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TrombettaM_2022_EARWhen do governments “go dark”? Evidence on governments’
disclosure choices in periods of uncertainty¹

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Keywords: governments; uncertainty; accountability; guidance; transparency; Stability and Growth Pact

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When do governments “go dark”? Evidence on governments’ disclosure choices in periods of uncertainty

ABSTRACT

We examine the effect of uncertainty shocks on the level of fiscal guidance – the guidance issued by governments on the expected evolution of the fiscal and economic outlook. Because uncertainty makes governments’ expectations less precise but potentially more valuable to users, we hypothesize that a disclosure dilemma leads governments to balance a higher demand for guidance with a higher probability of issuing inaccurate forecasts. Using natural disasters to randomize uncertainty shocks in our sample, we find that on average, governments issue less guidance in periods of uncertainty. The effect is driven by a reduction in the number of forecasts on the future evolution of balance sheet items, but only when governments have low refinancing needs and face a relatively quiet bond market. Instead, governments that maintain a stable level of guidance in periods of uncertainty appear to cater to coercive isomorphic pressures stemming from creditors. We further document that the relative ‘transparency’ of governments in periods of uncertainty is negatively related to indicators of fiscal reporting quality. Collectively, the evidence indicates that in the public sector, uncertainty leads to a trade-off between disclosure quantity and quality.

Keywords: governments; uncertainty; accountability; guidance; transparency; Stability and Growth Pact

1. Introduction

Recent years have witnessed a growing interest in the effect of uncertainty on accounting choices (e.g., Binz, 2021; Dai & Phong, 2021; Nagar et al., 2019). An important source of uncertainty is the unpredictability of policymaking (Pástor & Veronesi, 2012). Governments can reduce uncertainty by disclosing information about crucial fiscal and economic policies (Hollyer et al., 2013; Williams, 2009). However, governments are, too, subject to uncertainty shocks. An increase in the level of uncertainty creates a disclosure dilemma for governments: whether to disclose potentially valuable information, or whether to withhold potentially inaccurate information. We study how this dilemma has played out in the context of the European Union (EU) Stability and Growth Pact (SGP). More specifically, we examine the effect of uncertainty on the degree of governments' disclosure of fiscal guidance (Fujiwara & Waki, 2020). Fiscal guidance refers to the issuance of government forecasts on the expected evolution of government revenues, expenses, assets, liabilities, and macroeconomic variables and it is a fundamental component of what is more generally known as fiscal transparency (Kopits & Craig, 1998).

There exists a vast literature that argues that the disclosure of fiscal forecasts is *valuable* because it reduces information asymmetry about governments' plans and increases governments' accountability and monitoring to the benefits of citizens, firms, supranational institutions, and creditors (Heald, 2003; Kopits & Craig, 1998). Building on arguments from institutional theory and resource dependence theory, Carpenter & Feroz (2001) argue that when governments need external financing *coercive isomorphism* pushes them to increase fiscal guidance. However, fiscal guidance also sets a benchmark against which politicians and bureaucrats can be held accountable ex-post (Kopits & Craig, 1998). Uncertainty shocks make governments less able to predict the future fiscal outlook. Hence, issuing *inaccurate* fiscal guidance in periods of uncertainty makes governments more likely to be held accountable for

forecasts that will likely turn out to be relatively inaccurate. For this reason, governments may have an incentive to reduce fiscal guidance after an uncertainty shock. Consequently, in periods of uncertainty, governments face a trade-off between the demand to disclose potentially *valuable* information stemming from citizens, firms, supranational institutions and, particularly, creditors, and the incentive to reduce the disclosure of potentially *inaccurate* information.

To measure fiscal guidance, we rely on a novel dataset that contains all the fiscal forecasts issued by the 28 European Union (EU) governments in their fiscal plans released over the period 2001-2018 (Columbano, 2022). We show that governments respond to uncertainty shocks by reducing their amount of fiscal guidance. This effect is driven by a substantial reduction in the guidance on the expected value of assets, liabilities, and items that connect debt and deficit figures through so-called “stock-flow” adjustments (SFA).⁴ This result shows that the willingness to avoid disclosing inaccurate information dominates at a general level. However, we also find that those governments that *do not* reduce fiscal guidance in periods of uncertainty are subject to creditors’ pressure. These governments expect to run substantial deficits, face short-term refinancing needs, and confront high and volatile yields in the secondary bond market in the immediate pre-disclosure period. This result corroborates the importance of coercive isomorphism exercised by credit markets for governments in financial needs. Finally, we demonstrate that those governments that do not reduce guidance in periods of uncertainty present symptoms of poor fiscal reporting quality. These governments issue optimistic forecasts, publish their guidance with substantial delay, and present evidence of SFA in the pre-disclosure period. Governments with little need for external capital and better fiscal reporting quality “go dark” instead (Leuz et al., 2008). Our findings are consistent with the

⁴ SFA are items that affect the financial position of the government without being recorded in its income statement. They may include privatizations, acquisition, disposal and change in the valuation of financial assets and liabilities or cash-accrual reconciliations. Prior literature shows that SFA is a preferred way for governments to perform “creative accounting” and manage fiscal figures (Alt et al., 2014).

hypothesis that governments, in periods of uncertainty, prefer to avoid commitment to a future fiscal plan unless they are forced into doing so by coercive isomorphic pressures stemming from the market for government bonds. Moreover, transparency in guidance in periods of uncertainty should not necessarily be interpreted positively, because it may mask relatively more biased and less timely fiscal reporting.

So far, studies of fiscal transparency have emphasized the role of fiscal distress, economic conditions, and political dynamics as determinants of governments' willingness to be open about the budget process (Alt et al., 2006; Ríos et al., 2016; Wehner & de Renzio, 2013). We extend this literature by providing evidence of uncertainty shocks as a determinant of governments' disclosure choices, after controlling for previously identified determinants.

Moreover, previous literature on fiscal transparency has focused mainly on fiscal outcomes. We focus on fiscal guidance, i.e., fiscal forecasts. Understanding the dynamics of fiscal guidance in periods of uncertainty is of extreme importance in the current economic environment. Beginning with the Great Financial Crisis and the subsequent sovereign debt crisis that hit the US and Europe in 2008-2014 and continuing with the COVID-19 pandemic and the military conflicts, governments' initiatives to support the economy via unprecedented fiscal stimuli are becoming the rule rather than the exception. These fiscal initiatives are often preceded or followed by rather diverse forms of disclosure and fiscal reports that aim to ensure that governments are accountable for the extraordinary use of resources provided by creditors and the public (Alesina et al., 2015; Naughton & Spamann, 2015). Accordingly, research on fiscal guidance and fiscal reporting is becoming increasingly relevant to accounting scholars. In accounting research, governments' reporting choices have been studied primarily in the context of local and state governments (Carpenter & Feroz, 2001; Costello et al., 2017; Kido et al., 2012; Naughton et al., 2015; Vermeer et al., 2012). We extend this literature by focusing on central governments and studying fiscal guidance as a crucial pillar of fiscal transparency.

The paper proceeds as follows. Section 2 reviews the related literature and formulates our hypotheses. We elaborate on the research design in section 3 and present the data in section 4. Section 5 contains the results of the analysis. We briefly conclude in Section 6.

2. Related literature and hypothesis development

2.1. Fiscal reporting and fiscal transparency

The literature on fiscal transparency is vast and interdisciplinary, with impactful contributions found in accounting, political science, political economy and public administration journals (Alt, 2019; Zhao & Wang, 2006). At an intuitive level, it seems understandable that more transparency should lead to a better functioning of the government and, consequently to a higher level of welfare for the society. Indeed, equating government openness with accountability and good governance has been, historically, a potent force behind the diffusion of fiscal transparency initiatives (Mehrpooya & Salles-Djelic, 2019; The World Bank, 1992). Yet, the empirical evidence on the allegedly benefits of fiscal transparency is mixed (de Renzio & Wehner, 2017). The relationship between fiscal transparency, governance and citizens' welfare appears to be complex and context dependent (Alt, 2019). In addition, users of fiscal documents are often considered to be "hypothetical" and the actual demand for information in the public sector appears to be limited (Jones & Pendlebury, 2000; van Helden & Reichard, 2019). Therefore, there is a pressing theoretical need to problematize the ultimate purpose of the pillars of fiscal transparency initiatives. A useful starting point is the definition of fiscal transparency given by Kopits & Craig (1998):

"...openness toward the public at large about government structure and functions, fiscal policy intentions, public sector accounts, and projections" (p. 1).

This definition distinguishes three objects of fiscal transparency. Governments can be transparent about the institutional framework that supports fiscal choices. This *Institutional* form of transparency refers to the *process* area of public financial management (Allen et al.,

2013) and is the focus of process-based transparency indices (e.g., the Open Budget Index. See IPB, 2017). Governments can also be transparent about their accounts – e.g., by improving the coverage of fiscal reporting and the methodology used in preparing fiscal reports. This *Accounting* form of transparency is the focus of early research – particularly at the state level (Alt et al., 2006; Kido et al., 2012) with recent extensions at the central government level (Wang et al., 2015). Finally, governments can be transparent about their actual financial situation and about their expectations for the future. This is what Kopits & Craig (1998) call *Indicators and Projections* transparency and is the focus of our analysis. The determinants and effects of governmental disclosure may be different depending on which one of these three dimensions we take under consideration. In particular, there is an important difference between transparency on public sector accounts and projections. While transparency on fiscal outcomes requires *openness* about the consequences of prior policy actions, transparency on fiscal intentions requires information on governments’ *plans* for an uncertain future (Columbano, 2022). As we argue below, this form of transparency is likely to be subject to determinants of its own, reflecting the inherently uncertain nature of forward-looking disclosures. When focusing on “*Accounting*” and “*Indicators and Projections*” objects of fiscal transparency, two dimensions have been highlighted by the previous literature: *accountability* and *financing needs*, by both political scientists (Alt, 2019; Heald, 2003) and accounting scholars (Kim et al., 2021). We formulate our hypotheses on the government’s disclosure response to uncertainty shocks conditional on these two roles of transparency, i.e., accountability and monitoring.

2.2.Accountability and fiscal transparency

With respect to accountability, political scientists have traditionally focused on the agency relationship existing between the government (the agent) and the citizens/voters (the principal(s)) (Alt, 2019, 2021). Fiscal transparency should help citizens evaluate the policies implemented by the government and decide whether public resources have been used in a

proper way. More recently, the concept of government accountability has evolved due to the increased supervisory role played by supranational and international institutions on the fiscal activity of national governments (Heald, 2003). Hence, national governments are accountable and need to report not only to their citizens, but also to supranational and international institutions such as the World Bank, the IMF, or the EU, creating a new arena to study the determinants and the effects of fiscal transparency.

International institutions have been at the forefront of several initiatives to enhance fiscal transparency (IMF, 1998; OECD, 2002; The World Bank, 1992). The rationale behind these initiatives is expressed well by Alesina & Perotti (1996, p. 403)

“Lack of transparency helps to create confusion and ambiguity on the real state of public finances, by hiding as much as possible of the current and future tax burdens, overemphasizing the benefits of spending, and underestimating the extent of current and future government liabilities.” (p. 403)

Therefore, accountable governments are governments that are transparent in sharing their plans for the future, to prevent ambiguity over the future tax burden. More broadly, accountable governments are governments that share their plans about the future and take responsibility for delivering on them. This view can be traced back to Max Weber’s ethic of responsibility, which imposes on governments the duty to “answer for the (foreseeable) *consequences* of one’s actions.” (Weber, 2010, p. 360, original emphasis). But what if the future is hardly foreseeable? The argument that fiscal transparency in fiscal plans is beneficial for accountability purposes rests on the assumption that governments *always* possess precise information on the future that they choose to disclose or withhold. If this assumption holds, then government disclosure is always potentially informative. Distorted or reduced disclosure can be detected ex-post and punished. However, when it comes to fiscal plans, we must allow for the possibility that governments’ information set is imprecise, notably in periods of

uncertainty. Periods of uncertainty are periods in which it is difficult to obtain *precise* information that leads to accurate forecasts. In these circumstances, a desire to escape accountability may not be the *sole* reason for less than full transparency. If we allow governments to be partially uninformed about the future fiscal outlook, it is possible that governments reduce the level of transparency in their fiscal plans precisely because the consequences of fiscal plans are less foreseeable. Yet, once a plan is released, it will be used as a benchmark to evaluate government policies and the government will be held accountable for it. In this context, Prat (2005) studies a model of transparency that separate openness about *actions* from openness about *outcomes*. What matters in terms of social welfare is the coherence between actions and the ex-post realized state of the world. He demonstrates that if the government is forced to be transparent about future actions before the state of the world is realized and when the signals received are not very accurate, there exists a risk of conformism that pushes governments to choose what is ex-ante considered to be better rather than what is more likely to be ex-post appropriate. This is ex-post suboptimal for the public. Accordingly, he concludes that conditions exist in which “...*the intention to take an action, should not be revealed before the consequences of the action are observed.*” (Prat, 2005, p. 869). In short, the model demonstrates that transparency about plans is not always desirable. Thus, in the presence of high uncertainty about the ex-post realization of the state of the world, governments may have incentives to reduce their level of forward-looking transparency to minimize the possibility that these forecasts turn out to be inaccurate with respect to the ex-post realized state of the world. The incoherence between the announced fiscal plan and the actual realized situation could generate a lower level of social welfare and induce potential costs in terms of accountability. We express this hypothesis as follows.

Hp1a: Uncertainty shocks cause a reduction in the level of forward-looking transparency in governments' fiscal plans

Another important aspect of the concept of accountability in the context of surveillance by international and supranational institutions is the need to comply with rules and mandates

issued by these institutions. This is certainly the case for EU member states that adhere to the Stability and Growth Pact (SGP) – a set of rules governing the management and disclosure of fiscal aggregates, outcomes and plans. Two studies are of interest here. Von Hagen & Wolff (2006) report that EU governments achieve compliance with the 3% deficit target by making use of financial operations that increase government debt while not being recorded as a deficit, i.e., the SFA. SFAs break the automatic link that should exist between fiscal deficit/surplus and change in the overall level of national debt. A positive SFA allows the government to hide deficits while the officially recorded level of debt is increasing. Focusing on the latter case, Von Hagen & Wolff (2006) show that, after the introduction of the SGP, EU governments have used positive SFA to show compliance with the deficit rule while continuing to accumulate debt. This evidence supports the idea that the deficit rule is perceived to be more compelling than the debt rule (Alt, Lassen, & Wehner, 2014; e.g., Savage, 2005). Alt et al. (2014) document the systematic use of positive SFA after the adoption of the SGP in 1997 and before the financial crisis of 2008.⁵ Both these studies single out SFA as a key tool for fiscal gimmickry by EU member states. When uncertainty about the future increases, SFA may provide governments with the necessary flexibility to comply with a target level of deficit despite the occurrence of unexpected states of the world. If no clear forecasts on the detailed evolution of SFA are provided, fiscal gimmickry through SFA can be implemented in the dark without generating a surprise because ambiguous SFA targets were set in the first place. This disclosure strategy minimizes the possibility of the government being blamed for not adhering to its plan. In our disaggregation of the general index of transparency, SFA are included in the “Balance Sheet” sub-index. Hence, we expect that governments’ decision to reduce fiscal guidance after an uncertainty shock be more concentrated on balance sheet items in general, and on SFA in particular. Hence, we complement Hp1a with the following.

⁵ Cf. Alt et al. (2014), Appendix 3. They also show that the usage of SFA to manipulate reported fiscal figures is reduced by increased *Institutional* transparency.

Hp1b: Uncertainty shocks cause a relatively stronger reduction in the level of forward-looking transparency on balance sheet items contained in governments' fiscal plans.

It should be emphasized that our focus on transparency in the disclosure of balance sheet items derives from the fact that the SFA items – such as cash-accrual adjustments, acquisition/disposal of financial assets, etc. – as detailed in the Supplemental Material – are categorized as balance sheet items in the SGPs, because they affect the *reported* level of government debt rather than deficit. This is because these items do not count towards the calculation of the surplus/deficit of the government in the system of national accounts (Eurostat, 2013). Accordingly, we focus on the effect of uncertainty shocks on the transparency of balance sheet items because SFA items are categorized within the forecasts on the evolution of the debt outlook of the disclosing government, even if the action is meant to alter its reported deficit to keep it artificially low.

2.3. Financing needs and fiscal transparency

The second important purpose of transparency is to support the search for debt financing. Higher quality fiscal reporting and more disclosure have the potential to reduce information asymmetries, facilitate the access to the debt market and reduce the cost of debt. Alt et al. (2006) show that governments that face fiscal imbalances and a high degree of political competition are more likely to adopt higher level of fiscal transparency. Of particular interest for our analysis is the work of Arapis & Reitano (2018) who find that transparency increases in the size of fiscal imbalances and after economic crises. Copelovitch et al. (2018) show that borrowing costs decline for countries that release more comprehensive financial information. Gelos & Wei (2005) document that investment funds allocate greater resources to transparent jurisdictions. Glennerster & Shin (2008) use an exogenous shock to the timeliness of governments' release of macroeconomic information to show that borrowing costs decline by eleven percent following a signal that governments commit to greater transparency. Bastida et al. (2017) also show that interest rates are negatively associated with measures of fiscal

transparency. Anticipating these positive effects increases the incentive for governments to improve transparency when financing needs are high. Based on the results of these empirical studies, we expect that the effect of fiscal uncertainty on the transparency fiscal guidance will depend on the level of pre-disclosure financing needs. Government of countries with relatively low financing needs may afford to be cautious and reduce the transparency to limit accountability costs, whereas governments of countries with relatively high financing needs have an incentive to maintain or increase fiscal guidance transparency to obtain external resources at the expense of accountability. By preserving a stable level of transparency to achieve debt financing in periods of uncertainty, the government obtains a short-term benefit at little cost, because inaccurate forecasts can be “blamed” on the volatile fiscal environment (Hood, 2007).

Carpenter & Feroz (2001) and Carpenter et al. (2007) provide a theoretical support to these arguments. They study the fiscal reporting choices of local US state governments. By combining institutional theory (DiMaggio & Powell, 1983) and resource dependence theory (Pfeffer & Salancik, 1978), they use the concept of *coercive isomorphism* to explain government choices. Coercive isomorphism is the pressure exerted on organizations to adhere to existing rules and norms set, for example, by other organizations. Resource dependence theory stresses the importance of the need to procure external financial resources in explaining organizational behavior. Consequently, for governments with large external financing needs, the coercive pressure not to reduce fiscal guidance transparency exercised by the EU is reinforced by the coercive pressure exercised by the debt market that could negatively interpret a reduced level of transparency.

By combining the empirical and the theoretical arguments provided before we formulate the following hypothesis.

H_p2. The relation between uncertainty shocks and the level of forward-looking transparency on balance sheet items contained in governments' fiscal plans is moderated by the need for debt capital

In additional analyses, we test whether maintaining a stable level of transparency in periods of uncertainty has the unintended consequence of generating a stable supply of inaccurate forecasts (as measured by *Optimism*). In addition, the analysis tests if those governments that maintain a stable level of transparency in periods of uncertainty are the ones that present symptoms of poor fiscal reporting quality (as measured by the past magnitude of *Stock – Flow Adjustments* and *Publication Delay*), as it would be the case if governments self-servingly disclose optimistic forecasts in period of uncertainty, where signal is relatively difficult to extract from noise (Rogers & Stocken, 2005). These tests wish to corroborate indirectly the intuition that the quantity of disclosure of fiscal guidance is a poor symptom of the quality of fiscal disclosures in periods of uncertainty, as transparency is driven by the need for capital rather than the possession of superior information by the government.

3. Data

To measure fiscal guidance transparency, we rely on a novel dataset that contains all the forecasts issued by the 28 European Union (EU) governments in their fiscal plans released over the period 2001-2018 (Columbano, 2022). The dataset exploits the institutional features of the SGP, a set of regulations that dictates that every year, the governments of EU member states disclose to the public a document known in the SGP vernacular as the Stability/Convergence Programme (SCP). SCPs are fiscal plans that must include a numerical, point forecast on the governments' medium-term target for the budget balance – the difference between revenues and expenditures – and for government debt. In addition, governments can voluntarily disclose a large number of accompanying forecasts on, e.g., the drivers of economic growth, the categories of revenues and expenditures that contribute to the expected budget balance, the

evolution of assets and liabilities of the government, and the assumptions underlying the plan.⁶ These forecasts, while recommended, are ultimately voluntary. Thus, the SGP mandate to report fiscal plans is combined with provisions that give governments considerable leeway over the number of items on which a forecast is released or withheld. We leverage on the heterogeneity in disclosure choices over the period to construct a factor capturing the latent construct of fiscal guidance transparency.

3.1. Dependent variable: Transparency

Each SCP contains forecasts on up to 117 unique items and 4 forecast horizons: t , $t + 1$, $t + 2$ and $t + 3$ – with t indexing the guidance year. Each forecast horizon is considered as a separate observation for the same government-year, i.e., we have 4 forecast observations for each government-year. After eliminating missing data, we are left with 1,003 forecast-year observations, 265 guidance events and 24 countries for the period 2002-2017. We compute the amount of transparency in SCPs (*Transparency*) based on a measure of compliance with the EU code for the issuance of the annual SCP by each member government. Starting from the forecasts contained in the SCPs released between 2001 and 2018, each item is coded as equal to 1 (0) if present (missing) in each SCP. Whether an item is present or absent varies along several dimensions. Given a set of items $i = 1, \dots, N$, a government may choose to disclose forecasts on item i_1 but to not disclose forecasts on item i_2 or i_3 . Hence, compliance varies at the SCP level. In addition, given four forecast horizons $h = 0, \dots, 3$, the government may choose to release forecasts on, e.g., item i_1 at horizon $h = 0$ and $h = 1$ but not at horizons $h = 2$ or $h = 3$. In addition, given a set of submission years $t = 2001, \dots, 2018$, a government may release forecasts on an item-horizon dyad when $t = 2001$ but withhold it when $t = 2002$. Finally, each year there are $g = 1, \dots, G$ governments in our sample. Hence, an item i appears

⁶ The frequency with which each of these 117 items are reported in the sample of SCPs is presented in Table OA.14 in *Appendix A* of the on-line *Supplemental Material*.

in each SCP-horizon-year triad as $i_{g,t,h} \in \{0,1\}$. We sum across the presence/absence of items and divide the sum by the R number of items that the SGP mandate required in the focal year t , as follows:

$$Compliance = \frac{1}{R_t} * \sum_{i=1}^N i_{g,t,h} \quad (1)$$

We then calculate the mean-adjusted measure of compliance (*Uniqueness*), their first differences over two consecutive SCP vintages ($\Delta Compliance$ and $\Delta Uniqueness$), the number of times an item switches from present to absent at a given forecast horizon over two consecutive SCP vintages (*Switches*), and the probability that an item present in the previous SCP vintage at a given forecast horizon is also present in the focal SCP (*Persistence*).⁷ We then run a first principal component analysis of the six measures. We find that these measures load on two different factors. The first factor captures transparency *levels* (reporting high factor loadings of *Compliance*, *Uniqueness*, and *Persistence*). This will be our main variable of interest and we will call it *Transparency*. The higher the score on this factor the more transparent is the government. The second factor captures transparency *changes* (reporting high factor loadings of $\Delta Compliance$, $\Delta Uniqueness$, and *Switches*). Following the call of prior literature for a more granular analysis of fiscal transparency (Cucciniello, Porumbescu, & Grimmelikhuijsen, 2017; de Renzio & Wehner, 2017; Wang et al., 2015; Williams, 2015), we follow the same steps described above to construct sub-scores of transparency that include only items that belong to similar categories. We compute four sub-scores for (a) income statement items – revenues, expenditures, and their components; (b) balance sheet items and contingent liabilities; (c) economic items – such as GDP growth, inflation, and employment rates; (d) forecasts on the items that represent assumptions underlying the fiscal plan – such as assumptions on exchange and interest rates.

⁷ The construction of these measures, descriptive statistics, correlations, and the details of the factor analysis are presented in detail in the on-line *Supplemental Material, Appendix A*.

Our argument presupposes that the disclosure of forecasts represents a conceptually separate facet of transparency with respect to previous studies. If this is the case, we should expect to observe a non-significant or negative correlation between *Transparency* and other commonly used indices of budgetary and fiscal transparency for central governments. Table 1 presents evidence consistent with these priors. In particular, *Transparency* neither correlates with the Open Budget Index (OBI) (IPB, 2017) – a panel-based measure of *Institutional* transparency – nor with the Government Finance Statistics index (Wang et al., 2015) – a panel-based measure of *Accounting* transparency. The lack of a significant correlation between these measures suggests that *Transparency* in government forecasts indeed captures a separate facet of transparency – that focuses on *Indicators and Projections*. Interestingly, we also document a negative and statistically significant correlation between *Transparency* and the European Quality of Governance Index (EQI). The negative correlation indicates that countries characterized by high quality of governance tend to issue a lower quantity of forecasts on the future economic and fiscal outlook. This finding provides preliminary support for the intuition that, after an uncertainty shock, a higher amount of fiscal guidance is not necessarily an indication of good quality of governance and could simply be the result of coercive pressures from creditors.

[Table 1]

3.2. Independent variable: Uncertainty

Our measure of fiscal uncertainty derives from the standard deviation of the budget balance forecasts – expected revenues less expected expenditures – that is mandatorily released by governments in their SCP fiscal plans. We compute our measure of fiscal uncertainty as the standard deviation of the expected budget balance over a horizon that includes four years beginning with the year in which the SCP was published, i.e., t , $t + 1$, $t + 2$, and $t + 3$. The higher the standard deviation of these forecasts, the higher the level of fiscal uncertainty, i.e.,

the government faces a more volatile fiscal outlook. In *Appendix B* of the on-line *Supplemental Material*, we provide evidence that the measure is a credible proxy for the construct of interest by comparing it to other widely used proxies of fiscal volatility. We also show that the measure correlates positively and significantly with the popular index of Economic Policy Uncertainty (EPU) (Baker, Bloom, & Davis, 2016). In our main analyses in which we estimate the treatment effect of fiscal uncertainty, we transform this measure into a binary variable. We calculate, for each quarter-year in the sample, the median sample standard deviation of the budget balance forecasts and assign a value of 1 to observations that exceed the median, and 0 otherwise. The quarter-year is a valid reference point because fiscal plans belonging to the same annual cycle are mostly clustered around the same quarter of each year. Hence, in that quarter-year, governments can be compared in terms of the level of uncertainty surrounding their fiscal plan. The remaining data used in the analysis consists of pre-existing economic, fiscal, financial, and political conditions, already used by the previous literature on the determinants of budget transparency. We use these variables both in our identification strategy and to explore the heterogeneity in the treatment effects of *Uncertainty* on *Transparency*. The appendix at the end of the manuscript explains the construction of all the variables included in the analysis.

4. Research design

4.1. Identification strategy

Even if *Uncertainty* does capture the construct of fiscal uncertainty, it exposes us to an important identification challenge: episodes of “high” fiscal uncertainty are unlikely to be randomly assigned. Because our measure of fiscal uncertainty is based on the reported budget balance forecasts over the period t to $t + 3$, it is likely to be contaminated by the predictable incentives that governments have to bias these forecasts. If these determinants correlate with *Transparency*, any estimated effect of *Uncertainty* is likely to be biased. We use a two-

stage approach to design a treatment assignment mechanism in which our estimates of the effects of uncertainty on transparency are unlikely to be affected by unobserved factors.

First, we use the self-selection into desirable budget balance forecasts to our advantage. Governments in our setting must comply with EU requirements of reporting an annual budget deficit of 3 percent of GDP at most, while aiming for a budget close to zero, or in surplus, by the end of the forecast horizon. Therefore, governments that report a particularly negative fiscal performance have a greater likelihood of forecasting an improvement in the fiscal outlook that mechanically gives rise to an increase in *Uncertainty*. We follow the policy propensity score literature (Angrist & Kuersteiner, 2011) and measure the propensity of governments to report an improvement in the fiscal outlook conditional on the past fiscal performance. We then estimate treatment effects by weighting observations by the inverse of the estimated policy propensity scores (Hirano et al., 2003). Second, we attempt to alleviate the challenge that the policy propensity score model only produces unbiased treatment effects conditional on observables by using natural disasters to randomize uncertainty shocks in the sample. In line with Baker et al. (2016), we retrieve data gathered by the Center for Research on the Epidemiology of Disasters (CRED) that include data on unexpected natural disasters such as floods, pandemics, and earthquakes. Following these authors, we focus on major disasters, defined by disasters that cause either damages that exceed 0.1% of GDP or at least 100 casualties. We match this dataset with our measure of uncertainty at the (lagged) quarter-year level to ensure that disaster figures precede the issuance of annual fiscal guidance. As expected, past fiscal performance predicts *Uncertainty*. In addition, natural disasters correlate positively and significantly with the measure of uncertainty, supporting the use of natural disasters as exogenous shocks⁸.

⁸ The results of estimating the policy propensity score can be found in Table OB.1 in *Appendix B* of the on-line *Supplemental Material*, together with more information about the identification strategy.

4.2. Estimation of the baseline model: effect of uncertainty on transparency

The baseline model that we use to test Hp1a and Hp1b on the response of transparency to fiscal uncertainty shocks is an Ordinary Least Squares (OLS) of the form:

$$\text{Transparency}_{c,v,h} = \beta_1 \text{Uncertainty}_{c,v} + \mathbf{Controls}'\psi_{c,v} + \alpha_c + \varphi_v + \gamma_h + \epsilon_{c,v,h} \quad (2)$$

The baseline specification controls for country-specific characteristics α_c that are time-invariant as well as for the documented persistence in the level of transparency. We also include forecast-horizon fixed effects γ_h that capture the documented trend of less transparency at longer horizons. Also, the baseline specification includes a full set of quarter-year indicators φ_v . Controlling for quarter-year indicators is necessary because the fiscal plans issued as part of the SGP reporting mandate tend to be published around the same quarter-year, exposing our estimates to the influence of contemporaneous unobservable shocks. The term **Controls** includes all the covariates of the propensity score stage⁹, while $\epsilon_{c,v,h}$ is the usual error term. Except when differently stated, standard errors are always clustered two-way at the country-date dimension.¹⁰ Given that each country is either treated or untreated on a given date, the country-date pair is the dimension at which treatment takes place (Abadie, Athey, Imbens, & Wooldridge, 2017). Throughout, we will refer to model (2) as the “baseline model”. If governments’ transparency depends on fiscal uncertainty, we expect our estimate of β to be different from zero.

4.3. Estimation of the mechanism model: the role of pressure from creditors

To test Hp2 we investigate the role of isomorphic pressures stemming from the debt market as moderators of the effect of *Uncertainty* on *Transparency*. We estimate the following OLS:

⁹ A full description can be found in *Appendix B* of the on-line *Supplemental Material*.

¹⁰ Two-way clustering at the country-date dimensions seems appropriate to account for the structure of our data and with treatment assignment taking place at the country-date dimension. On the other hand, two-way clustering in presence of a limited number of clusters is robust but inefficient, which may lead to the inflated standard errors. We choose to be conservative. We implement two-way clustering through the `ivreg2` routine in Stata®, available from the SSC.

$$\begin{aligned}
Transparency_{c,v,h} = & \beta_1 Uncertainty_{c,v} + \beta_2 Mechanism_{c,v} + \beta_3 Uncertainty_{c,v} * \\
& Mechanism_{c,v} + \mathbf{Controls}'\psi_{c,v} + \alpha_c + \varphi_v + \gamma_h + \eta_{c,v,h}
\end{aligned} \tag{3}$$

where all variables are defined as in the baseline model, and *Mechanism* is one of the variables that capture pressure stemming from creditors. If the effect on fiscal uncertainty on transparency in fiscal plans depends on these isomorphic pressures, we expect the sum of the estimates of the β_1 and β_3 parameters to be statistically significant. To evaluate the strength of interaction effects and locate them along the distribution of *Mechanism*, we compute Average Marginal Effects (AME) of switching from *Uncertainty* = 0 to *Uncertainty* = 1 over the range of *Mechanism* between its 1st and 99th percentile, while keeping other variables at their observed sample value. When using the continuous measure of *Uncertainty*, the AME are estimated for small increments of the variable. Throughout, we will refer to model (3) as the “mechanism model”. Except when otherwise indicated, all models are estimated by conditioning on the inverse probability weights computed in the propensity score stage. We use the mechanism model also when examining the fiscal reporting quality of governments that choose (not) to “go dark” in periods of uncertainty.

5. Results

5.1. Descriptive analysis

Figure 1 plots the ranking of *Transparency* by country and separately for each forecast category, which confirms that substantial heterogeneity characterizes disclosure choices in the sample. Crucially, this heterogeneity is mostly driven by governments’ diverse approach to the disclosure of forecasts on items that pertain to the expected evolution of the outlook for the government’s balance sheet. Indeed, Figure 2, Panel A presents the historical series of the common factor *Transparency* and of its components. We notice a general increase in the level of transparency, but an inverse trend for transparency on balance sheet items. In Figure 2, Panel B we plot the evolution of *Transparency* for each country over time and again we

notice substantial heterogeneity.¹¹ These figures support a research design where fixed effects are used to control for both time-invariant country characteristics and common time trends.

[Figure 1]

[Figure 2]

Table 2 reports summary statistics of the sample used in the analysis. The average level of the *Transparency* factor is slightly negative at -0.06, while *Uncertainty* is equal to 1 in 49 percent of the observations. In turn, the average standard deviation of forecasts – the continuous measure of *Uncertainty* is 0.81 percent. The average level of 5-year government bond yields (*Yields*) is 3.05 percent, with an annualized volatility (*Yields Volatility*) of 0.17. The governments in our sample control about 56 percent of the seats in parliament (*Government Strength*) and face a fairly fractionalized parliament (*Political Competition*), with a 71 percent probability that members of the legislature belong to different parties. Elections are on average two years away from the focal year (*Years to Next Elections*). The economies in our sample run below potential, with the growth rate of GDP being about 0.55 percentage points lower than potential growth (*Output Gap*). On average, governments are 0.37 percent of GDP short of the deficit requirement (*Fiscal Gap*), with a level of debt that marginally exceeds the SGP requirements by 2.48 percent of GDP (*Debt Gap*). Turning to the variables used in the mechanism model, the variables that capture governments' reliance on creditors are *Expected Deficit* and *Gross Financing Needs*. *Expected Deficit* is the budget deficit as forecasted by the government in year t at the horizon $t + 1$, $t + 2$, and $t + 3$. This data is available in the fiscal plans. On average, governments expect the deficit to average 1.45 percent of GDP. The second measure is a proxy for fiscal pressures that directly captures governments' need for capital.

¹¹ *Appendix A* of the on-line *Supplemental Material* provides extensive evidence on the characteristics of the six disclosure measures across forecast category. This evidence indicates that the compliance of governments with SGP requirements is significantly higher when focusing on forecasts on the economic and income statement items compared to forecasts on balance sheet items and assumptions.

Specifically, we match our data with data on the amount of principal of governments' bonds as of year $t - 1$ that is maturing in year t . Following Gabriele et al. (2017), we measure governments' financing needs as the sum of the government deficit and the amount of maturing principal, and we denote this variable as *Government Financing Needs* (*GFN* in short). Compared to the *Expected Deficit* measure examined earlier, *GFN* has the advantage that it does not rely on governments' reported needs but on actual issue-level data. According to Gabriele, et al. (2017), this measure also captures governments' financing needs better, when compared to standard deficit or debt measures.¹² That is because governments with small deficit may face relatively high liquidity needs if a substantial portion of debt matures in a one-year period. This variable is retrieved from the European Central Bank and is missing for some of our observations. On average, governments' roll-over requirements average 14.54 percent of GDP.

In our additional analysis we will use three more variables: *Optimism*, *Stock – Flow Adjustment* (*SFA*) and *Publication Delay*. *Optimism* is the difference between the forecast for the budget balance and realized outcomes: hence, the variable is missing when budget balance outcomes have yet to be reported. On average, deficit forecasts for the budget balance are optimistic, with realized fiscal performance being 1.01 percent of GDP lower than forecasted. *Stock – Flow Adjustment* captures the difference between the annual change in debt and the annual deficit in the year prior to disclosure, and it is available for the entire sample. The higher the value of this variable, the more likely is the government to have practiced fiscal gimmickry to manipulate the deficit figure. In our sample, the average *SFA* is negative and large, at -1.86 of GDP - albeit exhibiting wide variation. Finally, fiscal guidance is issued with an average *Publication Delay* of 1.34 days compared to the deadline for submission of the fiscal plans to the EU. The timeliness of the release of fiscal information is

¹² We are thankful to Carmine Gabriele for helpful discussions on the construction of the *GFN* measure.

seen as a positive signal about the government by debt markets that rewards timely government reports with lower cost of debt (Andersen et al., 2014; Edmonds et al., 2017). It is also associated with better government performance (Islam, 2006). Hence, a delay in the release of the SCP will be used as a proxy for the quality of the fiscal reporting process. These figures are generally in line with related research.

[Table 2]

5.2. Estimation of the baseline model

We next test the baseline model of the effect of fiscal uncertainty on fiscal guidance transparency. Table 3 reports the results for the overall score and for each sub-score, conditional on the estimated policy propensity score and under two-way clustering on country and date. Columns 1-5 report effects when using a binary measure of *Uncertainty*, while columns 6-10 reports effects when using the continuous measure.

[Table 3]

The results indicate that *Uncertainty* is accompanied by a reduction in *Transparency* of 11 (13) percentage points using the binary (continuous) measure of uncertainty – an effect that is statistically significant at conventional levels. Hence, governments respond to uncertainty shocks by decreasing the intensity of their guidance about the future fiscal and economic outlook, supporting Hp1a. Turning to the forecast categories affected by uncertainty shocks, the evidence indicates that transparency declines for economic items and balance sheet items when using the binary measure of uncertainty. When using the continuous measure of uncertainty, transparency on income statement items declines, too. We find that the negative effect of the binary measure of uncertainty is particularly strong when focusing on balance sheet items, which decline by 19 percentage points, significant at 1 percent level. This effect is economically meaningful given that the interquartile range for the overall *Transparency* index is -0.46/0.60.

Turning to the control variables, we estimate a strongly positive effect of government bond yields volatility on the transparency of balance sheet items and assumptions. That is, when bond yields are volatile, governments respond with a greater transparency on the balance sheet items. This finding provides a first indication that isomorphic pressures stemming from creditors are sufficiently coercive to induce governments to increase the disclosure of forecasts. These pressures, when arising out of the need to comply with EU requirements, seem significantly weaker. Indeed, we find that governments that are far from meeting the EU requirements on the deficit reduce their transparency on balance sheet items, but increase their transparency on assumptions, leading to a null average effect. If we turn our attention to the political variables, we can notice the significant and negative effect of *Years to Next Elections* on the transparency with which balance sheet forecasts and assumptions are disclosed. This result provides some evidence of the existence of a political budget cycle for fiscal guidance. The closer elections are, the more transparent are governments. When elections approach, we can interpret fiscal plans as fiscal *promises* about future budgets. Hence, incumbent governments can use these promises to increase their likelihood of getting re-elected. In other words, when the electoral pressure is high the incentive of getting re-elected contrasts the accountability effect that pushes for a reduction of fiscal guidance in the presence of uncertainty.¹³ Finally, natural disasters are mostly unrelated to our transparency measures directly.

5.3. Estimation of the mechanism model

Hp2 predicts that in response to uncertainty shocks, the level of transparency on balance sheet forecasts is conditional on the isomorphic pressures on governments coming from the debt market. In particular, the larger the deficit that a government expects to run in the future, the

¹³ For a review of the literature on Political Budget Cycle (PBC) please refer to Aaskoven & Lassen (2017). However, standard PBC theory deals with *actual* fiscal choices and predicts that incumbent governments will pursue expansive fiscal policies immediately before elections to increase the likelihood to be elected. Transparency about fiscal processes and outcomes moderates the PBC. Our focus of interest here is transparency about fiscal *plans*. Hence, we cannot apply directly standard PBC theory, and we refrain from making explicit hypothesis about the relationship between electoral pressure and fiscal guidance.

larger the amount of debt that it will have to issue, leading to strong dependence on creditors and a need to satisfy their information requirement. Accordingly, we hypothesize that governments will target their level of guidance transparency depending on their capital needs. Table 4 reports the results of the mechanism model when we interact *Uncertainty* with our two measures of governments' borrowing needs. Columns 1-2 (3-4) present the results when using the binary (continuous) measure of uncertainty.

[Table 4]

We continue to find a negative main effect of *Uncertainty* on transparency on balance sheet items. In addition, we document a negative main effect of *Expected Deficit* on transparency. As anticipated, the more negative the expected fiscal performance of the government, the lower the amount of guidance provided by governments on their future debt trajectory. This finding suggests that on average, expectation of positive fiscal performance is associated with relatively high levels of transparency on the debt outlook. However, we also estimate a positive and statistically significant interaction effect between the two measures. As Figure 3 shows, the positive interaction effect indicates that the reaction to uncertainty shocks is opposite for governments that expect positive and negative fiscal performance. Indeed, only the latter continue to provide guidance on the debt outlook, while the former reduce substantially the amount of balance sheet-related forecasts. Overall, consistent with Hp2, the governments that reduce transparency in periods of uncertainty are those that have less need for investors' capital. It is also interesting to observe that the cutoff point at which governments reduce transparency in periods of uncertainty is close to the three percent deficit target. That is, governments that forecast a deficit that exceeds the EU target do not reduce disclosure in periods of uncertainty. Instead, governments that forecasts a small deficit or a surplus reduce disclosure when the fiscal outlook becomes uncertain. Hence, governments appear to internalize the three percent deficit threshold as the meaningful cutoff point at which the perceived pressures from the debt market exceed the accountability cost of issuing potentially

inaccurate guidance. This evidence suggests that coercive isomorphic pressures stemming from the EU are important to governments' disclosure decisions, but only in periods of uncertainty. A similar conclusion is reached when using *GFN* as a measure of borrowing needs. In the case of *GFN*, we do not estimate a significant interaction effect, on average. Yet, Figure 3 reveals that, like the evidence documented for *Expected Deficit*, a reduction in transparency does obtain for governments with relatively contained refinancing needs.

[Figure 3]

Next, we estimate the mechanism model by measuring the isomorphic pressure coming from investors in government bonds by looking at market-level data. We create two continuous measure of debt market pressure based on secondary market data. Secondary market data have the advantage that their daily frequency matches that of the treatment and dependent variable. In addition, they closely capture investors' views on the actual fiscal risk of the government, as opposed to *reported* fiscal risk. The first measure that we create is the annualized standard deviation of the daily secondary market yield on government bonds with 5-year maturity (*Yields Volatility*). We follow Borio & McCauley (1996) to calculate uncertainty from the monthly standard deviation of the change in daily yields. The second continuous measure are computed in the same way, but we focus on the yield itself (*Yields*). In periods of uncertainty, a reduction in government transparency may be expected if the level and the volatility of government bond yields are relatively low, i.e., when coercive debt market pressures are limited. We report the results in Table 5. The main effect of *Uncertainty* is again negative and strongly significant. The effect of the interaction term is consistently positive but not statistically significant on average.

[Table 5]

However, the average marginal effects displayed in Figure 4 points to a difference in the response of transparency to *Uncertainty* that depends on capital market conditions that is consistent with the findings reported in Table 4. In particular, focusing on the binary measure

of *Uncertainty*, the marginal effects indicate that when either the level or the volatility of bond yields is low, governments reduce transparency in periods of uncertainty. Once yields become high and volatile, however, governments respond with a stable level of transparency. The results are consistent with Hp2 that debt market pressures dictate governments' response to uncertainty shocks, in that governments can only afford to "go dark" when investors do not consider investment too risky. Results are very similar when we use a continuous measure of uncertainty in the place of the binary measure.

[Figure 4]

So far, we have found evidence that governments that strongly depend on creditors to refinance their debt do not reduce balance sheet transparency when faced with uncertainty shocks. We have also shown that governments reduce balance sheet transparency when investors' pressure is not too high. This evidence provides support for Hp2.

5.4 Additional analysis

We now want to investigate whether the decision to continue to guide in periods of uncertainty is associated with some specific characteristic of the government itself. Governments may choose to continue to issue guidance, only to release forecasts that are optimistic and blame the inaccuracy on the uncertainty surrounding the fiscal outlook (Hood, 2007). To test this conjecture, we use the variable *Optimism* to test if the relation between uncertainty and fiscal guidance transparency changes for governments that issue optimistic as opposed to conservative forecasts. We also use the variable *Stock – Flow Adjustments* to test whether guidance is associated with previous fiscal gimmickry. Finally, we use the variable *Delay* to test whether guidance is associated with the timeliness of guidance. We test these conjectures using again model (3), i.e., the "mechanism model". We report the results in Table 6. We continue to find that fiscal uncertainty has a negative effect on transparency, although standalone interaction terms are not significant.

[Table 6]

In Figure 5, however, we plot the AME to locate the effects of *Uncertainty* on *Transparency*. The graphs are concordant in indicating that those governments that do not reduce transparency in periods of uncertainty are characterized by attributes that suggest low quality of fiscal reporting. Indeed, the budget balance forecasts issued by these governments are on average more optimistic than those issued by governments who respond to uncertainty shocks with less transparent guidance on balance sheet items. In addition, these governments report a positive *SFA* in the year prior to the SCP disclosure, consistent with this indicator capturing deficit management techniques to some extent (von Hagen & Wolff, 2006). Finally, governments that guide in periods of uncertainty publish their SCP with a delay of over a month, which is consistent with these governments attempting to preserve informational rents (Alesina & Perotti, 1996; Alt et al., 2006). As a robustness test, we rerun all our analyses using an alternative measure of transparency based on the logarithm of the number of items disclosed in each fiscal plan. The results of these tests confirm that our findings are largely robust to using this simpler measure of transparency.¹⁴

[Figure 5]

6. Conclusions

We have studied if and how an increase in the uncertainty that surrounds the fiscal outlook affects governments' forward-looking disclosure choices. To investigate this question, we have exploited a reporting mandate that since 1998 applies to all EU governments. The mandate requires that EU governments publish a fiscal plan annually, leaving them substantial discretion in choosing the actual amount of information disclosed. We posit that in periods of uncertainty, fiscal plans raise a dilemma for governments. As the fiscal outlook becomes more uncertain, information on the government's fiscal plan becomes more valuable to users. Yet, governments may be unwilling to commit to a fiscal plan that, given the level of uncertainty, is likely to prove inaccurate. As a result, governments face a potential accountability cost from being

¹⁴ The results of this additional analysis can be found in *Appendix C* of the on-line *Supplemental Material*.

excessively transparent. We hypothesize and find that this cost is tolerable only for governments that have immediate liquidity needs and find evidence consistent with this hypothesis. Namely, in periods of uncertainty governments reduce the level of transparency on the outlook for assets and liabilities unless they have pressing refinancing needs and bond yields are either high or volatile. We also find that the fiscal forecasts issued by governments who continue to be transparent on debt-related items in periods of uncertainty are optimistic. In addition, these governments present evidence of large, past stock-flow adjustments and their fiscal plans are issued with substantial delay. We interpret this evidence through the concept of coercive isomorphism as developed by Carpenter & Feroz (2001). The need to procure external resources from the debt market forces indebted governments to comply more with the norms and habits imposed by this market which impose a higher level of transparency. Other governments can afford “going dark” instead (Leuz et al., 2008).

Our evidence contributes to the limited research on governments’ disclosure choices, and it complements prior studies that suggest that governments reduce transparency on fiscal outcomes and processes for opportunistic reasons in order to cover fiscal shortfalls, comply with balanced budget requirements, and portray a healthy fiscal picture (Chaney, Copley, & Stone, 2002; Costello et al., 2017; Frankel, 2011; Kido et al., 2012; Naughton et al., 2015; von Hagen & Wolff, 2006). Our focus on a related but distinct form of disclosure – guidance about the *future* fiscal outlook – allows to observe the disclosure choices of imperfectly informed governments. Our results invite caution in drawing inferences about governments’ willingness to be accountable from observed levels of fiscal guidance transparency. While governments say more about the future when they need capital, periods of uncertainty make this form of transparency a poor predictor of ex post forecast accuracy.

Supplemental material (online): Appendix A: Additional analyses of *Transparency*; Appendix B. Additional analyses of *Uncertainty*; Appendix C. Additional analyses and robustness tests.

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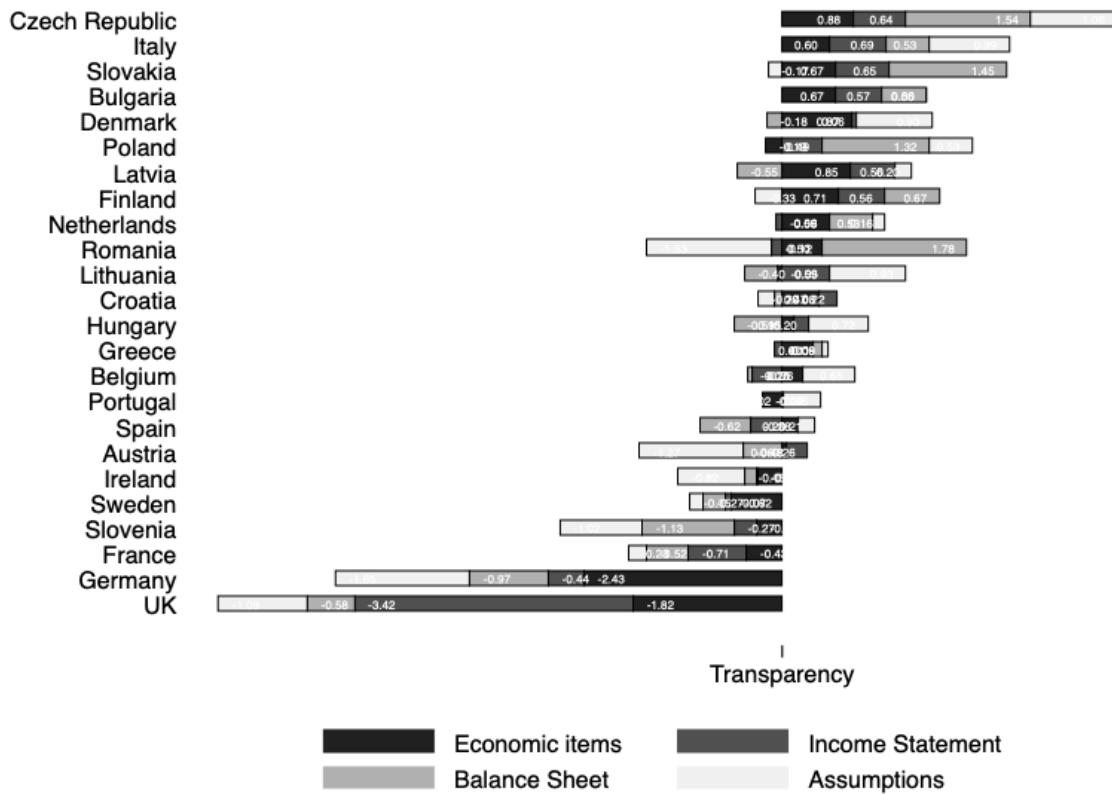
Appendix. Variable definition, sources, and method of construction

Variable name	Construction	Source
Outcome		
<i>Transparency</i>	The first principal component of <i>Compliance</i> , <i>Uniqueness</i> , Δ <i>Compliance</i> , Δ <i>Uniqueness</i> , <i>Switches</i> , and <i>Persistence</i> .	Authors' elaboration based on SCP primary data
Treatment		
<i>Uncertainty</i> (continuous)	Equal to the standard deviation of the fiscal balance forecast over the forecast horizon $k = 0, \dots, 3$. Built from SCP primary data.	Authors' elaboration based on SCP primary data
<i>Uncertainty</i> (binary)	<i>Uncertainty</i> is equal to one if <i>Uncertainty</i> (continuous) exceeds its quarter-year sample median.	
Exogenous shock		
<i>Natural disaster</i>	1 if in the quarter-year preceding the disclosure of the fiscal plan a natural disaster takes place in the country, and 0 otherwise.	Authors' elaboration based on data from the Center of the Epidemiology of Disasters (CRED).
Control variables and mechanisms		
<i>Yields</i>	The rolling 252-day mean of the daily yield on 5-year government bonds, winsorized at the 1 st and 99 th percentile.	Authors' elaboration based on data from Thomson Reuters EIKON
<i>Yields Volatility</i>	The rolling 252-day mean of the annualized monthly standard deviation of the daily first difference in the yield on 5-year government bonds. The daily first difference is the difference of the natural logarithm. Daily yields are winsorized at the 1 st and 99 th percentile.	Authors' elaboration based on data from Thomson Reuters EIKON
<i>Government Strength</i>	The percentage of seats in the legislature occupied by members that belong to political parties that support the governing coalition.	DPI, 2020 vintage
<i>Political Competition</i>	The probability that two randomly sampled members of the legislature belong to different political parties.	DPI, 2020 vintage
<i>Years to Next Elections</i>	The number of years between the year of disclosure of the SCP and the year of the next elections.	DPI, 2020 vintage
<i>Output Gap</i>	The difference between the annual growth of real GDP and the annual growth rate of potential GDP.	AMECO
<i>Fiscal Gap</i>	The difference between the general government net lending/net borrowing as percentage of GDP and 3 percent.	Authors' elaboration based on data from Eurostat
<i>Debt Gap</i>	The difference between the general government debt as percentage of GDP and 3 percent.	Authors' elaboration based on data from Eurostat
<i>Expected Deficit</i>	The forecast released by government for negative one times the general government net lending/net borrowing as percentage of GDP at each forecast horizon $k = 0, \dots, 3$.	Authors' elaboration based on data from Eurostat
<i>Gross Financing Needs (GFN)</i>	The sum of negative one times the general government net lending/net borrowing as percentage of GDP and the amount of principal on government bonds maturing in one year, measured one year earlier.	Authors' elaboration based on data from ECB and Eurostat
<i>Optimism</i>	The fiscal forecast error, defined as the difference between the forecast for the general government net lending/net borrowing as percentage of GDP and the outcome for the year.	Authors' elaboration based on data from Eurostat and primary SCP data
<i>Stock – Flow Adjustments (SFA)</i>	The sum of the annual first difference in the general government debt and the general government net lending/net borrowing, both as percentage of GDP	Authors' elaboration based on data from ECB and Eurostat
<i>Delay</i>	The number of days between the publication date of SCPs and the deadline for submission to the European Commission.	Authors' elaboration based on SCP primary data
Measures used to create Transparency Compliance		
	$Compliance = \frac{1}{R_t} * \sum_{i=1}^N i_{g,t,h}$ <p>where R is the number of items required by the SGP in year t, $i_{g,t,h} \in \{0,1\}$ denotes whether an</p>	Authors' elaboration based on SCP primary data

	item is disclosed by government g in year t at forecast horizon h	
<i>Uniqueness</i>	$Uniqueness = \sum_{i=1}^N i_{g,t,h} - \bar{i}_{t,h}$ <p>where $\bar{i}_{t,h}$ is the average proportion of governments excluding the focal government g that in year t disclose item i at forecast horizon h. The measure is standardized</p>	Authors' elaboration based on SCP primary data
$\Delta Compliance$	The first difference in <i>Compliance</i> between two consecutive SCP vintages	Authors' elaboration based on SCP primary data
$\Delta Uniqueness$	The first difference in <i>Uniqueness</i> between two consecutive SCP vintages	Authors' elaboration based on SCP primary data
<i>Switches</i>	$Switches_{g,h,t} = \frac{1}{R_t} * \sum_{s=-1}^1 s_{g,h,t}, s$ $= \begin{cases} 1 & \text{if } i_{g,h,t} = 1 \text{ and } i_{g,h,t-1} = 0 \\ -1 & \text{if } i_{g,h,t} = 0 \text{ and } i_{g,h,t-1} = 1 \\ 0 & \text{if } i_{g,h,t} = 1 \text{ and } i_{g,h,t-1} = 1 \\ 0 & \text{if } i_{g,h,t} = 0 \text{ and } i_{g,h,t-1} = 0 \end{cases}$ <p>where $s_{g,h,t}$ denotes a change in the item-level disclosure policy between two consecutive SCP vintages</p>	Authors' elaboration based on SCP primary data
<i>Persistence</i>	$Persistence = E(p_{g,h,t})$ <p>where $p = \Pr(i_{g,h,t} = 1 i_{g,h,t-1} = a), a \in (0,1)$</p>	Authors' elaboration based on SCP primary data
Measures used to validate		
Uncertainty		
<i>Fiscal Volatility</i>	The eight-year standard deviation of the general government net lending/net borrowing as percentage of GDP.	Authors' elaboration based on data from Eurostat
<i>Growth</i>	The annual growth rate of GDP per capita in constant 2010 US dollars. The annual growth rate of GDP is the first difference in the logarithm.	World Bank
<i>Output Volatility</i> <i>EPU</i>	The eight-year standard deviation of <i>Growth</i> Economic Policy Uncertainty index.	Authors' elaboration based on data from Eurostat The original Economic Policy Uncertainty index by Baker, Bloom, and Davis (2016), augmented with the indices created for Croatia, Greece, Ireland, Netherlands, and Sweden by the following authors: (Armeliu et al., 2017; Hardouvelis et al., 2018; Kok et al., 2015; Sorić & Lolić, 2017; Zalla, 2016). www.policyuncertainty.com
Alternative measures of		
Transparency		
<i>OBI</i>	Open Budget Index	IPB, 2019 vintage
<i>EQI</i>	European Quality of Government Index	University of Gothenburg, 2021 vintage. https://www.gu.se/en/quality-government
<i>GFS</i>	Government Finance Statistics Index	Wang, Irwin, and Murara (2015)
$\Delta Transparency$	The second principal component of <i>Compliance</i> , <i>Uniqueness</i> , $\Delta Compliance$, $\Delta Uniqueness$, <i>Switches</i> , and <i>Persistence</i> .	Authors' elaboration based on primary SCP data

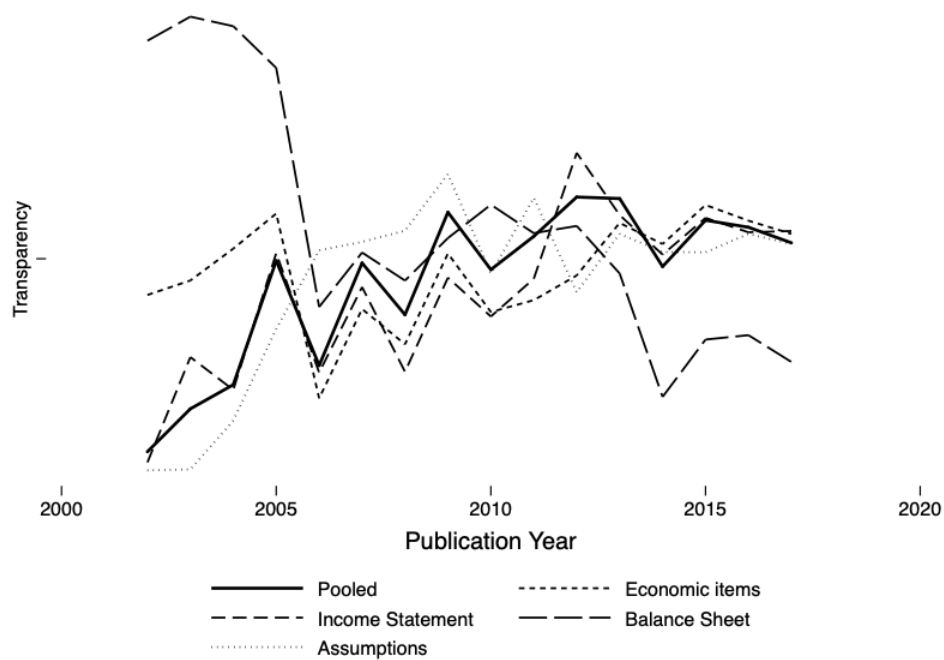
This table presents definitions, sources, and methods of construction of the variables used in the analysis shown in the manuscript and in the online appendixes presented in the on-line *Supplemental Material*. SCP denotes Stability/Convergence Programmes. ECB is the European Central Bank. GDP is Gross Domestic Product. DPI is the Database of Political Institutions. IPB is the International Budgetary Partnership.

Figure 1. Ranking of Transparency, by country and forecast category

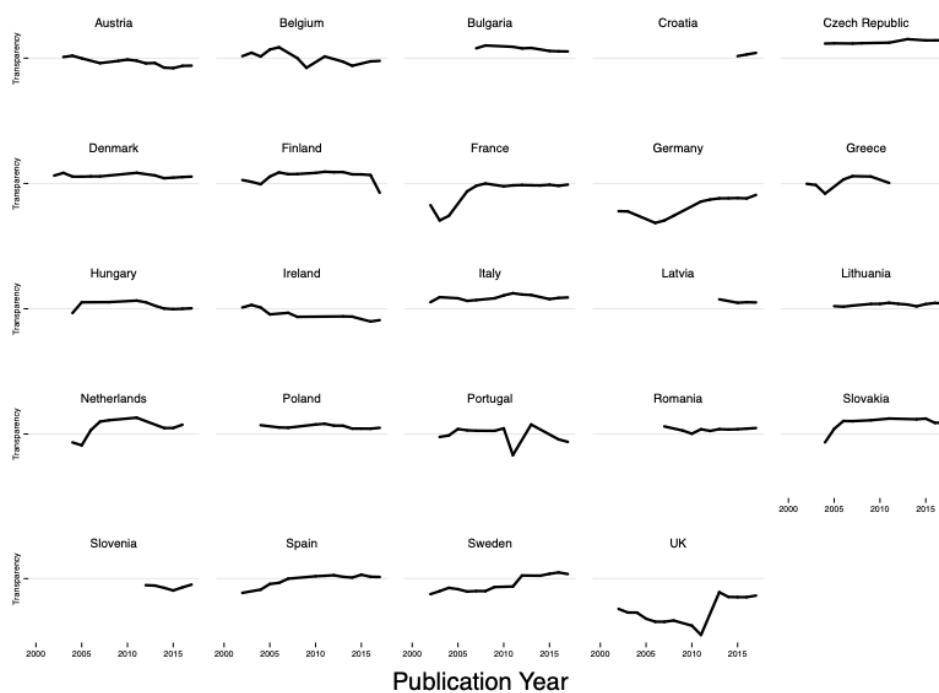


This figure plots the ranking of the average level of *Transparency*, separately by country and forecast category. The length of the stacked bars reflects the weight taken by each forecast category indicated in the legend.

Figure 2. Average and country-by-country trends in Transparency
Panel A

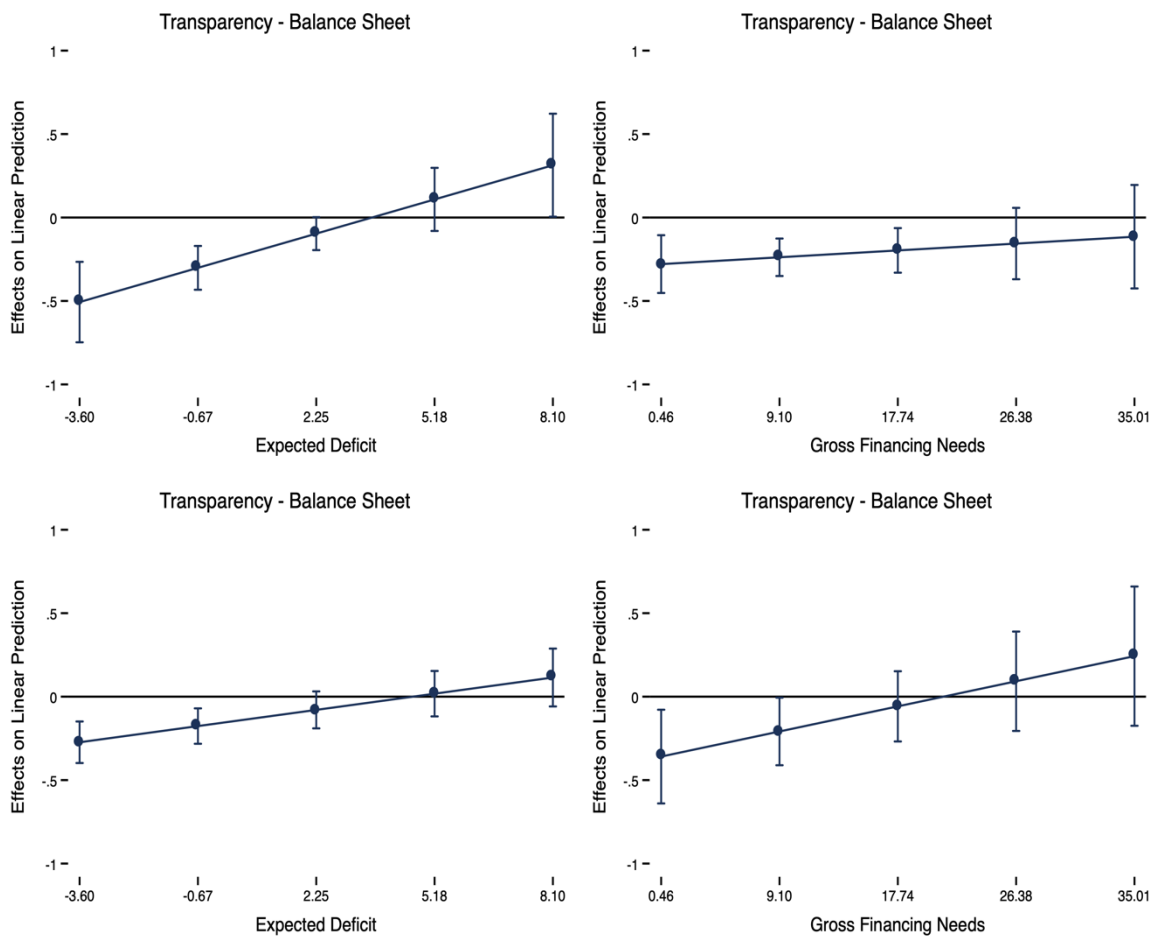


Panel B



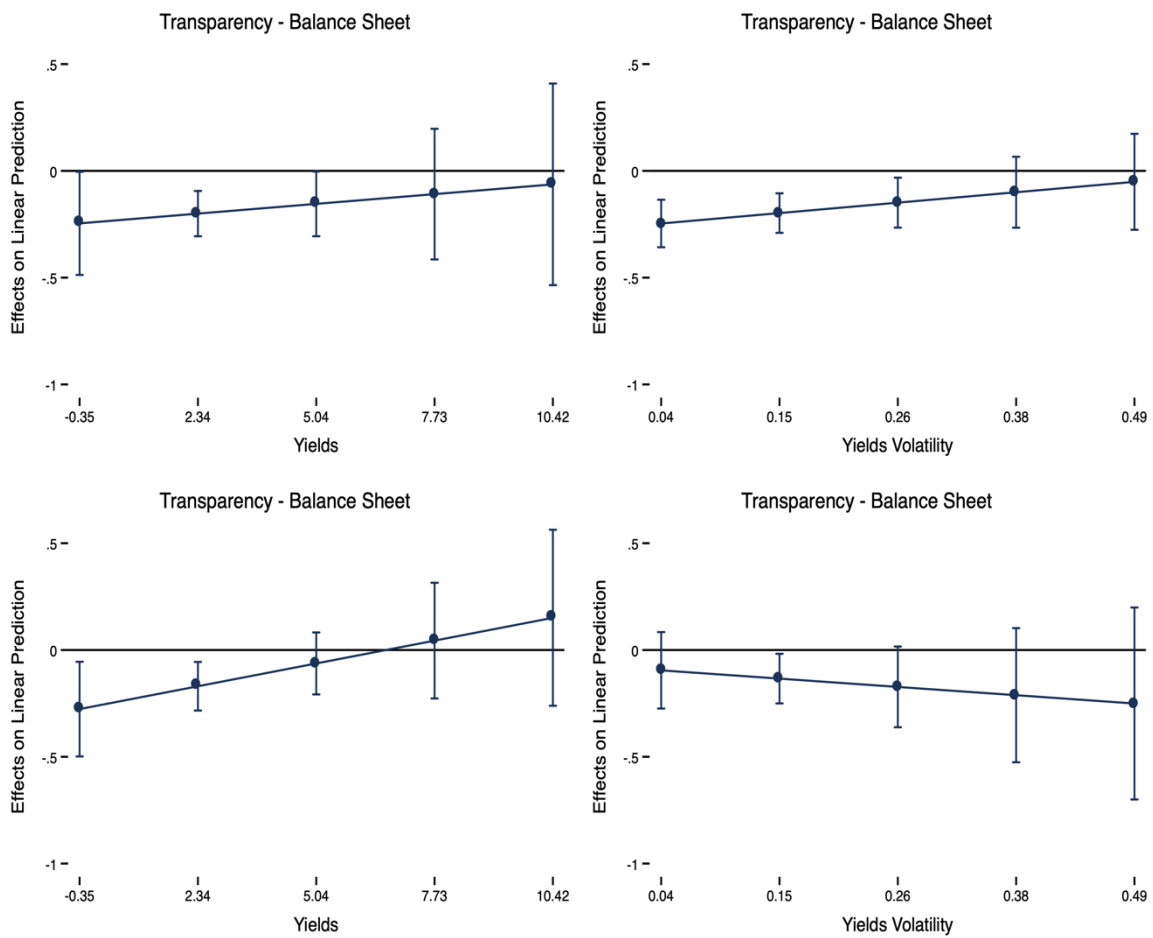
This figure plots the average level of *Transparency* over the sample period.

Figure 3. Marginal effect of uncertainty shocks on transparency conditional on borrowing needs



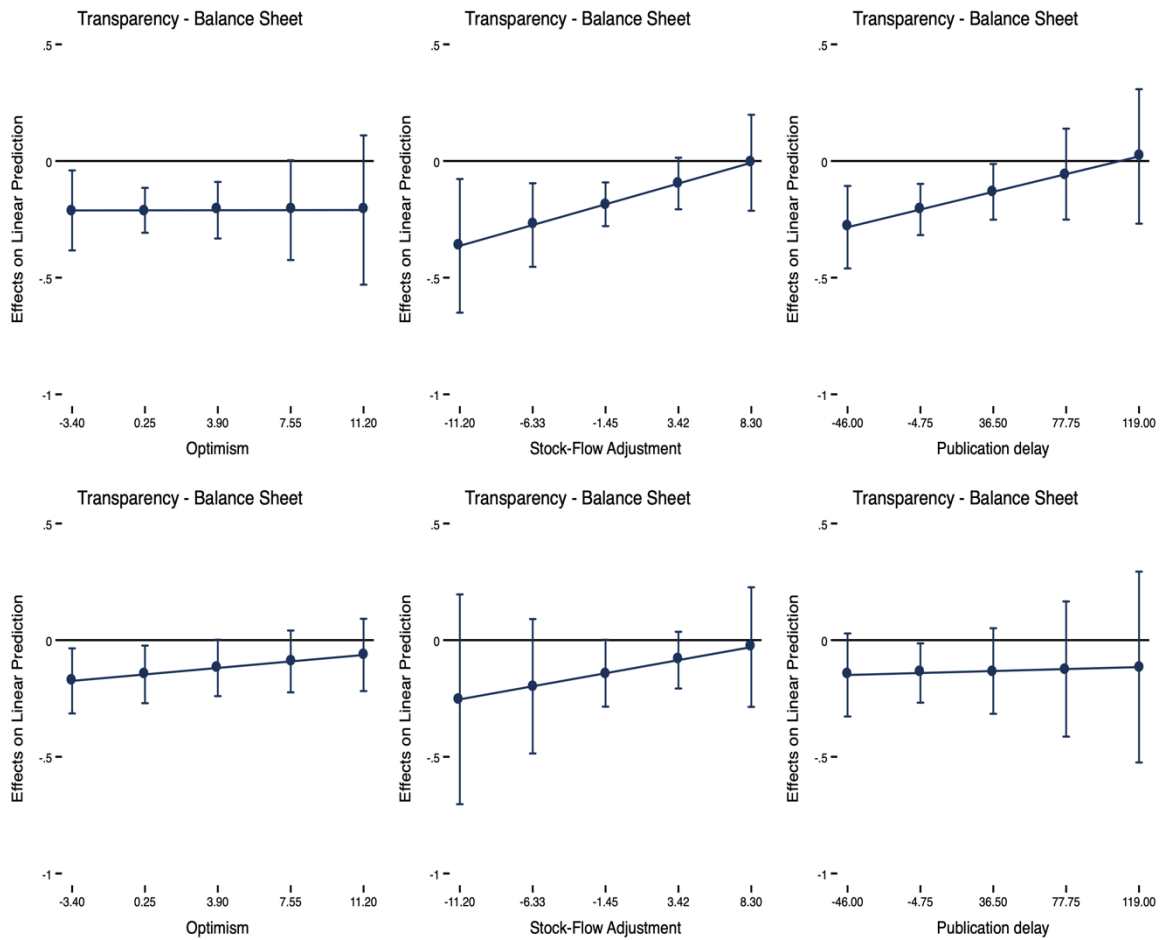
This figure shows the average marginal effects (AME) of *Uncertainty* on *Transparency* over the range of two measures of borrowing requirements. The top two graphs use the binary measure of *Uncertainty*. The bottom graphs use the continuous measure of *Uncertainty*. All variables are kept at their sample values. Bars indicate 90 percent confidence bands. See the appendix for variable definition, sources, and method of construction.

Figure 4. Marginal effect of uncertainty shocks on transparency conditional on bond market pressures



This figure shows the average marginal effects (AME) of *Uncertainty* on *Transparency* over the range of two measures of bond market pressures. The top two graphs use the binary measure of *Uncertainty*. The bottom graphs use the continuous measure of *Uncertainty*. All variables are kept at their sample values. Bars indicate 90 percent confidence bands. See the appendix for variable definition, sources, and method of construction.

Figure 5. Marginal effect of uncertainty shocks on transparency conditional on symptoms of poor fiscal reporting quality



This figure shows the average marginal effects (AME) of *Uncertainty* on *Transparency* over the range of three measures of symptoms of poor fiscal reporting quality. The top two graphs use the binary measure of *Uncertainty*. The bottom graphs use the continuous measure of *Uncertainty*. All variables are kept at their sample values. Bars indicate 90 percent confidence bands. See the appendix for variable definition, sources, and method of construction.

Table 1. Comparison with alternative measures of transparency

Variables	(1)	(2)	(3)	(4)	(5)
(1) <i>Transparency</i>	1.000				
(2) Δ <i>Transparency</i>	0.038	1.000			
	0.597				
(3) <i>EQI</i>	-0.398*	-0.263*	1.000		
	0.000	0.000			
(4) <i>GFS</i>	0.081	-0.209*	0.172*	1.000	
	0.444	0.046	0.094		
(5) <i>OBI</i>	-0.080	-0.200	0.429*	0.500*	1.000
	0.555	0.138	0.001	0.000	

This table shows pairwise correlations between the *Transparency* and Δ *Transparency* and other measures of government transparency. *EQI* is the European Quality of Government Index developed by the Quality of Government Institute at the University of Gothenburg, 2021 vintage. *GFS* is the Government Finance Statistics index developed by Wang et al. (2015); *OBI* is the Open Budget Index developed by the International Budget Partnership, 2019 vintage. * denotes significance at the 0.1 level.

Table 2. Summary statistics

Variable	N	Mean	Std.Dev.	Min	Max
<u>Baseline model</u>					
<i>Transparency</i>	1003	-.06	1.1	-4.66	1.61
<i>Uncertainty (binary)</i>	1003	.49	.5	0	1
<i>Uncertainty (continuous)</i>	1003	.81	.6	0	4.2
<i>Natural Disaster</i>	1003	.05	.21	0	1
<i>Yields</i>	1003	3.05	2.08	-.45	11.75
<i>Yields Volatility</i>	1003	.17	.14	.04	.49
<i>Government Strength</i>	1003	56.3	8.12	34.18	79.87
<i>Political Competition</i>	1003	71.37	10.43	49.67	89.71
<i>Years to Next Elections</i>	1003	1.9	1.28	0	4
<i>Output Gap</i>	1003	-.55	2.57	-10.72	8.19
<i>Fiscal Gap</i>	1003	-.37	3.08	-8.1	11.7
<i>Debt Gap</i>	1003	2.48	28.31	-47.7	86.2
<u>Mechanism model</u>					
<i>Expected Deficit</i>	1003	1.45	2.08	-6	12
<i>Gross Financing Needs (GFN)</i>	834	14.54	8.6	-.81	37.56
<i>Optimism</i>	870	1.01	3.02	-3.9	31
<i>Stock-Flow Adjustment (SFA)</i>	1003	-1.86	3.59	-29.2	9.1
<i>Publication Delay</i>	1003	1.34	27.69	-47	182

This table reports summary statistics of the variables used in the analysis. See the appendix for variable definition, sources, and method of construction.

Table 3. Main effect of fiscal uncertainty on the transparency of government forecasts

	(1) Transparency	(2) Transparency - Economic Items	(3) Transparency – Income Statement	(4) Transparency – Balance Sheet	(5) Transparency - Assumptions	(6) Transparency	(7) Transparency - Economic Items	(8) Transparency – Income Statement	(9) Transparency – Balance Sheet	(10) Transparency - Assumptions
Uncertainty (binary)	-0.11**	-0.11	-0.02	-0.19***	-0.01					
	[0.05]	[0.07]	[0.06]	[0.06]	[0.09]					
Uncertainty (continuous)						-0.13**	-0.09*	-0.13*	-0.13*	-0.03
						[0.07]	[0.05]	[0.07]	[0.07]	[0.06]
Yields	-0.01	-0.03	-0.01	0.06	0.01	-0.00	-0.03	0.00	0.06	0.01
	[0.02]	[0.03]	[0.04]	[0.04]	[0.04]	[0.02]	[0.03]	[0.04]	[0.04]	[0.04]
Yields Volatility	5.03	-5.28	-4.86	14.16**	17.04**	5.58	-4.86	-4.48	14.84**	17.13**
	[7.04]	[6.24]	[4.83]	[5.76]	[7.44]	[7.11]	[6.44]	[4.56]	[6.14]	[7.45]
Government Strength	-0.01*	-0.01**	-0.01	-0.01	-0.01	-0.01*	-0.01**	-0.01	-0.01	-0.01
	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]
Political Competition	-0.02	-0.01	-0.02	-0.02	-0.01	-0.02	-0.01	-0.02	-0.02	-0.01
	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]
Years to Next Elections	-0.03	-0.01	-0.00	-0.04*	-0.05**	-0.03	-0.01	-0.00	-0.04*	-0.05**
	[0.02]	[0.03]	[0.02]	[0.02]	[0.02]	[0.02]	[0.03]	[0.02]	[0.02]	[0.02]
Output Gap	-0.00	-0.00	-0.04	0.02	-0.00	-0.01	-0.00	-0.04	0.02	-0.00
	[0.03]	[0.04]	[0.04]	[0.02]	[0.03]	[0.03]	[0.04]	[0.04]	[0.02]	[0.03]
Fiscal Gap	-0.02	-0.02	-0.04	-0.04**	0.04**	-0.02	-0.02	-0.04	-0.04**	0.04**
	[0.02]	[0.02]	[0.03]	[0.02]	[0.02]	[0.02]	[0.02]	[0.02]	[0.02]	[0.02]
Debt Gap	0.00	0.01	-0.00	0.00	-0.01	0.00	0.01	-0.00	-0.00	-0.01
	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.00]	[0.01]
Natural Disaster	-0.17	-0.08	-0.21	-0.02	-0.21*	-0.16	-0.07	-0.20	-0.01	-0.21*
	[0.16]	[0.16]	[0.24]	[0.07]	[0.12]	[0.16]	[0.16]	[0.24]	[0.06]	[0.12]
Constant	1.45	1.83	2.52**	1.15	-1.26	1.43	1.77	2.63**	1.03	-1.24
	[1.03]	[1.14]	[1.10]	[1.34]	[1.21]	[1.08]	[1.17]	[1.11]	[1.37]	[1.15]
N	1003	1003	1003	1003	1003	1003	1003	1003	1003	1003
Adj. R2	0.80	0.68	0.78	0.85	0.72	0.80	0.68	0.78	0.85	0.72
Horizon FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cluster Weights	Country & Date IPW	Country & Date IPW	Country & Date IPW	Country & Date IPW	Country & Date IPW	Country & Date IPW	Country & Date IPW	Country & Date IPW	Country & Date IPW	Country & Date IPW

This table reports OLS estimates of the model: $Transparency_{c,v,h} = \beta_1 Uncertainty_{c,v} + \mathbf{Controls}'\psi_{c,v} + \alpha_c + \varphi_v + \gamma_h + \epsilon_{c,v,h}$. *Transparency* is the first principal component of six measures of levels and changes in disclosure intensity, as described in the on-line *Supplemental Material*. The *Transparency* sub-scores in models 2-5 and 7-10 are the principal components of the same measures of disclosure intensity, but limited to coherent groups of items including macroeconomic aggregates (*Transparency – Economic Items*), fiscal flows (*Transparency – Income Statement*), fiscal stocks (*Transparency – Balance Sheet*), and assumptions (*Transparency – Assumptions*). *Uncertainty* is binary in columns 1-5, and continuous in columns 6-10. **Controls** is the vector of covariates from the propensity score model. Fixed effects are estimated but unreported. Standard errors clustered two-way at the country-date level are presented in brackets. IPW are the non-truncated inverse probability weights estimated after the selection model. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. See the appendix for variable definition, sources, and method of construction.

Table 4. Interaction effect of fiscal uncertainty with borrowing needs

	(1) Transparency - Balance Sheet	(2) Transparency - Balance Sheet	(3) Transparency - Balance Sheet	(4) Transparency - Balance Sheet
<i>Uncertainty (binary)</i>	-0.25*** [0.07]	-0.28*** [0.11]		
<i>Expected Deficit</i>	-0.10*** [0.03]		-0.10*** [0.03]	
<i>Uncertainty (binary) # Expected Deficit</i>	0.07*** [0.03]			
<i>GFN</i>		-0.01 [0.02]		-0.03 [0.02]
<i>Uncertainty (binary) # GFN</i>		0.00 [0.01]		
<i>Uncertainty (continuous)</i>			-0.15** [0.06]	-0.37** [0.17]
<i>Uncertainty (continuous) # Expected Deficit</i>			0.03*** [0.01]	
<i>Uncertainty (continuous) # GFN</i>				0.02* [0.01]
<i>Constant</i>	1.33 [1.21]	1.12 [1.41]	1.33 [1.25]	1.26 [1.35]
N	1003	834	1003	834
Adj. R2	0.86	0.86	0.85	0.86
Horizon FE	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes
Quarter-Year FE	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
Cluster	Country & Date	Country & Date	Country & Date	Country & Date
Weights	IPW	IPW	IPW	IPW

This table reports OLS estimates of the model: $Transparency_{c,v,h} = \beta_1 Uncertainty_{c,v} + \beta_2 Mechanism_{c,v} + \beta_3 Uncertainty_{c,v} * Mechanism_{c,v} + \mathbf{Controls}'\psi_{c,v} + \alpha_c + \varphi_v + \gamma_h + \eta_{c,v,h}$. *Transparency - Balance Sheet* is the first principal component of six measures of levels and changes in disclosure intensity related to balance sheet items, as described in the on-line *Supplemental Material*. *Uncertainty* is binary in columns 1-2, and continuous in columns 3-4. *Mechanism* is *Expected Deficit* in columns 1 and 3, and *GFN* in column 2 and 4. **Controls** is the vector of covariates from the propensity score model. Fixed effects are estimated but unreported. Control variables are estimated but unreported. Standard errors clustered two-way at the country-date level are presented in brackets. IPW are the non-truncated inverse probability weights estimated after the selection model. * $p < 0.10$, * $p < 0.05$, ** $p < 0.01$. See the appendix for variable definition, sources, and method of construction.

Table 5. Interaction effect of fiscal uncertainty with debt market pressure

	(1)	(2)	(3)	(4)
	Transparency - Balance Sheet	Transparency - Balance Sheet	Transparency - Balance Sheet	Transparency - Balance Sheet
Uncertainty (binary)	-0.24*	-0.26***		
	[0.13]	[0.08]		
Uncertainty (binary) # Yields	0.02			
	[0.04]			
Uncertainty (binary) # Yields Volatility		0.43		
		[0.36]		
Uncertainty (continuous)			-0.26**	-0.08
			[0.12]	[0.13]
Uncertainty (continuous) # Yields			0.04	
			[0.03]	
Uncertainty (continuous) # Yields Volatility				-0.34
				[0.76]
Constant	1.25	1.12	1.24	1.00
	[1.33]	[1.31]	[1.37]	[1.40]
N	1003	1003	1003	1003
Adj. R2	0.85	0.85	0.85	0.85
Horizon FE	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes
Quarter-Year FE	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
Cluster	Country & Date	Country & Date	Country & Date	Country & Date
Weights	IPW	IPW	IPW	IPW

This table reports OLS estimates of the model: $Transparency_{c,v,h} = \beta_1 Uncertainty_{c,v} + \beta_2 Mechanism_{c,v} + \beta_3 Uncertainty_{c,v} * Mechanism_{c,v} + \mathbf{Controls}'\psi_{c,v} + \alpha_c + \varphi_v + \gamma_h + \eta_{c,v,h}$. *Transparency - Balance Sheet* is the first principal component of six measures of levels and changes in disclosure intensity related to balance sheet items, as described in the on-line *Supplemental Material*. *Uncertainty* is binary in columns 1-2, and continuous in columns 3-4. *Mechanism* is *Yields* in column 1 and 3, and *Yields Volatility* in columns 2 and 4. **Controls** is the vector of covariates from the propensity score model. Fixed effects are estimated but unreported. Control variables are estimated but unreported. Standard errors clustered two-way at the country-date level are presented in brackets. IPW are the non-truncated inverse probability weights estimated after the selection model. * $p < 0.10$, * $p < 0.05$, ** $p < 0.01$. See the appendix for variable definition, sources, and method of construction.

Table 6. Transparency, uncertainty, and symptoms of poor fiscal reporting quality

	(1)	(2)	(3)	(4)	(5)	(6)
	Transparency - Balance Sheet	Transparency - Balance Sheet	Transparency - Balance Sheet	Transparency - Balance Sheet	Transparency - Balance Sheet	Transparency - Balance Sheet
<i>Uncertainty (binary)</i>	-0.21*** [0.06]	-0.16*** [0.05]	-0.20*** [0.06]			
<i>Optimism</i>				-0.01 [0.01]		
<i>Uncertainty (binary) # Optimism</i>	0.00 [0.02]					
<i>SFA</i>		-0.02 [0.01]			-0.02 [0.02]	
<i>Uncertainty (binary) # SFA</i>		0.02 [0.01]				
<i>Publication Delay</i>			0.00 [0.00]			0.00 [0.00]
<i>Uncertainty (binary) # Publication Delay</i>			0.00 [0.00]			
<i>Uncertainty (continuous)</i>				-0.15** [0.08]	-0.13* [0.07]	-0.14* [0.08]
<i>Uncertainty (continuous) # Optimism</i>				0.01 [0.01]		
<i>Uncertainty (continuous) # SFA</i>					0.01 [0.02]	
<i>Uncertainty (continuous) # Publication Delay</i>						0.00 [0.00]
<i>Constant</i>	1.46 [1.35]	1.24 [1.33]	1.24 [1.32]	1.36 [1.39]	1.13 [1.40]	1.06 [1.36]
N	870	1003	1003	870	1003	1003
Adj. R2	0.85	0.85	0.85	0.85	0.85	0.85
Horizon FE	Yes	Yes	Yes	Yes	Horizon FE	Yes
Country FE	Yes	Yes	Yes	Yes	Country FE	Yes
Quarter-Year FE	Yes	Yes	Yes	Yes	Quarter-Year FE	Yes
Controls	Yes	Yes	Yes	Yes	Controls	Yes
Cluster	Country & Date	Country & Date	Country & Date	Country & Date	Cluster	Country & Date
Weights	IPW	IPW	IPW	IPW	Weights	IPW

This table reports OLS estimates of the model: $Transparency_{c,v,h} = \beta_1 Uncertainty_{c,v} + \beta_2 Mechanism_{c,v} + \beta_3 Uncertainty_{c,v} * Mechanism_{c,v} + \mathbf{Controls}'\psi_{c,v} + \alpha_c + \varphi_v + \gamma_h + \eta_{c,v,h}$. *Transparency - Balance Sheet* is the first principal component of six measures of levels and changes in disclosure intensity related to balance sheet items, as described in the on-line *Supplemental Material*. *Uncertainty* is binary in columns 1 – 2, and continuous in columns 3 – 4. *Mechanism* is *Optimism* in columns 1 and 4, *SFA* in columns 2 and 5, and *Publication Delay* in columns 3 and 6. **Controls** is the vector of covariates from the propensity score model. Fixed effects are estimated but unreported. Control variables are estimated but unreported. Standard errors clustered two-way at the country-date level are presented in brackets. IPW are the non-truncated inverse probability weights estimated after the selection model. * $p < 0.10$, * $p < 0.05$, ** $p < 0.01$. See the appendix for variable definition, sources, and method of construction.