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**The political economy of fiscal
transparency and independent fiscal
councils**

Roel Beetsma, Xavier Debrun and Randolph Sloof

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The political economy of fiscal transparency and independent fiscal councils

Abstract

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JEL Classification: E62, H6

Keywords: Independent fiscal councils, fiscal transparency, public debt, partisan bias, opportunistic bias, competence, congruence

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Roel Beetsma,** Xavier Debrun*** and Randolph Sloof****

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“A popular government without popular information or the means of acquiring it, is but a prologue to a farce, or a tragedy, or perhaps both.” James Madison (1822).

1. INTRODUCTION

Fiscal transparency is generally viewed as beneficial for society.¹ This paper qualifies this view. It shows that enhanced transparency frequently raises welfare, but not always, and that this depends on which sources of information are improved and the weight that voters attach to the competence of politicians versus other factors determining their electoral appeal. Our analysis has implications for independent fiscal councils, which have recently become a popular instrument for enhancing fiscal transparency. Although these councils do not control any fiscal policy instrument, their official role as public finance watchdogs is expected to improve the quality of the public debate on fiscal policy, thereby encouraging better fiscal outcomes (Debrun et al. 2013; Kopits, 2013).

Our analysis is conducted in the context of a political-economy model with two political parties—an incumbent and a challenger—competing for office. Voters assess political parties along two dimensions: “competence” and “congruence”. Our metric for “competence” is the quantity of public goods and services a party can provide out of a given resource pool. As such, it captures a party’s ability to run the public sector in an efficient manner. It is assumed to be stochastic and not directly observed by the voting public. “Congruence” refers to any other determinant of voters’ preference in favor of a given political party. It includes ideological alignment, the sense of empathy coming from party leadership, etc. For instance, if voters care about the global warming impact of carbon emissions and must choose between two equally competent political parties, they would prefer the party that will spend a billion euros on a new commuter train line rather than on a new highway. Together, congruence and competence shape electoral outcomes and popularity. Voters receive only imprecise signals about incumbent competence, the state of the economy and the level of public debt chosen by the incumbent. More fiscal transparency means that one or more of these signals become more precise.

¹ Fiscal transparency is interpreted in the broad sense of a better ability for the public to understand the true motivations behind policy actions and to assess the chances of meeting policy objectives with such actions. It follows from the IMF (<http://www.imf.org/external/np/fad/trans/index.htm>) definition of fiscal transparency as “The comprehensiveness, clarity, reliability, timeliness, and relevance of public reporting on the past, present, and future state of public finances.” Transparency aims at providing an “accurate picture of [government] finances,” which includes cost-benefit analyses of policy changes, risks to public finances and comprehensive public sector balance sheets.

In line with a long tradition in the literature, the model exhibits a bias towards excessive public deficits and debts. The equilibrium debt level deviates from its socially-optimal value for two reasons. The first is policymakers' myopia characterizing the "partisan" deficit bias, studied in Alesina and Tabellini (1990) and many subsequent contributions. Because it will no longer benefit from the right to spend public resources if it is voted out of office, the incumbent party finds it optimal to spend more now and pass the problem of repaying the debt to its successor. The second source of deficit bias is "opportunism" in the tradition of Rogoff and Sibert (1988). To improve re-election chances, the incumbent opportunistically spends more than a hypothetical social planner would do, just to appear more competent to voters. In equilibrium, the attempt to raise re-election chances in this way is futile and debt is too high.

As far as we know, this paper is the first to combine these two sources of deficit bias in relation to fiscal transparency. If voters rank political parties based solely on perceived competence, more precise information on competence alleviates the debt bias. While the partisan bias is unaffected, more precise inference of competence will defeat the purpose of engaging in costly, but in equilibrium futile, expenditure increases to appear more competent. However, a more precise signal about the state of the economy leads to more debt, as the opportunism bias worsens in this case. Better information about the actual debt level chosen has no impact at all on both biases.

The analysis is subtler when voters are simultaneously interested in competence and congruence. For given competence, congruence makes policymakers popular, giving them an electoral advantage. Considering the partisan debt bias in isolation, increasing transparency about competence or the state of the economy lowers the re-election chances of a popular incumbent, because it increases the risk of being exposed as less competent and consequently erodes his advantage in the electoral contest. The opposite holds for an unpopular incumbent. Reduced re-election chances in turn cause equilibrium debt to rise. Considering the opportunistic debt bias in isolation, more precise information about competence reduces this bias in the presence of a moderate electoral advantage or disadvantage, but worsens it otherwise, while a more precise signal about the state of the economy always worsens the debt bias, as re-election chances are unfavourably affected. Again, more information about the actual debt has no effect on either debt bias. The overall effect of fiscal transparency on public

debt thus depends on how it is operationalized and how it affects the combination of the partisan and opportunistic biases.

Turning to social, or voter, welfare, support for more fiscal transparency not only depends on its effect on debt (inter-temporal resource allocation) but also on the average competence of the incumbent (if re-elected). An unequivocal positive consequence is that more precise information about competence implies that re-elected incumbents are on average more competent. The consequences resulting from changes in the equilibrium public debt are ambiguous. If voters only care about competence, a more precise competence signal raises social welfare by suppressing the “opportunistic” motive for issuing debt. But with a highly popular incumbent, who is highly congruent to their tastes, voters may also lose out from more transparency, because the welfare loss from higher debt could exceed the benefit of better selection.

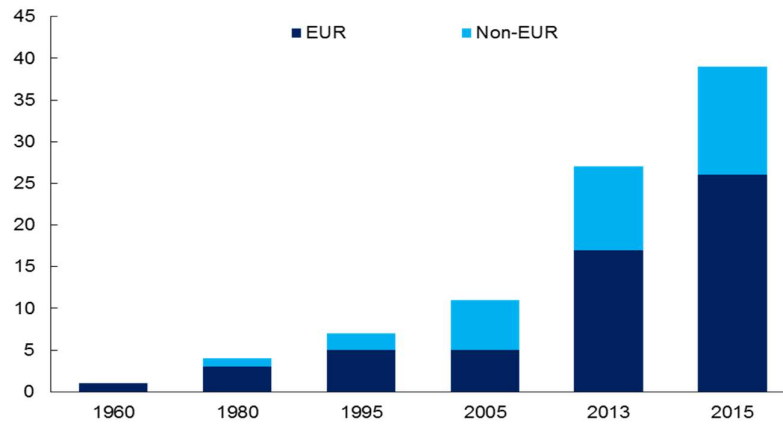
Unlike voters, the incumbent also takes the impact on its own re-election chances into account when assessing the effect of raising fiscal transparency. This causes that social and incumbent’s preferences regarding the amount and the type of fiscal transparency may not be aligned. If either voters do not care about congruence at all (and thus only competence matters), or the challenger holds an electoral advantage in terms of congruence, both society and the incumbent prefer more transparency about competence, and more so than better information about either the state of the world or the actual debt level. In these cases, more information about competence improves selection, lowers equilibrium debt (by reducing the opportunism bias), and increases the incumbent’s electoral chances at the same time. In fact, although greater transparency about competence may not always be beneficial in all these dimensions, irrespective of congruence it is always preferred by both the incumbent and voters alike above more transparency about the state of the world. In the remaining case in which (based on congruence) the incumbent has an electoral advantage, however, the preferences of voters and the incumbent may potentially clash. Because for this case unambiguous formal results appear elusive, we resort to numerical analysis. This reveals that it indeed can happen that a moderately popular incumbent prefers less transparency about its competence for fear of being exposed as incompetent, while society actually prefers more transparency. At the same time we are unable to detect circumstances in which the voter is against and the incumbent in favour of increasing transparency about competence. The overall picture that emerges from our analysis is thus one of substantial voter support for higher rather than lower

transparency about competence. The incumbent is also in favour of this when he does not enjoy a substantial electoral advantage, but when he does, he is likely against raising transparency about his competence. He would then rather prefer better information about the actual debt, as this is harmless.

Our paper studies, from a general perspective, the impact of improved fiscal transparency on debt and welfare. In practice, such improvement could be accomplished in various different ways. One arguably prominent way that has become popular recently is the creation of so-called independent fiscal councils (IFCs) as a possible institutional fix for a lack of fiscal transparency. IFCs fulfil a role as fiscal watchdogs, but lack the formal policy levers.² In the recent past, the world has seen a proliferation of new IFCs, in particular in the European Union (EU). To illustrate, at end-2015, close to 40 IFCs were in activity (Figure 1), a three-fold increase in less than 10 years. The sudden surge in IFCs plausibly reflects efforts by many governments to signal a stronger commitment to fiscal responsibility in the aftermath of the Global Financial crisis of 2008-9, and the deep scars it left on public budgets.³

² Debrun *et al.* (2013) define an IFC as “*A fiscal council is a permanent agency with a statutory or executive mandate to assess publicly and independently from partisan influence government’s fiscal policies, plans and performance against macroeconomic objectives related to the long-term sustainability of public finances, short-medium-term macroeconomic stability, and other official objectives.*” The descriptives presented below (cf. Figures 1 and 2) are based on this definition.

³ The driver behind the EU being at the forefront of the global trend are several new provisions of EU law—regulations constituting the so-called “Two-pack” and an intergovernmental treaty on policy coordination—mandating independent, national-level oversight of official budget forecasts and compliance with fiscal rules. Although EU legal requirements remain vague on the precise nature of the “independent bodies” in charge of providing such oversight, many countries ended up creating new institutions qualifying as IFCs.

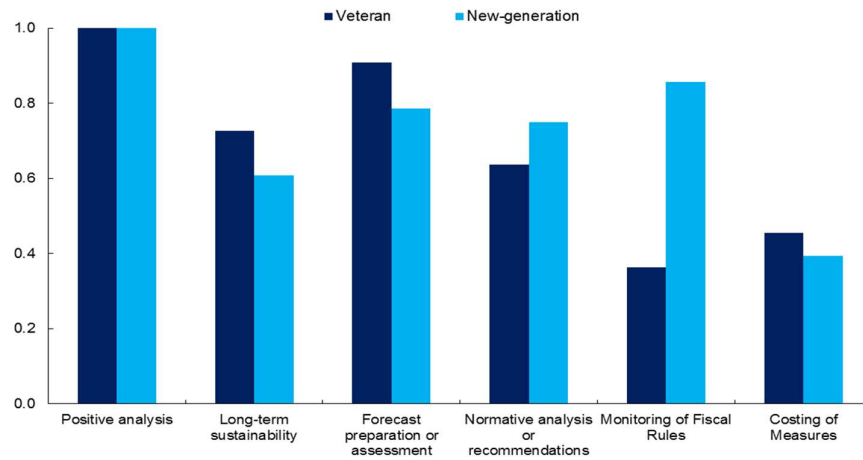
Figure 1. Number of Independent Fiscal Councils in the World

Note: "EUR" refers to EU fiscal councils. Source: IMF Fiscal Council Dataset (2017) and Beetsma et al. (2019).

While institutional models of IFCs remain highly country-specific (see Debrun and Kinda, 2017), they have in common a watchdog role that allows them to clarify the public debate about fiscal policy by providing all stakeholders – legislature, political parties, voters – with usable and relevant information on the true state of public finances. This is reflected in the fact that all IFCs are mandated to produce positive analyses of fiscal policy, and a large majority of them are also expected to assess the long-term sustainability of public finances and to prepare or at least qualitatively assess macroeconomic and budgetary forecasts (Figure 2).⁴ These functions all contribute to clear the noise emanating from the multiple, conflicting and potentially biased sources of information about fiscal policy and the budget (official documents, press commentaries, partisan analyses, etc.). Hence, for a given amount of public information, an effective IFC should enhance the signals that the general public can extract from it. In the end, although IFCs may very well serve various different roles, an important one among these appears to be to sharpen voters' perceptions about the government's competence, which is a relevant dimension in their decision to re-elect incumbent politicians or not.

⁴ Beyond IFCs' possible role in fiscal forecasting (see Jonung and Larch, 2006), evidence that their presence is indeed associated with more precise and less biased forecasts for budgetary indicators would be consistent with their contribution to improved, less noisy, public information about fiscal policy. While the evidence in that regard is still tentative (e.g. Debrun and Kinda, 2017; Beetsma et al., 2019), it is sufficiently promising to seriously regard IFCs as vehicles for promoting fiscal transparency.

Figure 2. The Remit of Fiscal Councils
(Relative frequencies in the sample)



Note: "Veteran" are councils established before or in 2005, while "New-generation" are councils established after 2005. Source: IMF Fiscal Council Dataset (2017).

Our theoretical analysis has several concrete implications for IFCs. First, we formally characterize channels (transparency) through which *effective* fiscal watchdogs can durably improve policy outcomes. By extension, our theory validates often mentioned design flaws of IFCs such as limited access to information, lack of genuine independence, and resource constraints that impair their effectiveness. Second, our analysis openly raises the question of IFCs' political foundations and resilience to political shocks. In some well-specified environments—for instance when congruence eclipses competence as the driver of voting behaviors—these foundations can be shaken, suggesting that IFCs are vulnerable to existential threats. Third, the possibility of strongly diverging interests between the incumbent and the voters might explain why IFCs can emanate directly from the legislative branch's desire to reassert better control over the public purse through greater transparency.

The remainder of this paper is structured as follows. In the next section we position our paper within the related literature. Section 3 lays out the basic elements of our model. Equilibrium debt levels are first characterized for the social planner benchmark (Section 4) and then in the political game (Section 5). Section 6 looks into the effect of raising fiscal transparency in various dimensions on the equilibrium debt. Section 7 explores whether more fiscal transparency (and of what type) is in the interest of the incumbent and society. Section 8 concludes the main text.

2. RELATED LITERATURE

This paper relates to a rich literature on the politics of fiscal policy. One strand of that literature explains macroeconomic outcomes in the context of a game-theoretic setting. Early contributions include Rogoff and Sibert (1988) and Rogoff (1990), who model “political business cycles” in fiscal and macroeconomic variables as the result of signaling by incumbent governments in the presence of information asymmetries. In the context of a two-period model with elections and unknown incumbent competence, Bonfiglioli and Gancia (2013) show that the incumbent has an incentive to signal ability by underinvesting in costly policies with future pay-offs. They find that more uncertainty about competence may reduce myopia and improve social welfare.

Another relevant strand of the literature explores the theoretical or empirical consequences of increasing fiscal transparency. Alt et al. (2006) find that both political factors and fiscal policy outcomes affect fiscal transparency at the level of U.S. states. In the context of a career-concerns model with political parties, Alt and Lassen (2006) explore how fiscal transparency affects debt accumulation, which is used strategically by the incumbent to appear more competent. They construct a transparency index for 19 OECD countries and find a negative association between public debt and transparency. Gavazza and Lizzeri (2011) show that enhanced transparency may lead to more wasteful transfers in a framework in which transfers are set by the government to affect its re-election probability. There are key differences between these papers and ours. First, we focus on (a comparison of) the circumstances under which an elected policymaker and voters would prefer more transparency. While more transparency raises welfare in Alt and Lassen (2006), this is not necessarily the case in our context. Second, congruence plays no role in Gavazza and Lizzeri (2011), while it is a key driving force of our results. Third, unlike this paper, Gavazza and Lizzeri (2011) do not explicitly analyze optimal public debt, while Alt and Lassen’s (2006) model features only the opportunistic debt bias. They find that more transparency has an unambiguously negative effect on the equilibrium debt, while in our framework the effect of transparency depends on the role of congruence in voting behavior and the direction in which transparency is enhanced.⁵

⁵ Gavazza and Lizzeri (2009) analyze the effects of transparency in government expenditures and revenues in a model with purely office-motivated politicians and find that debt is decreasing in transparency of expenditures.

Allowing for transparency in different dimensions is a final extension our paper adds to the aforementioned literature.

The present paper also relates to the literature describing the emergence of IFCs and analyzing their design features. Basso and Costain (2016) and Larch (2016) study the delegation of fiscal stabilization to IFCs, while Horvath (2016) investigates how IFCs can be designed to effectively scrutinize national fiscal policies. Formal empirical work on the effectiveness of IFCs is rare, reflecting limited experience in most countries. Debrun et al. (2009, 2013) find positive associations between fiscal performance and the presence of an IFC, in part because they appear to encourage the adoption of stricter fiscal rules. Estimations by Beetsma et al. (2019) for the EU suggest that IFCs enhance the precision of budgetary forecasts and rule compliance. Also Reuter (2019) finds that IFCs increase compliance with fiscal rules. Calmfors and Wren-Lewis (2011) and Wyplosz (2018) argue that IFCs complement fiscal rules.

This paper therefore also connects to the literature on fiscal rules, whose adoption tends to precede the emergence of IFCs (Beetsma and Debrun, 2017). Examples of theoretical analyses include Beetsma and Uhlig (1999) and Beetsma and Debrun (2007). On the empirical side, Bergman and Hutchison (2015) show that fiscal rules are only effective in reducing the procyclicality of fiscal policy when government efficiency is sufficiently high. Caselli et al. (2018) review the “second-generation” fiscal rules based on enhanced flexibility that emerged after the global financial crisis. The nexus between fiscal rules and transparency is explored in Milesi-Ferretti’s (2003) theory of fiscal rule compliance in the presence of imperfect budgetary transparency, while Alt et al. (2014) analyze empirically the use of creative accounting to formally comply with the EU fiscal rules.

Finally, the analytical approach in this paper is related to some contributions in other contexts. For instance, Hanssen (2004) shows that sufficient political competition, which resembles the case of a moderate electoral advantage here, makes the establishment of an independent judiciary attractive for the incumbent. The reason is that the benefits of independence in case the opponent takes office may dominate those of a dependent judiciary that would pander to the incumbent’s views for only as long as he is in office. In contrast, an incumbent with a large electoral advantage would only feel constrained by an independent judiciary, as the odds of an

opponent’s victory – and the corresponding benefits from independence – are low.⁶ Prat (2005) studies a principal-agent setting in which (only) the agent receives a combined signal about the state of the world and his own level of expertise. He compares a situation in which the principal obtains information about the consequences of the agent’s action only (but not about the action itself), with one in which the principal observes the agent’s action as well. Prat concludes that, while transparency about outcomes is always beneficial, transparency about actions is not.

3. THE MODEL

We propose a 2-period model (periods indexed by 1 and 2) with 2 political parties competing for office: P and Q . We assume that P holds office in period 1 and that at the start of period 2 elections take place in which the incumbent (P) can either be re-elected or voted out of office. The main decision P makes is to allocate resources between the two periods by issuing debt (or accumulating assets). In each period, these resources are spent on public goods valued by P , Q , and the voters. Resource constraints for public consumption g_t ($t = 1,2$) take the following form:

$$\begin{cases} g_1 = \eta_1 + \varepsilon + d \\ g_2 = \eta_2 - d \end{cases} \quad (1)$$

Here, η_t reflects the “competence” of the elected policymaker. Competence can capture the efficiency with which resources can be transformed into public goods, the efficiency of the interaction between government and the civil service, and the extent to which the government is not wasteful or corrupt. Competence is not known in advance and it is stochastic. In the absence of any further information, the competence of each party is normally distributed with mean $\bar{\eta} > 0$ and variance $\sigma_{\eta}^2 > 0$, i.e. $\eta_P, \eta_Q \sim N(\bar{\eta}, \sigma_{\eta}^2)$. As P is in power in the first period, $\eta_1 = \eta_P$. If P is re-elected, we have $\eta_2 = \eta_P$ as well, whereas if Q is elected, then $\eta_2 = \eta_Q$.

Aside competence, period-1 resources are also affected by an independent, normally distributed shock, $\varepsilon \sim N(0, \sigma_{\varepsilon}^2)$. This shock captures aggregate uncertainty and economic volatility as one of the underlying economic fundamentals. Resources can be reallocated over

⁶ Hanssen (2004) views the choice of judiciary from the government’s perspective. His model builds on Maskin and Tirole (2004), who consider a broader institutional choice between direct democracy, indirect democracy and independence (non-accountability) from a voter perspective.

time by the issuance of public debt d in period 1 to be repaid in period 2. (Of course, d can be negative if the government decides to accumulate assets.) In a two-period setting with zero initial debt, d equals the period-1 budget deficit. For convenience, the (net) real interest rate is set to zero and debt cannot exceed a given, positive upper bound $d \leq D$.

To facilitate tractability, utility is assumed to be time-separable and quasi-linear: the felicity function of public goods consumption is concave in period 1 and linear in period 2. In line with the “partisan” model of Alesina and Tabellini (1990), a political party obtains utility from public good provision only if it is in office. Moreover, we assume that a party always prefers to be in office if it would be elected by voters, irrespective of the debt level inherited from period 1. Hence, if not elected, a party receives utility $-K$, with $K > 0$ sufficiently large.⁷ As a result, the expected utility of the incumbent is given by $E[u(g_1)] + p \cdot (g_2) + (1 - p) \cdot (-K)$, where $u'(x) > 0$ and $u''(x) < 0$ for all x , and p is the (endogenous) probability of re-election of the incumbent.

Tractability is also served by assuming identical voters who share the same felicity function as political parties. However, unlike elected policymakers, voters’ utility from public goods provision is independent of which party is in office to provide these goods. Two distinct factors determine their preference for one or the other party. The first is the perceived competence η attached to each party. The second factor, is “congruence,” a term that captures any consideration — including ideology or the perceived empathy of party leadership for voters’ concerns — that may give one party a relative advantage or a disadvantage in the electoral contest. The degree of congruence is assumed to be exogenous and orthogonal to competence. It captures all the factors relevant to voters that are not linked to the amount of public goods provision. Formally, the challenger has an electoral advantage Δ , such that voters prefer the incumbent if $\eta_P \geq \eta_Q + \Delta$. So if $\Delta > 0$, the challenger has an electoral advantage independent of its perceived competence, while in case $\Delta < 0$, the incumbent holds such an advantage.

Voters do not directly observe the incumbent’s competence. Yet they can partially infer it after experiencing the benefits from public goods. Moreover, based on publicly available information like budget documents, press commentaries, political statements et cetera, they

⁷ The condition on K is made explicit in expression (14) in Section 5.C.

also perceive a noisy signal about competence. Similarly so, voters obtain noisy information about the debt level chosen by the incumbent, as well as the size of the economic shock. In particular, we assume that besides observing g_1 , voters receive the following three noisy signals before they cast their vote:

$$\begin{aligned} s_\mu &= \eta_1 + \mu, \text{ with } \mu \sim N(0, \sigma_\mu^2) \\ s_\tau &= d + \tau, \text{ with } \tau \sim N(0, \sigma_\tau^2) \\ s_\theta &= \varepsilon + \theta, \text{ with } \theta \sim N(0, \sigma_\theta^2) \end{aligned} \tag{2}$$

The variances σ_i^2 , for $i = \mu, \tau, \theta$ play a key role in our analysis; improvements in fiscal transparency are captured by a reduction in the noise levels surrounding the signals s_μ , s_τ and s_θ .

The precise timing and the information structure are as follows. First, either society (i.e. the voters directly or through the legislative branch) or the incumbent (the executive) decides upon whether or not to improve fiscal transparency, and if so how. We will analyze both cases. Second, nature draws the competence levels of both P and Q and the size of the economic shock ε . Neither the parties nor the voters are informed of these draws, so that none of the players in the political game initially know the parties' competence levels nor the size of the economic shock. Third, period 1 starts with the incumbent selecting a debt level d , which voters cannot directly observe. After d is set, the voters and the incumbent receive signals s_μ , s_τ and s_θ . They also both observe public consumption g_1 , as they directly experience the benefit from public goods and services. Finally, at the start of period 2, elections take place based on the voters' updated assessment of the incumbent's competence.⁸

A number of assumptions underlie this structure. First, like voters also political parties initially do not know their own level of competence. In practice, parties are likely to find out their competence only once they actually start governing their country, for example by learning

⁸ The exact order of play is immaterial in some respects, for instance regarding when exactly competence levels and the economic shock are drawn by nature. Since both voters and the political parties do not observe these draws, exactly the same results are obtained when competence and the economic shock are determined in the first stage (so before the decision about improved fiscal transparency), or in the third stage (then after then incumbent's choice of debt). Similarly so, there is some degree of freedom in exactly when voters and the incumbent observe the informative signals s_μ , s_τ and s_θ . The main feature of the assumed timing is that voters observe these signals before they cast their vote, while the incumbent does so after having chosen its debt level.

about the effectiveness of their interaction with the civil service and the opposition in parliament. Congruence (i.e. parameter Δ) is common information though. In reality, electoral advantage is easier to observe than competence. Frequent opinion polls, for instance, give a fairly precise idea of a party's congruence with the electorate, while competence can at most be observed with error from the performance of the economy or from budgetary data.

Second, the incumbent chooses debt d rather than the level of public consumption g_1 directly, while voters perfectly observe g_1 but not d . In practice there are many uncertain and imprecisely known influences on the effective provision of public consumption, like the diversion of resources for wasteful purposes, making that public consumption is not fully under the policymaker's control. The non-observability of d reflects the fact that voters typically ignore the details of the government's balance sheet, including its true net worth, providing fertile ground for creative accounting. For instance, Gandrud and Hallerberg (2017) show that Eurostat upward debt revisions are systematically larger for more indebted countries and when financial stress increases. The real-world counterpart to d is thus best seen as the *net* debt level, i.e. the gross public debt net of all government assets, whose existence is not often known to the public and whose valuation is sometimes uncertain, especially for non-financial assets. Key in our model is that the voter does not perfectly observe the choice made by the incumbent, but (besides the signals s_μ , s_τ and s_θ) only a policy outcome that is a composite of competence, policy choice and aggregate uncertainty. This gives the incumbent room to opportunistically manipulate this policy outcome for electoral purposes via the policy choice made. One could alternatively conceive of a situation in which the government chooses public consumption directly, while only the debt level (then resulting from competence, choice of public consumption and aggregate uncertainty) is perfectly observed by voters.

Third, improvements in fiscal transparency make the signals s_μ , s_τ and s_θ less noisy. This reflects the indirect nature of the influence of fiscal transparency on the conduct of fiscal policies. In democracies, the ultimate stick to discipline politicians is that they are voted out of office. By improving the provision of information to voters, fiscal transparency may strengthen the effectiveness of electoral accountability and selection. This, in turn, may discipline politicians. An, in our view less suitable, alternative formulation would have been to model the impact of fiscal transparency through affecting the variance of the economic shock ε in the first-period budget constraint (1). Note that this term does not just reflect informational noise, but rather and foremost economic volatility as one of the underlying

economic fundamentals. This would thus amount to assuming that fiscal transparency per se (i.e. voters being better informed) could reduce economic uncertainty – and thus directly impact available budgetary resources in the first period, an unrealistic conjecture in our view.⁹

In line with the remit of most of the recently-established IFCs (cf. the Introduction), fiscal transparency in our model can be improved in various dimensions. The general purpose of an IFC is to improve the public debate about fiscal policy, for instance by providing objective analysis of macroeconomic and budgetary information, thereby enabling voters to more effectively reward good policies and sanction undesirable ones by voting incompetent politicians out of office. In terms of our model, this general purpose corresponds to a reduction in σ_μ^2 . The additional information about net debt reflected in a reduction of σ_τ^2 may capture the task of many IFCs to monitor fiscal sustainability or compliance with fiscal rules. Better information about the economic shock, i.e. a reduction of σ_θ^2 , may square well with IFCs' task to produce and assess macroeconomic and budgetary forecasts. In fact, for macroeconomic forecasts, this is even a mandatory task of Eurozone IFCs. In order to understand the direction of the effects of improving fiscal transparency in these various ways, the main goal of our theoretical analysis is to derive the responses of the equilibrium debt level and social welfare to marginal changes in the precision of the signals.

4. FIRST-BEST BENCHMARK: THE SOCIAL PLANNER SOLUTION

This section characterizes the first-best benchmark for public debt, which is selected by a social planner sharing voters' preferences. Instead of elections, the planner reappoints (or not) the incumbent policymaker to produce public goods and services. The planner neither observes the incumbent's competence nor the economic shock when choosing public debt, but does so perfectly once debt has been set. As the expected competence of a newly appointed policymaker (i.e. challenger Q) simply equals the unconditional mean $\bar{\eta}$ of η , the incumbent is reappointed whenever $\eta_1 \geq \bar{\eta} + \Delta$. Otherwise the challenger gets the job. Hence, the planner chooses d^{FB} that maximises:¹⁰

⁹ As noted in the Introduction, Bonfiglioli and Gancia (2013) investigate the impact of variations in aggregate uncertainty (which in the current context would amount to a change in the variance of the economic shock ε) on the incentives to invest in costly policies. They find that increases in uncertainty can sometimes alleviate underinvestment and increase social welfare.

¹⁰ Here, we have used the fact that if $X \sim N(\mu, \sigma^2)$, then $E[X|X \geq a] = \mu + \sigma \cdot \phi\left(\frac{a-\mu}{\sigma}\right) / \left[1 - \Phi\left(\frac{a-\mu}{\sigma}\right)\right]$.

$$E[u(g_1)] + Pr(\eta_1 \geq \bar{\eta} + \Delta) \cdot (E[\eta_1 | \eta_1 \geq \bar{\eta} + \Delta] - d) + (1 - Pr(\eta_1 \geq \bar{\eta} + \Delta)) \cdot (\bar{\eta} - d + \Delta) = E[u(\eta_1 + \varepsilon + d)] + (\bar{\eta} - d) + \sigma_\eta \cdot \phi(\Delta/\sigma_\eta) + \Delta \cdot \Phi(\Delta/\sigma_\eta) \quad (3)$$

where $\phi(\cdot)$ is the density of the standard-normal distribution and $\Phi(\cdot)$ its cumulative distribution. The first two terms in the planner's objective function reflect voters' ex ante expected felicity from public good consumption (in the absence of selection) and govern the planner's choice of d^{FB} . The final two terms capture selection effects. The first one arises from the reappointment of the incumbent. Given the planner's reappointment rule, a reappointed incumbent will be more competent on average than the challenger (for which competence results from a new random draw), so that he is expected to provide more public goods. This reappointment effect always increases the planner's expected payoff and is largest for $\Delta = 0$, i.e. when congruence does not confer any advantage or disadvantage to the challenger and only competence matters. The final term in (3) reflects a different selection effect, this time related to partisan preferences. If the challenger is appointed, the planner obtains an extra payoff of Δ due to better or worse congruence with voters' tastes. This effect can go either way, depending on the sign of Δ . Because the planner's selection decision is optimal, the sum of the two selection effects is always positive though.

With the planner's objective function as in (3), together with the felicity function $u(\cdot)$ being concave, the first-best debt level d^{FB} is fully characterized by the first-order condition:

$$E[u'(\eta_1 + \varepsilon + d^{FB})] = 1 \quad (4)$$

Note that due to the quasi-linear specification of our model, the selection effects – which only affect period-2 public consumption – have no impact on the first-best debt level. Put differently, the same first-order condition (4) for d^{FB} applies if the social planner ignores Δ (this corresponds to fixing $\Delta = 0$ in (3)). Therefore, even when Δ is alternatively interpreted as a lack of voter rationality which makes that the political contestability of political power is sub-optimally low, the same first-best benchmark for the debt level results.

As debt is expressed in net terms, d^{FB} can be positive or negative. The planner might indeed decide to accumulate assets in period 1 to spend more in period 2. One of the main insights in

what follows is that the equilibrium debt level d^* in the political game is greater than d^{FB} , thus implying that future public consumption is smaller than its socially-optimal level.

5. DEBT CHOICE IN THE POLITICAL GAME

In this section, we characterize the equilibrium debt level in the political game. The game is solved backwards, i.e. by first solving for the election outcome. At this stage, the way beliefs about policymakers' competence (and the economic shock) are formed is crucial. We discuss this intuitively and assess how the process is affected by the debt level.

A. Belief Formation and Updating

Both the incumbent and the voter would prefer to know the incumbent's competence η_1 ($= \eta_P$). For a given re-election probability, better knowledge about its own competence allows the incumbent to better allocate resources inter-temporally. Similarly, ceteris paribus the voter prefers to elect more able candidates. However, competence is unobservable, leaving the incumbent and the voter the task to make inferences based on the additional observed information $I \equiv (g_1, s_\mu, s_\tau, s_\theta)$.

First consider the incumbent. Because public consumption g_1 in the first period is affected by competence, debt accumulation and an economic shock (see (1)), the incumbent can back out the chosen debt level d from the observed level of g_1 to obtain a noisy estimate $g_1 - d = \eta_1 + \varepsilon$ of competence. In addition, there is the independent signal $s_\mu = \eta_1 + \mu$ of competence that the incumbent receives. The noisy signal s_τ of the debt level is of no value to the incumbent, as the incumbent perfectly knows which d it has chosen. Finally, s_θ can be used, together with g_1 and d , to obtain a third independent signal of competence: $g_1 - d - s_\theta = \eta_1 - \theta$. Effectively, observing vector I implies that the incumbent obtains three independent noisy estimates of η_1 : $\eta_1 + \varepsilon$, $\eta_1 + \mu$ and $\eta_1 - \theta$. These can be used to obtain the incumbent's posterior expectation $\hat{\eta}_{1,P} \equiv E(\eta_1|I, d)$. From the assumed normal distributions, it follows that (see Belot and van de Ven, 2011):

$$\hat{\eta}_{1,P} \equiv E(\eta_1|I, d) = \frac{h_\eta \cdot \bar{\eta} + h_\varepsilon \cdot (\eta_1 + \varepsilon) + h_\mu \cdot (\eta_1 + \mu) + h_\theta \cdot (\eta_1 - \theta)}{h_\eta + h_\varepsilon + h_\mu + h_\theta} \quad (5)$$

where $h_i \equiv 1/\sigma_i^2$ for $i = \eta, \varepsilon, \mu, \tau, \theta$ measures the precision of the various stochastic variables.¹¹ The incumbent's posterior expectation is simply a weighted average of the prior expectation and the three different noisy signals received, where the weights reflect the relative precision of the various information sources.

Ex-ante, the incumbent expects to receive information via vector $(g_1, s_\mu, s_\tau, s_\theta)$, but does not know yet what exactly this information will be. Taking expectations over all the possible signals we have that the posterior expectation $\hat{\eta}_{1,P}$ is also normally distributed, i.e. $\hat{\eta}_{1,P} \sim N(\bar{\eta}, \sigma_I^2)$, where

$$\sigma_I^2 = \frac{h_\varepsilon + h_\mu + h_\theta}{h_\eta + h_\varepsilon + h_\mu + h_\theta} \cdot \sigma_\eta^2 \quad (6)$$

From an ex ante perspective, σ_I^2 can be interpreted as a measure of *informativeness*. The higher σ_I^2 , the more informative vector I is about competence ex post. Note that $\sigma_I^2 \leq \sigma_\eta^2$ and that σ_I^2 is strictly increasing in h_ε , h_μ and h_θ . In particular, $\sigma_I^2 = 0$ if $h_\varepsilon = h_\mu = h_\theta = 0$. Intuitively, if the informative signals that make up vector I were all so noisy that they would actually not contain any relevant information about η_1 , the posterior expectation would always be equal to the prior expectation $\bar{\eta}$ regardless of the information received. At the other extreme, if either $h_\varepsilon \rightarrow \infty$, $h_\mu \rightarrow \infty$, or $h_\theta \rightarrow \infty$, then $\sigma_I^2 \rightarrow \sigma_\eta^2$, and the incumbent would anticipate that ex post, i.e. after having received information I, he would know his competence with certainty.¹² Similarly, σ_I^2 decreases with h_η . If there is less a priori uncertainty about the value of η_1 , the additional information I can provide is necessarily less. In sum, σ_I^2 reflects the incremental informational value of observing I from an inference perspective.

Voters are in a less favourable position than the incumbent is to make inferences about η_1 because they do not observe net public debt d . Instead, they must form beliefs \hat{d}_V about d and back these beliefs out from the government's public consumption g_1 . In principle, voters could use all the information they receive to refine their beliefs about the debt level chosen by the

¹¹ The posterior belief $f(\eta_1|I)$ of the incumbent given the information received is normally distributed with mean $\hat{\eta}_{1,I}$ and variance $(h_\eta + h_\varepsilon + h_\mu + h_\theta)^{-1}$.

¹² In that case, the posterior $\hat{\eta}_{1,P}$ always equals the realization η_1 and, hence, it must be normally distributed with mean $\bar{\eta}$ and variance σ_η^2 .

incumbent, i.e. $\hat{d}_V(I)$. Apart from that, in equilibrium these beliefs must be rational, i.e. in line with the equilibrium debt strategy of the incumbent.

Following the extant literature (see e.g. Holmstrom, 1999; Dewatripont et al, 1999a, 1999b), we focus on pure strategy equilibria only; the government does not randomize over different levels of debt. A perhaps somewhat counterintuitive insight is that equilibrium beliefs $\hat{d}_V(I)$ are then necessarily independent of the signals received, including the signal s_τ on the level of public debt. To see this, note that the assumed infinite support of the various stochastic terms implies that all combinations of possible signals are compatible with (i.e. have positive support for) any given debt level chosen. In particular, any s_τ is compatible with any d , since τ can reach any value with positive probability. This thus also holds true for the equilibrium debt level. If beliefs about the debt chosen would vary with the information received, so would beliefs on the equilibrium path; but this is inconsistent with these beliefs being part of a pure strategy equilibrium. Loosely put, since all signal combinations occur with positive probability on the equilibrium path, voters can never infer that the incumbent chose a debt level different from the equilibrium level (and there is also no need to specify voters' expectations out-of-equilibrium). The information received, and in particular the noisy signal s_τ of the debt, will thus be ignored in shaping beliefs about the debt chosen simply because s_τ is always consistent with any belief \hat{d}_V and cannot prove such beliefs wrong.¹³ With $\hat{d}_V(I) = \hat{d}_V$ we obtain the voter's posterior expectation:

$$\hat{\eta}_{1,V} \equiv E(\eta_1 | I, \hat{d}_V) = \frac{h_\eta \bar{\eta} + h_\varepsilon (\eta_1 + \varepsilon + (d - \hat{d}_V)) + h_\mu (\eta_1 + \mu) + h_\theta (\eta_1 - \theta + (d - \hat{d}_V))}{h_\eta + h_\varepsilon + h_\mu + h_\theta} = \hat{\eta}_{1,P} + \frac{h_\varepsilon + h_\theta}{h_\eta + h_\varepsilon + h_\mu + h_\theta} \cdot (d - \hat{d}_V) \quad (7)$$

As a consequence of the way equilibrium beliefs are formed, variations in h_τ have no impact at all on voters' posterior expectations. Like the incumbent's, these are normally distributed with variance σ_τ^2 , but its mean is given by the far right-hand side (r.h.s.) of (7). The latter opens up the opportunity for the incumbent to try to boost the voter's posterior expectations of its competence by choosing a higher debt level. Obviously, in equilibrium such attempts are

¹³ Based on Mirrlees (1999, Section 3) one might have intuitively expected that s_τ is informative, despite the infinite support of τ , and thus should be considered by the voter when updating his beliefs and casting his vote. However, the crucial difference with a principal-agent setup is that there the principal can commit to a compensation schedule ex ante, while in our setup the voter cannot commit ex ante to a certain voting rule. Yet, if the voter could do so, he would commit to a voting rule that takes s_τ into account as well.

futile, because the voters' equilibrium beliefs regarding the actual debt choice are necessarily correct ($\hat{d}_V = d^*$) and thus $\hat{\eta}_{1,V} = \hat{\eta}_{1,P}$.

B. Election Outcome

After the first period, voters have an updated belief $\hat{\eta}_{1,V}$ about the expected competence of the incumbent. The expected competence of the challenger equals the prior expectation $\bar{\eta}$. If voters cared about competence only, the incumbent would be re-elected whenever $\hat{\eta}_{1,V} \geq \bar{\eta}$. Yet, because congruence also plays a role, voters re-elect the incumbent if $\hat{\eta}_{1,V} \geq \bar{\eta} + \Delta$. The incumbent's re-election probability thus writes:

$$p \equiv Pr(\hat{\eta}_{1,V} \geq \bar{\eta} + \Delta) = 1 - \Phi\left(\Gamma(d, \hat{d}_V)\right), \quad (8)$$

where

$$\Gamma(d, \hat{d}_V) \equiv \frac{1}{\sigma_1} \cdot \left(\Delta - \left[\frac{h_\varepsilon + h_\theta}{h_\eta + h_\varepsilon + h_\mu + h_\theta} \right] \cdot (d - \hat{d}_V) \right) \quad (9)$$

Equation (9) captures the challenger's standardized electoral advantage, i.e. the *margin* in standardized units by which the expected competence of the incumbent should exceed the expected competence of the challenger for the former to be re-elected. Notice that, for a given debt level \hat{d}_V expected by voters, an increase in debt d lowers $\Gamma(d, \hat{d}_V)$ and thus raises the re-election probability of the incumbent. In equilibrium, the expected benefits from higher debt are weighed against the costs of a suboptimal inter-temporal allocation of resources.

C. Equilibrium Public Debt

Moving up one step in the game tree, we next consider the policymaker's decision about debt. With the expected election outcome characterized by (8), the incumbent's objective can be written as:¹⁴

$$\begin{aligned} & E[u(g_1)] + p \cdot (E[\hat{\eta}_{1,P} | \hat{\eta}_{1,V} \geq \bar{\eta} + \Delta] - d) + (1 - p) \cdot (-K) \\ &= E[u(\eta_1 + \varepsilon + d)] + \left[1 - \Phi\left(\Gamma(d, \hat{d}_V)\right)\right] \cdot (K + \bar{\eta} - d) + \sigma_1 \cdot \phi\left(\Gamma(d, \hat{d}_V)\right) - K \end{aligned} \quad (10)$$

As before, the next-to-final term in (10) reflects a selection effect. If the incumbent is re-elected, in expected terms he will be more competent than the challenger and thus able to provide more public consumption. The incumbent maximizes its objective (10) taking the voters beliefs about debt \hat{d}_V as given. The first-order condition governing his choice of debt then equals:

$$E[u'(g_1)] = \left[1 - \Phi\left(\Gamma(d, \hat{d}_V)\right)\right] - q_I \cdot \phi\left(\Gamma(d, \hat{d}_V)\right) \cdot (K + \bar{\eta} - d + \sigma_1 \cdot \Gamma(d, \hat{d}_V)) \quad (11)$$

where we have defined

$$q_I \equiv -\frac{\partial \Gamma(d, \hat{d}_V)}{\partial d} = \frac{1}{\sigma_1} \cdot \left[\frac{h_\varepsilon + h_\theta}{h_\eta + h_\varepsilon + h_\mu + h_\theta} \right]. \quad (12)$$

As defined in (12), q_I reflects the extent to which an increase in debt d lowers the challenger's standardized electoral advantage $\Gamma(d, \hat{d}_V)$, i.e. the extent to which debt improves (in standardized units) the voter's perception of the incumbent's relative position. Note that $q_I = 0$ when $h_\varepsilon = h_\theta = 0$. Intuitively, if g_1 is so noisy that stand-alone it does not convey any relevant information about η_1 (as $h_\varepsilon = 0$), and the additional signal s_θ about the economic shock ε cannot be fruitfully used to filter part of this noise out (as $h_\theta = 0$), an increase in debt (and thereby g_1) has no impact on the incumbent's perceived relative position.

¹⁴ Here we have used the general formula in Footnote 10 to obtain: $E[\hat{\eta}_{1,P} | \hat{\eta}_{1,V} \geq \bar{\eta} + \Delta] = E\left[\hat{\eta}_{1,P} | \hat{\eta}_{1,P} \geq \bar{\eta} + \Delta - \left[\frac{h_\varepsilon + h_\theta}{h_\eta + h_\varepsilon + h_\mu + h_\theta}\right] \cdot (d - \hat{d}_V)\right] = \bar{\eta} + \sigma_1 \cdot \phi(\Gamma(d, \hat{d}_V)) / [1 - \Phi(\Gamma(d, \hat{d}_V))]$.

In equilibrium, voter beliefs about the selected debt level are correct. In that case, the challenger's electoral advantage reduces to $\Gamma(d, \hat{d}_V) = \Delta/\sigma_1$. As a result, the equilibrium debt level d^* is characterized by:

$$E[u'(\eta_1 + \varepsilon + d^*)] = [1 - \Phi(\Delta/\sigma_1)] - q_1 \cdot \phi(\Delta/\sigma_1) \cdot (K + \bar{\eta} - d^* + \Delta) \quad (13)$$

For (13) to fully characterize equilibrium debt, the second-order condition should also be satisfied at $\hat{d}_V = d = d^*$. A sufficient condition for this is that K is sufficiently large (see Appendix A.1 for a formal proof):

$$K > (D - \bar{\eta}) - \min\{\Delta, 0\} \quad (14)$$

This makes explicit the earlier assumption that K is sufficiently large, such that a party always prefers to be in office if it would be elected by voters.

Comparing the first-order condition (13) with the social planner's (equation (4), where the r.h.s. is equal to one), the equilibrium debt level d^* exceeds the first-best debt level d^{FB} for two reasons. First, the incumbent only faces an inter-temporal allocation problem to the extent that he is re-elected. If he would be secured of keeping office, he would choose the first-best debt level. To the other extreme, if he knew for sure that he would not be re-elected, he would borrow as much as possible to maximize public consumption in period 1. More generally, a fall in the re-election probability increases the debt, a standard result in the "partisan bias" literature and captured by the first term on the r.h.s. of (13). We label this the *partisan motive* to (over-)accumulate debt.

Second, in an in equilibrium futile attempt to improve electoral prospects, the incumbent chooses a higher debt to boost its competence as perceived by voters.¹⁵ Indeed, a higher debt allows an increase in public consumption, so that the voters perceive the incumbent as more competent. This 'signal jamming' effect is captured by the second term on the r.h.s. of (13), which is necessarily negative by assumption (14). This effect also makes higher debt more

¹⁵ Paraphrasing Holmstrom (1999, p. 172): "... the *incumbent* cannot fool the *voters*. Yet he is trapped in supplying the equilibrium *debt* level that is expected of him, because, as in a rat race, a lower supply of *debt* will bias the evaluation procedure against him." (with our changes in italics)

attractive to the incumbent. We refer to this as the *opportunistic* motive to (over-) accumulate debt.

6. THE EFFECT OF MORE TRANSPARENCY ON EQUILIBRIUM DEBT

We capture improvements in fiscal transparency by means of a reduction in the noise levels surrounding the signals s_μ , s_τ and s_θ . Formally, this raises h_μ , h_τ and h_θ , with potential repercussions on the equilibrium level of debt d^* . These repercussions follow from how the partisan and opportunistic motive to accumulate debt are affected. The former is fully governed by how the first term on the r.h.s. in (13), viz. $[1 - \Phi(\Delta/\sigma_I)]$, varies with h_i . The changes in d^* due to changes in the opportunistic motive follow from how $q_I \cdot \phi(\Delta/\sigma_I)$ in the second term on the r.h.s. of (13) is affected by changes in h_i . More specifically, differentiating both sides of (13) with respect to h_i we obtain:

$$\{E[u''(\eta_1 + \varepsilon + d^*)] - q_I \cdot \phi(\Delta/\sigma_I)\} \cdot \frac{\partial d^*}{\partial h_i} = -H(\Delta; h_i)$$

$$\text{where } H(\Delta; h_i) \equiv -\frac{\partial[1-\Phi(\Delta/\sigma_I)]}{\partial h_i} + \frac{\partial[q_I \cdot \phi(\Delta/\sigma_I)]}{\partial h_i} \cdot (K + \bar{\eta} - d^* + \Delta) \quad (15)$$

The term on the left-hand side (l.h.s.) in curly brackets is necessarily negative, so that $\frac{\partial d^*}{\partial h_i}$ has the same sign as $H(\Delta; h_i)$. Further, the term $K + \bar{\eta} - d^* + \Delta$ is positive given the assumption in (14). Table 1 below reports the expressions for the relevant marginal effects that make up $H(\Delta; h_i)$.

Table 1: Effect of increased transparency on the two motives to accumulate debt.

	Partisan motive: $-\frac{\partial[1-\phi(\Delta/\sigma_I)]}{\partial h_i} =$	Opportunistic motive: $\frac{\partial[q_I \cdot \phi(\Delta/\sigma_I)]}{\partial h_i} =$
h_μ	$-\phi(\Delta/\sigma_I) \cdot \left[\frac{\Delta}{\sigma_I^2}\right] \cdot \frac{\partial \sigma_I}{\partial h_\mu}$ + if $\Delta < 0$ and - if $\Delta > 0$	$\phi(\Delta/\sigma_I) \cdot \left\{ \frac{\partial q_I}{\partial h_\mu} + q_I \cdot \left[\frac{\Delta^2}{\sigma_I^3}\right] \cdot \frac{\partial \sigma_I}{\partial h_\mu} \right\}$ + if $ \Delta > \bar{\Delta}$ and - if $ \Delta < \bar{\Delta}$
h_τ	0	0
h_θ	$-\phi(\Delta/\sigma_I) \cdot \left[\frac{\Delta}{\sigma_I^2}\right] \cdot \frac{\partial \sigma_I}{\partial h_\theta}$ + if $\Delta < 0$ and - if $\Delta > 0$	$\phi(\Delta/\sigma_I) \cdot \left\{ \frac{\partial q_I}{\partial h_\theta} + q_I \cdot \left[\frac{\Delta^2}{\sigma_I^3}\right] \cdot \frac{\partial \sigma_I}{\partial h_\theta} \right\}$ +

Note: here $\frac{\partial \sigma_I}{\partial h_\mu} = \frac{\partial \sigma_I}{\partial h_\theta} = \frac{1}{2\sigma_I} \cdot \frac{1}{(h_\eta + h_\varepsilon + h_\mu + h_\theta)^2}$ and $\bar{\Delta} \equiv \sigma_I \cdot \sqrt{1 + \frac{2(h_\varepsilon + h_\mu + h_\theta)}{h_\eta}}$

The first term in $H(\Delta; h_i)$ captures the effect of an increase in precision on the odds of re-election. If the latter fall, a partisan policymaker turns more myopic and the partisan deficit bias increases. Two interesting observations can be made from Table 1 to gauge this effect. First, variations in h_μ and h_θ have the exact same impact on how the partisan motive is affected, while variations in h_τ have no impact at all. Second, an increase in either h_μ or h_θ lowers the incumbent's probability of re-election if congruence gives him an electoral advantage, i.e. when $\Delta < 0$. Intuitively, more transparency makes assessing competence easier, implying that the importance of the incumbent's electoral advantage in terms of congruence diminishes. The opposite happens for $\Delta > 0$ (electoral disadvantage).

Interesting and clear-cut results regarding the impact of greater transparency thus emerge when the partisan motive is the sole reason for a deficit bias. This, for instance, occurs when public consumption shocks are so erratic that the observed g_1 tells very little about competence and the noisy signal of the economic shock s_θ cannot be fruitfully used to filter part of the noise. Formally, $h_\varepsilon, h_\theta \rightarrow 0$, so that $q_I \rightarrow 0$, suppressing the opportunistic motive to accumulate debt

in period 1 (the second term in $H(\Delta; h_i)$ disappears).¹⁶ The impact of increased transparency on the partisan motive to raise debt in that case is summarized in the following proposition:

Proposition 1. *Solely focusing on the partisan motive to accumulate debt, a marginal increase in either h_μ or h_θ has the exact same effect and raises equilibrium debt d^* if $\Delta < 0$, while it lowers d^* if $\Delta > 0$. If $\Delta = 0$, d^* is unaffected. Variations in h_τ do not impact the partisan motive to accumulate debt at all.*

The second term in $H(\Delta; h_i)$ captures the effect of greater fiscal transparency on the incentive to opportunistically raise debt. To intuitively interpret this term, recall that q_I reflects the extent to which an increase in debt improves the voter's perception of the incumbent's relative position. In turn, $\phi(\Delta/\sigma_I)$ gives the marginal increase in the incumbent's probability of re-election due to such a change in perception. Thus, the product of the two, $q_I \cdot \phi(\Delta/\sigma_I)$, is the *marginal re-election probability* (in equilibrium) due to an increase in debt.¹⁷ If this marginal re-election probability increases with h_i , the incumbent has a stronger incentive to opportunistically raise debt in response to greater transparency. The opposite is true when this marginal re-election probability decreases with h_i .

The effect of increased transparency on $\phi(\Delta/\sigma_I)$ is straightforward. More transparency in terms of either h_μ or h_θ augments the signals' informativeness (i.e., it raises σ_I^2), which lowers $|\Delta/\sigma_I|$ and correspondingly raises the marginal effect of a change in the voters' perception on reelection chances as measured by $\phi(\Delta/\sigma_I)$. This magnifies the opportunistic motive for excessive debt. (As before, variations in h_τ have no impact at all.) The direction of the effect of increased transparency on q_I , however, depends on which signal is improved. From the defining equation (12) of q_I we immediately obtain that q_I is independent of h_τ and that:

$$\frac{\partial q_I}{\partial h_\mu} = - \left(2(h_\varepsilon + h_\theta) + \frac{q_I}{\sigma_I} \right) \cdot \frac{\partial \sigma_I}{\partial h_\mu} < 0 \quad \text{and} \quad \frac{\partial q_I}{\partial h_\theta} = \left(2(h_\eta + h_\mu) - \frac{q_I}{\sigma_I} \right) \cdot \frac{\partial \sigma_I}{\partial h_\theta} > 0 \quad (16)$$

¹⁶ Other instances where the opportunistic motive for higher deficits disappears occur when the incumbent's competence can be perfectly inferred from other data, i.e. when either (i) the direct signal of competence s_μ is not subject to noise (i.e. when $h_\mu \rightarrow \infty$) and hence η_1 can be observed with perfect precision, or (ii) competence η_1 itself is subject to little variation and thus effectively known from the outset (i.e. when $h_\eta \rightarrow \infty$). In both these cases q_I again shrinks to zero. Obviously though, with η_1 effectively (becoming) known, greater transparency in other dimensions then has no impact, thus also not on the partisan motive.

¹⁷ Note that from the incumbent's re-election probability p in (8) we obtain $\left. \frac{\partial p}{\partial d} \right|_{d=d^*} = q_I \cdot \phi(\Delta/\sigma_I)$.

A more precise direct signal of the incumbent's competence (a higher h_μ) thus erodes the influence of debt on the voters' perception of the incumbent's relative position, i.e. it lowers q_I . In contrast, a more informative signal of the economic shock (a higher h_θ) effectively makes public consumption a stronger signal of competence, thereby intensifying the influence of debt on the voters' perception of competence (i.e. it increases q_I). For an increase in h_θ the impacts on $\phi(\Delta/\sigma_I)$ and q_I go into the same direction and more transparency thus necessarily strengthens the opportunistic motive. For variations in h_μ this is not the case. As long as the role of congruence in giving electoral (dis)advantage Δ remains sufficiently limited, the decrease in q_I dominates the increase in $\phi(\Delta/\sigma_I)$, and greater transparency mitigates the opportunistic motive for excessive public debt. Formally, this holds when:

$$\frac{\partial[q_I \cdot \phi(\Delta/\sigma_I)]}{\partial h_\mu} = \phi(\Delta/\sigma_I) \cdot \left\{ \frac{\partial q_I}{\partial h_\mu} + q_I \cdot \left[\frac{\Delta^2}{\sigma_I^3} \right] \cdot \frac{\partial \sigma_I}{\partial h_\mu} \right\} \leq 0 \Leftrightarrow |\Delta| \leq \sigma_I \cdot \sqrt{1 + \frac{2(h_\varepsilon + h_\mu + h_\theta)}{h_\eta}} \equiv \bar{\Delta} \quad (17)$$

If condition (17) is violated, the increase in $\phi(\Delta/\sigma_I)$ dominates the decrease in q_I , magnifying the opportunistic motive to raise debt. Proposition 2 summarizes the marginal impact of greater transparency on the opportunistic motive to increase debt in equilibrium:

Proposition 2. *Solely focusing on the opportunistic motive to accumulate debt, a marginal increase in h_μ lowers d^* if $|\Delta| < \bar{\Delta}$, while it increases d^* if $|\Delta| > \bar{\Delta}$.¹⁸ A marginal increase in h_θ always raises d^* per the opportunistic motive, while variations in h_τ do not impact the opportunistic motive to accumulate debt at all.*

Propositions 1 and 2 reveal that the partisan and opportunistic motives to raise debt do not always move in the same direction in response to greater transparency. Only for variations in h_τ the overall impact is always clear cut, as both motives are unaffected. For increases in h_μ the effects on the two motives only go in the same direction if either $\Delta \leq -\bar{\Delta}$ or $0 \leq \Delta \leq \bar{\Delta}$. In the former case increased transparency always strengthens the two motives to accumulate debt, while in the latter case both motives are weakened. For the remaining values of Δ the two motives move in the opposite direction. Comparing the size of the opposing effects it appears

¹⁸ The proposition considers the effect of small (i.e. marginal) increases in h_i . As $\bar{\Delta}$ increases without bounds with h_μ or h_θ , large increases in either of these two effectively result in cases where $|\Delta| < \bar{\Delta}$ always applies.

that for $\Delta > \bar{\Delta}$ the effect on the partisan motive is decisive and d^* decreases with h_μ . For the interval $-\bar{\Delta} < \Delta < 0$ the overall effect cannot unambiguously be signed for the general case, yet there exists a threshold $-\bar{\Delta} < \Delta_L < 0$ below which d^* unambiguously increases with h_μ and another threshold Δ_H satisfying $\Delta_L \leq \Delta_H < 0$ above which d^* unambiguously decreases with h_μ .¹⁹ Hence, for Δ negative and sufficiently small, debt increases with greater transparency about competence, while for Δ sufficiently large the opposite holds true.

For variations in h_θ the effects on the two motives go in the same direction if $\Delta \leq 0$; greater transparency about the economic shock then unambiguously strengthens the incentives to accumulate debt. When $\Delta > 0$ the two motives move in opposite directions and greater transparency may in general affect debt in either direction. Yet a relevant observation from the above analysis is that, independent of the value of Δ , an increase in h_θ always induces a larger increase (or a smaller decrease) in debt than an equally-sized increase in h_μ does.

Proposition 3 summarizes and formally characterizes these observations about the joint impact of the two motives behind the debt bias (see Appendix A.2 for a formal proof).

Proposition 3. *Taking both the partisan and the opportunistic motive to accumulate debt into account, it holds that:*

- (i) *A marginal increase in h_μ leads to an increase in d^* if $\Delta < \Delta_L$ and to a decrease in d^* if $\Delta > \Delta_H$. For the two thresholds Δ_L and Δ_H it holds that $-\bar{\Delta} < \Delta_L \leq \Delta_H < 0$.*
- (ii) *A marginal increase in h_τ does not affect d^* at all.*
- (iii) *A marginal increase in h_θ always has a more inflating effect on d^* than a marginal increase in h_μ has: $\frac{\partial d^*}{\partial h_\mu} < \frac{\partial d^*}{\partial h_\theta}$.*

Given that the incumbent always chooses a debt level above first best, greater transparency about competence always has a relatively more favourable effect in terms of reducing or limiting the debt bias than greater transparency about the economic shock has. It also makes

¹⁹ It may well be the case that $\Delta_L = \Delta_H$ and thus that the interval for which the effect is ambiguous is empty. Technically, it turns out to be hard to prove that there is just a single intersection point (in the interval $(-\bar{\Delta}, 0)$) at which the marginal effect of transparency on debt turns sign; although always such an intersection point exists, we have not been able to prove that is unique. Using a CARA utility function we ran simulations (see Section 7) and never encountered instances where there were multiple intersection points.

that there are instances in which greater transparency about competence mitigates the debt bias, while increases in transparency about the economic shock worsen the bias. This for instance occurs when only competence matters in the eyes of the voters. The partisan motive is then unaffected ($\Delta = 0$, see Proposition 1), while for h_μ the opportunism motive is weakened ($|\Delta| < \bar{\Delta}$, see Proposition 2). Intuitively, when congruence does not confer any electoral advantage, a more precise direct signal about competence s_μ alleviates the costly incentive for the incumbent to raise debt just to appear more competent. For h_θ , however, the effect on the opportunistic motive is in the opposite direction. Better information about the economic shock then induces voters to make stronger inferences on the basis of the observed level of public consumption g_1 , in turn giving the incumbent stronger incentives to manipulate appearances by increasing debt.

7. WHO LIKES GREATER TRANSPARENCY?

This section explores the preferences for greater transparency, both by the incumbent and by the voters. This is important from both a positive and from a normative perspective. In some countries, independent fiscal councils were introduced by the government, while in others the initiative was on the side of the parliament. As far as the positive perspective is concerned, the design of independent fiscal councils, such as their mandate and resources, is likely a reflection of the preferences of those who decide about their design. For example, a government that fears a critical council would provide it with only few resources and limited access to information. On the normative side, the question is who, the government or the legislature, should take the initiative to set up an independent fiscal council to enhance the degree of fiscal transparency. We may expect an independent fiscal council founded on the initiative of the legislature not only to command broader ownership and be more durable, in particular if the current opposition moves into government, but also to be better from a social welfare perspective if preferences about the degree of transparency differ systematically between the government and the legislature, which represents broader parts of society.

A. The incumbent's case

Using (10), the incumbent's equilibrium utility is given by:

$$U^P \equiv E[u(\eta_1 + \varepsilon + d^*)] + [1 - \Phi(\Delta/\sigma_1)] \cdot (K + \bar{\eta} - d^*) + \sigma_1 \cdot \phi(\Delta/\sigma_1) - K$$

$$= E[u(\eta_1 + \varepsilon + d^*)] + (\bar{\eta} - d^*) + \sigma_1 \cdot \phi(\Delta/\sigma_1) - \Phi(\Delta/\sigma_1) \cdot (K + \bar{\eta} - d^*) \quad (18)$$

We differentiate (18) with respect to h_i and use the first-order condition for equilibrium debt (13) to obtain:

$$\begin{aligned} \frac{\partial U^P}{\partial h_i} &= (E[u'(\eta_1 + \varepsilon + d^*)] - [1 - \Phi(\Delta/\sigma_1)]) \cdot \left(\frac{\partial d^*}{\partial h_i}\right) + \frac{\Delta}{\sigma_1^2} \cdot \phi\left(\frac{\Delta}{\sigma_1}\right) \cdot (K + \bar{\eta} - d^* + \Delta) \cdot \left(\frac{\partial \sigma_1}{\partial h_i}\right) + \\ &\phi\left(\frac{\Delta}{\sigma_1}\right) \cdot \left(\frac{\partial \sigma_1}{\partial h_i}\right) = \phi(\Delta/\sigma_1) \cdot \left\{ \frac{\Delta}{\sigma_1^2} \cdot \left(\frac{\partial \sigma_1}{\partial h_i}\right) - q_I \cdot \left(\frac{\partial d^*}{\partial h_i}\right) \right\} \cdot (K + \bar{\eta} - d^* + \Delta) + \phi(\Delta/\sigma_1) \cdot \left(\frac{\partial \sigma_1}{\partial h_i}\right) \quad (19) \end{aligned}$$

In general, greater transparency affects the incumbent's utility in three ways. First, there is an effect of increased transparency on the equilibrium path of public consumption. In the eyes of the government greater transparency improves the intertemporal allocation of resources only if equilibrium debt falls as a result, which may only be the case if the incumbent does not hold a strong electoral advantage (cf. Proposition 3).²⁰ Second, increased transparency may have a direct impact on the odds of reelection and thus the expected benefits from being in office in period 2. When the incumbent has an electoral advantage ($\Delta < 0$), the odds of re-election deteriorate with transparency, whereas in case the incumbent is at an initial disadvantage ($\Delta > 0$) these odds improve with transparency.²¹ Third, conditional on reelection, the incumbent will on average be more competent, which constitutes an unambiguously (weakly) positive selection effect associated with greater transparency.

The overall impact depends on the exact size of the potentially opposing effects. When the challenger has an electoral advantage ($\Delta > 0$), all three effects move in the same direction for variations in h_μ and greater transparency about competence necessarily makes the incumbent (weakly) better off. In case the incumbent holds an electoral advantage ($\Delta < 0$), the impact of greater transparency about competence can potentially go either way. Nevertheless, independent of the degree of congruence Δ , it is always preferred by the incumbent over and above greater transparency about the economic shock. This follows from the fact that variations in h_μ and h_θ only impact the opportunistic motive differently, with h_θ having a

²⁰ Note that changes in transparency also lead voters to change (the way in which they update) their beliefs and thereby to a shift in the incumbent's best response. The utility implications from a change in the debt choice that greater transparency induces thus do not follow from the envelope theorem, as also changes in the behavior of other players (here voters) in the game should be accounted for.

²¹ More precisely formulated, in general (i.e. for all h_i) these effects only hold so weakly, as variations in h_τ do not affect the odds of reelection at all.

stronger (upward) impact. This larger increase (or smaller decrease) in debt harms the incumbent, because in equilibrium opportunism is fully in vain. Finally, as greater transparency about the debt level chosen has no impact on the amount of information voters effectively have in equilibrium, variations in h_t do not impact the incumbent's utility.

B. The voter's case

An interesting property of the model is that the incumbent's incentives to increase transparency are not necessarily aligned with the voters' incentives. This possible discrepancy relates to the two distinct motives for an incumbent to accumulate debt and to the combined influence of competence and congruence on voting behavior. While the incumbent and society in equilibrium both experience a loss from the opportunistic motive for debt accumulation, the partisan motive results from the incumbent's "political DNA"; it reflects a specific desire to be in office. Thus, voters and the government will agree on the desirability of greater transparency to the extent that it mitigates opportunistic debt buildups, but they may have conflicting views due to the impact of greater transparency on electoral outcomes. As discussed above, an incumbent benefitting from a sufficient electoral advantage may potentially dislike greater transparency, because it increases exposure to the risk of being deemed incompetent, and ultimately lowers re-election chances. In contrast, voters always value more precise information about competence, because it improves selection at the election stage. They might nevertheless oppose greater transparency if the favorable selection effect is more than offset by higher equilibrium debt. This subsection characterizes voters' preferences with respect to transparency.

In equilibrium, social welfare is given by:

$$U^S \equiv E[u(\eta_1 + \varepsilon + d^*)] + [1 - \Phi(\Delta/\sigma_1)] \cdot (E[\hat{\eta}_{1,V} | \hat{\eta}_{1,V} \geq \bar{\eta} + \Delta] - d^*) + \Phi(\Delta/\sigma_1) \cdot (\bar{\eta} - d^* + \Delta) = E[u(\eta_1 + \varepsilon + d^*)] + (\bar{\eta} - d^*) + \sigma_1 \cdot \phi(\Delta/\sigma_1) + \Phi(\Delta/\sigma_1) \cdot \Delta \quad (20)$$

Note that equation (20) coincides with (3), i.e. the social planner's objective, except that σ_1 features in (20) instead of σ_η in (3). Intuitively this follows because the social planner observes η_1 *perfectly* after period 1 (maximum information), whereas voters have to rely on the noisy information collected in vector I instead. The positive selection effect as captured by the last two terms of (20) is thus necessarily smaller for voters.²² The more precise the voters' information becomes, the larger σ_1 , and the larger the corresponding selection effect. In the limit, $\sigma_1 \rightarrow \sigma_\eta$ and the selection effects in (20) and in (3) coincide.

Differentiating (20) with respect to h_i and using the first-order condition for equilibrium debt (13) we obtain:

$$\begin{aligned} \frac{\partial U^S}{\partial h_i} &= (E[u'(\eta_1 + \varepsilon + d^*)] - 1) \cdot \left(\frac{\partial d^*}{\partial h_i}\right) + \phi(\Delta/\sigma_1) \cdot \left(\frac{\partial \sigma_1}{\partial h_i}\right) \\ &= -[\Phi(\Delta/\sigma_1) + q_I \cdot \phi(\Delta/\sigma_1) \cdot (K + \bar{\eta} - d^* + \Delta)] \cdot \left(\frac{\partial d^*}{\partial h_i}\right) + \phi(\Delta/\sigma_1) \cdot \left(\frac{\partial \sigma_1}{\partial h_i}\right) \end{aligned} \quad (21)$$

Compared to the corresponding expression (19) for the incumbent, we see that voters' views about the desirability of greater transparency are only shaped by the strength of the overall selection effect and the impact of transparency on equilibrium debt. Re-election concerns are obviously absent, and greater transparency will always be preferred if it does not induce greater debt; there is ambiguity otherwise. Per Proposition 3, which characterizes the response of equilibrium debt to transparency, voters will necessarily favor more transparency about competence if the incumbent's electoral advantage is not too large (i.e. $\Delta > \Delta_H$). Moreover, just like the incumbent voters always prefer greater transparency about competence over and above greater transparency about the economic shock, while greater transparency about the debt level chosen does not impact their utility at all. These observations, together with the earlier ones regarding the incumbent, are summarized in Proposition 4.

²² Differentiating the last two terms $\sigma_1 \cdot \phi(\Delta/\sigma_1) + \Delta \cdot \Phi(\Delta/\sigma_1)$ towards σ_1 yields $\phi(\Delta/\sigma_1) > 0$.

Proposition 4. *Greater transparency is valued by the incumbent and voters as follows:*

- (i) *A marginal increase in h_μ necessarily benefits the incumbent if $\Delta > 0$ but may hurt him if $\Delta < 0$. A marginal increase in h_μ necessarily benefits voters if $\Delta_H < \Delta$ (with $\Delta_H < 0$), but may hurt them if $\Delta < \Delta_H$.*
- (ii) *A marginal increase in h_τ neither affects the incumbent nor voters at all.*
- (iii) *Both the incumbent and voters alike always prefer a marginal increase in h_μ over a (similar sized) marginal increase in h_θ .*

In case $\Delta \geq 0$ more information about competence is beneficial to both the incumbent and voters alike. Both are then better off when the budget for increased transparency is spent on making the direct signal of competence s_μ more precise, rather than getting better information on the actual size of the chosen debt. When the incumbent holds an electoral advantage $\Delta < 0$, however, their interests in regard to (the type of) transparency might potentially clash. For this case we are unable to formally establish exactly when the incumbent and voters prefer more to less transparency about competence and thus whether (and how) their interests differ. Nevertheless, Proposition 4 suggests that voters are never less in favor of greater transparency about competence than the incumbent is (as, unlike the incumbent, voters are not concerned about the negative impact of more transparency on the incumbent's odds of reelection). This would in turn imply that, in case of conflicting preferences, voters prefer greater transparency about competence, while the incumbent dislikes it. For him, greater transparency about the debt level chosen then would be better, as this does not affect his utility at all. In the next subsection we briefly discuss the results from a numerical simulation that supports this conjecture.

C. Numerical evaluation

As we are unable to formally establish whether the incumbent and the voter prefer more to less transparency in the range where $\Delta < 0$, we resort to a numerical investigation of this question. We assume that period-1 utility is of the constant absolute risk aversion (CARA) type, i.e. $u(g_1) = (1 - \exp(-\xi g_1))/\xi$. We conduct a large number of simulations in which we draw random combinations of the values of the parameters in the model. We retain those parameter

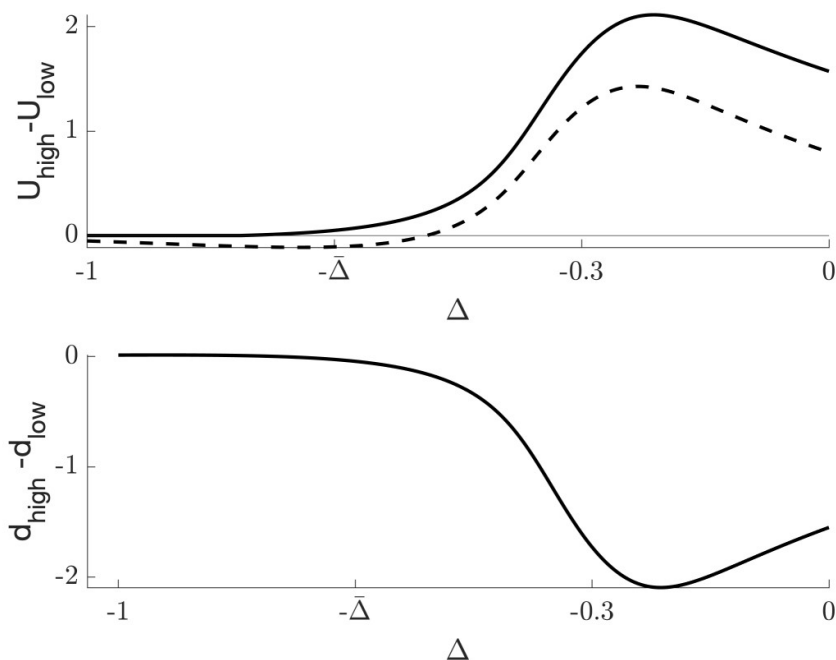
combinations for which the second-order condition for an internal optimum is fulfilled.²³ Concretely, we draw from the uniform density over the interval $[0,5]$ the value of the CARA-parameter ξ , from the uniform density over the interval $[1,5]$ the values of h_ε , h_θ and h_η (a lower bound on these parameters is needed for numerical precision), and from the uniform density over the interval $[1,20]$ the values of K and $\bar{\eta}$. Finally, each of the resulting parameter combinations is combined with two draws of the transparency parameter h_μ from the uniform density over the interval $[1,10]$. The situation in which the given parameter combination is combined with the lower of the two values of h_μ is referred to as “low fiscal transparency” ($h_\mu = h_{\mu,low}$), while that the higher value of h_μ is referred to as “high fiscal transparency” ($h_\mu = h_{\mu,high}$). We compare for each given level of political congruence Δ the incumbent’s and the voter’s utility when transparency is high with utility when transparency is low, thus always keeping the parameters other than h_μ constant in the comparison. In particular, we look at the differences $U_{high}^P(\Delta) - U_{low}^P(\Delta)$ and $U_{high}^S(\Delta) - U_{low}^S(\Delta)$, where $U_{high}^P(\Delta)$, $U_{high}^S(\Delta)$, $U_{low}^P(\Delta)$ and $U_{low}^S(\Delta)$ are the utilities for given Δ of the incumbent and society when transparency is high, respectively low. Further, we explore also how the public debt behaves as a function of Δ . At each value of Δ we also check whether the second-order condition for an internal optimum is fulfilled.

Note that from our theoretical analysis we already know that both $U_{high}^P(\Delta) - U_{low}^P(\Delta)$ and $U_{high}^S(\Delta) - U_{low}^S(\Delta)$ are necessarily positive for $\Delta > 0$. (Similarly so, we know that equilibrium debt d^* is necessarily decreasing in transparency in that range.) In our simulations we thus focus on the range $\Delta < 0$. Although in principle many different potential configurations could be possible, only a limited number of configurations actually occur in our set of simulations. These can be generally characterized as follows. For both the incumbent politician and the voters (i.e., society) a switch point $\tilde{\Delta}_P$, respectively $\tilde{\Delta}_S$, (potentially) exists. For congruence levels below this switch point the utility difference $U_{high}^i(\Delta) - U_{low}^i(\Delta)$ is negative (with either $i = P$ or $i = S$), while for congruence levels above the switch point the utility difference is positive. In case no such switch point exists, the utility difference is positive for any value of Δ ; this essentially corresponds to a switch point $\tilde{\Delta}_i = -\infty$.

²³ The total number of simulations was 20,718. However, 718 of these were dismissed because the second-order condition was not fulfilled, hence 20,000 were retained for the analysis.

In our simulations we always find that $\tilde{\Delta}_S \leq \tilde{\Delta}_P$. Hence, if the incumbent prefers the higher degree of fiscal transparency, so do voters, but not necessarily vice versa. (Similarly so, if voters prefer less transparency, so does the incumbent, but not necessarily the reverse.) The typical case is where $-\infty = \tilde{\Delta}_S < \tilde{\Delta}_P$. In particular, in slightly less than three quarters of the cases, voters always prefer high transparency over low transparency, while for the incumbent this only holds when his electoral advantage is not too large. Figure 3 illustrates this typical case (for one specific set of parameter draws). The figure also shows the difference between debt under high minus debt under low transparency, which is negative over the interval from $-\bar{\Delta}$ to 0. In about 20 percent of the cases, both the voter and the incumbent always prefer high transparency (i.e. $-\infty = \tilde{\Delta}_S = \tilde{\Delta}_P$). Finally, in about 6 percent of the cases both voters and the incumbent prefer low transparency if the incumbent holds a strong electoral advantage, but high transparency otherwise; $-\infty < \tilde{\Delta}_S < \tilde{\Delta}_P$.

Figure 3: Conflicting preferences – voters prefers high, incumbent prefers low transparency when he has a large electoral advantage



Note: the solid line in the upper panel depicts voter utility when transparency about competence is high minus voter utility when transparency is low. The dashed line does the same for the incumbent's utility. The lower panel depicts debt under high minus debt under low transparency. The figure is based on the following parameter combination: $h_\epsilon = 4.89$, $h_\theta = 4.91$, $h_\eta = 1.53$, $K = 19.23$, $\bar{\eta} = 7.77$, $\xi = 4.38$, $h_{\mu.low} = 2.41$ and $h_{\mu.high} = 8.89$.

Overall, our simulations thus suggest that voters are never less in favor of high transparency about competence than the incumbent is. In fact, it seems that voters typically prefer higher to lower transparency, while for the incumbent this does not hold when he holds a considerable electoral advantage. In the latter case, the incumbent would rather prefer high transparency about the level of debt actually chosen, as this type of transparency is harmless to him.

8. CONCLUSION

This paper has shown that an increase in fiscal transparency is frequently, but not always, beneficial. The theoretical analysis was conducted in the context of a political-economy model with uncertainty about the competence of the incumbent policymaker. The model combines two sources of excessive debt: a “partisan bias” related to the incumbent’s myopia in the face of uncertain re-election, and an “opportunistic bias” emanating from the incumbent’s incentive to boost debt-financed expenditure just to appear competent. In the presence of a partisan bias only, more transparency reduces the incumbent’s re-election chances if he enjoys an electoral advantage, leading to higher debt. In the presence of the opportunistic bias only, more transparency about competence may lead to lower debt if there is no or only a limited electoral advantage. However, the debt bias can become more severe when the incumbent enjoys a sufficiently large electoral advantage or disadvantage. A more precise signal about the state of the economy always worsens the debt bias from opportunism, as it unfavourably affects re-election chances.

The ambiguity about the effect on debt translates into potentially conflicting incentives for society (voters) and elected policymakers to raise fiscal transparency. Society’s willingness to do so depends on the consequences for equilibrium public debt and on its improved ability to elect policymakers that are on average more competent. In addition to these two factors, the incumbent also considers the effect of more transparency on re-election chances. If voters care about competence only, more transparency about competence benefits both the incumbent and society by suppressing the opportunistic debt bias. The same holds true in case voters, besides competence, also care about ‘congruence’ (e.g. ideology) and the challenger holds an electoral advantage in that regard. For the opposite case in which (based on congruence) the incumbent has an electoral advantage, it is more difficult to formally assess the benefits of higher transparency for the general case. We thus resorted to numerical analysis, which suggests substantial voter support for increasing transparency about competence. Both voters and

incumbent prefer more such transparency when the latter does not have a too large electoral advantage. However, when the incumbent enjoys a substantial electoral advantage, he is likely against raising transparency about competence, while the voter may or may not be in favour.

Our analysis provides some useful general lessons about the impact of (different types of) increased fiscal transparency on debt and welfare. These insights can, for instance, be applied in the context of designing effective independent fiscal councils (IFC), institutions that – besides the other roles they have – can arguably be seen as one of the more prominent vehicles for promoting fiscal transparency. First, our analysis qualifies the perception that the increased transparency generated by establishing an IFC is always beneficial: if voters do not care sufficiently about policymakers' competence, an IFC does not necessarily produce a lower debt bias and social welfare may be harmed. The possibility that more transparency could exacerbate the debt bias suggests to give the IFC a broad remit that includes analysing long-term public debt sustainability and monitoring fiscal performance against numerical fiscal rules. Recently established IFCs often include these tasks in their remit, especially those in the Euro Area.

Second, our analysis also demonstrates that not all political environments are conducive to the emergence of a well-designed IFC. A government may not find it in its interest to establish an IFC. Alternatively, it may pay lip-service to popular demand by establishing an IFC, but giving it insufficient resources and access to information to play an effective role. Sometimes, as was the case with the U.S. Congressional Budget Office, the legislature takes the initiative to set up an IFC to reduce the information gap with the government.

Finally, in line with experience, our analysis highlights the inherent vulnerability of IFCs to shifts in political conditions, such as the popularity of the government. In particular, an IFC set up on the initiative of the government seems vulnerable, as it may command less ownership across the political spectrum than one established by the legislature. An example is the Swedish Fiscal Policy Council, which was established on the initiative of a government that in response to the Council's critical evaluation of certain policies later (in vain) tried to curtail its already limited resources (Calmfors, 2012). Strict guarantees of independence, including safeguards on financial resources, thus seem important to guarantee their sustainability over the longer run. For the same reason, adapting the IFC's institutional model to the specific characteristics of the country can increase the likelihood that its existence commands broad

political consensus. To the contrary, IFCs imposed by external conditions are likely to be particularly vulnerable to political change or to be simply ignored by policymakers and the public. Still, even IFCs operating in well-functioning democracies and created in the absence of external pressures may see their independence threatened.

The analysis in this paper suggests interesting avenues for further research. First, one may relax the assumption that, when choosing debt, the government does not have an information advantage about its own competence. Debt would then become a signalling instrument as well. Second, a fundamental question concerns the role of IFCs in relation to fiscal rules, as the latter can prevent potential collateral damage from introducing a council. We did not formally study this complementarity, but the fact that IFCs are usually established when one or more fiscal rules are already in place warrants such an analysis. Finally, it would be interesting to extract testable empirical predictions from our theory and investigate their validity, especially once more observations with IFCs have become available. For example, one might test whether IFCs are more frequently established when government poll ratings are less favourable and their fiscal transparency-enhancing effect is more likely to raise re-election chances.

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Appendix A: Proofs

A.1. Second-order condition

Here we formally show that condition (14) is sufficient for the second-order condition (s.o.c.) of the incumbent's maximization problem to hold. Given the first-order condition (f.o.c.) in (11), the s.o.c. becomes:

$$E[u''(g_1)] - q_1 \cdot \phi(\Gamma(d, \hat{d}_V)) \cdot (2 + \sigma_1 \cdot q_1) + q_1 \cdot \Gamma(d, \hat{d}_V) \cdot \left\{ q_1 \cdot \phi(\Gamma(d, \hat{d}_V)) \cdot (K + \bar{\eta} - d + \sigma_1 \cdot \Gamma(d, \hat{d}_V)) \right\} < 0$$

From $u'' < 0$, a sufficient condition is thus that:

$$\Gamma(d, \hat{d}_V) \cdot \left\{ q_1 \cdot \phi(\Gamma(d, \hat{d}_V)) \cdot (K + \bar{\eta} - d + \sigma_1 \cdot \Gamma(d, \hat{d}_V)) \right\} < \phi(\Gamma(d, \hat{d}_V)) \cdot (2 + \sigma_1 \cdot q_1)$$

Using f.o.c. (11) this reduces to:

$$\Gamma(d, \hat{d}_V) \cdot \left\{ 1 - \frac{E[u'(g_1)]}{[1 - \Phi(\Gamma(d, \hat{d}_V))]} \right\} < \frac{\phi(\Gamma(d, \hat{d}_V))}{[1 - \Phi(\Gamma(d, \hat{d}_V))]} \cdot (2 + \sigma_1 \cdot q_1)$$

First suppose $\Gamma(d, \hat{d}_V) > 0$. For the hazard rate of the standard normal distribution, it holds that $\frac{\phi(x)}{1 - \Phi(x)} > x$. Therefore, as the term within curly brackets on the l.h.s. is necessarily below 1, the s.o.c. is always satisfied. Next, suppose $\Gamma(d, \hat{d}_V) < 0$. A sufficient condition for the s.o.c. to hold is then that $E[u'(g_1)] < 1 - \Phi(\Gamma(d, \hat{d}_V))$. From (11), this is certainly satisfied if:

$$K + \bar{\eta} - d + \sigma_1 \cdot \Gamma(d, \hat{d}_V) > 0$$

This in particular must be satisfied at $d = \hat{d}_v$. This reduces to $K + \bar{\eta} - d + \Delta > 0$, which should hold for equilibrium debt level d^* . A sufficient condition for this is that $K + \bar{\eta} - D + \min\{\Delta, 0\} > 0$, which after rewriting gives (14).

A.2. Proof of Proposition 3

From (15) it follows that $\frac{\partial d^*}{\partial h_i}$ has the same sign as $H(\Delta; h_i)$. Now, from Table 1 we obtain $H(\Delta; h_r) = 0$, immediately yielding part (ii) of the proposition. For part (i) we obtain from (15), Table 1 and (16) that:

$$H(\Delta; h_\mu) = -\phi(\Delta/\sigma_1) \cdot \frac{\partial \sigma_1}{\partial h_\mu} \cdot \left\{ \frac{\Delta}{\sigma_1^2} + \left((2(h_\varepsilon + h_\theta) + \frac{q_I}{\sigma_1}) - q_I \cdot \left[\frac{\Delta^2}{\sigma_1^3} \right] \right) \cdot (K + \bar{\eta} - d^* + \Delta) \right\}$$

Hence $H(\Delta; h_\mu) = -\phi\left(\frac{\Delta}{\sigma_1}\right) \cdot \frac{\partial \sigma_1}{\partial h_\mu} \cdot F(\Delta)$, with $F(\Delta)$ a function of the form $F(\Delta) = c_1 \cdot \Delta + (c_2 - c_3 \cdot \Delta^2) \cdot (f(\Delta) + \Delta)$, where $c_i > 0$ for all i and $f(\Delta) + \Delta \equiv K + \bar{\eta} - d^* + \Delta > 0$ by (14). Let $\bar{\Delta} = \sqrt{\frac{c_2}{c_3}}$. Note that $F(-\bar{\Delta}) < 0$ and $F(\bar{\Delta}) > 0$. Moreover, by $f(\Delta) + \Delta > 0$ from assumption (14) we have $F(\Delta) < 0$ for all $\Delta < -\bar{\Delta}$ and $F(\Delta) > 0$ for all $\Delta \in [0, \bar{\Delta}]$.

We are interested in the roots Δ_r of $F(\Delta)$, i.e. where $F(\Delta_r) = 0$. From the above it already follows that such a root cannot lie in the interval $(\infty, -\bar{\Delta}]$ and neither in $[0, \bar{\Delta}]$. We next show that, under assumption (14), a root $\Delta_r > \bar{\Delta}$ does not exist as well. Rewriting first-order condition (13) we obtain:

$$K + \bar{\eta} - d^* + \Delta = \frac{1}{q_I} \cdot \left\{ \frac{[1 - \Phi(\Delta/\sigma_1)]}{\phi(\Delta/\sigma_1)} - \frac{E[u'(\eta_1 + \varepsilon + d^*)]}{\phi(\Delta/\sigma_1)} \right\}$$

From $\frac{\phi(x)}{1 - \Phi(x)} > x$ it follows for $x > 0$ that $\frac{1 - \Phi(x)}{\phi(x)} < \frac{1}{x}$. Together with $\frac{E[u']}{\phi} > 0$ we obtain for $\Delta > 0$:

$$K + \bar{\eta} - d^* + \Delta < \frac{\sigma_1}{q_I} \cdot \frac{1}{\Delta} \equiv c_4 \cdot \frac{1}{\Delta}$$

Therefore, for $\Delta > \bar{\Delta}$ we get:

$$F(\Delta) = c_1 \cdot \Delta + (c_2 - c_3 \cdot \Delta^2) \cdot (f(\Delta) + \Delta) > c_1 \cdot \Delta + (c_2 - c_3 \cdot \Delta^2) \cdot c_4 \cdot \frac{1}{\Delta} = \\ (c_1 - c_3 \cdot c_4) \cdot \Delta + c_2 \cdot c_4 \cdot \frac{1}{\Delta} = c_2 \cdot c_4 \cdot \frac{1}{\Delta} > 0$$

where $c_1 = c_3 \cdot c_4$ follows from the definition of these coefficients. Hence a root $\Delta_r > \bar{\Delta}$ does not exist.

From $F(-\bar{\Delta}) < 0$, $F(0) > 0$ and the intermediate value theorem it follows that at least one root exists on the interval $(-\bar{\Delta}, 0)$, with F increasing in this root. Potentially multiple (generically, an odd number) of roots may exist on the interval $(-\bar{\Delta}, 0)$; let Δ_L denotes the smallest of these and Δ_H the largest. This yields part (i) of the proposition.

For part (iii) we get from (15), Table 1 and (16) that:

$$H(\Delta; h_\theta) = -\phi(\Delta/\sigma_I) \cdot \frac{\partial \sigma_I}{\partial h_\theta} \cdot \left\{ \frac{\Delta}{\sigma_I^2} + \left(- \left(2(h_\eta + h_\mu) - \frac{q_I}{\sigma_I} \right) - q_I \cdot \left[\frac{\Delta^2}{\sigma_I^3} \right] \right) \cdot (K + \bar{\eta} - d^* + \Delta) \right\}$$

Hence $H(\Delta; h_\theta) = -\phi\left(\frac{\Delta}{\sigma_I}\right) \cdot \frac{\partial \sigma_I}{\partial h_\theta} \cdot J(\Delta)$, with $J(\Delta)$ a function of the form $J(\Delta) = c_1 \cdot \Delta - (b_2 + c_3 \cdot \Delta^2) \cdot (f(\Delta) + \Delta)$, where c_1, c_3 and $b_2 > 0$. Note that $F(\Delta) = J(\Delta) + (b_2 + c_2) \cdot (f(\Delta) + \Delta)$. (Recall that $\frac{\partial \sigma_I}{\partial h_\theta} = \frac{\partial \sigma_I}{\partial h_\mu}$.) From assumption (14) we have $f(\Delta) + \Delta > 0$; with $(b_2 + c_2) > 0$ it follows that $F(\Delta) > J(\Delta)$. From (15) we have $\frac{\partial d^*}{\partial h_i} = \frac{1}{q_1 \cdot \phi - E[u'']}$ $H(\Delta; h_i)$ and the result follows. ■