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Fiscal Forecasting Rationality Among Expert Forecasters

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ABSTRACT

Macroeconomic theories attribute rigidities in expectations formation to two mechanisms: sticky or noisy information. Recent advances in testing time variations in forecast dispersion—using the fluctuation rationality test—allow detecting departures from forecaster rationality over time. Relating individual forecaster behavior to economic or political factors on a panel of budget balance forecasts from Consensus Economics, a large panel of individual expert forecasters in four major OECD countries between 1993 to 2023, we find evidence for forecaster behavior in line with noisy information. Traditional full-sample tests show that forecasters are not rational, but this is due to an overly pessimistic reaction to sudden big shifts, like the global financial crisis or the pandemic. In normal times, forecasters do systematically incorporate economic and political news in budget forecast revisions.

Jel Classification: C53, E27, E37, E62, D8, H30

1 | Introduction

Understanding how agents form expectations holds significant importance in macroeconomics. Two predominant theories hold opposing views: Mankiw and Reis (2002) argue that forecasters infrequently update their information sets due to fixed acquisition costs; Woodford (2002) and Sims (2003) in turn argue that agents continuously receive updates about the true state of the economy but must extract relevant changes from noisy signals. Both theories predict information rigidities leading to deviations from full information rational expectations.

A recent literature has focused on the drivers underlying the dispersion among experts' forecasts, notably on growth and inflation, and the influence of macroeconomic or political factors on those deviations (Coibion and Gorodnichenko 2012). This literature has not yet come to robust evidence about the quantitative importance and nature of information rigidities faced by different types of economic agents, as it is hard to get detailed data on expectations from different sources, either in surveys or laboratory experiments (Cornand and Hubert 2020).

This paper innovates by testing the drivers underlying the dispersion of experts' forecasts on fiscal policy and by employing new methods to test the rationality of those expectations. We rely on recent advances in testing forecaster rationality over time—the fluctuation rationality (FR) test by Rossi and Sekhposyan (2016)—to examine the role of economic or political information in updating forecasts. We apply the test to a quarterly panel dataset with survey forecasts from four countries (France, Germany, Italy and the United States) and with a maximum of 94 (current year) and 101 (year ahead) expert forecasters on a long sample with quite some fiscal shifts, such as the introduction of the SGP in EMU countries, the surge in spending during the global financial crisis, the interventions during the pandemic, or costly military interventions like the Iraq War between 1993 and 2023. After applying a battery of standard tests for absolute and relative performance of budget balance forecasts, we then test for the presence of information rigidities on those forecasts, and for the impact of external information on these rigidities. Next, we apply the FR test to detect when expert forecasters deviate from rationality, followed by an exploration of the role of external information—in particular, policy frameworks, global risk factors, or macroeconomic factors—on these deviations from rationality.

Our findings indicate that forecaster behavior for budget balances is best modeled as a mixture of sticky and noisy information. The reason is that traditional tests using full-sample averages tend to smooth out variations in forecast behavior over time, making it difficult to detect shifts between sticky and noisy responses. In fact, we confirm that expert forecasters are not efficient in revising forecasts over the period 1993–2023. For European countries, the large-scale consolidation leading up to EMU entry in 1999, the repercussions of the 2008 global financial crisis culminating in the early 2010s debt sovereign crisis, and the disruptions created by the pandemic were responsible to major sudden changes in the experts' fiscal forecasts. In the case of the United States, the common informational shock is captured by large swings in tax policies, and increased outlays owing to both the global financial crisis and military events. In the presence of such large shifts, the capacity of each expert forecaster to understand the budgetary implications is compromised, and forecasters overreact, especially in countries where fiscal policy lacks a stable framework.

Nevertheless, a lack of rationality is concentrated only in those episodes. When explaining the time-varying changes in rationality, we find that expert forecasters do adjust their forecast of the budget balance in reaction to specific news. In normal times, forecasters do systematically incorporate economic and political news in their budget forecast revisions and seem to become more cautious during episodes of political and economic uncertainty.

Our paper contributes to the literature in two ways. First, we extend the tests developed by Dovern et al. (2015) to test forecaster efficiency and shed a new light on testing information rigidities. We do so first by augmenting the Dovern et al. (2015) test with news on economic or political variables and second by using the FR test to examine time variation in forecast efficiency. Second, from a practical point of view, our paper further extends another branch investigating absolute and relative performance of fiscal forecasting (Leal et al. 2008; Jalles, Karibzhanov, and Loungani 2015). We do so by detailing how expert forecasters deviate from rationality and shed a new light on the quality of fiscal forecasts (Leal et al. 2008). Expert budget forecasters seem to be overall performing rational projections but overreact to structural breaks. Forecasters have a hard time filtering out the future tendencies after these large policy shifts. Such a view is in line with models of noisy information.

The remainder of the paper is structured as follows. Section 2 describes the dataset; Section 3 first tests absolute forecasting performance of budget forecasts, then checks for information rigidities, to apply next tests of forecast rationality. Section 4 then explains deviations from rationality with a combination of economic and political variables. Finally, Section 5 presents conclusions and policy implications.

2 | Expert Forecasts on Fiscal Data

We use *Consensus Economics* (CE) forecasts data to investigate how experts form fiscal expectations. CE conducts a monthly survey in up to 100 countries and queries respondents every first week of each month about current and future developments for a number of macroeconomic and financial variables. These forecasts are then published early in the second week of the same month. The fiscal variable surveyed by CE is the overall budget balance, which a significantly lower coverage than other macroeconomic variables, such as GDP growth and inflation, for example. This variable is reported in nominal local currency terms on an annual basis, both for the current and the next fiscal year.[1]

Unlike other surveys, individual forecasts in CE should not suffer a bias owing to the release of strategic forecasts, as often happens for official projections released by governmental agencies (Ottaviani and Sorensen 2006; D'Agostino and Ehrmann 2014). In addition, evidence shows that CE forecasts are less biased and more accurate than forecasts of some international institutions. CE data are public, which helps to prevent a participant from reproducing others' forecasts and also limits the possibility of herding (Trueman 1994). Moreover, forecasters are bound in their survey answers by their recommendations to their clients, and discrepancies between the survey and their private recommendation would be hard to justify (Keane and Runkle 1990). Overall, we can reasonably argue that the CE survey data broadly reflect the spectrum of expectations of market experts.

Our analysis focus on France, Germany, Italy, and the United States with data covering a sample of forecasts surveyed between January 1993 to December 2022. Fiscal forecasts have not always received the same attention by forecasters over time. Varying data availability for different months implies that in some months, several fiscal forecasts were available, while others had none. To ensure a consistent and reliable series of forecasts over a longer period, we follow Heppke-Falk and Huefner (2004) and Cimadomo, Claeys, and Poplawski-Ribeiro (2016) and proceed in various steps.

Firstly, we aggregate monthly data on a quarterly basis. For each quarter, we select the most recent monthly forecast available within that quarter. This means that if there were forecasts available in January, February, and March, we chose the March forecast as representative value for Quarter 1, but if there are no data for March, we select the February forecast. Secondly, CE reports the budget balance in nominal local currency terms only, yet the literature has typically compared absolute and relative forecasting performance of the budget balance-to-GDP ratio (Artis and Marcellino 2001; Leal et al. 2008; Merola and Pérez 2013; Jalles, Karibzhanov, and Loungani 2015). We therefore transform each forecast to a ratio of GDP by dividing the fixed-horizon current (or 1-year-ahead) forecast of the nominal budget balance in a certain month m by the GDP forecast for the same year. As in Cimadomo, Claeys, and Poplawski-Ribeiro (2016), given that the CE dataset only provides forecasts of GDP *growth rates*, we compute the year-ahead nominal GDP level forecast by applying the CE growth rate to the latest available estimate for the same-year GDP level. The latter is taken from IMF WEO (see Appendix A for more details).

CE conducts surveys among professional economists working for commercial or investment banks, government agencies, research centers and university departments.[2] We distinguish four categories of forecasters: banks, financial services, consultants, and research departments. Banks include domestic or international banks that primarily engage in providing

financial services to individuals and businesses. The group of experts from financial services includes insurance companies, investment firms, or hedge funds. Consultants refer to consulting companies and other specialized organizations that provide macroeconomic forecasts and analyses. Research departments are specialized units within universities, think tanks, or major corporations focused on producing in-depth economic research. A detailed list of the forecasters in the sample is available in Appendices B (per country) and C (per subgroup).

Table 1 shows some descriptive statistics of the projected budget balances for the current year and year ahead in our sample, reporting their overall mean and the mean (and other statistics) for each group of experts.[3] The mean forecast is computed using information available for the expert forecasters in each quarter.

Figure 1a compares the mean forecast across experts for the current year to the realized budget balance ratio to GDP, while Figure 1b does the same for the year-ahead forecast. As realized values, we take the different issues of the IMF World Economic Outlook's budget balance for European countries. For the United States, we use the outturn data reported by the US Congressional Budget Office.

3 | An Evaluation of Expert Forecasters' Performance

3.1 | Understanding Bias in Expert Forecasters' Budget Forecast

The accuracy of government budget forecasts is critical for effective fiscal policy, for accountability in using public funds, and oversight from fiscal councils (Auerbach and Gale 1999; Jonung and Larch 2006). Nevertheless, evidence of systematic bias in fiscal forecasts (An and Jalles 2021), and in particular the persistence of overly optimistic forecasts in public forecasts, has been a continuous concern (Estefania-Flores et al. 2023; Perrelli et al. Forthcoming). On the one hand, bias might create the perception that budget forecasts are central to the political process, and there is pressure on forecasters to present favorable outcomes, potentially leading to biased predictions (Strauch, Hallerberg, and von Hagen 2004; Moulin and Wierts 2006). On the other hand, major economic shocks like the global financial crisis, the pandemic, or international conflict might create unforeseen budgetary pressures. Assessing the performance of budget balance forecasts and refining forecasting techniques should lead to better informed policy decisions (Leal et al. 2008).

A first test for absolute forecasting performance is on bias. The standard test for bias by Holden and Peel (1990) examines whether the forecast error is zero on average in-sample. We define the forecast error as follows:

$$e_{i,t}^{h} = B_t - F_{i,t}^{h}, \tag{1}$$

in which B_t is the realized value of the budget balance-to-GDP ratio for period t and $F_{i,t}^{h}$ is the forecast budget balance ratio by an expert forecaster i at time t. The forecast error $e_{i,t}^{h}$ for each expert forecaster i can be produced for different horizons h, in our case either the current year or at 1 year ahead.

A simple way to test bias is to regress the forecast error on a constant as follows[4]:

$$e_{i,t}^{h} = \alpha + \upsilon_{i,t}^{h}. \tag{2}$$

Forecasts are unbiased if we cannot reject the null hypothesis that $\alpha = 0$. A negative α indicates an optimistic bias. In this case, forecasters systematically underestimate the actual budget deficit (or overestimate the surplus). By contrast, a positive α suggests a pessimistic bias, where forecasts tend to overstate deficits or understate surpluses.

In order to compare our results to previous studies, we test (2) on the mean forecast across all forecasters, for both the current-year and the year-ahead forecast, in all four countries. We additionally test the mean forecast for bias in each of the four subgroups of forecasters. We estimate model (2) with an OLS estimator correcting standard errors as in Driscoll and Kraay (1998) as there is a potential correlation structure.

The results in Table 2, panel (a), demonstrate notable differences in forecast bias of budget balances across countries and groups of experts. Forecasts for the Italian budget, for example, consistently shows large underestimations, especially in 1-year-ahead forecasts, where the bias reaches −1.79% of GDP. France also displays a negative bias, with a drop in performance when looking at the year-ahead forecasts. By contrast, forecasts for Germany shows an overall slightly positive bias for current-year forecasts (+0.19%), but it turns negative for the 1-year-ahead projections. The United States has a similar bias in current-year predictions as in Germany. Bias is much more pronounced for 1-year-ahead forecasts overall, which is to be expected given the larger uncertainty that surrounds longer term projections.

Across the subgroups of experts, some differences in bias become clear, reflecting the varying forecasting abilities of different institutions. Financial institutions in Italy show the largest negative bias, particularly for current-year forecasts (−1.06), and so they are in France. By contrast, Germany's international banks stand out with a strong positive bias in current-year forecasts (+0.45). But in the United States, international banks tend to be very negatively biased, while research departments tend to be overly pessimistic. The year-ahead forecasts are more strongly biased, and forecasters in all subgroups tend to expect a smaller deficit than what actually happens. Only the German international banks tend to get the forecast about right, in stark contrast to the mostly negative results for groups.

In general, results in panel (a) of Table 2 align with previous research on budget forecasts. Strauch, Hallerberg, and von Hagen (2004) show a statistically significant optimism bias in EU countries; Jalles, Karibzhanov, and Loungani (2015) find statistically significant biases in fiscal forecasts on advanced economies using the same data but in a shorter period of time (from 1993 to 2009). Yet, when these authors investigate forecasts by country, they find a positive bias for current forecast in the United States, Germany, and Italy and a negative bias in France, while for year-ahead forecast, all negative bias.

TABLE 1 | Descriptive statistics for budget balance forecasts, overall, and per group of expert forecasters.

		(a) Current year						(b) Year ahead					
	Group	**Mean**	**SE**	**Min**	**Max**	**Obs.**	***N* of experts**	**Mean**	**SE**	**Min**	**Max**	**Obs.**	***N* of experts**
Italy	All	−4.31	(3.11)	−14.19	−0.88	422	17	−3.40	(1.73)	−10.44	−0.22	415	21
	Banks	−4.16	(3.23)	−14.19	−0.98	195	8	−3.11	(1.53)	−7.50	−0.67	125	8
	Consultants	−4.61	(2.97)	−13.67	−1.17	167	7	−3.76	(1.90)	−10.44	−0.71	155	8
	Financial services	−3.93	(2.64)	−13.06	−0.88	60	2	−3.26	(1.63)	−9.33	−0.22	135	5
	Research departments	—	—	—	—	—	—	—	—	—	—	—	—
France	All	−4.14	(2.11)	−12.78	−0.21	596	24	−3.49	(1.54)	−9.23	−0.19	436	23
	Banks	−4.13	(2.27)	−12.55	−0.24	209	8	−3.55	(1.51)	−8.53	−0.19	102	8
	Consultants	−3.90	(1.32)	−7.87	−2.67	357	13	−3.67	(1.67)	−9.23	−0.22	228	11
	Financial services	−3.90	(1.32)	−7.86	−2.67	15	1	−3.26	(1.11)	−5.75	−0.97	47	2
	Research departments	−3.59	(1.45)	−7.17	−2.34	15	1	−2.89	(1.18)	−5.80	−0.27	59	2
Germany	All	−1.78	(2.20)	−11.46	2.04	1005	27	−1.76	(1.77)	−7.65	2.03	973	27
	Banks	−0.74	(2.31)	−10.10	2.04	94	5	−0.72	(1.82)	−5.42	1.45	49	5
	Consultants	−2.05	(2.21)	−11.46	1.16	663	14	−1.94	(1.73)	−7.27	1.56	662	14
	Financial services	−0.78	(1.70)	−4.01	1.25	35	1	−1.15	(1.51)	−4.59	1.05	35	1
	Research departments	−1.56	(1.97)	−5.62	1.75	213	7	−1.55	(1.81)	−7.65	2.03	227	7
United States	All	−3.98	(3.40)	−20.26	3.15	626	26	−2.82	(2.61)	−12.61	3.42	580	30
	Banks	−4.32	(3.03)	−17.00	2.65	144	7	−2.96	(2.44)	−9.55	2.67	171	8
	Consultants	−4.53	(3.63)	−20.26	2.45	239	10	−3.62	(2.81)	−11.53	2.70	128	9
	Financial services	−3.10	(3.02)	−17.18	3.15	106	4	−2.29	(2.41)	−12.61	3.42	118	7
	Research departments	−3.36	(3.43)	−19.34	2.48	137	5	−2.44	(2.61)	−11.42	2.80	163	6

Source: Consensus Economics forecasts and authors' calculations.

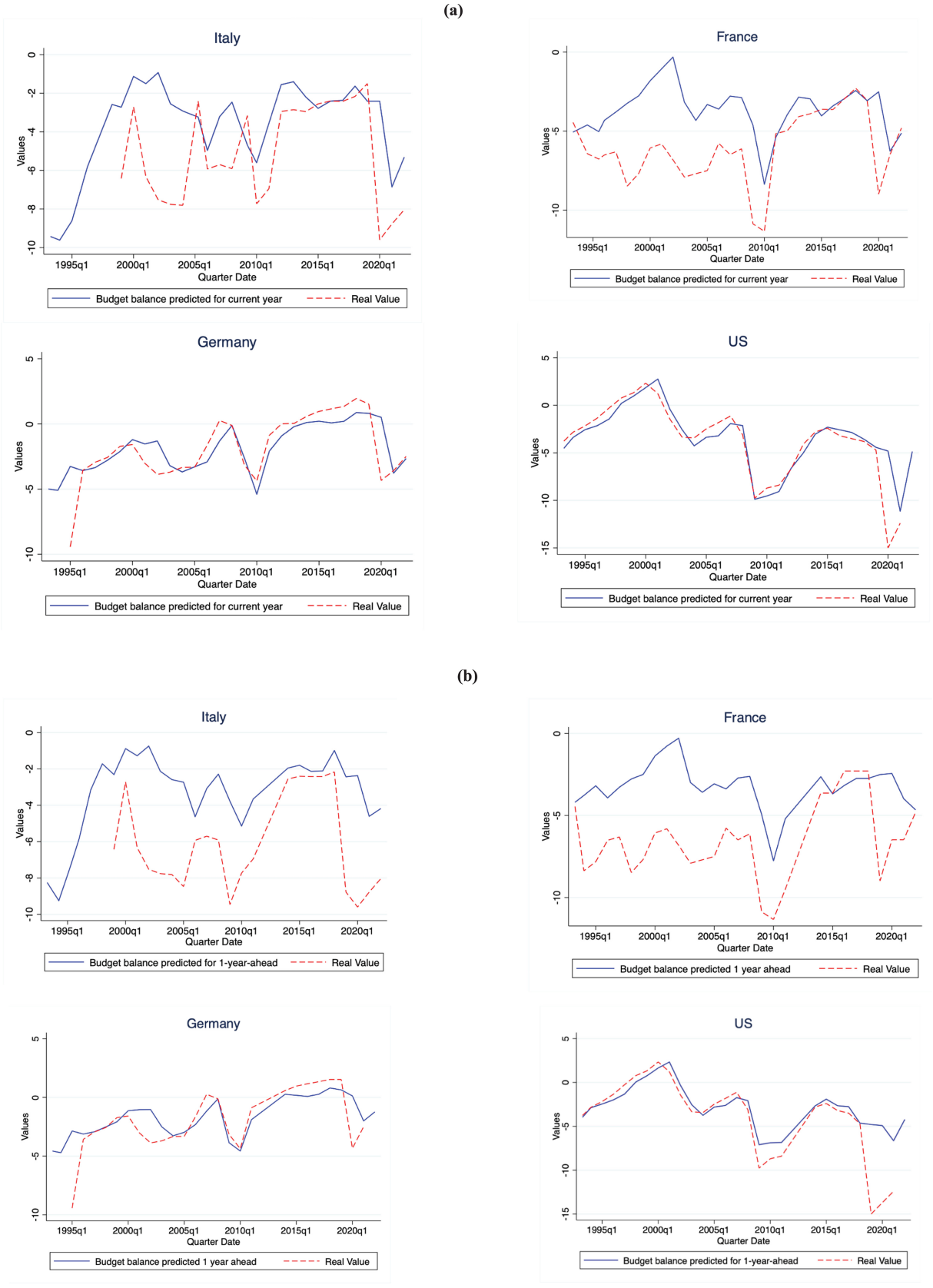

FIGURE 1 | Mean of budget balance forecasts. (a) Current-year forecast versus realized value. (b) Year-ahead forecast versus realized value.

Most of the literature on fiscal forecasts evaluates bias for specific institutions' forecasts, such as the IMF or the EC, as in Artis and Marcellino (2001). When multiple forecasts from the same source are tested—as in Jalles, Karibzhanov, and Loungani (2015) or An and Jalles (2021)—often only the mean forecast is tested for bias, rather than the entire distribution.[5]

TABLE 2 | Testing bias budget balance forecast, overall, and per group of expert forecasters.

		Current year		Year ahead	
Country	**Groups**	α	**SE**	α	**SE**
(a) In the mean					
Italy	All	−0.46***	(0.10)	−1.79***	(0.14)
	Banks	−0.29**	(0.14)	−1.86***	(0.25)
	Consultants	−0.45***	(0.15)	−1.90***	(0.24)
	Financial services	−1.06***	(0.36)	−1.60***	(0.28)
	Research departments[a]	—	—	—	—
France	All	−0.21**	(0.10)	−0.74***	(0.14)
	Banks	−0.19	(0.17)	−0.86***	(0.28)
	Consultants	−0.17	(0.11)	−0.72***	(0.20)
	Financial services	−0.83	(0.48)	−0.54	(0.41)
	Research departments	−0.79*	(0.43)	−0.76*	(0.39)
Germany	All	0.19***	(0.04)	−0.45***	(0.05)
	Banks	0.45***	(0.11)	0.01	(0.29)
	Consultants	0.24***	(0.06)	−0.52***	(0.07)
	Financial services	0.36**	(0.16)	−0.14	(0.28)
	Research departments	−0.10	(0.10)	−0.41***	(0.13)
United States	All	0.04	(0.05)	−0.76***	(0.10)
	Banks	−0.20*	(0.12)	−0.68***	(0.17)
	Consultants	0.12	(0.08)	−1.43***	(0.27)
	Financial services	0.01	(0.05)	−0.62***	(0.19)
	Research departments	0.16**	(0.71)	−0.45***	(0.16)
(b) In panel model					
Italy	All	−2.11***	(0.52)	−3.56***	(0.48)
	Banks	−2.01***	(0.52)	−3.30***	(0.57)
	Consultants	−1.82**	(0.49)	−3.15***	(0.60)
	Financial services	−2.89	(0.84)	−4.24***	(0.55)
	Research departments[a]	—	—	—	
France	All	−2.02***	(0.49)	−3.69***	(0.46)
	Banks	−2.37***	(0.58)	−3.98***	(0.46)
	Consultants	−1.86***	(0.45)	−3.79***	(0.52)
	Financial services	0.00	(0.00)	−2.59	(0.87)
	Research departments	0.00	(0.00)	−3.77	(0.63)
Germany	All	0.02	(0.31)	−0.49	(0.38)
	Banks	0.14	(0.52)	−0.05	(0.51)
	Consultants	0.07	(0.29)	−0.53	(0.39)
	Financial services	0.03	(0.69)	0.02	(0.86)
	Research departments	−0.18	(0.36)	−0.55	(0.40)

(Continues)

TABLE 2 | (Continued)

Country	Groups	Current year		Year ahead	
		α	SE	α	SE
United States	All	−0.08	(0.24)	−0.75**	(0.34)
	Banks	−0.70	(0.61)	−0.90**	(0.38)
	Consultants	0.09	(0.26)	−1.23**	(0.53)
	Financial services	−0.03	(0.16)	−0.61*	(0.31)
	Research departments	0.24	(0.14)	−0.30	(0.35)

Note: (a) OLS estimation. (b) Fixed-effect panel model; fixed-effect panel including time dummies. Standard robust errors in parentheses.
Source: Consensus Economics forecasts and authors' estimations.
[a]No research institutes in Italy over full sample.
***$p < 0.01$, **$p < 0.05$, and *$p < 0.1$.

Testing the bias on the mean forecast has a drawback, though. Carabotta and Claeys (2024) show that different forecast combinations—of which the mean is just one—smooths out differences across forecasters and their different biases. We therefore use the entire panel of expert forecasters to test for bias and estimate (2) on the panel of all expert forecasters using fixed effects and correcting standard errors as in Driscoll and Kraay (1998). This correction does not require strong assumptions on the form of the cross-sectional and temporal correlation in the error terms (Dovern et al. 2015). We also include time dummies to account for potential common shocks or events that jointly shift the budget forecasts across experts. We report in Table 2 results for both the full sample of expert forecasters and for the subgroup samples.

Results in panel (b) of Table 2 show a complementary picture of the mean results in panel (a). The fixed-effect panel data show significantly higher negative biases (both for the current-year and year-ahead forecasts) in Italy and France. Even if we look at specific groups like banks or consultants, we observe this increase in bias. By contrast to the forecasts for France or Italy, the German expert forecasters never display a bias (at both horizons): None of the coefficients is statistically significant. Something similar is true for the US budget balance forecasts in the current year. Yet, for the year-ahead forecast, an optimistic bias is obtained. These results add insight into mean forecasts, as it shows that taking into account individual forecaster and time fixed effects leaves us with a similar insight. Expert forecasters—on average and on a full sample—display a bias even if there is a wide dispersion across them. This shows that averaging out over different information sets across forecasters can be useful to improve forecasting performance, as Carabotta and Claeys (2024) show. However, it does not reflect how expert forecasters update their information or what type of information is taken into account.

3.2 | Analysis of Information Rigidities in Budget Forecasts

Under rational expectations theory, professional forecasters are expected to use all available information and process it correctly and without any systematic bias. The theory implies that revisions to forecasts should be uncorrelated because if forecasters are rational, they would have already incorporated all relevant information into their forecasts (Nordhaus 1987). This scenario assumes no informational frictions.

A large literature in the macroeconomics field shows that, contrary to theory, in practice, forecast revisions tend to be positively correlated, such as shown in Nordhaus (1987) or Coibion and Gorodnichenko (2012) who show that revisions to forecasts often contain a predictable component, suggesting that forecasters face frictions in processing information (Cornand and Hubert 2020). Such frictions lead to stickiness in forecasts. The source of this stickiness is not clear, however. On the one hand, the processing of information itself may be sticky: Mankiw and Reis (2002) posit that forecasters update their information sets infrequently, either due to the costs of acquiring and processing new information or due to cognitive biases, leading to a lag in the full assimilation of new data. On the other hand, agents have to extract from a large set of information those changes that could modify economic developments in the future. Noisy information could make agents only slowly adapt their forecasts as they have to learn what information is relevant and distinguish it from irrelevant noise.

In both cases, information processing makes forecasters, even expert ones, slow to adjust. One test for measuring stickiness in information is the one developed by Dovern et al. (2015). They argue that as forecasters receive new information, they should revise their new forecast. The test suggests testing forecast smoothing by regressing forecast revisions on past forecast revisions, as in (3). Revisions are calculated as follows: $r^h_{i,t} = F^h_{i,t} - F^h_{i,t-1}$, where F^h_t is the forecast made by expert forecaster i on horizon h (current year or 1 year ahead) at time t and F^h_{t-1} was the forecast made in the previous period.

$$r^h_{i,t} = \lambda r^h_{i,t-1} + v^h_{i,t-1}. \tag{3}$$

In (3), the parameter λ is the estimated autocorrelation on the forecast revision, and $v^{C,h}_{i,t-1}$ is an independent and identically distributed error term. As Dovern et al. (2015) argue, when $\lambda = 0$, forecasts are (weakly) efficient—that is, there is no stickiness, and revisions are updated.

We first estimate Equation (3) on the mean expert forecast (for each country and across subgroups), and then, estimate a panel

fixed-effect model on the sample of all expert forecasters to account for their singular forecast behavior. The mean test for forecast efficiency in (3) is estimated with OLS, whereas the panel version is estimated with a fixed-effect model. In the panel, we also include time dummies to account for common shocks that affect all forecasters in every quarter.

Panel (a) of Table 3 shows the results of testing stickiness in the mean. We observe a clear pattern of stickiness on both horizons. In all cases, the coefficient λ is found to be negative and statistically significant, indicating that forecasters tend to overadjust their predictions when faced with new information, which leads to persistent forecast errors. There is no evidence that this pattern is different for year-ahead projections, because the stickiness coefficient is not significantly different from the current-year measure of expectations.

Dovern et al. (2015) argue that the degree of information rigidity in the mean forecasts is substantially higher than that in individual forecasts. A comparison of the mean versus the panel version of the efficiency test in panel (b) of Table 3 confirms the findings on the mean forecast though. The stickiness coefficient is quite similar, even if the response is not always significant for all countries. This result indicates that budget forecasts behave differently than GDP or inflation forecasts.

These results might be surprising given that most studies on GDP or inflation forecasts find a substantial amount of rigidity (Coibion and Gorodnichenko 2012). By contrast, the results indicates that forecasters tend to overreact to new information. This would induce a mean-reverting behavior in the forecasts. If forecasters make an upward revision in one period, the next period might see a downward revision, moving back toward the mean or "true" value. This behavior suggests that forecasts are not smoothly adjusting to the correct values but rather oscillating. Results are not a specific outcome of the panel model; even in a model without time dummies, the same degree of stickiness is found.[6] Jalles, Karibzhanov, and Loungani (2015) examine rigidities in mean fiscal forecast (revisions) on the CE data for the first half of our sample and in all cases find a mean strong positive correlation among revisions.

3.3 | Is Stickiness Influenced by Information?

The drivers of stickiness of forecasts could be several. As theory postulates, it might reflect genuine rigidities in information processing or efforts to understand new information. In the latter case, lack of efficiency in fiscal forecasts could be explained by economic and political conditions and not only by autocorrelation in the forecast revisions.

The kind of economic or political information that expert forecasters digest is varied. On the one hand, changes in GDP growth, inflation rates, or policy decisions directly affect the fiscal outlook. For example, during an economic downturn, governments run up deficits due to lower tax revenues while simultaneously facing higher spending on social welfare programs. Higher inflation or rising interest rates can lead to increased debt servicing costs. On the other hand, political conditions also shape expert forecasters expectations. Governments often adjust their fiscal policies in response to political pressures or upcoming elections. Beetsma et al. (2013) study budget forecast errors from national stability and convergence programs and find that political factors, specifically upcoming elections, are import factors that explain optimism in expectations. Pina and Venes (2011) also highlight the importance of upcoming elections in optimistic fiscal forecasts.

Some papers analyze the disagreement between market experts, such as Dovern et al. (2015), which document multivariate forecast disagreement about GDP growth among

TABLE 3 | Standard test of forecast stickiness.

	Current year				Year ahead			
	Italy	France	Germany	United States	Italy	France	Germany	United States
(a) In the mean								
λ	−0.22***	−0.14***	−0.17***	−0.16***	−0.30***	−0.13**	−0.14***	−0.18***
	(0.06)	(0.05)	(0.03)	(0.04)	(0.06)	(0.06)	(0.04)	(0.05)
Obs.	311	522	857	522	310	361	819	461
R^2	0.04	0.02	0.03	0.02	0.1	0.01	0.02	0.02
(b) In panel model								
λ	−0.18*	−0.15*	−0.18**	−0.18	−0.29***	−0.14	−0.16	−0.21**
	(0.09)	(0.08)	(0.07)	(0.05)	(0.05)	(0.13)	(0.12)	(0.16)
Obs.	311	522	857	522	310	361	819	461
N of experts	17	24	27	26	21	23	38	30
Within R^2	0.09	0.02	0.04	0.02	0.12	0.04	0.04	0.05

Note: (a) OLS estimation. (b) Fixed-effect panel model; fixed-effect panel including time dummies. Standard robust errors in parentheses.
Source: Consensus Economics forecasts and authors' estimations.
***$p < 0.01$, **$p < 0.05$, and *$p < 0.1$.

expert forecasters of the euro area economy and discuss implications for models of heterogeneous expectation formation. Poplawski-Ribeiro and Rülke (2011) also analyze the dispersion of financial market forecasts on government budget deficits in France, Germany, Italy, and the United Kingdom and how the Stability and Growth Pact (SGP) fiscal rule changed those. They find that accuracy of financial expert deficit forecasts significantly increased in France with the introduction of the SGP. Yet the heightened monitoring of fiscal figures on account of the SGP rules were not statistically significant in explaining accuracy of fiscal forecasts from market experts in other countries analyzed.

We suggest adding to model (3) additional control variables for all countries that contain news on economic and political developments. We add three political variables—the economic policy uncertainty index by Baker, Bloom, and Davis (2016), a geopolitical risk index by Caldara and Iacoviello (2022), and a dummy series for elections[7]—and two macroeconomic variables, the output gap and realized interest rate of governments bonds.[8] We again look at the impact on the mean forecast (per country, for the current year and the year ahead) and at the panel of expert forecasters (per country and per group of experts). Panel (a) of Table 4 reports an OLS regression, while panel (b) shows a fixed-effect panel model including time dummies.

If we first turn to panel (a), the stickiness coefficient remains negative and statistically significant for all countries, and there is also no appreciable difference between current-year and year-ahead forecasts again. Results are not greatly affected by the control for political and macroeconomic variables, yet their impact on the revision is significant (and raises explanatory power of the forecast revisions significantly). An economic boom (a higher output gap), elections, and global political risk tend to let forecasters update more strongly their forecast, which should not come as a surprise for budget forecasts.

Panel (b) shows a slightly different picture. The adjustment in forecasts is still negative, yet the impact of economic or political variables is much more limited. The impact of the economic climate, particularly the output gap, is incorporated by forecasters made year ahead. Global political risk has positive impact on revisions in all countries, except in France. This result suggests that information rigidities for budget forecasts are mostly due to inherent rigidities in the way expert forecasters process information and implies that different forecasters do not incorporate all the news they could in their set of information.

It is possible that banks, financial services, consultants, or research departments have different incentives to digest economic or political information more or less rapidly. Some are focused on economic monitoring, and producing forecasts is not just a by-product of their main business. We saw in Table 2 that bias differs across expert forecasters, and so may information rigidities. We therefore test model (3)—adding the control variables—with a panel fixed-effect model on each group of forecasters to examine their exposure to political and economic information.

Table 5, in panels (a) and (b), shows the results for an OLS on the mean budget balance forecast for the current year and for the year ahead, respectively. Panel (a) shows that overall stickiness is smallest for research departments. This is to be expected given that they are usually focused (or obliged) to analyze the budget. There are few significant differences across the other groups. We also observe that additional economic or political information does not substantially modify the adjustment coefficient, nor are they often significant. So the results suggest that expert forecasters are behaving rather similarly. As per the previous set of results in panel (b) of Table 4, panel (b) of Table 5 shows that accounting with a panel model for different types of expert forecasters does not substantially modify the outcomes. While the parameter λ is not always significant, it is in the same range for all forecasters, with the exception of research departments, and economic or political variables matter little. Panels (c) and (d) in Table 5 analyze the presence of stickiness in panel datasets for current-year and year-ahead forecasts, with a fixed-effect model, including time dummies, and broadly confirm the previous findings.

4 | Rationality of Forecasters: A Time-Varying Test

4.1 | Time Variation in Rationality Applying the FR Test

Economic forecasts are inherently dynamic. Rational expectations mean that agents update their expectations based on all available information and take optimal decisions without bias and systematic errors. As we just showed, expert forecasts do not produce forecasts in a rational way for budget balance forecast in our sample as relevant macroeconomic or political factors are ignored. We would therefore endorse macroeconomic theories that argue agents may receive information only with a delay, so that forecasts adapt only slowly to incoming information. This sticky information makes agents only slowly adapt their forecasts.

Fiscal policy forecasts are particularly interesting in this regard. The lack of success in producing forecasts for budget variables is not only the result of an optimistic bias from public forecasts. Structural changes, both in the budget and the economy, can come from various sources and complicate budget forecasts (Leal et al. 2008).

We now go one step further and innovate on this field by adapting a test by Rossi and Sekhposyan's (2016) for time variation in forecast rationality. Their FR test allows us to detect periods where deviations from rationality breaks down, even if the overall sample average suggests otherwise. By analyzing the time variation in forecasting performance, we can detect and test overestimations or underestimations during specific subperiods or specific adaptations in the forecaster's behavior.

The FR test evaluates rationality over time using rolling windows estimates of the forecast values (current year and year ahead) and comparing it with the real value of budget balance. As in similar parametric tests for structural instability, the test statistic is based on a Wald test, but must be adjusted for the fact that we test forecasts. Under the null of rationality (i.e., that forecast errors are unbiased and serially uncorrelated), the test statistic follows a χ^2 distribution (with degrees of freedom equal to the number of restrictions tested). The null hypothesis

TABLE 4 | Augmented test of forecast stickiness.

	Current year				Year ahead			
	Italy	**France**	**Germany**	**United States**	**Italy**	**France**	**Germany**	**United States**
(a) In the mean								
λ	−0.27***	−0.24***	−0.28***	−0.19***	−0.35***	−0.20***	−0.26***	−0.34***
	(0.05)	(0.04)	(0.03)	(0.05)	(0.06)	(0.06)	(0.04)	(0.05)
Interest rate	−0.05	0.02	0.09***	−0.03	0.01	0.06*	0.03*	0.13***
	(0.09)	(0.06)	(0.02)	(0.09)	(0.05)	(0.03)	(0.02)	(0.05)
Output gap	0.42***	0.36***	0.42***	0.12**	0.29***	0.17***	0.26***	0.07**
	(0.07)	(0.06)	(0.03)	(0.05)	(0.04)	(0.04)	(0.02)	(0.03)
Policy uncertainty	−0.00	0.00**	−0.00	−0.01***	−0.00	0.00	−0.00***	−0.00***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Global political risk	2.78***	0.25	0.57***	0.44***	1.92***	0.10	0.51***	0.11**
	(1.05)	(0.20)	(0.21)	(0.12)	(0.63)	(0.16)	(0.17)	(0.05)
Elections	0.67**	0.30*	0.33***	−0.88***	−0.17	−0.44***	0.15*	−0.12
	(0.30)	(0.18)	(0.10)	(0.28)	(0.21)	(0.13)	(0.08)	(0.15)
Obs.	309	488	850	544	310	361	814	456
R^2	0.22	0.14	0.20	0.12	0.25	0.11	0.17	0.17
(b) In panel model								
λ	−0.26***	−0.24***	−0.29***	−0.22**	−0.34***	−0.23	−0.26*	−0.36**
	(0.04)	(0.08)	(0.10)	(0.09)	(0.08)	(0.16)	(0.14)	(0.14)
Interest rate	−0.06	0.08	0.10	0.05	0.01	0.04	0.01	0.16***
	(0.14)	(0.10)	(0.07)	(0.16)	(0.09)	(0.07)	(0.05)	(0.06)
Output gap	0.45**	0.41*	0.43**	0.14	0.31**	0.21**	0.28***	0.09
	(0.19)	(0.22)	(0.20)	(0.14)	(0.13)	(0.10)	(0.10)	(0.07)
Policy uncertainty	−0.00	0.00*	−0.00	−0.01*	−0.00	0.00	−0.00***	−0.00**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Global political risk	1.87	0.19	0.55	0.49	1.46**	0.05	0.51	0.10
	(1.74)	(0.24)	(0.33)	(0.34)	(0.57)	(0.23)	(0.33)	(0.10)
Elections	0.78*	0.29	0.34	−0.86	−0.18	−0.44	0.20	−0.13
	(0.37)	(0.29)	(0.23)	(0.61)	(0.25)	(0.29)	(0.20)	(0.28)
Obs.	309	488	850	544	310	361	814	456
N of experts	17	24	27	26	21	23	38	29
R^2	0.302	0.186	0.215	0.149	0.319	0.138	0.187	0.198

Note: (a) OLS estimation. (b) Fixed-effect panel model; fixed-effect panel including time dummies. Standard robust errors in parentheses.
Source: Consensus Economics forecasts and authors' estimations.
***$p < 0.01$, **$p < 0.05$, and *$p < 0.1$.

of stability is discarded if the supremum value of the Wald test statistic series $\theta_{i,t}$ exceeds the critical threshold. In the presence of parameter estimation error, the variance of the test statistic needs to be corrected using Newey–West estimators to account for heteroskedasticity and autocorrelation. The variance correction is applied based on the length of the rolling window and the number of lags (Rossi and Sekhposyan 2016).[9]

To examine time-varying forecast rationality, we run FR test with a window of 24 for both current-year and year-ahead

TABLE 5 | Augment test of stickiness per group of expert forecasters.

	Italy			France				Germany				United States			
	Banks	Consultants	Financial services	Banks	Consultants	Financial services	Research departments	Banks	Consultants	Financial services	Research departments	Banks	Consultants	Financial services	Research departments
(a) In the mean—Current year															
λ	−0.31***	−0.26**	−0.28***	−0.25***	−0.05	−0.20	−0.17	−0.18	−0.22***	−0.15	−0.30***	−0.35***	−0.15	−0.39***	−0.31***
	(0.08)	(0.10)	(0.10)	(0.07)	(0.09)	(0.15)	(0.17)	(0.13)	(0.05)	(0.21)	(0.08)	(0.08)	(0.13)	(0.12)	(0.10)
Interest rate	−0.30**	−0.01	0.09	−0.11	0.00	0.06	−0.07	−0.05	0.04**	−0.22	0.03	0.00	0.16*	0.23***	0.07
	(0.15)	(0.10)	(0.06)	(0.10)	(0.05)	(0.09)	(0.06)	(0.36)	(0.02)	(0.21)	(0.04)	(0.22)	(0.09)	(0.08)	(0.11)
Output gap	0.61***	0.40***	0.12**	0.41***	0.19***	0.19	−0.05	1.00***	0.24***	0.25	0.30***	−0.02	−0.07	0.07	0.25***
	(0.11)	(0.09)	(0.05)	(0.10)	(0.05)	(0.12)	(0.07)	(0.24)	(0.03)	(0.17)	(0.05)	(0.09)	(0.05)	(0.08)	(0.08)
Policy uncertainty	0.00	−0.00	−0.00	0.00	0.00	0.00	−0.00	0.00	−0.00***	−0.00	−0.00***	−0.01*	−0.00	−0.00	−0.00
	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Global political risk	3.10*	2.29*	0.85	0.25	−0.08	0.78*	−0.15	0.49	0.55***	−0.72	0.76**	0.46**	0.02	0.03	0.20
	(1.61)	(1.22)	(0.82)	(0.32)	(0.27)	(0.40)	(0.20)	(0.89)	(0.19)	(1.46)	(0.37)	(0.23)	(0.09)	(0.12)	(0.13)
Elections	0.90*	−0.40	−0.05	0.28	−0.26	−0.55	−0.83***	−0.37	0.18**	−0.55	0.25	−0.98*	0.10	0.31	−0.13
	(0.46)	(0.52)	(0.28)	(0.29)	(0.18)	(0.39)	(0.27)	(0.76)	(0.09)	(1.14)	(0.18)	(0.52)	(0.31)	(0.28)	(0.35)
Obs.	148	118	43	182	275	15	16	63	555	30	202	138	187	91	128
R^2	0.30	0.32	0.15	0.14	0.08	0.21	0.43	0.31	0.17	0.21	0.22	0.19	0.10	0.21	0.19
(b) In the mean—Year ahead															
λ	−0.48***	−0.26**	−0.28***	−0.46***	−0.05	−0.20	−0.17	−0.47***	−0.22***	−0.15	−0.30***	−0.50***	−0.15	−0.39***	−0.31***
	(0.09)	(0.10)	(0.10)	(0.11)	(0.09)	(0.15)	(0.17)	(0.16)	(0.05)	(0.21)	(0.08)	(0.09)	(0.13)	(0.12)	(0.10)
Interest rate	−0.20*	−0.01	0.09	0.16**	0.00	0.06	−0.07	0.18	0.04**	−0.22	0.03	0.10	0.16*	0.23***	0.07
	(0.11)	(0.10)	(0.06)	(0.07)	(0.05)	(0.09)	(0.06)	(0.83)	(0.02)	(0.21)	(0.04)	(0.09)	(0.09)	(0.08)	(0.11)
Output gap	0.48***	0.40***	0.12**	0.35***	0.19***	0.19	−0.05	0.62**	0.24***	0.25	0.30***	0.07	−0.07	0.07	0.25***
	(0.09)	(0.09)	(0.05)	(0.09)	(0.05)	(0.12)	(0.07)	(0.29)	(0.03)	(0.17)	(0.05)	(0.05)	(0.05)	(0.08)	(0.08)
Policy uncertainty	−0.00	−0.00	−0.00	0.00**	0.00	0.00	−0.00	0.00	−0.00***	−0.00	−0.00***	−0.01***	−0.00	−0.00	−0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Global political risk	2.70**	2.29*	0.85	0.25	−0.08	0.78*	−0.15	−0.90	0.55***	−0.72	0.76**	0.14	0.02	0.03	0.20
	(1.29)	(1.22)	(0.82)	(0.44)	(0.27)	(0.40)	(0.20)	(1.92)	(0.19)	(1.46)	(0.37)	(0.09)	(0.09)	(0.12)	(0.13)

(Continues)

TABLE 5 | (Continued)

	Italy			France				Germany				United States			
	Banks	Consultants	Financial services	Banks	Consultants	Financial services	Research departments	Banks	Consultants	Financial services	Research departments	Banks	Consultants	Financial services	Research departments
Elections	−0.28	−0.40	−0.05	−0.76**	−0.26	−0.55	−0.83***	−0.74	0.18**	−0.55	0.25	−0.40	0.10	0.31	−0.13
	(0.39)	(0.52)	(0.28)	(0.31)	(0.18)	(0.39)	(0.27)	(1.04)	(0.09)	(1.14)	(0.18)	(0.26)	(0.31)	(0.28)	(0.35)
Obs.	105	90	115	88	181	43	49	31	569	30	184	149	88	94	125
R^2	0.36	0.32	0.15	0.29	0.08	0.21	0.43	0.35	0.17	0.21	0.22	0.32	0.10	0.21	0.19
(c) In panel model—Current year															
λ	−0.27***	−0.16**	−0.55	−0.24***	−0.27**	−0.08	0.16	−0.10	−0.34**	−0.12	−0.20	−0.37**	−0.17	−0.51	−0.03
	(0.05)	(0.06)	(0.09)	(0.06)	(0.09)	(0.09)	(0.14)	(0.08)	(0.11)	(0.13)	(0.11)	(0.11)	(0.12)	(0.26)	(0.11)
Interest rate	−0.28	0.03	0.26	−0.10	0.13	1.34	1.07	−0.11	0.10	−0.11	0.10	0.20	0.17	−0.04	−0.07
	(0.16)	(0.18)	(0.26)	(0.15)	(0.10)	(0.50)	(0.12)	(0.39)	(0.08)	(0.10)	(0.05)	(0.29)	(0.36)	(0.23)	(0.20)
Output gap	0.61**	0.33**	0.16	0.48*	0.43*	0.24	0.31	0.90*	0.44*	0.36	0.31**	−0.03	0.18	0.14	0.14
	(0.25)	(0.13)	(0.12)	(0.22)	(0.24)	(0.18)	(0.12)	(0.34)	(0.23)	(0.14)	(0.12)	(0.15)	(0.17)	(0.25)	(0.22)
Policy uncertainty	0.00	−0.00	−0.02	0.00	0.00	0.01	−0.00	0.00	−0.00	−0.00	0.00	−0.01	−0.01	−0.01*	−0.00
	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)
Global political risk	1.78	1.95	3.13	0.15	0.25	0.84	−0.60	−0.15	0.45	0.74	0.83**	0.56	0.67	0.02	0.19
	(1.97)	(1.72)	(1.27)	(0.26)	(0.29)	(0.42)	(0.31)	(0.73)	(0.40)	(0.82)	(0.31)	(0.35)	(0.41)	(0.29)	(0.27)
Elections	0.89	0.74**	0.97	0.19	0.25	−1.51	−0.33	−0.08	0.42	−0.16	0.13	−0.76	−1.60*	−0.17	0.10
	(0.49)	(0.30)	(0.57)	(0.27)	(0.34)	(0.86)	(0.35)	(0.58)	(0.31)	(0.47)	(0.13)	(0.73)	(0.86)	(0.49)	(0.28)
Obs.	148	118	43	182	275	15	16	63	555	30	202	138	187	91	128
N of experts	8	7	2	8	13	1	1	5	14	1	7	7	10	4	5
Within R^2	0.360	0.308	0.455	0.196	0.199	0.557	0.927	0.424	0.225	0.448	0.225	0.219	0.248	0.264	0.0522
(d) In panel model—Year ahead															
λ	−0.51***	−0.28***	−0.18	−0.50**	−0.05	−0.20	−0.19	−0.52***	−0.22	−0.09	−0.31	−0.53**	−0.14	−0.52	−0.30*
	(0.12)	(0.08)	(0.09)	(0.20)	(0.11)	(0.12)	(0.15)	(0.06)	(0.16)	(0.15)	(0.20)	(0.16)	(0.09)	(0.28)	(0.13)
Interest rate	−0.20	0.05	0.09	−0.08	−0.01	0.04	−0.05	0.39	0.02	−0.27	−0.00	0.23**	0.17**	0.20**	0.12
	(0.11)	(0.13)	(0.09)	(0.10)	(0.10)	(0.07)	(0.08)	(0.41)	(0.05)	(0.18)	(0.05)	(0.08)	(0.06)	(0.05)	(0.10)
Output gap	0.57*	0.42***	0.13	0.46**	0.19*	0.17	−0.03	0.71**	0.26**	0.24	0.30**	0.07	−0.05	0.14	0.22
	(0.25)	(0.11)	(0.06)	(0.17)	(0.09)	(0.08)	(0.05)	(0.18)	(0.10)	(0.11)	(0.11)	(0.08)	(0.04)	(0.08)	(0.16)

(Continues)

TABLE 5 | (Continued)

	Italy			France				Germany				United States			
	Banks	Consultants	Financial services	Banks	Consultants	Financial services	Research departments	Banks	Consultants	Financial services	Research departments	Banks	Consultants	Financial services	Research departments
Policy uncertainty	−0.00	−0.00	−0.00	0.00*	0.00	−0.00	−0.00	0.00	−0.00***	−0.00	−0.00***	−0.01**	−0.00*	−0.00	−0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Global political risk	2.60*	2.54**	−0.28	−0.12	0.04	0.89	−0.07	−0.37	0.55*	−0.64	0.75	0.17	0.03	−0.07	0.23
	(1.20)	(0.99)	(0.46)	(0.36)	(0.29)	(0.23)	(0.12)	(1.22)	(0.29)	(0.94)	(0.42)	(0.10)	(0.08)	(0.10)	(0.15)
Elections	−0.52	−0.61	0.11	−0.62**	−0.27	−0.58	−0.87	−1.42	0.22	−0.74	0.27	−0.34	0.10	0.26	−0.12
	(0.46)	(0.45)	(0.15)	(0.22)	(0.27)	(0.47)	(0.29)	(0.90)	(0.19)	(0.41)	(0.25)	(0.32)	(0.32)	(0.25)	(0.29)
Obs.	105	90	115	88	181	43	49	31	569	30	184	149	88	94	125
N of experts	8	8	5	8	11	2	2	5	14	1	7	8	9	7	6
Within R^2	0.433	0.375	0.324	0.408	0.106	0.296	0.482	0.477	0.192	0.238	0.220	0.364	0.148	0.282	0.218

Note: (a and b) OLS estimation. (c and d) Fixed-effects panel model and OLS where N of experts is one; fixed-effect panel including time dummies. Standard robust errors in parentheses.
Source: Consensus Economics forecasts and authors' estimations.
$^{***}p<0.01$, $^{**}p<0.05$, and $^{*}p<0.1$.

forecasts. Figure 2 shows the FR test values and the critical value: If the FR test value (red line) exceeds the critical value (blue line), the forecast is deviating from rationality. Panel (a) shows test values for the mean current-year forecast and panel (b) the 1-year-ahead forecast. The interesting finding that emerges from these graphs is that forecasters do indeed change their behavior significantly over time.

Most of these changes for the current-year forecast seem to be associated with either the global financial crisis or the pandemic, both periods in which the budget balance deteriorated quickly. Such deviations in the global financial crisis were incorporated by expert forecasters in France of Germany, though. Changes in forecasting performance can be gradual—as the slow decline in performance in Germany shows—or rather quick—as the spiky behavior of the FR test in the United States demonstrates.[10] What the FR test suggests is that large shifts in the economic and political situation make expert forecasters stray away from rationality, yet they do adjust to this new information. Such shifts need to be big before forecasters incorporate them, which seems to endorse once more the "sticky information" view in which fixed acquisition costs make forecasters update their information sets only intermittently.

Panel (b) of Figure 2 also sheds an interesting light on how expert forecasters see longer term budgetary developments. The results so far seemed to suggest that forecasters did not adjust the year-ahead forecast in a substantially different way than current-year forecasts. But this hides the fact that expert forecasters revise more quickly the year-ahead forecast. This can be seen from the same periods in which the global financial crisis or the pandemic made expert forecasters deviate but with a much faster adjustment. In addition, forecasters appear to experience more easily deviations but then return more quickly to efficient forecasts. The sometimes-erratic jumps in the FR test in France over different periods illustrate this.[11] This result seems to suggest that expert forecasters incorporate the news they receive for current-year forecasters and in that case also adjust their longer term forecast simultaneously. This explains both the smaller deviations from rationality and the same adjustment behavior we found in Table 4.

4.2 | Explaining Deviations From Rationality

Periods of deviations from rationality can be assessed also in a more formal way. We can consider the FR test statistics as a measure of the deviations from rationality over time. Periods of behavior are then classified as irrational when the test statistic exceeds the critical value and as a rational if it stays under it. Hence, we regress this binary measure against the set of macroeconomic and political variables we used in Section 3, testing Equation (5) with a logit model, where 1 indicates if it exceeds the threshold and 0 if not.

$$\hat{\theta}_t = \alpha + \beta Z_t + \varepsilon_t. \quad (5)$$

Panel (a) of Table 6 indicates a few interesting patterns in the behavior of expert forecasters. Firstly, higher interest rates make it less likely that forecasters deviate, albeit in Italy, the effect is

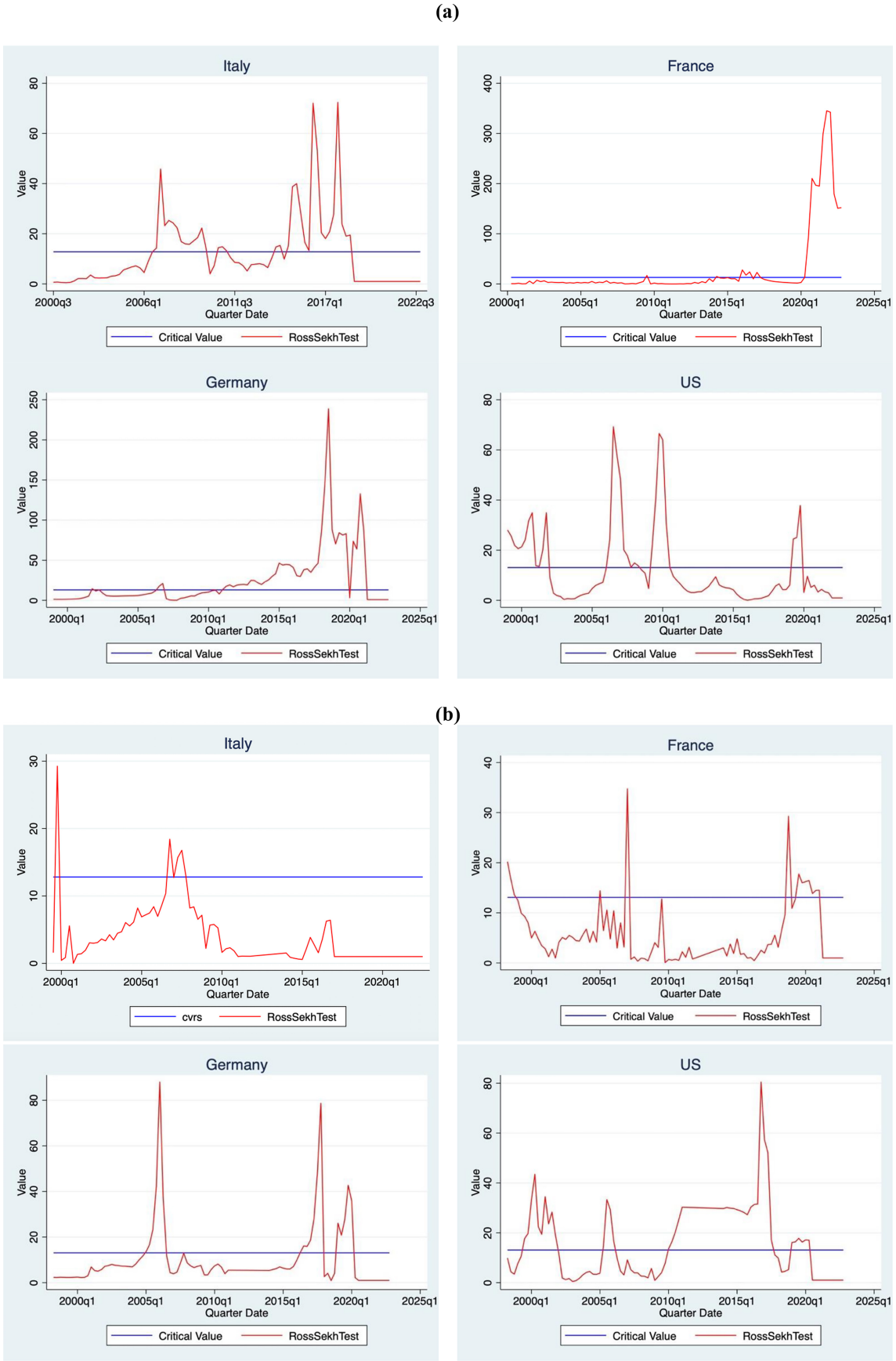

FIGURE 2 | Fluctuation rationality test for mean budget balance forecast. (a) Current year. (b) Year ahead.

TABLE 6 | Explaining the deviation of rationality by country.

	(a) Current year				(b) Year ahead			
	Italy	**France**	**Germany**	**United States**	**Italy**	**France**	**Germany**	**United States**
Interest rate	2.05	−0.61*	−3.00***	1.57***	−1.69*	−1.69*	−0.49**	−0.73***
	(2.07)	(0.31)	(0.89)	(0.39)	(0.96)	(0.96)	(0.25)	(0.27)
Output gap	1.42	−1.11**	1.49**	−0.04	0.12	0.12	0.45*	0.01
	(1.06)	(0.43)	(0.59)	(0.12)	(0.61)	(0.61)	(0.26)	(0.12)
Policy uncertainty	−0.03	0.00	−0.01*	0.01*	−0.04**	−0.04**	−0.01	−0.00
	(0.04)	(0.00)	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.00)
Global political risk	1.95	0.49	5.69*	−0.54**	−0.74	−0.74	0.05	0.20
	(8.45)	(0.94)	(2.93)	(0.25)	(3.11)	(3.11)	(2.07)	(0.20)
Elections	2.19	0.59	−0.09	−1.07	—	—	0.95	0.38
	(2.15)	(0.85)	(1.24)	(0.81)	—	—	(0.82)	(0.63)
Constant	−9.46	−3.09*	7.72***	−6.15***	8.17	8.17	0.83	2.20
	(11.23)	(1.73)	(2.56)	(1.95)	(5.70)	(5.70)	(1.77)	(1.47)
Obs.	71	91	89	92	72	78	84	85
McFadden pseudo-R^2	0.26	0.41	0.14	0.27	0.23	0.02	0.17	0.11

Note: Logit estimation. Standard errors in parentheses.
Source: Consensus Economics forecasts and authors' estimations.
***$p < 0.01$, **$p < 0.05$, and *$p < 0.1$.

insignificant. The inverse occurs in the US current year, though. Stronger economic growth also raises probability of deviations, but just in Germany. This growth effect also carries over to the next budget year.

Secondly, heightened uncertainty about economic policy (France current year and Italy and France year ahead) reduces the probability of making large mistakes, underscoring our previous finding that forecasters become more cautious in the revisions of their forecast when faced with uncertainty on economic policies. This result is in line with most of the literature on the effects of uncertainty (Bekaert, Hoerova, and Duca 2013; Kang, Lee, and Ratti 2014; Baker, Bloom, and Davis 2016). Uncertainty is also more important than just election news. Elections actually have no impact on the rationality of forecasters. Geopolitical risk only impact significantly German and US current-year forecasts. Nevertheless, both results are completely different in magnitude and direction. Higher geopolitical risk increases the probability of deviations in Germany, while in the United States, it slightly decrease the chance of deviations. This is a surprising finding given that global political tensions are more likely to lead to conflict and military expenditure in the United States. These effects do not carry over to the next budget year.

Finally, the explanatory power of the logit model seems to indicate that expert forecasters update their information, mostly overreacting to big shifts, as we argued before, and that such deviations are coming from relevant economic or political news, to which they more slowly (in the current year) or more quickly (for the coming year) adjust.

5 | Conclusion

Macroeconomic theories attribute expectations formation to sticky or noisy information. Information processing under both types is characterized by rigidities. The degree of stickiness of forecasts can be examined with standard rationality tests. Recent advances in these tests allow looking into time variation in forecasting performance. In particular, the FR test by Rossi and Sekhposyan (2016) allows detecting departures from forecaster rationality. We apply the exercise to fiscal forecasts from CE, on a large panel of individual expert forecasters in four major OECD countries between 1993 to 2023.

The first contribution of this paper is to demonstrate that forecast rationality breaks down in specific episodes. We build on previous papers that examine forecast bias and rationality over full samples, but such averaging ignores the large swings that characterize fiscal policy changes over time, and that can be easily missed even by expert forecasters. Forecasters subsequently overreact to big changes.

The second contribution of this paper is to relate individual forecaster behavior to economic or political factors. We find evidence that is in line with the noisy information view: Specific

economic and political news is systematically incorporated in forecast revisions. It is hard though for forecasters to understand future policy tracks after sudden big shifts, like the global financial crisis or the pandemic.[12]

A lesson for policymakers is that the dispersion of experts' expectations about the future fiscal and economic outlook is directly related to anchoring market expectations on fiscal policies. In this context, better public financial management systems that improve fiscal reporting, including through the use of fiscal rules or national fiscal councils, could improve budget transparency (Beetsma, Debrun, and Sloof 2022) and the implementation of fiscal policy (Lledó and Poplawski-Ribeiro 2013), affecting how frequently expert forecasts update their information sets and forecasts of the budget balance. Credibly anchoring market expectations can further significantly improve the effectiveness of macroeconomic policies by alleviating uncertainty and, therefore, risk premia (Cimadomo, Claeys, and Poplawski-Ribeiro 2016).

Next to the theoretical implications, the methodology of this paper also carries practical policy relevance. Fiscal forecasting is considered a complicated exercise (Leal et al. 2008). Detecting time variation in forecast dispersion can be useful for upgrading budget forecasts. Further work for researchers might include the examination of additional factors that determine forecasters' revisions, in particular herding behavior. An extension of the existing panel tests would allow incorporating more complex behavior.

Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Endnotes

[1] For a few countries and time frames, additional fiscal variables include government debt, revenues, and expenditures, yet its coverage in the survey is patchy, even in the main advanced economies.

[2] All surveyed experts provide forecasts for their own country only. Some international financial institutions or research institutes are included in the sample in several countries, but it is the national representative of that institution who provides the domestic forecast. Further information on how the survey is conducted is available at www.consensuseconomics.com.

[3] Italy has the smallest sample of expert forecasters, and as a result, only banks, financial services, and consultants are included in the subgroups.

[4] All tests are applied to forecasts of the budget balance as percent of GDP. Tests on an alternative measure as the real local currency budget balance led to qualitatively similar results. Results are available upon request.

[5] Jalles, Karibzhanov, and Loungani (2015) test bias on the mean budget balance-to GDP ratio in advanced and emerging countries over the period 1993–2009. An and Jalles (2021) evaluate the performance of individual private and public forecasters in the United States. Carabotta and Claeys (2024) test absolute and relative forecasting performance of private and public expert forecasters for the Italian budget.

[6] Results are available upon request. The only difference is that significance is reduced.

[7] Presidential elections in the United States and France, federal Bundestag elections in Germany, and parliamentary general elections in Italy.

[8] The output gap and real interest rate are collected from World Bank database.

[9] The FR test has so far been applied only for very few variables. Rossi and Sekhposyan (2016) apply their test to inflation forecasts. Tsuchiya (2024) analyses government construction forecasts.

[10] Results are very similar for the different groups of forecasters. As the number of observations is much smaller, only the pandemic seems to lead to large shifts in rationality. Figures are available upon request.

[11] Very similar results hold for the different groups of forecasters. Figures are available upon request.

[12] In a similar manner, Kontogeorgos and Lambrias (2019) evaluate the accuracy of inflation forecasts in Europe and find how the persistent and significant bias changes over time in the EU sample. Before the global financial crisis, those authors find that inflation was persistently underpredicted, while in post-2013, the bias reverses into overprediction.

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Appendix A: Calculation of the Forecasted Budget Balance (as a Ratio of GDP)

The CE provides forecasts for the total deficit only in nominal values (local currency). Hence, we follow Heppke-Falk and Huefner (2004) and Poplawski-Ribeiro and Rülke (2011) to construct a forecast measure of deficit ratio to GDP (percentage of GDP). For that, we cannot simply scale the nominal value deficit forecast by the GDP forecast, because the CEF surveys for growth rates only, and not for the GDP in nominal value.

We construct a measure of the expected nominal year-ahead GDP forecast of forecaster i at month m and year t as follows. In the first step, we take a real-time measure of real GDP in levels for a particular year t. We use the real-time forecast of the same-year real GDP (in levels) coming from the most recent IMF World Economic Outlook (WEO) vintage available at any particular month m of year t. The IMF WEOs are published either in April or October; hence, from May to October, we use the April issue, and the October issue in the other months.

The second step is to compute the year-ahead GDP forecast in nominal value. We multiply the real-time (WEO) measure of the same-year real GDP (in levels), $E_{WEO,t}\left[y_t\right]$, by the year-ahead market (Consensus) forecasts for GDP *growth*, $E_{i,t,m}\left[\Delta y_{t+1}\right]$, and inflation, $E_{i,t,m}\left[\pi_{t+1}\right]$, for each forecaster i at a particular month m of year t. The expected year-ahead nominal GDP value for each country is then

$$E_{i,t,m}\left[\Delta y_{t+1}\right] = E_{WEO,t}\left[y_t\right] \times \left(1 + E_{i,t,m}\left[\Delta y_{t+1}\right] + E_{i,t,m}\left[\pi_{t+1}\right]\right). \tag{A1}$$

The year-ahead expected budget balance for each country is then

$$E_{i,t,m}\left[b_{t+1}\right] = \frac{E_{i,t,m}\left[b^{nom}_{t+1}\right]}{E_{i,t,m}\left[y_{t+1}\right]}, \tag{A2}$$

where $E_{i,t,m}\left[b^{nom}_{t+1}\right]$ is the (CE) forecast of the nominal budget balance by forecaster i in month m of year t for 1-year-ahead $t+1$.

Appendix B: List of Expert Forecasters From CE, by Country

Italy	France	Germany	United States
ABI	AXA Investment Managers	Allianz	Action Economics
Allianz	Allianz	BHF Bank	Allianz
Bank of America Merrill	BIPE	Bank of America Merrill	American International Group
Capital Economics	BNP Paribas	BayernLB	BBVA
Centro Europa Ricerche	Bank of America Merrill	Berliner Sparkasse	BMO Capital Markets
Confindustria	Barclays	Capital Economics	Barclays
EIU	Capital Economics	Citigroup	CIBC Capital Markets
Fitch Ratings	CentrePrevlExpansion	Commerzbank	DuPont
IHS Economics	Citigroup	DIW Berlin	EY-Parthenon
ING	Coe Rexecode	DZ Bank	EIU
Intesa Sanpaolo	Crédit Agricole	DekaBank	Fannie Mae
LC Macro Advisors	EIU	Deutsche Bank	FedEx Corporation
Moody's Analytics	Euler Hermes	FERI	First Trust Advisors
Natixis	Fitch Ratings	Goldman Sachs	Ford Motor Company
Oxford Economics	IHS Economics	HSBC Trinkaus	Georgia State University
Prometeia	ING	HWWI	Goldman Sachs
Ref	Moody's Analytics	Helaba Frankfurt	ICIS
S&P Global Market Intelligence	Morgan Stanley	IFO Munich Institute	Macroeconomic Advisers
Société Générale	OFCE	IHS Economics	Moody's Analytics
UBS	Oddo BHF	IW Cologne Institute	Morgan Stanley
UniCredit	Oxford Economics	IWH Halle Institute	Nomura
	Rexecode	IfW Kiel Institute	Northern Trust
	UniCredit	MM Warburg	Oxford Economics
		Morgan Stanley	Robert Fry Economics

Italy	France	Germany	United States
		Oxford Economics	Roubini Global Econ
		RWI Essen	S&P Global Market Intelligence
		UniCredit	Standard & Poor's
			Swiss Re
			The Conference Board
			Wells Capital Management

Appendix C: List of Expert Forecasters From CE, by Subgroup

Banks	Consultants	Research departments	Financial services
BNP Paribas	BIPE	OFCE	Euler Hermes
Bank of America Merrill	Capital Economics	DIW Berlin	Allianz
Citigroup	Coe Rexecode	HWWI	Confindustria
Crédit Agricole	EIU	IFO Munich Institute	Intesa Sanpaolo
Exane	GAMA	IW Cologne Institute	Fannie Mae
Goldman Sachs	IHS Economics	IWH Halle Institute	First Trust Advisors
HSBC	Oxford Economics	IfW Kiel Institute	Swiss Re
La Banque Postale	PAIR Conseil	RWI Essen	Wells Capital Management
Morgan Stanley	Rexecode	DuPont	
Natixis	FERI	Eaton Corporation	
Oddo BHF	Kiel Economics	Ford Motor Company	
Société Générale	Capital Economics	General Motors	
UniCredit	Centro Europa Ricerche	Georgia State University	
BHF Bank	IHS Economics		
BayernLB	LC Macro Advisors		
Berliner Sparkasse	Oxford Economics		
Commerzbank	Prometeia		
DZ Bank	Ref		
DekaBank	Action Economics		
Deutsche Bank	National Association of Home Builders		
HSBC Trinkaus	RDQ Economics		
Helaba Frankfurt	Robert Fry Economics		
MM Warburg			
ABI			
Bank of America Merrill			
Goldman Sachs			
ING			
Barclays			
Credit Suisse			
UBS			
BMO Capital Markets			
JPMorgan			
Wells Fargo			