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How do Experts Forecast Sovereign Spreads?

by Jacopo Cimadomo, Peter Claeys, and Marcos Poplawski-Ribeiro

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How do Experts Forecast Sovereign Spreads?*

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Abstract

This paper assesses how forecasting experts form their expectations about future government bond spreads. Using monthly survey forecasts for France, Italy and the United Kingdom between January 1993 and October 2014, we test whether respondents consider the expected evolution of the fiscal balance—and other economic fundamentals—to be significant drivers of the expected bond yield differential over a benchmark German 10-year bond. Our main result is that a projected improvement of the fiscal outlook significantly reduces expected sovereign spreads. This suggests that credible fiscal plans affect market experts' expectations and reduce the pressure on sovereign bond markets. In addition, we show that expected fundamentals generally play a more important role in explaining forecasted spreads compared to realized spreads.

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I. INTRODUCTION

The global financial crisis fallout significantly unsettled European sovereign bond markets. Bond spreads jumped during the crisis mainly on the back of a deteriorating outlook for public finances, worsening macro-economic conditions, and rising international risk aversion. Views diverge over the importance of these drivers of sovereign bond market turbulence. One interpretation is that markets paid little attention to fiscal and economic fundamentals before the crisis in the European Monetary Union (EMU), and thus spreads were excessively low. With the deterioration of the fiscal and economic outlook during the crisis, bond investors rediscovered the role of those fundamentals (Ghosh et al., 2013). Another interpretation is that risk premia are mostly driven by market sentiment and as such independent of the underlying expected fundamentals (Blommestein et al., 2012, De Grauwe and Ji, 2013). Thus, uncertainty about policy outcomes could make investors sell sovereign bonds out of fear and lead to a mispricing in bond markets (see also Akerlof and Shiller, 2009). Each of these views carries a different policy prescription. Under the former view, fiscal consolidation and improved economic conditions are necessary steps in curbing bond spreads. Under the latter view, bond market reactions may be difficult to predict as they are fueled by sentiment and instincts, therefore pursuing virtuous macroeconomic policies may be insufficient to reduce spreads.

Some papers attribute a role to the sovereign's fiscal position in determining realized bond spreads, i.e., the actual spreads observed in bond markets (e.g., Codogno et al., 2003; Akitoby and Stratmann, 2008, Schuknecht et al., 2010; Aizenman et al., 2013). However, other studies fail to find fiscal variables among the main determinants of bond spreads for advanced economies. Conversely, they highlight that bond yield spreads are increasingly driven by international factors that reflect global investor risk aversion (Bellas et al., 2010; Favero et al., 2010; Manganelli and Wolswijk, 2009). As they look into the reaction of realized spreads to realized fundamentals, however, most of those studies do not treat expectations explicitly.

More recently, Laubach (2009) suggested directly relating realized sovereign spreads to proxies of expectations on fiscal and other macro developments. The main idea behind this approach is that market prices incorporate the expectations of the future path of fiscal and economic fundamentals, rather than their current or past values. In this context, future implicit or explicit liabilities, such as the size of bank rescue packages and the position of the domestic banking sector, are often found to explain developments in government bond spreads (Ejsing and Lemke, 2009; Attinasi et al., 2009; Gerlach et al., 2010). D'Agostino and Ehrmann (2014) use survey-based forecasts from the *Consensus Economics* (hereafter generally referred to as "*CE*") dataset to investigate the time-varying relationship between realized sovereign bond spreads of the G7 countries and expectations about fiscal and other macroeconomic fundamentals. Their results show that fundamentals and general risk aversion were downplayed in the years preceding the global financial crisis, but an over-pricing of the same factors occurred during the European sovereign debt crisis. Yet, this

strand of the literature does not investigate how experts' forecasts about future bond yield differentials react to changes in their perception of future macroeconomic and fiscal developments.

Indeed, which variables underline the individual experts' forecast of sovereign spreads is still unknown in the literature. In particular, it is not clear whether forecasting experts value predominantly expected fundamental or non-fundamental factors in their projections. In addition, the relative weight of each specific expected fundamental factor in predicting spreads is also not known. This paper addresses both unknowns. First, we test the importance of expected macroeconomic fundamentals as well as a global risk factor in the forecast of sovereign spreads. Second, we estimate the contribution of three key expected fundamentals—i.e., the overall fiscal balance, defined as general government primary balance plus interest payments (hereafter simply referred to as 'fiscal balance'), GDP growth, and CPI inflation—in shaping the forecasted spreads.

Addressing these two unknowns is important because they shed light on how expectations about future sovereign spreads are formed, which is directly related to the need to anchor market expectations on fiscal policy and sovereign risk premia. Indeed, according to a recent literature, credibly anchoring the market's fiscal expectations can significantly improve the effectiveness of macroeconomic policies (Leeper, 2009 and 2010) by alleviating the risk premium and ensuring fiscal solvency (Bi, 2012; and Bi et al., 2013).

Understanding how spread forecasts are shaped is further important because realized observations for financial variables—including bond spreads—do not necessarily reflect expectations about future fiscal and macroeconomic conditions in the same way as future (expected) financial variables. In fact, fundamentals are often found to play an important role in explaining the long-run predictability of financial variables and exchange rates, but generally have little power in accounting for current market developments.[3] In addition, a vast finance literature has shown that other factors—including high frequency news and "irregular" trading behaviors (e.g., bandwagon effect, excess speculation, and major trading manipulation)—are important in explaining the short-term dynamics of financial variables and exchange rates;[4] whereas their role is less clear in explaining the medium or long-term

[3] Focusing on foreign exchange markets, for example, Cheung, Chinn, and Marsh (2000) and Cheung and Chinn (2001) survey the U.K. and U.S.-based foreign exchange (FX) dealers and find that, at short horizons, exchange rate movements do not reflect changes in fundamentals. However, for medium-term horizons (up to six months), 60 percent of the U.S.-based FX dealers responded to those surveys that exchange rate movements move according to fundamentals. For horizons over 6 months that proportion rise to 88 percent.

[4] De Bondt and Thaler (1985) and Barberis et al. (1998), for example, show that agents tend to over- or under-react to unexpected news about firms' profitability, leading to realized stock prices which are significantly different from those initially forecasted. In turn, using laboratory experiments, Hommes et al. (2005), Bao et al. (2012), and Bao, Duffy, and Hommes (2013) find that realized prices may differ significantly from expected values, typically exhibiting oscillations around or slow convergence to them.

forecasts of the same variables (e.g., Odean, 1999; Shleifer, 2000; Hirshleifer, 2001; Claessens and Kose, 2013; and Hommes, 2014).

Overall, this literature suggests that fundamentals should affect the expectations and realizations of financial variables (including sovereign spreads) in substantially different ways. However, instead of directly inquiring about such differences via a survey to sovereign bond traders (Cheung and Chinn, 2001) or by designing a laboratory experiment (Hommes et al., 2005), we look into the forecasters' predictions themselves and investigate how these projections relate to forecasted and realized sovereign bond spreads.

This paper, therefore, uses a regression-based methodology to analyze the role of expected fundamentals in determining spread forecasts. This econometric approach appears to be the most appropriate when the underlying forecast model is not observed. Moreover, the other alternative of directly inquiring about such differences via a survey to sovereign bond traders would be rather difficult to implement and would not deliver the same number of observations, high frequency data and degrees of freedom that our approach does.

Our empirical analysis employs the *CE* survey-based monthly dataset of individual forecasters The *CE* survey primarily includes forecasting experts from financial institutions and (private and public) research centers. We focus on France, Italy, and the U.K., and use a period sample from January 1993 until October 2014, which includes a substantial part of the recent financial crisis. Using GMM methods to address possible reverse causality issues, we estimate whether market experts' projections for the fiscal balance, GDP growth and CPI inflation—as well as a global risk factor—play a significant role in explaining their forecast of the government bond spreads.

Our main finding is that the projections of fiscal and other macroeconomic fundamentals significantly explain the one-year-ahead expectations of the French, Italian and U.K. sovereign spreads over Germany. In particular, an improvement in the one-year-ahead projected fiscal outlook reduces expected spreads. This is especially the case for the Italian spread: a 1 percent rise in the expected surplus ratio to GDP reduces forecasted spreads by around 38 basis points; whereas the effect is smaller—but still significant—for the French and British spreads. The projected fiscal balance and real GDP growth have a substantially larger effect on the expectations of future government spreads compared to regressions based on realized spreads.

The results also show that, until the recent financial crisis, a weaker growth outlook was associated with a reduction in forecasted spreads. This might reflect a flattening of the yield curve in bad economic times due to the expectation of easier monetary policy. Nevertheless, this relationship is reversed for Italian spreads during the financial crisis. In this period, expectations of higher growth considerably reduced the expected Italian 10-year bond spread,

suggesting that markets perceive future growth as crucial to the future sustainability of public finance.

We further check whether the distance of an economy from its fiscal limit matters for the determination of the expected spreads in Italy and France, as opposed to the United Kingdom. The fiscal limit can be described as the point at which the government no longer has the ability and willingness to increase its borrowing capacity through changes in tax policy (Leeper, 2013 and 2015). Its importance also depends on whether a country controls its own monetary policy. For example, as part of the EMU, France and Italy delegate the control of their own monetary policy to the European Central Bank (ECB). Hence, for those two countries, the domestic nominal government debt becomes effectively equivalent to real debt and must be backed by real surpluses (Leeper, 2015). For this reason, as those countries' debt levels approach their fiscal limits, their sovereign yields and spreads should react more strongly. On the other hand, the U.K. controls its own monetary policy and issues nominal bonds, which are a claim to pounds in the future. Therefore, in the event of a very severe crisis that puts the sustainability of public finances at risk, it is more likely that the British authorities would tolerate a deviation from the Bank of England's inflation target rather than a default on government debt. For these reasons, the fiscal limit is expected to be less binding than in France and Italy.

We test this hypothesis based on the distance of an economy from its fiscal limit as estimated by Polito and Wickens (2015). Our results indeed corroborate the discussion above and suggest that for France and Italy — and in contrast to the U.K.—the sensitivity of the expected spread to the fiscal space becomes stronger when the fiscal limit is approached.

The rest of the paper is structured as follows. Section II describes the dataset, Section III presents the methodology and Section IV the results. Conclusions and policy implications follow in Section V.

II. DATA: EXPERT FORECASTS

We use *Consensus Economics* data to investigate the relationship between the projections of macroeconomic fundamentals and of sovereign bond spreads. *CE* conducts a survey—mainly based on OECD countries—among professional economists working for commercial or investment banks, government agencies, research centers and university departments. Most of the surveyed experts provide forecasts for their own country only. However, there are also a few experts working for international financial institutions or research institutes that provide forecasts for several countries simultaneously. The survey queries respondents every first week of each month about current and future developments for a number of macroeconomic and financial variables, including the yields on 10-year benchmark

government bonds. The forecasts are then published early in the second week of the same month.[5]

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.[6] CE data is public, which help 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 reflects the spectrum of expectations of market experts.

We focus on Italy, France and the U.K., with data covering the period from January 1993 to October 2014. Apart from Germany, these are the only European Union countries for which fiscal forecasts are reported in the CE survey for a long time span. Including the U.K. has two main advantages. First, it allows us to study a non-euro area country, observing how the results for this country may differ from countries belonging to the EMU.[7] Second, the CE survey includes many observations for the U.K., which allows us to significantly expand our dataset. The last CE survey in our sample (October 2014) comprises 52 forecasters in France, 42 in Italy, and 86 in the United Kingdom. However, we use a subset of these respondents. In fact, despite the gradual expansion of the dataset, fiscal forecasts have not always received the same attention from forecasters over time. Some forecasters stopped producing projections for the fiscal balance, while others that were initially included left the sample owing to closures, mergers or other reasons. Moreover, new forecasters joined the CE survey only at a later stage. Therefore, we apply a double criterion to select our sample. First, we do not consider those forecasters that have participated for fewer than 12 consecutive months in the CE survey. Second, among those forecasters, we select only those with no gaps between two consecutive forecasts that are larger than 36 months. This reduces the panel to 19 forecasters in France, 25 forecasters in Italy, and 43 in the U.K. (all forecasters are listed in

[5] Further information on how the survey is conducted is available at www.consensuseconomics.com.

[6] Batchelor (2001) shows that CE forecasts are less biased and more accurate in terms of mean absolute error and root mean square error than OECD and IMF forecasts.

[7] It is important to notice that even though France and Italy devolved their monetary policy to the ECB, the fragmentation of financial markets between these two countries and also the others in the EMU may have persisted during the EMU period, undermining the transmission of the common monetary policy (see Al-Eyd and Berkmen, 2013).

the Appendix).[8] Overall, our dataset is characterized by a large number of observations, i.e., around 1,500 for France, 1,200 for Italy and 2,500 for the United Kingdom. In the following, we describe the CE variables used in the paper.

A. Expected Bond Yield Spreads

In each month *m* of year *t*, the CE survey provides the forecast of the 10-year government bond yield for month *m+3* and *m+12*. We calculate the expected spread at the single forecaster level as follows. First, we collect the individual forecast (12-month-ahead) of the 10-year government bond yield for the respective country (France, Italy, or U.K.). Second, we construct the expected spread vis-à-vis Germany—i.e., the dependent variable in our regressions—based on the average of all fixed horizon 12-month-ahead forecasts for Germany included in the CE dataset. We use the average forecast for the German yield because most forecasters do not report both the forecast for the domestic bond yield and the German benchmark one.[9]

This bond spread includes an exchange rate premium for the U.K. over the full sample and, for France and Italy, in the pre-EMU period. To filter out this effect, we subtract the forward swap spread from the forecast spread. The forward swap spread is the difference in the 10-year fixed interest rate from forward swap contracts denominated in the two currencies. Given that swap contracts are free from default risk, the difference purely reflects exchange rate risk.

Figure 1 summarizes the information of all spread forecasts by plotting the inter-quartile range of the forecasters' distribution. It then reports the realized spread for the three countries. The figure highlights a rather large degree of disagreement among forecasters on the 12-month-ahead spread. The range between the upper and the lower quartile in forecasted spreads is generally no less than 50 basis points. The 1999-2007 period has been characterized as having a strong consensus among forecasters, and the forecast distribution tends to track quite closely the realized spread. However, for France and Italy, the range in forecasts increased to about 100 basis points during the recent crisis. For the U.K., despite the less pronounced increase in realized spreads after 2008, there is also a rise in the dispersion of forecasts. During the global financial crisis, realized spreads appear to be generally under-predicted, revealing that experts tended to be *ex-ante* overly optimistic about developments in sovereign debt markets.

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[8] We also apply stricter selection criteria and exclude those forecasters that did not participate in the CE for at least 24 or 48 months from the sample. The findings do not change substantially (results not shown, available from the authors).

[9] The use of the forecast yield produced by the German forecasters included in the CE dataset supposes that all (non-German) forecasters have the same projection for the German yield. We believe that this is a reasonable assumption, provided that non-German forecasters use a benchmark forecast for another country as a proxy for their own forecast on that country (on which they are likely to have limited information and forecast expertise).

B. Expected Macroeconomic Fundamentals

In addition to government bond yields, the CE survey provides projections for the fiscal balance, GDP growth and CPI inflation (among other macroeconomic variables) for the current year *t* and the year ahead *t+1*. For these variables, the monthly update implies a shrinking horizon of the forecast, e.g., as we move from January to December of each projection year *t*, the horizon until the target year *t+1* is progressively reduced. Hence, following Dovern et al. (2012), we compute the forecast at a constant horizon of 12 months. For the fiscal balance, GDP growth and CPI inflation and in each projection month *m* of year *t*, we therefore calculate the constant-horizon (12-month-ahead) forecast as a weighted average of the same-year and the year-ahead bond rate with arithmetic weights $\left(1-\frac{m}{12}\right)$ and $\frac{m}{12}$ respectively.

Regarding the fiscal balance, CE asks respondents for a forecast in nominal terms (i.e. amounts of millions).[10] In order to transform this forecast into one of the fiscal balance as a ratio to GDP, we divide the fixed-horizon one-year-ahead forecast of the nominal overall balance (surplus) in a certain month *m* by the GDP forecast for the same year. As 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).[11]

Figure 2 displays the inter-quartile range of the 12-month-ahead fiscal balance ratio forecasts. This range is generally small and contained in an interval of just half a percentage point around the median for all three countries under examination. The range increases to 1 percentage point when there are major turning points in the realized fiscal balance. This strong consensus among forecasters continues even during the global financial crisis. This agreement does not imply accurate forecasting. On the contrary, the realized fiscal balance—i.e., the annualized quarterly fiscal balance to GDP ratio—deviates from the forecasted balance quite considerably. Figure 2 shows that, during the recent crisis, there has been a tendency to overestimate the fiscal balance for all three countries in our sample, and especially for the United Kingdom.

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[10] For France or Italy, experts forecast the (nominal) overall balance for the current and subsequent year. For example, in each month of 2014, they release their forecast for the overall balance for 2014 and 2015. For the U.K., experts forecast the overall balance for the current and next fiscal year. For example, in each month of 2014, they release their forecast for the overall balance for the fiscal years 2014/2015 and 2015/2016.

[11] See also Poplawski-Ribeiro and Rülke (2011) and Dick et al. (2013) for other fiscal analyses using survey forecasts from financial market experts.

III. METHODOLOGY

Our empirical model follows the standard specification adopted by the literature on sovereign spreads in the EU, in which the dependent variable (the sovereign spread) is assumed to depend on a set of domestic variables, foreign variables and other controls, often including a global risk factor (Schuknecht et al., 2010; Poghosyan, 2012, Favero and Missale, 2012; and Favero, 2013). Different from the above-mentioned papers, given that our aim is to relate financial market experts' predictions of the long-term 10-year bond spread to the balance ratio to GDP forecast while controlling for other variables, we use the 12-month ahead forecast of the sovereign spreads for France, Italy and the U.K. as dependent variables in our regressions.

In particular, we test whether expectations of the 12-month-ahead fiscal balance (surplus) for a certain forecaster *i* in some month *m* of a year *t*, which will be denoted by $E_{i,t,m}\left[fiscal\_balance_{t+1,m} \right]$, influence the expected 12-month ahead bond spread $E_{i,t,m}\left[spread_{t+1,m} \right]$. In addition to the fiscal balance, other economic developments may also matter for the forecasted government bond yield. Therefore, we control the relationship between the forecasted spread and fiscal balance forecast for the expected 12-month ahead economic growth $E_{i,t,m}\left[growth_{t+1,m} \right]$, and the inflation rate $E_{i,t,m}\left[inflation_{t+1,m} \right]$.

We expect the fiscal balance to have a negative effect on the projected spread. This is justified by the fact that the perception of better future fiscal positions should ease the pressure on sovereign securities, thus resulting in lower spreads. Regarding the expected GDP growth, it can be argued that low growth tends to be associated with a flattening of the yield curve due to an expected future easing in monetary policy. Therefore, this channel would suggest a positive coefficient of growth on spreads. However, the expectation of lower future growth may, in some circumstances, imply additional fiscal adjustments in order to keep public finances under control (Alesina et al., 1992). If a permanently lower level of growth casts doubt on the long-term sustainability of public finances, higher risk premia on sovereign bonds may be the consequence. This risk factor is likely to be more important for high debt countries (Bi, 2012). This channel would therefore suggest a negative coefficient of growth on sovereign spreads. Overall, the effect of growth on spreads will depend on which of the two channels prevail: in "normal times" or for low-debt countries, we expect the first channel to prevail, while in "crisis times" or for high-debt countries, the second channel should be stronger.

In turn, if market participants expect higher inflation in the future, they may foresee a higher interest rate on government bonds. Inflation expectations push up the entire term structure, as

monetary policy is expected to react by tightening. Hence, the response of sovereign interest rates and spreads to higher expected inflation should be positive.[12]

Besides the macroeconomic variables, global risk factors can be important in determining the expectations on spreads as most studies analyzing realized spreads suggest. The inclusion of these global risk factors is important to avoid biased estimators (e.g., Dell'Erba and Sola, 2011). In the literature, global risk has been generally proxied with a common "global" factor, corporate risk premia in the U.S., or indicators of market volatility like the VIX Index. Other papers have used the bond rate of a reference country (Blommestein et al., 2012). In line with this approach, we include the forecast of the 10-year U.S. government bond yield as a proxy of international developments and global risk.[13] Descriptive statistics of all variables are shown in Table 1.

Most studies that analyze realized bond yield differentials define all explanatory variables in relative terms to a benchmark country (see, e.g., Favero and Missale, 2012; and Favero, 2013). Similarly, we take the difference between the forecast of the fiscal balance, GDP growth, and inflation of each forecaster, and the mean forecast of those variables among surveyed experts in Germany, as explanatory variables.

In sum, the baseline specification to test the relationship between projections of the overall fiscal balance and the expected sovereign spread for our panel of forecasters can be described as follows:

$$E_{i,t,m}\left[spread_{t+1,m}\right] = \begin{array}{c}\alpha_i + \beta_1 E_{i,t,m}\left[fiscal\_balance_{t+1,m}\right] + \beta_2 E_{i,t,m}\left[growth_{t+1,m}\right] + \\ \beta_3 E_{i,t,m}\left[inflation_{t+1,m}\right] + \beta_4 E_{i,t,m}\left[Z_{t+1,m}\right] + \sum_{n=2}^{12}\theta_n month_n + \varepsilon_{i,t,m}\end{array}. \quad (1)$$

$E_{i,t,m}\left[x_{t+1,m}\right]$ is the 12-month-ahead forecast for fundamental *x* released at month *m* of year *t* by respondent *i*. In model (1), *x* is therefore the fiscal balance, inflation, and the GDP growth rate while *Z* represents the global factor, i.e., the interest rate on the U.S. 10-year government bond.

We also include a forecaster specific fixed-effect α_i to account for unobserved heterogeneity across forecasters. Accordingly, we estimate (1) with panel fixed effects.[14] Moreover,

[12] A possibly indirect effect of higher inflation on the budget may come from the erosion of the real value of debt. In advanced economies, however, savings on interest payments are unlikely to be sufficiently large to offset the effect of investors demanding a higher return on compensate the inflationary risk.

[13] In Section IV.C, we also results based on other global risk factors.

[14] This choice is also supported by a Hausman test.

monthly dummies are used to account for regular seasonal effects in the budget forecasts (see, for example, Onorante et al., 2009). In fact, in France and Italy the regular budget cycle comprises the following steps. First, an initial draft budget is prepared (usually in late Spring). Second, the budget is submitted to the Parliament in September or October. Third, the final budget is voted on in December. The U.K. also follows a similar cycle, albeit lagged by three months given that the budget year covers the period from 1 April until 31 March. In these various stages, the government (generally, the Ministry of Finance) releases new information on the new fiscal measures planned for the next years and of its own budget forecasts. This implies that all forecasters receive the same budget news every year in the same months. Hence, we add to (1) time dummies $\left(\sum_{n=2}^{12}\theta_n month_n\right)$ for each month, but January, represented by the index n (February, $n=2$; March, $n=3$;…; December, $n=12$) to control for these effects.[15] Each of these dummies equals to one whenever $n=m$ and equals zero otherwise.

The estimation of (1) by fixed effects is not straightforward as the forecast of surplus, inflation, and real GDP growth are all potentially endogenous. The reason is that, for each forecaster, all three variables are likely to be part of the same forecasting model for the spread. To address this possible endogeneity issue, we estimate (1) using the Generalized Method of Moments (GMM). To construct strong and valid instruments, we exploit the fact that respondents update their forecast each month. Such updates reflect the 'news' that each forecaster receives over time and that is used for the forecast revision. We define the news as the month-to-month change $\left(E_{i,t,m}\left[x_{t+1,m}\right]-E_{i,t,m-1}\left[x_{t+1,m-1}\right]\right)$, and the year-on-year change $\left(E_{i,t,m}\left[x_{t+1,m}\right]-E_{i,t-1,m}\left[x_{t,m}\right]\right)$ of the first three regressors in (1), i.e., the fiscal balance, economic growth and inflation.

Using this instrument is, in our view, appropriate for the following reasons. First, the news is likely to be highly correlated with the year-ahead forecasts of the explanatory variables. In fact, when forecasters construct their macroeconomic projections in any month *m*, developments over the last month (the 'news') are taken into account in updating the forecasts. Second, the news is fully exogenous to the explanatory variables, that is, there is no feedback of the forecast series to the news during that month. Third, there is no direct impact from the forecast spread (i.e., our dependent variable) on the news.

We perform a battery of tests to check the validity and strength of the chosen instruments. The validity of the instruments is tested with the Hansen J-test. A p-value of less than 0.05 implies a rejection of the validity of instruments (at the 95 percent significance level). In

[15] We do not include the monthly dummy for January to avoid a case of perfect collinearity with the other months.

addition, we compute the (HAC robust first-stage) LM test for weak instruments of Kleibergen and Paap (2006). A low statistic on this KP-test indicates weak instruments, which causes a bias in the coefficient estimates and size distortion in hypothesis tests (Stock et al., 2002). The null of weak instruments is rejected if the statistic is larger than the Stock-Yogo critical values for a single endogenous regressor.[16]

IV. RESULTS

A. Baseline Results

Table 2 reports the estimates for the baseline model for the three countries' spreads over the entire January 1993–October 2014 sample. The main result is that expectations of a higher fiscal balance significantly reduce forecasted spreads for all the three countries. This effect is particularly strong for Italian spreads: a 1 percent rise in the expected surplus to GDP ratio reduces forecasted spreads by about 38 basis points. The effect is smaller for French and British spreads (around 4 and 6 basis points, respectively), but the coefficient is still highly statistically significant.[17]

The growth outlooks also matter to forecasters. A higher expected economic growth leads to larger forecast spreads in all three countries. As previously discussed, in normal times, an expected improvement in the economic outlook is likely to be associated with expectations of tighter monetary policy in the medium-term and an upward shift in the term structure. For the full period sample, this effect seems to outweigh the fall in spreads triggered by fading concerns over the sustainability of public finances on the back of better growth prospects.

The effect of expected higher inflation is positive and significant, but for the U.K. only. This might be explained by a higher premium on U.K. bonds—and possibly tighter future monetary policy—when investors expect higher future inflation. For Italy and France, the coefficient on expected inflation is not significant. This may be related to the fact that during the EMU period, realized inflation and inflation expectations were relatively low in these two countries. As Dick et al. (2013) argue, in such a specific environment, it may be that investors cared relatively less about inflation compared to real growth or uncertainty.

[16] We further estimate the panel model with alternative robust estimators such as the Continuously Updated Estimator (CUE) and the Fuller-k estimator. Results based on these estimators (not shown here, but available upon request) confirm our main findings.

[17] In order to facilitate the exposition Table 2 reports the estimations on a country-by-country basis, but its results are robust to pooling all forecasters data for the three countries in a same regression and use interaction terms to understand differences across countries.

The coefficient on the external global risk factor indicates that more risk in the U.S., as reflected in a higher expected interest rate on the 10-year U.S. government bond, raises forecasted spreads in all three countries in our sample. This global risk effect is particularly strong for Italian spreads, more moderate for French and rather weak for the British spreads. The regression diagnostics also show that the model is well identified: the KP test for weak instruments validates the use of the chosen instruments.

How do these results compare to those arising from the use of realized spreads? We substitute the forecast with the realized spread at time *t* as the dependent variable. This implies that the left hand side variable is identical for all forecasters, instead of being specific to each forecaster. As shown in Table 3, it emerges that the use of realized spreads leads to smaller coefficients—in absolute values—for the fiscal balance and GDP growth, compared to the regression based on spread forecasts. In particular, it turns out that the expected surplus reduces the realized French and Italian sovereign bond spread. However, the size of the effect is substantially smaller than in the case of spread forecasts. Expectations by experts of a 1 percent cut in the forecast deficit implies, on average, a fall of about 28 basis points in the Italian realized spread, which is around 10 basis points less than what we find using the spread forecasts. The effect on the French spread appears to be more than halved. For the U.K. spread, the effect falls by around 8 basis points and even turns positive as compared to the reaction of the forecasted spread.

Regarding GDP growth, in all three cases the effect is smaller compared to results in Table 2. Interestingly, for France and the U.K., the sign of the growth coefficient is now reversed: a positive growth outlook tends to reduce realized spreads. For Italy, the coefficient on growth remains positive but it is now not significant. With respect to inflation, the coefficient becomes not significant for U.K. and positive and significant, at the 5 percent level, for Italy. For France, the effect on inflation is now reversed and becomes negative. Regarding the external global-risk factor, the coefficient in Table 3 is broadly similar compared with the results in Table 2 for the projected spreads.

All in all, these results suggest that the expected evolution of fundamentals—in particular the fiscal surplus and GDP growth—is quantitatively more relevant in explaining spread projections than spread realizations. This indicates that, ex-ante, market participants seem to assign a bigger role to these factors than what is observed ex-post. This also suggests that realized spreads are likely to reflect other factors (e.g. bandwagon effect, excess speculation) beyond the expected evolution of fundamentals.[18]

[18] For an estimation of the impact of market sentiment on realized spreads in Europe's specific case, see Aristei and Martelli (2014). Moreover, the recent European ban on naked short sales of euro-zone government cash bonds and related CDS in 2012 have further restricted the dealers' abilities to make market positions, exacerbating price moves at times of stress (see Citibank, 2012; and Shearman and Sterling, 2012).

B. Debt limit and Fiscal Space

One goal of our analysis is to deepen our understanding of how experts perceive the evolution of sovereign spreads in reaction to concerns on debt sustainability. In our baseline specification, we use the fiscal balance to investigate this reaction. Now, we treat the expectations of debt sustainability more explicitly by looking at the distance of an economy from its "fiscal limit". The latter can be defined as the point where the government no longer has the ability and the willingness to increase its borrowing capacity (Leeper, 2013 and 2015). Exceeding the fiscal limit would result in a debt-GDP ratio that cannot be sustained without appreciable risk of default or higher inflation. We therefore incorporate a measure of "fiscal space", defined as the distance between the time-varying fiscal limit estimated by Polito and Wickens (2015) for France, Italy and the U.K. and the debt-GDP ratio for the same countries and time periods.[19] Polito and Wickens (2015) develop a measure of fiscal limit—which is an adaptation to an open economy with distortionary taxation on income from labor, capital, and consumption of the fiscal limit derived by Davig et al. (2011) and Bi (2012)—and derive time series for this limit for a set of advanced economies. A positive fiscal space would indicate that countries would have "room for maneuver" before approaching an unsustainable level of public finance. Therefore, in general, we would expect to observe a negative relationship between the fiscal space and the projected spread. In fact, experts are likely to assess a diminishing fiscal space as a risk to sustainability and thus to raise their forecast of spreads.

One important reason why experts evaluate public finances to be sustainable or not depends on monetary policy. By being part of the euro area, France and Italy do not control their own monetary policy. Consequently, for both countries, the nominal government debt that they issue becomes effectively equivalent to real debt and must be backed by real surpluses (Leeper, 2015). For this reason, as those countries' debt levels approach their fiscal limit, their sovereign yields and spreads should tend to rise. On the other hand, the U.K. issues nominal debt and controls its own monetary policy. Nominal bonds are thus a claim to its currency in the future. In this context, an expansion of British nominal debt can be unbacked by future surpluses, as the "fiscal theory of the price level" would predict (e.g., Leeper, 1991; Sims, 1994). Thus, in the event of a very severe crisis that puts the sustainability of public finances at risk, it is likely that —faced with a choice between defaulting on government debt or violating the inflation target— the British government would try to avoid default at the cost of deviating from its inflation target. This is a critical difference between EMU countries and the U.K., which retains control of its monetary policy. All in all, we expect that—for EMU members—the sensitivity of the spread should be larger as the fiscal space gets smaller

[19] Since we are looking at spreads relative to the German bund, we analyze the fiscal space for the countries in analysis relative to the German one. Moreover, it should be stressed that measuring fiscal space is complex and may be affected by the implementation of structural reforms and other policy levers, which may increase the space in the future, suggesting that those measures are judgmental by their very nature.

because they cannot resort to monetary policy to address perceived risks to sustainability. Therefore, we expect the reaction of the spread to the fiscal space to be non-linear for these countries: it should become stronger the closer debt gets to the limit.

We test this hypothesis by including the fiscal space variable in our baseline regression, for the three countries under examination. We first test the reaction on the full EMU sample. Second, we divide the sample in two periods, labelled as "high" and "low" fiscal space regime, that coincide with values of the fiscal space above or below the average fiscal space for each country. These two regimes allow us to test whether there are non-linear effects of the fiscal space variable on the expected spread, depending on whether a country is inside the EMU or not.

Results, shown in Table 4, indicate that the coefficient associated with the fiscal space variable is—as expected—negative for the full EMU sample, for all three countries. When we look at the two separate regimes, we find that the coefficient is broadly stable for the U.K. over the two regimes. Conversely, for France and Italy we observe a very strong decline of the coefficient in the low fiscal space regime as compared to the high fiscal space regime. This is particularly evident for Italy, for which the coefficient is not significant in the high fiscal space regime, but becomes highly significant and negative in the low fiscal space regime. These findings indicate that, for countries in the EMU, approaching the fiscal limit leads to a higher perceived risk for the sustainability of public finances, which is translated in a stronger reaction of the (projected) sovereign spread.[20]

C. Additional Results

Alternative indicators for global risk

Financial integration has made investors' international portfolios co-move more strongly, such that portfolio adjustments tend to uniformly shift in one direction. In times of uncertainty, this has generally implied a flow towards safe havens. These developments have made bond yields increasingly sensitive to global conditions, rather than to country-specific risk factors (Alper and Forni, 2011; Kumar and Okimoto, 2011). So far, we have used the U.S. yield as forecasted by CE experts as an indicator of international market movements and found this variable to significantly influence spreads forecasts. The reason for adopting this measure is that alternative indicators of global risk, which have been commonly used in the literature, are realized series and not projections. At the same time, several studies argue that other financial factors may also play a role in explaining the dynamic of sovereign spreads,

[20] See also De Grauwe and Ji (2013) on the determinants of the spreads in EMU and non-EMU countries.

especially in periods of market turbulence. We thus replace the forecasted U.S. 10-year yield with these alternative indicators for global risk.

First, we include the AAA-BAA U.S. corporate bond spread, which is frequently used in the related literature (Codogno et al., 2003). This spread reflects international liquidity and credit risks. The first block in Table 5 shows that the main findings of Table 2 remain broadly unchanged. In particular, the AAA-BAA corporate spread appears to raise forecasted spreads. The impact is quantitatively stronger in Italy and the United Kingdom. In Italy, such a strong impact may be due to the high public debt and the fiscal situation in the country. In the U.K., results may reflect the strong interlinkages between U.S. and British financial markets.

The global financial crisis tied fiscal budgets to banking sector bailouts, so financial stability is likely an important indicator of risk to fiscal sustainability. Therefore, we also use the IMF's Financial Stress Index, FSI (see Cardarelli et al., 2011). We take the difference between the FSI for the U.S., and the French, Italian and British's FSI, as an indicator of potential financial sector problems in the three countries. The second block in Table 5 reveals that higher financial stress in the U.S.—or a lower financial stress in Italy and the U.K.—has been associated with lower expected spreads, with a particularly strong effect for Italy.

We further test the interaction between the FSI with the projected fiscal balance. In the third block in Table 5, we observe a negative and, indeed, highly significant effect for Italy and the U.K.: in those countries, higher surpluses lead to an additional reduction in spreads when financial stress is high in the United States. However, this effect appears to be quantitatively small. Finally, the interaction coefficient between the fiscal balance and the BAA-AAA U.S. corporate spreads remains negative for the U.K. and France, but turns positive for Italy. However, the coefficients on the country-specific fundamentals in this regression remain broadly consistent with the baseline findings.

All in all, we find that the impact of global-risk factors tend to be statistically significant but small. Moreover, the overall fit of the regression does not significantly improve when these factors are included. This might be due to the fact that forecasters not paying a great deal of attention to other financial elements than those in the baseline model when making their bond spread projections.

Primary balance

Next, we estimate a panel model in which we use the expected primary balance—instead of the fiscal balance—on the right-hand-side of equation (1). This variable may help to address the possible issue of reverse causality, given that interest payments depend on interest rates on sovereign securities. Therefore, a change in interest rate conditions could have an effect

on the expectations of the fiscal balance for the next year. We correct the overall fiscal balance ratio by subtracting the realized interest payments to GDP ratio.

Results reported in Table 6 confirm the main findings from the baseline regression: the sign and statistical significance of the coefficients on fiscal and macro-economic fundamentals is always preserved. In particular, the future primary balance still has the expected negative sign while the coefficient for growth is positive for all three countries. The coefficient for inflation is further positive in the specific case for the United Kingdom.

Realized spreads

The realized level of spreads may also be an important determinant of the spread forecasts. Therefore, we include the lagged realized spreads (for month *m-1*) in the regression to test whether this variable is important in explaining spread forecasts for the *m+12* horizon. We use the end-of-month value of the realized spread for month *m-1*, and not for the current month *m* because the latter is not fully known by forecasters when producing their forecast in month *m*.[21] It is important to note that, contrary to the forecasted spread, the realized spread is the same for every single forecaster.

Table 7 shows that the lagged market spreads have significant coefficients in the regressions and increase their fit. This result shows there is a partial adaptation of the spread forecasts to the realized spread on the market. This is likely to be the result of news being incorporated gradually over time. This also shows that forecasters weigh both the role of macroeconomic fundamentals (expected fiscal balance, inflation and output growth) and past financial conditions in preparing their forecasts.

Data in levels

So far, we have expressed all variables as a difference of the CE forecast from surveyed experts for a particular country relative to the mean forecast of this variable from surveyed experts in Germany. Using all variables in difference vis-à-vis a benchmark country is common practice in the literature on realized spreads (e.g., Favero and Missale, 2012). However, we have also estimated model (1) directly on the data in levels. In other words, while we still use the expected spread against the German 10-year bond as the dependent variable, following D'Agostino and Ehrmann (2014) we now also include separately the

[21] The CE survey inquires every first week of each month *m* about current and next year forecasts for a number of macroeconomic variables. Therefore, when releasing their projections, the forecasters do not entirely know the full realization of the spread for the current month *m*, as they do not observe the final three weeks of the month.

country specific variables and the German variables—all of them in levels—on the right-hand-side of the regression equation.[22]

As highlighted in Table 8, the results for the country-specific fundamentals are similar to those in the baseline model. In particular, it is shown that a higher surplus significantly lowers expected spreads in the three countries of our sample. Nevertheless, it also appears that German economic developments matter for the forecast of bond spread of the other countries, as reflected in the coefficients of the German variables. This is in line with what one would expect: spreads should reflect events both from the country under analysis but also from the benchmark country. In particular, a higher surplus in Germany tends to decrease the yield for that country, thus increasing the spreads. Additionally, a higher growth in Germany is accompanied by a higher yield for that country relative to other countries' yields, thus lowering the spread. Finally, the effect of German inflation is moderate for the U.K. and strong for Italy.[23]

D. Sub-Sample Analysis

The recent global financial crisis has been reflected in increased tension and turbulence in European sovereign bond markets. Bond spreads for fiscally vulnerable countries jumped to very high levels, and increased volatility of bond markets stood in sharp contrast with market developments in the first phase of the EMU (Figure 1). The higher volatility in bond spreads during the financial crisis suggests that there may have been significant changes in market participants' expectations, possibly related to a reassessment of the sustainability of public finances as the financial crisis developed. For the fiscal balance, Figure 2 also shows that the distribution of forecasts has deviated (even over prolonged spells) from the realized balance.

Therefore, we analyze how market experts changed their spread predictions over time. As in D'Agostino and Ehrmann (2014), we look at three different subsamples for the relationship between expected spreads and expected fundamentals, covering different periods of the EMU institutional architecture. The first sample is the one ahead of the currency union, or pre-EMU period: from the start of our sample (i.e., January 1993) until December 1998. We then

[22] This approach has the advantage of allowing us to estimate the relative weight of the benchmark and domestic variables in the determination of the spreads without imposing that the coefficients on these variables sum to zero. However, the approach may be problematic in case of a strong co-movement among the independent variables, which could result in a multicollinearity problem in the estimation. Therefore, given that in our analysis the independent variables for the reference country (France, Italy and U.K.) and the benchmark country (Germany) display a high degree of correlation, we use the specification in differences as our baseline.

[23] As a final robustness exercise, we re-estimate the baseline regressions of Table 2, but we drop one forecaster at a time. This is useful to address the possible presence of outliers in our sample that might drive the overall results. This test indicates that the estimated coefficients are broadly unchanged when regressions are run with n-1 forecasters, thus confirming the overall robustness of our results for each country (results not shown, but available upon request).

focus on the subperiod from the start of the EMU and circulation of the euro (January 1999) until the pre-Lehmann crisis (August 2008). Over this period, sovereign bond markets were particularly calm, as reflected in relatively flat spread over this period (Figure 1). The third subsample covers the financial crisis period, i.e., a subsample starting from the Lehman Brothers collapse (September 2008), covering the ensuing eruption of the euro area debt crisis (2011-2012), and ending in the last available observation of our sample (October 2014)..[24]

Table 9 presents the results for these three periods. In the first (pre-EMU) subsample, forecasters consider the projected fiscal balance, other macroeconomic fundamentals, and the global factor as relevant for the projected spread. These results are broadly in line with the full-sample estimates (Table 2). For Italy and U.K., higher expected deficits are significantly associated with higher projected sovereign spreads. For France, however, the coefficient has a positive and significant coefficient. Expectations of a higher US yield also reduce expected spreads in the three countries in the sample.

In the Italian case, the large and negative coefficient for the projected fiscal outlook appears to be associated with the convergence process to meet the Maastricht criteria. During that period, Italy undertook considerable fiscal efforts to meet the Maastricht criteria. It reduced its budget deficit from about 10 percent of GDP in 1993 to below 3 percent in 1998. This involved the introduction in 1997 of a one-off tax (so called "Euro tax") worth around 0.6 percent of GDP. For comparison, France had a budget deficit below 6 percent of GDP already in 1993.

Regarding the initial (pre-crisis) EMU period, the role of the macroeconomic fundamentals is significantly weaker compared to the full-sample estimates. This is probably due to the fact that during this period investors did not fully price-in country-specific fundamental factors in sovereign yields, which were substantially more flat and similar across European countries and thus spreads were excessively low. In line with Ghosh et al. (2013), our results for this subsample period may suggest that, although forecasters continued to attach some relevance to macroeconomic fundamentals in their assessment of bond prices, they may have also expected that countries running into times of economic or financial distress could receive some sort of assistance (financing or transfers) from the rest of the monetary union. Thus, spreads were relatively unreactive to country-specific developments.

The period covering the financial crisis provides some insights on how expectations about future spreads have been formed during a period of severe market turbulence. The expected

[24] We have further tested the effects of joining the Eurozone by using a dummy for the entire euro area period, and further interacting it with the three fundamentals. The outcomes are broadly in line with the average effect of the two subsamples during the euro area period, as reported in Table 9 (results not shown, but available upon request).

fiscal balance regains strong relevance during the crisis. It is significant and negative for the three countries and especially sizable for Italy. This suggests that, indeed, bond investors rediscovered a role for those fundamentals (Ghosh et al., 2013). In particular, concerns about fiscal sustainability are likely to have pushed expected spreads up during the crisis, especially in the most fiscally vulnerable countries.

In turn, expectations on the growth outlook become again important during this period. In particular, the coefficient for this variable substantially increases for the United Kingdom. Yet, it becomes negative, large and highly significant for Italy. This last result suggests that better economic prospects for Italy become relevant for the evolution of expected spreads. In the view of the experts, higher growth would support fiscal sustainability and, therefore, is accompanied by lower expected spreads in this critical phase of the business cycle (see also Alesina et al., 1992, and Cottarelli and Jaramillo, 2012). This difference, with Italy on the one side, and the U.K. on the other, might be due to a different perception about the sustainability of public finances for these countries. Markets might have perceived that sustainability was not an issue for the U.K. (and, partially, for France) during the crisis. Therefore, the link between growth and interest rates was positive in the U.K. during the crisis, as in "normal times". Expected inflation in this more recent period also shows a high and positive coefficient in the regression for Italy. This may indicate that the prospect of a prolonged period of low inflation, which have in part come about since mid-2013, was reflected in a drop in expected sovereign spreads in this country.[25]

V. CONCLUSION

Expectations about macroeconomic and fiscal developments have triggered reactions in sovereign bond markets, especially since the start of the global financial crisis. Some argue that bond markets are rediscovering fundamentals. Others claim that, in a very uncertain economic environment, sentiments spurred by political events and contagion from vulnerable countries might have pushed financial markets into an equilibrium in which spreads are unrelated to fiscal or other macroeconomic fundamentals.

In this paper, instead of analyzing how realized spreads reacted to macroeconomic fundamentals, we test how expectations about future government bond spreads are formed by

[25] As argued by some authors (see, e.g. De Grauwe, 2015), the financial turbulences of the euro area debt crisis appear also to have their roots in the incompletion of the EMU architecture. In particular, available policy tools at the single country and aggregate euro area level proved to be insufficient to deal with asymmetric shocks (see, e.g., Furceri and Zdzienicka, 2013). This incompleteness seems to have led to an abrupt and sharp reassessment of perceived fundamentals by markets for the euro area countries in 2011-2012. More recently, the euro area gradually achieved several progresses on many institutional fronts and strengthened its architecture. This, together with improved fundamentals for vulnerable countries and the ECB's reaction to crisis, contributes to significantly improve the situation in European sovereign debt markets.

market experts. This allows us to check whether expectations about macro and fiscal fundamentals matter to market experts' perception of future sovereign risk premiums, helping to ensure the sustainability of public finance (Bi, 2012). We employ a survey-based monthly dataset of individual forecasters (from *Consensus Economics*) composed of financial institutions, but also of private and public research centers. Our sample covers the period from January 1993 to October 2014, and therefore includes a substantial part of the recent financial crisis. We employ the expert-specific spread between the 12-month-ahead forecast of the 10-year government French, Italian and British bond yields relative to the average expected 10-year government bond yield for Germany. We then test whether the 12-month-ahead projections for the fiscal balance, GDP growth and CPI inflation played a significant role in explaining the projected government spreads.

Our findings suggest that forecasters do consider expected fiscal and other macroeconomic fundamentals in forming their expectations about the 12-month ahead sovereign bond spreads. A better expected fiscal outlook significantly reduces expected spreads. While true for all countries, this effect is particularly strong and robust for Italian forecast spreads. For this country, a 1 percent rise in the expected surplus-to-GDP ratio reduces the forecast spread by 38 basis points. Higher expected GDP growth tends to be positively and significantly associated with forecast spreads. Moreover, international developments, as reflected in global risk factors, are also relevant to spread forecasts. Our findings further indicate that fundamentals tend to play a significantly more important role in explaining expectations about future government spreads, compared to regressions based on realized spreads. In fact, realized market spreads are likely influenced by noisy trading and other contingent market conditions.

Additional evidence on the importance of stable fiscal policies and expected economic growth also emerges from the changing relationship between the forecast of fundamentals and of spreads. The fiscal policy outlook is more important in the period prior to the EMU and during the financial crisis. In the latter period, experts also find that, for Italy, lower expected growth tends to lead to higher forecast spreads.

Our analysis also sheds light on the role of fiscal limits and their different effects on expected sovereign spreads for countries participating in a monetary union versus a country that controls its own monetary policy. As expected, improvements in fiscal positions as reflected in an increased distance of the debt level from a country-specific "fiscal limit", are significantly associated with a decline in expected spreads. This is particularly true for the countries participating in the EMU (France and Italy), where the fiscal limit is more binding as debt must be backed by real surpluses. For the U.K., which controls its own monetary policy, the fiscal limit does not affect differently the expected spreads depending on whether the distance between the debt level and the limit is higher or lower.

Overall, our results support the call to increase fiscal transparency and anchor fiscal expectations (Leeper, 2010). Besides significantly improving the effectiveness of fiscal policy (Leeper, 2009), anchoring expectations about the future path of fiscal policy (and other macro-fundamentals) can ease financial markets' concerns and expectations about the long-term sustainability of public finances (Bi, 2012). A sound, stable and credible macro-fiscal framework implemented by fiscal authorities can lead to stable expectations of the evolution of sovereign bond markets, reducing the country's expected risk premium.

TABLES AND FIGURES

Table 1. Descriptive Statistics, January 1993– October 2014

variable	France					Italy					UK				
	Mean	Stand. Dev.	Bottom Quartile	Median	Top Quartile	Mean	Stand. Dev.	Bottom Quartile	Median	Top Quartile	Mean	Stand. Dev.	Bottom Quartile	Median	Top Quartile
Forecast constant maturity swap corrected spread (t+1)	0.07	0.42	-0.18	0.06	0.28	0.44	0.90	-0.03	-0.24	0.66	-0.23	0.50	-0.52	-0.22	0.08
Forecast spread to Germany (t+1)	0.16	0.47	-0.13	0.13	0.43	1.38	1.81	0.10	0.46	2.44	0.83	0.78	0.29	0.73	1.31
Forecast spread to Germany (t)	0.26	0.44	-0.02	0.16	0.49	1.61	1.97	0.15	0.46	3.05	0.95	0.77	0.45	0.86	1.35
Realized spread	0.20	0.31	0.04	0.12	0.34	0.85	1.01	0.21	0.37	1.18	-0.09	0.26	-0.21	-0.12	0.12
Forecast fiscal balance (t+1)[a]	-3.55	1.53	-4.22	-3.48	-2.77	-3.65	2.20	-4.54	-2.99	-2.26	-3.31	2.78	-4.75	-2.90	-1.37
Forecast fiscal balance (t)[a]	-3.74	1.64	-4.27	-3.46	-2.90	-3.95	2.47	-4.99	-3.04	-2.37	-3.63	3.14	-5.24	-3.25	-1.54
Forecast fiscal balance differential to Germany[a]	-1.46	1.68	-3.13	-0.66	-0.12	-1.46	1.69	-2.46	-1.17	-0.10	-0.91	2.83	-2.21	0.12	1.00
Forecast growth (t+1)[a]	1.91	0.97	1.30	2.00	2.55	1.62	0.92	1.00	1.70	2.30	2.22	1.07	1.80	2.40	2.80
Forecast growth differential to Germany[a]	0.10	0.74	-0.28	0.14	0.54	-0.23	0.65	-0.67	-0.17	0.23	0.31	1.12	-0.26	0.34	0.95
Forecast inflation (t+1)[a]	1.75	0.73	1.40	1.67	1.90	2.50	1.30	1.80	2.00	2.60	3.07	1.28	2.30	2.79	3.50
Forecast inflation differential to Germany[a]	-0.15	0.59	-0.45	-0.16	0.13	0.59	0.82	0.12	0.45	0.93	0.99	1.04	0.54	0.92	1.36
Forecast yield US	1.89	1.07	0.84	2.14	2.83	1.83	1.09	0.80	2.03	2.77	1.80	1.04	0.84	1.94	2.71
Financial Stress Index[b]	-1.17	2.22	-3.11	-1.06	0.62	-1.03	2.44	-2.71	-1.48	0.19	-0.36	3.39	-2.69	-1.23	1.40
Financial Stress Index (relative to US)[b]	-0.74	2.61	-1.37	-0.36	0.56	-0.49	2.68	-1.79	-0.29	0.86	0.20	1.76	-0.73	0.20	1.12
BAA-AAA US spread	0.95	0.44	0.70	0.85	1.03	0.94	0.42	0.70	0.85	1.03	0.91	0.40	0.67	0.83	1.01
Bid ask differential to Germany	1.46	10.56	-1.25	1.57	5.26	1.80	18.31	-2.25	0.24	3.00	-19.33	28.13	-25.77	-13.23	0.24

Source: Cardarelli et al. (2011), Consensus Economics, Datastream, ECB, and authors' calculations. Notes: [a] Percent of forecasted GDP. [b] Scalar.

Table 2. Panel Baseline Regressions, Jan. 1993–Oct. 2014[a]

Dependent variable: spread forecasts	France	Italy	UK
Fiscal balance (forecast t+1)	-0.042**	-0.381***	-0.065***
	(-2.004)	(-8.186)	(-6.354)
Growth (forecast t+1)	0.151***	0.458***	0.169***
	(3.945)	(4.027)	(8.530)
Inflation (forecast t+1)	-0.002	-0.112	0.120***
	(-0.042)	(-1.381)	(4.926)
Global factor: yield US (forecast t+1)	0.121***	0.261***	0.046***
	(7.029)	(7.730)	(2.728)
Adjusted R^2	0.20	0.03	0.26
F-test	17.10	10.11	39.55
J-test (p-value)	0.38	0.04	0.15
KP LM test[b]	71.04	27.52	95.90
Number of forecasting institutions	19	25	43
Number of observations	1,527	1,210	2,574

Notes: [a] All variables are forecasts for the year ahead and (apart from US yields) represent differences from the values for Germany; significance at *** p<0.01, ** p<0.05, * p<0.1; monthly dummies not reported. [b] KP LM test is the Kleibergen Paap LM test for weak instruments.

Table 3. Panel with Realized Spreads, Jan. 1993–Oct. 2014[a]

Dependent variable: realized spreads	France	Italy	UK
Fiscal balance (forecast t+1)	-0.019*	-0.275***	0.020***
	(-1.669)	(-7.128)	(3.416)
Growth (forecast t+1)	-0.037*	0.040	-0.091***
	(-1.863)	(0.461)	(-7.559)
Inflation (forecast t+1)	-0.065***	0.114**	0.015
	(-2.641)	(2.095)	(1.067)
Global factor: yield US (forecast t+1)	0.092***	0.312***	0.131***
	(10.120)	(11.972)	(13.180)
Adjusted R^2	0.46	0.23	0.10
F-test	24.38	15.92	42.73
J-test (p-value)	0.02	0.04	0.15
KP LM test[b]	72.77	29.40	64.79
Number of forecasting institutions	19	25	38
Number of observations	1,651	1,416	2,133

Notes: [a] All variables (apart from the spreads) are forecasts for the year ahead and (apart from US yields) represent differences from the values for Germany; significance at *** p<0.01, ** p<0.05, * p<0.1; monthly dummies not reported. [b] KP LM test is the Kleibergen Paap LM test for weak instruments.

Table 4. Panel with high and low values for the Fiscal Space, EMU period (Jan. 1999–Oct. 2014)[a]

Dependent variable: spread forecasts	France			Italy			UK		
	Full Sample	High Space	Low Space	Full Sample	High Space	Low Space	Full Sample	High Space	Low Space
Fiscal balance (forecast t+1)	-0.020	-0.031	-0.020	-0.106*	-0.053	-0.164*	-0.021	0.012	-0.025
	(-0.873)	(-0.746)	(-0.747)	(-1.954)	(-1.315)	(-1.949)	(-1.257)	(0.687)	(-1.076)
Growth (forecast t+1)	0.107***	0.187***	0.118**	-0.322***	-0.166***	-0.081	0.074*	0.201***	-0.018
	(2.363)	(2.674)	(2.211)	(-4.589)	(-2.682)	(-0.573)	(1.846)	(5.622)	(-0.230)
Inflation (forecast t+1)	-0.068	0.128***	-0.135*	0.096	-0.233***	0.540***	0.059*	0.116***	0.082**
	(-1.267)	(2.690)	(-1.650)	(1.300)	(-3.093)	(4.959)	(1.798)	(3.530)	(2.023)
Global factor: yield US (forecast t+1)	0.079***	0.135***	-0.131***	0.148***	0.202***	0.399***	0.090***	-0.000	0.122***
	(4.422)	(5.747)	(-5.127)	(5.764)	(5.751)	(7.570)	(4.596)	(-0.009)	(2.840)
Fiscal space (distance FL-debt)	-0.553***	0.489*	-3.405***	-1.294***	0.274	-10.683***	-0.526***	-0.910***	-0.513*
	(-3.260)	(1.915)	(-8.543)	(5.764)	(5.751)	(7.570)	(4.596)	(-0.009)	(2.840)
Adjusted R^2	0.14	0.30	0.29	0.32	0.26	0.42	0.27	0.12	0.21
F-test	12.98	14.37	14.08	14.23	7.59	19.99	27.58	6.99	13.26
J-test (p-value)	0.61	0.38	0.24	0.54	0.82	0.08	0.05	0.01	0.03
KP LM test[b]	76.19	59.60	84.66	35.91	28.70	50.56	26.25	113.70	17.11
Number of forecasting institutions	18	15	15	21	13	18	28	20	28
Number of observations	1,049	542	506	761	348	411	1,460	783	677

Notes: [a] All variables are forecasts for the year ahead and (apart from US yields) represent differences from the values for Germany; significance at *** p<0.01, ** p<0.05, * p<0.1; monthly dummies not reported. High- and low fiscal space split the sample for those observations in which fiscal space is above or below the average sample.

[b] KP LM test is the Kleibergen Paap LM test for weak instruments.

Table 5. Panel including alternative Global Risk variables, Jan. 1993–Oct. 2014[a]

Dependent variable: spread forecasts	France	Italy	UK	France	Italy	UK	France	Italy	UK	France	Italy	UK
Fiscal balance (forecast	-0.040*	-0.433***	-0.004	-0.022	-0.407***	-0.072***	-0.038*	-0.555***	-0.031**	-0.032	-0.371***	0.053
	(-1.881)	(-8.750)	(-0.234)	(-0.933)	(-9.289)	(-7.721)	(-1.915)	(-7.196)	(-2.262)	(-1.431)	(-8.203)	(1.377)
Growth (forecast t+1)	0.140***	0.376***	0.200***	0.106***	0.362***	0.172***	0.288***	0.163	0.187***	0.152***	0.420***	0.225***
	(3.542)	(3.285)	(9.874)	(2.628)	(3.369)	(8.928)	(7.278)	(1.485)	(9.027)	(3.831)	(3.720)	(9.429)
Inflation (forecast t+1)	0.015	-0.174**	0.169***	0.051	-0.242***	0.159***	0.138***	-0.057	0.190***	0.029	0.022	0.194***
	(0.313)	(-2.194)	(7.457)	(1.072)	(-3.122)	(7.353)	(3.263)	(-0.603)	(8.327)	(0.585)	(0.253)	(7.706)
AAA-BAA corporate US	0.099***	0.446***	0.310***									
bond spread	(3.448)	(5.796)	(8.057)									
Adjusted FSI relative to				-0.001	-0.106***	-0.010*						
US				(-0.205)	(-8.444)	(-1.736)						
Fundamental and FSI							0.001	-0.047***	-0.005***			
interaction							(0.682)	(-6.045)	(-7.050)			
Fundamental and BAA-										-0.014**	0.155***	-0.052***
AAA US spread										(-2.225)	(6.826)	(-4.303)
Adjusted R^2	0.10	0.01	0.18	0.07	0.04	0.26	0.13	0.01	0.23	0.07	0.01	0.13
F-test	10.28	7.20	28.35	9.43	10.99	25.21	11.78	4.94	26.63	9.65	6.51	34.78
J-test (p-value)	0.70	0.08	0.11	0.62	0.16	0.01	0.70	0.72	0.02	0.60	0.00	0.02
KP LM test[b]	56.89	27.87	31.60	54.13	28.75	83.26	72.19	14.05	64.03	58.11	31.37	8.06
Number of forecasting institutions	19	25	43	19	25	43	18	23	43	19	25	43
Number of observations	1,527	1,210	2,574	1,468	1,185	2,512	1,238	1,058	2,263	1,527	1,210	2,574

Notes: [a] All variables are year-ahead forecasts and (apart from the financial variables) represent differences from Germany; significance at *** p<0.01, ** p<0.05, * p<0.1; monthly dummies not reported. [b] KP LM test is the Kleibergen Paap LM test for weak instruments.

Table 6. Panel Using Primary Surplus, Jan. 1993–Oct. 2014[a]

Dependent variable: spread forecasts	France	Italy	UK
Primary balance (forecast t+1)	-0.042**	-0.237***	-0.054***
	(-2.052)	(-11.756)	(-6.234)
Growth (forecast t+1)	0.153***	0.155*	0.159***
	(3.991)	(1.852)	(8.055)
Inflation (forecast t+1)	0.007	0.084	0.121***
	(0.142)	(1.344)	(4.868)
Global factor: yield US (forecast t+1)	0.117***	0.172***	0.059***
	(6.367)	(6.605)	(3.708)
Adjusted R^2	0.21	0.37	0.23
F-test	17.33	20.10	38.27
J-test (p-value)	0.40	0.07	0.15
KP LM test[b]	59.28	66.81	135.89
Number of forecasting institutions	19	25	43
Number of observations	1,527	1,210	2,574

Notes: [a] All variables are forecasts for the year ahead and (apart from US yields) represent differences from the values for Germany; significance at *** p<0.01, ** p<0.05, * p<0.1; monthly dummies not reported. [b] KP LM test is the Kleibergen Paap LM test for weak instruments.

Table 7. Panel Using Realized Spreads as Explanatory Variables, Jan. 1993–Oct. 2014[a]

Dependent variable: spread forecasts	France	Italy	UK
Fiscal balance (forecast *t+1*)	-0.034*	-0.242***	-0.048***
	(-1.711)	(-6.405)	(-4.818)
Growth (forecast *t+1*)	0.202***	0.346***	0.126***
	(5.675)	(4.570)	(6.054)
Inflation (forecast *t+1*)	0.031	-0.192***	0.116***
	(0.700)	(-3.310)	(4.606)
Global factor: yield US (forecast *t+1*)	0.060***	0.094***	0.044***
	(4.108)	(3.780)	(3.070)
Realized spread (end of month *m-1*)	0.768***	0.617***	0.392***
	(10.966)	(14.757)	(6.866)
Adjusted R^2	0.32	0.47	0.34
F-test	38.62	58.73	57.45
J-test (p-value)	0.78	0.03	0.00
KP LM test[b]	99.74	22.55	99.37
Number of institutions	19	25	37
Number of observations	1,527	1,210	2,031

Notes: [a] All variables are year-ahead forecasts and (apart from the financial variables) represent differences from Germany; significance at *** p<0.01, ** p<0.05, * p<0.1; monthly dummies not reported. [b] KP LM test is the Kleibergen Paap LM test for weak instruments.

Table 8. Panel Using Data in Levels, Jan. 1993–Oct. 2014[a]

Dependent variable: spread forecasts	France	Italy	UK
Fiscal balance (forecast t+1)	-0.039*	-0.310***	-0.082***
	(-1.646)	(-8.284)	(-5.432)
Growth (forecast t+1)	0.107***	0.147*	0.187***
	(2.823)	(1.882)	(7.569)
Inflation (forecast t+1)	-0.095*	-0.135**	0.141***
	(-1.886)	(-2.236)	(5.402)
Global factor: yield US (forecast t+1)	0.107***	0.250***	0.042**
	(6.020)	(8.084)	(2.046)
Surplus ratio for Germany (forecast t+1)	0.149***	0.637***	0.090***
	(8.277)	(15.578)	(8.475)
Growth for Germany (forecast t+1)	-0.254***	-0.217***	-0.190***
	(-7.297)	(-2.786)	(-7.533)
Inflation for Germany (forecast t+1)	-0.175***	-0.734***	-0.002
	(-4.174)	(-5.335)	(-0.066)
Adjusted R^2	0.34	0.40	0.28
F-test	31.57	31.40	50.15
J-test (p-value)	0.56	0.67	0.04
KP LM test[b]	78.05	85.83	56.91
Number of institutions	19	25	43
Number of observations	1,527	1,210	2,574

Notes: [a] Significance at *** p<0.01, ** p<0.05, * p<0.1; monthly dummies not reported. [b] KP LM test is the Kleibergen Paap LM test for weak instruments.

Table 9. Panel with Different Period Subsamples, Jan. 1993–Oct. 2014[a]

Dependent variable: spread forecasts	Jan. 1993–Dec. 1998 (pre-EMU)			Jan. 1999–Sep. 2008 (EMU, pre-crisis)			Sep. 2008–Oct. 2014 (crisis)		
	France	Italy	UK	France	Italy	UK	France	Italy	UK
Fiscal balance (forecast t+1)	0.490***	-0.342***	-0.093***	0.012	0.053**	-0.046***	-0.137***	-0.334***	-0.080***
	(4.923)	(-12.633)	(-3.436)	(0.584)	(1.976)	(-2.685)	(-4.190)	(-4.943)	(-3.089)
Growth (forecast t+1)	0.560***	0.350***	0.188**	0.116**	0.062	0.050	0.100*	-0.654***	0.341***
	(6.004)	(3.442)	(7.102)	(2.093)	(1.110)	(0.946)	(1.835)	(-4.947)	(5.641)
Inflation (forecast t+1)	0.321**	-0.624***	0.189***	0.081	0.112*	0.126**	0.042	0.370***	0.168***
	(2.515)	(-8.696)	(4.267)	(1.214)	(1.811)	(2.527)	(0.558)	(2.777)	(3.426)
Global factor: yield US (forecast t+1)	-0.431***	-0.969***	-0.296***	0.097***	-0.075***	0.031*	-0.354***	-0.723***	-0.029
	(-5.956)	(-10.926)	(-7.611)	(4.682)	(-2.677)	(1.704)	(-8.095)	(-6.576)	(-0.655)
Adjusted R^2	0.15	0.31	0.31	0.24	0.09	0.17	0.24	0.53	0.07
F-test	5.83	16.67	14.39	12.42	4.48	9.11	12.36	12.31	6.48
J-test (p-value)	0.24	0.55	0.82	0.47	0.87	0.63	0.48	0.49	0.02
KP LM test[b]	25.82	89.46	78.05	32.16	27.33	14.96	57.94	37.33	26.56
Number of forecasting institutions	10	11	31	16	20	27	13	11	15
Number of observations	280	344	894	701	566	1,116	546	298	561

Notes: [a] All variables are forecasts for the year ahead and (apart from US yields) represent differences from the values for Germany; significance at *** p<0.01, ** p<0.05, * p<0.1; monthly dummies not reported. [b] KP LM test is the Kleibergen Paap LM test for weak instruments.

Figure 1. Realized Values and Market Forecast (12-month ahead) of the 10-year Government Bond Spreads vs. Germany

Figure 1a: France

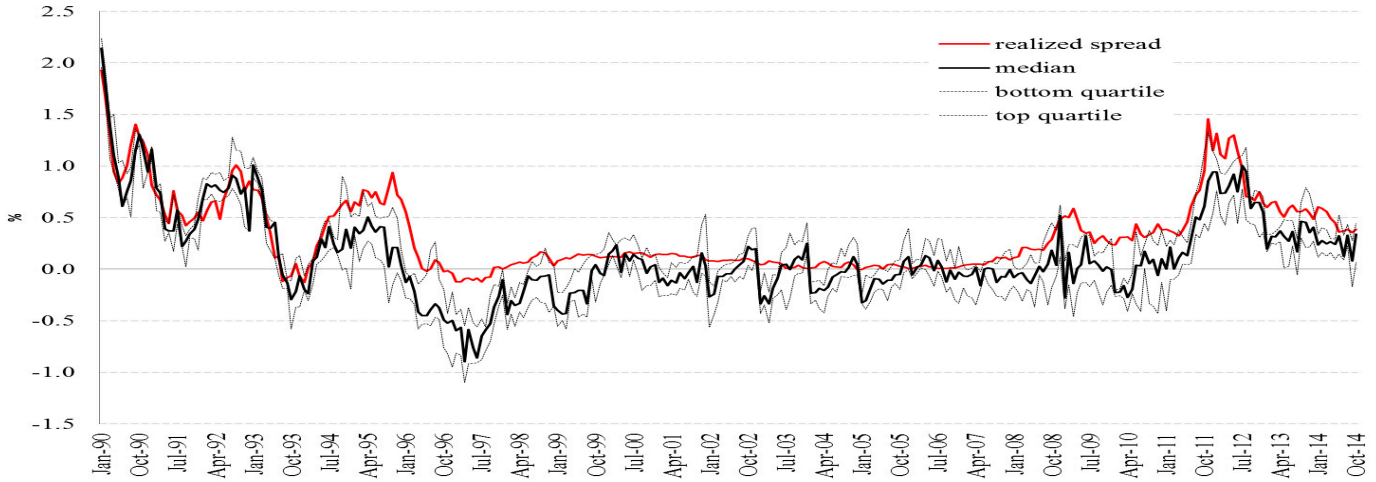


Figure 1b: Italy

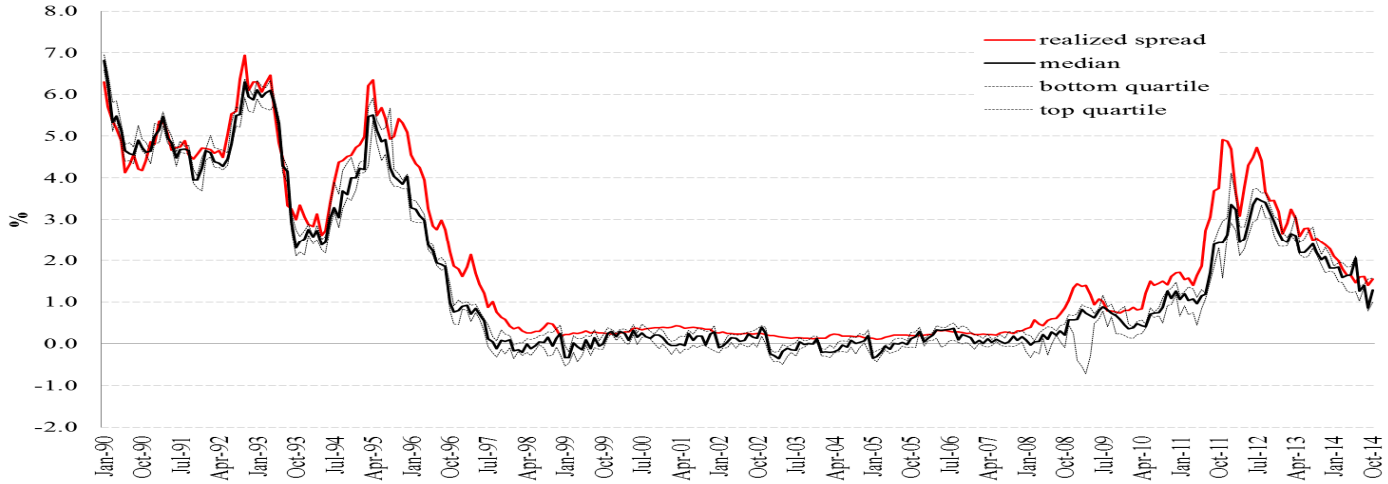
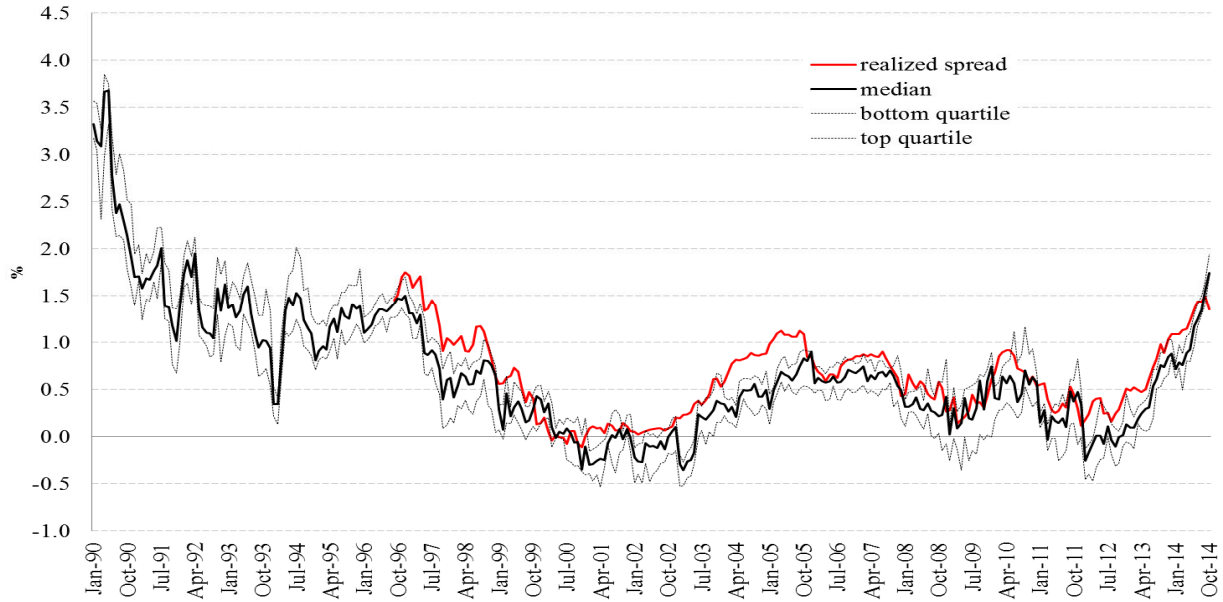


Figure 1c: United Kingdom



Source: CE dataset (forecast spreads) and Datastream (realized spreads).
Note: the figure shows the forecast for month m of year t+1, as expressed in month m of year t (black lines), together with realized series for month m of year t+1 (red line).

Figure 2. Realized Values and Market Forecast of Fiscal Balance (as percent of GDP)

Figure 2a: France

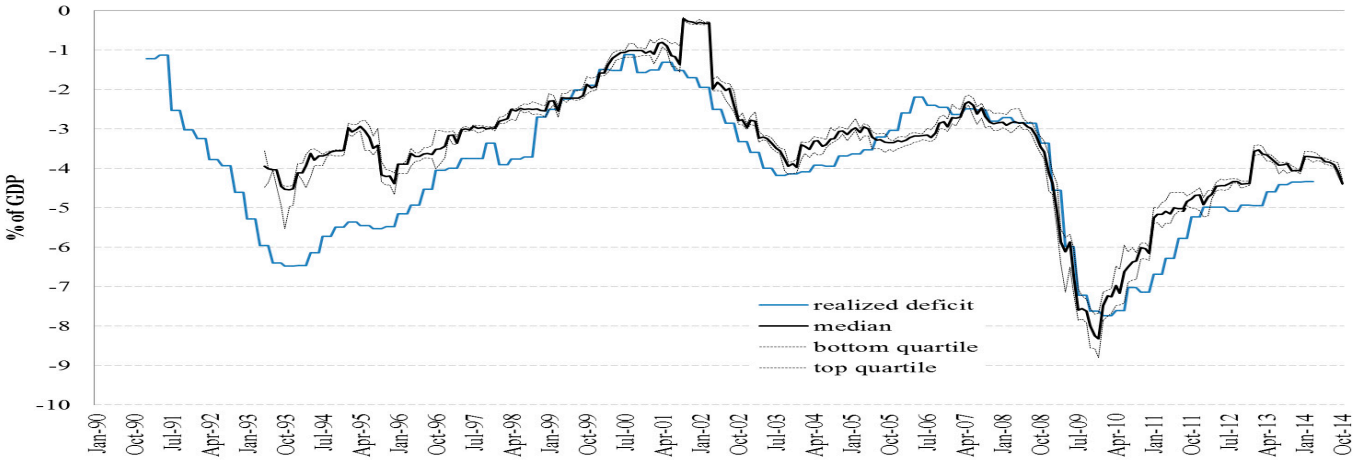


Figure 2b: Italy

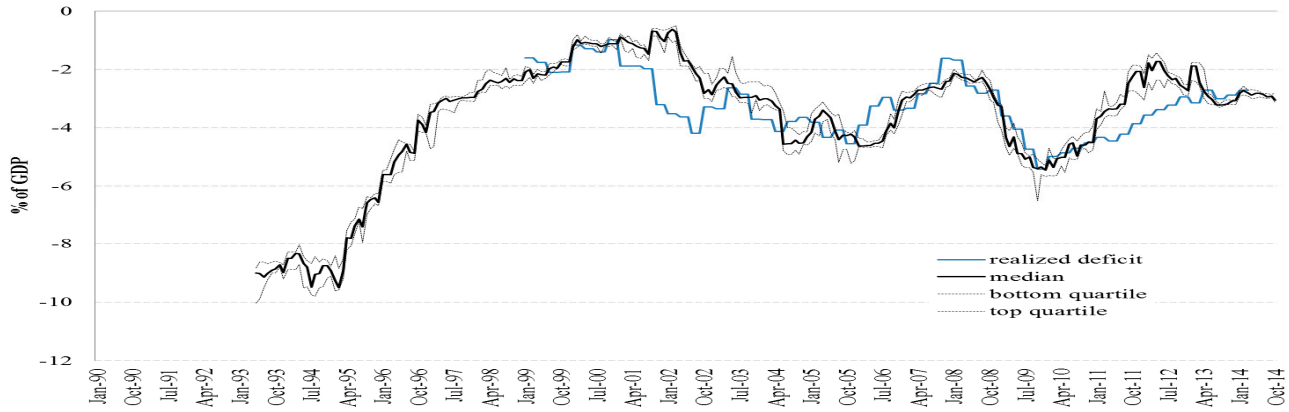
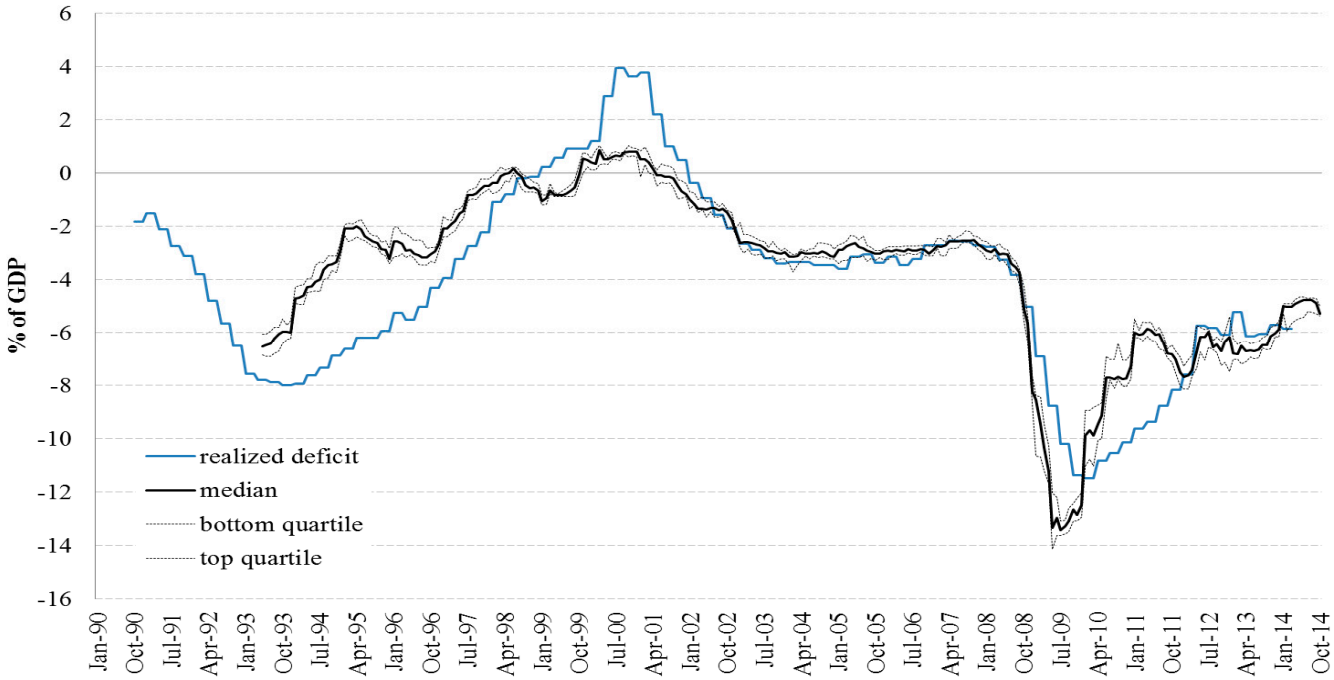


Figure 2c: United Kingdom



Source: CE dataset (government balance forecast) and Datastream (realized government balance).
Note: the figure shows the annualized government balance forecast for month m of year t+1, as expressed in month m and year t (black lines), together with realized quarterly values for quarter q (that includes month m) of year t+1 (blue line).

APPENDIX

A. Description of variables

Name	Description	source
Overall balance, forecast	Forecast for t and t+1 of nominal overall balance (in local currency)	Consensus Economics
Growth of GDP, forecast	Forecast for t and t+1 of GDP growth (in %)	
Inflation, forecast	Forecast for t and t+1 of GDP growth (in %)	
US long term rate, forecast	Forecast for t and t+1 of 10 year rate (in %)	
US short term rate, forecast	Forecast for t and t+1 of 3 month rate (in %)	
Government bond yield	Forecast for t and t+1 of 10 year rate (in %)	
AAA-BAA US corporate bonds	spread on risky corporate bonds (in %)	Datastream
Bid ask spread	Benchmark bond -10-year government benchmark bond yield, Ask price or primary activity, average of observations through period - Euro	ECB
Financial St Index	(in %)	IMF (Cardarelli et al., 2011)
realized spread	Spread between yield on 10 year government bond in country, relative to yield on 10 year German government bond (in %)	Datastream

B. Forecasters in Italy, France and the U.K.

Italy			France		
ISCO	Banca di Roma	Bank of America - Merrill	Elf Aquitaine	AXA Investment	Bank of America - Merrill
Fiat SpA	Banca Commerciale	Citigroup	Centre Prev l'Expansion	Banque D'Orsay	Citigroup
IRS	Credito Italiano	Deutsche Bank – Milan	EXANE	Banque Indosuez	Deutsche Bank France
Studi Finanziari	Istituto Bancario Italiano	Econ Intelligence Unit	GAMA	Banque Paribas	Econ Intelligence Unit
Prometeia	Euromobiliare	FAZ Institut	Gaz de France	Banque Populaire	FAZ Institut
ENI	Banca IMI	IHS Global Insight	OFCE	BFCE	IHS Global Insight
Centro Europa Ricerche	Banca Intesa	Goldman Sachs	INSEE	BIPE	Goldman Sachs
ISAE	Cariplo SpA	Chase Manhattan - Milan	IPECODE	BNP	ING Financial Markets
Ref.	RASFIN	ING Financial Markets	Total	BNP-Paribas	UBS
ref.irs	Cofiri SIM	UBS	Total Fina Elf	Caisse des Depots	HSBC France
	Caboto	HSBC		CDC IXIS	Salomon SB Citibank
	Banca Nzle del Lavoro	Salomon SB Citibank		COE – CCIP	Schroder SSB Citibank
	Capitalia	Schroder SSB Citibank		COE-Rexecode	JP Morgan Paris
	Intesa Sanpaolo	JP Morgan – Milan		Natixis Banque Populaire	Morgan Stanley
	IXIS CIB	Morgan Stanley		CPE	S G Warburg Bacot
	UniCredit			Crédit Agricole	Morgan Guaranty Paris
				Crédit Comm de France	
				Crédit Lyonnais	
				Crédit National	
				Rexecode	
				Société Générale	
				Nomura France	
				Oddo Securities	

	U.K.		
Cambridge Econometrics	ABN Amro Hoare Govett	James Capel	Bank of America
Beacon Econ Forecasting	Barclays Bank	Schroders	Citigroup
British Telecom	Williams de Broe	Kleinwort Benson	Chase Manhattan
Business Strategies	Barclays Capital	Lloyds Bank	Deutsche Bank
Capital Economics	Barclays de Zoete	UBS Phillips & Drew	Credit Suisse First Boston
City Univ Business School	Baring Brothers	UBS	Credit Suisse
Confed of British Industry	BNP Paribas	Lloyds TSB Group	Econ Intelligence Unit
ITEM Club	Citibank	Lloyds TSB Financial Markets	Global Insight
Economic Perspectives	County Nat West	Lombard Street Research	IHS Global Insight
Experian Business Strategies	Credit Lyonnais Secs	Yamaichi	Goldman Sachs
Imperial Chemical Inds	Deutsche Morgan Grenfell	Midland Bank	HSBC
Liverpool Macro Res.	Greenwell Montagu	Morgan Guaranty	ING Financial Markets
London Business School	Greenwich NatWest	UBS Warburg	JP Morgan
NIESR	Halifax Building Soc	National Westminster	Lehman Brothers
Oxford – LBS	Halifax PLC	NatWest Group	Merrill Lynch
Oxford Econ Forecasting	Société Générale	NatWest Markets	Morgan Stanley
Oxford Economics	Hambros Bank	Nomura Research Institute	Schroder SSB Citibank
	HBOS	Norwich Union	Salomon Brothers
	Henley Centre	Shearson Lehman	Salomon Smith Barney
	Hoare Govett	Panmure Gordon	
	West LB Panmure	RBC Dominion	
	Smith New Court	RBS Financial Markets	
	SGST Securities	Robert Fleming Secs	
	Industrial Bank of Japan	Royal Bank of Scotland	
	ING-Barings	S G Warburg	
	SBC Warburg	Salomon Brothers	

C. Calculation of the forecasted overall balance (as a ratio of GDP)

CE provides forecasts for the total deficit only in nominal values (local currency). Hence, we follow Heppke-Falk and Hüfner (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, since the CE 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 same-year real GDP (in levels), $E_{WEO,t}\left[y_{t,m}\right]$ f, by the year-ahead market (CE) forecasts for GDP *growth*, $E_{i,t,m}\left[growth_{t+1,m}\right]$, and inflation, $E_{i,t,m}\left[inflation_{t+1,m}\right]$, for each forecaster *i* at a particular month *m* of year *t*. The expected year-ahead nominal GDP value for each country is then

$$E_{i,t,m}\left[y_{t+1,m}\right] = E_{WEO,t}\left[y_{t,m}\right] \times \left(1 + E_{i,t,m}\left[growth_{t+1,m}\right] + E_{i,t,m}\left[inflation_{t+1,m}\right]\right).$$

The year-ahead expected overall balance for each country is then:

$$E_{i,t,m}\left[fiscal\_balance_{t+1,m}\right] = \frac{E_{i,t,m}\left[fiscal\_balance^{nom}_{t+1,m}\right]}{E_{i,t,m}\left[y_{t+1,m}\right]},$$

where $E_{i,t,m}\left[fiscal\_balance^{nom}_{t+1,m}\right]$ is the CE forecast of the nominal overall balance by forecaster *i* in month *m* of year *t* for one year-ahead *t+1*.

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