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# Are the European Commission's forecasts of public finances better than those of national governments?

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# Are the European Commission's forecasts of public finances better than those of national governments?

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## Abstract

The academic literature in the past has frequently highlighted that the European Commission (EC) tends to provide more accurate public finance forecasts compared with national governments, thanks to its neutrality. The recent conflicts regarding the excessive deficit procedure with Romania and Italy and rule of law with Hungary and Poland raises the question of whether such conclusions are still binding. Therefore, we analysed a panel of forecasts submitted by the national governments with an annual update of Convergence programmes and corresponding EC predictions. Our dataset contains predictions of the general government deficit, revenues and expenditures for EU27 economies and the United Kingdom in the years 2014–2019. First, the analysis shows no meaningful discrepancies between both estimates when the horizon is set at the current year. Forecasts for the next year have equal accuracy in the case of government revenues and expenditures. However, the EC performs worse in the case of the final deficit. Second, cross-country effects are present, but the accuracy is different mainly in the very small economies, that is, the Baltic countries, Cyprus, Malta and Luxembourg. Amongst the more populated states, the EC outperforms the Slovakian and Denmark governments but has worse performance than the Irish, Portuguese and Spanish governments. We also do not see evidence of any political bias in the forecasts.

## Keywords

fiscal forecasts | convergence programme

## JEL Codes

H62, H68

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## 1 Introduction

This paper aims to compare the forecasting performance of the European Union's (EU's) national governments and the European Commission (EC), based on the estimates published in the years 2014–2019 during the convergence programme update. The academic literature frequently emphasizes the supremacy of international institutions in accurate forecasting of the fiscal situation, thanks to its neutrality. Presently, given the recent conflicts between the EC and several governments regarding, for example, the Polish, Hungarian rule of law (Article 7 procedure) or fiscal discipline and migration policy with the former M5S-Lega Nord government of Italy, this argument is debatable.

First, contrary to previous research, we found evidence that EC estimates have similar accuracy

compared with national governments in the short-term horizon (i.e. current year). In the case of the next year's forecasts, EC estimates do not strongly differ regarding both revenues and expenditures. However, it has the worse performance to correctly forecast the joint effect of policy decisions – its budget balance estimates are less accurate. Our research suggests that governmental estimates became more professional compared to those in the previous decade (e.g. Brück & Stephan, 2006; Jonung & Larch, 2006; Pina & Venes, 2011).

Second, our research highlights different forecasting accuracies between the countries. The major discrepancies are visible especially in the case of small economies. The weak performance of the EC in forecasting the fiscal situation in such countries creates an incentive for multinational companies and governments to allow for tax evasion. In the case of slightly more populated countries, there is consistent

evidence that the estimates of the Danish and Slovakian governments underperform the forecasts of the EC. Furthermore, we do not find significant evidence of fiscal forecasts being used as a soft power tool against governments in conflict with the EC (i.e. Poland or Hungary) – there are no meaningful deviations between the estimates of the organisation and national governments.

Finally, we identified a worse performance of the EC's forecasts in the case of indebted countries, that is, Spain and Portugal. This problem is likely related to the conditions of the Stability and Growth Pact – forecasts may be overly optimistic not to trigger panic regarding the stability of public debt in those countries. Unfortunately, a lenient approach of the EC creates the incentive for national governments to deliberately delay fiscal consolidation, as there will be no punishment for the hazardous behaviour.

This paper is structured as follows: Section 2 presents a literature review on fiscal forecasting, Section 3 discusses the fiscal variables forecasted in the update of the Convergence programme by the national governments and the EC, Section 4 describes our methodology, Section 5 presents the model outcomes and, finally, Section 6 interprets the results and concludes the paper.

## 2 Literature review

The problem regarding the accurate comparison of fiscal forecast between those of the national governments and international organisations came into the literature two decades ago. The most pronounced papers (Brück & Stephan, 2006; Jonung & Larch, 2006) analysed the forecast errors of national governments via fixed effect panel regressions. These authors highlighted two problems: (1) excessive optimism and (2) existence of a so-called electoral cycle, which resulted in bigger forecast errors during the election year. According to the authors both the problems were inevitable – each political faction has strong motivation to depict the success story of its rule and maximise voting outcomes. Therefore, they recommended increase competences of international supervision to shape fiscal policy. Theoretically, such institutions should be free of motivational biases.

The next generation of papers was more critical towards the accuracy of forecasts by international institutions (Pina & Venes, 2011; Merola and Pérez,

2012; Frankel & Schreger, 2013). The authors, basing their comparisons on root mean squared errors (RMSE) and panel models, highlighted that the estimates were also prone to errors typical for national government estimates. However, they also sustained the view that the forecast accuracy of international organisations is better than those of the national governments. Second, research on fiscal policy frequently recommended the introduction of a new generation of fiscal rules to improve the predictability of policies (Schaechter et al., 2012; Schick, 2010).

Introduction of a stricter fiscal framework and reform of the Stability and Growth Pact created new incentives in economics forecasting. Researchers were reporting special country-specific biases related to the use of fiscal rules visible in the case of both national governments' estimates and forecasts of international organisations (Baldi, 2016; Gilbert & de Jong, 2017; Rybacki, 2019).

A new and relatively uninvestigated phenomenon is the recent clash between the EC and several countries regarding the rule of law (i.e. Hungary and Poland) or fiscal discipline (Italy and Romania). Our study attempts to verify whether such conflicts have an impact on the forecasting performance.

## 3 Convergence programme and EC forecast

This section presents the datasets used during the research and data transformation. All of the used raw information comes from statistical annexes of the institutional paper series, *The YYYY Stability & Convergence Programmes: An Overview and Assessment of the Euro Area Fiscal Stance*. YYYY denotes the year of publishing. The series started in 2014, is published up to date (2019) and is an annual publication. The paper series discusses various topics related to the fiscal policy, for example, review of the previous year's performance, medium-term objectives for the stability of public finances and differences between the EC and national government forecasts.

The statistical appendixes publish projections of the following:

- Three fiscal indicators: general government balance (surplus or deficit), revenues and expenditures. Each statistic is expressed as a percentage of gross domestic product (% GDP).

Our aim is to compare the forecasting performance in the case of each series. All of the mentioned indicators are the most crucial variables for the fiscal policy. The amount of expenditure presented in the budget bill typically sets the limit for a social and healthcare system spending or the government's investments. The projected revenues shape the tax policy – it justifies the introduction of new levies or a change in their rates. Finally, the fiscal balance is a difference between these two variables, which is widely scrutinised by the financial markets and international organisations, such as the International Monetary Fund.

- Two structural estimates: first, structural balance (% GDP) describes the long-term budget equilibrium without the effects of the business cycle and extraordinary activities. Second, structural primary balance also excludes interest costs of debt servicing. We are not using these variables for direct comparison as both are unobservable and strongly dependent on applied assumptions.
- Two activity indicators: real GDP and growth, output gap (%). The different assessment of this assumption may influence the final government balance forecasts.
- Previous editions of the institutional paper also provided information about the public debt in relationship to GDP. These statistics are still widely accessed but are not in the scope of interest either of the institutional paper or our research.

The analysed sample consists of 27 countries – EU members and the United Kingdom. Greece is not represented. During the years 2014–2018, the Greek economy was under the surveillance of the EC, the European Central Bank and the International Monetary Fund. At this time, the Greek government did not publish their forecasts. Regular publications started only in 2019.

The forecasts presented in the paper offer probably the greatest opportunity for a comparison. National governments submit the reform programmes to receive notification from the EC. Therefore, both sides should have similar information sets available during the preparation of forecasts.

Second, the projected variables are equally defined by the ESA 2010 methodology. Some discrepancies may occur if the national government and EC disagree on whether an activity constitutes valid ESA revenue or expenditure. However, to limit the influence of such phenomena we compared the cumulative changes in

revenues and expenditure from the starting point of forecast, rather than their levels about the GDP.

National governments may use different approaches to construct their estimates. Yet, our exercise should answer whether unified procedures from the EC can perform better, at least on the average.

## 4 Methodology

The problem of accuracy comparison of fiscal forecasts is not straightforward. Although there exist plenty of recognised methods for testing the forecast accuracy, they apply mainly to the long time series with frequent estimations. Unfortunately, this is not the case for fiscal forecasts – given the fact that estimates are produced annually or semi-annually, the panel contains a high number of cross-sections and a low number of time periods.

Therefore, the application of tools such as Diebold Mariano test (Diebold & Mariano 1995; Harvey et al, 1997; further DM) would end up with problems of estimating forecast variance,<sup>1</sup> if the test is done separately for each country. This would produce inconclusive statistics because of the limited number of observations used in the analysis. Alternatively, if the test is performed on pooled data, one makes a very strong assumption that forecast variance is identical for each country. Such a test may produce the wrong results. For example, solid mistakes in countries with low volatility of fiscal deficit would not be classified as significant, because there exist countries in which the deficit is volatile and forecasters are making greater errors. The problem may be partially alleviated by applying the weighting scheme to forecast, but such an approach is prone to subjectivity.

Thus, we decided to use a different approach. We run the fixed effects panel regression, which explains the difference between the squared errors of two forecasts (numerator in the forecast accuracy test). The advantages of such an approach include simplicity and straightforward interpretation. The major drawback is the lack of possibility to present a

<sup>1</sup> Formally the spectral density of the loss function differential. The DM test compares expected value of the difference between loss function applied to the two forecasts (numerator) and its spectral density (denominator). DM statistics follows a standardised normal distribution.

**Tab. 1.** The difference in squared forecast errors – model

Horizon Variable	Current year			Next year		
	Balance	Expenditure	Revenue	Balance	Expenditure	Revenue
Model – $\beta_0$	0.08	0.19	-0.36	-0.33	-0.25	0.3
	0.05	0.14	0.49	0.13	0.26	0.23
	1.59 (0.12)	1.39 (0.17)	-0.73 (0.47)	-2.57 (0.01)	-0.95 (0.34)	1.31 (0.19)
$R^2$	0.29	0.24	0.28	0.34	0.34	0.28
Observations	159	159	159	132	132	132
Periods	6	6	6	5	5	5
Cross sections	27	27	27	27	27	27

Note: This table presents the estimated parameter of  $\beta_0$  for different forecast horizons. The model specification is presented in Eq. (2). The values in row 3 denote the parameter value, standard deviation of its estimation,  $t$ -statistics and  $p$ -value (in brackets), respectively.

formal test comparable to DM, with strong theoretical foundations.

Based on such methodology, we attempt to perform two tests, which will allow us to identify whether there exist statistically significant differences between the forecast accuracy of national governments and the EC.

Let us define the following notation:

$e_{t,h,gov}$  denotes national government's forecast error for the year  $t$  with horizon  $h$ . For example,  $e_{2005,1,XX}$  denotes the forecast for the year 2005, published 1 year earlier (in 2004) by the government XX.

$e_{t,h,EC}$  denotes the EC's forecast error for the year  $t$  with horizon  $h$ .

$\mu_i$  stands for the individual effect of  $i$ -th country estimated via fixed effects.

$\theta_t$  denotes the period fixed effect.

$\varepsilon_t$  represents the random disturbance and  $\beta_x$  are the estimated parameters.

The forecast errors are described as the difference between the realised value of a variable and its forecasts. The calculation is as follows:

$$e_{t,h} = \text{realization}_t - \text{forecast}_{t,h} \quad (1)$$

First, we would estimate the panel model, which explains the difference between squared forecast errors of national governments and the EC. The model formula is as follows:

$$e_{t,h,gov}^2 - e_{t,h,EC}^2 = \beta_0 + \mu_i + \theta_t + \varepsilon_t \quad (2)$$

Second, based on the following models, we verify the following hypotheses:

- 1) EC forecasts are generally more accurate than national governments. Therefore parameter  $\beta_0$  should be statistically significant and its values should exceed zero.
- 2) There are no visible differences in forecasting accuracy for a different country. If such hypothesis is true, individual effects  $\mu_i$  should be redundant.
- 3) There are no visible differences in forecasting accuracy for a different time period. If such hypothesis is true, period effects  $\theta_t$  should be redundant.

## 5 Estimation results

This section presents the results of our estimation. The estimated parameters  $\beta_0$  and the corresponding model outputs are presented in Table 1. Tables 2 and 3 show the numerical values of the estimated period and the cross-sectional fixed effects. The results of redundant fixed effects tests are presented in Table 4.

**Tab. 2.** Cross-sectional fixed effects of the model

Horizon Variable	Current year			Next year		
	Balance	Expenditure	Revenue	Balance	Expenditure	Revenue
Belgium	0.00	-0.13	0.12	-0.02	-0.22	-0.86
Germany	0.11	-0.18	0.45	0.51	0.24	-0.03
Estonia	0.07	0.34	0.50	0.31	0.22	-0.93
Ireland	-0.19	-1.25	0.41	-1.29	-4.83	1.47
Spain	0.10	-0.14	0.00	0.87	0.43	-2.30
France	-0.08	-0.12	0.22	0.37	0.73	-0.45
Italy	-0.06	-0.24	0.26	1.01	0.63	-0.44
Cyprus	-0.64	-0.32	-20.02	0.45	-2.30	-1.13
Latvia	-0.09	0.17	0.54	0.25	1.94	1.76
Lithuania	-0.39	1.27	0.18	-0.02	1.08	-0.06
Luxembourg	-0.16	-0.36	1.69	-1.03	-0.11	3.10
Malta	-0.30	-0.24	1.20	-0.55	-0.75	1.82
Netherlands	-0.06	-0.05	-0.03	0.32	0.63	-0.35
Austria	-0.07	-0.22	0.22	0.17	0.24	-0.61
Portugal	0.13	0.11	-0.54	0.16	-1.02	-2.11
Slovenia	-0.21	-0.37	0.71	-0.71	0.12	-0.72
Slovakia	0.07	1.82	1.89	0.35	5.18	3.54
Finland	0.12	-0.21	0.37	0.23	-0.64	-0.79
Bulgaria	0.65	-1.90	0.40	-0.69	-3.14	0.44
Czech Republic	-0.19	-0.40	0.09	-0.05	-0.09	0.21
Denmark	1.18	-0.39	1.65	1.16	0.54	1.07
Croatia	-0.35	-0.47	0.15	-3.61	-2.35	-0.23
Hungary	-0.11	0.23	0.48	0.25	0.79	-0.06
Poland	0.60	2.60	0.76	-0.19	0.55	-0.85
Romania	-0.14	0.47	0.91	0.45	0.43	-0.36
Sweden	-0.08	-0.16	0.24	0.02	0.19	-0.82
United Kingdom	-0.05	-0.21	0.46	0.57	0.05	-0.45

*Note:* This table presents the estimated cross-sectional effects for different forecast horizons. The model's specification is presented in Eq. (2). The positive values indicate that the EC is more accurate in forecasting the selected variable than the national government of the country, presented in column 1.

## 5.1 Forecast horizon for the current year ( $T_0$ )

The differences between the forecast errors describing the current year fiscal performance are not statistically significant.  $\beta_0$  parameters presented in Table 1 are slightly positive in the case of general government balance and expenditure. Therefore,

the model suggests equal accuracy. There is also no evidence that the period effects were statistically significant over the past 5 years – we do not find sufficient evidence to reject the null hypothesis that these parameters are equal to zero in the redundant fixed effects test. The results of the test are presented in Table 4 and the estimates of period effects in Table 3. This finding implies no impact of the business cycle

**Tab. 3.** Time period fixed effects of the model

Horizon Variable	Current year			Next year		
	Balance	Expenditure	Revenue	Balance	Expenditure	Revenue
2014	0.04	-0.32	0.00	-0.20	0.63	1.13
2015	-0.12	-0.36	-0.26	-0.42	-1.56	-0.45
2016	-0.19	-0.17	0.61	-0.01	0.29	0.05
2017	0.05	0.57	1.21	-0.07	0.30	-0.42
2018	-0.02	0.15	0.58	0.70	0.34	-0.31
2019	0.25	0.13	-2.15			

*Note:* This table presents the estimated period effects for different forecast horizons. The model specifications are presented in Eq. (2). Positive values indicate that EC was on average more accurate in forecasting the selected variable than the national governments in the selected year.

**Tab. 4.** Redundant fixed effects – test

Horizon Variable	Current year			Next year		
	Balance	Expenditure	Revenue	Balance	Expenditure	Revenue
Cross-sectional <i>F</i>	1.68 (0.03)	1.36 (0.13)	1.67 (0.03)	1.70 (0.03)	1.66 (0.04)	1.29 (0.19)
Cross-sectional chi-square	46.89 (0.01)	39.18 (0.05)	46.73 (0.01)	47.91 (0.01)	47.07 (0.01)	37.83 (0.06)
Period <i>F</i>	1.47 (0.20)	1.05 (0.39)	0.96 (0.44)	2.23 (0.07)	2.26 (0.07)	1.53 (0.20)
Period chi-square	8.92 (0.11)	6.43 (0.27)	5.91 (0.32)	11.14 (0.03)	11.31 (0.02)	7.77 (0.10)
Cross-section/period <i>F</i>	1.65 (0.03)	1.31 (0.15)	1.56 (0.04)	1.76 (0.02)	1.74 (0.02)	1.33 (0.15)
Cross-section/period chi-square	53.81 (0.01)	44.05 (0.06)	51.39 (0.01)	55.41 (0.00)	55.06 (0.00)	44.05 (0.05)

*Note:* This table presents the output of redundant fixed effects tests. The model specifications are presented in Eq. (2). The values in the columns denote the test statistics and its *p*-value (in brackets), respectively. The null hypothesis is that all parameters corresponding to cross-sectional fixed effects or time period fixed effects are equal to zero.

on the accuracy of forecasting. However, the cross-sectional fixed effects are statistically significant. Yet, the differences in accuracy are visible mainly in small economies such as Cyprus, Malta and Luxembourg. In the group of slightly more populated countries, fiscal forecasts made by national governments of Slovakia and Denmark are less accurate compared to the EC estimates – the cross-sectional fixed effects presented in Table 2 are positive.

Looking at the countries in conflict with the EC, there is also no evidence of lower accuracy of this institution's forecasts in the case of Hungary, Italy and Romania. In the case of Poland, the EC has even greater accuracy of forecasting expenditures. This phenomenon may be related to the legal framework in the budgeting procedure in this country. The Polish government cannot exceed the expenditures written in the budget bill at any case – therefore, it is motivated to add some buffer.

## 5.2 Forecast horizon for the next year ( $T_1$ )

The  $\beta_0$  parameters presented in Table 1 suggest that the EC tends to provide similarly accurate forecasts regarding both the government's expenditure and revenues – the differences between errors are not statistically different than zero. Unfortunately, forecasting of these two components does not lead to similarly accurate estimate of the final budget balance – parameter  $\beta_0$  is negative and statistically significant in this case.

In contrast, again time period fixed effects are rather redundant according to the  $F$  test (Table 4). There is no consistent evidence that the forecasting accuracy tends to become worse or better during the peak of a business slowdown or a slowdown.

Again, the cross-sectional fixed effects presented in Table 2 are statistically significant. The biggest differences are visible in the case of small economies, that is, Cyprus, Latvia Lithuania. The underperformance of the EC is visible in the case of Croatia and Ireland, while the national governments of Denmark and Slovakia again make greater errors.

There is also evidence that the EC forecast has a greater error in the case of strongly indebted countries, that is, Spain and Portugal. In both cases, this organization tends to be especially overly optimistic regarding the revenue collection capability – the fixed effects in Table 2 are negative, especially in the case of the revenues.

However, there is also no evidence that accuracy is worse in the case of the countries in conflict, that is, Poland, Hungary, Romania and Italy. Similar to the case of forecasts with a shorter horizon, the EC tends to even slightly outperform national governments in the case of predicting expenditures (see Table 2), but discrepancies are rather low.

## 6 Policy conclusions

Contrary to previous research, our study shows no meaningful differences in the forecasts between the national governments and the EC. The Stability and Growth Pact introduced the European Semester, wherein each country provides its fiscal estimates for international supervision. All the government estimates thus became more accessible – and,

therefore, the differences between forecasts were easier to compare. This mechanism likely limited the incentives for national governments to present unrealistically optimistic fiscal forecasts.

There is also no convincing evidence of stigmatizing governments, which have an open conflict with the Institution. In such a case, the negative assessment of polices by the EC could be used as a soft power tool to oppress cabinets in conflict. The potential identification of such an issue would indicate that the EU authorities abuse their position in the process of fiscal supervision to influence the political landscape in the country with conflict. The presented methodology does not present evidence of such dishonest behaviour.

However, we identified numerous examples of small economies where the forecasting accuracy of the EC was weak. Although the mentioned problem does not pose a threat to financial the stability of the EU as a whole organism, it may backfire. The weak performance of the EC in forecasting the fiscal situation in such countries creates an incentive for multinational companies and governments to allow for tax evasion. For example, Ireland reported 26.3% GDP growth related to intellectual property in 2016, attracting companies with low corporate tax. The loss of fiscal revenues in the EU was so great that this phenomenon started a debate about whether the activity of digital entities should be taxed in the country of origin (so-called digital tax). Such problems are likely to repeat in the future.

We have also highlighted some evidence that the EC is less accurate in the case of long-term forecast for indebted countries. Again, this phenomenon may be related to motivational problems. Analysts of the EC may be overly optimistic to avoid triggering fears of public debt instability. Yet, such an approach has consequences. It creates incentives for national governments to deliberately delay fiscal consolidation, as there will be no punishment for hazardous behaviour.

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