Supplemental Appendix for Energy Versus Safety

Contents

1 Proofs of the Baseline Model

1.1 Checks and Balances

Proof of Proposition 1. I solve the game by backward induction. In the second period, there is no future election, so all politicians select their type-preferred policy.

Given second-period strategies, I propose the following retrospective voting rule: reelect politicians when $x^1 = 1$ and replace all politicians otherwise. Under the retrospective voting rule, in the first period:

(1) When both politicians are congruent, both maximize their policy payoff and reelection chances by selecting $x_i^1 = 1$.

(2) When the executive is congruent and the legislator is divergent: if the legislator selects $x_L^1 = 1$, the executive selects $x_E^1 = 1$ and both are reelected; if the legislator selects $x_L^1 = -1$, the executive selects $x_E^1 = 1$, gridlock occurs, and both are replaced. The legislator chooses $x_L^1 = 1$ when:

$$u_L(1, -1; \beta_L, \theta_L = D) = 2\beta_L - 1 \geq \beta_L = u_L(-1; \beta_L, \theta_L = D)$$
$$\beta_L \geq 1.$$

(3) When the executive is divergent and the legislator is congruent, the legislator always selects x_L^1. If the executive has high office benefit, he selects $x_E^1 = 1$, and both are reelected; if he has low office benefit, the executive selects $x_E^1 = -1$, gridlock occurs, and both are replaced. The executive chooses $x_L^1 = 1$ when $\beta_E \geq 1$ by a similar inequality as above.

(4) When both are divergent, if the legislator selects $x_L^1 = 1$, the executive does as well. If the legislator selects $x_L^1 = -1$, the executive does as well. The alternative in either case would be gridlock, which would provide a lower payoff in both cases regardless of the executive's office-holding benefit. The legislator chooses $x_L^1 = 1$ when:

$$u_L(1, -1; \beta_L, \theta_L = D) = 2\beta_L \geq \beta_L + 1 = u_L(-1; \beta_L, \theta_L = D)$$
$$\beta_L \geq 1.$$

Given these strategies, I now confirm that the voter's retrospective rule is sequentially rational. In doing so, I note that β_i falls below the cut point $\beta_i = 1$ with $\Pr(\beta_i < 1) = \frac{1}{\frac{3+\pi}{2}} = \frac{2}{3+\pi}$. When the voter observes $x^1 = 1$, the posterior probabilities of congruence are greater than γ and π.

$$\Pr(\theta_E = C|x^1 = 1) = \frac{\gamma\left[\pi+(1-\pi)\left(1-\frac{2}{3+\pi}\right)\right]}{\gamma\left[\pi+(1-\pi)\left(1-\frac{2}{3+\pi}\right)\right]+(1-\gamma)\left(1-\frac{2}{3+\pi}\right)} = \frac{\gamma(1+3\pi)}{1+\pi+2\gamma\pi} \geq \gamma$$

$$\Pr(\theta_L = C|x^1 = 1) = \frac{\pi\left[\gamma+(1-\gamma)\left(1-\frac{2}{3+\pi}\right)\right]}{\pi\left[\gamma+(1-\gamma)\left(1-\frac{2}{3+\pi}\right)\right]+(1-\pi)\left(1-\frac{2}{3+\pi}\right)} = \frac{\pi(1+2\gamma+\pi)}{1+\pi+2\gamma\pi} \geq \pi.$$

When the voter observes $x^1 = 0$:

$$\Pr(\theta_E = C|x^1 = 0) = \frac{\gamma(1-\pi)\left(\frac{2}{3+\pi}\right)}{\gamma(1-\pi)\left(\frac{2}{3+\pi}\right)+(1-\gamma)\pi\left(\frac{2}{3+\pi}\right)} = \frac{\gamma-\gamma\pi}{\gamma+\pi-2\gamma\pi} < \gamma \text{ iff } \pi > \frac{1}{2}$$

$$\Pr(\theta_L = C|x^1 = 0) = \frac{\pi(1-\gamma)\left(\frac{2}{3+\pi}\right)}{\pi(1-\gamma)\left(\frac{2}{3+\pi}\right)+(1-\pi)\gamma\left(\frac{2}{3+\pi}\right)} = \frac{\pi-\gamma\pi}{\gamma+\pi-2\gamma\pi} < \pi \text{ iff } \gamma > \frac{1}{2}$$

As π and γ are greater than $\frac{1}{2}$ by definition, the voter rationally replaces both politicians after observing gridlock. Finally, as $x^1 = -1$ only when both politicians are divergent, the voter rationally replaces them. Thus these strategies and beliefs constitute a Perfect Bayesian equilibrium. □

1.2 Unilateralism

Proof of Lemma 1. In the second period, if both politicians share a type, the legislator proposes her type-preferred policy and the executive proposes that same policy legislatively. Acting unilaterally in such a case would reduce his second-period payoff by $\frac{1}{2}$. When the politicians' types differ, the legislator proposes her type-preferred policy, but the executive always acts unilaterally, increasing his payoff by $\frac{1}{2}$ over the alternative, gridlock.

□

Proof of Proposition 2. To simplify the exposition, a utility function $u_E((x_E^1 = 1, \alpha^1 = 1), (x_E^2 = 1, \alpha^2 = 1); \beta_E, \theta_E = C)$ will be written as $u_E((1,1),(1,1); \beta_E, \theta_E = C)$.

Given Lemma 1.2, I propose the following retrospective voting rule: reelect all politicians after observing $x^1 = 1, \alpha^1 = 0$ and replace politicians when $x^1 \neq 1, \alpha^1 = 0$. Reelect the executive and replace the legislator when $x^1 = 1, \alpha^1 = 1$ and reelect the legislator and replace the executive when $x^1 = -1, \alpha^1 = 1$.

Given this retrospective rule, in the first period:

(1) When both politicians are congruent, both maximize their policy payoff and reelection chances by selecting $x_i^1 = 1$ and the executive sets $\alpha^1 = 0$ as acting unilaterally would both lower his policy-specific payoff and lead to the congruent legislator's replacement and a lower expected second-period policy payoff.

(2) When the executive is congruent and the legislator is divergent, if the legislator selects $x_L^1 = 1$, the executive would always select $x_E^1 = 1, \alpha = 0$. Although unilateral action in this case would lead to the divergent legislator's replacement, it is not optimal:

$$u_E((1,1),(1,\alpha^2);\beta_E,\theta_E = C) = 2\beta_E + 1 + \frac{\pi}{2} < 2\beta_E + \frac{3}{2} = u_E((1,0),(1,1);\beta_E,\theta_E = C).$$

If the legislator chooses $x_L^1 = -1$, the executive optimally selects $x_E^1 = 1, \alpha^1 = 1$. The legislator chooses $x_L^1 = 1$ when:

$$u_L(1,-1;\beta_L,\theta_L = D) = 2\beta_L - 2 \geq \beta_L - 1 = u_L(-1;\beta_L,\theta_L = D)$$
$$\beta_L \geq 1.$$

(3) When the executive is divergent and the legislator is congruent, the legislator always selects $x_L^1 = 1$ as $\bar{\beta} < \frac{3+\pi}{2}$. If the executive has high office benefit, he also selects $x_E^1 = 1, \alpha^1 = 0$. Otherwise, he selects $x_L^1 = -1, \alpha^1 = 1$. He chooses the voter's preferred policy when:

$$u_E((1,0),(-1,1);\beta_E,\theta_E = D) = 2\beta_E - \frac{1}{2} \geq \beta_E + \frac{1}{2} = u_E((-1,1);\beta_E,\theta_E = D)$$
$$\beta_E \geq 1.$$

(4) When both politicians are divergent, if the legislator selects $x_L^1 = -1$, the executive always selects $x_E^1 = -1, \alpha^1 = 0$ as $\bar{\beta} < \frac{3+\pi}{2}$. If the legislator selects $x_L^1 = 1$, the executive may choose between $x_E^1 = 1, \alpha^1 = 0$ if he has high office benefit or $x_E^1 = -1, \alpha^1 = 1$ if he has low office benefit. He chooses the voter's preferred policy when:

$$u_E((1,0),(-1,0);\beta_E,\theta_E = D) = 2\beta_E \geq \beta_E + \frac{1}{2} = u_E((-1,1);\beta_E,\theta_E = D)$$
$$\beta_E \geq \frac{1}{2}.$$

From the legislator's perspective, when $\beta_E < \frac{1}{2}$ and the legislator has high office benefit, she prefers to select $x_L^1 = 1$. Doing so forces the executive to act unilaterally. The legislator secures her preferred policy but per the voting rule, retains office. If she has low office benefit, then she selects $x_L^1 = -1$. Conditional on $\beta_E < \frac{1}{2}$, the legislator chooses $x_L^1 = 1$ when:

$$u_L(1,-1;\beta_L,\theta_L = D) = 2\beta_L + 2 - 2\gamma \geq \beta_L + 1 = u_L(-1;\beta_L,\theta_L = D)$$
$$\beta_L \geq 2\gamma - 1.$$

If $\beta_E \geq \frac{1}{2}$ and the legislator has high office benefit, she chooses $x_L^1 = 1$, and $x_L^1 = -1$ otherwise. She chooses the voter's preferred policy when:

$$\begin{gathered} u_L(1, -1; \beta_L, \theta_L = D) = 2\beta_L \geq \beta_L + 1 = u_L(-1; \beta_L, \theta_L = D) \\ \beta_L \geq 1. \end{gathered}$$

Given these strategies, I now confirm that the voter's retrospective rule is sequentially rational. In doing so, I note that β_i falls below the cut point $\beta_i = \frac{1}{2}$ with $\Pr(\beta_i < \frac{1}{2}) = \frac{\frac{1}{2}}{\frac{3+\pi}{2}} = \frac{1}{3+\pi}$. When the voter observes $x^1 = 1, \alpha^1 = 0$, the posterior probabilities of congruence are greater than γ and π.

$$\begin{aligned} \Pr(\theta_E = C | x^1 = 1, \alpha^1 = 0) &= \frac{\gamma\left[\pi+(1-\pi)\left(1-\frac{2}{3+\pi}\right)\right]}{\gamma\left[\pi+(1-\pi)\left(1-\frac{2}{3+\pi}\right)\right]+(1-\gamma)\left[\pi\left(1-\frac{2}{3+\pi}\right)+(1-\pi)\left(1-\frac{2}{3+\pi}\right)\left(1-\frac{1}{3+\pi}\right)\right]} \geq \gamma \\ \Pr(\theta_L = C | x^1 = 1, \alpha^1 = 0) &= \frac{\pi\left[\gamma+(1-\gamma)\left(1-\frac{2}{3+\pi}\right)\right]}{\pi\left[\gamma+(1-\gamma)\left(1-\frac{2}{3+\gamma}\right)\right]+(1-\pi)\left[\gamma\left(1-\frac{2}{3+\pi}\right)+(1-\gamma)\left(1-\frac{2}{3+\pi}\right)\left(1-\frac{1}{3+\pi}\right)\right]} \geq \pi. \end{aligned}$$

When $x^1 = -1, \alpha^1 = 0$, it must be the case that both politicians are divergent and should be dismissed.

When $x^1 = 1, \alpha^1 = 1$, it must be the case that the executive is congruent and the legislator is divergent. And finally, when $x^1 = -1, \alpha^1 = 1$, the executive must be divergent, and the legislator is more likely to be congruent than a new legislator:

$$\Pr(\theta_L = C | x^1 = -1, \alpha^1 = 1) = \frac{\pi(1-\gamma)\left(\frac{2}{3+\pi}\right)}{\pi(1-\gamma)\left(\frac{2}{3+\pi}\right)+(1-\pi)(1-\gamma)\left(\frac{1}{3+\pi}\right)\left(1-\frac{4\gamma-2}{3+\pi}\right)} > \pi$$

Finally, $x^1 = 0$ is never observed in equilibrium, and the voter's beliefs, were he to observe gridlock, are not well defined. Suppose, though, that the voter were to believe that the executive is congruent and legislature is divergent when observing gridlock. Even with this alternative belief, two congruent politicians prefer $x^1 = 1, \alpha^1 = 0$. If the executive is congruent, the legislator is divergent, and the legislator proposes $x_L^1 = -1$, gridlock is equilibrium dominated by $x_E^1 = 1, \alpha^1 = 1$:

$$u_E((1,1),(1,\alpha^2);\beta_E) = 2\beta_E + 1 + \tfrac{\pi}{2} > 2\beta_E + \tfrac{1}{2} + \tfrac{\pi}{2} = u_E((1,0),(1,\alpha^2);\beta_E)$$

Thus, after observing gridlock, the voter would conclude the executive was divergent with probability 1, ruling out this belief by the Intuitive Criterion. The same is also true of a voting rule where the voter believes both politicians are congruent after observing gridlock. A similar analysis cannot be conducted for the legislator as the legislator is never directly responsible for choosing gridlock. Ultimately, the Intuitive Criterion (or similar restrictions) are not directly applicable to this game, which is not a standard two-player sender-receiver model. Given the preceding discussion, I impose the restriction that were the voter to observe gridlock, he would also believe the legislator is divergent with probability 1, however, in this case, such a belief does not materially affect the voter's payoff as the executive in period 2 chooses the policy outcome. □

1.3 Welfare Comparison

Following Proposition 1, the voter's welfare under Checks and Balances is given by:

$$\begin{aligned} W_C \equiv\ & \gamma\pi(2) + \gamma(1-\pi)\left[\tfrac{2}{3+\pi}(\gamma+\pi-1) + (1-\tfrac{2}{3+\pi})\right] + \\ & (1-\gamma)\pi\left[\tfrac{2}{3+\pi}(\gamma+\pi-1) + (1-\tfrac{2}{3+\pi})\right] + (1-\gamma)(1-\pi)\left[\tfrac{2}{3+\pi}(\gamma+\pi-2)\right]. \end{aligned} \tag{A2}$$

Following Lemma 1 and Proposition 2, the voter's welfare under Unilateralism is given by:

$$\begin{aligned} & W_U \equiv \gamma\pi(2) + \gamma(1-\pi)(2) + (1-\gamma)\pi\left[\tfrac{2}{3+\pi}(2\gamma-2)\right] + \\ & (1-\gamma)(1-\pi)\left[\left(1-\left((1-\tfrac{2}{3+\pi})\left(1-\tfrac{1}{3+\pi}\right)\right)\right)(2\gamma-2)\right]. \end{aligned} \tag{A3}$$

Setting $W_C = W_U$ and solving for γ yields:

$$\tilde{\gamma}(\pi) \equiv \frac{31-\pi^2+2\pi^3-\sqrt{849+\pi(-824+\pi(-246+\pi(356+\pi(105+4\pi(3+\pi)))))}}{4(7-\pi-2\pi^2)}, \tag{A4}$$

which is shown in Figure 1 of the main text.

2 Extensions and Robustness

2.1 Transparency of Policy Selections

In this section, I relax the assumption that the voter only observes the ultimate policy outcome (x^t). Instead, in both regimes, after the politicians make their policy selections, the voter observes both x_L^1 and x_E^1 with probability τ.

2.1.1 Checks and Balances

When the voter does not observe the individual policy proposals, he follows the voting rule as described in the main text. When he does observe the individual actions, he adjusts his voting rule to retain politicians who choose $x_i^1 = 1$ and replace politicians who choose $x_i^1 = -1$.

Notice that action revelation provides no additional information if policy change occurs. For example, if the first period outcome is $x^1 = 1$, then the only possible way that could have occurred is for both politicians to have selected $x_i^1 = 1$, which the voter correctly infers in the baseline model without any action revelation. Thus, action revelation is only relevant under gridlock.

When both politicians are congruent, they always select the voter's preferred policy. When one agent is divergent and one is congruent, τ does not alter the divergent politician's strategy. The congruent politician always chooses $x_i^1 = 1$. If the divergent agent were to select $x_i^1 = -1$, they would be dismissed with or without action revelation and their payoff would be β_i (and so the relevant cut point is still $\beta_i = 1$). However, when actions are revealed, the voter can retain the congruent politician, increasing his welfare.

Finally, when both politicians are divergent, an important change occurs. If the legislature chooses $x_L^1 = -1$, the executive can earn a higher payoff by choosing $x_E^1 = 1$ and causing gridlock when:

$$u_E(1, -1; \beta_E, \tau, \theta_E = D) = \beta_E + \tau(\beta_E + 1 - \pi) \geq \beta_E + 1 = u_E(-1; \beta_E, \tau, \theta_E = D)$$
$$\beta_E \geq \frac{1-\tau+\tau\pi}{\tau}$$

Given this inequality, the legislator optimally selects $x_L^1 = -1$ only when the executive would also choose $x_E^1 = -1$, that is when $\beta_E < \frac{1-\tau+\tau\pi}{\tau}$ and $\beta_L < 1$. Although gridlock is never observed when both politicians are divergent, this new threshold nonetheless effects the voter's beliefs following the observation of $x^1 = 1$. We can determine the probability with which β_E

fails to achieve the cutoff by:

$$\Pr\left(\beta_E < \frac{1-\tau+\tau\pi}{\tau}\right) = \frac{\frac{1-\tau+\tau\pi}{\tau}}{\frac{3+\pi}{2}} = \frac{2(1-\tau+\tau\pi)}{\tau(3+\pi)} \equiv \eta$$

A small complication results from the fact that τ appears in the denominator of η, such that for small τ, $\eta > 1$ and is not an admissible probability and the strategies and cut points revert back to those in the baseline model. However, I focus on the case when $\tau > \frac{1}{2}$, which allows for this new cut point, fixes the strategies for all values of π, and is a harder test case for the model.

Before stating the equilibrium fully, I check the sequential rationality of the retrospective voting rule. When $\tau > 1/2$:

$$\Pr(\theta_E = C|x^1 = 1) = \frac{\gamma\left(\pi+(1-\pi)\left(1-\frac{2}{3+\pi}\right)\right)}{\gamma\left(\pi+(1-\pi)\left(1-\frac{2}{3+\pi}\right)\right)+(1-\gamma)\left[\pi\left(1-\frac{2}{3+\pi}\right)+(1-\pi)\left((1-\eta)+\eta\left(1-\frac{2}{3+\pi}\right)\right)\right]} > \gamma.$$

$\Pr(\theta_L = C|x^1 = 1)$ is constructed similarly and is also greater than π. Enacting $x^1 = -1$ reveals that both politicians are divergent. If, on the other hand, the voter does observe the individual proposals, as only divergent politicians choose $x_i^1 = -1$, she always dismisses both. When politicians choose $x_i^1 = 1$, $\tau > 1/2$, and the voter observes individual actions:

$$\Pr(\theta_E = C|x_E^1 = 1) = \frac{\gamma}{\gamma+(1-\gamma)\left[\pi\left(1-\frac{2}{3+\pi}\right)+(1-\pi)\left((1-\eta)+\eta\left(1-\frac{2}{3+\pi}\right)\right)\right]} > \gamma$$

and the logic for $\Pr(\theta_L = C|x_L^1 = 1)$ is similar. Finally, gridlock is only observed when actions are not revealed, and gridlock occurs under the same conditions as in the baseline model, meaning the voter dismisses both politicians.

Proposition B1. *(Checks and Balances Equilibrium with Transparency) There exists a Perfect Bayesian equilibrium when $\tau > 1/2$ in which the voter reelects both politicians when $x^1 = 1$ and dismisses them otherwise in the absence of transparency; otherwise, she retains politicians who choose $x_i^1 = 1$ and dismisses them otherwise. Both politicians choose their type preferred policy in the second period and in the first period:*

(1) both politicians choose the voter's preferred policy if: both are congruent; or one is divergent and has high office benefit; or both are divergent and transparency is high; or both are divergent when transparency is low and the legislator has high office benefit;

(2) both politicians select the voter's least-preferred policy if both are divergent, transparency is low, and the legislator has low office benefit; and

(3) *otherwise one politician is congruent and chooses the voter's preferred policy while the other is divergent and chooses the voter's least-preferred policy.*

I calculate voter welfare for the case where $\tau > 1/2$:

$$
\begin{aligned}
W_C^\tau \equiv & \gamma\pi(2) + \gamma(1-\pi)\left[\left(1-\tfrac{2}{3+\pi}\right) + \left(\tfrac{2}{3+\pi}\right)((1-\tau)(\gamma+\pi-1)+\tau\pi)\right] \\
& (1-\gamma)\pi\left[\left(1-\tfrac{2}{3+\pi}\right) + \left(\tfrac{2}{3+\pi}\right)((1-\tau)(\gamma+\pi-1)+\tau\gamma)\right] + \\
& (1-\gamma)(1-\pi)\left[\eta\left(\tfrac{2}{3+\pi}\right)(\gamma+\pi-2)\right]
\end{aligned}
\tag{B1}
$$

2.1.2 Unilateralism

Transparency does not alter strategies or payoffs under Unilateralism. As such, I carry forward the voter's welfare equation from the baseline model.

2.1.3 Welfare Comparison under Transparency

To understand how transparency effects the welfare comparison, I investigate this relationship graphically at varying levels of τ. As in the baseline model, I set $W_C^\tau = W_U$ and solve for γ to construct $\tilde{\gamma}^\tau(\pi, \tau)$. I plot this function as the solid curve in Figure B1. Area above this curve (green) shows (π, γ) pairs at which Unilateralism provides higher welfare. Area below this curve (purple) shows (π, γ) pairs at which Checks and Balances provides higher welfare. The dashed line is the 45-degree line and the dotted curve is $\tilde{\gamma}(\pi)$ from the baseline model.

Figure B1 shows that, on the left, when $\tau = 1/2$, the main result is attenuated but continues to hold: when γ and π are similar, Unilateralism provides higher welfare. However, When τ is large, on the right, the results reverse. The voter's preferences over separation of powers depends in part on the transparency of unilateral action relative to gridlock.

2.2 Costlier Second-Period Unilateral Action

Suppose that in the first period, the cost of unilateral action is $\kappa = \frac{1}{2}$ as in the baseline model, and in the second period, the cost of unilateral action is $\kappa = \frac{3}{2}$. Now, in the second period, the executive no longer finds it profitable to unilaterally enact his preferred policy. Therefore, if both politicians share a type, they enact that type's preferred policy. If their types differ, gridlock results. Suppose the voter announces the same retrospective voting rule as in the baseline model.

If the executive is congruent and the legislator is divergent, the executive now always enacts the voter's preferred policy unilaterally as:

$$
u_E((1,1),(1,0);\beta_E;\theta_E = C) = 2\beta_E + \frac{1}{2} + \pi > 2\beta_E + 1 = u_E((1,0),(1,0);\beta_E,\theta_E = C).
$$

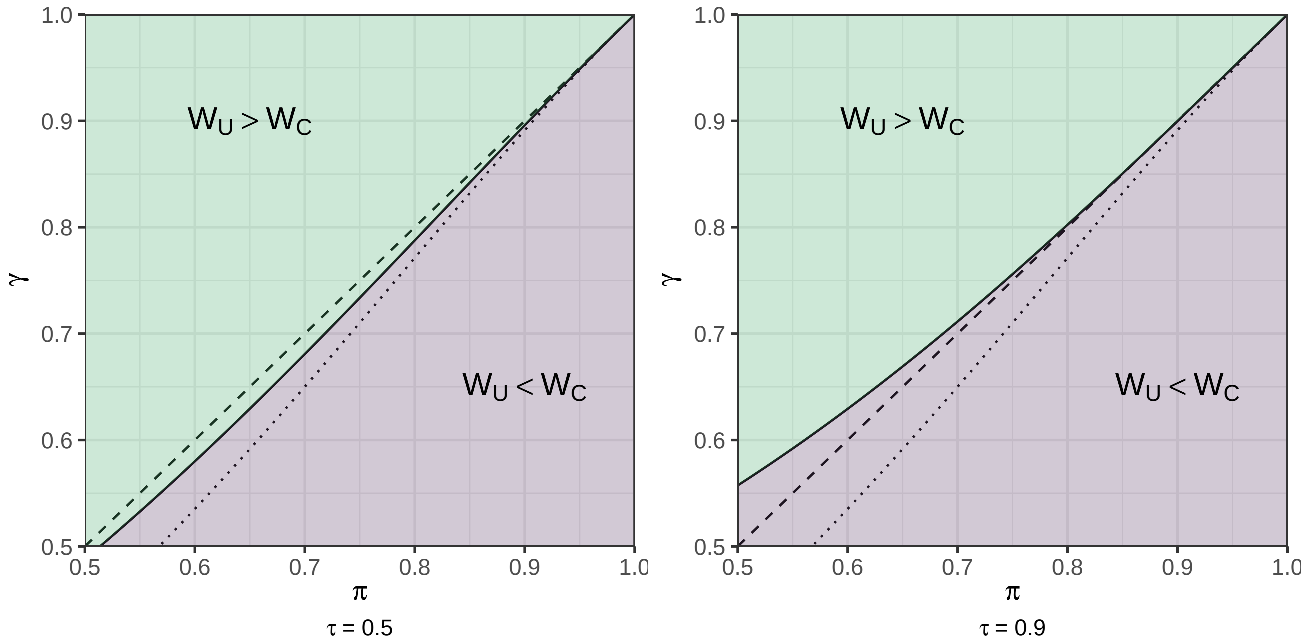

Figure B1: A comparison of voter welfare between Checks and Balances and Unilateralism with transparency. The solid curve tracks $\tilde{\gamma}^{\tau}(\pi, \tau)$, the threshold at which the voter is indifferent between either regime type. The area above (below) the curve indicates when the voter would prefer the Unilateralism (Checks and Balances). The dashed line is the 45-degree line, and the dotted curve is $\tilde{\gamma}(\pi)$ from the baseline model.

If the executive is divergent and the legislator is congruent, the executive is more likely to unilaterally implement the voter's least favorite policy as he cannot act unilaterally in the second period and would otherwise be blocked by the congruent legislator. The new cut point at which the divergent executive enacts the voter's preferred policy is:

$$u_E((1,0),(-1,0);\beta_E;\theta_E = D) = 2\beta_E - 1 \geq \beta_E + \frac{1}{2} = u_E((-1,1);\beta_E,\theta_E = D)$$
$$\beta_E \geq \frac{3}{2}.$$

When both politicians are divergent, the legislator selects $x_L^1 = -1$ if $\beta_L < 1$ and $\beta_E \geq \frac{1}{2}$, at which point, the executive also selects $x_E^1 = -1, \alpha^1 = 0$. Otherwise, the legislator selects $x_L^1 = 1$. If $\beta_E < \frac{1}{2}$, the executive selects $x_E^1 = -1, \alpha^1 = 1$ and $x_E^1 = 1, \alpha^1 = 0$ otherwise.

To check that the retrospective voting rule is sequentially rational, when $x^1 = 1$ and $\alpha^1 = 0$:

$$\Pr(\theta_E = C | x^1 = 1, \alpha^1 = 0) = \frac{\gamma\pi}{\gamma\pi + (1-\gamma)\left(\pi\left(1 - \frac{3}{\pi+3}\right) + (1-\pi)\left(1 - \frac{2}{\pi+3}\right)\left(1 - \frac{1}{\pi+3}\right)\right)} > \gamma$$

$$\Pr(\theta_L = C | x^1 = 1, \alpha^1 = 0) = \frac{\pi\left((1-\gamma)\left(1 - \frac{3}{\pi+3}\right) + \gamma\right)}{(1-\gamma)(1-\pi)\left(1 - \frac{2}{\pi+3}\right)\left(1 - \frac{1}{\pi+3}\right) + \pi\left((1-\gamma)\left(1 - \frac{3}{\pi+3}\right) + \gamma\right)} > \pi.$$

If $x^1 = -1, \alpha^1 = 0$, then certainly both politicians are divergent. If $x^1 = 1, \alpha^1 = 1$, then the executive is surely congruent and the legislature is divergent. If $x^1 = -1, \alpha^1 = 1$, then the executive is surely divergent and the legislature is more likely congruent given:

$$\Pr(\theta_L = C | x^1 = -1, \alpha^1 = 1) = \frac{\pi(1-\gamma)\frac{3}{3+\pi}}{\pi(1-\gamma)\frac{3}{3+\pi} + (1-\pi)(1-\gamma)\frac{1}{3+\pi}} > \pi$$

Finally, consistent with the restriction criteria established previously, were the voter to observe gridlock, he would believe both politicians to be divergent with probability 1.

Proposition B2. *There exists an equilibrium in which the voter retains both politicians when observing his favorite policy legislatively and replaces both politicians when observing any other legislative outcome. When the voter observes his favorite policy unilaterally, he reelects the executive and replaces the legislator and replaces the executive and reelects the legislator given any other unilateral outcome. Both politicians choose their type-preferred policy in the second period and the executive never uses unilateral action. In the first period:*

(1) both politicians choose the voter's preferred policy legislatively if: both are congruent; or the executive is divergent and has high office benefit while the legislator is congruent; or both are divergent and have sufficiently high office benefit;

(2) both politicians select the voter's least-preferred policy legislatively if both are divergent and the legislator has low office benefit while the executive has moderate to high office benefit;

(3) the executive unilaterally enacts the voter's preferred policy when the legislator is divergent; and

(4) otherwise the executive unilaterally enacts the voter's least-preferred policy.

Voter welfare under Unilateralism is given by:

$$\begin{aligned} W_U^{\kappa} \equiv &\gamma\pi(2) + \gamma(1-\pi)(1+\pi) + (1-\gamma)\pi[(\tfrac{3}{3+\pi})(-1+\gamma) + (1-\tfrac{3}{3+\pi})] + \\ &(1-\gamma)(1-\pi)[(\tfrac{1}{3+\pi})(-1+(1-\gamma)(-1))] + (1-\tfrac{1}{3+\pi})(\tfrac{2}{3+\pi})(-2+\gamma+\pi)] \end{aligned} \tag{B2}$$

Since this change does not affect the welfare equation in the Checks and Balances regime, we can construct a welfare plot by setting $W_C = W_U^{\bar{\kappa}}$ and solving for γ to create the function $\tilde{\gamma}^{\kappa}(\pi)$, plotted as a solid curve in Figure B2. Area above this curve (green) shows (π, γ) pairs at which Unilateralism provides higher welfare. Area below this curve (purple) shows (π, γ) pairs at which Checks and Balances provides higher welfare. The dashed line is the 45-degree line and the dotted curve is $\tilde{\gamma}(\pi)$ from the baseline model.

Interpreting the figure, the main results from the baseline model hold. However, voter welfare is slightly attenuated as compared to the baseline model when the prior probabilities are low, but it is higher when the prior probabilities are high.

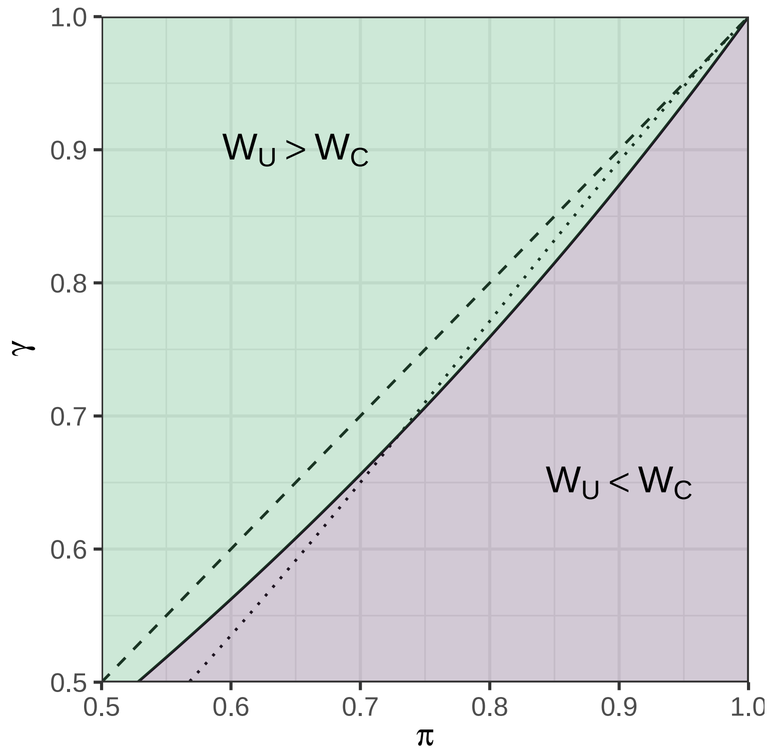

Figure B2: A comparison of voter welfare between Checks and Balances and Unilateralism with prohibitively costly second-period unilateral action. The solid curve tracks $\tilde{\gamma}^{\kappa}(\pi)$, the threshold at which the voter is indifferent between either separation of powers setting. The area above (below) the curve indicates when the voter would prefer the Unilateralism (Checks and Balances). The dashed line is the 45-degree line, and the dotted curve is $\tilde{\gamma}(\pi)$ from the baseline model.

2.3 Asymmetric Costs of Policy Outcomes

In this section, I relax the assumption that the voter's payoffs from policy, $x^t = 1$ and $x^t = -1$, are symmetric around the default policy at $x^t = 0$. Suppose the politicians' utility functions are equivalent to the baseline model while the voter's per-period utility function is given by:

$$u_V(x^t, c) = \begin{cases} 1 & \text{if } x^t = 1 \\ -c & \text{if } x^t = -1 \end{cases}$$

where $c > -1$. As the politicians utility functions, and thus strategies, do not change, we need only examine the voter's welfare equations to determine how this shapes preferences over separation of powers. Generalizing Equation A3, we can calculate the voter's welfare under Checks and Balances as:

$$\begin{aligned}W_C^{\dagger} \equiv\ & \gamma\pi \cdot 2 + \gamma(1-\pi)\left[\left(\tfrac{2}{3+\pi}\right)(\gamma\pi + (1-\gamma)(1-\pi)(-c)) + \left(1 - \left(\tfrac{2}{3+\pi}\right)\right) \cdot 1\right] + \\ & (1-\gamma)\pi\left[\left(\tfrac{2}{3+\pi}\right)(\gamma\pi + (1-\gamma)(1-\pi)(-c)) + \left(1 - \left(\tfrac{2}{3+\pi}\right)\right) \cdot 1\right] + \\ & (1-\gamma)(1-\pi)\left[\left(\tfrac{2}{3+\pi}\right)(-c + \gamma\pi + (1-\gamma)(1-\pi)(-c)) + \left(1 - \left(\tfrac{2}{3+\pi}\right)\right) \cdot (1-c)\right].\end{aligned} \tag{B3}$$

And similarly under Unilateralism:

$$\begin{aligned}W_U^{\dagger} \equiv\ & \gamma\pi 2 + \gamma(1-\pi)2 + \\ & (1-\gamma)\pi[\left(\tfrac{2}{3+\pi}\right)(-c + \gamma + (1-\gamma)(-c)) + \left(1 - \tfrac{2}{3+\pi}\right)(1-c)] + \\ & (1-\gamma)(1-\pi)\Bigg[\left(1 - \tfrac{2}{3+\pi}\right)\left(1 - \tfrac{1}{3+\pi}\right)(1-c) + \left(1 - \left(1 - \tfrac{2}{3+\pi}\right)\left(1 - \tfrac{1}{3+\pi}\right)\right) \\ & (-c + \gamma + (1-\gamma)(-c))\Bigg].\end{aligned} \tag{B4}$$

To determine how these asymmetric costs affect the voter's welfare, I investigate this relationship graphically, I plot $\tilde{\gamma}^{\dagger}(\pi, c)$ (a function constructed by setting $W_U^{\dagger} = W_C^{\dagger}$ and solving for γ) in Figure B3. On the left, I plot this function when $c = 0.5$, which shows that Unilateralism provides higher welfare under broader conditions than in the baseline model. On the right, I set $c = 2$, which shows that for moderate asymmetry of costs, the conclusions of the baseline model no longer hold and Checks and Balances becomes more preferable.

2.4 Generic Distribution of Office Benefit and Varying Unilateral Cost

Suppose β_i is drawn from any strictly increasing CDF, F_β, with support $[0, (3+\pi)/2]$ and that the cost of unilateral action is given by $\kappa \in (0, 1)$. Changing the underlying distribution changes voter welfare, but not the politicians' strategic choices. Further, for any $\kappa \in (0, 1)$, Lemma 1 still holds.

Before proceeding to the voter welfare calculation, however, we need to establish two definitions regarding the cut points. First, let $\phi \equiv F_\beta(1)$ and $\psi \equiv F_\beta(1-\kappa)$. Also note that because F_β is strictly increasing, $\psi \leq \phi$. Now we are ready to define $W_C^{\ddagger}$ as:

$$\begin{aligned}W_C^{\ddagger} \equiv\ & \gamma\pi(2) + \gamma(1-\pi)\left[\phi(\gamma + \pi - 1) + (1-\phi) \cdot 1\right] + \\ & (1-\gamma)\pi\left[\phi(\gamma + \pi - 1) + (1-\phi) \cdot 1\right] + (1-\gamma)(1-\pi)\left[\phi(-1 + \gamma + \pi - 1)\right]\end{aligned} \tag{B5}$$

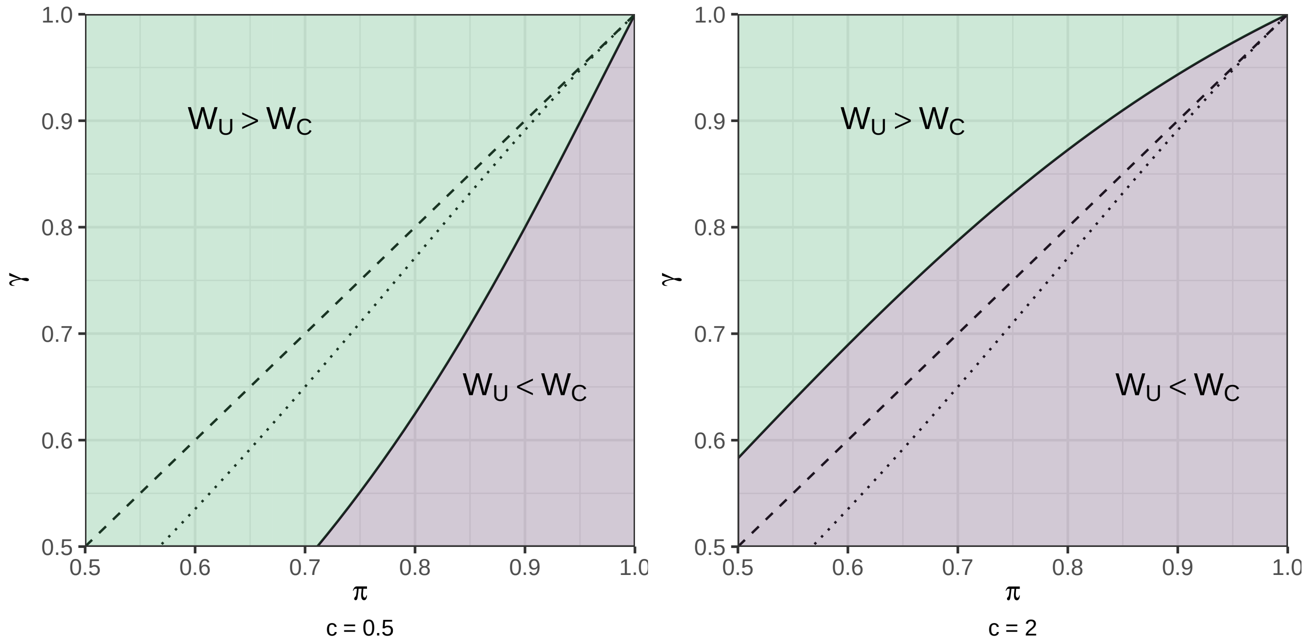

Figure B3: A comparison of voter welfare between Checks and Balances and Unilateralism with asymmetric costs. The solid curve tracks $\tilde{\gamma}^{\dagger}(\pi, c)$, the threshold at which the voter is indifferent between separation of powers settings. The area above (below) the curve indicates when the voter would prefer Unilateralism (Checks and Balances). The dashed line is the 45-degree line, and the dotted curve is $\tilde{\gamma}(\pi)$ from the baseline model.

and $W_U^{\ddagger}$ as:

$$\begin{aligned} W_U^{\ddagger} \equiv & \gamma\pi(2) + \gamma(1-\pi)(2) + (1-\gamma)\pi[\phi(2\gamma-2)]+ \\ & (1-\gamma)(1-\pi)\left[\phi\left(1-\psi\right)\left(2\gamma-2\right) + \left(\psi\right)\left(2\gamma-2\right)\right]. \end{aligned} \tag{B6}$$

Define $\Delta^{\ddagger}(\gamma, \pi, \phi, \psi) \equiv W_U^{\ddagger} - W_C^{\ddagger}$, which is equal to:

$$\begin{aligned} & \Delta^{\ddagger}(\gamma, \pi, \phi, \psi) \equiv \gamma^2(-\phi(-2\psi(1-\pi) - \pi + 2) - 2\psi(1-\pi))+ \\ & \gamma(\phi(\psi(4\pi-4) + (\pi-2)\pi + 3) + 4\psi(1-\pi) + 1) - 2(1-\phi)\psi \end{aligned}$$

From the first derivative with respect to ψ, we see that $\Delta^{\ddagger}(\gamma, \pi, \phi, \psi)$ is decreasing in ψ. The more likely $\beta_E < 1 - \kappa$, welfare under Unilateralism decreases relative to Checks and Balances:

$$\frac{\partial\Delta^{\ddagger}(\gamma,\pi,\phi,\psi)}{\partial\psi} = -\gamma^2(2(1-\pi) - 2\phi(1-\pi)) - \gamma(4\phi(1-\pi) + 4\pi - 4) - 2(\phi\pi - \phi - \pi + 1) < 0$$

The effect of ϕ is less certain. To interpret the effect of ϕ, I construct $\tilde{\gamma}^{\ddagger}(\pi, \phi, \psi)$ by setting $W_U^{\ddagger} = W_C^{\ddagger}$ and solving for γ. In Figure B4, I plot this function as the solid curve in (π, γ) space at low (left) and high (right) values of ϕ. Area above the curve (green) shows (π, γ)

pairs at which Unilateralism provides higher welfare. Area below this curve (purple) shows (π, γ) pairs at which Checks and Balances provides higher welfare. The dashed line is the 45-degree line and the dotted curve is $\tilde{\gamma}(\pi)$ from the baseline model.

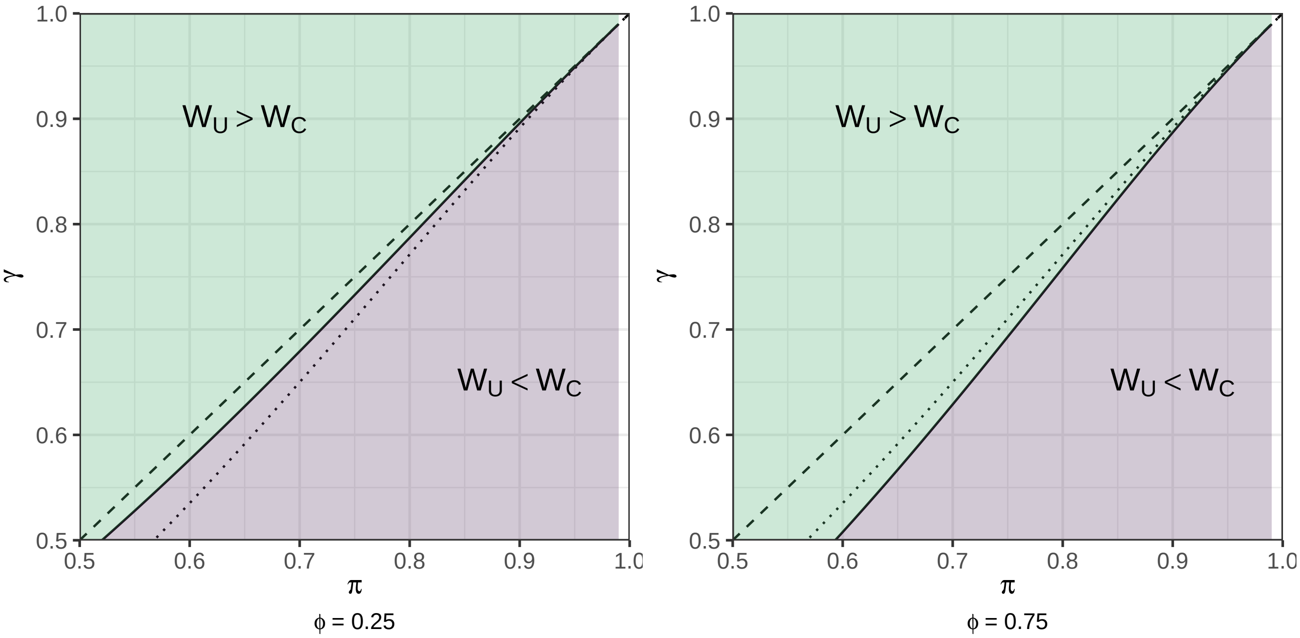

Figure B4: A comparison of voter welfare between Checks and Balances and Unilateralism with non-uniform β_i. The solid curve tracks $\tilde{\gamma}^{\ddagger}(\pi, \phi, \psi)$, the threshold at which the voter is indifferent between either separation-of-powers setting. The area above (below) the curve indicates when the voter would prefer Unilateralism (Checks and Balances). The dashed line is the 45-degree line, and the dotted curve is $\tilde{\gamma}(\pi)$ from the baseline model. Note $\psi = 0.2$.

As ϕ increases, two things happen: under Checks and Balances, first-period gridlock is more likely, however, under Unilateralism, the divergent executive is more likely to enact $x^1 = -1$ unilaterally. The loss from the former effect is generally larger than the loss from the latter effect, and so increasing ϕ increases welfare under Unilateralism as compared to Checks and Balances. Decreasing ϕ has the opposite effect and attenuates the benefits of Unilateralism relative to the baseline model. However, the main results hold.