

Real-Time Measures of the Output Gap and Fiscal Policy Stance

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Abstract

This paper studies real-time measures of the output gap and fiscal policy stance estimates for EU countries. We construct a comprehensive real-time data set on fiscal forecasts and study whether there are systematic differences between the European Commission and IMF estimates of the output gap and structural budget balance. We argue that differences in the EC and the IMF estimates should provide a lower bound for the potential heterogeneity that is likely to emerge when national governments begin to release their estimates of the output gap and structural budget balance as required by the new fiscal rules in the EU. We find evidence that while the two institutions are likely to agree on cyclical conditions and fiscal policy measures in EU countries after the fact, there are statistically significant differences in their real-time estimates of the output gap and structural budget balance.

Key words: Business cycles, fiscal policy, forecasting

JEL: E32, E62, H68

Tuotantokuilun ja rakenteellisen budjettitasapainon reaaliaikaiset arviot

Tiivistelmä

Tässä artikkelissa tarkastellaan Kansainvälisen valuuttarahaston (IMF) ja Euroopan komission julkaisemia reaaliaikaisia arvioita EU-maiden tuotantokuilusta ja rakenteellisesta budjettialijäämästä. Tulokset viittaavat siihen, että vaikka instituutioiden jälkikäteen tekemät arviot kunkin maan tuotantokuilusta ja rakenteellisesta budjettialijäämästä ovat keskenään yhdenmukaisia, vastaavat reaaliaikaiset arviot poikkeavat toisistaan tilastollisesti merkitsevästi.

Asiasanat: Suhdannevaihtelut, finanssipolitiikka, ennusteet

JEL: E32, E62, H68

1 Introduction

Real-time estimates of the output gap and structural budget balances are of key interest to economic policy making. They help policy makers to assess the extent to which the government budget balance is driven by structural factors affecting tax revenues and government spending and, on the other hand, the extent to which it is driven by short-run fluctuations in economic activity. For example, if observed budgetary imbalances are largely due to unfavorable cyclical conditions, policy makers should feel confident that the current policy stance is still sustainable in the medium-term. In effect, this captures the conceptual basis for the revised fiscal policy rules in the European Economic and Monetary Union (EMU). In particular, the Treaty on Stability, Coordination and Governance, states that national governments should keep their structural budget balance above a -0.5 per cent of GDP threshold. If accurately estimated, the structural balance target lets automatic fiscal stabilizers work counter-cyclically, but constrains national fiscal policy so that it does not endanger the sustainability of the medium-term fiscal policy stance.

Fiscal forecasts play a significant role in the new fiscal policy rules. The European Commission (EC) provides estimates of the output gap, structural budget balance and the changes in the fiscal policy stance for all EU countries. These estimates are then employed to assess whether member countries comply with the fiscal policy rules. Thus, the credibility of the rules is to a significant degree dependent on the accuracy and quality of the EC's estimates and on the possible disparities with alternative estimates provided by national governments or other influential international institutions. It is generally acknowledged that the estimates are uncertain and revised considerably many years after the fact (see f.e., Orphanides and van Norden 2002 and Larch and Turrini 2009). Yet, their quality and accuracy is difficult to scrutinize directly. As opposed to observable variables such as GDP or government budget balance, the estimates of the output gap and structural budget balance never become verified after the fact. Different institutions may thus have contrasting views on both the current and the past fiscal policy stance of a given country. Consequently, national governments may aim to discredit the EC's estimates by providing their own output gap and structural budget balance estimates or referring to other available estimates if they are more favorable. However, to date there is little evidence whether the estimates provided by different institutions are mutually consistent.

To assess the potential heterogeneity in fiscal forecasts, we study fiscal forecasts by the EC and the International Monetary Fund (IMF). The EC's forecasts form the basis of EU's policy recommendations, warnings and sanctions, while the IMF forecasts are also widely used in fiscal policy analyses. We take advantage of a real-time database that consists of

consecutive estimates of the key fiscal policy variables as estimated by the EC and the IMF. A comparison of these forecasts has two main features which make it particularly interesting. First, both organizations produce real-time estimates of the output gap and structural budget balances that are consistent with the present EU and national level fiscal policy rules. We may hence study the associated real-time uncertainty, which is central for the euro area. Second, both organizations have potential to influence national policy making, but may also be considered as independent from any national interests. Hence, any differences in the EC and the IMF estimates should provide a lower bound for the potential heterogeneity between national governments' and international institutions' estimates.

Our analysis is related to a large body of previous literature on fiscal forecasts. First, a wealth of studies assesses the track record of international institutions' and national governments' fiscal forecasts (see Artis and Marcellino 2001, Larch and Jonung 2006, Pina and Venes 2011 among others). This research finds some support for politically motivated, opportunistic fiscal forecasts and suggests that independent fiscal forecasts would provide an attractive alternative to national government forecasts. Second, previous literature highlights the uncertainty related to real-time estimation of the output gap (Orphanides 2001, Orphanides and van Norden 2002, 2005 and Kempkes 2012 among others). The evidence suggests real-time estimates produced by traditional statistical methods to estimate the cyclical component of output fluctuations and official international organizations estimates only weakly predict the ex-post output gap estimates. Finally, and more generally, there has been a rise recently in the debate about potential output estimates when the actual level of output has stagnated for several years and the total factor of productivity has lagged pre-crisis levels (see Bouis et al. 2012).

Yet, despite the consensus on the difficulties in real-time estimation, little previous research has addressed whether there are systematic differences in the output gap and structural budget balance estimates across international organizations. This is despite the fact that i) these estimates are key indicators for fiscal policy making in real-time, ii) they are more subjective and less transparent than forecasts of observed variables and iii) the EC's and IMF's have legal and advisory significance for national fiscal policy making. Our aim is to provide a first step in assessing the potential magnitude of these differences.

The rest of this paper is constructed as follows. Section 2 briefly presents our data set. Section 3 presents our empirical strategy to study differences in real-time fiscal forecasts across institutions. Section 4 shows our baseline results and discusses their robustness. Section 5 concludes.

2 Data and Descriptive Statistics

Our data set consists of consecutive EC and IMF economic forecasts from 2000 to 2013. In each of their biannual forecast both institutions project the real GDP growth path and estimate the output gap and structural budget balance for a total of EU 27 countries.¹ ² Spring forecasts are published in April-May and Autumn forecasts in October-November.³ Each Autumn forecast includes forecasts for years t , $t + 1$ and $t + 2$ and each Spring forecast exercise includes forecasts for periods t and $t + 1$. In the following we concentrate on the forecast horizons that are common to both forecast exercises. In addition to actual forecasts, we look at the previous year ($t - 1$) and ex-post (i.e. Spring 2013) estimates in order to illustrate the patterns of real-time estimates and their revisions over time and after the fact.

The major advantage of our data is that it consist of true and representative real-time fiscal forecasts that are consistent with the present fiscal policy rules in the EU. First, the EC and IMF real-time estimates are conceptually consistent, both over time and with present fiscal policy rules. While the methodologies to assess the level of potential output, and the output gap have been updated over the years, the main characteristics of the approach are similar over the sample period 2000-2013. In particular, both of the institutions have adopted a form of production function methodology to assess the level of potential output and the output gap. Second, since country forecasts include significant judgmental calls, a similar analysis would not be possible if one aimed to reproduce real-time estimates ex-post even if the observed real-time data was available.⁴ A similar data has been the basis for

¹The countries include Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Germany, Greece, Denmark, Estonia, Spain, Finland, France, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, the Netherlands, Poland, Portugal, Romania, Sweden, Slovenia, Slovak Republic and the United Kingdom. Note that not all of the variables are available for the full time period for all countries. For a detailed description of the variables, see AMECO and World Economic Outlook Databases.

²The output gap is defined as the distance of actual economic activity from its potential level, i.e.

$$Y^{GAP} = (Y - Y^P)/Y^P,$$

where Y^P is the level of potential output and Y is the level of actual or projected output. The structural budget balance is measured as

$$SB = BB - \varepsilon Y^{GAP},$$

where BB is the actual budget balance and ε is the elasticity of budget balance to the output gap. For a more detailed description of the output gap and structural balance estimation strategy, see Fedelino et al. (2009), D'Auria et al. (2010), Bornhorst et al. (2011) and Mourre et al. (2013).

³Exact publication dates vary somewhat from year to year.

⁴For example Jonung and Larch (2006) reconstruct structural budget balance estimates based on national government growth and budget balance estimates and by ex-post estimating the implicit deviation from trend GDP. However, it is not clear whether this estimate, in fact, reflects true fiscal policy stance as perceived by the respective government.

Table 1: Spring Forecasts Descriptive Statistics

	Forecast date	EC				IMF			
		Obs	ME	MAE	RMSE	Obs	ME	MAE	RMSE
Growth (% of GDP)	previous year	341	-0.220***	0.580	0.760	375	-0.290***	0.620	0.810
	current year	341	-0.0900	1.240	1.560	368	-0.230**	1.310	1.600
	year-ahead	341	0.980***	2.340	3.320	367	0.730***	2.210	3.110
Output Gap (% of Pot. GDP)	previous year	287	-1.210***	1.620	2.090	192	-1.320***	1.640	1.710
	current year	287	-1.550***	1.980	2.570	192	-1.610***	1.930	1.970
	year-ahead	287	-0.990***	2.280	2.960	191	-1.160***	2.020	2.130
Structural Balance (% of Pot. GDP)	previous year	277	0.800***	0.990	1.220	177	1.220***	1.340	1.400
	current year	277	0.840***	1.520	1.900	177	1.500***	1.780	1.850
	year-ahead	277	0.940***	1.990	2.610	176	1.620***	2.130	2.280
Fiscal Policy (% of Pot. GDP)	previous year	277	0.220***	0.570	0.760	177	0.240***	0.710	0.830
	current year	277	0.0400	1.010	1.360	177	0.280***	0.970	1.170
	year-ahead	277	0.100	1.200	1.640	176	0.130	1.050	1.250

Source: IMF Spring forecasts 2000-2013, EC Spring forecasts 2000-2013, authors own calculations. For the output gap and structural balance estimates the forecast errors refer to forecast revisions with respect to spring 2013 estimates. Asterisks suggest whether mean error/mean revision is different from zero: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

the literature on fiscal forecast, but this exercise has not been previously carried out by comparing the output gap or structural budget balance estimates.

Before we proceed to our empirical analysis, it is important to underline the level of uncertainty related to estimating and forecasting unobserved variables such as the output gap and structural budget balances over time. Table 1 shows the Spring forecast errors and revisions for GDP growth, the output gap and structural balance for three different forecast horizons (year ahead, current year and previous year) and the ex-post figures.^{5 6} Essentially, it shows that the real time estimates are subject to significant revision over time and that real-time estimates of the output gap and fiscal policy stance have been biased estimates of the ex-post estimates. First, and mostly due to the prolonged recession after 2007, there is a

⁵We define forecast errors as

$$fe_{t,i}^F = E(y_{t,i}^F | t - h) - y_{t,i}^F, \quad (1)$$

where the index i refers to the country, $y_{t,i}$ is the *ex-post* value of the forecast variable, $E(y_{t,i} | t - p)$ is the forecast conditional on the information available at time $t - p$. For example, in the case of growth forecasts, positive values are associated with projections that were more optimistic than the actual out-turn.

⁶For brevity, we concentrate here on the spring forecasts, but a similar pattern emerges from autumn forecasts as well. The difference in autumn forecasts is that the forecast errors and revisions are smaller when compared to spring forecasts, which is consistent with the fact that more information has become available for forecasters.

tendency that output forecast have been revised downwards, i.e. the projected growth was, on average, greater than the actual out-turn. Second, the errors tend to be more significant for unobserved variables than for the output growth. In particular, while there is a clear tendency that the accuracy of output forecasts increases when the forecast horizon becomes shorter, the effect is much smaller and less clear for the output gap and structural budget balance.

However, there is a limit to the usefulness of studying these revisions for fiscal policy making in the future. For instance, ex-post it seems intuitive that potential output (output gap) estimates have been revised downward (upward), during the Great Depression since the crisis may have had considerable effects on factors of production and which was unforeseen by both policy makers and institutions providing output gap estimates. Also, the estimates of structural budget balance may also have been revised by updating the estimates of the cyclical sensitivity of budget balances which were re-estimated ex-post.⁷ In contrast, given that different institutions make their forecasts in real-time based on the same available information, there is no reason to suspect, ex-ante, that the revisions would have been systematically related to the institution making these forecasts. This is the setting that we employ in our following empirical analysis.

3 Empirical Analysis

This section presents our framework to study real-time differences in fiscal forecast across institutions and discusses the empirical results.

3.1 Empirical Strategy

Since both of the institutions provide their estimates within a short interval of time, we may employ a rather simple strategy to assess differences in fiscal forecasts by the EC and the IMF. In particular, we estimate the following model

$$E_{t-h}(y_{t,i}^{EC}) - E_{t-h}(y_{t,i}^{IMF}) = \alpha + \lambda_t + AUTUMN + \varepsilon_{t,i} \quad (2)$$

where $h \in \{-1, 0, 1\}$ accounts for different forecast horizons, y_t is the dependent variable of interest (i.e., GDP growth, the output gap, structural balance or a measure of discretionary fiscal policy), α is constant, λ_t is time dummy and $AUTUMN$ is a binary variable indicating

⁷See Fedelino et al. 2009, Bornhorst et al. 2011 Larch and Turrini 2009 and Mourre et al. 2013 among other for the methodology to construct structural budget balances and the estimation of budget elasticities to the business cycle.

autumn forecast. Hence, the left hand side of this equation equals to real-time differences in fiscal forecasts. Under the assumption that both institutions use all of the available information in producing the real-time estimates, the parameter α reflects systematic differences in real-time estimates between institutions and λ reflects differences that are fixed in time but common across countries. Finding that α and λ do not deviate significantly from zero would be interpreted that there is no systematic difference in forecasts.

3.2 Baseline Results

Next, we present our baseline results for real-time differences in the EC and IMF estimates of output growth, the output gap, structural balance and fiscal policy indicators. We pool all real-time forecasts and study the differences based on a simple OLS framework as suggested above. We combine both spring and autumn forecast of the same year together in order to take advantage of the largest available data set for all fiscal variables. We found no significant differences between spring and autumn forecasts and hence omit the vintage-fixed-effect in the baseline analysis.⁸

Table 2 shows the differences in fiscal forecasts for four different pooled vintages: year-ahead, current year, previous year and ex-post estimates. Two immediate results stand out. On the one hand, there are statistically significant differences in real-time (i.e., year-ahead and current year) fiscal forecasts between the EC and the IMF (see columns 1 and 2). This suggests that, on average, the EC and the IMF tend to have different real-time projections for key fiscal policy variables. On the other hand, there is less evidence that the ex-post (i.e., previous year and 2013) estimates would be significantly different from each other, which suggests that the forecasts and estimates converge when the forecast horizon becomes shorter and when the state of the economy or fiscal policy is evaluated after the event (see columns 3 and 4).⁹ This convergence is also illustrated in Figures 3 and 4, which show the distribution of forecast differences across different horizons. Yet, there are some notable differences in the interpretation of these results depending on the forecast variable.

First, the results suggest no clear or significant systematic differences for GDP growth projections. The year-ahead difference is small (less than 0.05 p.p. of GDP) and negative, indicating a more pessimistic growth projection from the EC. In contrast, the current year difference is small (less than 0.1 p.p. GDP), but positive and statistically significant. The previous year and ex-post differences are zero as expected as both institutions may rely

⁸We allowed for a fixed vintage effect, but it turns out that this fixed effect is statistically significant only for the growth forecasts. The sign of the vintage-fixed effect suggest that there is some degree of convergence in the estimates when moving from spring to autumn forecasts.

⁹In addition, autumn dummy is not statistically significant for most of the regressions, but the sign is consistent with converging forecasts, i.e. differences in autumn forecasts are smaller than in spring forecasts.

Table 2: Baseline Results

		(1)	(2)	(3)	(4)
		year-ahead	current year	previous year	ex-post (2013)
Growth, (% of GDP)	α	-0.031	0.075***	0.013	-0.006
	s.e.	(0.026)	(0.022)	(0.013)	(0.009)
	N	711	712	672	402
Output Gap, (% of Pot. GDP)	α	0.218***	0.239***	0.189**	0.033
	s.e.	(0.067)	(0.070)	(0.082)	(0.101)
	N	394	395	368	297
Structural Balance, (% of Pot. GDP)	α	-0.415***	-0.266***	-0.032	-0.004
	s.e.	(0.056)	(0.051)	(0.048)	(0.070)
	N	363	364	365	372
Fiscal Policy, (% of Pot. GDP)	α	-0.150***	-0.235***	-0.051	0.014
	s.e.	(0.033)	(0.042)	(0.045)	(0.056)
	N	363	364	365	363

Source: IMF World Economic Outlooks 2000-2013, EC Forecasts 2000-2013, author's own calculations. The EC output gap estimates based on potential output estimates from autumn 2002 and structural budget balance (and fiscal policy) estimates are available from autumn 2006.

Note: Robust standard errors in parentheses: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

on available official GDP estimates. In addition, if we allow for vintage fixed effects the difference between spring and autumn forecasts is statistically significant only for year-ahead forecasts (not shown). This suggests that, in the aggregate, the two institutions have a similar real-time outlook of the future economic activity for the EU countries.

Second, there are much larger differences in the real-time estimates of the output gap for the same sample of countries. The size of the difference amounts to 0.2 p.p. of GDP for current and year-ahead estimates and hence cannot be accounted for by differences in output forecasts.¹⁰ The positive sign of the difference suggests that according to the the EC estimates the cyclical stance was more positive (i.e. the level of potential output was lower) than the IMF estimate over the sample period. The difference is statistically significant at the 95% level for the year-ahead forecasts and 90% level for the current year estimates, but small and insignificant for the previous year and ex-post estimates. However, the standard errors associated with output gap estimates are considerably larger than for growth estimates. Thus, the results suggest that while the institutions tend to agree on the future growth of economic activity, they do differ in interpreting the degree on which this is due to structural

¹⁰For example, controlling for differences in growth forecasts in our regression does not account for the differences, which suggests that the difference is due to the potential output estimate. For brevity, we omit a more detailed account.

and which is due to cyclical factors.

Third, we find statistically significant differences in real-time estimates of the EU countries structural budget balances and discretionary fiscal policy (as measured by the change in structural budget balance). Specifically, the results suggest that the EC has estimated the fiscal policy stance to be worse in real-time than the IMF. The difference amounts to between 0.3 and 0.4 p.p. of potential GDP. This is consistent with the differences in output gap estimates, which are the basis for cyclical adjustment of the budget balance, but it cannot fully account for the quantitative size of the difference. In particular, given that the cyclical elasticities used in constructing structural balances is around 0.5 for most EU countries (see Girouard and André 2005 and Mourre et al. 2013), the results suggest that about half of the difference in structural budget balance estimates is due to different output gap estimates and half of the difference is either due to differences in budget balance estimates or differences in underlying estimates of the cyclical elasticity.

Finally, the difference for discretionary fiscal policy, which is an indicator of fiscal effort in policy analysis and fiscal policy surveillance, is also statistically significant, suggesting that the EC and the IMF do not only differ in the interpretation of the level of the fiscal stance, but also on the year-on-year implementation of fiscal policy measures. Yet, for both the structural budget balance and discretionary fiscal policy estimates, the differences are smaller and not statistically significant for ex-post estimates, again suggesting that the institutions tend to agree on the fiscal stance and discretionary fiscal policy after the fact.

3.3 Robustness

Next our aim is to study the robustness of our baseline results. We emphasize three different factors that could drive the results or account for the found differences in real-time estimates.

First, we test whether the differences could be driven by our choice of the EC fiscal stance estimate. In particular, at present, the EC publishes two different structural budget balance estimates for EU countries. The so-called cyclically-adjusted budget balance aims to correct the general government budget balance for fluctuations in aggregate economic activity over the business cycle. In effect, this is the conceptual starting point for the structural budget balance estimates, and in our data it is available since the year 2000. The second estimate, which we employed in the baseline analysis and which is officially referred to as “structural budget balance” in the current EC forecasts and fiscal policy rules, also corrects for so-called one-off and transitory measures that should have no effects on the medium-term fiscal stance. Due to this transitory effect, the choice between the two should not, at least in principle,

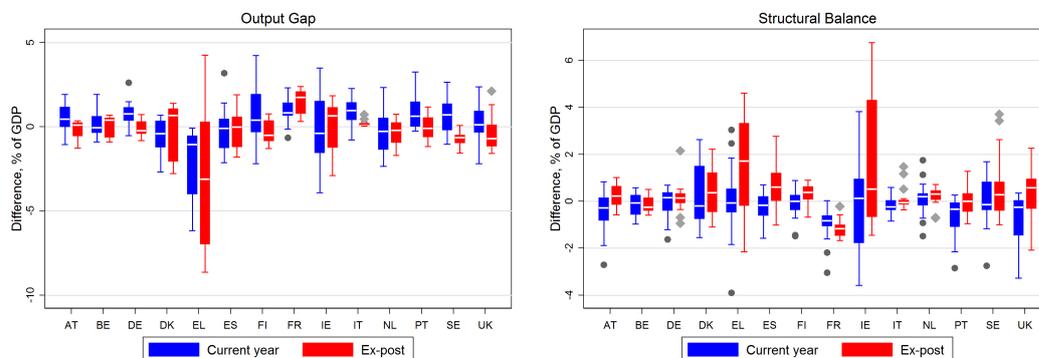
Table 3: Results Based on Alternative Fiscal Stance Indicators

		(1)	(2)	(3)	(4)
		year-ahead	current year	previous year	ex-post
Output Gap (A)	α	0.218***	0.239***	0.189**	0.033
(% of Pot. GDP)	s.e.	(0.067)	(0.070)	(0.082)	(0.101)
	N	394	395	368	297
Output Gap (B)	α	0.939***	0.955***	1.050***	0.669***
(% of Trend GDP)	s.e.	(0.073)	(0.066)	(0.077)	(0.089)
	N	394	395	368	297
Structural Balance (A)	α	-0.415***	-0.266***	-0.032	-0.004
(% of Pot. GDP)	s.e.	(0.056)	(0.051)	(0.048)	(0.070)
	N	363	364	365	372
Structural Balance (C)	α	-0.398***	-0.222***	-0.122	-0.044
(% of Pot. GDP)	s.e.	(0.056)	(0.086)	(0.106)	(0.095)
	N	363	364	365	372
Fiscal Policy (A)	α	-0.150***	-0.235***	-0.051	0.014
(% of Pot. GDP)	s.e.	(0.033)	(0.042)	(0.045)	(0.056)
	N	363	364	365	363
Fiscal Policy (C)	α	-0.176**	-0.099	-0.055	2.713***
(% of Pot. GDP)	s.e.	(0.070)	(0.111)	(0.118)	(0.178)
	N	363	364	365	371

Source: IMF World Economic Outlooks 2000-2013, EC Forecasts 2000-2013, author's own calculations.

Note: Robust standard errors in parentheses: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. (A): Pooled EC's cyclically-adjusted budget balance and structural budget balance estimates so that missing SB estimates are substituted with CAB estimates available since 2002; (B) based on HP-filtered trend GDP available since 2000; (C): EC's cyclically-adjusted budget balance estimates available since 2002.

Figure 1: Difference Across Countries



(a) Output Gap

(b) Structural Balance

Source: IMF World Economic Outlooks 2000-2013, EC Forecasts 2000-2013, author's own calculations.

Note: Boxes represent the 25th and 75th percentile, the vertical line shows the median, whiskers show the adjacent values and dots show outside values.

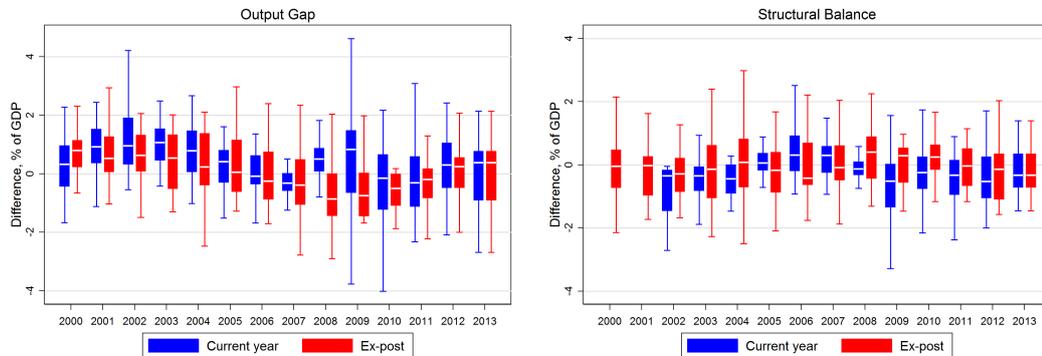
systematically bias our estimates as the measures should balance out over the years.¹¹ Indeed, we find that the results are essentially independent of whether we constrain our analysis to only cyclically adjusted budget balance estimates or later structural budget balance estimates (see Table 3). This applies to both structural balance estimates and fiscal policy indicators. Further, if we add the cyclically-adjusted budget balance measures to our structural balance estimates to construct the longest available series for the fiscal policy stance, the results are similar to the baseline results.

Second, we consider the possibility that the results are driven by individual countries. For example, the observed difference between the estimates could be driven by one or two countries for which there was significant uncertainty about some fundamentals, such as the level of structural unemployment. Indeed, it appears that there are some significant and persistent differences in real-time as well as ex-post estimates for individual countries. This is illustrated in Figure 1, which shows the current-year and ex-post differences in output gap and structural budget balance estimates across countries. The largest absolute differences and volatility emerge for the countries that were hit considerably during the post-2007 economic crisis, such as Greece, Ireland and Spain.¹² However, even excluding the countries for which most significant and volatile differences exist does not affect the results for real-time

¹¹Of course, this only holds if the sample period is sufficiently long.

¹²Also, allowing for fixed country effects in the baseline regression yields significant country effects and much a higher fit to the data. However we choose to omit these results as estimating the differences in a fixed-effect model would mean that we should fix somewhat arbitrary one of the countries as a reference country.

Figure 2: Differences Over Time



(a) Output Gap

(b) Structural Balance

Source: IMF World Economic Outlooks 2000-2013, EC Forecasts 2000-2013, author's own calculations.

Note: Boxes represent the 25th and 75th percentile, the vertical line shows the median, whiskers show the adjacent values and dots show outside values.

differences, suggesting that the differences cannot be fully accounted for by any individual outliers (not shown).

Third, we study whether the differences could be due to differences that are common to all countries, but vary over time i.e. due to time-fixed effects. This could be due to, for example, the two institutions making different interpretation of the currently available information concerning the long-term economic outlook for the economic area as a whole. This is illustrated in Figure 2, which shows the differences in current-year and ex-post estimates of output gap and structural budget balance by year. Indeed, it appears that the differences are driven by macroeconomic conditions. In particular, considering the real-time estimates, the EC estimated the output gap was smaller (or more positive) in the aftermath of the early 2000s crisis and again in the run up to the financial crisis (see panel A). This translates mechanically also to lower estimates of the fiscal stance during the same years as discussed above (see panel B).¹³ On the other hand, these time varying effects are different when we consider the differences in ex-post estimates. For example, while the EC considers that the cyclical conditions in the early 2003 were still more favorable compared to IMF's perception, the differences for the post-2007 crisis (especially for year 2008 and 2009) have reversed. In effect, the EC estimates'd in 2013 that the initial cyclical downturn was more significant in the beginning of the crisis than what is estimated by the IMF.

To conclude, our results suggest that, on average, there exists statistically significant

¹³Similar to fixed country effect, allowing for time-fixed effects indeed suggests that the differences vary over the years as the coefficient for individual years are positive and the fit to the data becomes higher.

differences in real-time estimates of the output gap, structural budget balances and discretionary fiscal policy. These differences are at least partly driven by individual countries and by differences in the real-time interpretation of the aggregate economic environment and the underlying level of potential output for the EU.

There are a number of potential reasons why the two institutions might differ in their real-time estimates of the fiscal stance and the output cycle. First, different institutions may have systematic differences in how they perceive the likely future path of economic activity, given their sight over the near and longer term future. Second, the institutions might differ in their averseness to attribute fiscal outcomes to cyclical conditions. In particular, while the IMF statements are not constrained by the EU fiscal policy rules and the stability and the growth pact, the EC has to always consider the implications for EU countries fiscal policy. For example, the methodological paper underlying the EC estimates of the potential output states that “given that the estimates are used for budgetary surveillance purposes, it is considered to be important to take a prudent view regarding the assessment of the past and future evolutions of potential growth in EU” (D’Auria et al. 2010). This seems to imply that there is a certain motivation not to overstate the business cycle’s effect on budget balances. If this is the case, we would expect that the estimates of output gap are more moderate for the European Commission. Hence, in case a country is close to breaching a commonly agreed threshold in budget balances the two institutions willingness to marginally cross this threshold might differ.

4 Conclusions

In this paper we study real-time differences in output gap and fiscal stance estimates published by the EC and the IMF. We motivate that these estimates are influential in national policy making and central for the credibility of the new fiscal policy rules in the EU. Employing a simple empirical strategy, we find that there are statistically significant differences between the real-time estimates of the output gap and structural budget balance. In the sample period, the EC estimated that the output gap was smaller (i.e., the cyclical stance was more positive) in the EU countries when compared to the IMF estimates. As there is no similar discrepancy with regard to growth forecasts, the difference on output gap forecasts mostly stems from a different view of potential growth. This is however not sufficient to explain the difference in estimated structural balances or fiscal effort. The institutions also differ with regard to the fiscal impact of policy measures. The results are robust across alternative EC output gap and fiscal policy indicators. According to our look at the data, we find that the differences are driven by time varying effects that are common to all countries

and to some extent by persistent differences in country specific estimates.

Our results suggests that fiscal policy rules that target unobserved components are subject to larger cross institutional differences. This is likely to pose challenges for both fiscal policy making and for the credibility of the new fiscal policy rules in real-time. This is especially the case in EU countries where national governments are potentially more inclined to make politically motivated or optimistic forecasts about the potential level of output if there emerges threats to their sovereign fiscal policy making. While our results support the conclusion that ex-post estimates and estimates for the previous year are not systematically different, and one can hence assume that if the forecasts are made by independent institutions, there is no ex-ante reason to think that they would be in disagreement with each other. Yet, ex-post agreement has little effect in the implementation stage of fiscal policy making and hence limits the role of the rules to effectively constrain fiscal policy in real-time.

References

- [1] Bouis, R., Cournède, B. & Christensen, A.K., 2012. "Implications of Output Gap Uncertainty in Times of Crisis," *OECD Economics Department Working Papers* No. 977.
- [2] Bornhorst, F., Dobrescu, G., Fedelino, A., Gottschalk, J. & Nakata, T. 2011. "When and How to Adjust Beyond the Business Cycle? A Guide to Structural Fiscal Balances," IMF Technical Notes and Manuals.
- [3] D'Auria, F., Denis, C., Havik, K., McMorro, K. Planas, C., Raciborski, R., Roger, W. & Rossi, A., 2010. "The production function methodology for calculating potential growth rates and output gaps," DG-ECFIN, *Economic Papers, European Economy*, No. 420.
- [4] Fedelino, A., Ivanova, A. & Horton, M. 2009. "Computing Cyclically Adjusted Budget Balances and Automatic Stabilizers," IMF Technical Notes and Manuals.
- [5] Girouard, N. & André, C., 2005. "Measuring Cyclically-adjusted Budget Balances for OECD Countries," *OECD Economics Department Working Papers*, No. 434.
- [6] Jonung, L. & Larch, M., 2006. "Improving fiscal policy in the EU: the case for independent forecasts," *Economic Policy*, vol. 21(47), pages 491-534.
- [7] Kempkes, G., 2012. "Cyclical adjustment in fiscal rules: Some evidence on real-time bias for EU-15 countries," *Deutsche Bundesbank Discussion Papers* 15/2012.
- [8] Larch, M. & Turrini, A., 2009. "The cyclically-adjusted budget balance in EU fiscal policy making : A love at first sight turned into a mature relationship," DG-ECFIN, *Economic Papers, European Economy*, No. 374.
- [9] Mourre, G., Isbasoiu, G.-M., Paternoster, D. & Salto, M., 2013. "The cyclically-adjusted budget balance used in the EU fiscal framework: an update," DG-ECFIN, *Economic Papers, European Economy*, No. 478.
- [10] Orphanides, A. & van Norden, S., 2005. "The Reliability of Inflation Forecasts Based on Output Gap Estimates in Real Time," *Journal of Money, Credit and Banking*, vol. 37(3), pages 583-601.
- [11] Orphanides, A. & van Norden, S., 2002. "The Unreliability of Output-Gap Estimates in Real Time," *The Review of Economics and Statistics*, vol. 84(4), pages 569-583.
- [12] Orphanides, A. 2001. "Monetary Policy Rules Based on Real-Time Data," *American Economic Review*, vol. 91(4), pages 964-985.
- [13] Pina, Álvaro M. & Venes, Nuno M., 2011. "The political economy of EDP fiscal forecasts: An empirical assessment," *European Journal of Political Economy*, vol. 27(3), pages 534-546.

Appendix

Figure 3: Distribution of Differences in Forecasts I

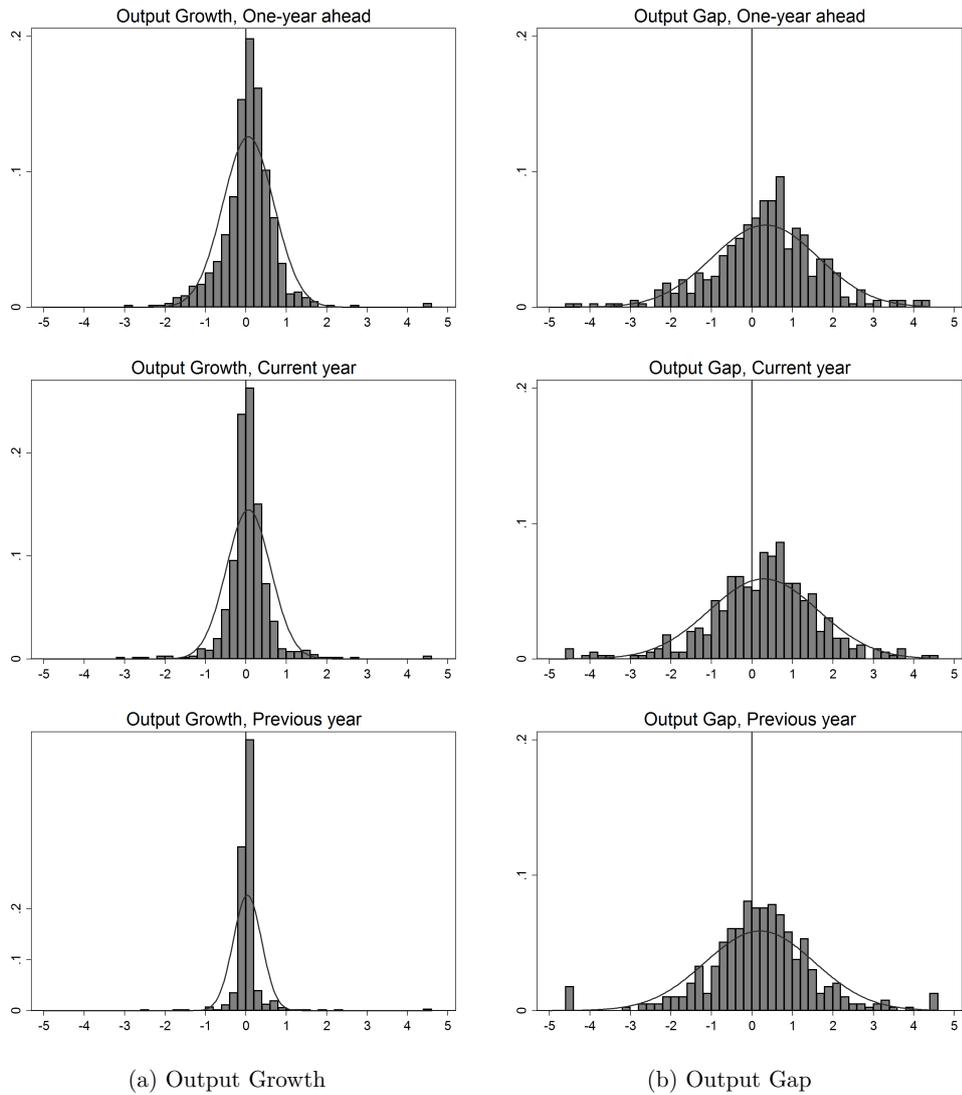
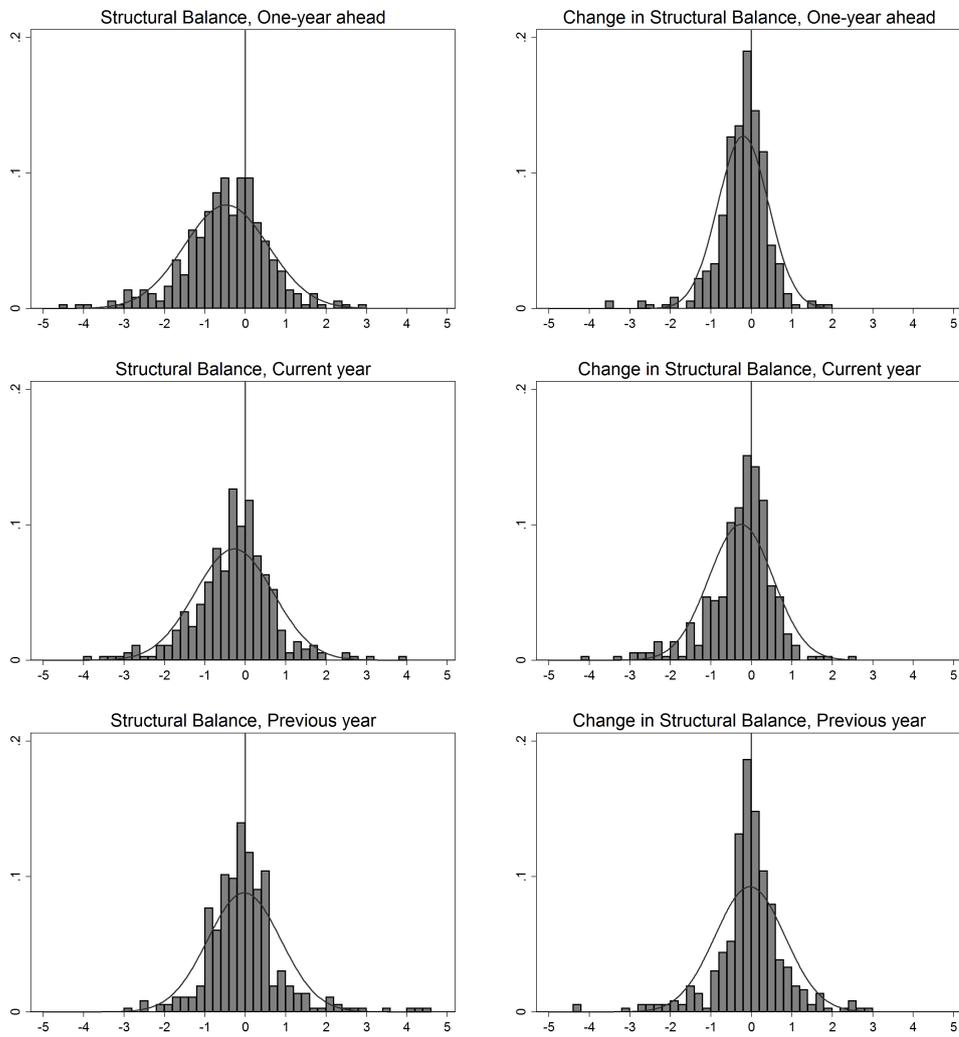


Figure 4: Distribution of Differences in Forecasts II



(a) Structural Balance

(b) Change in Structural Balance

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