The LM test showed that the errors are not correlated in all the samples with the exception for NATIONAL2´s current year forecasts for December.

Unbiasdeness and efficiency. LM and Wald test for each agency by month

May				**June**				**October**				**December**			
N 1	Bias	LM	WT	N 1	Bias	LM	WT	N 1	Bias	LM	WT	N1	Bias	LM	WT
(9)	0,86 **	0,27 **	0,62	(9)	0.91 **	0.34 **	0.66	(9)	0.98 **	0.81 **	0.07**	(9)	0.86 **	0.49 **	0.26
(10)	0,86 **	0.61 **	0,12	(10)	0.87 **	0.69 **	**0.00**	(10)	1 **	0.81 **	0.67	(10)	1 **	0.89 **	0.57
(11)	-0,083 **	0,44 **		(11)	-0.21 **	0.34 **		(11)	0.48 **	0.82 **		(11)	0.21 **	0.88 **	
(12)	-0,47 **	0,82 **		(12)	**-0.52 ****	0.83 **		(12)	-0.007 **	0.09		(12)	-0.26 **	0.90 **	
N 2	Bias	LM	WT	N2	Bias	LM	WT	N 2	Bias	LM	WT	N 2	Bias	LM	WT
(9)	1 **	0,43 **	0,36	(9)	1 **	0.04	**0.00**	(9)	0.97 **	0.20 **	0.85	(9)	0.98 **	**0.0045**	0.94
(10)	0,91 **	0,81 **	0,44	(10)	0.98 **	0.28 **	0.82	(10)	0.89 **	0.34 **	0.65	(10)	1 **	0.65 **	0.13
(11)	0,27 **	0,34 **		(11)	0.45 **	0.10 **		(11)	-0.11 **	0.20 **		(11)	0.032 **	**0.0053**	

(12)	1,10	0,81 **		(12)	1,10	0.95 **		(12)	0.79	0.65 **		(12)	0.17 **	0.79**	
N 3	Bias	LM	WT	N 3	Bias	LM	WT	N 3	Bias	LM	WT	N 3	Bias	LM	WT
(9)	0,87 **	0.72 **	0.32	(9)	0.90 **	0.99 **	0.64	(9)	0.83 **	0.95 **	0.40	(9)	0.91 **	0.66 **	0.39
(10)	0.94 **	0.59 **	0.16	(10)	0.92 **	0.87 **	0.49	(10)	1 **	0.73 **	0.84	(10)	1 **	0.83 **	0.50
(11)	-0.16 **	0.59 **		(11)	-0.002 **	0.99 **		(11)	-0.02 **	0.72 **		(11)	-0.2 **	0.67 **	
(12)	-0.19 **	0.29 **		(12)	-0.002 **	0.29 **		(12)	-0.08 **	0.07		(12)	-0.27 **	0.31**	
N 4	Bias	LM	WT	N4	Bias	LM	WT	N 4	Bias	LM	WT	N 4	Bias	LM	WT
(9)	0,86 **	0,95 **	0,14	(9)	0.86 **	0.95 **	0.06	(9)	0.87 **	0.59 **	0.25	(9)	0.89 **	0.43 **	0.29
(10)	0,89 **	0,99 **	0,07 **	(10)	0.91 **	0.77 **	0.09	(10)	0.91 **	0.74 **	0.16	(10)	0.95 **	0.40 **	0.14
(11)	-0.17 **	0.53 **		(11)	-0.23 **	0.57 **		(11)	-0.23 **	0.49 **		(11)	-0.07 **	0.27 **	
(12)	0,032 **	0.17 **		(12)	-0.042 **	0.27 **		(12)	-0.52 **	0.54 **		(12)	-0.23 **	0.33 **	
N 5	Bias	LM	WT	N 5	Bias	LM	WT	N 5	Bias	LM	WT	N 5	Bias	LM	WT
(9)	0,78 **	0,92 **	0,17	(9)	0.84 **	0.75 **	0.25	(9)	0.92 **	0.61 **	0.58	(9)	0.91 **	0.42 **	0.41
(10)	0,83 **		0.24	(10)	0.96 **	0.67 **	0.18	(10)	0.94 **	0.99 **	0.19	(10)	0.93 **	0.99 **	0.26
(11)	-0.02 **	0.86 **		(11)	-0.03 **	0.65 **		(11)	0.07 **	0.69 **		(11)	0.09 **	0.57 **	
(12)	0,004 **	0.45 **		(12)	-0.02 **	0.50 **		(12)	0.10 *	0.55 **		(12)	-0.04 **	0.73 **	
Int 2	Bias	LM	WT	Int 1	Bias	LM	WT	N 6	Bias	LM	WT	Int 1	Bias	LM	WT
(9)	0,85 **	0,83 **	0,11	(9)	0.88 **	0.24 **	0.17	(9)	0.94 **	0.54 **	0.58	(9)	0.90 **	0.28 **	0.16
(10)	-	-	-	(10)	0.97 **	0.24 **	0.60	(10)	0.95 **	0.25 **	0.01**	(10)	0.96 **	0.89 **	0.04**
(11)	-0,32 **	0,48 **		(11)	-0.01 **	0.08		(11)	-0.11 **	0.44 **		(11)	0.18 *	0.85 **	
(12)	-	-	-	(12)	0.23 **	0.46 **		(12)	-0.19 **	0.11 **		(12)	-0.19 **	0.94 **	

(Continuation) ANNEX 3 Table A. 3. Unbiasdeness and efficiency. LM and Wald test for each agency by month.

May				June				October				December			
Int3	Bias	LM	WT					Int 2	Bias	LM	WT	-	-	-	-
(9)	0,83 **	0,32 **	0,058**	-	-	-	-	(9)				-	-	-	-
(10)	0,89 **	0,99**	0,07**	-	-	-	-	(10)	0.83 **	0.72 **	0.15	-	-	-	-
(11)	-0,03 **		0.05**	-	-	-	-	(11)				-	-	-	-
(12)	0,15 **		0,29	-	-	-	-	(12)	0.11 *	0.05		-	-	-	-
-	-	-	-	-	-	-	-	Intl 3	Bias	LM	WT	-	-	-	-
-	-	-	-	-	-	-	-	(9)	0.88 **	0.48 **	0.15	-	-	-	-
-	-	-	-	-	-	-	-	(10)	0.94 **	0.35 **	0.07**	-	-	-	-
-	-	-	-	-	-	-	-	(11)	0.03	0.18		-	-	-	-

									**	**					
-	-	-	-	-	-	-	-	(12)	0.02 **	0.54 **		-	-	-	-

Source: elaborations on public and private data.

Note: ** indicate a more 5% significance and ** 1% significance.

4. Conclusions

This paper is focused on analysis of forecasts deficit, expressed as a ratio relative to GDP, made by international, national and private agencies. I compared the current year forecast and the year ahead forecast and their relative forecast errors, for each agency depending on the month the forecast was released.

A principal motivation for doing so is that taking into account the stronger economic governance and coordination at the EU level, the decisions of policy makers will depend more and more on the previsions made during the European semester. These forecasts will play a central role in this process.

Test of accuracy for the forecasts are also examined. The tests of data released by five private, three international and one national forecasters from years 1992 to 2012, show that the former are more accurate in forecast than the others. The evidence showed us, in general, a common prediction pattern for every agency for current year and year ahead forecasts. ME are in general small and negative which imply that outturns are, on average, worse than projected, about MAD and RMSE indicate ror current year NATIONAL2 is the best forecaster for every month of the sample while for year ahead NATIONAL2 is the best forecaster for December and National1 is the best forecaster for October, June and May.

Formally, I tested for unbiasedness and uncorrelation used from existing methodology show that each agency (with some exceptions) respect the conditions. Considering the forecasts as a whole, for year ahead none respect the econometric conditions when taken as a whole, while for current year only October and December respect the conditions. The results indicate that October is the period which I accept the null for both.

Finally, I compared the RMSE for an AR(1) model with the RMSE for the forecaster and found that the latter is better the former consistently with the existent literature.

As regards policy implications, it would be useful to have as much information as possible by the fiscal forecasts about the economic and financial situation of a country before issuing ex-ante strategies at the EU level. In light of this analysis, it can be concluded that private sector forecasts paint the best picture about a country's public debt situation and that the forecast data provided in December of the previous year is the most accurate. It may also be important to consider in the assessment of the European Commission during the European Semester that forecast data provided in December during the previous year “year ahead” is a significant indicator of the future behaviour of that variable. During the year a monitoring of the “current year” fiscal forecast variable could be useful considering the high level of accuracy provided by private agencies.

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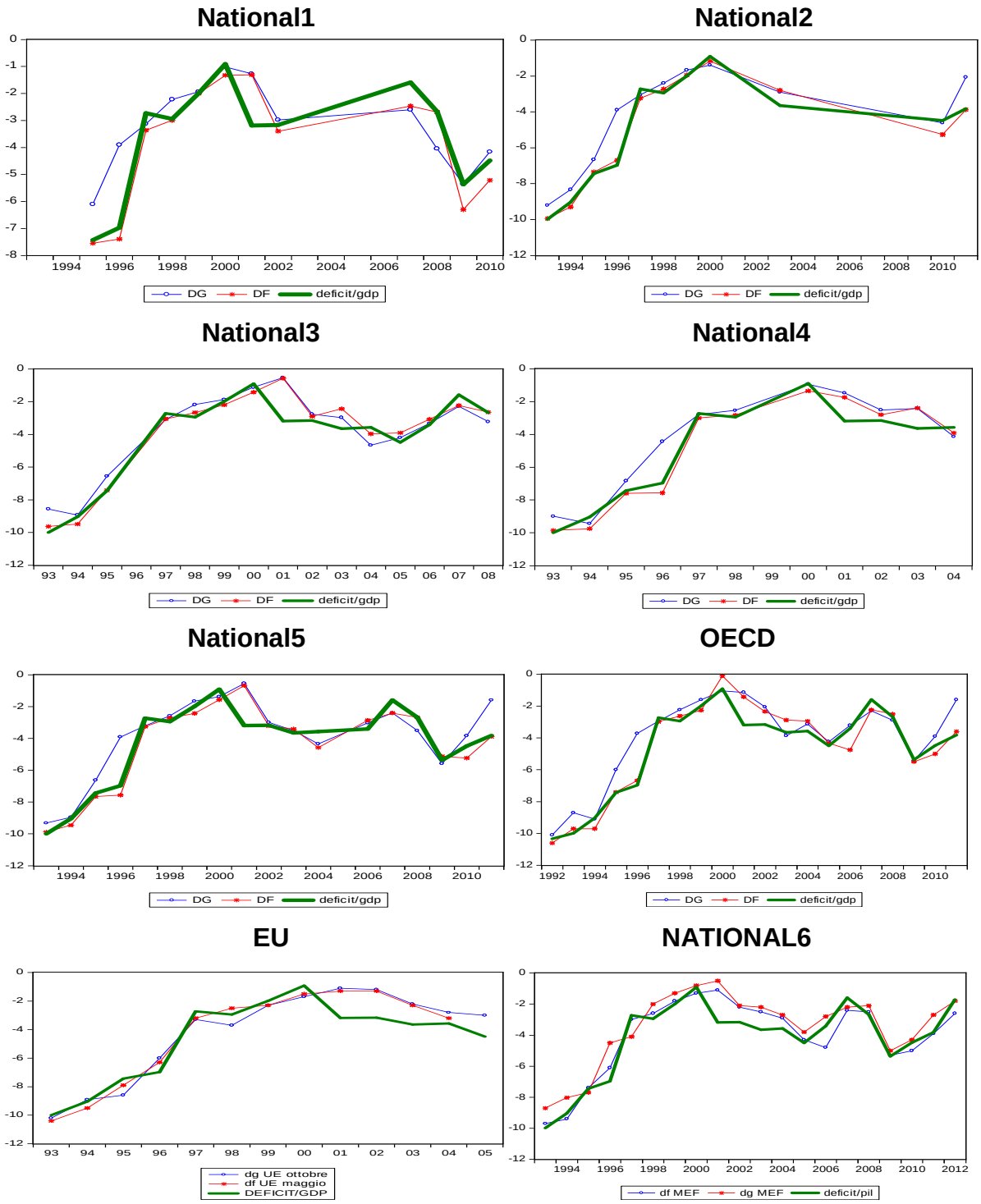
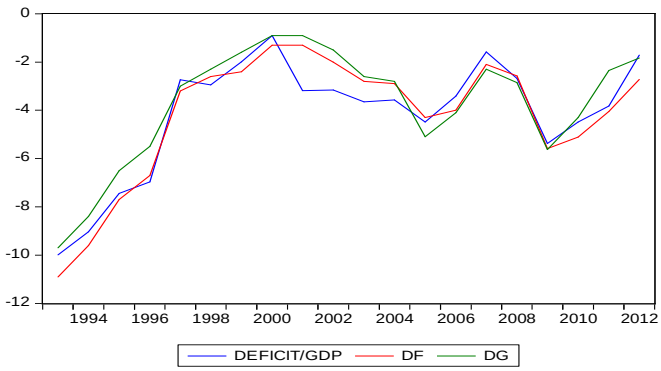
Figures

Figure 8. df and dg for each forecaster



IMF



Note: It's considered every forecaster depending on the released data. In particular for December: National1, National2, National3, National4, National5 and OECD and for October: UE, NATIONAL6 and IMF

Figures FORECAST CURRENT YEAR (Df), FORECAST YEAR AHEAD (Dg), DEFICIT/GDP by month