Optimal Checks and Balances Under Policy Uncertainty*

Gabriele Gratton† and Massimo Morelli‡

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Abstract

Political checks and balances are certainly among the most debated desiderata in the construction of democratic systems and their evaluation. This paper suggests a conceptual framework that could be useful to inform this debate. We propose a model where the pros and cons of a strengthening of checks and balances are respectively the reduction of type-I errors and the increase of potential type-II errors in policy decision-making. Political checks and balances are less desirable for intermediate levels of competence of the political class when in conjunction with high accountability. In policy areas where the welfare effects of a reform are harder to evaluate and effective accountability is low, political checks and balances are always desirable. Positive constitutional design unfortunately reveals the possibility of constitutional traps, with politicians choosing or defending the less desirable regime.

Keywords: Checks and balances, Information, Uncertain policy quality, Effective accountability, constitutional design.

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†School of Economics, UNSW Business School, UNSW Sydney. Email: g.gratton@unsw.edu.au.

‡Department of Social and Political Sciences, Bocconi University, IGIER, PERICLES and CEPR. Email: massimo.morelli@unibocconi.it.

1 Introduction

Democracies feature three types of checks on political decisions. First, before a political decision is taken, it is subject to the preventive veto of multiple political actors—what we refer to as *political* checks and balances. Second, after a political decision has been taken, it is subject to the legal scrutiny of the judicial and bureaucratic systems—*institutional* checks. Finally, after a political decision is implemented, it is subject to the scrutiny of the voters, who, depending on the information or feedback they can obtain on the policy, may hold political leaders accountable for the consequences of their decisions—*electoral accountability*.

Political scientists and economists alike maintain that liberal democracies require a combination of electoral accountability, political checks and balances, and institutional checks to constrain the power of individual politicians or parties.[1] Accordingly, accountability and checks and balances are viewed by some as essential *complements* in the provision of good public policies, and by others as *substitutes*. Mounk (2018) argued that political accountability to voters and constitutional checks and balances, while essential for the functioning of a liberal democracy, are naturally in conflict with each other, making liberal democracy both fragile and historically rare. Mounk's argument is that voters in democracies are likely to demand that the policymaker they elected has the power to deliver on his or her promises. Therefore, political and institutional checks and balances, which limit the action of elected politicians, may appear to voters as limits to their democratic rights, especially when voters demand swift changes in policies. More broadly, in times of crisis, as in the recent COVID-19 emergency, checks and balances may be eroded away, either because voters demand swift, decisive actions, or because governments use emergency powers to bypass parliamentary discussions.[2] The wave of populism in Western democracies after the great financial crisis may in part reflect a demand of more power to the people, obtained through a leader that promises electoral accountability while fighting against the political and institutional constraints that create rents for the elites. According to this view, electoral accountability and checks and balances are at best *substitutes* in the production of good public policies, and one may even hinder the positive effects of the

[1] "In framing a government which is to be administered by men over men, the great difficulty lies in this: you must first enable the government to control the governed; and in the next place oblige it to control itself. A dependence on the people is, no doubt, the primary control on the government; but experience has taught mankind the necessity of auxiliary precautions." (The Federalist Papers, 51). This famous principle by Madison must be credited to Montesquieu (1750) in *The Spirit of Laws*. See also Barro (1973) and Ferejohn (1986) as classic references on accountability.

[2] The intellectual basis for this goes back to Locke's *Second Treatise of Civil Government* (1689, Sec. 160-161).

other.

In this paper we develop a simple stylized framework to study political checks and balances and their interaction with electoral accountability, highlighting the conditions under which political checks and balances may be desirable to voters. Our aim is to understand when electoral accountability and political checks and balances complement each other in the production of good policies, and when instead political checks and balances may be counterproductive. We show that political checks and balances may both increase or decrease the voters' welfare, depending on the effectiveness of electoral accountability and the average quality of politicians. When all politicians are either very likely to be competent or incompetent, political checks and balances are always optimal, complementing electoral accountability in driving less competently designed policies to be stopped before they are enacted. But when the competence of the political class is intermediate, political checks and balances are only optimal if electoral accountability is sufficiently ineffective. Therefore, whether checks and balances are productive or counterproductive depends on elements that favor the voters' ability to discern good from bad policies within the time-horizon that is relevant for the politicians. These factors include the specific policy area, the political stability of the country, the quality of the bureaucracy that implements and measures the effects of policies, and the independence and efficacy of media inquiries. In particular, policy decisions that voters would find difficult to evaluate and that are likely to produce effects only in a distant future require more checks and balances than policies that can be more transparently evaluated on a routine basis.

Political checks and balances affect both legislative and executive decisions. For example, in most democratic constitutions, executive appointments are subject to the approval of parliament. Similarly, in bicameral legislatures, bills approved by the lower house must pass the scrutiny of the upper house before being enacted. Political checks and balances also affect the relation between different levels of government, as national presidents or regional and state legislatures may have veto power over bills passed by the national parliament. Whether individual decisions are subject to the scrutiny of multiple political actors or not is likely to determine the quality and the quantity of policies. As a result, the amount of political checks and balances is at the center of the debate over the merits of a constitution.

For example, the debate over the merits of bicameral legislative systems dates back at least to Madison, who warned against the risks of the "excess of law-making" and defended the bicameral system on the basis of the "check on legislation" provided by the U.S. Senate (The Federalist Papers, 62). The view that bicameralism's main merit rests on hindering excessive change is widespread among political scientists (e.g., Tsebelis and

Money, 1997).[3] In the 20th Century, progressive political scientists questioned the merits of the bicameral checks on legislation. For example, Orfield (1935) writes that "[T]he present system results in too much check and balance. For every poor measure that may be defeated under the bicameral system, it is likely that two or more good measures fail." Similarly, Stouffer, Opheim, and Day (1996) write that in bicameral systems "although careless stupid action is less likely, wise or sensible action is more difficult to accomplish." In summary, the collective wisdom on checks and balances points to a tradeoff: while subjecting policies to the preventive scrutiny of a veto player helps to stop bad reforms, it may also stop good ones. Borrowing from the terminology of statistical inference, the scrutiny of a veto player decreases the frequency of type-I errors, but increases that of type-II errors.[4]

We propose a stylized framework that captures this tradeoff between type-I and type-II errors and allows us to study the relative merits of political checks and balances for different levels of accountability. Our framework is based on three key ingredients. First, we posit that politicians design and attempt to implement reforms in order to signal their competence, for example because of reelection incentives or other career concerns (Ash, Morelli, and Van Weelden, 2017; Canes-Wrone, Herron, and Shotts, 2001; Morelli and Van Weelden, 2013). Second, within this framework excessive law-making and bad reforms arise because voters learn the quality of enacted reforms only with delay, as complex reforms take time to realize their impact on voters' welfare, or because measuring such impact, or judging on their legality, may require rich information, time, and specialized scrutiny (Gratton, Guiso, Michelacci, and Morelli, 2021; Gratton, Holden, and Kolotilin, 2018). Finally, we introduce political checks and balances by allowing the system to prescribe that reforms need to pass the scrutiny of a political veto player, who is also driven by the desire to signal her competence (Buisseret, 2016; Fox and Van Weelden, 2010; Tsebelis, 1995).

Our model delivers normative as well as positive insights about political checks and balances. We show that optimal checks and balances depend on other features of the political system, as well as on the specific policy area and the quality of the state bureaucracy and media. We also study how checks and balances interact with these features, and more broadly with all factors which affect the degree of electoral accountability of politicians. Finally, we use our model to shed light on when and why sub-optimal constitutions may arise and why constitutional designers may fail to update a constitution to reflect changes in the political environment.

[3] See Rogers (2003) for a critical review of this literature.

[4] Sah and Stiglitz (1986) study a similar tradeoff in their seminal contribution to team theory.

Related literature. Our parsimonious model captures the tradeoff between type-I and type-II errors and allows us to draw simple and yet powerful conclusions regarding the relative merits of checks and balances. By focusing on politicians' career concerns only, we are able to draw these conclusions independently of the specific and additional effects of divided or unified government (Fox and Van Weelden, 2010) and joint or individual accountability (Buisseret, 2016). Our model differs from these related models in several dimensions. First, we assume that competent politicians are policy-motivated rather than career motivated (Alesina, 1988). Second, we compare a system with Madisonian checks and balances to one without them, while Fox and Van Weelden (2010) focus on the merits of partisan differences between proposers and veto players and Buisseret (2016) studies the relative merit for the voter to hold proposers and veto players jointly or separately accountable for the policy outcome. Third, and most importantly, our focus is on the effect of factors that make it easier or harder for the voter to learn whether the policy outcome is good, even if a reform is passed and the status quo is therefore abandoned. This variable is absent in these related models.[5] Therefore, they are unsuitable to study how checks and balances interact with the effectiveness of electoral accountability, and whether the optimality of checks and balances depends on the policy area or on the quality of the country's bureaucracy and media—the exact questions this paper tries to address.

Our contribution is complementary to other approaches to the study of political checks and balances. Most of this literature focuses on spatial models of politics and studies how the number and location of veto players affect policy stability (how difficult it is to make new reforms) (Tsebelis, 2002). The fundamental result is that an increase in the number of veto players reduces the ability of the system to produce significant legislation (see Tsebelis, 1999, for an empirical investigation of this hypothesis). Riker (1992) shows that, in two-dimensional policy spaces, bicameral legislatures are an efficient way to generate delay in decision-making so to force the adoption of compromises when Condorcet cycles exist. Acemoglu, Robinson, and Torvik (2013) argue that checks and balances reduce politician rents, thus favoring political influence through bribes. Grunewald, Hansen, and Pönitzsch (2017) show that the concentration of political power favors politicians more aligned with the median voter, but induces politicians to pursue more risky policies to signal their competence. Another literature focuses on a different type of checks and

[5] In Fox and Van Weelden (2010), the voter acts before observing whether the policy is good or bad and only observes the politicians' behaviors. They show that their key result about partisanship survives if the voter observes the result of reforms, but do not study the comparative effects of more or less information. In Buisseret (2016), the voter learns whether an enacted reform is good with certainty if it is good or with arbitrarily large probability if bad. This probability plays no role in equilibrium and thus this model is unsuitable to study the effects of more or less information for the voter.

balances, pertaining to the separation of political authority over differing policy areas (Ashworth and Bueno de Mesquita, 2017; Besley and Coate, 2003; Hatfield and Padro i Miquel, 2006). Nakaguma (2014) studies an interesting historical example where the form of government reform that voters have been called to decide on affected both checks and balances and the conditions under which they can be optimal.

A parallel literature studies the role played by institutional checks and balances, such as judicial review (e.g. Dragu et al., 2014). Fox and Stephenson (2011), Fu and Li (2014), and Stephenson and Nzelibe (2010) study judicial review as a remedy to the proposer's tendency to take bold but unwarranted actions. As these models study institutional checks and balances, veto players are unaccountable to voters and accountability only affects the behavior of the proposer.[6] Therefore, these models are unsuitable to study the role played by political checks and balances when veto players have reputational concerns and are accountable to voters. Our focus is precisely on whether such politically-motivated veto players would improve the quality of the passed legislation. In this context, we show that accountability may be a double-edge sword when designing political checks and balances, as it may induce incompetent politicians to veto in order to look competent. In order to isolate this tradeoff, we build a model in which the key elements are the incentives for veto players to veto (or pass) legislation, and study how these incentives change when voters are more likely to be able to observe the outcome of new reforms—more accountability.[7]

The remainder of the paper is organized as follows. Section 2 presents our model; Section 3 analyzes equilibrium behavior with and without checks and balances. We compare the two systems in Section 4, where we also discuss how we interpret our results and we study the interaction between accountability and checks and balances. Section 5 provides new insights on positive constitutional design and on the possibility of various types of constitutional traps. Section 6 concludes.

[6] Stephenson and Nzelibe (2010) study the optimal design of accountability of proposers by voters and show that more accountability is desirable when the risk of politicians' posturing is high. In Fu and Li (2014), more accountability is always desirable.

[7] Obviously, in practice more accountability also has an effect on the proposer's inclination to make new proposals (see Gratton et al., 2021), but adding this further element to the model would obfuscate the results and make the tradeoff we wish to study less apparent.

2 The Model

We model a polity with two politicians and a single voter. The relevant politicians determine whether a reform, which can either increase or decrease the voter's welfare, is implemented. The voter observes the actions taken by the politicians and may also observe the impact of the reform on his welfare. Each politician maximizes her reputation for competency in the eyes of the voter.

Formally, there are two politicians: a proposer P and a veto player V. Each politician $i \in \{P, V\}$ is competent, $\theta_i = C$, with probability $\pi \in (0,1)$. Otherwise she is incompetent, $\theta_i = N$. Politician i's type θ_i is her private information.

The proposer chooses whether to design a reform, $a_P = 1$, or not, $a_P = 0$. A competent proposer always chooses to design a reform,[8] and her reform is good: if implemented, it adds $A > 0$ units of voter's welfare. An incompetent proposer strategically chooses whether to design a reform, but her reform is bad: if implemented, it destroys $D > 0$ units of voter's welfare.

Whether a reform that has been designed is implemented depends on whether the political system features political checks and balances or not.

No checks and balances. Under a political system with no checks and balances, the reform is implemented if and only if the proposer chooses to design it.

With checks and balances. Under a political system with checks and balances, if the proposer chooses to design a reform, then the veto player chooses whether to pass it, $a_V = 1$, or veto it, $a_V = 0$. If the veto player is competent, then she passes a good reform and vetoes a bad reform,[9] i.e., she observes θ_P and passes any designed reform if and only if $\theta_P = C$. If the veto player is incompetent, she is unable to tell good reforms from bad ones, i.e., she strategically chooses whether to pass or veto any reform without observing θ_P. The reform is implemented if and only if the proposer chooses to design it and the veto player passes it.

The voter observes whether the proposer has designed a reform and, if checks and balances are in place, whether the veto player has passed it or vetoed it. If a reform has been implemented, then with probability $\alpha \in (0,1)$ the reform produces visible fruits

[8] As we shall see, this behavior is optimal in equilibrium whether the competent proposer maximizes her public reputation for competency, as an incompetent proposer does, or if she maximizes the voter's welfare.

[9] As we shall see, this behavior is optimal in equilibrium whether the competent veto player maximizes her public reputation for competency, as an incompetent veto player does, or if she maximizes the voter's welfare.

before the end of the legislature and the voter learns whether the reform is good or bad, i.e., the voter observes the proposer's type, θ_P (effective accountability). With probability $1-\alpha$ the voter only observes the politicians' actions but not the quality of the reform (ineffective accountability).

The parameter α is meant to capture the combined effects of multiple factors that directly affect electoral accountability. Whether the quality of a reform is revealed by the end of a legislature clearly depends on the length of the legislature itself. Furthermore, a political system may be more or less transparent, so that voters may observe the true quality of a reform with different degrees of delay and noise. Finally, α is likely to be specific to the policy area of the reform. In all these interpretations a higher α implies a greater ability for the voter to keep the politicians accountable for their actions.

Let s_i, $i \in \{P, V\}$, be the voter's posterior belief that politician i is competent at the end of the legislature. Each politician's i payoff equals s_i.[10] The voter's payoff equals 0 if no reform is implemented, and $A\mathbb{1}[\theta_P = C] - D\mathbb{1}[\theta_P = N]$ otherwise.

In the following sections we characterize the unique perfect Bayesian equilibrium of this model with and without checks and balances. Let σ_P and σ_V in $[0,1]$ represent the strategies of the incompetent proposer and veto player, respectively, where σ_P is the probability the proposer designs a reform and σ_V is the probability the veto player passes it. With a slight abuse of notation, let $s_i(\sigma_P, \sigma_V, H)$ be the voter's posterior belief that politician i is competent ($\theta_i = C$) when the politicians play strategies σ_P and σ_V and upon observing H: the history of play and, if an implemented reform produced visible fruits, θ_P. An assessment $(\sigma_P, \sigma_V, s_P, s_V)$ is an equilibrium if $\sigma_P \in \arg\max_\sigma \mathbb{E}[s_i(\sigma, \sigma_V, H) \mid \theta_P = C]$, $\sigma_V \in \arg\max_\sigma \mathbb{E}[s_i(\sigma_P, \sigma, H) \mid \theta_V = C, a_P = 1]$, and $s_i(\sigma_P, \sigma_V, H)$ is derived from the politicians' strategies and Bayes' rule whenever possible. All proofs are in Appendix A.

3 Equilibrium

3.1 No checks and balances

Proposition 1 characterizes equilibrium behavior when there are no checks and balances.

Proposition 1. *If there are no checks and balances, there exists a unique equilibrium. In equilibrium, an incompetent proposer designs a reform with probability* 1*. Therefore, a good reform is implemented with probability π and a bad reform is implemented with probability $1-\pi$. The voters's expected welfare is given by $\pi A - (1-\pi) D$.*

[10] It is immaterial for the results in the paper whether politicians value their reputation for competency because of reelection incentives or other types of career concerns.

Intuitively, abstaining from designing a reform immediately reveals the proposer's incompetence. Therefore, an incompetent proposer strictly prefers to design a reform in the hope that the voter will not observe the fruits of the reform before the end of the legislature—hence incompetent politicians prefer ineffective accountability.

Proposition 1 highlights an important feature of the model we study in this paper, namely that electoral accountability has no direct effect on the amount of reforms that are designed by the proposer. That is, our model isolates the effects of electoral accountability through the strategic incentives it gives to the veto player, without any direct effect on the strategic incentives for the proposer. The reason for this result is that we assume that a competent proposer designs a reform with probability 1. Gratton et al. (2021) study a model in which even competent politicians can design good proposals with probability $p < 1$. In this case, even in the absence of a veto player, a higher α decreases the amount of reforms designed by incompetent politicians, therefore reducing the frequency of type-I errors. As shall be clear in the next section, this further comparative static would go in the direction of reinforcing our results.

3.2 With checks and balances

We now turn to the analysis of equilibrium behavior when checks and balances are in place. The focus is on the veto player's choice to pass or veto a reform that has been designed. Proposition 2 says that in equilibrium an incompetent proposer always designs a reform while an incompetent veto player passes a designed reform with interior probability that decreases with α and increases with π.

Proposition 2. *If there are checks and balances, there exists a unique equilibrium. In equilibrium, an incompetent proposer designs a reform with probability* 1*; an incompetent veto player passes a designed reform with probability* $\sigma_V^*(\alpha, \pi) < \pi$ *which decreases with* α *and increases with* π*. Therefore, a good reform is implemented with probability* $\pi(\pi + (1-\pi)\sigma_V^*(\alpha, \pi))$ *and a bad reform is implemented with probability* $(1-\pi)^2 \sigma_V^*(\alpha, \pi)$*. The voter's expected welfare is given by*

$$\pi(\pi + (1-\pi)\sigma_V^*(\alpha, \pi))A - (1-\pi)^2 \sigma_V^*(\alpha, \pi) D.$$

To see the intuition behind this result, recall first that an incompetent veto player cannot tell good from bad reforms. All she knows is that the reform has been designed. Therefore, in equilibrium she believes that the reform is good (the proposer is competent) with probability π.[11]

[11] Let $\mu_P(1)$ be the veto player's (and the voter's) interim belief that the proposer is competent given

An incompetent veto player then takes a calculated risk. On the one hand, passing the reform exposes her to the risk that the reform will reveal to be bad, revealing to the voter that the veto player is incompetent. On the other hand, if the veto player were to veto most reforms, then the voter would conclude that vetoes most often come from incompetent politicians. Therefore, vetoing would signal incompetence.

To understand the tradeoff faced by an incompetent veto player, we consider what the voter believes about the veto player if she passes or vetoes the reform. Let $\mu_V^*(a_V)$ be the voter's equilibrium[12] interim belief that the veto player is competent given that she took action a_V. Recall that σ_V is the incompetent veto player's probability of passing a designed reform. By Bayes's rule,

$$\mu_V^*(1) = \frac{\pi^2}{\pi^2 + (1-\pi)\sigma_V}$$
$$\mu_V^*(0) = \frac{\pi}{\pi + (1-\sigma_V)}.$$

If a reform is implemented, then the voter observes the fruits produced by the reform and therefore learns the proposer's type with probability α. If the reform is bad, then the voter learns that both the proposer and the veto player are incompetent. Indeed, a competent veto player would be able to tell that the reform is bad and veto it. Therefore, the voter's belief that the veto player is competent given that a bad reform has been passed equals 0. In contrast, if the reform is good, the voter can conclude with certainty only that the proposer is competent, but cannot tell with certainty whether the veto player is. Indeed, a good reform may be passed by both a competent or an incompetent veto player: conditional on the reform being good, a competent veto player passes it with probability 1; an incompetent veto player passes it with probability σ_V.

Let $s_V^*(G)$ be the voter's equilibrium[13] posterior belief that the veto player is competent given that the reform has produced fruits and it is good. By Bayes's rule,

$$s_V^*(G) = \frac{\pi^2}{\pi^2 + (1-\pi)\sigma_V\pi} = \frac{\pi}{\pi + (1-\pi)\sigma_V}.$$

If she were to pass the reform, an incompetent veto player expects to receive this payoff

that she designed a reform, but before the reform produces fruits. By Bayes's rule,

$$\mu_P(1) = \frac{\pi}{\pi + (1-\pi)\sigma_P}.$$

In equilibrium, $\sigma_P = 1$ and so $\mu_P(1) = \pi$.

[12] I.e., given that $\sigma_P = 1$ and so $\mu_P(1) = \pi$.

[13] I.e., given that $\sigma_P = 1$ and so $\mu_P(1) = \pi$.

with probability $\alpha\pi$. Therefore, the expected payoff of passing a reform for an incompetent veto player is given by

$$(1-\alpha)\,\mu_V^*(1)+\alpha\pi\,s_V^*(G)\,.$$

The expected payoff of vetoing a reform is instead given by $\mu_V^*(0)$. Thus, an incompetent veto player prefers to pass the reform whenever

$$(1-\alpha)\,\mu_V^*(1)+\alpha\pi\,s_V^*(G)\geq\mu_V^*(0)\,. \tag{1}$$

In equilibrium, an incompetent veto player vetoes with interior probability $\sigma_V^*(\alpha,\pi)$ that induces voter's beliefs such that she is indifferent between passing and vetoing a reform (i.e., (1) holds with equality). A greater α increases the risk that the reform will reveal to be bad, thus making a veto more palatable to the veto player. A greater π implies that most reforms are designed by competent proposers, thus reducing the risk of passing a reform and making a veto less palatable for the veto player.

4 Comparing the systems

An important implication of Proposition 2 is that political checks and balances reduce the amount of good reforms. In fact, without checks and balances, the probability that a good reform is implemented is simply given by the probability that the proposer is competent, π. With checks and balances, a fraction $(1-\pi)\,(1-\sigma_V^*(\alpha,\pi))$ of good reforms are vetoed, meaning that the probability that a good reform is implemented is $\pi\left[\pi+(1-\pi)\,\sigma_V^*(\alpha,\pi)\right]<\pi$.

Corollary 1 (**Type-II error.**). *The probability that a good reform is implemented is strictly lower when checks and balances are in place.*

Checks and balances are a double-edged sword. On the one hand, the veto player vetoes some bad reforms, thus reducing the loss in voter's welfare generated by type-I errors. On the other hand, when the veto player is incompetent herself, she vetoes some good reforms as well, thus reducing the gain in voter's welfare—a type-II error. Which of these two effects dominates depends on the net effect of good and bad reforms, as well as on the probability α that an implemented reform produces fruits in time, and the quality of the politicians, π.

Comparing the voter's expected welfare with (Proposition 2) and without (Proposition 1) checks and balances, we obtain that the voter prefers checks and balances if and

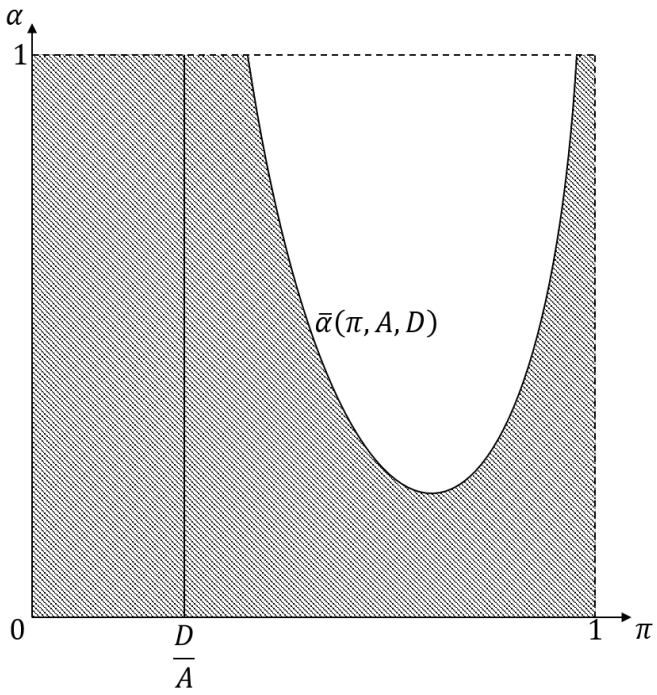

Figure 1: Checks and balances in the $\alpha \times \pi$ space. Shaded areas represent the combinations of α and π for which checks and balances are optimal.

only if

$$\pi\left(\pi+(1-\pi)\,\sigma_V^*\left(\alpha,\pi\right)\right)A-(1-\pi)^2\,\sigma_V^*\left(\alpha,\pi\right)D>\pi A-(1-\pi)\,D. \tag{2}$$

Solving this inequality delivers Proposition 3, the key result that allows to form precise predictions as to how the tradeoff between type-I and type-II errors is resolved.

Proposition 3 (Comparing the systems.). *If $\pi \leq D/A$, then checks and balances are optimal for the voter for any $\alpha \in (0,1)$. If $\pi > D/A$ but not too large, then there exist values of π, A, and D such that checks and balances are optimal for the voter if and only if α is below a threshold $\bar{\alpha}\left(\pi, A, D\right) < 1$. For $\pi < 1$ but sufficiently large, checks and balances are optimal for the voter for any $\alpha \in (0,1)$.*

We offer a graphical representation of Proposition 3 in Figure 1, where the shaded areas represent the parameter values for which checks and balances are optimal for the voter.

Let us describe the intuition for Proposition 3. When π is sufficiently small, then most reforms that are designed are bad. Therefore, type-I errors are the main concern for the voter and hence checks and balances are optimal. Similarly, if D is large and A is small, so that bad reforms yield great damages while good reforms are of little benefit, then

type-I errors are more likely to be the main concern for the voter. In fact, an immediate consequence of Proposition 3 is that checks and balances are always optimal for the voter whenever the damages D produced by a bad reform are at least as large as the benefits A produced by a good one.

When $D/A < \pi < 1$, the relative merits of checks and balances depend on the strategic incentives for the veto player. When α is low, the voter is unlikely to discover the quality of the reform in time. Hence passing a reform exposes an incompetent veto player to little risk that the reform will reveal to be bad—revealing to the voter that the veto player is incompetent. As a result, an incompetent veto player passes a reform with high probability, making type-II errors infrequent. On the contrary, when α is high, an incompetent veto player prefers to veto most reforms, making type-II errors very frequent. Thus checks and balances are optimal when π is sufficiently low. However, when π is so large that most designed reforms are good, even an incompetent veto player who expects most reforms to produce fruits by the end of the legislature does not veto too many reforms. More precisely, she passes a reform with probability close to π. Therefore, type-II errors are sufficiently infrequent even if α is close to 1, and checks and balances are optimal for any $\alpha \in (0,1)$.

To better quantify this intuition, consider a reform that has been blocked by the veto player. The voter will never know whether this reform is good—all he knows is that the reform was blocked. By Proposition 2, the voter rationally concludes that this reform is good with probability

$$\frac{\pi(1-\pi)\left(1-\sigma_V^*(\alpha,\pi)\right)}{\pi(1-\pi)\left(1-\sigma_V^*(\alpha,\pi)\right)+(1-\pi)\left(\pi+(1-\pi)\left(1-\sigma_V^*(\alpha,\pi)\right)\right)}.$$

Therefore, if the voter had the power to override the veto player, she would not do so if and only if

$$\frac{\pi}{1-\pi}\frac{(1-\pi)\left(1-\sigma^*(\alpha,\pi)\right)}{\pi+(1-\pi)\left(1-\sigma^*(\alpha,\pi)\right)}<\frac{D}{A}.$$

which is equivalent to (2). Therefore, the condition for the optimality of checks and balances is that the voter would never (ex-post) prefer to override the veto player.

It may be useful to consider an extension of our model in which the veto player partially internalizes the voter's welfare. For example, she may maximize a convex combination of s_V and the voter's equilibrium expected payoff:

$$\omega s_V+(1-\omega)a_V\left[\pi A-(1-\pi)D\right],\ \omega\in(0,1).$$

In this case it is easy to see that checks and balances become more appealing to the voter. In the limit as ω approaches 0, the veto player blocks a reform if and only if the voter would block it himself. As a result, checks and balances are always optimal. While this may be considered an argument in favor of a non-elective veto player, it comes with an important caveat: even when ω is 0, any conservative bias of the veto player has potentially catastrophic consequences. To see this, assume that the non-elective veto player has relatively more conservative views in the sense that it perceives the cost of enacting a bad reform[14] as equal to $D_V > D$ such that

$$\frac{D_V}{A} > \frac{\pi}{1-\pi}.$$

A non-elective incompetent veto player would then veto all reforms, generating a voter's welfare equal to $\pi^2 A$—checks and balances would be optimal if and only if $\pi < D/A$.[15]

4.1 Interpreting the main result

We can interpret our results by considering which factors are likely to affect the parameters α, π, and D/A. Several factors can induce a smaller α and therefore a lower degree of electoral accountability. Shorter legislatures, as well as a more inefficient bureaucracy, jointly determine a lower probability that a reform yields tangible fruits in time. Similarly, a less transparent bureaucracy, as well as a less active role of media reporting on the quality of reforms, lower the chances that voters learn the quality of reforms. Proposition 3 says that all these factors, by inducing less effective electoral accountability, increase the appeal of checks and balances. More broadly, our key result says that a more unstable political system, in which politicians focus on short term visibility while reforms affect long-term outcomes is one that would demand greater checks and balances.

The policy area affected by the reform is also likely to affect α. In some policy areas, reforms may be easier to evaluate for the voters, for example because they are less complex, they require less specialized knowledge, or because they produce tangible fruits as soon as they are implemented. In other policy areas, reforms may be highly complex and their implications for welfare only understood by specialized bureaucrats, so that voters may be able to evaluate their effects only in time, once systematic analyses of the long-term impact of these reforms are published. More broadly, our model suggests that different policy areas should be allocated to different legislative procedures, or to different levels of government with differing amounts of checks and balances and different term lengths.

[14] A similar statement could be described in terms of risk-aversion.

[15] Maskin and Tirole (2004) study a similar tradeoff between elective and non-elective proposers.

For example, most federal constitutions allocate different policy areas to either the federal or state governments, which may have differing legislative processes. Similarly, most federal constitutions prescribe different levels of state veto power on differing lists of policy areas.[16] Political scientists, as well as law scholars and economists, evaluate the allocation of policy areas to different levels of government mostly on the basis of the tradeoff between policy coordination and the subsidiarity principle. Our results suggest an additional dimension, namely the delay and precision with which voters can evaluate the effects of reforms. This calls for the development of empirical methods to measure such dimension.

Proposition 3 also says that checks and balances are less likely to be optimal when π, the average competence of politicians, is intermediate. The supply of competent politician may be exogenously given, perhaps by long-term cultural factors, in which case our key result suggests that checks and balances are more likely to be optimal when the political class is highly incompetent or highly competent, but less likely to be optimal in intermediate cases. However, we notice that more effective accountability (a greater α) benefits competent politicians and damages incompetent ones (see also Section 5 below). Therefore, in an environment in which the supply of competent politicians responds to the relative expected payoff of entering the political market (as in, e.g., Caselli and Morelli, 2004), the relative supply of competent politicians is positively correlated with accountability, so that not all combinations of α and π in the above figure are equally relevant in practice.

Whether checks and balances are optimal also depends on the relative cost of type-I and type-II errors, as captured by D/A. When D/A is small, type-I errors are not very costly, while type-II errors are relatively more costly. This is likely to be the case in periods of emergencies and crises. For example, when a country is hit by a large economic or health shock, the cost of inaction (A) is likely to be much larger than the cost of taking an incorrect action (D). Voters would then prefer a system with fewer checks and balances, demanding that the policymaker they elected have the power to direct policy swiftly and effectively.

[16] For example, in Germany all *Land* legislatures are unicameral, while the federal level is bicameral. Furthermore, the power of the house representing the *Länder* (the Bundesrat) to veto legislation passed in the federal house of representatives (the Bundestag) is limited to a prescribed list of policy areas in the Basic Law.

4.2 Transparency, accountability, and checks and balances

We have so far evaluated whether factors that enhance electoral accountability, such as a more transparent bureaucracy or a more active media, affect the relative appeal of checks and balances. We now turn to the analysis of how these factors interact with checks and balances, when they exist, in generating better (or worse) policies for the voter. Proposition 4 shows how this interaction hinges again on the tradeoff between type-I and type-II errors.

Proposition 4. *If there are checks and balances, then the voter's expected welfare increases with α if*

$$\frac{D}{A} \leq \frac{\pi}{1-\pi}$$

and decreases with α otherwise.

Intuitively, a greater α increases the veto player's probability of blocking reforms because σ_V^* is decreasing in α (see Proposition 2). Therefore, a greater α decreases the risk of type-I errors and increases the risk of a type-II errors. When D is large, so that bad reforms are more costly, or when $(1-\pi)$ is large, so that more designed reforms are bad, type-I errors are a greater concern, and therefore a greater α increases the voter's welfare. On the contrary, when A is large, so that good reforms bring large benefits, or when π is large, so that more designed reforms are good, type-II errors are a greater concern, and therefore a greater α decreases voters' welfare.

Proposition 4 offers us an insight into the role of transparency (and, more broadly, electoral accountability) in the presence of political checks and balances. A more transparent bureaucracy, or more effective mass media, are more likely to reveal to the voter whether an enacted policy is benefiting them. They therefore expose the veto player to a greater risk when she chooses to pass a reform she is unsure about. As a result, a more transparent bureaucracy and more effective media reduce the amount of reforms (both good and bad) that are passed by the political system.

Corollary 2. *If there are political checks and balances, then a greater α decreases the amount of reforms that are passed.*

5 Positive constitutional design

So far our analysis has focused on how political checks and balances affect voters' welfare. However, constitutions are often designed by politicians who expect to fill some

of the posts defined by the constitution. We now study how checks and balances affect politicians' welfare and discuss when politicians would prefer to design a constitution with or without checks and balances. In reality, power to veto may also entail other benefits, so we allow for (but do not require) the possibility that a politician who expects to fill a veto player position may also benefit from checks and balances through a mechanism different than reputational concerns.

Proposition 5 says that whether a politician prefers checks and balances to be in place depends on the amount of accountability α, whether the politician is competent, and whether the politician expects to be filling the position of proposer or veto player.

Proposition 5. *If α is sufficiently small, then all competent politicians prefer checks and balances and all incompetent politicians prefer no checks and balances. If α is sufficiently large, then incompetent proposers and competent veto players prefer checks and balances; competent proposers and incompetent veto players prefer no checks and balances. If the veto player gains any office benefit $b > 0$ from the existence of checks and balances, then there exist $\underline{\alpha}(b)$ such that for all $\alpha < \underline{\alpha}(b)$, all veto players prefer checks and balances.*

Intuitively, competent politicians appreciate systems that reveal more information regarding their type to the voter; incompetent politicians appreciate systems that reveal less information. From the perspective of a veto player, a system with no checks and balances offers no opportunity to the politician to prove her competence. As a consequence, competent politicians who may be veto players always prefer checks and balances to exist; incompetent politicians who may be veto players always prefer there not to be checks and balances. However, the expected reputational gains and losses for the veto player depend on the amount of accountability α. When α is very large, the introduction of checks and balances exposes incompetent veto players to greater risks, as passing any reform will reveal the veto player's incompetence with probability $\alpha\pi$. If instead α is close to 0, then the voter is unlikely to learn much about the veto player's competence in any case. Therefore, if checks and balances provide other benefits to the veto player, then she would prefer them to be in place, whether she is competent or not.

How checks and balances affect the preferences of a politician who expects to be a proposer crucially depends on the amount of accountability α. When α is sufficiently small, in the absence of checks and balances the voter is unlikely to learn the competence of the proposer. Introducing checks and balances then offers a chance to the proposer to reveal her competence, because the presence of a veto player who is competent with strictly positive probability works as a signaling tool revealing some information to the voter. As a result, competent proposers prefer checks and balances; incompetent proposers prefer no

checks and balances. Instead, when α is sufficiently large, in the absence of checks and balances, the voter is likely to learn the competence of the proposer, as reforms are likely to reveal their quality fast. Introducing checks and balances would then conceal some of this information to the voter, as some reforms are vetoed and therefore never reveal their quality. Therefore, checks and balances damage competent proposers and benefit incompetent proposers.

The results in Proposition 5 highlight the risks associated with politicians writing constitutions when expecting to be filling some of the roles in it. To identify these risks, it is useful to imagine that the constitution is designed by a convention of politicians each of whom expects to be filling a proposer position with probability $\beta \in [0,1]$ and to fill a veto player positions with probability $1-\beta$.[17] We can then characterize three cases in which the reputational concerns of politicians induce *constitutional traps* by which politicians design constitutions that are not optimal for the voters. In the first two cases, it is incompetent politicians who push for an inefficient constitution. Thus, these constitutional traps are more likely to arise if voters do not make inferences about a politician's type based on what she does at the constitutional convention. The last type of constitutional trap we characterize is instead likely to arise independently of whether voters correctly make such inferences.

First, for low levels of accountability, incompetent politicians would push for a constitution without checks and balances, independently of β. Such a system, if approved, is then likely to attract incompetent politicians, as the quality of politicians is likely to endogenously respond to the relative opportunity politics offer to competent and incompetent citizens (Caselli and Morelli, 2004). As a result, when α is low, an initial condition of a majority of incompetent constitutional designers may dynamically determine the selection of incompetent politicians in the future.

Second, for high levels of accountability, if there are many incompetent politicians who expect to be veto players with high probability (low β), they would push for a constitution without checks and balances even if checks and balances are actually optimal for the voters (because π is low; see Proposition 3).

Third, and perhaps most surprisingly, for high levels of accountability, even a con-

[17] For example, a politician may expect to be a President, or a member of Congress. Depending on what will be the salient or most important policy dimension at the policy-making stage, the proposal may come from Congress or from the President. Similarly, some proposals initiate in one chamber and some in the other in bicameral systems, or at the state or federal level in federal systems. Extending our model to allow a random selection of which player is the proposer and which the veto player is straightforward. The equilibrium play remains unchanged, but whether a politician would prefer checks and balances to exist would, in that case, depend also on her probability of being a proposer or a veto player, other than her competence and the amount of accountability α.

vention of mostly competent constitutional designers (high π) may design a suboptimal constitution. In fact, if they expect to be veto players with high probability (low β), they would push for a constitution with checks and balances. But for values of π large but less than some threshold such a constitution is not optimal for the voters: they would prefer no checks and balances.

Our model can also be employed to reckon whether competent and incompetent politicians may prefer greater transparency and more effective accountability, α. In the absence of checks and balances, competent proposers benefit from greater transparency, as it increases the likelihood of revealing their competence; conversely, incompetent proposers are damaged by greater transparency, as it increases the likelihood of revealing their incompetence. However, when checks and balances are in place, more transparency affects the proposer both directly and indirectly. Directly, it increases the chances that an implemented reform reveals the proposer's competence to the voter—this benefits competent proposers and damages incompetent ones. Indirectly, more transparency affects the payoff of the proposer through two distinct effects: a *strategic* effect and a *Bayesian* effect. By the strategic effect, more transparency reduces the probability that a reform is implemented. Since implementation (being passed) signals competence, this reduces the payoff of both competent and incompetent proposers. However, by the Bayesian effect, more transparency induces the voter to have a higher opinion of all reforms that have yet to produce visible fruits, whether they were passed or vetoed. In fact, greater transparency induces incompetent veto players to veto with greater probability. Therefore, passed reforms are more likely to have been passed by a competent veto player, who passes only good reforms. At the same time vetoed reforms are more likely to have been vetoed by an incompetent veto player, who also vetoes good reforms. Therefore, the Bayesian effect, if dominant, would imply that greater transparency benefits both competent and incompetent proposers. Proposition 6 says that the Bayesian effect indeed dominates when α is sufficiently large and π is sufficiently small.

Proposition 6. *If there are no checks and balances, a greater α increases the expected payoff of competent proposers and decreases the expected payoff of incompetent proposers. If there are checks and balances, a greater α always increases the expected payoff of competent proposers and also increases the payoff of incompetent proposers if α is sufficiently large and π is sufficiently small. Competent veto players benefit from a greater α while incompetent veto players are damaged by it.*

Thus, whether a convention of politicians would favor greater transparency would depend on the average competence of the politicians, their expectations to be proposers or veto players, and also the range of α they can choose from.

6 Discussion

We developed a model that allows us to make normative recommendations as to when political checks and balances increase public welfare. We concluded that political checks and balances are surely optimal for sufficiently low quality of politicians and for sufficiently low electoral accountability, whereas high electoral accountability makes political checks and balances too costly when the quality of politicians is intermediate, due to the excessive frequency of equilibrium vetoing in such cases. Moreover, we proved that, conditional on having chosen a constitution with political checks and balances, adding more accountability or transparency is welfare improving only if the cost of bad reforms (or the cost of too many reforms) is sufficiently high.

A natural question is whether constitutions tend to reflect this normative implications and when and why they may not. In practice, when designing a new constitution it may be hard to predict the quality of future leaders and bureaucracies. In this sense, a "Rawlsian" founding father may prefer to choose a system that maximizes welfare in the worst case scenario of low quality politicians operating in a polity with a non-transparent and slow bureaucracy.[18] In our model, this corresponds to the case in which both α and π are small. A founding father particularly preoccupied about future incompetent politicians will choose a system with many checks and balances, even if he knows that such system may delay (or even hinder) good reforms. This may, for example, capture the motivations of the German and Italian constitutional designers after the tumultuous experience of the 1920's and 30's.

Alternatively, the constitution may be designed by a "Buchananian" founding father, whose only concern is his personal payoff as he remains in power. In Section 5 we have shown how this realistic type of constitutional incentives can determine multiple types of suboptimal choices and constitutional traps.

In future research, our model could be extended in several directions. For example, politicians may strategically choose which policy areas to reform, the complexity of the reform, and when to do so during a legislature. If so, how much voters learn, α, may be an endogenous choice of proposers (see also Gratton et al., 2018), in turn affecting veto players' incentives. Furthermore, non-political veto players, such as constitutional courts, may also have career concerns, but their horizon is likely to be farther, so that this corresponds to the case where the veto player in our model behaves as if $\alpha \approx 1$.

In future research we could also study the relation between constitutional rules and

[18] Alternatively, he may maximize the welfare of those voters who are particularly damaged by bad reforms (D/A large).

political development. At lower levels of political development, when α and π are low, checks and balances increase the quality of policy-making, but, as we have argued in Section 5, the constitutional designer may choose a suboptimal regime. This type of constitutional trap could then hinder political development. On the other hand, for higher levels of political development (with higher π) checks and balances may become redundant and pose an excessive limit on the good reforms proposed by competent politicians. At such intermediate levels of political development, a more centralized system with one strong decision-maker would increase welfare and perhaps accelerate political development, but the constitutional designer may prefer to have many checks and balances. To reiterate, in systems with bad politicians the endogenous constitutional choice process could create too little incentives to introduce checks and balances, while for intermediate quality of politicians the constitutional design incentives push towards excessive checks and balances. Both types of constitutional traps reduce the voter's welfare. However, the second type may dynamically lead to political development: the excess of checks and balances benefits competent politicians and may therefore attract further competent politicians, increasing π until eventually checks and balances are indeed optimal and the quality of implemented reforms is very high.

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A Omitted proofs

Proof of Proposition 1. Let $\mu_P(a_P)$ be the voter's interim belief that the proposer is competent given that she took action a_P, but before the reform produces fruits. Also, let σ_P be the incompetent proposer's probability of designing a reform. By Bayes's rule,

$$\mu_P(1) = \frac{\pi}{\pi + (1-\pi)\sigma_P} > 0$$
$$\mu_P(0) = 0.$$

If an incompetent proposer designs a reform, then she receives a payoff of $\mu_P(1)$ if the reform does not produce fruits in time (which happens with probability $1-\alpha$) and a payoff of 0 if the reform produces fruits in time and the voter observes θ_P. If she does not design a reform, her payoff equals $\mu_P(0)$. Thus, an incompetent proposer prefers to propose a reform if

$$(1-\alpha)\mu_P(1) \geq \mu_P(0) = 0$$

which is trivially satisfied for all $\alpha \in (0,1)$. This immediately implies the proposition. □

Proof of Proposition 2. ***Preliminaries***. Let $\mu_V(a_V)$ be the voter's interim belief that the veto player is competent given that she took action a_V. Also, let σ_V be the incompetent veto player's probability of passing a designed reform. By Bayes's rule,

$$\mu_V(1) = \frac{\pi\mu_P(1)}{\pi\mu_P(1) + (1-\pi)\sigma_V}$$
$$\mu_V(0) = \frac{\pi(1-\mu_P(1))}{\pi(1-\mu_P(1)) + (1-\pi)(1-\sigma_V)}.$$

Let $s_V(G)$ be the voter's posterior belief that the veto player is competent given that the reform has produced fruits and it is good. By Bayes's rule,

$$s_V(G) = \frac{\pi\mu_P(1)}{\pi\mu_P(1) + (1-\pi)\sigma_V\mu_P(1)} = \frac{\pi}{\pi + (1-\pi)\sigma_V}.$$

Therefore, the expected payoff of passing a reform for an incompetent veto player is given by

$$(1-\alpha)\mu_V(1) + \alpha\mu_P(1)s_V(G).$$

The expected payoff of vetoing a reform is instead given by $\mu_V(0)$. Thus, an incompetent

veto player prefers to pass the reform whenever

$$(1-\alpha)\,\mu_V(1)+\alpha\mu_P(1)\,s_V(G)\geq\mu_V(0)\,. \tag{3}$$

Let

$$\sigma_V^*(\alpha,\pi)\equiv\frac{1}{2}\frac{\pi}{1-\pi}\left[\sqrt{(2-\pi)^2+((1-\pi)\,\pi\alpha)^2-2\,(1-\pi)\,(2-\pi^2)\,\alpha}-\pi\,(1-(1-\pi)\,\alpha)\right]$$

Existence. We construct the equilibrium as follows. First, given $\sigma_V=\sigma_V^*$, the proposer strictly prefers to make a proposal. This is trivially satisfied given Lemma 2 below.

Second, given $\sigma_P=1$, the indifference condition for the veto player is given by

$$\begin{gathered}(1-\alpha)\,\mu_V(1)+\alpha\mu_P(1)\,s_V(G)=\mu_V(0)\\(1-\alpha)\,\frac{\pi^2}{\pi^2+(1-\pi)\,\sigma_V}+\alpha\frac{\pi^2}{\pi+(1-\pi)\,\sigma_V}=\frac{\pi\,(1-\pi)}{\pi\,(1-\pi)+(1-\pi)\,(1-\sigma_V)}\end{gathered}$$

from which we obtain $\sigma_V=\sigma_V^*$.

Uniqueness. We begin by showing that whenever $\sigma_P>0$, then $\sigma_V<1$.

Lemma 1. *In any equilibrium, if $\sigma_P>0$, then $\sigma_V<1$.*

Proof. By contradiction, suppose $\sigma_V=1$ and $\sigma_P>0$. Then, upon observing a veto, the voter must conclude that the veto player is competent: $\mu_V(0)=1$. But the veto player risks nothing by vetoing, as there is no way to prove that the reform was instead a good one if it is not passed. Therefore, she would strictly prefer to veto, a contradiction. □

We now show that in equilibrium an incompetent proposer chooses to propose the reform with probability 1 whenever some reform is passed by the veto player with positive probability.

Lemma 2. *In any equilibrium, if $\sigma_V>0$, then $\sigma_P=1$.*

Proof. Let $\bar{s}_P(a_P,a_V)$ be the voter's posterior belief about the proposer after observing the profile of actions (a_P,a_V) but before observing the fruits of the reform. The expected payoff of proposing a reform for an incompetent proposer is given by

$$(1-\pi)\,\sigma_V\,(1-\alpha)\,\bar{s}_P(1,1)+(\pi+(1-\pi)\,(1-\sigma_V))\,\bar{s}_P(1,0)$$

That is, if the reform is eventually passed (only if the veto player is incompetent and

passes it) and it is not completed, she receives a payoff equal to

$$\bar{s}_P(1,1) = \frac{[\pi + \sigma_V(1-\pi)]\pi}{[\pi + \sigma_V(1-\pi)]\pi + \sigma_V\sigma_P(1-\pi)^2}.$$

If instead the reform is passed and the voter observes its fruits, the incompetent proposer receives a payoff of 0, as her incompetence is revealed. Otherwise, she receives a payoff equal to

$$\bar{s}_P(1,0) = \frac{(1-\sigma_V)(1-\pi)\pi}{(1-\sigma_V)(1-\pi)\pi + [\pi + (1-\sigma_V)(1-\pi)]\sigma_P(1-\pi)}.$$

It is easy to see that the expected payoff of proposing a reform for an incompetent proposer is strictly positive for any $\sigma_V \in (0,1)$. Instead, the expected payoff of not making a proposal is $\mu_P(0) = 0$. Therefore the proposer strictly prefers to design a reform. □

Notice that this last lemma also implies that in equilibrium $\mu_P(1) = \pi$.

We now show that in equilibrium an incompetent veto player passes a proposed reform with strictly positive probability.

Lemma 3. *In equilibrium, $\sigma_V > 0$.*

Proof. By contradiction, suppose $\sigma_V = 0$. Then an incompetent veto player strictly prefers to pass a reform if and only if (using $\mu_P(1) = \pi$)

$$(1-\alpha)\mu_V(1) + \alpha\pi s_V(G) \geq \mu_V(0),$$

where

$$\begin{aligned}
\mu_V(1) &= 1 \\
\mu_V(0) &= \frac{\pi(1-\pi)}{\pi(1-\pi) + (1-\pi)} = \frac{\pi}{1+\pi} \\
s_V(G) &= 1.
\end{aligned}$$

That is,

$$1 > \frac{\pi}{1+\pi},$$

which is satisfied for all π. A contradiction. □

Therefore, all equilibria must feature $\sigma_P = 1$ and $\sigma_V \in (0,1)$. They have to satisfy the indifference condition above and therefore $\sigma_V = \sigma_V^*$.

Finally, we show by contradiction that $\sigma_V^*(\alpha,\pi) < \pi$ for all $(\alpha,\pi) \in (0,1)^2$. Suppose $\sigma_V^*(\alpha,\pi) \geq \pi$. Then for any $\alpha > 0$, the left hand side of (3) is strictly less than the right hand side of (3). Therefore, an incompetent veto player strictly prefers to veto, contradicting $\sigma_V^*(\alpha,\pi) \geq \pi > 0$.

Comparative statics. Taking the first derivative of $\sigma_V^*(\alpha,\pi)$ with respect to α and π we obtain that σ_V^* is decreasing in α and increasing in π for all $\alpha \in (0,1)$ and $\pi \in (0,1)$. □

Proof of Proposition 3. By Propositions 1 and 2, voter's welfare with checks and balances is greater than without checks and balances if and only if

$$\pi\left(\pi + (1-\pi)\,\sigma_V^*(\alpha,\pi)\right)A - (1-\pi)^2\,\sigma_V^*(\alpha,\pi)\,D > \pi A - (1-\pi)\,D \tag{4}$$

$$\iff \left[\pi A - (1-\pi)\,D\right]\sigma_V^*(\alpha,\pi) > \pi A - D. \tag{5}$$

We first show that $\pi \leq D/A$ is a sufficient condition for (4) to hold, thus proving the first part of the proposition. Notice that whenever $\pi < D/(A+D) < D/A$, the condition in (4) yields

$$\sigma_V^*(\alpha,\pi) \leq \frac{D - \pi A}{(1-\pi)\,D - \pi A}$$

which is always satisfied. Also, if $D/(A+D) < \pi \leq D/A$, the condition yields

$$\sigma_V^*(\alpha,\pi) > \frac{\pi A - D}{\pi(A+D) - D} =: \Phi(\pi, A, D).$$

The right hand side is non-positive while $\sigma_V^*(\alpha,\pi) > 0$. Therefore, the condition is always satisfied for any $\pi \leq D/A$.

We now show that whenever $\pi > D/A$, whether (4) holds depends on α being sufficiently small. By Proposition 2, $\sigma_V^*(\alpha,\pi)$ decreases with α. Instead, the right hand side is constant in α. Therefore, (4) holds if and only if

$$\sigma_V^*(\alpha,\pi) > \sigma_V^*(\bar{\alpha}(\pi,A,D),\pi) \equiv \Phi(\pi,A,D)$$

$$\iff \alpha < \bar{\alpha}(\pi,A,D). \tag{6}$$

We now show that there indeed exist $(\pi,D,A) \in (0,1)\times\mathbb{R}_+^2$ such that $\bar{\alpha}(\pi,A,D) < 1$, so that (6) is binding. By Proposition 2, $\sigma_V^*(\alpha,\pi) < \pi$ for all $(\alpha,\pi) \in (0,1)^2$. Therefore,

$\bar{\alpha}(\pi, A, D) < 1$ whenever $\Phi(\pi, A, D) \geq \pi$, which yields

$$\pi \in \left[\frac{1}{2} - \frac{\sqrt{1 - \frac{4D}{A+D}}}{2}, \frac{1}{2} + \frac{\sqrt{1 - \frac{4D}{A+D}}}{2}\right].$$

Hence, a sufficient condition for there to exist (π, D, A) such that $\bar{\alpha}(\pi, A, D) < 1$ is $A \geq 3D$.

Finally, we now show that the limit of $\sigma_V^*(\alpha, \pi)$ as $\pi \to 1$ equals 1. To see this, notice that the limit of the indifference condition (3) yields (after using De L'Hôpital's rule)

$$(1 - \alpha) + \alpha - \frac{1 - 2}{\lim_{\pi \to 1} \sigma_V^*(\alpha, \pi) - 2} = 0$$

and therefore $\lim_{\pi \to 1} \sigma_V^*(\alpha, \pi) = 1$. Also, the limit of $\Phi(\pi, A, D)$ as $\pi \to 1$ equals $1 - D/A < 1 = \lim_{\pi \to 1} \sigma_V^*(\alpha, \pi)$. Therefore, when $1 > D/A$, since both Φ and σ_V^* are continuous at $\pi = 1$, (4) does not hold for sufficiently large $\pi < 1$ for any $\alpha \in (0, 1)$. If $1 \leq D/A$, then (4) also does not hold for sufficiently large $\pi < 1$, because $\pi \leq D/A$. □

Proof of Proposition 4. By Proposition 2, the voter's expected welfare is given by

$$\mathbb{E}V(\alpha, \pi) \equiv \pi(\pi + (1 - \pi)\sigma_V^*(\alpha, \pi))A - (1 - \pi)^2 \sigma_V^*(\alpha, \pi) D.$$

Using (see Proof of Proposition 2)

$$\sigma_V^*(\alpha, \pi) \equiv \frac{1}{2}\frac{\pi}{1 - \pi}\left[\sqrt{(2 - \pi)^2 + ((1 - \pi)\pi\alpha)^2 - 2(1 - \pi)(2 - \pi^2)\alpha} - \pi(1 - (1 - \pi)\alpha)\right]$$

and taking the derivative of $\mathbb{E}V(\alpha, \pi)$ with respect to α yields

$$\frac{\partial \mathbb{E}V(\alpha, \pi)}{\partial \alpha} \leq 0 \iff \frac{D}{A} \leq \frac{\pi}{1 - \pi}.$$

□

Proof of Proposition 5. Fix $\pi \in (0, 1)$. Consider first the expected payoff of the veto player. Without checks and balances, the voter's posterior belief that the veto player is competent is necessarily equal to the prior probability π. With checks and balances, in

equilibrium, a competent veto player's expected payoff is given by

$$\pi\left[\left(1-\alpha\right)\mu_V^*\left(1\right)+\alpha s_V^*\left(G\right)\right]+\left(1-\pi\right)\mu_V^*\left(0\right);$$

an incompetent's veto player's expected payoff equals

$$\left(1-\alpha\right)\mu_V^*\left(1\right)+\alpha\pi s_V^*\left(G\right)=\mu_V^*\left(0\right).$$

For any $\alpha>0$, $\sigma^*\left(\alpha,\pi\right)\in\left(\pi^2,\pi\right)$. Therefore, a competent veto player's expected payoff is strictly greater than π and an incompetent veto player's expected payoff is strictly smaller than π. Notice that these differences are vanishingly small as α approaches 0 and equal

$$\left(1-\pi\right)\frac{\pi}{\pi+\left(1-\pi^2\right)}$$

in the limit as $\alpha\to 1$. Therefore, if there are benefits $b>0$ from holding a veto player position, for sufficiently small α all veto players prefer checks and balances to exist.

We now turn to the expected payoff of the proposer. Consider a sequence of games with parameters $\{\alpha_k,\pi\}_{k=0}^{\infty}$. We divide our argument in two cases. First consider a sequence of games such that $\alpha_k\to 0$. In the absence of checks and balances, the expected payoff of both competent and incompetent proposers converges to π (from above if competent; from below if incompetent). When there are checks and balances, because the veto player is competent with strictly positive probability π, then the voter, upon observing whether the reform is passed by the veto player, learns useful information about the quality of the reform, and hence about θ_P. It follows that the expected payoff of a competent proposer is strictly larger than π, while the expected payoff of an incompetent proposer is strictly less than π. Because of the continuity of σ^* and the posterior belief s_P with respect to α, this proves that competent proposers strictly prefer checks and balances and incompetent proposers strictly prefer no checks and balances for any k such that α_k is sufficiently small.

Consider now a sequence of games such that $\alpha_k\to 1$. In the absence of checks and balances, the expected payoff of a competent proposer converges to 1; the expected payoff of an incompetent proposer converges to 0. When there are checks and balances, it is useful to notice that as $\alpha_k\to 1$, $\sigma^*\left(\alpha_k,\pi\right)\to\pi^2\in\left(0,1\right)$. Therefore, the reform is both passed and vetoed with strictly positive probability whether θ_P equals 0 or 1. As a consequence, the expected voter's posterior belief that the proposer is competent is interior whether θ_P equals 0 or 1, implying that the expected payoff of a competent proposer is bounded away from 1; the expected payoff of an incompetent proposer is bounded away

from 0. Because of the continuity of σ^* and the posterior belief s_P with respect to α, this proves that competent proposers strictly prefer no checks and balances and incompetent proposers strictly prefer checks and balances for any k such that α_k is sufficiently large (close to 1). □

Proof of Proposition 6. Without checks and balances, the expected payoff for a competent proposer is given by $(1-\alpha)\pi + \alpha$, which is increasing in α; the expected payoff for an incompetent proposer is given by $(1-\alpha)\pi$, which is decreasing in α. This proves the first part of the proposition. With checks and balances, the expected payoff for a competent proposer is given by

$$\pi\left[(1-\alpha)\bar{s}_P(1,1)+\alpha\right]+(1-\pi)\left[\sigma_V^*(\alpha,\pi)\left((1-\alpha)\bar{s}_P(1,1)+\alpha\right)+(1-\sigma_V^*(\alpha,\pi))\bar{s}_P(1,0)\right].$$

Taking the derivative with respect to α shows that the expression is increasing in α. The expected payoff for an incompetent proposer is given by

$$\pi\bar{s}_P(1,0)+(1-\pi)\left[\sigma_V^*(\alpha,\pi)(1-\alpha)\bar{s}_P(1,1)+(1-\sigma_V^*(\alpha,\pi))\bar{s}_P(1,0)\right].$$

The total derivative of the expected payoff with respect to α is given by

$$\underbrace{-(1-\pi)\sigma^*(\alpha,\pi)\bar{s}_P(1,1)\,d\alpha}_{\text{direct effect}}+\underbrace{(1-\pi)\left[(1-\alpha)\bar{s}_P(1,1)-\bar{s}_P(1,0)\right]\frac{\partial\sigma^*(\alpha,\pi)}{\partial\alpha}d\alpha}_{\text{strategic effect}}+$$
$$+\underbrace{\left[(1-\pi)\sigma^*(\alpha,\pi)(1-\alpha)\frac{\partial\bar{s}_P(1,1)}{\partial\alpha}+(\pi+(1-\pi)(1-\sigma^*(\alpha,\pi)))\frac{\partial\bar{s}_P(1,0)}{\partial\alpha}\right]\frac{\partial\sigma^*(\alpha,\pi)}{\partial\alpha}d\alpha}_{\text{Bayesian effect}}.$$

Notice that $\bar{s}_P(1,1)$ approaches 1 if $\pi\to 1$ and 0 if $\pi\to 0$; $\bar{s}_P(1,0)$ approaches 0 if $\pi\to 1$ and 1 if $\pi\to 0$. Also recall that σ^* is increasing in π and decreasing in α, with limits: π^2 as $\alpha\to 1$; and π as $\alpha\to 0$.

Consider a neighborhood of $\pi=0;\alpha=1$. The expression for the expected payoff of the incompetent proposer approaches

$$\underbrace{-1\cdot 0\cdot 1\cdot d\alpha}_{\text{direct effect}}+\underbrace{1\cdot[0\cdot 1-0]\frac{\partial\sigma^*(\alpha,\pi)}{\partial\alpha}d\alpha}_{\text{strategic effect}}+$$
$$+\underbrace{\left[1\cdot 0\cdot 0\frac{\partial\bar{s}_P(1,1)}{\partial\sigma_V}+(0+1\cdot 1)\frac{\partial\bar{s}_P(1,0)}{\partial\sigma_V}\right]\frac{\partial\sigma^*(\alpha,\pi)}{\partial\alpha}d\alpha}_{\text{Bayesian effect}}\approx\frac{\partial\bar{s}_P(1,0)}{\partial\sigma_V}\frac{\partial\sigma^*(\alpha,\pi)}{\partial\alpha}d\alpha$$

Since

$$\frac{\partial \bar{s}_P(1,0)}{\partial \sigma_V} \frac{\partial \sigma^*(\alpha,\pi)}{\partial \alpha}\bigg|_{\alpha=0,\pi=1} d\alpha = -\pi^2 \frac{\partial \sigma^*(\alpha,\pi)}{\partial \alpha}\bigg|_{\alpha=0,\pi=1} > 0$$

because $\frac{\partial \sigma^*(\alpha,\pi)}{\partial \alpha}$ is strictly negative at $\alpha = 0$, and since the whole expression is continuous for all π and α, then we conclude that there exists a neighborhood of $(\alpha, \pi) = (0, 0)$ for which a greater α increases the expected payoff of the incompetent proposer. This proves the second part of the proposition.

Finally, the expected payoff for an incompetent veto player is given by (recall that in equilibrium she is indifferent between vetoing and passing any reform) $\mu_V(0)$ evaluated at $\sigma_V = \sigma_V^*(\alpha, \pi)$, which is decreasing in α; the expected payoff for a competent veto player is given by

$$\pi\left[\alpha S_V(G) + (1-\alpha)\mu_V(0)\right] + (1-\pi)\mu_V(0)$$

evaluated at $\sigma_V = \sigma_V^*(\alpha, \pi)$, which is increasing in α.

□