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ABSTRACT

Government forecasts of GDP growth and budget balances are generally more over-optimistic than private sector forecasts. When official forecasts are especially optimistic relative to private forecasts ex ante, they are more likely also to be over-optimistic relative to realizations ex post. For example, euro area governments during the period 1999-2007 assiduously and inaccurately avoided forecasting deficit levels that would exceed the 3% Stability and Growth Pact threshold; meanwhile private sector forecasters were not subject to this crude bias. As a result, using private sector forecasts as an input into the government budgeting-making process would probably reduce official forecast errors for budget deficits.

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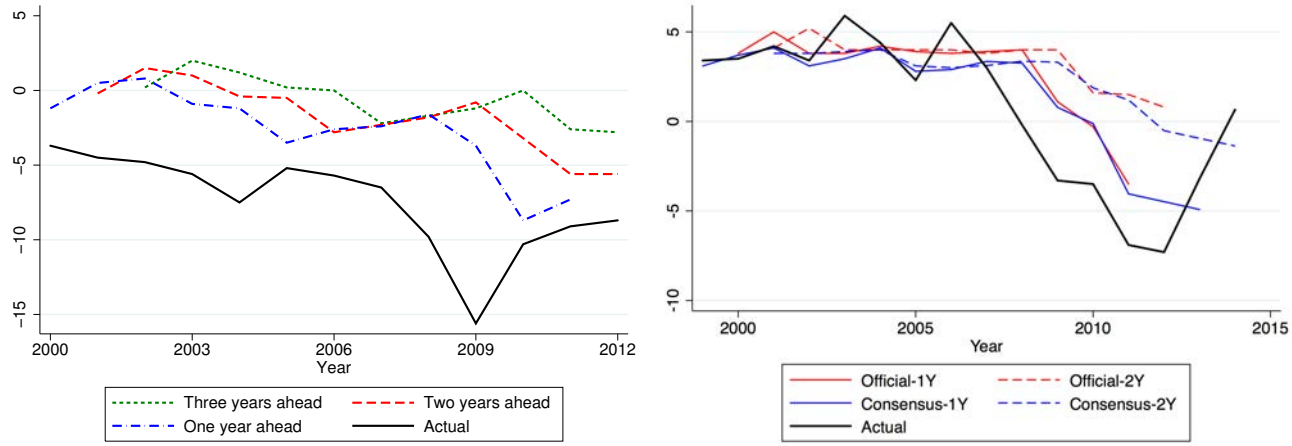
Figure 1: Greek Budget Balance (Left) and Real GDP (Right)



Notes: The left panel plots official one, two, and three year ahead budget balance forecasts, as well as the realizations. The right panel plots official one and two year ahead official and private sector consensus forecasts of real GDP growth, as well as the realization.

1 Introduction

Excessive public debts and deficits are among the most widely discussed of macroeconomic problems. Why do countries find it so hard to get their deficits under control? There are many theories, most having to do with short horizons on the part of politicians[1] and dispersion of political power.[2] But we believe that systematic patterns in the errors that official budget agencies make in their forecasts also play an important role, particularly forecasts of GDP growth, tax receipts, and budget balances.

To take an egregious example, the official Greek forecast in 2000 said that the fiscal deficit would fall below 2% of GDP one year in the future, fall below 1% of GDP two years into the future, and convert to a surplus three years into the future. (Figure 1). The subsequent budget deficit actually fell into the range of 4-5%, well above the 3% of GDP ceiling required by the Maastricht criterion and the Stability and Growth Pact. Did the Greek government then adjust its overall fiscal policies in response to missing the targets? No, it adjusted its forecasts, predicting steady progress toward budget balance in the future. This pattern also describes the forecasts reported by the government in 2001, and every year for the next ten years: always overly optimistic, and the more so the longer the horizon.

[1] For example, Alesina and Tabellini (1990a,b), Grilli et al. (1991), Roubini and Sachs (1989b,a), Caballero and Yared (2010), Battaglini and Coate (2008), Song et al. (2012).

[2] Lane (2003). Other explanations for budget deficits abound as well. Surveys include Alesina et al. (1998) and Persson and Tabellini (2002).

The same pattern extends qualitatively to most other industrialized countries. Having a fiscal rule like the Stability and Growth Pact does not seem to help. In fact it worsens the bias toward overoptimistic forecasting. Most euro countries, even when they ran deficits that exceeded 3% of GDP, continued to forecast future budget deficits that would fall under that threshold, every year until the crisis of 2010 hit, and in some cases even then.

Our previous research studies forecasts of real growth rates and budget balances made by official government agencies among 24 countries.[3] In general, the forecasts are found: (i) to have a positive average bias, (ii) to be more biased in booms, (iii) to be even more biased at the 3-year horizon than at shorter horizons. This over-optimism in official forecasts can help explain excessive budget deficits: if rapid growth is expected, retrenchment is treated as unnecessary. Many believe that better fiscal policy can be obtained by means of rules such as ceilings for the deficit or, better yet, the structural deficit. But we also find: (iv) countries subject to a budget rule, in the form of euroland's Stability and Growth Path, make official forecasts of growth and budget deficits that are even more biased then others.

The question becomes how to overcome governments' tendency to satisfy fiscal targets by wishful thinking rather than by action. One possibility is a rule whereby the government must use in its fiscal planning process forecasts coming from the private sector or some other independent body that is insulated from political pressures and the temptations of wishful thinking. (Chile instituted such a system in 2000. This presumably explains why its budget forecasts were not overly optimistic after that, even in booms.[4])

When governments are overly optimistic, subsequent realized budget deficits turn out to be larger than projected and realized surpluses are smaller. If no one used the forecasts for anything, then these mistakes, even though systematic, would not matter much. But the forecasts of the budget or economic agency within each government are used as the basis for fiscal planning. If the forecast is for a strong budget, tax parameters and spending policies are likely to be eased accordingly. Thus the excessive optimism in forecasts can help explain excessive deficits in practice. (Returning to the case of Chile, its avoidance of overly optimistic forecasts may explain why it was

[3] Frankel (2011) and Frankel and Schreger (2013).

[4] Canada too has avoided optimism bias (and in fact has been too pessimistic on average), perhaps because it too uses independent forecasts. With the years 2010 and 2011 added to the sample, several countries as well are no longer over-optimistic on average at the one-year horizon, though they still are at the two-year horizon

able to take advantage of the 2000-2008 boom to run a surplus, when so many other countries did not.)

The present paper seeks further progress on these issues by expanding the data set in crucial ways. Most importantly, it brings data on private sector forecasts together with the official government forecasts. The resulting extension of the analysis helps answer two important questions. First, might the earlier findings of over-optimism be explained by one major historical event, the severe global financial crisis and recession that began in 2008 and which everyone underestimated? More generally, when the time sample is short, results based on ex post realizations can be too sensitive to particular historical outcomes. Private sector forecasts offer an alternative standard by which to judge the performance of official forecasts, a standard less sensitive to historically volatile ex post outcomes. Second, if the reform proposal is that governments should use in the budget-making process independent projections such as those by private forecasters, what better way to test it than to see if private forecasters suffer from optimism bias as badly as the government forecasters?

We have three main results, for a sample of 26 countries during sample periods that usually go up to 2013. First, official forecasters are more over-optimistic on average than private sector forecasters on average at the one and two-year horizon for budget balances and real GDP forecasts. Second, the difference between the official forecast and the private forecast is positively correlated with the difference between the official forecast and the ex post realization, that is, the prediction error. Third, while euro area governments were very reluctant to forecast violations of the 3% deficit/GDP cap in the Stability and Growth Pact during the period 1999-2007, private sector forecasters were not. Together, these results suggest that incorporating private sector forecasts into the budget process could reduce violations of limits set by fiscal rules by identifying over-optimism ex ante rather than just ex post.

2 Related Literature

Our work builds on a moderately large literature that tries to understand bias in government forecasts. Jonung and Larch (2006) demonstrate that European Union countries have overly optimistic forecasts and propose independent budget forecasting as a remedy. Debrun et al. (2009) survey the literature on the performance of independent fiscal agencies. Merola and Pérez (2012) compare

the forecasts of European governments in their Stability and Convergence Programs (SCPs) to the forecasts made by the European Commission (EC); they find that the forecasts made by the EC are no better than those made by national governments and are affected similarly by political economy factors, such as over-optimism in budget years. Beetsma et al. (2013a) also analyze the sources of national budget forecast errors from national SCPs and find that political factors, specifically upcoming elections, play a role in explaining government over-optimism. Pina and Venes (2011) also point to the importance of upcoming elections in over-optimism. Beetsma et al. (2013a) break the budget forecasts into an implementation error, the difference between the initial projection in the budget and the preliminary figures calculated at the end of that fiscal year, and the revision error, or the difference between the preliminary measure and the final statistic. The authors find that implementation errors are driven by overly optimistic expenditure projections, whereas revision errors are driven by overly optimistic revenue forecasts. Frankel (2011) shows across a cross-section of countries that government forecasts are overly optimistic in booms. Frankel and Schreger (2013) find that euro area countries are much less likely to forecast a breach of the 3% limit but are no less likely actually to breach the limit. Pina and Venes (2011) find a similar result. Looking at the Stability and Convergence programs of European countries, Martins and Correia (2016) find that countries with better domestic institutions publish more prudent economic forecasts.

Boylan (2008) examines the forecasting behavior of individual US state governments and finds an election year bias. Bischoff and Gohout (2010) undertake a similar exercise for West German States. Beetsma et al. (2013b) study budget forecasting in the Netherlands from 1958-2009 and find that the plans are on unbiased on average. Mühleisen et al. (2005) compare the forecasting of Canada to that of other developed economies and find that countries with fiscal rules and strong budgetary institutions are more successful in their budget forecasting.

A number of authors have pointed out the dangers when studies rely on ex post GDP data that could not have been known at the time when the authorities were making their fiscal plans and have looked instead at what was knowable contemporaneously. They include Avellan and Vuletin (2015), Bernoth et al. (2007), Cimadomo (2012), Croushore and van Norden (2014), Forni et al. (2005), and Golinelli and Momigliano (2006, 2009). On the one hand, to the extent that spending plans are too high or pro-cyclical even when judged by a government's own forecasts, that would suggest a role for institutional and political economy influences unrelated to forecasting bias (such

as short horizons for politicians). On the other hand, to the extent the government forecasts that are used for fiscal planning are systematically biased (on average or in a procyclical way), this pattern constitutes information that in fact can be known in advance of the realization and can be used to reduce the average size or procyclicality of future spending. But if we accept the point that ex post income data are more volatile than all sorts of forecasts (optimal or otherwise) and using them can make a study susceptible to a big business cycle swing or two that occurs in the data, such as the global recession that began in 2008. This argument is a major motivation for using ex ante private sector forecasts data, which are available contemporaneously in real time, as a standard by which potential bias in the official forecasts is judged.

Avellan and Vuletin (2015) examine IMF forecasts for 101 countries. They conclude that the explanation for fiscal procyclicality lies less with forecast bias and more with institutions and political economy factors. Outlooks published by the IMF and OECD can be subject to advance political pressure from the countries concerned. Thus it is not clear to us where such forecasts lie on the spectrum between official forecasts, where there is a clear possible incentive for bias, and private sector forecasts, where there is much less of an incentive.

Ribeiro and Rulke (2011) use the same private sector forecast data that we do, and examine whether adoption of the SGP leads private, national and EC forecasts to converge and find mixed results. Jalles et al. (2015) also examine private-sector forecasts, and find that the bias toward optimism is stronger among developing countries than among advanced countries.

3 Data on Private Forecasts

In this paper, we use three types of data: government forecasts from national budgets, private sector forecasts, and realizations reported by from international organizations and national sources.[5] The most important respect in which we seek to improve on earlier research is the use of the private sector forecasts.

Our private sector forecasts come from Consensus Economics. Every month, Consensus Economics surveys a number of private sector forecasters for their one- and two-year ahead forecasts about a number of macroeconomic variables. Here, we examine forecasts of real GDP and the

[5] Realizations for budget balances come from Eurostat for European countries and the IMF or World Bank for the others.

budget balance. Consensus polls private sector forecasters more commonly on Real GDP growth than on the budget balance, limiting the size of our budget balance sample and leading to different country and years coverage across the variables.

In addition, for many countries private forecasters forecast the size of the budget balance in terms of local currency, rather than as a percentage of GDP. In these cases, we create a private sector forecast for the deficit/GDP ratio by first estimating the implied private sector forecast for the level of nominal GDP. We take the previous year's nominal GDP and multiply it by (1+Real GDP Growth Rate Forecast)*(1+Inflation rate forecast).[6]

Unfortunately, GDP deflator forecasts are unavailable and so we use CPI inflation for the inflation rate. For the two-year ahead nominal GDP forecasts, we multiply our one year ahead estimate by one plus the two-year ahead Real GDP Growth Rate Forecast and one plus the two-year ahead inflation rate. We then divide the budget balance forecast (in levels) by our estimated nominal GDP forecasts.[7]

In order to make sure our private and official forecasts are comparable, we match the two forecasts by the date the forecast was made. Every month, Consensus releases two sets of forecasts for the two upcoming years. The forecasts are not for a fixed horizon, but rather forecast a given variable for a given year. For instance, in the January 2003 release of Consensus Economics, respondents will forecast French real GDP growth for the 2003 and 2004 calendar years. In February 2003, the same variables will be forecast, but now instead of being 12 and 24 month forecasts, they are 11 and 23 month forecasts. In contrast, our government forecasts are made only once a year in the official budget document. We match private and official forecasts so that there is at most a 2 month gap between their forecast dates. For the budget deficit, 72.2% of our matches are exact to the month and the remaining 27.8% are within two months for one year forecasts. For one-year ahead real GDP forecasts, 63.3% of our matches are to the month and the remaining 36.7% are within two months. There still is the possibility that the forecasts were not made at the same time, as

[6] Australia, France, Germany, Italy, New Zealand, Norway, Sweden, Switzerland and the United States.

[7] In the case of countries where the fiscal year differs from the calendar year but only private sector calendar year GDP growth and inflation forecasts are available, we collect official forecast data on the level of the budget deficit and divide both the official and private sector forecasts by realized GDP. Although this means that these countries are treated slightly differently than the others, within each country the treatment is identical across private and official forecasts, minimizing the potential bias. The annual variation in the level of GDP is much smaller than the variation in the level of the budget deficit. (The countries with fiscal years other than the calendar year are Australia, Canada, New Zealand, the United States and the UK.) To be conservative, we exclude these countries from this analysis.

the official forecast date is the date that the budget was released whereas the private forecast date is the date that Consensus polled the firms. There is presumably a lag between when government forecasts are actually made and when the budget is released.

Tables 1 and 2 summarize the dataset for budget balance and real GDP growth forecasts, respectively. We report the average official error ("Off. Error), the average private consensus forecast error ("Consensus Error") and the number of observations of each type "Obs." for the one and two-year ahead forecasts. The data has significantly more one year ahead than two year ahead forecasts and more data for real GDP forecasts that for budget balance forecasts. Generally, Consensus Economics provides significantly more GDP forecast data than budget balance forecast data, and this is the primary constraint on dataset size and explains why this same is significantly smaller than in our previous work[8]. In addition, by excluding countries with different fiscal years, we significantly reduce the size of the sample.

Our data on official forecasts is summarized in our previous work. We have also posted the official forecasts and realization on our websites. We are unable to post the private forecasts because these come from a proprietary commercial dataset.

[8]Frankel and Schreger (2013)

Table 1: Country Mean Forecast Errors: Budget Balance/GDP

	One-Year Ahead			Two-Years Ahead		
	Off. Error	Con. Error	Obs.	Off. Error	Con. Error	Obs.
Australia	0.40	0.63	19			
Austria						
Belgium						
Canada	-0.86	-0.82	19	-0.40	-0.52	4
Chile	-0.86	-0.94	15			
Cyprus						
Czech Republic	-0.56	-0.82	9	-0.44	-0.56	9
Denmark						
Estonia	-0.33	-0.72	6	-0.70	-0.87	6
Finland						
France	0.43	0.19	15	1.33	0.75	15
Germany	-0.31	-0.17	14	-0.19	-0.26	14
Greece						
Hungary	0.72	-0.49	9	0.39	-0.52	9
Ireland						
Italy	0.73	0.30	15	1.55	0.67	15
Latvia	1.37	0.79	6	1.55	1.53	6
Lithuania	1.60	1.33	6	2.60	1.96	6
Mexico	0.34	0.11	13	0.88	0.79	5
Netherlands						
New Zealand	-0.15	-0.24	15			
Norway	-3.15	-3.43	2			
Poland	1.06	0.63	9	1.71	1.00	9
Portugal						
Slovakia	-0.27	-0.58	3	-0.73	-0.45	3
Slovenia	1.77	2.59	6	4.10	3.76	6
South Africa						
Spain						
Sweden	0.27	0.32	3	1.87	1.33	3
UK	0.49	1.49	11	1.21	1.33	16
USA	0.21	0.30	20			

Table 2: Country Mean Forecast Errors: Real GDP Growth

	One-Year Ahead			Two-Years Ahead		
	Off. Error	Con. Error	Obs.	Off. Error	Con. Error	Obs.
Australia	-0.08	-0.34	24	0.36	0.11	6
Austria	-0.10	-0.16	15	0.53	0.48	15
Belgium	-0.01	-0.09	15	0.66	0.56	15
Canada	-0.10	0.02	23	0.58	0.47	22
Chile	0.35	0.09	14			
Cyprus	0.72	0.51	8	2.36	2.36	8
Czech Republic	0.47	0.41	9	1.49	1.54	9
Denmark	0.80	0.88	15	0.87	1.26	15
Estonia	0.71	0.95	9	2.75	2.62	9
Finland	0.64	0.49	15	1.17	1.27	13
France	0.56	0.19	15	1.11	0.84	15
Germany	0.34	0.23	15	0.61	0.53	14
Greece	1.27	0.76	12	2.79	2.20	12
Hungary	1.22	0.97	9	2.45	2.08	9
Ireland	0.41	0.31	15	1.44	1.00	14
Italy	0.87	0.58	15	1.71	1.40	15
Latvia	0.76	0.32	9	2.48	2.47	9
Lithuania	0.48	0.17	9	1.45	1.44	9
Mexico	1.25	0.99	13	2.44	1.92	5
Netherlands	0.28	0.05	15	0.69	0.58	12
New Zealand	-0.29	-0.19	16	0.28	0.24	15
Norway	0.93	0.87	11			
Poland	-0.05	-0.34	9	0.29	0.08	9
Portugal	0.45	0.28	13	1.51	1.23	13
Slovakia	-0.35	-0.52	9	0.88	0.62	9
Slovenia	0.30	0.69	9	1.64	1.72	9
South Africa	0.14	-0.05	15	0.52	0.55	15
Spain	0.03	-0.23	15	0.83	0.51	15
Sweden	0.03	0.01	15	0.50	0.35	15
UK	-0.21	-0.27	16	0.50	0.09	5
USA	-0.05	-0.07	22	0.55	0.33	22

3.1 What are the differences between private and official forecasts?

Having constructed a dataset combining the private and official forecasts, we then turn to understanding how the two sets of forecasts differ. Here, we only use the mean private forecast in the Consensus dataset and compare it to the single official forecast.

In Table 3, we compare the one- and two-year ahead budget balance forecasts and actual outcomes. At the one-year horizon, official forecasts are on average 0.26% of GDP higher than Con-

Table 3: Budget Balance Forecast Errors

	Horizon	Mean	Standard Error	Observations	Countries
Official Minus Consensus	1Y	0.261***	(0.0781)	123	12
Official Forecast Error	1Y	0.341	(0.335)	123	12
Consensus Forecast Error	1Y	0.0802	(0.340)	123	12
Official Minus Consensus	2Y	0.478***	(0.0863)	95	10
Official Forecast Error	2Y	1.060*	(0.541)	95	10
Consensus Forecast Error	2Y	0.582	(0.548)	95	10

Driscoll-Kraay Standard Errors with 2 year lag. Only includes countries with at least 6 years of data.

Table 4: Real GDP Forecast Errors

	Horizon	Mean	Standard Error	Observations	Countries
Official Minus Consensus	1Y	0.163***	(0.0276)	323	26
Official Forecast Error	1Y	0.465	(0.489)	323	26
Consensus Forecast Error	1Y	0.302	(0.477)	323	26
Official Minus Consensus	2Y	0.135**	(0.0484)	278	23
Official Forecast Error	2Y	1.244	(0.738)	278	23
Consensus Forecast Error	2Y	1.110	(0.736)	278	23

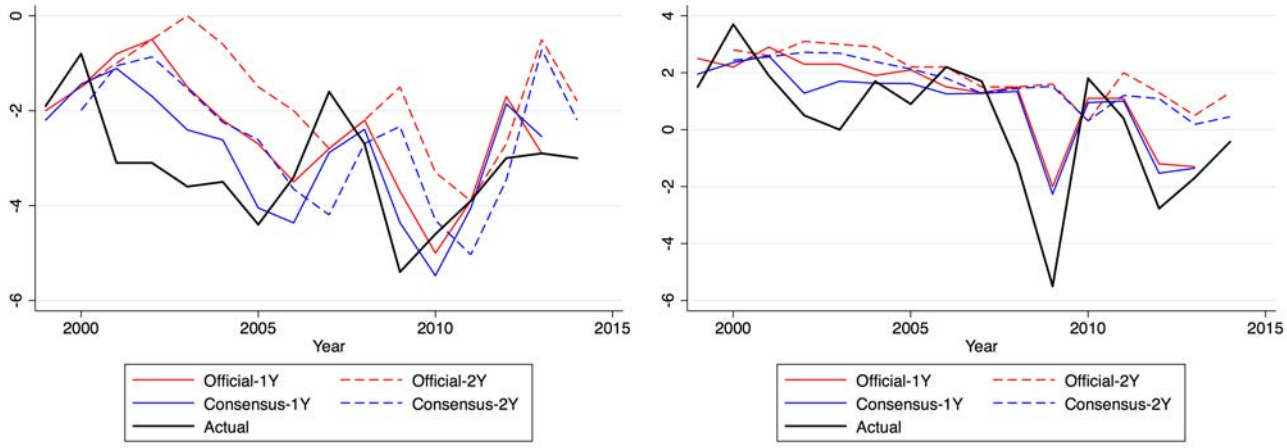
Driscoll-Kraay Standard Errors with 2 year lag. Only includes countries with at least 6 years of data.

sensus forecasts and at the two-year horizon official forecasts are 0.48% of GDP more optimistic than private forecasts. These differences are significant at the 1% level. All standard errors are calculated following Driscoll and Kraay (1998) to account for heteroskedasticity, autocorrelation and spatial correlation. A two-year lag length is used. While we find that official forecast errors are positive at the one and two year horizon, only the two year result is statistically significant at the 10% level. The difference between this result and in our previous work comes from the large reduction in sample size in order to match official and private forecasts. At both horizons private forecast errors are positive but not statistically significant from zero.

In Table 4, we compute similar statistics for real GDP forecasts. At the one year horizon, official forecasts are 0.16% higher than Consensus forecasts and 0.14% higher than Consensus forecasts at the two-year level. The one-year difference is significant at the 1% level and the two-year difference is significant at the 5% level. While the one and two year ahead official and private forecasts are all positive, none are statistically different from zero.

This fact that over-optimism is statistically significant when comparing official and private forecasts is potentially more important than judging official forecasts against the standard of ex post

Figure 2: Italy: Budget Balance (Left) and Real GDP (Right)



Notes: The left panel plots Official government forecasts and private consensus forecasts of the budget balance as a share of GDP at the one and two year horizons for Italy. It also plots the realized value. The right panel is an equivalent figure for the Real GDP growth rate.

outcomes. Because the comparison of official forecasts with private forecasts makes no use of ex post data, it is immune from the possibility that our results are driven by one record-breaking recession. Intuitively, it is harder to excuse the authorities from under-estimating the severity of the recession to the extent that private forecasters did not make the same mistake.

Figure 2 plot the data for the example of Italy, comparing private and official forecasts with the actual realizations. While private and official forecasts co-move strongly, government forecasters consistently predict smaller deficits and faster growth. In sample, both private and official forecasts proved themselves to be generally over-optimistic, but private forecasts less so.

3.2 Can private forecasts be used to predict when official forecasts will prove to be over optimistic?

In this section, we want to see if we can use private forecasts to improve on the performance of predictions made by the official agencies. In other words, is the ex ante discrepancy between private and official forecasts positively correlated with the discrepancy between official forecasts and the realized outcome, that is, the ex post prediction error? In Tables 5 and 6, we see that the answer is (generally) yes.

We define the quantity "Official-Consensus" for budget balances and GDP as the difference between the official forecast of the macroeconomic variable and the private sector forecasts of the same variable over the same horizon. We define the Official forecast error ("Off. Error") as the Official forecast minus the realization. Each are defined at the one- and two- year head horizons. In Table 5, we regress the official forecast error at the one and two year horizon on the disagreement between official and private sector forecast and various combination of year and country fixed effects. At the one year horizon, a 1% larger difference between the official and private sector forecasts predicts roughly a 0.6% higher ex post forecast error, but the results are statistically insignificant. At the two year horizon, a 1% larger difference between the official and private sector forecasts predicts a 1% higher forecast error, with all results being statistically significant.

In Table 6, we conduct the same exercise for GDP forecasts. Here, we see that at the one year horizon, a 1% higher official-private disagreement predicts between a 0.66% and 1.12% higher ex post forecast error, with all columns significant at the 1% level. At the two-year level, we find that conditional on year fixed effects, a 1% higher private-official disagreement predicts a 0.4% - 0.5% ex post forecast error. Without year fixed effects, there is no effect at all.

Table 5: Official Forecast Errors: Budget Balance

	(1)	(2)	(3)	(4)
	Off. Error t+1	Off. Error t+1	Off. Error t+1	Off. Error t+1
Official-Consensus	0.645	0.591	0.725	0.572
	(0.675)	(0.727)	(0.641)	(0.658)
Constant	0.173	-0.734**	0.948	2.834
	(0.357)	(0.309)	(1.514)	(2.731)
Observations	123	123	123	123
R-squared	0.082	0.424	0.210	0.547
Countries	12	12	12	12
Year FE	No	Yes	No	Yes
Country FE	No	No	Yes	Yes

	(1)	(2)	(3)	(4)
	Off. Error t+2	Off. Error t+2	Off. Error t+2	Off. Error t+2
Official-Consensus	1.074**	1.206*	0.956***	0.975**
	(0.457)	(0.576)	(0.312)	(0.418)
Constant	0.546	2.181***	1.987	3.036
	(0.694)	(0.129)	(2.428)	(2.587)
Observations	95	95	95	95
R-squared	0.063	0.525	0.219	0.659
Countries	10	10	10	10
Year FE	No	Yes	No	Yes
Country FE	No	No	Yes	Yes

Notes: Driscoll-Kraay Standard Errors with 2 year lag. Only includes countries with at least 6 years of data.

Table 6: Official Forecast Errors: Real GDP Growth

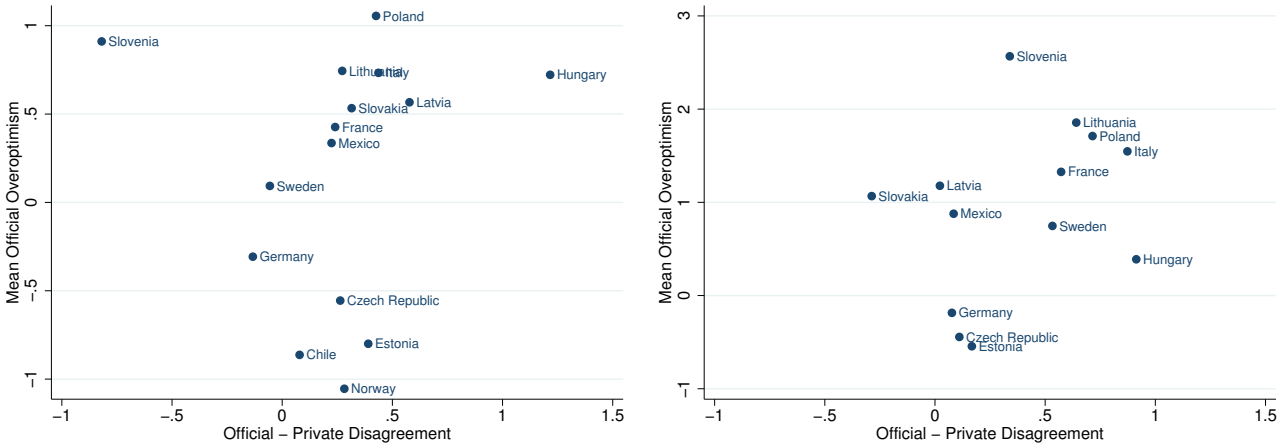
	(1)	(2)	(3)	(4)
	Off. Error t+1	Off. Error t+1	Off. Error t+1	Off. Error t+1
Official-Consensus	1.112***	0.675***	1.163***	0.660***
	(0.148)	(0.123)	(0.186)	(0.0999)
Constant	0.284	-1.234***	0.754	-5.583***
	(0.476)	(0.0781)	(0.894)	(0.828)
Observations	323	323	323	323
R-squared	0.074	0.592	0.103	0.621
Countries	26	26	26	26
Year FE	No	Yes	No	Yes
Country FE	No	No	Yes	Yes

	(1)	(2)	(3)	(4)
	Off. Error t+2	Off. Error t+2	Off. Error t+2	Off. Error t+2
Official-Consensus	0.00101	0.511**	-0.194	0.395*
	(0.256)	(0.195)	(0.280)	(0.188)
Constant	1.244	1.591***	2.518**	3.094***
	(0.765)	(0.0195)	(1.148)	(0.810)
Observations	278	278	278	278
R-squared	0.000	0.610	0.042	0.640
Countries	23	23	23	23
Year FE	No	Yes	No	Yes
Country FE	No	No	Yes	Yes

Notes: Driscoll-Kraay Standard Errors with 2 year lag. Only includes countries with at least 6 years of data.

In both tables, our preferred specification is column 2, with year fixed effects but without country fixed effects. The reason for this is that we believe country fixed effects remove much of the variation we are interested in. For instance, the Greek government predicts a higher rate of GDP growth than private sector forecasters in 11 of the 12 years in the sample. Subsequently, Greece is found to have the most biased forecasts. By including country fixed effects, we would only be looking at the time variation in Greece's level over-optimism, when the first-order benefit of looking at private forecasts may be that the government Greece is *always* over-optimistic. Year fixed effects, on the other hand, are important for controlling for common factors across countries driving ex post deficits or slow growth. Viewed in this light, our results point to the idea that private forecasts may be most useful in identifying which countries are overly optimistic in their forecasts, rather than when countries are more optimistic than usual.

Figure 3: Ex Post Official Overoptimism and Official-Private Disagreement: Budget Balance, Country Average, (1Y, Left, 2Y Right)

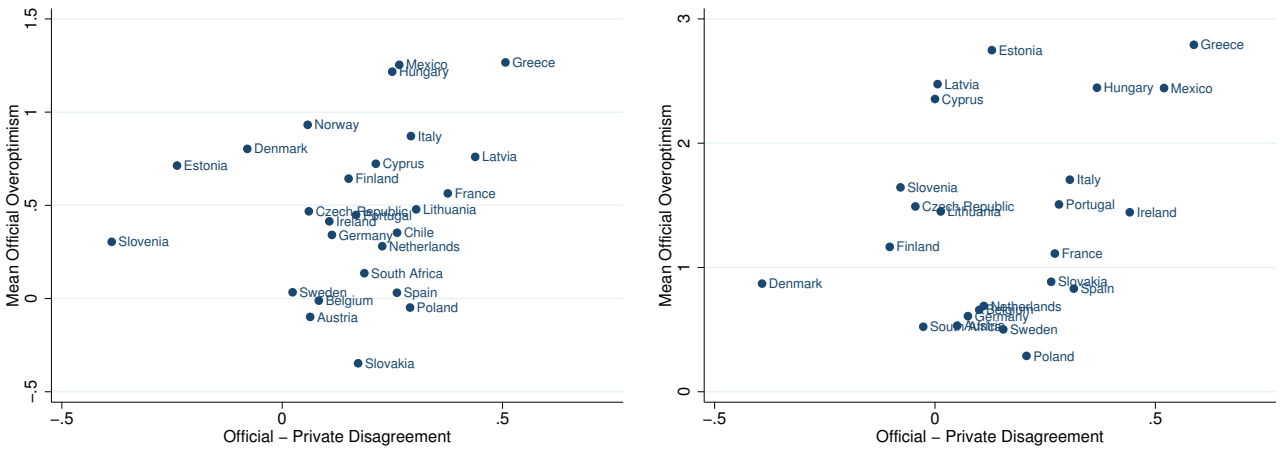


Notes: Minimum 6 Observations per country. Left panel is one-year horizon, right panel is two-year horizon.

This idea is presented graphically in Figures 3 and 4. In the scatter plot, each marker indicates the mean of a country. Only countries with at least 6 observations are included.

In Table 7, we repeat the analysis from Tables 5 and 6 while excluding the Global Financial Crisis years of 2008 and 2009. We find that our results are largely robust to this change.

Figure 4: Ex Post Official Overoptimism and Official-Private Disagreement: Real GDP Growth, Country Average



Notes: Minimum 6 Observations per country. Left panel is one-year horizon, right panel is two-year horizon.

Table 7: Official Forecast Errors:Budget Balance and Real GDP Growth, Excluding 2008-2009

(A) Budget Balance/GDP

	(1) Off. Error t+1	(2) Off. Error t+1	(3) Off. Error t+2	(4) Off. Error t+2
Official-Consensus	0.418	0.319	1.128*	0.896**
	(0.854)	(0.767)	(0.612)	(0.398)
Constant	-0.664	4.854	1.076	1.237
	(0.939)	(2.792)	(0.628)	(1.644)
Observations	99	99	79	79
R-squared	0.267	0.555	0.425	0.602
Countries	12	12	10	10
Year FE	Yes	Yes	Yes	Yes
Country FE	No	Yes	No	Yes

(B) Real GDP Growth

	(1) Off. Error t+1	(2) Off. Error t+1	(3) Off. Error t+2	(4) Off. Error t+2
Official-Consensus	0.856***	0.845***	0.471**	0.284*
	(0.161)	(0.181)	(0.203)	(0.135)
Constant	-4.669***	-1.855**	1.595***	1.141
	(0.124)	(0.764)	(0.0203)	(0.702)
Observations	272	272	232	232
R-squared	0.416	0.594	0.424	0.593
Countries	26	26	23	23
Year FE	Yes	Yes	Yes	Yes
Country FE	No	Yes	No	Yes

Notes: Driscoll-Kraay Standard Errors with 2 year lag. Only includes countries with at least 6 years of data.

3.3 Can private forecasts be used to make fiscal rules move effective?

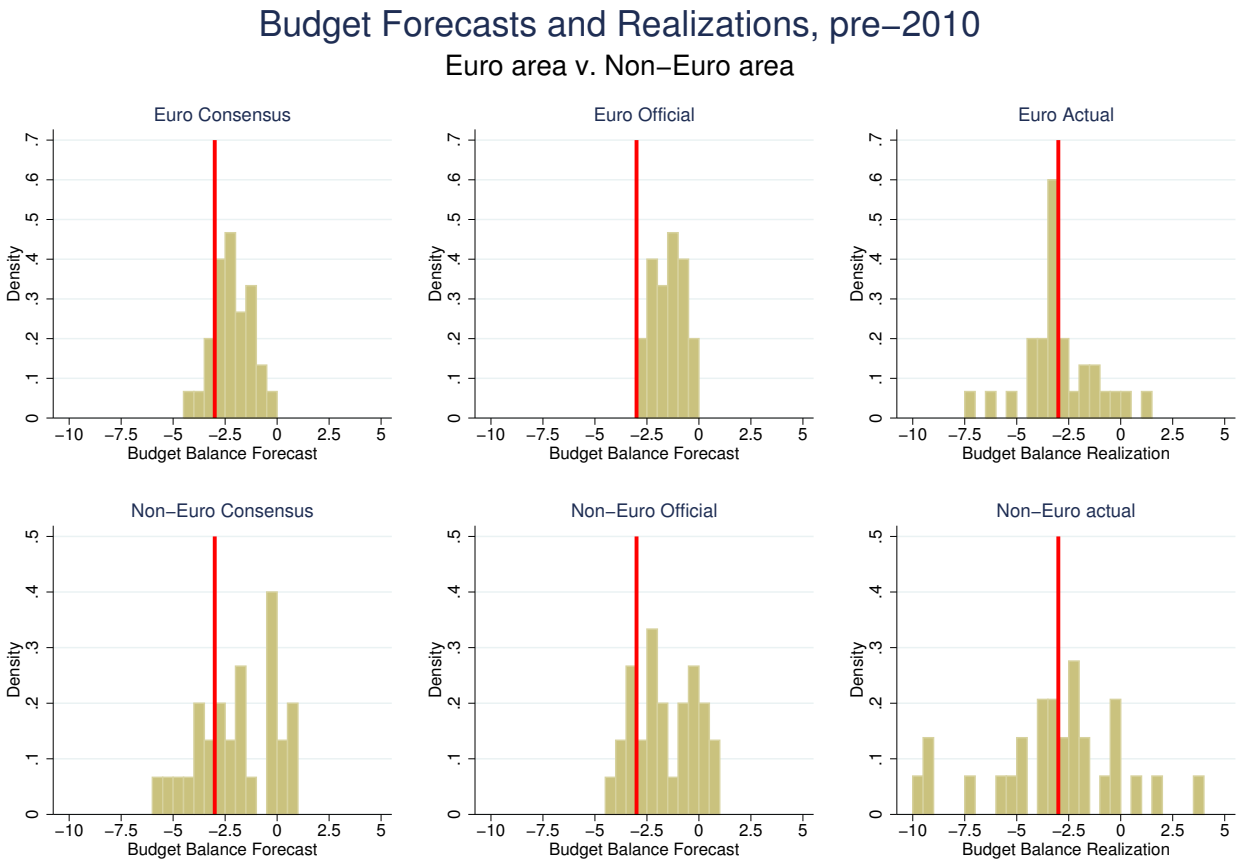
Finally, we turn to whether private forecast rules can potentially make fiscal rules more effective. Frankel and Schreger (2013) demonstrate that the extra bias among euro area countries took the specific form of rarely forecasting that their budget would breach the 3% threshold enshrined in the Stability and Growth Pact during the period 1999-2007. (After 2007, the financial crisis pushed them too far past the threshold to keep up the pretense.) This was in spite of the fact that their actual budget balances displayed no such discontinuity at 3%. By only including forecasts made through 2007, the two-year ahead figure covers forecasts of budget deficits through 2009. After the start of the financial crisis, budget balances became much larger and European countries began deficits in excess of the 3% threshold.

In Figure 5, we replicate these results[9] from while checking whether the private sector forecasters made a similar sort of error (in those country-years where we also have Consensus data). In the middle panel, we reproduce the figure for official forecasts as in our earlier work. In the upper left hand graph, we create the analogous figure for Consensus data and find no discontinuity at 3%. In other words, if the national governments had been using private sector forecasts to determine when their countries were likely to breach the 3% requirements of the SGP, they could not have used wishful thinking to respond to warnings from the EC.

These results help sharpen the evidence on bias in official forecasts. They confirm that the existence of a fiscal rule such as the Stability and Growth Pact does nothing to solve the problem of over-optimism, and may even make it worse. They might even shed some light on the motives of governments. The findings of over-optimism in the literature could have been explained in a number of ways. One obvious hypothesis is that national leaders seek to convince their voters that their country's generic economic performance is good, either for the political purpose of winning votes or for the economic purpose of boosting consumer and business confidence. There may be psychological explanations as well. But the finding of a threshold of 3% among the euro country forecasts suggests a narrower explanation, that they were in effect gaming the rules of the European Commission's excessive deficit procedure under the SGP.

[9] Frankel and Schreger (2013).

Figure 5: Europe Figures



Notes: Euro refers to countries in the euro area at time forecasts were made and non-euro refers to other countries. Consensus are the mean of private forecasts, official is the official government forecast, and actual is the realization.

4 Conclusion

In this paper we document three main findings. First, official forecasts are more optimistic than private forecasts. Second, the ex ante discrepancy between private and official forecasts is positively correlated with the discrepancy between official forecasts and the realized outcome, that is, with the ex post prediction error. Private sector forecasts can improve on official forecasts (though less so when we add fixed effects for countries). Third, private sector forecasts predicted euro area countries would breach the 3% limit in the Stability and Growth Pact, usually accurately, even though government agencies did not forecast breaching the limit.

There is an important possible implication for reform proposals: Tightening fiscal rules may not help limit budget deficits, if forecasts remain subject to gaming the rules or (more charitably) to

wishful thinking. Giving independence to the agencies that make the forecasts used in the budget-making process or even using leading private forecasts directly may be more likely to reduce the bias. However, private forecasters, while less optimistic than governments, certainly did not foresee the huge budget deficits and growth decline during the Global Financial Crisis. This suggests private sector forecasts are more likely to improve on official ones when governments are being strategically over-optimistic rather than in instances where ex post everyone turns out to have been too optimistic.

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