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Trust What You Hear:

Policy Communication, Expectations, and Fiscal Credibility

Nicolas End and Gee Hee Hong

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Trust What You Hear: Policy Communication, Expectations, and Fiscal Credibility

Prepared by Nicolas End and Gee Hee Hong*

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How do policy communications on future fiscal targets affect market expectations and beliefs about the future conduct of fiscal policy? In this paper, we develop indicators of fiscal credibility that quantify the degree to which policy announcements anchor expectations, based on the deviation of private expectations from official targets, for 41 countries. We find that policy announcements partly re-anchor expectations and that fiscal rules and strong fiscal institutions, as well as a good policy track record, contribute to magnifying this effect, thereby improving fiscal credibility. Conversely, empirical analysis suggests that markets reward credibility with more favorable sovereign financing conditions.

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WORKING PAPERS

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Prepared by Nicolas End and Gee Hee Hong[1]

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Glossary

AMSE	Aix-Marseille School of Economics
AR	Auto-regressive
CDS	Credit default swap
CEPR	Centre for Economic Policy Research
CPDS	Comparative Political dataset
DBP	Draft budgetary plans
ECB	European Central Bank
EU	European Union
FGLS	Feasible generalized least squares
GDP	Gross domestic product
IBI	Independent budgetary institution
IFES	International Foundation for Electoral Systems
IMF	International Monetary Fund
JEL	Journal of Economic Literature
MONA	IMF's Monitoring of Fund Arrangements
NBER	National Bureau of Economic Research
OBI	Open Budget Index
OBS	Open Budget Survey
OLS	Ordinary least squares
PBSs	Publications of pre-budget statements
PEFA	Public expenditure and financial accountability
PIMA	Public investment management assessment
RMSE	Root mean squared error
SCP	Stability and convergence plan
SGP	Stability and Growth Pact
SSRN	Social Science Research Network
WEO	IMF's World Economic Outlook
WUI	World uncertainty index

Executive summary

How do policy communications on future fiscal targets affect market expectations and beliefs about the future conduct of fiscal policy? This paper is about credibility and communication of fiscal policy. It investigates how effective policy communication can bolster a government's credibility and anchor expectations. Credibility is about having private agents trust that policymakers will deliver with respect to their mandate or stated objectives. In the fiscal realm, when *credible* governments announce fiscal strategy or targets, the public expects them not to deviate. Governments need to be perceived as committed to fiscal discipline through clear communication, demonstrating sufficient administrative capacity and political will. When the public sees the government as credible, in other words, *believes that the government will achieve its announced objectives as much as possible*, the difference between private expectations and official forecasts should be minimal.

We develop quantitative indicators of fiscal credibility, using the expectations of professional forecasters about the overall fiscal balance and analyzing how they deviate from the official targets announced by governments. We introduce three fiscal credibility indicators, *bias*, *skepticism* and *unanchoring*, to capture different aspects of the discrepancy between private and official expectations. Official announcements of new fiscal targets have an *anchoring effect*, as fiscal credibility improves on average by 0.2-0.4 percent of GDP when new targets are announced. However, the announcements are met with skepticism. By comparing growth projections, we find that disagreements about the macroeconomic outlook are not as important for fiscal credibility as one could have expected.

The strength, in terms of size and speed, of the anchoring effect of policy announcements depends on the institutional framework and past fiscal performances. Fiscal rules, which refer to lasting numerical constraints on budget aggregates, and strong fiscal frameworks, help fiscal credibility by reducing the discrepancy between professional and official forecasts and disagreement among private forecasts. Fiscal slippages and downward revisions to fiscal targets worsen credibility, confirming that credibility is based on reputations built over time; credibility is gained when governments strive to commit to their fiscal plans, and erodes when fiscal actions are insufficient to deliver on these plans. In turn, we find that improved fiscal credibility is rewarded with lower borrowing costs, highlighting that governments should strive to hone their credibility.

1 Introduction

Political leaders know the value of communication. Communication is crucial, especially as it provides direction and alleviates uncertainty: "The only limits to our realization of tomorrow are our doubts of today" (F.D. Roosevelt). Thus, communication on the direction of economic policy shapes economic agents' expectations, hence economic decisions (Mankiw, Reis, and Wolfers, 2003; Coibion and Gorodnichenko, 2015). In an economic system with dispersed information, economic agents may anticipate a variety of paths for future policies. To steer private agents' beliefs and reduce disagreement, credible communication by policymakers about their views and intentions is key (Morris and Shin, 2002). As former Fed chairman J. Yellen once said "In government institutions and in teaching, you need to inspire confidence. To achieve credibility, you have to very clearly explain what you are doing and why." Communication and credibility go in tandem.

This paper is about credibility and the communication of fiscal policy. It shows how effective policy communication can bolster a government's credibility and anchor expectations. Credibility refers to the extent to which private agents trust that policymakers will deliver on their mandate or stated objectives. In the realm of fiscal policy, when *credible* governments announce fiscal strategy or targets, the public expects these to be achieved. The quality of fiscal projection—the realism of macroeconomic and fiscal assumptions, the feasibility of the policies—matters (Frankel and Schreger, 2012; Schick, 2008). But there is also a more subjective element to it. Governments need to be perceived as committed to fiscal discipline through clear communication, demonstrating sufficient administrative capacity and political will. When the public sees the government as credible, in other words, *believes that the government will achieve its announced objectives*, the difference between private expectations and official forecasts should be minimal.

We translate the concept of fiscal credibility into quantitative indicators. Using professional forecasters' projections on fiscal variables and official documents containing fiscal projections, we propose indicators of fiscal credibility derived from the deviation of private forecasts on future fiscal balances from officially announced fiscal projections. While policy communications on fiscal policies take various forms, we focus on budget documents and multi-year fiscal plans as these are the primary documents that lay out government's fiscal priorities. In particular, we introduce three fiscal credibility indicators, *bias*, *skepticism* and *unanchoring*, which capture different aspects of the discrepancy between private and official expectations. We are also able to break down credibility

between disagreements about macroeconomic forecasts and expectations of policy slippages. We find that growth disagreements are not as important for fiscal credibility as one could think, given the literature on optimism biases in official projections (Frankel and Schreger, 2012).

We find that official announcements of new fiscal targets have an *anchoring effect*, as fiscal credibility improves on average by 0.2-0.4 percent of GDP when new targets are announced. However, announcements are met with skepticism - only 10 percent of the unexpected component of the new targets is immediately incorporated into private forecasts, and less than half is eventually incorporated into market beliefs. These findings are consistent with the existence of informational rigidities (Coibion and Gorodnichenko, 2012; Ricco, Callegari, and Cimadomo, 2016).

We investigate a set of variables that may improve or deteriorate fiscal credibility, by looking at the behaviors of fiscal credibility indicators around the months when new fiscal targets are announced. Focusing on the months of official announcements has the following advantages. First, it filters out the fact that public and private forecasts are not updated at the same frequency. While official targets are updated only for annual budgets or mid-year budget revisions, private forecasters update their fiscal forecasts more often, so that a discrepancy in expectations in-between two successive official announcements may reflect the evolving set of available information about macroeconomic and political developments as much as fiscal credibility. Hence, times of release of new fiscal targets are when credibility is best captured by our indicators based on expectations and forecast disagreement.[1] Second, this approach allows us to quantify fiscal credibility through the anchoring effect of announcements. The more credible the government, the stronger the anchoring effect should be—private forecasts should move closer to official targets and disagreements around official targets should decrease. Focusing on the *change* in credibility upon announcements rather than its *level* also helps alleviate omitted variable concerns and establish the causality of some key credibility factors.

We find that the strength, in terms of size and speed, of the anchoring effect of policy announcements depends on the institutional framework and past fiscal performances. To achieve a causal interpretation, we first construct a novel measure of fiscal news as the difference between the new target and what private forecasts expected a month before it was announced. Fiscal rules, which refer to lasting numerical constraints on budget aggregates, and strong fiscal frameworks help

[1] Later on, other factors might influence private forecasts, which are not necessarily related to fiscal credibility (even though one could argue that credibility should anchor expectations independently of shocks).

fiscal credibility overall, by reducing the discrepancy between professional and official forecasts and disagreement among private forecasts. But all rules and institutional designs do not have the same impact; budget deficit rules have a stronger effect as in Lledó et al. (2018), as they directly target the fiscal balance which is closely linked to our fiscal credibility indicators. Fiscal slippages and downward revisions to fiscal targets worsen credibility, confirming that credibility is based on reputations built over time; credibility is gained when governments strive to commit to their fiscal plans and erodes when fiscal actions are not commensurate with what they promised to deliver (Clark, 2011).

In turn, we find that improved fiscal credibility is rewarded with lower borrowing costs—highlighting that governments should strive to hone their credibility. Figure 1 shows that countries with high fiscal credibility enjoy sovereign yields on average 70 basis points lower than less credible governments. Further, the anchoring effect of their policy announcements is rewarded with a sizable decrease in financing costs, while there is no such material change in sovereign yields for low credibility countries. In annex A, we provide a more rigorous empirical analysis of the market rewards associated with fiscal credibility, expanding on End (2020). More broadly, the literature has long found that excessive optimism by policymakers leads to inferior fiscal and growth outcomes (Larch, Malzubris, and Busse, 2021; Baqir, Ramcharan, and Sahay, 2005; Frankel, 2011).

In monetary policy, the principle of policy credibility is rooted in the expectation channel, which is widely studied and well understood, even for fairly recent unconventional monetary policies such as forward guidance (Del Negro, Giannoni, and Patterson, 2012; McKay, Nakamura, and Steinsson, 2016). While a similar expectation channel should also be relevant for fiscal policy, less is known about it. Recent studies emphasize the importance of anchoring fiscal expectations, arguing that credibly anchoring the market's expectations on fiscal policy should improve the effectiveness of macroeconomic policies (Leeper, 2009) by reducing the risk premium and facilitating fiscal solvency (Bi, Leeper, and Leith, 2012; Cimadomo, Claeys, and Poplawski-Ribiero, 2016). Studies also show that expectations for future fiscal policy affect economic decisions (Gbohoui, 2019; D'Acunto, Hoang, and Weber, 2018). However, these studies are mostly theoretical contributions and quantitative indicators of fiscal credibility are not well studied.

This paper is an extension of the analysis initiated in End (2020). First, it expands country coverage to include non-European countries. This paper is the first to our knowledge to provide

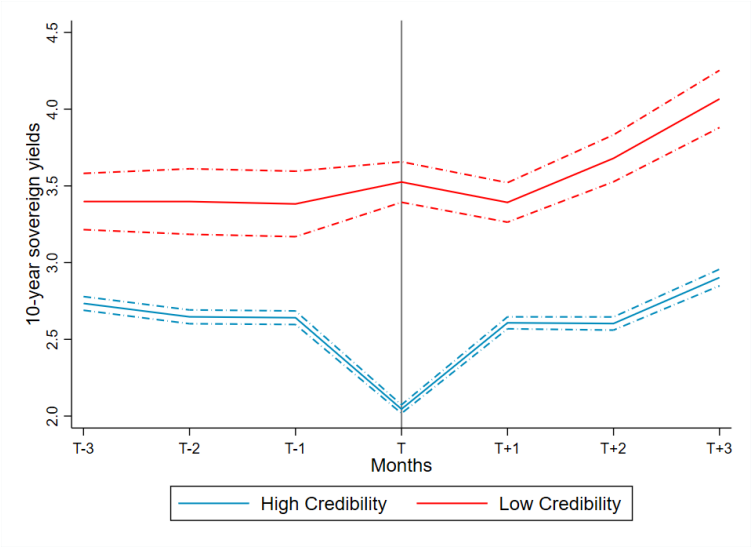


Figure 1. *10-year Sovereign Yields around the Time of Budget Announcement (T)*

Note: X-axis denotes months before and after the release of new fiscal targets ($T = 0$). Y-axis refers to the average 10-year sovereign yields for *high-credibility* and *low-credibility* countries. High-credibility (low-credibility) countries refer to the countries whose average improvement in the *Bias* indicator in month T relative to T-1 is larger than the 75th percentile value (smaller than the 25th percentile value). The dotted lines represent the 68 percent confidence band.

a measure of fiscal credibility across a large sample of countries that includes emerging markets, allowing for a deeper analysis of the drivers of credibility. Second, we develop a new summary measure of credibility that combines information about the level of disagreement across forecasters and their average skepticism *vis-à-vis* official targets. Third, this paper deepens the analysis on the role of policy announcements and communication, thereby shedding light on the expectation formation process. It describes the response of professional forecasts to the announcement of new fiscal targets and links fiscal credibility to the effectiveness of policy communications to *convince* private forecasters.

The literature on government's creditworthiness and budget credibility tends to ignore the role of expectations created by policy and communications. We posit instead that governments should actively seek to convince agents, as credible governments better anchor expectations, which is conducive to better macro-fiscal outcomes, especially where fiscal policy is an important source of uncertainty (Baker, Bloom, and Davis, 2016; Fatás and Mihov, 2007; Bi, Leeper, and Leith, 2012; Corsetti, André, and Müller, 2012). Fiscal rules and strong fiscal frameworks have been shown to provide fiscal discipline and enhance fiscal predictability, as they are positively correlated with smaller deficits (Debrun et al., 2008; Bergman, Hutchison, and Jensen, 2016). However, the

causal relationship from fiscal rules and fiscal frameworks to outcomes is harder to establish, as the adoption of the former is highly likely to be endogenous. Recent studies made strides in this direction, for instance, using instrumental variables (Badinger and Reuter, 2017; Caselli and Reynaud, 2020).

Budget projections have been used in the literature that use forecast errors to construct shocks to government spending (Auerbach, 1999; Frankel and Schreger, 2012; Furceri et al., 2018; Hadzi-Vaskov et al., 2021). The gap between budgets and actual fiscal outcomes also fueled studies on budget predictability (Jena and Sikdar, 2019; Sarr, 2015; Pérez Quirós, Pérez, and Paredes, 2015), as well as metrics of the quality of budget institutions.[2] A literature on fiscal foresight has utilized the impact of fiscal announcements on expectations and behaviors, focusing on the lag between a policy decision and its implementation (Forni and Gambetti, 2010; Leeper, Walker, and Yang, 2013; Forni and Gambetti, 2016). An implicit assumption in the literature has been that the announcements are credible enough. Our finding that not all governments are able to anchor private expectations confirms that the effectiveness of government announcements depends on signals (the informational content), rather than noise (Fève and Pietrunti, 2016). Finally, we contribute to a relatively under-explored but growing literature on making use of private forecasts of fiscal balance (An et al., 2018; Ricco, Callegari, and Cimadomo, 2016).

Our paper is structured as follows. In section 2, we present the proposed indicators of fiscal credibility. In section 3, the anchoring effects of new official targets are examined using a novel measure of fiscal news. In section 4, using event studies and cross-country panel regressions, we explore the institutional frameworks and circumstances under which fiscal credibility improves or deteriorates upon the announcements of new targets. Finally, we venture some policy conclusions in section 5.

[2] Such as the Public expenditure and financial accountability (PEFA) and the Public investment management assessment (PIMA) frameworks (both co-developed by the IMF).

2 Indicators of fiscal credibility

2.1 Definition

Fiscal credibility can be defined as the extent to which economic agents expect the government to try and fulfill its fiscal policy commitments, at least within a reasonable margin of error and with a certain likelihood. This covers two aspects: the intention *and* ability to achieve targets.[3] This paper's scope is on the credibility of budgets, and therefore it focuses on the anchoring of expectations around government fiscal targets.

There are many reasons why private expectations may differ from government announcements and from one another. First, by contrast with monetary policy, fiscal policy has many objectives, which are also less clearly spelled out and prioritized (Musgrave, 1959). This leads to uncertainty about government intentions. Absent a clear normative benchmark for what fiscal policy should be, agents are likely to have diverging views. In this paper, we focus on the views of educated agents—professional forecasters—on fiscal balance, which is the most visible headline indicator of fiscal policy.

Second, agents may expect governments not to keep their promises. If stated policy objectives appear unsustainable or unrealistic, markets and other observers would not expect them to materialize. Typically, agents would look at the track record of policy slippages to assess the likelihood of current targets to be reached or breached. Moreover, and somewhat independently of the actual track record, governments might have acquired, because of their communication or political agenda, a certain reputation (*e.g.*, a preference for austerity or profligacy), which in turn would affect expectations.

Third, agents may consider that they have access to better information or forecasting tools than governments. Privileged information could, for instance, come from proprietary market data. Compared with markets, governments are often expected to have a longer time horizon, and tend to be more optimistic. Disagreements about parameters underpinning the budget, such as the

[3] In the context of the credibility of an exchange rate regime, Obstfeld (1991) and Drazen and Masson (1994) consider credibility only as the ability of policymakers to sustain a peg. Obstfeld and Taylor (2003) studies credibility as countries' past decisions on gold standard adherence.

macroeconomic environment or commodity prices, are common and could stem from diverging assessments of both the current situation and the distribution of risks.

Fiscal credibility relates also to the effectiveness of government's signaling. In the complex process of expectation formation, private forecasters face many informational imperfections and asymmetries—that is why there is disagreement among them (Andrade and Le Bihan, 2013; Coibion and Gorodnichenko, 2012). Forecast disagreement can be seen as the result of a Bayesian learning process in the midst of noisy information (Lahiri and Sheng, 2010; Ricco, Callegari, and Cimadomo, 2016). In this context, private agents must decide how much to weigh government announcements (signal or noise), knowing that they are engaged with the government in a principal-agent relationship and that the government might have incentives to disclose only partial, biased information.

A credible government succeeds in anchoring private beliefs around official targets when its communications dominate other potential sources of information and private forecasts put more weight on information from the government than from other sources. We expand in this paper the methodology first proposed by End (2020) and focus on the difference between private forecasters' expectations and official policy targets in terms of the fiscal balance b expected at time t for country i for the forecast horizon h: $\delta^{(h)}_{i,t,f} \equiv \mathbb{E}^f_t b^{(h)}_{i,t} - \mathbb{E}^o_t b^{(h)}_{i,t}$. [4] Namely, we consider three complementary indicators of credibility, all concurring to measuring the anchoring of private expectations.

First, we look at the government's forecast bias, as perceived by investors and markets. We compute the average, across the set of forecasters $\mathcal{F}$, of the relative difference between private forecasts and official targets. By convention, it is negative when on average private investors foresee a larger deficit than the government (which is the case in about 70 percent of our sample). The **perceived bias** of country i at time t is defined as follows:[5]

$$Bias^{(h)}_{i,t} \equiv \left\langle \delta^{(h)}_{i,t,f} \right\rangle_{f \in \mathcal{F}} = \mathbb{E}^p_t b^{(h)}_{i,t} - \mathbb{E}^o_t b^{(h)}_{i,t} \tag{1}$$

[4] In this paper, superscripts f, p, and o stand respectively for forecasts by an individual forecaster f, average private forecasters, and official documents; $b^{(h)}_{i,t}$ is the fiscal balance h years after t. $\mathbb{E}_t X$ is the expectation or forecast at time t of the random variable X and $\left\langle X_j \right\rangle_{j \in J}$ is the unweighted geometric average of X when j describes the value set J.

[5] The number of forecasters varies across time and countries.

The bias measure is implicitly treating differently government's (perceived) optimism and pessimism. Yet, if credibility is about anchoring expectations, it means private agents should be neither more bullish nor more bearish than governments. Likewise, central bankers want expectations to hover around their inflation target, not systematically below. In fact, whether it is better for markets to expect more or less deficit than governments depends on the context. While governments undertaking fiscal consolidation may prefer to have private expectations above their fiscal balance target (to ensure cheaper financing costs), governments embarking on a fiscal stimulus may on the contrary want agents to believe that the money will actually be spent to maximize Keynesian effects.[6] Accordingly, our second indicator is the average **skepticism**, computed as the absolute discrepancy between government and market forecasts:

$$Skept_{i,t}^{(h)} \equiv \left| Bias_{i,t}^{(h)} \right| \equiv \left| \mathbb{E}_t^p b_{i,t}^{(h)} - \mathbb{E}_t^o b_{i,t}^{(h)} \right| \tag{2}$$

Third, by virtue of anchoring expectations, credibility should also be associated with less dispersion among private forecasts (Capistrán and Ramos-Francia, 2010; Dovern, Fritsche, and Slacalek, 2012). Hence, we examine the dispersion of private forecasts around official government targets, or **unanchoring**:[7]

$$Unanc_{i,t}^{(h)} \equiv \sqrt{\left\langle \left[\delta_{i,t,f}^{(h)} \right]^2 \right\rangle_{f \in \mathcal{F}}} \tag{3}$$

While the dispersion of private forecast has been interpreted as intrinsic forecast uncertainty in previous studies (Lahiri and Sheng, 2010; Dovern, Fritsche, and Slacalek, 2012; Ricco, Callegari, and Cimadomo, 2016; Montes, da Fonseca Nicolay, and Acar, 2019), our interpretation is slightly different as we link disagreements to the credibility of policy announcements. The intuition is that private forecasters have different priors about the relevance of available information (Lahiri and Sheng, 2010; Andrade and Le Bihan, 2013). In turn, private agents must decide how to process government announcements as one piece of information. A credible government should dominate

[6] This is a typical issue for emerging and developing economies, where public financial management systems are often not effective enough to spend fully non-recurrent budget allocations (*e.g.*, investment projects or COVID-19-related spending).

[7] This definition is inspired by the forecast error literature that routinely complements mean error measures with root-mean-squared error (RMSE). *Unanc* is not strictly speaking an RMSE, since we are not comparing private forecasts to an actual outcome, but we see it as a convincing way to combine information from the mean and the dispersion.

other potential sources of information and should anchor private forecasts. The more credible the government, the more expectations should converge. [8]

Our measures implicitly include two components: disagreements about the macroeconomic environment and disagreements about budget aggregates given macroeconomic assumptions. A credible government should be able to convince the private sector that it will reach its targets, independently of transitory shocks or cyclical developments. We nonetheless compute **cyclically-adjusted indicators**, as a robustness check. To do so, we replace in equations (1), (2), and (3) the difference between fiscal balance forecasts $\delta_{i,t,f}^{(h)}$ by a cyclically-adjusted version $\delta_{i,t,f}^{*(h)} \equiv \delta_{i,t,f}^{(h)} - \eta_i \sum_{\ell=0}^{h} \left(\mathbb{E}_t^f \gamma_{i,t}^{(\ell)} - \mathbb{E}_t^o \gamma_{i,t}^{(\ell)} \right)$ based on the divergence in views about growth forecasts $\mathbb{E}_t \gamma^{(\ell)}$ and the country-specific elasticity η_i of the fiscal balance to the output gap (End, 2020). The cyclically-adjusted versions of $Bias$, $Skept$, and $Unanc$ will be denoted with a star ($Bias^*$, $Skept^*$, and $Unanc^*$).[9]

While budgets today often provide a medium-term outlook for the main fiscal variables, private forecasters usually adopt a shorter time horizon—current and next years. For this reason, we focus on $h \in \{0, 1\}$; in other words, $b_{i,t}^{(0)}$ and $b_{i,t}^{(1)}$ denote the current and next years. We focus on *calendar* years, to increase comparability across countries. When necessary, we interpolate linearly fiscal year data into calendar years.

To minimize discontinuities in the time series, we build fixed-horizon measures *à la* Dovern, Fritsche, and Slacalek (2012). At the start of each fiscal year, there is suddenly more uncertainty about current and next year fiscal balances (12 more months enter the forecasting horizon), so that indicators focusing on current or next year forecasts could exhibit jumps. To avoid this as well as the effect of asynchronous budget cycles across our country panel, we develop a proxy for **one-year-ahead forecasts** (denoted with $h = \perp$), namely a weighted average of current and next year forecasts:[10]

$$b_{i,t}^{(\perp)} \equiv \frac{(12 - m(t))b_{i,t}^{(0)} + m(t)b_{i,t}^{(1)}}{12} \tag{4}$$

[8] From the government's perspective, the challenge is therefore to build reputation under imperfect information (as in Backus and Driffill (1985)). As such, our approach also has some contiguity with articles on fiscal forward guidance (Fujiwara and Waki, 2017).

[9] On top of such cyclical adjustment, it could be desirable to also filter out disagreements about other forecasting assumptions, such as commodity prices, which play an important role in some countries.

[10] $m(t) \in 1, \cdots, 12$ stands for the calendar month of date t.

2.2 Data

For government plans, we collect data from official sources, compiling fiscal balance objectives and their underlying growth forecasts as presented in budget documents, including mid-year budget reviews or revised budgets (Hadzi-Vaskov et al., 2021). Moreover, for countries in the European Union (EU), we use stability and convergence plans (SCPs) and draft budgetary plans (DBPs). These various budgetary plans provide objectives rather than forecasts, akin to a central bank's inflation objective (except that they are more frequently redefined). They rely on certain macroeconomic forecasts; they incorporate some policy buffers so that governments can in theory adjust to shocks without missing their budgetary targets. We also incorporate program targets for those countries that underwent an IMF-supported program. The sources for each country are listed in appendix Table B.1. When possible, we derive from these sources the medium-term adjustment planned by the government as it enables us to assess the pace of announced fiscal adjustments.

For private forecasts, the *Consensus Economics* constitute our main data source. Each month since 1989, this organization polls more than 700 non-governmental economists for their macroeconomic forecast. The poll covers the key macroeconomic and financial variables for the current and the next years for 43 countries. The so-called *Consensus forecast* is the unweighted, arithmetic average of each respondent's forecast; it is considered to reflect well market expectations, as many respondents belong to financial institutions (D'Agostino and Ehrmann, 2014). Consensus fiscal forecasts have rarely been used in the literature, compared with macroeconomic variables such as growth and inflation (Dovern, Fritsche, and Slacalek, 2012), possibly because data coverage is more uneven. For some countries, Consensus Economics provides fiscal balance forecasts in nominal terms rather than a ratio of GDP; [11] in such instances, as the data set does not comprise a nominal GDP forecast, we approximate it by assuming that: (1) the government and the market always share a common estimate of what nominal GDP was in the preceding year—given by the contemporaneous IMF's World Economic Outlook (WEO) forecast; (2) and private forecasters consider that GDP deflators grow at the same rate as consumer price indices.[12] We also complement the Consensus Economics

[11] The Consensus Economics provides fiscal balances in nominal terms and fiscal years for 16 countries out of 41 in our sample, while real GDP growth rate is projected in calendar year.

[12] In other words, we infer recursively the Consensus' nominal GDP forecast, starting with $\mathbb{E}_t^p Y_{i,t-1} = Y_{i,t-1}\big|_{\text{WEO}_t}$ and chaining:

$$\mathbb{E}_t^p Y_{i,t+h} = (1 + \mathbb{E}_t^p g_{i,t+h})(1 + \mathbb{E}_t^p \pi_{i,t+h})\mathbb{E}_t^p Y_{i,t+h-1}$$

Then, we linearly interpolate fiscal year GDP, as necessary.

data with market forecast data compiled by Bloomberg.[13] The resulting coverage is available in appendix Table B.2. For the econometric work, we compile a variety of data including fiscal institutions, fiscal councils, budget transparency as well as market data on sovereign yields and CDS spreads (Table B.3).

Figure 2 compares official fiscal targets as reported in budget documents and the mean expectation across professional forecasters for Australia and Spain. The difference between the two varies over time, with a wider gap during economic downturns, most apparently during the Great Recession and the COVID-19 pandemic as well as the dot-com crash in the early 2000s. Divergence of views and timing differences between official and private forecasts may explain this observation. In Spain, official forecasts are persistently higher (or more optimistic) than private forecasts regardless of the economic cycle, suggesting that there are also structural factors responsible for the gap (Frankel and Schreger, 2012).

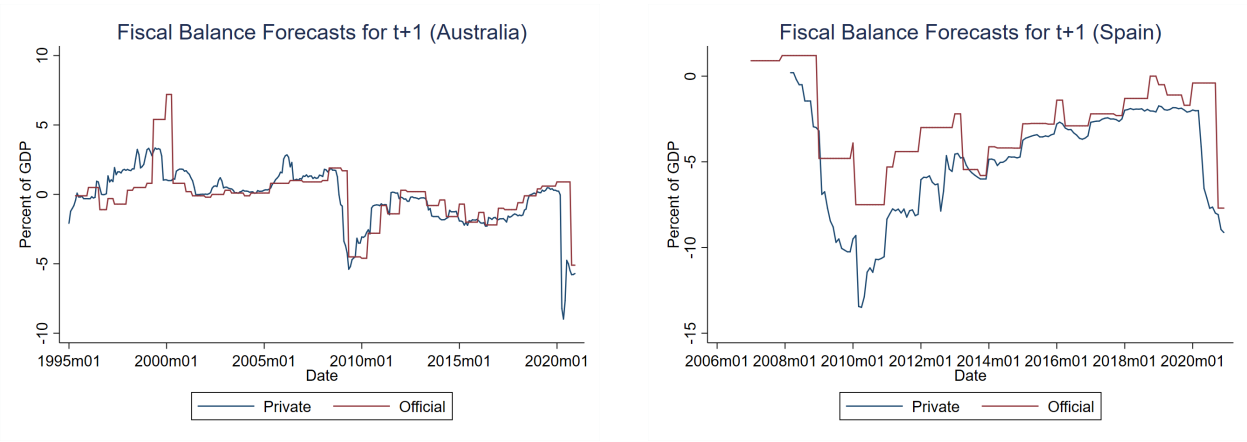


Figure 2. *Fiscal Balance Forecasts: Private vs. Official Forecasts*

Whose forecast is the most reliable? Figure 3 suggests that governments make larger fiscal forecast errors than private forecasts. The average difference between official and private forecast errors is about 0.5 percent of GDP, which is relatively mild. However, this masks a significant distribution of forecast errors, where about a quarter of observations where forecast errors of official projections were larger than those of private forecasts. The difference even exceeded 1 percent of GDP, confirming again the over-optimism of official forecasts (Frankel and Schreger, 2012).

[13] As a data compilation rule, we give precedence to Consensus Economics, which generally polls more forecasters than Bloomberg and conveniently discloses individual forecasts, which we use to compute the dispersion indicator *Unanc*.

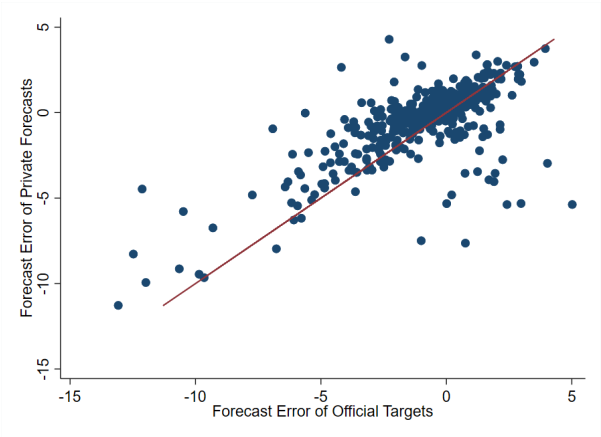


Figure 3. *Forecast Errors: Government vs. Private (in percent of* GDP*)*

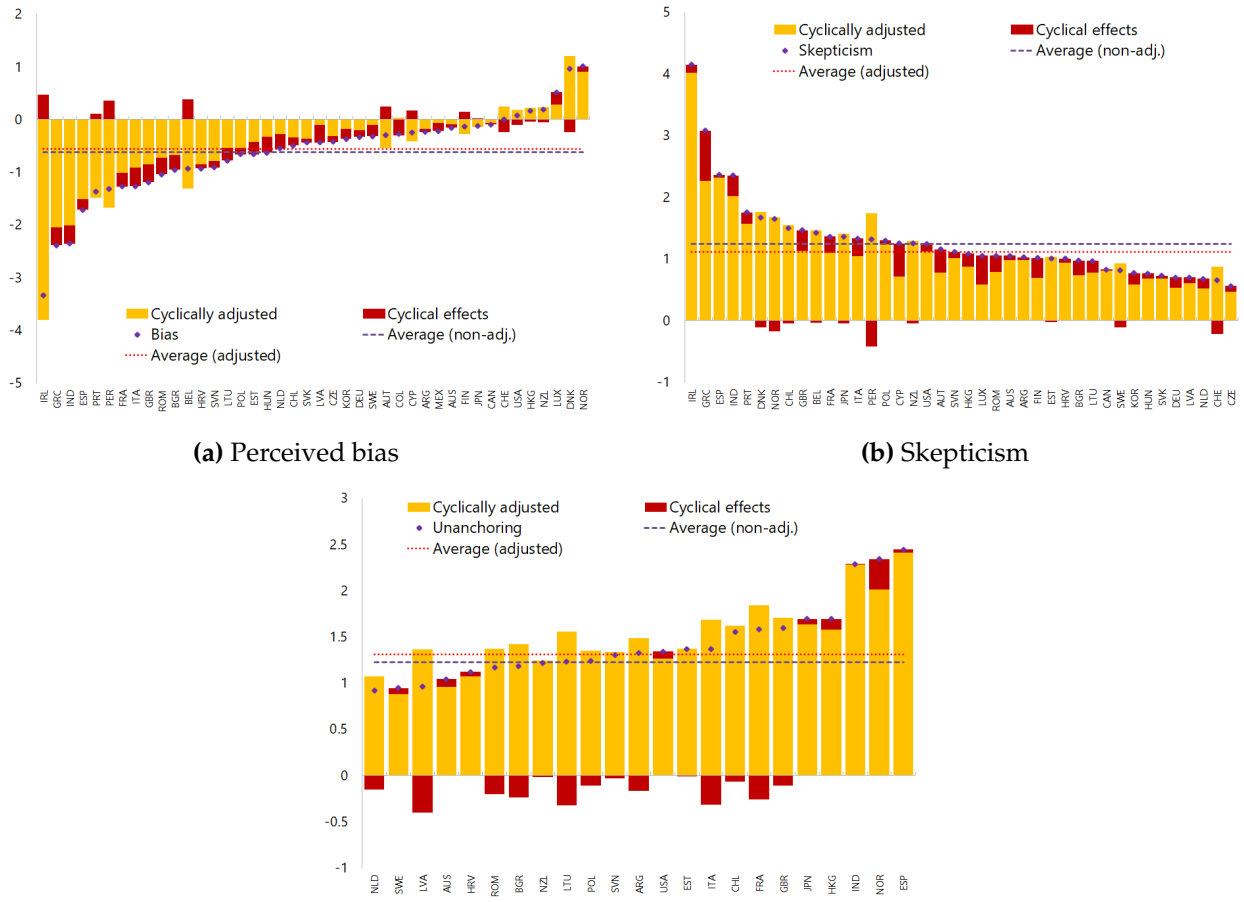
Note: X-axis represents forecast errors of one-year ahead fiscal balance by official projections calculated as the difference between one-year ahead (t+1) fiscal balance of official projections at t-1 and actual fiscal balance at time t. Y-axis represents forecast errors by private forecasters for fiscal balance projections for the same projection horizon. Red-line is a 45-degree line.

2.3 Stylized characteristics of fiscal credibility

Our indicators of fiscal credibility exhibit important cross-country heterogeneity. First, the perceived bias is often negative, ranging between -2.0 and +0.5 percent of GDP (Figure 4a). This means that for most countries, market forecasts tend to be more conservative (or pessimistic) than governments on average, consistent with the findings from Frankel and Schreger (2012) and End (2020). This bias could also arise through the expectation that most governments eventually prepare revised or supplementary budgets. Yet, a small number of countries exhibit a positive average bias. Second, the cross-country average of the skepticism indicator (not cyclically adjusted) hovers around an average of 0.8 percent of GDP and ranges from 0.2 to 2.0 percent of GDP (Figure 4b). Given that the actual fiscal balance lies within the $[-12;\ +12]$ percent of GDP interval, the average value of this indicator may seem marginal; however, it is large compared with the typical size of an annual fiscal adjustment. Third, disagreement among private forecasters *Unanc* is on average 1 percent of GDP (Figure 4c). Pairwise correlations between the three credibility indicators are relatively high at 0.8–0.9, even though time-series variations are not negligible.

Our indicators capture more than sheer disagreements about macroeconomic assumptions. Admittedly, professional forecasts may differ from official targets for many reasons; private agents may disagree with the government about the realism of growth or inflation projections, or about

the realism of public revenue and expenditure forecasts, or, more fundamentally, about the government's willingness to stick to plan. Our cyclically-adjusted credibility indicators filter out the cyclical effects—the red bars in Figure 4—, thus proxying credibility for given macroeconomic assumptions. They reflect expectations of policy slippages and trust in budget controls. Cyclical effects explain a minor share of the average *Bias* and *Unanc* indicators, implying that expectation gaps are mostly driven by divergent views on fiscal projections rather than growth. Cyclically-adjusted *Bias** has a higher (or a less negative) value than non-adjusted *Bias* for most countries, implying that diverging perceptions on the cyclical position widens the perceived government bias. By contrast, *Skept* is higher than *Skept** for some countries, but lower for others.



(a) Perceived bias

(b) Skepticism

(c) Unanchoring

Figure 4. *Fiscal Credibility Indicators: Country Averages*

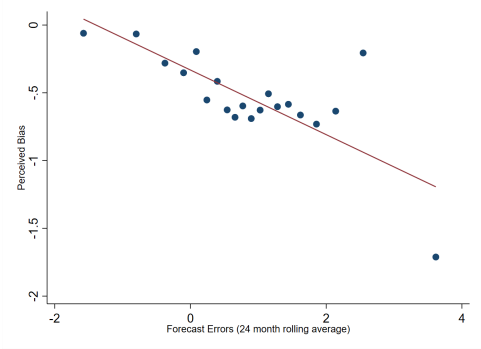
Note: The dotted lines represent the mean value of each indicators, averaged across countries over time. For the unanchoring indicator, since Bloomberg provides only the mean forecast and not the dispersion, the sample is somewhat reduced. Japan, as an outlier, is excluded.

A fair portion of time-series variation can be explained by the current macroeconomic conditions and fiscal stance, as they are correlated with fiscal credibility (Appendix Figure D.1). Official targets tend to be more credible when real GDP growth has been high, although the correlation becomes weaker when cyclically-adjusted bias is used instead, suggesting that our cyclical adjustment meaningfully controls for macroeconomic fluctuations. When government debt-to-GDP level is higher, fiscal credibility tends to worsen, as suggested by the negative correlation. At the same time, professional forecasters tend to penalize governments that indulge in large fiscal deficits.

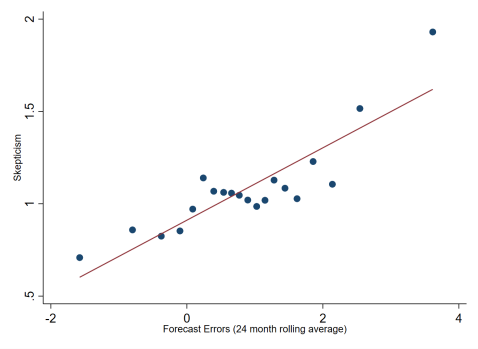
Finally, our credibility measures strongly correlate with past forecast performance. Figure 5 shows that countries with higher forecast errors exhibit lower fiscal credibility for all three indicators. Table C.1 separates forecast errors by sign with positive forecast errors representing fiscal slippages while negative forecast errors representing over-performance of actual fiscal outcomes compared to the previous year's projection. Columns (1)–(3) represent results using non-cyclically-adjusted indicators, while columns (4)–(6) use cyclically-adjusted indicators. Our results show that making forecast errors, in either direction, worsens fiscal credibility, but in a non-linear manner. An over-performance of fiscal outcome (*i.e.*, a decrease in Err_{-}) by one percentage point of GDP leads to a deterioration of *Bias* by 0.26 percentage point of GDP, while a fiscal slippage (an increase in Err_{+}) by one percentage point of GDP lowers *Bias* by 0.39 percentage point of GDP. This non-linear correlation between forecast errors and fiscal credibility is confirmed for all indicators.

3 Announcements, surprises, and anchoring

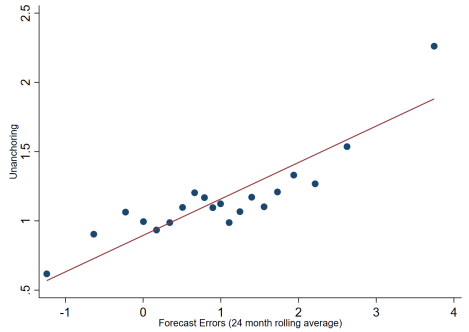
In this section, we study further how the communication of fiscal policy targets influences private expectations. Our working hypothesis is that private forecasters observe and assess such communication as budget documents and multiyear fiscal plans (including plans prepared for supranational entities, such as IMF programs or EU surveillance), and reflect them in their own forecasts. However, because of information rigidities and partial trust in the government, private forecasts cannot be expected to immediately follow the government's signal. We first document how credibility behaves around the time of policy announcements. Then, we extract the unexpected component of these announcements and use this novel measure of fiscal surprises to quantify how much and how fast these policy changes diffuse through expectations over time.



(a) Perceived bias



(b) Skepticism

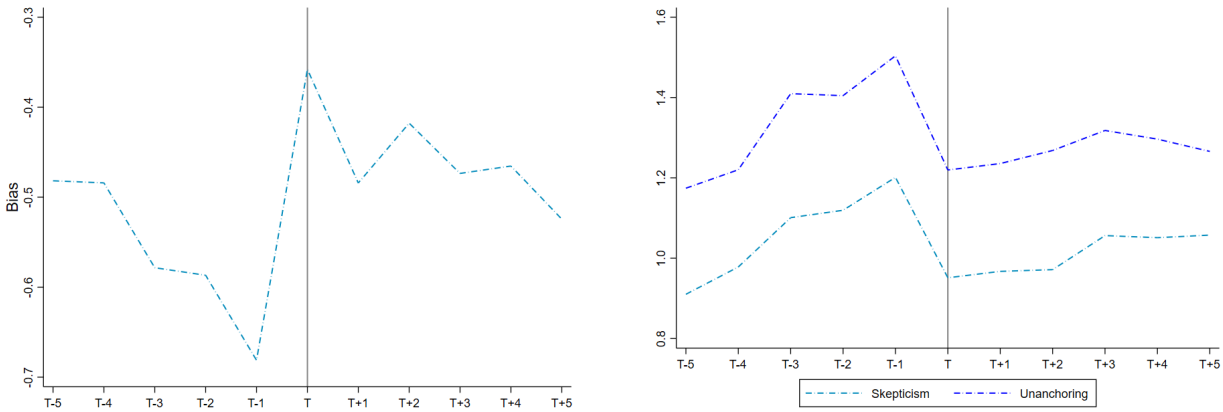


(c) Unanchoring

Figure 5. *Fiscal Credibility and Past Projection Performances*

Note: Bin-scatter plots represent the correlation between credibility indicators (y-axis) and forecast errors of official projections (24-month, rolling average), controlling for lagged real GDP growth, public debt-to-GDP ratio, primary balance, and year and country fixed effects. The slope coefficients are -0.24, 0.20, and 0.26 respectively for *Bias*, *Skept*, and *Unanc*, with p-value lower than 1%.

Credibility improves with policy communication—what we call the **credibility boost** or **anchoring effects** associated with policy communications. Namely, private expectations converge towards on official targets upon announcement—time T on Figure 6a which plots the average credibility across countries around the release of official fiscal targets. The difference between private and official forecasts for the fiscal balance widens to up to 0.7 percent of GDP on the month preceding the announcement (possibly reflecting the uncertainty around budgetary debates) and shrinks to less than 0.4 percent of GDP on impact at T. Similarly. the announcement is associated with a reduction in unanchoring and skepticism. However, the anchoring appears to be partial; market participants either believe the government only partly or take time to update their forecasts due to information rigidities (Ricco, Callegari, and Cimadomo, 2016). In subsequent months, the bias gradually widens again, probably because of new developments and our measure of credibility



(a) Perceived bias

(b) Skepticism and Unanchoring

Figure 6. *Fiscal Credibility around the Release of New Official Forecasts*

Note: Panel (a) shows how *Bias* behaves during the period $[T-5,\ T+5]$ around new budget announcements. For panel (b), *Skept* and *Unanc* are on the y-axis instead.

gradually worsens (Figure 6b). At fiscal consolidation announcements, private forecasters only expect about 20 percent of announced adjustments to materialize, according to Figure 7.

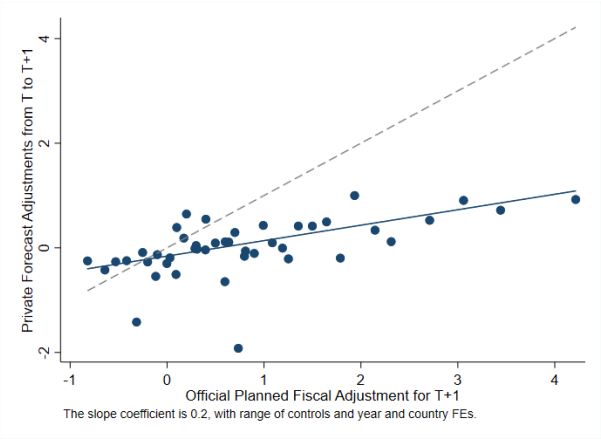


Figure 7. *Official Plans for Fiscal Adjustments vs. Private Forecast Updates*

Note: The dashed gray line is the first bisector $y = x$.

Based on these observations, we formalize how government communication on fiscal plans catalyzes expectations and fosters credibility. As some policy announcements can be anticipated, we construct a novel measure of **fiscal surprise** or **news**—the component of new targets that private

forecasters did not expect:[14]

$$News_{i,t} \equiv \mathbb{E}_t^o b^{(\perp)} - \mathbb{E}_{t-1}^p b^{(\perp)} \tag{5}$$

This surprise is an exogenous shock. Markets do not have complete internal information within the government, with some policies being decided on the very last day before the draft budget is released. The *News* indicator also filters out the asymmetry between private agents and governments in terms of frequency of fiscal forecast updates, as for announcement dates both presumably rely on the latest available economic and fiscal data, as schematized on Figure 8.

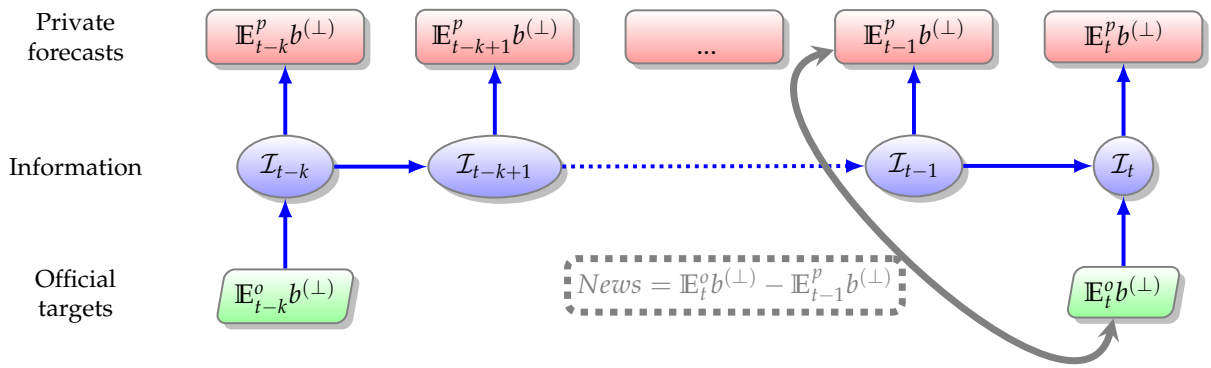


Figure 8. *Construction of Fiscal News*

Note: $\mathcal{I}_t$ denotes the set of information available at time t.

The impact of fiscal news (or surprises) on credibility is *a priori* ambiguous. The release of new official targets reflecting the latest developments could help re-anchor private expectations, if budget announcements contain more signal than noise about future fiscal policy (Fève and Pietrunti, 2016). Market perceptions of the information content of new official targets depend on various factors, such as macroeconomic conditions, policy track record, the existence of fiscal rules, and political factors. At the same time, disclosure of new official targets could add confusion if commitment is perceived as weak, and deteriorate credibility by de-anchoring private expectations or increasing the gap between private sector forecasts and official targets. A delay in the update by private forecasters, often referred to as information rigidities (Coibion and Gorodnichenko, 2012; Ricco, Callegari, and Cimadomo, 2016) can also result in our credibility indicators to deteriorate until private forecasts fully reflect the information contained in official announcements.

[14]While the construction of fiscal news is similar in spirit to Ricco, Callegari, and Cimadomo (2016), we focus on the update of official targets rather than private forecast errors.

To shed light on how fiscal news diffuse to private expectations and affect credibility, we model the update in expectations as an imperfect response to fiscal news:

$$\mathbb{E}_t^p b^{(\perp)} - \mathbb{E}_{t-1}^p b^{(\perp)} = \beta News_t \tag{6}$$

The parameter β is the share of policy intentions that agents trust; if it equalled one, equation (6) would boil down to $\mathbb{E}_t^p b^{(\perp)} = \mathbb{E}_t^o b^{(\perp)}$ (or $Bias^{(\perp)} = 0$).[15] We estimate empirically the size of β with the following local projection regression (Jordà, 2005), taking advantage of the exogenous nature of the fiscal surprise variable:

$$\mathbb{E}_{t+h}^p b_i^{(\perp)} - \mathbb{E}_{t-1}^p b_i^{(\perp)} = \phi_{i,h} + \alpha_h(L) X_{i,t} + \beta_h News_{i,t} + \varepsilon_{i,t+h} \tag{7}$$

with i and t denoting countries and the months when new targets are released and $h \in \{0, \ldots, 5\}$ parsing the months elapsed since the release of new official targets. X is a vector of control variables: lagged real GDP growth, private expectations for next year real GDP growth, lagged primary balance, public debt ratio, country-specific uncertainty index, policy rate, inflation, a dummy for election months, and a dummy for countries under an IMF program. $\alpha_h(L)$ is a polynomial in the lag operator. On the left-hand side, we consider the evolution of the one-year-ahead private forecasts over h months after the new target release.

How much do private forecasts update their fiscal expectations in response to policy news embedded in the announcements? The estimated coefficients $\hat{\beta}_h$ are plotted in Figure 9; they are positive, implying that credibility improves when the government targets a more ambitious fiscal objective than expected. However, they remain smaller than one for several months after the new releases, suggesting that private forecasts do not fully converge to official forecasts even as time passes. One month after the announcement, only 10 percent of the fiscal surprise is reflected in private forecasts (after controlling for current economic conditions and growth forecasts). Then private projections lean more and more towards the official target, which highlights the existence of information rigidities. Yet, even after several months, expectations reflect less than half of the fiscal surprise from new targets, suggesting that private forecasters may discount the relevance of official objectives for their lack of realism or political economic reasons. In Appendix Figure D.2,

[15] The advantage of looking at differences in forecasts rather than levels is that we thereby admit the possibility that governments and markets may have disagreements about the initial level $b^{(-1)}$ or that private forecasters factor in a persistent bias in government projections.

regressions are run separately for high credibility group and low credibility groups, based on the *Bias* indicator, the former with *Bias* higher than the median and the latter smaller than the median. Figures demonstrate that, as expected, the pass-through of fiscal news is higher for the high-credibility group, with $\hat{\beta}_h$ reaching 0.6, whereas the pass-through is only about half of that for the low-credibility group.

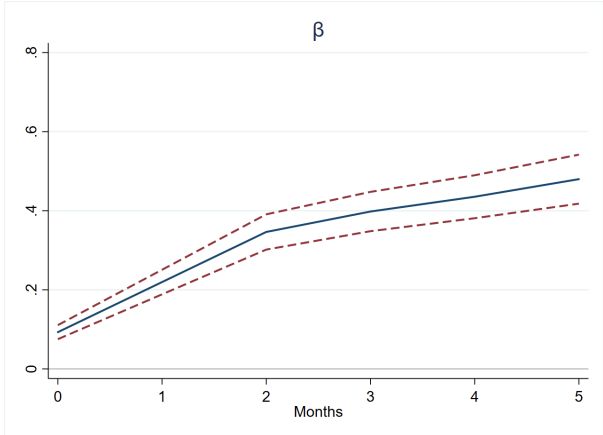


Figure 9. *Impact $\hat{\beta}_h$ of Fiscal Surprises on Private Forecast (in percentage point of* GDP*)*

Note: This chart plots the coefficients in equation (7) estimated with a local projection method, using FGLS regressions and allowing for within-panel AR(1) autocorrelation, cross-panel heteroskedasticity, and autocorrelation. Red dotted lines indicate 90 percent confidence interval.

As a robustness check, we additionally control for the size of fiscal target revisions. Large revisions can be a source of noise or disturbance, especially if not anticipated, while at the same time proving the government's determination to use fiscal policy.[16] To account for this, we rewrite equation (6) by subtracting the change in official targets $Rev_t^{(\perp)} \equiv \mathbb{E}_t^o b^{(\perp)} - \mathbb{E}_{t-1}^o b^{(\perp)}$ from both sides: $Bias_t^{(\perp)} - Bias_{t-1}^{(\perp)} = \beta News - Rev_t^{(\perp)}$. This leads to the following regression that controls for the size of revisions:[17]

$$Bias_{i,t+k}^{(\perp)} - Bias_{i,t-1}^{(\perp)} = \phi_{i,h} + \alpha_h(L)X_{i,t-1} + \beta_h News_{i,t} + \gamma_h Rev_t^{(\perp)} + \varepsilon_{i,t+h} \tag{8}$$

The resulting impulse response functions are shown in Figure 10. As before, the β coefficients are positive and even stronger now that we control for revision size. On the other hand, the γ coefficients are negative, pointing to the fact that large revisions can confuse private forecasters

[16] Private agents might get anxious if governments revised abruptly their fiscal targets—the reader can imagine what would happen to inflation expectations if central banks changed their objectives every six months.

[17] Notations, controls, and methodology are identical to equation (7).

and bear negatively on credibility. More frequent, smaller revisions might thus be preferable to building credibility over time.

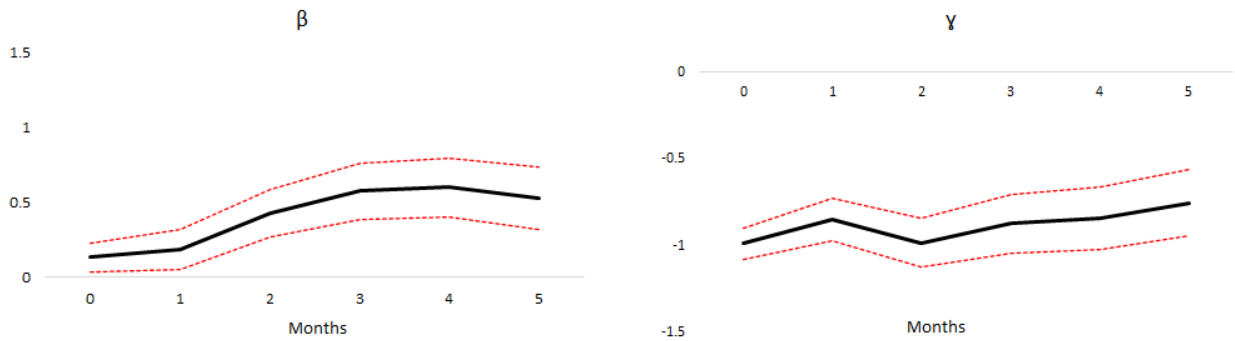


Figure 10. *Credibility Response to New Fiscal Targets (in percentage point of* GDP*)*

Note: The impulse response functions come from equation (8) that we estimated in a local projection method, using FGLS estimators and allowing for within-panel AR(1) autocorrelation, cross-panel heteroskedasticity, and autocorrelation.

4 What supports fiscal credibility?

In this section, we examine a set of factors that may contribute to improve or erode credibility based on cross-country panel regressions. The first set of factors that we examine concern fiscal rules and fiscal institutions. In theory, fiscal rules and fiscal institutions, such as fiscal councils or legal frameworks to support fiscal rules, should enhance credibility as they are designed to promote predictable and prudent fiscal policies. Countries who have more transparent fiscal policy should better anchor private forecasters' projections. Finally, as policymakers' track record builds up (Bernanke and Mishkin, 1997), past actions should affect how private forecasters update their projections after policy announcements. At the same time, while announcements of prudent fiscal policy may help fiscal credibility, fiscal objectives that appear unrealistically ambitious to market participants could erode credibility.

As in the previous section, we conduct our analysis focusing on the change in the proposed credibility indicators in the months when new fiscal targets are released and control for the fiscal surprise variable (*News*). The baseline empirical specification is as follows:

$$\Delta Cred_{i,t}^{(\perp)} = \phi_{y(t)} + \phi_{m(t)} + \phi_i + \beta X_{i,t} + \theta Z_{i,t} + \pi Z_{i,t} News_{i,t} + u_{i,t} \tag{9}$$

where i and t denote countries and monthly dates of new policy announcements. We control for country ϕ_i, year $\phi_{y(t)}$, and seasonal (month) $\phi_{m(t)}$ fixed effects and for a vector of macroeconomic factors $X_{i,t}$ as well as political cycle by including an election dummy and a dummy to indicate whether a country is under the IMF program, as in equation (7). The dependent variable is the change in one-year-ahead fiscal credibility, as measured by our three indicators. The main coefficients of interest are $\hat{\theta}$, denoting the direct effects of controls on the change in credibility and $\hat{\pi}$, which should be understood as how much $Z_{i,t}$ contributes or undermines the credibility change associated with the publication of new official targets (which we described in section 2.2). A set of variables, $Z_{i,t}$, comprises of institutional factors (fiscal rules, frameworks, fiscal transparency), the content of announced fiscal plans (transparency, accountability and communications), past policy records and announced plans for the future. We use FGLS estimations to control for heteroskedasticity and AR(1) autocorrelation.

Our specification alleviates potential endogeneity problems related to omitted variables. Suppose that there exists factors that determine how optimistic or pessimistic government official targets are (such as, a more hawkish stance *vis-à-vis* public finances). Such factors could in turn be endogenously correlated with some variables in Z—for example, the adoption of certain fiscal institutions and the degree of budget transparency and accountability—even though the sign of that correlation would be *a priori* ambiguous. Prudent governments are likely to adopt virtuous fiscal institutions which will, in turn, result in prudent fiscal projections, but, conversely, imprudent governments might need to adopt strong fiscal institutions when facing adverse market conditions.[18] By looking at the *change* in credibility indicators, instead of the *level*, hence removing country-specific factors that may be correlated with controls, we reduce such concerns for omitted variable bias. We further include a fair number of fixed effects as well as time-varying macroeconomic controls.

As for reverse causality, we argue that fiscal surprises *News* are exogenous in equation (9). They materialize upon announcement, which is before the left-hand side variable can be observed. And the evolution of credibility *after* an announcement pertains only to the formation of private expectations, while *News* reflect how much the market failed to anticipate government's decisions *before* that announcement. Besides, the interaction term between surprises and control variables is

[18] That being said, a government is rarely subjected to institutions it designed; usually, institutions are a legacy of past governments and decisions.

interesting, in the sense that it provides a diff-in-diff setup somewhat similar to Rajan and Zingales (1998). It compares the response of credibility (the anchoring of expectations) to fiscal surprises between countries with different levels of the variable Z of interest.

4.1 Fiscal frameworks

First, we look at how fiscal frameworks affect fiscal credibility. As fiscal policymakers face time-inconsistency issues, strong fiscal institutions and fiscal rules help discipline fiscal actions by strengthening the link between fiscal planning and implementation (Beetsma and Giuliodori, 2009; Beetsma et al., 2019; Debrun et al., 2013).

In theory, the existence of fiscal rules should impact private expectations, especially when commitment mechanisms are binding. In the case of the EU, Figure 11 describes the relation between official fiscal targets and the perceived bias indicator, with a quadratic fit. The fitted line bends at the 3-percent fiscal deficit level, the headline threshold used by the supranational rules embedded in the Stability and Growth Pact (SGP). The gap between private and official forecasts widens when the deficit target is far from the ceiling, especially when larger. This finding echoes Caselli and Wingender (2021)'s finding that the 3-percent threshold works like a magnet that attracts official projections. If the official deficit target is close to 3 percent, it could be because the government did the impossible for the budget to fall within the rules but is likely to experience slippages, which should lead to more skepticism (Frankel and Schreger, 2012). Conversely, targeting a deficit within the allowed range signals a willingness to comply, which might in turn signal a stronger commitment than a larger deficit target. Private forecasters seem to trust more governments that respect the rules (at least, *ex ante*).

We use the IMF databases of fiscal rules and fiscal councils (Budina et al., 2012; Davoodi et al., 2022). These data sets provide, across a large sample of countries, time-varying indicators capturing the existence and the coverage of fiscal rules, as well as the existence and institutional characteristics of fiscal councils. We focus on two types of numerical rules—debt and budget-balance rules—and on three features of fiscal institutions—(i) whether a monitoring body of fiscal rules exists outside the government; (ii) whether there exists formal enforcement procedures of fiscal rules outside the government; and (iii) whether there exists a legal framework for fiscal rules.

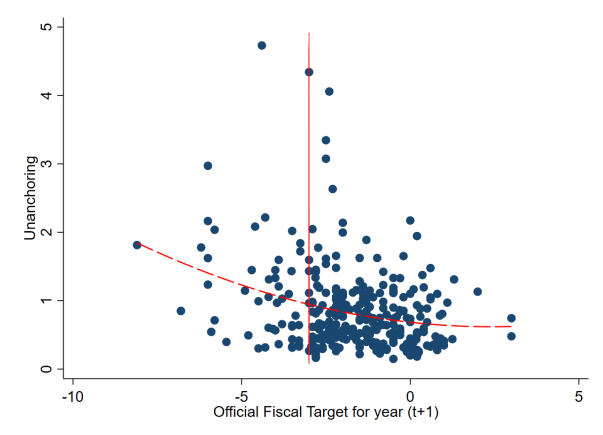


Figure 11. *Discrepancy between Private and Official and Deviations from Fiscal Rules: EU example*

Fiscal rules and strong fiscal institutions tend to improve the anchoring of private expectations on official targets, although different types of rules and frameworks have varying effects on the different aspects of fiscal credibility. Table C.2 shows how fiscal rules and fiscal institutions help fiscal credibility, once macroeconomic fundamentals are controlled for as in equation (9).[19] Fiscal surprises (*News*) reduce credibility when announcements are made, as shown by negative coefficients on the change of *Bias* and positive coefficients on *Skept*. Markets are unsettled when governments surprise them too much (beyond what they could have expected from extrapolating past behaviors).

Debt rules and deficit rules are found to exert direct effects on credibility by improving our credibility indicators when new budgets are announced: debt rules decrease the discrepancy between private and official targets by about 2 percentage point of GDP based on *Bias* and *Skept*, while the budget balance rule also has a similar impact on *Skept* indicator. Furthermore, the interaction terms show that debt rules dampen the negative impact of fiscal surprise on credibility (*Bias*) by 0.4 percent of GDP, which is equivalent to about half (54.6% $\approx 0.498/0.911$) of the negative impact on credibility due to fiscal surprise. Debt rules also have similar effects on reducing the disagreement of private forecasters by about 0.8 percent of GDP.

Previous studies have found that strong fiscal institutions support fiscal rules and help enforce those rules. Similarly, the existence of fiscal agencies outside of the government fosters compliance of fiscal rules (Reuter, 2019). Our results are consistent with these findings in that fiscal institutions

[19] As the categorical variables describing fiscal rules have few variations over time, we drop the country fixed effects for these regressions.

enhance credibility. Having an independent watchdog that monitors budgets and fiscal rules diminishes the negative impact of fiscal surprises on fiscal credibility by more than 1 percentage point of GDP (except for *Unanc*). Similarly, enshrining fiscal rules in the law (rather than in a mere political commitment) appears to improve credibility and reduce skepticism.

Finally, we also look at the impact of the multi-year spending ceilings on credibility. Expenditure ceilings are quantitative upper limits on the amount of expenditure set for specific years. In some countries, such as the Netherlands and Sweden, this quantitative target is set not only for the current year but for the outer years, so as to prevent a pro-cyclical increase in expenditure during economic expansions. This "top-down budgeting" is considered good practice for aggregate expenditure to be in line with fiscal objectives (Robinson, 2013). We find that having multiyear spending limits contributes to fiscal credibility, by dampening the negative impact of fiscal surprises for all indicators of fiscal credibility. Even after controlling for the political cycle, fiscal rules and institutions tend to improve fiscal credibility, which is a new finding that contrasts with Debrun (2007).

4.2 Fiscal transparency and communication

To the extent that fiscal credibility is about the government's ability to convince market participants of future fiscal policy, fiscal transparency is an essential ingredient. Moreover, the format of policy communications—posting a document in the official bulletin *vs*. proactive speeches, blogs, and media outreach—could matter. While measuring fiscal transparency or the quality of communication is challenging, existing quantitative indicators have examined various features of budget documents and budget processes. Based on these indicators, previous studies have highlighted the role of fiscal transparency in generating more accurate budget forecasts (ElBerry and Goeminne, 2021), more favorable economic outcomes (Hameed, 2005), and better market borrowing conditions (Arbatli and Escolano, 2015; Kemoe and Zhan, 2018).

We draw on the Open Budget Survey (OBS) published by the International Budget Partnership, a biennial survey that covers various dimensions of fiscal transparency and accountability such as the availability and publication of fiscal information, the quality of the information, and the presence of independent experts who voice their views about current and future conduct of budget

and tax policies. [20] The 100+ categorical questions sent to independent researchers worldwide are spliced into a composite index, the Open Budget Index (OBI) that ranks countries on a 0–100 scale (Seifert, Seifert, and Mondo, 2013). Accounting for methodological breaks, we focus on a subset of ten questions, which relate to (i) the publication of key documents and the quality and importance of citizens budgets in the budget process; (ii) the existence, quality, and role of independent control institutions; and (iii) the content and accountability of fiscal projections (Table B.4).

We find that governments that communicate budgets and fiscal objectives effectively with the public have higher fiscal credibility. Table C.3 shows that there are direct effects as countries with higher scores on the publications of pre-budget statements (PBSs) have higher credibility according to our three indicators. The quality and accessibility of citizens budgets demonstrate how well governments communicate their intentions and forecasts. We confirm that countries that have a better communication to the public, as measured by the OBI sub-index for Citizens Budgets (and questions Q65 and Q67), indeed enjoy higher credibility. We do not find any significant link with the variables related to other types budget documents such as year-end reports, budget proposals, and audit reports, but we suspect that this is likely due to the fact that almost all countries in the data release these budget documents, generating little variation across countries and across time. The OBI sub-index that reflects the quality, comprehensiveness, and transparency of PBSs also improves fiscal credibility.

In addition, we look at the benefits of independent budgetary institutions (IBIs), which in theory act as counter-powers to government discretion and should improve the predictability of fiscal policy. Looking at the specific questions in the OBS dedicated to IBIs, Table C.4 confirms that countries that allow their IBIs to conduct macro-fiscal projections (Q104), carry out an objective budget cost analysis (Q105), or present publicly their views at budget committees (Q106) also exhibit higher credibility. Finally, the content of official communications also matters for fiscal credibility. For governments that explicitly recognize expenditure arrears (Q41) and publish debt projections (Q57), both *Bias* increases and *Skept* and *Unanc* indicators decrease as shown in Table C.5. Countries that describe early on, in PBSs, their intentions in terms revenue and spending also manage to reduce the perceived bias and disagreements among private forecasters.

[20] Caution is needed in interpreting scores for any individual country given measurement error because the quality of underlying data can vary across countries and data sources.

4.3 Track record and fiscal adjustments

Credibility can be considered as a stock of trust and comprises backward- (how much trust has been betrayed in the past) and forward-looking considerations (promises about future behavior). Past policy actions and outcomes should contribute to the government's track records, hence influencing its credibility. Do market forecasts place less confidence in the official projections of countries that deviated from officially announced fiscal targets in the past? How about countries that update their official targets in ways that deviate significantly from their own past forecasts? Looking at the forward-looking elements, do market forecasts entrust countries with fiscal adjustments than fiscal expansion? Does the size of planned adjustment matter?

To address these questions, we run the regressions (9) with various indicators of track record: forecast errors (which proxy fiscal slippages) and forecast revisions, which we can easily compute with our data set by comparing official fiscal targets in different years.

For fiscal slippages, we consider the gap between official targets and actual outturns for the fiscal balance:

$$Err_{i,t}^{(\perp)} \equiv \mathbb{E}_t^o b_{i,s}^{(\perp)} - b_{i,s}^{(\perp)} \tag{10}$$

A positive value of *Err* reflects governments that have often incurred larger fiscal deficits than announced in the recent past. We expect private forecasters to constantly learn about the government's behavior by observing its recent performance; in particular, if there have been recurrent slippages, markets could anticipate further slippages in the future.[21] Table C.6 reports the results. As a direct effect, fiscal slippages ($Err > 0$) deteriorate credibility: the associated coefficients indicate that *Bias* goes down. The interaction between fiscal surprises and track records also suggest that fiscal slippages lower credibility, by lowering *Bias* and *Skept* indicators by 0.06 percentage point of GDP for *Bias* and about 0.02 percentage point of GDP for *Skept*.

Revisions to previous targets also affect credibility. An upward (downward) revision improves(worsens) credibility. Direct effects of *Bias* and *Skept* suggest an improvement of credibility as much as 0.8 percentage point of GDP. The interaction terms paint a more nuanced picture, as the negative impact on credibility due to fiscal news are dampened only for *Skept* and *Unanc*, but

[21] We look only at the last two years to keep enough observations and also because it is likely that recent track record matters more than more ancient one.

not for *Bias*. This shows that an upward revision decreased positive bias (private forecasts more optimistic than official forecasts). On the other hand, it improved fiscal credibility in terms of disagreements and the absolute deviation between private and official forecasts.

As much as markets keep an account of past fiscal actions, they necessarily ponder the ambition and feasibility of future fiscal plans, too. Table C.7 investigates with panel regressions how the size, direction, and pace of the targeted changes in the fiscal stance—for the following year as well as over a few years—impact expectations. First, consolidation plans for year t+1, especially large ones, tend to impact credibility negatively. By contrast, large expansionary adjustments ($LargeAdjust = 1$) for year t+1 also impact credibility negatively, but much less so. This implies that private agents either have doubts the government can implement as large policy changes as it pledges (because of technical or political economy constraints) or factor in larger fiscal multipliers than the authorities. Thus, both surprises and large adjustments are detrimental to credibility. The effect of surprise consolidation, however, is less than the sum of the two effects, as evidenced by the interaction term. Yet, the overall effect remains negative. Looking at medium- rather than short-term adjustment, the impact is less strong, probably because markets put a greater weight on immediate policy changes and discounts the government's commitment on long-term commitments. Private agents, however, are affected by long-term plans when governments claim large medium-term consolidation ambitions. In such case, private expectations become less anchored and more dispersed.

5 Conclusion and policy implications

In this paper, we adopt a novel approach to quantifying the credibility of budgets, by analyzing the effect of budget announcements on private expectations, in a group of advanced and emerging economies for which professional forecasts of the fiscal balance are available. We find that new fiscal target announcements by governments can help anchor private forecasts, although anchoring is only partial, implying that private forecasters may not find official targets fully credible.

Our measure of credibility is influenced by a confluence of factors: the macroeconomic environment, past fiscal actions, institutional setup, and future policy announcements. We find in particular that credibility is eroded when there have been large slippages in the past and when

planned fiscal adjustments are unrealistically ambitious. Institutions, such as fiscal rules and independent watchdogs, and fiscal transparency lead to higher credibility, but should be accompanied by credible fiscal actions. Credibility, in turn, is strongly correlated with how markets evaluate sovereign creditworthiness; hence it can lower financing costs.

The paper thus provides valuable policy implications. These lessons resonate, particularly in the COVID-19 context, when economic uncertainty remains elevated and the public demand for governments to articulate fiscal plans and guide their economic decisions is higher than ever. To the extent that credibility is associated with better market conditions, governments should be mindful of the impact that policy slippages and policy communication have on market sentiment and make careful fiscal projections. Furthermore, these fiscal projections should be clearly communicated to the public, accompanied by institutions and transparency to further enhance fiscal credibility.

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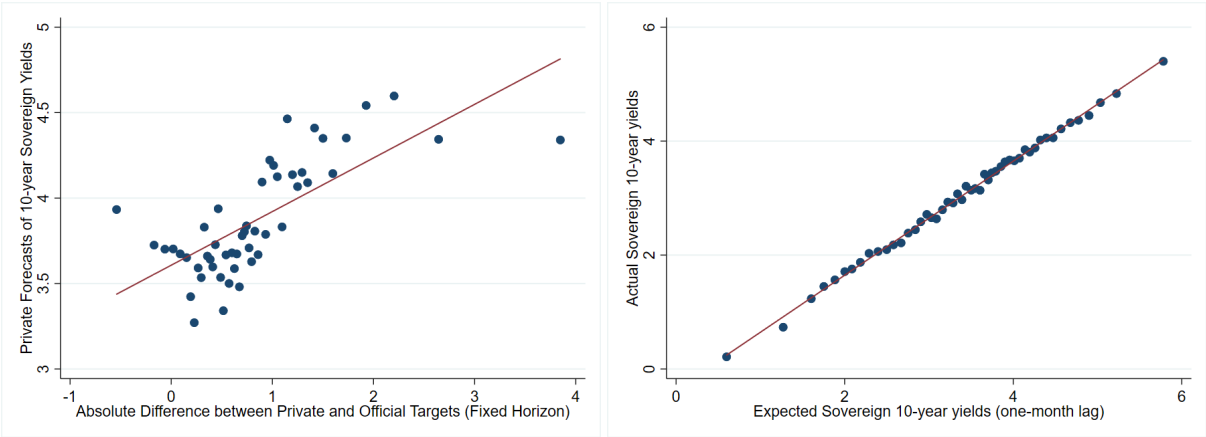
Appendices

A Market rewards of fiscal credibility

Why should countries care about building fiscal credibility? This appendix motivates our research by empirically underlining the benefits of credibility. In theory, once fiscal credibility is established, fiscal policymakers can have more flexibility to respond to shocks and temporarily deviate from their objectives, improving the effectiveness of fiscal policy (similarly to the credibility hypothesis in monetary policy). For example, public spending shocks have a more effective impact on growth when expectations are more strongly anchored (Ricco, Callegari, and Cimadomo, 2016). As fiscal policy is the largest source of policy uncertainty (Baker, Bloom, and Davis, 2016), credibility—that is, better anchoring of expectations—can make it more successful at stabilizing the economy.

Fiscal credibility affects expectations and thereby intertemporal allocations; it should thus impact the sovereign interest rates. A credible government, by convincing markets about its fiscal policy, should be able to access better financing conditions—lower interest rates and/or more abundant financing sources. We find that markets associate higher credibility with lower yields. Figure A.1a shows that higher values of absolute difference between private and official targets (lower credibility) have higher sovereign yields, even when controlling for macroeconomic factors. Figure A.1b further suggests that market's expectations of sovereign yields may be a good indicator of actual (market) sovereign yields, as *expected* yields almost perfectly track actual yields.

Fiscal credibility tends to help lower government borrowing costs. We observe this by comparing changes in sovereign yields around new fiscal announcements for countries with high *vs*. low credibility, and for different types of fiscal policy plans (consolidation, large consolidation, and expansion). Consolidation attempts should *a priori* be perceived positively by the market (as they signal prudent policymaking) and lead to a favorable change in borrowing costs, but large consolidation objectives might seem too ambitious. But, would market participants reward these announcements differently depending on fiscal credibility? Figure A.2a shows that fiscal announcements on average trigger a 40 basis point drop in sovereign yields for high and low credibility countries alike. But the reduction in yields associated with consolidations is smaller



(a) Credibility and Expected Sovereign Yields **(b)** Expected vs. Actual Sovereign Yields

Figure A.1. *Sovereign Risk: Expectations and Market Price*

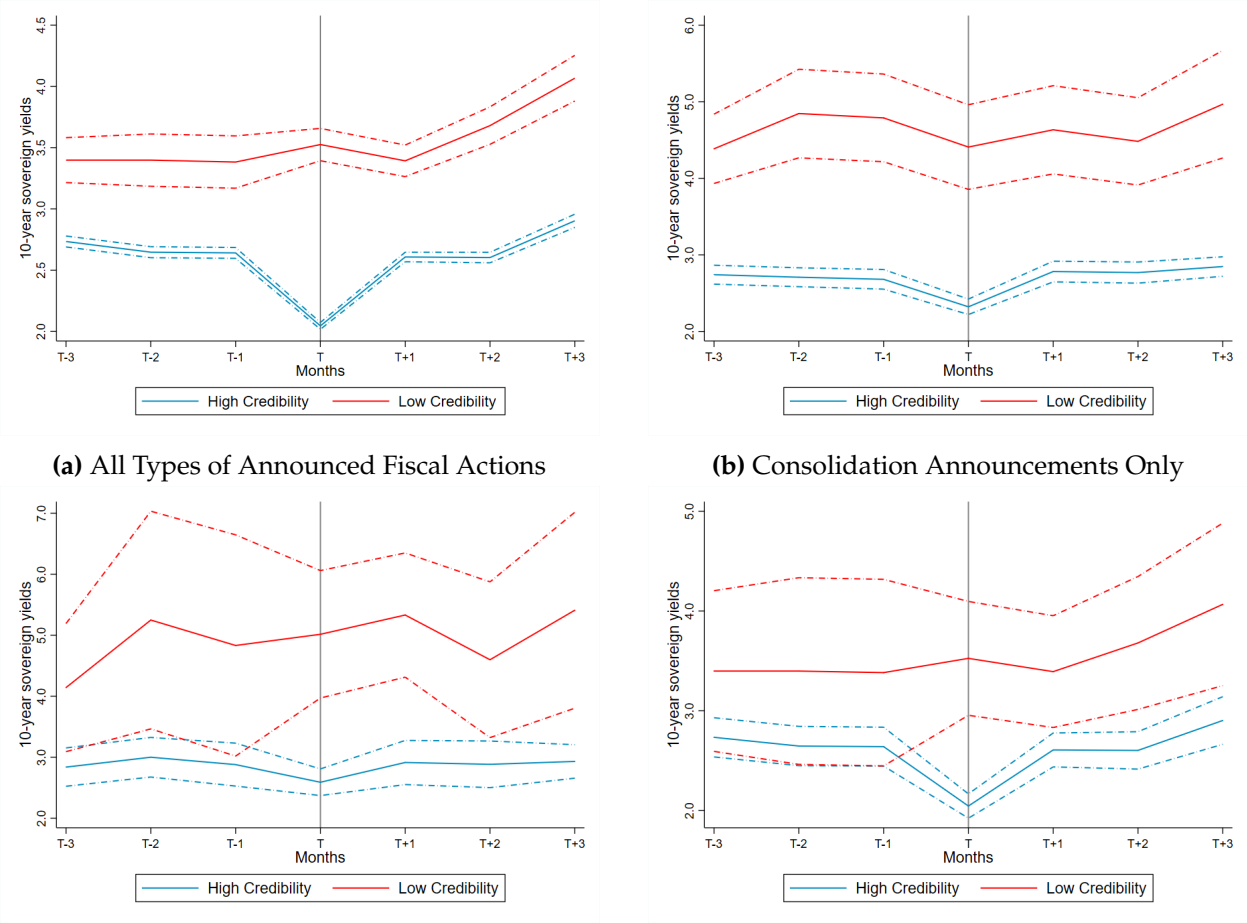
Note: Panel (a) plots the $Skept^{(\perp)}$ indicator (absolute difference between private and official targets at one-year-ahead horizon) against private forecasts sovereign yields. Panel (b) plots one-month ahead private forecasts of sovereign yields against actual yields. For both, observations are categorized into 50 equal-sized bins. Both regression lines control for private forecasts of real GDP growth, public debt ratio, primary balance, inflation, uncertainty (Ahir, Bloom, and Furceri, 2018), and country fixed effects.

for low-credibility countries relative to high-credibility countries (20 *vs.* 40 bps; Figure A.2b). In the case of a large consolidations, sovereign yields decrease only for more credible governments (Figure A.2c). Last, while fiscal expansion announcements are equally met with a reduction in financing costs for credible governments, less credible ones do not see any change in theirs. Credible governments might then enjoy more fiscal space and more flexibility, if they can engage in fiscal expansions without immediately alerting markets.

For a more rigorous analysis of these correlations between credibility and market perception of creditworthiness, we run the following panel regressions:

$$y_{i,t} = \phi_{y(t)} + \phi_i + \beta Cred_{i,t}^{(\perp)} + \Theta X_{i,t} + \varepsilon i, t \tag{A.1}$$

where the dependent variable is the market perception of sovereign risk, as measured by either CDS spreads, sovereign yields, or credit ratings. The parameter of focus is the influence of credibility β. Macroeconomic conditions are used as control variables X, along with country ϕ_i and year $\phi_{y(t)}$ fixed effects. Table C.8 reports the results.



(a) All Types of Announced Fiscal Actions

(b) Consolidation Announcements Only

(c) Large Consolidation Announcements Only

(d) Expansion Announcements Only

Figure A.2. *Announced Fiscal Actions, Credibility and Sovereign Yields*

Note: X-axis denotes 5 months before and after the release of new fiscal targets ($T = 0$). Y-axis refers to the average 10-year sovereign yields for 'high-credibility' and 'low-credibility' countries. High-credibility (low-credibility) countries refer to the countries whose average improvement in the *Bias* indicator in month T relative to T-1 is larger than the 75th percentile value (smaller than the 25th percentile value). A consolidation is called large when the planned size of adjustment is above the 90th percentile of the distribution of all planned fiscal policy changes (2percentage point of GDP) . The dotted lines represent the 90 percent confidence band.

We find that fiscal credibility is highly correlated with market perceptions of sovereign worthiness. Better credibility, as proxied by three market-based indicators, is strongly associated with lower sovereign CDS spreads (Table C.8, columns (1) to (6)) with statistical significance. We observe that CDS spreads are around 2-3 percentage points higher on average for a level of skepticism or a perceived bias of 0.5 percent of GDP, even after controlling for macroeconomic fundamentals. Likewise, the impact on sovereign yields, for shorter maturities as well as longer tenures, is signifi-

cant (columns (7)-(12)). Credit assessments by rating agencies are also somewhat better for credible governments (columns (13)–(15)).[22]

Credibility should foster a virtuous sentiment of confidence, which in turn would stimulate demand through higher investment and higher consumption. Therefore, credibility could contribute to higher GDP growth. This growth should translate into more robust tax revenues, which, together with better financing terms, should help to improve fiscal outturns. When agents mistrust the government, they might delay consumption and investment, accumulate precautionary savings, and possibly resort to informality.[23] This might erode tax bases and tax morale, making it more likely for fiscal targets to be missed and fueling mistrust further.

[22] As in Afonso, Furceri, and Gomes (2012), we transform ratings by the main credit agencies (DBRS, Fitch, Moody's, and S&P) into a discrete numerical variable, AAA being the highest value. We add (subtract) 0.5 when the outlook is positive (negative).

[23] The literature on informality finds a clear link between lack of trust in governments and institutions and the extent of informal activity.

B Data sources

Country	Source	Fiscal Year Start	Coverage Start
Argentina	www.economia.gob.ar/onp/presupuestos/2021	January	2002
Australia	archive.budget.gov.au	July	1994
Canada	www.canada.ca/en/department-finance/services/publications/annual/archives.html	April	1994
Chile	www.dipres.gob.cl/598/w3-propertyvalue-2129.html	January	2002
Colombia	Marco Fiscal de Mediano Plazo	January	2004
EU countries	Stability and Convergence Programs, Draft Budgetary Plans ec.europa.eu	January	various
Hong Kong SAR	www.budget.gov.hk/2020/eng/previous.html	April	2002
India	www.indiabudget.gov.in/previous_union_budget.php	April	2011
Japan	www5.cao.go.jp/keizai3/econome.html	April	2002
Mexico	www.finanzaspublicas.hacienda.gob.mx/es/Finanzas_Publicas/Paquete_Economico_y_Presupuesto	January	1999
New Zealand	www.treasury.govt.nz/publications/budgets/current-and-past-budgets	July	1997
Norway	www.regjeringen.no/en/topics/the-economy/the-national-budget/id1437/	January	2009
Peru	www.mef.gob.pe/es/marco-macroeconomico/marco-macroeconomico-multianualmmm	January	2000
South Korea	https://korea.nabo.go.kr/publi/publications.php?ptype=list&code=publications&category=103	January	2003
Switzerland	www.efv.admin.ch/efv/en/home/finanzberichterstattung/finanzberichte/staatsrechnung.html	January	2006
United Kingdom	National Archives website	April	1998
United States	www.govinfo.gov/app/collection/budget/	October	1996

Table B.1. *Official Budget Documents*

Country	Code	First available Official forecast	First available Consensus forecast	Forecast directly in % of GDP	# of obs.	Group
Austria	AUT	1998M11	2012M05	Yes*	92	Core
Belgium	BEL	1998M12	2012M05	Yes*	92	Core
Bulgaria	BGR	2007M12	2007M05	Yes	145	Eastern
Croatia	HRV	2013M04	2007M05	Yes	81	Eastern
Cyprus	CYP	2004M05	2014M01	Yes*	72	Program
Czech Republic	CZE	2004M05	1998M05	Yes	188	Eastern
Denmark	DNK	1998M12	2008M02	Yes*	143	Core
Estonia	EST	2004M05	2007M05	Yes	152	Eastern
Finland	FIN	1998M09	2012M08	Yes*	89	Core
France	FRA	1998M12	1995M01	No	253	Core
Germany	DEU	1999M01	1995M01	No	252	Core
Greece	GRC	1998M12	2010M05	Yes*	116	Program
Hungary	HUN	2004M12	1998M05	Yes	181	Eastern
Ireland	IRL	1998M12	2010M05	Yes*	116	Program
Italy	ITA	1998M12	1995M01	No	253	Core
Latvia	LVA	2004M12	2007M05	Yes	152	Eastern
Lithuania	LTU	2004M05	2007M05	Yes	152	Eastern
Luxembourg	LUX	1999M02	2014M08	Yes	65	Core
Netherlands	NLD	1998M11	2010M03	No	118	Core
Poland	POL	2004M12	1998M05	Yes	181	Eastern
Portugal	PRT	2000M02	2010M05	Yes*	116	Program
Romania	ROM	2007M11	2010M05	Yes*	116	Eastern
Slovak Republic	SVK	2004M11	2010M03	Yes	118	Eastern
Slovenia	SVN	2004M05	2007M05	Yes	152	Eastern
Spain	ESP	1998M12	2008M03	No	142	Program
Sweden	SWE	1998M12	2007M10	No	147	Core
United Kingdom	GBR	1998M12	1995M01	No	253	Core
Australia	AUS	1994M05	1995M01	No	311	NA
Canada	CAN	1994M02	1995M01	No	309	NA
New Zealand	NZL	1997M06	1995M01	No	287	NA
United States	USA	1996M02	1995M01	No	299	NA
Hong Kong SAR	HKG	2002M03	2003M06	No	212	NA
Japan	JPN	2002M01	1995M01	No	229	NA
India	IND	2011M02	1997M04	No	123	NA
South Korea	KOR	2003M12	2007M10	Yes*	154	NA
Mexico	MEX	1999M12	1995M01	Yes	246	NA
Peru	PER	2000M12	2016M03	Yes	61	NA
Colombia	COL	2004M06	2016M03	Yes	61	NA
Chile	CHL	2002M10	1995M04	Yes	222	NA
Argentina	ARG	2002M05	1995M04	Yes	230	NA
Switzerland	CHE	2006M08	2007M11	Yes*	161	NA
Norway	NOR	2009M09	2007M10	Yes*	130	NA

* Available *via* Bloomberg

Table B.2. *Data Coverage*

Variable	Unit	Source
Private forecast of general government's overall balance	percent of GDP	Monthly Consensus Economics publications, Bloomberg surveys
Official forecast of general government's overall balance	percent of GDP	Budget documents, IMF program reviews. For EU countries, fiscal proejctions are from the Stability and Convergence Programs, Draft budgetary plans
Output gap	percent of potential GDP	WEO
Real GDP growth	percent of GDP	WEO
Public debt	percent of GDP	WEO
General government's overall balance (net borrowing)	percent of GDP	WEO, Eurostat
Non-interest balance	percent of GDP	WEO
Long-term yield (10-year T-bond)	percent	WEO
GDP per capita	EUR, USD	WEO
Fiscal rule design	indices	IMF fiscal rule database (Lledó et al., 2017)
Fiscal councils	indices	IMF Fiscal council dataset (Debrun et al., 2013; Beetsma et al., 2019)
Independent fiscal institution	index	European Commission, 2018 vintage
Sovereign CDS spreads and currency asset swap spreads	last price	Bloomberg
Sovereign credit ratings	index	DBRS Morningstar, Moody's, Fitch, S&P
Sovereign yields	percent	Eurostat (Maastricht definition), Bloomberg
IMF programs and program reviews	dummy	IMF's Monitoring of Fund Arrangements (MONA) database
Political data	index	Comparative Political dataset (CPDS) (Armingeon et al., 2019)
Election	dummy	Election Guide by International Foundation for Electoral Systems (IFES) [here]
Uncertainty	index	Ahir, Bloom, and Furceri (2018)

Table B.3. *Macroeconomic, Fiscal, and Institutional Data*

#	Question
Communication, Citizens budget	
Q65	How is the Citizens budget disseminated to the public?
Q67	Are "citizens" versions of budget documents published throughout the budget process?
Independent budget institution (IBI) as counter-power	
Q104	Does the IBI publish macroeconomic and/or fiscal forecasts?
Q105	Does the IBI publish its own costings of new policy proposals, to assess their impact on the budget?
Q106	In the past 12 months, how frequently did the head or a senior staff member of the IBI take part and testify in hearings of a committee of the legislature?
Accountability: transparency and quality of official projections	
Q41	Do draft budget or budget doc present estimates of expenditure arrears for at least the budget year?
Q54	Do PBSs present information on the macroeconomic forecast upon which the budget projections are based?
Q55	Do PBSs present information on the government's expenditure policies and priorities that will guide the development of detailed estimates for the upcoming budget?
Q56	Do PBSs present information on the government's revenue policies and priorities that will guide the development of detailed estimates for the upcoming budget?
Q57	Do PBSs present three estimates related to government borrowing and debt: the amount of net new borrowing required during the budget year; the total debt outstanding at the end of the budget year; and interest payments on the debt for the budget year?

Table B.4. *Open Budget Survey Questionnaire (excerpt)*

Note: www.internationalbudget.org/open-budget-survey provides further information.

C Detailed regression results

	(1)	(2)	(3)	(4)	(5)	(6)
	Bias	*Skept*	*Unanc*	*Bias**	*Skept**	*Unanc**
Err_-	0.261***	-0.027	-0.168***	0.204***	-0.054*	-0.048
	(0.043)	(0.032)	(0.037)	(0.038)	(0.030)	(0.043)
Err_+	-0.390***	0.264***	0.356***	-0.274***	0.207***	0.345***
	(0.023)	(0.016)	(0.016)	(0.020)	(0.015)	(0.020)
Observations	4,728	4,728	3,582	4,728	4,728	3,332

Table C.1. *Non-linear Relationship between Forecast Errors and Fiscal Credibility*

Note: Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. Results using an OLS regression. Left-hand side variables with superscript * denotes cyclically-adjusted indicators. Err_- denotes 24-month average rolling window forecast errors to be negative, implying fiscal surpluses higher than projections, while Err_+ denotes forecast errors to be positive, implying fiscal slippages. Controls include lagged real GDP growth, lagged public debt to GDP and lagged primary balance to GDP.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
			$\Delta Bias$					$\Delta Skept$					$\Delta Unanc$		
News	-0.775***	-0.818***	-1.468***	-1.042***	-0.491***	0.337	0.116	1.052***	0.536***	0.202***	-0.585***	-0.918***	0.323	-0.0759	0.170***
	(0.193)	(0.221)	(0.230)	(0.171)	(0.0470)	(0.207)	(0.250)	(0.235)	(0.165)	(0.0498)	(0.155)	(0.146)	(0.503)	(0.180)	(0.0540)
Debt Rule	-2.130					-1.544***					-1.508***				
	(1.668)					(0.485)					(0.324)				
Debt Rule × *News*	0.486**					-0.241					0.678***				
	(0.199)					(0.212)					(0.162)				
Budget Bal. Rule		0.0509					0.0609					0.0562			
		(0.151)					(0.137)					(0.0993)			
Budget Bal. Rule × *News*		0.520**					0.00905					1.022***			
		(0.227)					(0.255)					(0.152)			
Monitoring Institutions			0.469					-0.240					-0.135		
			(0.388)					(0.464)					(0.428)		
Monitoring Institution × *News*			1.186***					-0.978***					-0.262		
			(0.235)					(0.241)					(0.507)		
Legal basis				-0.0385					0.0436					0.0554	
				(0.106)					(0.126)					(0.111)	
Legal basis × *News*				0.190***					-0.107**					0.0426	
				(0.0441)					(0.0429)					(0.0498)	
Multiyear expenditure ceiling					-0.605***					-0.0179					-0.0148
					(0.158)					(0.230)					(0.191)
Multiyear expenditure ceiling × *News*					0.369***					-0.188***					-0.154**
					(0.0692)					(0.0702)					(0.0676)
Constant	-1.252	0.810	0.681	0.818	0.803	0.0644	1.676	1.889*	1.727	1.651	-0.745	0	0.919	1.035	1.392**
	(1.192)	(1.475)	(1.406)	(1.409)	(1.404)	(1.095)	(1.167)	(1.119)	(1.113)	(1.085)	(0.692)	(0)	(0.994)	(0.961)	(0.659)
Observations	450	439	450	439	450	450	439	450	439	450	305	305	305	305	305

Table C.2. *Fiscal Rules, Frameworks, and Credibility*

Note: Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. Fiscal rules and fiscal institutions variables used in the regression are dummy variables that equal 1 if the institution exists and 0 otherwise. Controls include fiscal surprise, expected growth, lagged real GDP growth, lagged public debt to GDP, lagged primary balance to GDP, inflation, uncertainty index, a dummy if an election took place in the month and a dummy when the country was under an IMF review.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
			$\Delta Bias$				$\Delta Skept$				$\Delta Unanc$	
News	0.0565	-0.386***	-0.480***	-0.490***	-0.327***	-0.0171	0.102	0.132**	-0.156*	0.0429	0.209***	0.226***
	(0.117)	(0.126)	(0.101)	(0.104)	(0.0929)	(0.0767)	(0.0672)	(0.0670)	(0.0885)	(0.0688)	(0.0493)	(0.0407)
OBI of PBSs	0.00203				-0.00795***				-0.00578**			
	(0.00296)				(0.00248)				(0.00226)			
OBI of PBSs $\times$ *News*	-0.000645				0.00189*				0.000732			
	(0.00129)				(0.00107)				(0.00108)			
OBI of Citizen budget		-0.00454				-0.00411				-0.00463*		
		(0.00397)				(0.00335)				(0.00264)		
OBI of Citizen budget $\times$ *News*		0.00597***				-0.00298**				-0.00268**		
		(0.00173)				(0.00116)				(0.00126)		
Q65			-0.00443*				0.000571				-0.000306	
			(0.00268)				(0.00190)				(0.000856)	
Q65 $\times$ *News*			0.00363***				-0.00248**				-0.00404***	
			(0.00124)				(0.000973)				(0.000753)	
Q67				0.00258				-0.00489**				-0.00440***
				(0.00309)				(0.00199)				(0.00101)
Q67 $\times$ *News*				0.00458**				-0.00461***				-0.00638***
				(0.00185)				(0.00135)				(0.00103)
Observations	125	125	91	91	125	125	91	91	105	105	79	79

Table C.3. *Public Engagement and Publication of Budget Documents and Credibility*

Notes: Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. Variables Q65 and Q67 are questions from the OBS (Table B.4). For simplicity, the following controls are not shown: expected growth, lagged real GDP growth, lagged public debt ratio, lagged primary balance, inflation, Uncertainty, and dummies for electoral months

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
		$\Delta Bias$			$\Delta Skept$			$\Delta Unanc$	
News	-0.685***	-0.094	-0.684***	0.653***	0.094	0.443***	0.325***	0.028	0.352***
	(0.160)	(0.110)	(0.117)	(0.109)	(0.088)	(0.105)	(0.090)	(0.085)	(0.109)
Q104	-0.002			0.006***			0.001		
	(0.002)			(0.002)			(0.001)		
Q104×*News*	0.007***			-0.011***			-0.005***		
	(0.002)			(0.002)			(0.002)		
Q105		0.004*			-0.001			-0.005	
		(0.002)			(0.002)			(0.002)	
Q105×*News*		0.001			-0.004***			-0.001	
		(0.002)			(0.001)			(0.001)	
Q106			0.002			-0.003			-0.009
			(0.002)			(0.002)			(0.002)
Q106×*News*			0.009***			-0.007***			-0.006***
			(0.002)			(0.001)			(0.002)
Observations	90	125	125	90	125	125	78	105	105

Table C.4. *Independent Fiscal Institutions and Credibility*

Notes: Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. Variables Q103, Q104, Q105, Q106, and Q107 are questions from the OBS (Table B.4). For simplicity, the following controls are not shown: expected growth, lagged real GDP growth, lagged public debt ratio, lagged primary balance, inflation, Uncertainty, and dummies for electoral months.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
			$\Delta Bias$					$\Delta Skept$					$\Delta Unanc$		
News	-0.950***	-0.0645	-0.873***	-0.947***	-0.817***	0.294***	-0.289***	0.474***	0.476***	0.286**	0.142	-0.0780	0.470***	0.424***	0.411***
	(0.145)	(0.110)	(0.126)	(0.121)	(0.0913)	(0.110)	(0.0859)	(0.173)	(0.162)	(0.141)	(0.120)	(0.0852)	(0.127)	(0.114)	(0.0875)
Q41	-0.00910					0.0134***					0.00901*				
	(0.00554)					(0.00406)					(0.00487)				
Q41 × *News*	0.0108***					-0.00969***					-0.00625***				
	(0.00257)					(0.00173)					(0.00229)				
Q54		-0.00109					-0.00604***					-0.00265			
		(0.00253)					(0.00228)					(0.00206)			
Q54 × *News*		0.000712					0.00165*					-0.000212			
		(0.00121)					(0.000990)					(0.00101)			
Q55			0.00109					-0.00262					-0.00131		
			(0.00379)					(0.00329)					(0.00216)		
Q55 × *News*			0.00685**					-0.00508*					-0.00567***		
			(0.00276)					(0.00268)					(0.00209)		
Q56				-0.00146					-0.00307					-0.00257	
				(0.00321)					(0.00292)					(0.00182)	
Q56 × *News*				0.00902***					-0.00526**					-0.00462***	
				(0.00279)					(0.00248)					(0.00175)	
Q57					0.00558*					-0.0116***					-0.00396**
					(0.00289)					(0.00260)					(0.00175)
Q57 × *News*					0.00822***					-0.00291					-0.00592***
					(0.00196)					(0.00182)					(0.00127)
Observations	60	125	72	72	72	60	125	72	72	72	48	105	66	66	66

Table C.5. *Transparency and Quality of Budget Forecasts and Credibility*

Notes: Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. Variables Q38, Q41, Q54, Q55, Q56, and Q57 are questions from the OBS (Table B.4). For simplicity, the following controls are not shown: expected growth, lagged real GDP growth, lagged public debt ratio, lagged primary balance, inflation, Uncertainty, and dummies for electoral months

	(1)	(2)	(3)	(4)	(5)	(6)
	$\Delta Bias$		$\Delta Skept$		$\Delta Unanc$	
$News$	-0.284***	0.003	0.087**	0.034	0.052	0.039
	(0.041)	(0.017)	(0.038)	(0.030)	(0.035)	(0.026)
Err_{t+1}	-0.002		0.013		0.020	
	(0.025)		(0.024)		(0.022)	
$Err_{t+1} \times News$	-0.058***		0.024*		0.013	
	(0.013)		(0.014)		(0.012)	
$Rev_t^{(\perp)}$		-0.862***		0.463***		0.294***
		(0.016)		(0.027)		(0.023)
$Rev_t^{(\perp)} \times News$		-0.005		0.128***		0.160***
		(0.009)		(0.015)		(0.016)
Observations	450	450	450	450	305	305

Table C.6. *Government Track Records and Credibility*

Note: Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. $Rev_t^{(\perp)} = \mathbb{E}_t^o b^{(\perp)} - \mathbb{E}_{t-1}^o b^{(\perp)}$ and Err is defined in equation (10). Controls include fiscal surprise, expected growth, lagged real GDP growth, lagged public debt to GDP, lagged primary balance to GDP, inflation, uncertainty index, a dummy if an election took place in the month and a dummy when the country was under an IMF review.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
			$\Delta Bias$					$\Delta Skept$					$\Delta Unanc$		
$Consolid = 1$	-0.486***					0.0958					0.150**				
	(0.0752)					(0.0712)					(0.0679)				
$(Consolid = 1) \times News$	0.319***					0.245***					0.0833				
	(0.0894)					(0.0783)					(0.0716)				
$LargeConsolid = 1$		-0.616***					0.247***					0.209**			
		(0.0853)					(0.0825)					(0.0828)			
$(LargeConsolid = 1) \times News$		0.484***					-0.206***					-0.128*			
		(0.0825)					(0.0766)					(0.0667)			
$LargeAdjust = 1$			-0.170**					0.138*					0.0730		
			(0.0848)					(0.0723)					(0.0686)		
$(LargeAdjust = 1) \times News$			0.306***					-0.347***					-0.217***		
			(0.0905)					(0.0803)					(0.0779)		
$MTConsolid = 1$				-0.0611					-0.0164					0.0217	
				(0.107)					(0.0972)					(0.0879)	
$(MTConsolid = 1) \times News$				0.0798					0.134					0.0513	
				(0.108)					(0.0940)					(0.0828)	
$LargeMTConsolid = 1$					-0.283					0.538***					0.382***
					(0.179)					(0.151)					(0.141)
$(LargeMTConsolid = 1) \times News$					0.290***					-0.402***					-0.278***
					(0.0976)					(0.0811)					(0.0744)
Constant	0.706	0.543	1.209	1.358	1.054	1.450	1.862	1.777	1.518	1.876	0	1.150*	0	0	0.654
	(1.301)	(1.320)	(1.423)	(1.404)	(1.440)	(1.150)	(1.147)	(1.141)	(1.175)	(1.175)	(0)	(0.670)	(0)	(0)	(0.473)
Observations	424	424	424	424	424	424	424	424	424	424	299	299	299	299	299

Table C.7. *Composition of Announced Fiscal Plans and Credibility*

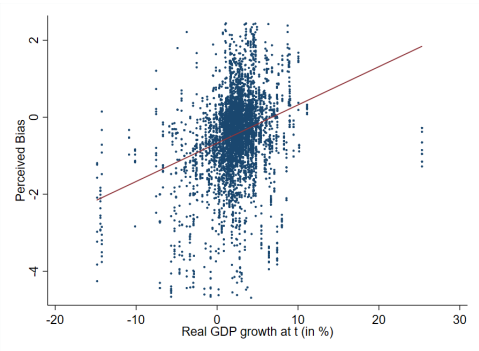
Note: Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. Focusing on the adjustment between current and following years, $(Consolid = 1)$ is a dummy for announcements that target a fiscal policy tightening for the next year. $(LargeConsolid = 1)$ is for consolidations that are larger than 1 percentage point of GDP and $(LargeAdjust = 1)$ is for adjustments in any direction that are larger than ± 1 percentage point of GDP. $(MTConsolid = 1)$ captures medium-term consolidation efforts and $(LargeMTConsolid = 1)$ episodes when the government aims at reducing the deficit by more than 1 percentage point of GDP over the medium-term. For simplicity, the following controls are not shown: expected growth, lagged real GDP growth, lagged public debt ratio, lagged primary balance, inflation, Uncertainty, and dummies for electoral months.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
		5-yr CDS			10-yr CDS			2-yr yield			10-yr yield			Rating	
$Skept^{(\perp)}$ (lagged)	6.059***			5.356***			0.138***			0.383***			-0.0313***		
	(0.602)			(0.766)			(0.0342)			(0.0355)			(0.00870)		
$Bias^{(\perp)}$ (lagged)		-4.707***			-4.028***			-0.0248			-0.116***			0.0216**	
		(0.501)			(0.630)			(0.0276)			(0.0288)			(0.00902)	
$Unanc^{(\perp)}$ (lagged)			12.22***			9.636***			0.230***			0.468***			-0.0224*
			(0.664)			(0.810)			(0.0343)			(0.0334)			(0.0123)
Uncertainty	44.87***	39.50***	40.11***	122.0***	118.1***	76.26***	-6.984***	-7.099***	-6.947***	-5.095***	-5.240***	-4.636***	-0.187	-0.524***	-1.313***
	(11.46)	(11.61)	(13.18)	(14.75)	(14.80)	(16.31)	(0.516)	(0.519)	(0.603)	(0.526)	(0.535)	(0.577)	(0.144)	(0.179)	(0.236)
Growth (lagged)	1.552***	1.636***	1.314***	2.369***	2.479***	1.940***	0.00283	0.00458	0.00418	0.0647***	0.0693***	0.0678***	-0.0120***	-0.0300***	-0.0321***
	(0.178)	(0.180)	(0.205)	(0.226)	(0.227)	(0.249)	(0.00959)	(0.00965)	(0.0119)	(0.00970)	(0.00987)	(0.0112)	(0.00233)	(0.00289)	(0.00410)
Inflation	2.222***	2.585***	5.776***	4.336***	4.514***	4.483***	0.514***	0.515***	0.495***	0.569***	0.577***	0.572***	0.0200***	0.0119**	0.0145*
	(0.205)	(0.208)	(0.223)	(0.261)	(0.262)	(0.272)	(0.0231)	(0.0233)	(0.0274)	(0.0221)	(0.0225)	(0.0251)	(0.00469)	(0.00581)	(0.00743)
Constant	19.77***	21.69***	3.369	27.83***	30.06***	26.80***	1.259***	1.361***	1.200***	2.192***	2.487***	2.013***	16.86***	16.84***	16.83***
	(3.844)	(3.870)	(4.222)	(5.173)	(5.154)	(5.458)	(0.140)	(0.140)	(0.156)	(0.144)	(0.145)	(0.151)	(0.0439)	(0.0536)	(0.0677)
Observations	3,992	3,992	3,089	3,949	3,949	3,047	2,977	2,977	2,129	3,122	3,122	2,266	3,414	3,414	2,392
R^2	0.972	0.971	0.908	0.913	0.912	0.828	0.947	0.947	0.953	0.991	0.991	0.994	0.990	0.985	0.974

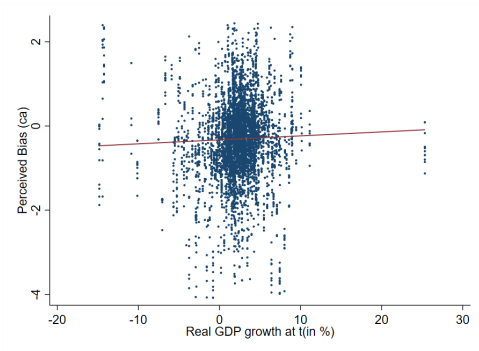
Table C.8. *Sovereign borrowing costs and fiscal credibility*

Note: Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

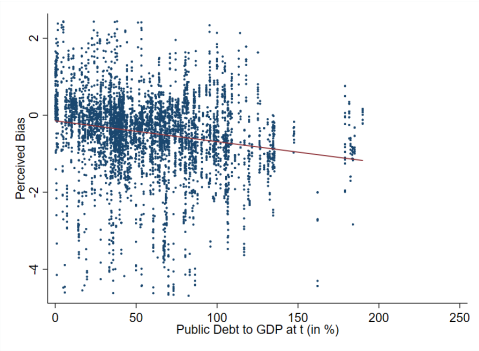
D Figures



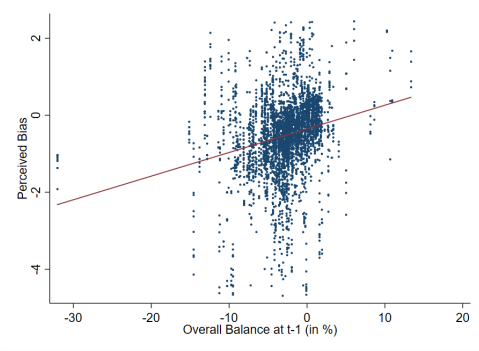
(a) Growth



(b) Growth *vs.* cyclically-adjusted bias

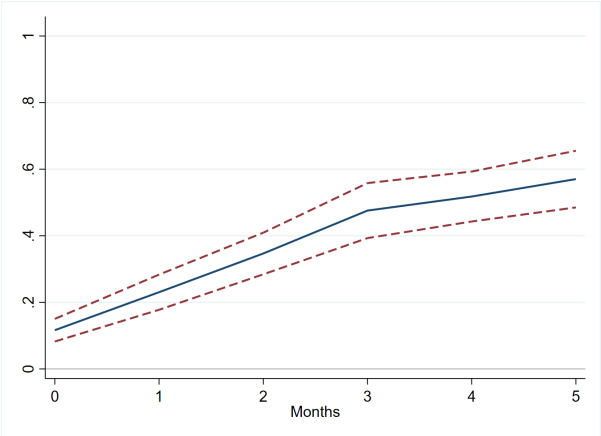


(c) Public debt ratio

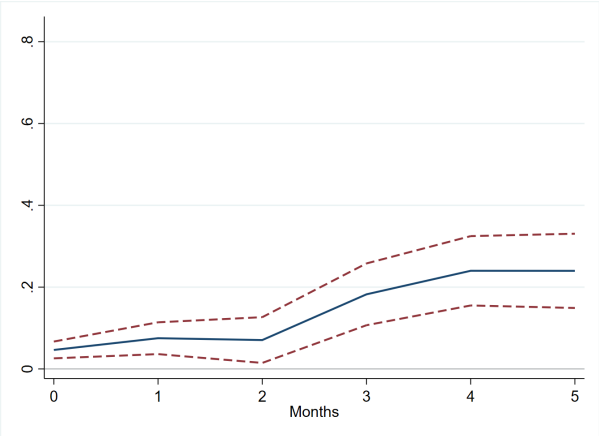


(d) Overall fiscal balance

Figure D.1. *Perceived Bias and Macroeconomic Indicators*



(a) High Credibility



(b) Low Credibility

Figure D.2. *Pass-Through of Fiscal News: High Credibility vs. Low Credibility*

Note: Each graph plots the results of (7), run separately on high credibility group (*Bias* greater than the median) and low credibility group (*Bias* smaller than the median). Red dotted lines indicate 90 percent confidence interval.

PUBLICATIONS

Trust What You Hear: Policy Communication, Expectations, and Fiscal Credibility

Working Paper No. **WP/22/36**