1 Supplemental Appendix

Supplemental Appendix to accompany Woo, Ae sil. 2019. "Opposition Threat and Legislative Process in Dictatorships."

1.1 Median Voters in Dictatorships

The interest of this paper lies in a setting where the median voter may have a policy preference different from a dictator. While it is difficult to directly observe one's policy preferences, I report an increasing pattern of dictatorial legislatures where the regime party occupies less than 50% of legislative seats. Quality of Governance data by Cruz, Keefer and Scartascini (2016) reports the seat share of the largest government party in a legislature. The largest government party in the dataset is a political party of the head of the state. Such a party is often called 'the regime party' in the literature. With this data, I created a binary variable to code 1 if the regime party's legislative seat share is greater than 50%. Figure 1 presents variation in the legislative seat share of the regime party across time. Over time, we observe an increasing percent of legislatures where the median voter may belong to non-regime political parties. In 1974, most dictatorships (98%) had a regime party that occupied the majority of legislative seats. In 2008, the proportion decreased to 72%.

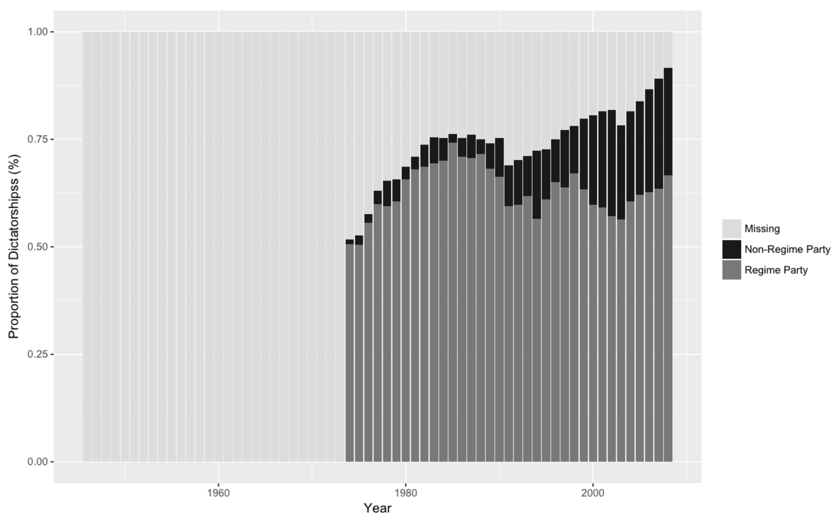

Figure 1: Median Voter's Party Membership

1.2 Model Proof

To find the equilibria of each model, I solved for the Subgame Perfect Nash Equilibrium, which requires that each actor's strategy be optimal, given the other actors' strategies after every possible history in the model (Osborne 2004). In addition, the actor's strategy should be optimal given the status quo. I assume status quos are uniformly distributed throughout the unidimensional space. That is, every status quo has an equal chance to be chosen by Nature at the beginning of the model play.

Figure 2: Opposition Right to Majority Vote with Executive Veto

D proposes a bill under the closed rule. M is now a veto player who can vote on a proposed bill. Only bills that are strictly preferred to x̄ by M will be adopted. In other words, M accepts x *iff* $U_M(x) > U_M(\bar{x})$. O does not have any formal right in the legislative process. Let x_D, x_M and x_O denote ideal points of D, M, and O. Let $\bar{x}$ denotes the status quo while W($\bar{x}$) denote the Winset of the status quo (Tsebelis 2002).

Proposition 1. *(1) $\bar{x} \leq x_D$: $W(\bar{x}) = [\bar{x}, x_D + (x_D - \bar{x})]$. Of all position in $W(\bar{x}) \cup \bar{x}$, D proposes x_D, and M passes. (2) $x_D < \bar{x} \leq x_M$: $W(\bar{x}) = \phi$. Therefore, $W(\bar{x}) \cup \bar{x} = \bar{x}$. (3) $x_M < \bar{x} \leq x_O$: $W(\bar{x}) = [x_M - (x_M - \bar{x}), \bar{x}]$. Of these positions, D prefers $\max_x -|x - x_D|$. Therefore, D proposes $x = x_M - (x_M - \bar{x}) + \alpha$. M passes because D's proposal gives a utility that is α greater than the status quo. (4) $x_D < \bar{x}$: $W(\bar{x}) = [x_M - (x_M - \bar{x}), \bar{x}]$. Of all positions in $W(\bar{x}) \cup \bar{x}$, D proposes $x = x_D$, and M passes.*

Figure 4: Opposition Right to Amendment Power with Executive Veto

O has the right to amend a bill proposed by D, and M has the right to choose among D's proposal, O's amendment, and the status quo. M accepts a bill that gives the greatest utility among the three options. D has the veto right to accept or reject the M's choice.

Proposition 2. *(1) $\bar{x} \leq x_D - (x_M - x_D)$: Once D proposes a, $W(a) = [a, m + |m - a|]$ if $a < m$ and $W(a) = [a, m - |a - m|]$ if $a > m$. Of all positions in $W(a) \cup a$, O prefers $\max_x -|x - x_O|$. Therefore, O amends the bill to make the following: $m + |m - a|$ if $a < m$ and o if $o < a$. If $m < a < o$, O's any amendment $b > m$ will be rejected by M. Expecting this, D maximizes its utility by proposing $a = m$. Therefore, D proposes $a = m$, O makes an amendment to get β, and M accepts a. (2) $x_D - (x_M - x_D) < \bar{x} < x_D$: If D proposes $a = x_D$, then O can propose $b = x_O - \alpha$. M would accept b, but D would veto, resulting $x = sq$. D can produce a greater utility by propose $a = d + |d - sq| - \alpha$. O cannot amend to better itself off because D will veto and $x = sq$ which is worse than having $x = d + |d - sq| - \alpha$. M will accept $a = d + |d - sq| - \alpha$ because $-|m - sq| < -|m - (d + |d - sq| - \alpha)|$. Therefore, D proposes $a = d + |d - sq| - \alpha$, O makes an amendment to get β, and M accepts a. (3) $x_D < \bar{x} \leq x_M$: $W(\bar{x}) = \phi$. Therefore, $W(\bar{x}) \cup \bar{x} = \bar{x}$, and the status quo policy stays. (4) $x_M < \bar{x}$: Once D proposes a, $W(a) = [a, m + |m - a|]$ if $a < m$ and $W(a = [a, m - |a - m|]$ if $a > m$. Of all positions in $W(a) \cup a$, O prefers $\max_x -|x - x_O|$. Therefore, O amends the bill to make the following: $m + |m - a|$ if $a < m$ and o if $o < a$. If $m < a < o$, O's any amendment $b > m$ will be rejected by M. Expecting this, D maximizes its utility by proposing $a = m$. Therefore, D proposes $a = m$, O makes an amendment to get β, and M accepts a.*

Figure 6: Opposition Right to First Proposal Power with Executive Veto

O has the right to propose a bill, and M has the right to vote on the bill proposed by O. M accepts the bill *iff* $U_M(x) \geq U_M(\bar{x})$ and rejects it otherwise. D has the veto right to accept or reject the bill accepted by M. D accepts the bill that is accepted by M *iff* $U_D(x) > U_D(\bar{x})$, and rejects it otherwise.

Proposition 3. *(1) $\bar{x} \leq x_D - (x_O - x_D)$: W($\bar{x}$ = $[\bar{x}, x_D + (x_D - \bar{x})]$. Of all positions in W($\bar{x}$) ∪ $\bar{x}$, O prefers* $\max_x$ -|*x*-x_O|. *Therefore, O proposes x_O, M accepts, and D accepts. (2) $x_D - (x_M - xs_D) < \bar{x} \leq x_O$: W($\bar{x}$) = [$\bar{x}$, x_O + ($x_O - \bar{x}$)]. Of all positions in W($\bar{x}$) ∪ $\bar{x}$, O prefers* $\max_x$ -|*x*-x_O|. *Therefore, O proposes x= x_D + ($x_D - \bar{x}$), M accepts, and D accepts. (3) $x_D < \bar{x} \leq x_M$: W($\bar{x}$) = ϕ. Therefore, W($\bar{x}$) ∪ $\bar{x}$ =$\bar{x}$, and the status quo policy stays. (4) $x_M < \bar{x} \leq x_O$: W($\bar{x}$) = ϕ. Therefore, W($\bar{x}$) ∪ $\bar{x}$ =$\bar{x}$, and the status quo policy stays. (5) $x_O < \bar{x}$: W($\bar{x}$) =[$x_D - (\bar{x} - x_D)$, $\bar{x}$]. Of all positions in W($\bar{x}$) ∪ $\bar{x}$, O prefers* $\max_x$ -|*x*-x_O|. *Therefore, O proposes x_D, M accepts, and D accepts.*

Figure 8: Opposition Right to Second Proposal Power with Executive Veto

D has the right to propose a bill first before any other actor. If D proposes a bill, M has the right to vote on the bill for passage. M passes a bill *iff* $U_M(x) > U_M(\bar{x})$ and rejects it otherwise. O gets to exercise a proposal right under two conditions: 1) M does not pass a bill by D, or 2) D does not propose any bill. If O does not propose any bill, the status quo stays. If O proposes a bill, M decides whether or not to pass it. If M does not pass, the status quo stays. If M passes the bill, D decides whether or not to assent. If D does not assent to the bill, the status quo stays. If D passes the bill, O's bill becomes a new law.

Proposition 4. *(1) $\bar{x} \leq x_D$: W($\bar{x}$) = $[\bar{x}, x_D + (x_D - \bar{x})]$. Of all position in W($\bar{x}$) ∪ $\bar{x}$, D proposes x_D, and M passes because -$|x_D - x_M|$ > -$|\bar{x} - x_M|$ for M. (2) $x_D < \bar{x} \leq x_M$: If D does not propose a new bill, O gets to propose $x = x_M + (x_M - \bar{x}) - \alpha$ because it maximizes O's utility among bills in W($\bar{x}$) =$[\bar{x}, x_M + (x_M - \bar{x})]$] for both M and O. M will pass because b's proposal makes M α much better than having the $\bar{x}$. However, D will veto O's proposal because it makes D worse off than having $\bar{x}$. Therefore, $x = \bar{x}$. (3) $x_M < \bar{x} \leq x_O$: W($\bar{x}$) = [x_M - ($x_M - \bar{x}$), $\bar{x}$] for M. Of these positions, D prefers* $\max_x$ -|x_D-*x*|. *Therefore, D proposes x = x_M - ($\bar{x} - x_M$)+α, and M passes because D's proposal makes M α much better. (4) $x_O < \bar{x}$: W($\bar{x}$) = [x_M - ($\bar{x} - x_M$), $\bar{x}$). Of all positions in W($\bar{x}$) ∪ $\bar{x}$, D proposes x=x_D, and M passes because* -$|x_D - x_M|$ > -$|\bar{x} - x_M|$.

Below, I provide proofs for models that combine legislative procedures without the executive veto. As mentioned on Page 8, the model outcomes are similar even without veto; the first proposal power and the amendment power incur significant policy loss for the dictator, but the second proposal power incurs the least policy loss. However, policy loss is larger in models without the executive veto regardless of opposition legislative powers. Below, I provide figures of models without the executive veto and their formal proofs.

Opposition Right to Amendment Power without Executive Veto

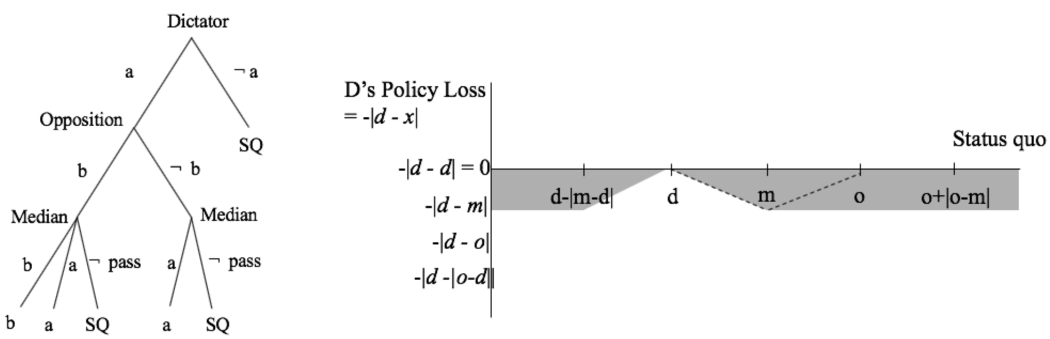

Figure 2: Opposition Right to Amendment Power without Executive Veto and attendant policy loss

O has the right to amend a bill proposed by D, and M has the right to choose among D's proposal, O's amendment, and the status quo. M accepts a bill that gives the greatest utility among the three options (D's proposal, O's proposal, or status quo).

Proposition 5. *(1) $\bar{x} \leq x_D - (x_M - x_D)$: Once D proposes a, W(a) = $[a, m + |m - a|]$ if $a < m$ and W(a) = $[a, m - |a - m|]$ if $a > m$. Of all positions in W(a) $\cup$ a, O prefers $\max_x$ -$|x$-$x_O|$. Therefore, O amends the bill to make the following: $m + |m - a|$ if $a < m$ and o if $o < a$. If $m < a < o$, any of O's amendments $b > a$ will be rejected by M. Expecting this, D maximizes its utility by proposing $a = m$. Therefore, D proposes $a = m$, O makes an amendment to get β, and M accepts a. (2) $x_D - (x_M - x_D) < \bar{x} < x_D$: If D proposes $a = x_D$, then O can propose $b = x_O - \alpha$. M would accept b. D does not have an institutional means to counteract. D is better off to keep the status quo. Therefore, D does not propose and $x = \bar{sq}$. (3) $x_D < \bar{x} \leq x_M$: $W(\bar{x}) = \phi$. Therefore, $W(\bar{x}) \cup \bar{x} = \bar{x}$, and the status quo policy stays. (4) $x_M < \bar{x}$: Once D proposes a, W(a) = $[a, m + |m - a|]$ if $a < m$ and W(a = $[a, m - |a - m|]$ if $a > m$. Of all positions in W(a) $\cup$ a, O prefers $\max_x$ -$|x$-$x_O|$. Therefore, O amends the bill to make the following: $m + |m - a|$ if $a < m$ and o if $o < a$. If $m < a < o$, any of O's amendment $b > m$ will be rejected by M. Expecting this, D maximizes its utility by proposing $a = m$. Therefore, D proposes $a = m$, O makes an amendment to get β, and M accepts a.*

Opposition Right to First Proposal Power without Executive Veto

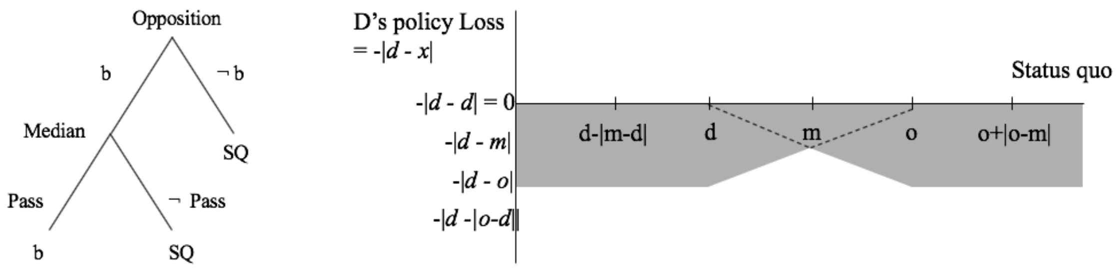

Figure 3: Opposition Right to First Proposal Power without Executive Veto and attendant policy loss

The opposition has the exclusive power to propose a bill. The median voter decides whether or not to pass the proposed bill. Only bills that are weakly preferred to x̄ by M will be adopted. D does not have any formal role in the legislative process.

Proposition 6. *(1) $\bar{x} \leq x_D$: $W(\bar{x}) = [\bar{x}, x_M + (x_M - \bar{x})]$. Of all position in $W(\bar{x}) \cup \bar{x}$, O proposes x_O, and M passes because -$|x_O - x_M| >$ -$|\bar{x} - x_M|$ for M. (2) $x_D < \bar{x} \leq x_M$: $W(\bar{x}) = [\bar{x}, x_M + (x_M - \bar{x})]$. Of these positions, O prefers $\max_x$ -$|x_O$-$x|$. Therefore, O proposes $x = x_M + (\bar{x} - x_M)$, and M passes (3) $x_M < \bar{x} \leq x_O$: $W(\bar{x}) = \phi$ for both O and M. Therefore, $W(\bar{x}) \cup \bar{x} = \bar{x}$. (4) $x_O < \bar{x}$: $W(\bar{x}) = [x_M$ - $(\bar{x} - x_M), \bar{x})$. Of all positions in $W(\bar{x}) \cup \bar{x}$, O proposes x=x_O, and M passes because -$|x_O - x_M| >$ -$|\bar{x} - x_M|$.*

Opposition Right to Second Proposal Power without Executive Veto

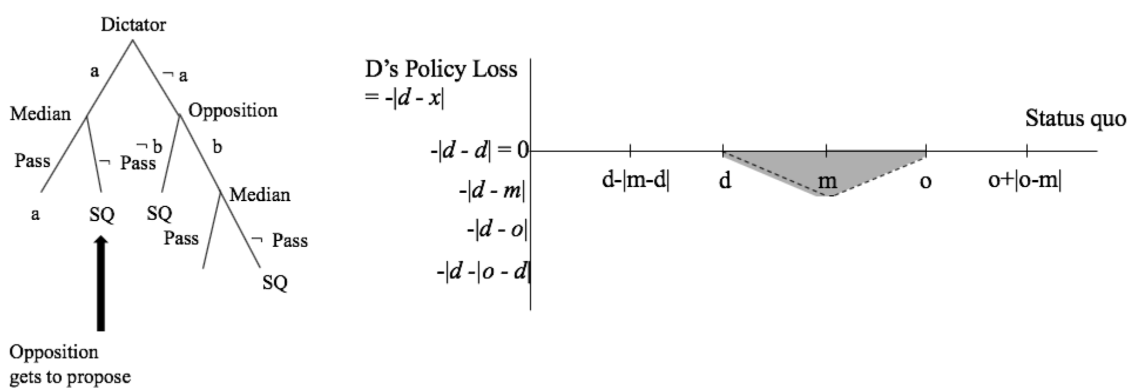

Figure 4: Opposition Right to Second Proposal Power without Executive Veto and attendant policy loss

O has the right to propose a bill if L does not propose any. M has the right to vote on the bill proposed by either D or O. M accepts the bill iff $U_M(x) \geq U_M(\bar{x})$ and rejects it otherwise. Here, we will see a change in the status quo range (2) $x_D < \bar{x} \leq x_M$. In Case 2 where O did not have the second proposal right, the equilibrium in the range was $\bar{x}$ because W($\bar{x}$) = ϕ for both D and M. If D does not propose, however, O gets to propose. If O gets to propose, O will propose $x = x_M + (x_M - \bar{x})$ because it maximizes O's utility among bills in W($\bar{x}$) =$[\bar{x}, x_M + (x_M - \bar{x})])$ for both M and O. Given this logic, Proposition 7 follows below.

Proposition 7. *(1) $\bar{x} \le x_D$: W($\bar{x}$) = $(\bar{x}, x_D + (x_D - \bar{x})]$. Of all position in W($\bar{x}$) $\cup$ $\bar{x}$, D proposes x_D, and M passes because -$|x_D - x_M|$ > -$|\bar{x} - x_M|$ for M. (2) $x_D < \bar{x} \le x_M$: If D does not propose a new bill, D gets $U_D = -|x_D - (x_M + (x_M - \bar{x}))|$. This outcome is worse than having $\bar{x} + \alpha$, α being an infinitesimal policy loss that D takes to satisfy M. Therefore, D will propose $x = \bar{x} + \alpha$ because -$|x_D - (\bar{x} + \alpha)|$ > -$|x_D - (x_M + (x_M - \bar{x}))|$. (3) $x_M < \bar{x} \le x_O$: W($\bar{x}$) = [x_M - $(x_M - \bar{x})$, $\bar{x}$] for M. Of these positions, D prefers $\max_x$ -$|x_D$-$x|$. Therefore, L proposes $x = x_M$ - $(\bar{x} - x_M)$, and M passes. (4) $x_O < \bar{x}$: W($\bar{x}$) = [x_M - $(\bar{x} - x_M)$, $\bar{x}$). Of all positions in W($\bar{x}$) $\cup$ $\bar{x}$, D proposes x=x_D, and M passes because -$|x_D - x_M|$ > -$|\bar{x} - x_M|$.*

1.3 Coding Types of Legislatures

Table 1 provides a list of possible procedural arrangements made by three individual procedures surveyed in the text. Values in the matrix of [Executive Proposal, Proposal Right, Executive Veto] determine the arrangement type. Given that each variable for an individual legislative procedure is binary ([0,1]), we have 8 combinations of procedural arrangements ($2^3 = 8$). For example, [0,0,0] proxies a legislature without legislative procedures written in constitutions. [1,0,0] proxies an arrangement where there exists the executive exclusive proposal right with no proposal rights for legislators and no executive veto. Both [0,0,0] and [1,0,0] represent a *Cheap Legislature* where the participation is low (no proposal right) and so expected policy cost is none. [0,0,1], [1,0,0] and [1,1,0] also serve as a proxy for a *Cheap Legislature*.[1] [0, 1, 0] and [0, 1, 1] represent a *Desperate Legislature*. The model outcome shows that these designs incur greater policy costs for dictators. [1, 1, 1] represents an *Optimal Legislature*.

Table 1: Operationalization of Legislature Type

Executive Proposal	Proposal Right	Executive Veto	Legislature Type
0	0	0	Cheap Legislature
0	0	1	Cheap Legislature
1	0	0	Cheap Legislature
1	0	1	Cheap Legislature
1	1	0	Cheap Legislature
0	1	0	Desperate Legislature
0	1	1	Desperate Legislature
1	1	1	Optimal Legislature

Null Legislature does not exist in my theory. Policy loss for a dictator occurs if and only if the opposition participates and exercises his or her legislative power. If the opposition is not given the right to exercise legislative procedures, such as a proposal right, there is no theoretical reason to expect for dictators to systematically incur policy loss.

[1] In [1,1,0], the individual legislators have the de jure power to propose a bill, but the model equilibrium shows that a dictator will not give the opposition a chance to utilize its proposal right because the dictator does not have other institutional tool to counteract the opposition's proposal. See Subsection 1.4 for an informal proof.

1.4 [1, 1, 0] as a *Cheap Legislature*

I present here another type of a *Cheap Legislature* to show when O's second proposal power does not provide any chance for O to express their demand. In this procedural arrangement, D has the first proposer power. O can propose a bill only after being given the opportunity-either when D does not propose any or when D fails to pass a new law. Figure 5 describes the procedural arrangement. Figure 6 visualizes D's policy losses under this arrangement. Compared to policy losses under the baseline model (depicted with dotted lines), D loses α between l and m.[2]

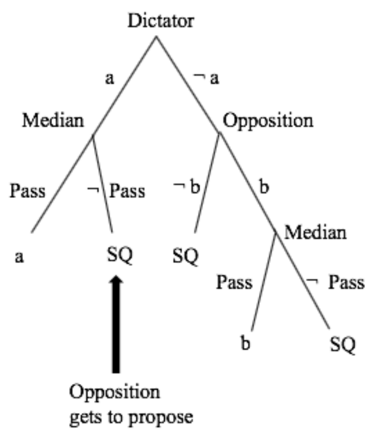

Figure 5: Opposition's Second Proposal Power

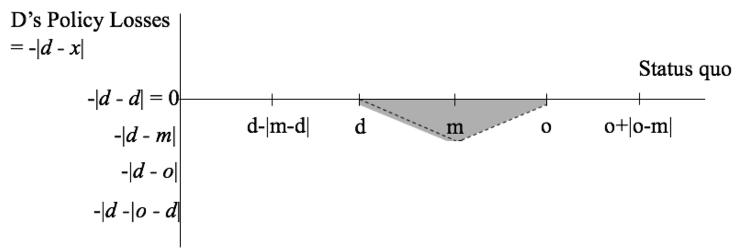

Figure 6: L's Policy Losses

If D lets O participate as a 'second proposer' while securing the position as a 'first proposer,' D can mostly achieve policy outcomes that D can produce from the baseline model in the text.[3] However, moving from the baseline model to this procedural arrangement creates a different consequences for opposition participation. Although the opposition is formally given the institutional right to make a proposal, the leader will always avoid opposition participation in order to protect against a larger policy loss. For example, when Nature chooses status quo between d and m, D would not propose anything and keep the status quo (by the logic of Subgame Perfect Nash Equilibrium). However, if D does not propose anything under this arrangement, O gets to propose $m + |m - sq|$ and pass a bill further from D, and D does not have any institutional tool to counteract this legislative challenge. To prevent this, D proposes a compromised bill, $sq + \alpha$, to minimize a policy loss and prevent opposition participation in the process. This way, O does not get to propose anything in equilibrium.

Thus, while on the constitution the opposition seems to have the opportunity to voice their concerns in the legislature, this arrangement may not actually reduce the threat very much

[2] α denotes a positive infinitesimal change. How theoretical α can be translated into an empirical observation is a topic for future research.

[3] D loses $\alpha * |m - d|$ more in this arrangement compared to the baseline model.

because the dictator would always propose a bill to prevent the opposition from actively participating. In other words, the opposition may perceive that their procedural inclusion is not enough because what they are really seeking is the opportunity to voice out their protest within the formal institution. This implies that this arrangement does not serve as an institutional tool for sharing legislative power to reduce threat.

1.5 Predicted Probabilities with Different Variable Values

In the text, I compute predicted probabilities of an *Optimal Legislature* for country-years that are non-military and non-communist. Below, I present predicted probabilities with different variable values for military leaders and communist regimes.

Table 2: Differences in Predicted Probabilities of an *Optimal Legislature*

	Variable Values	High	Low	Differences
Urban Concentration	Non-military & Non-communist	0.7204972	0.4594926	+ 26.10%
	Non-military & Communist	0.001728084	0.0002581884	+ 0.01%
	Military & Non-communist	0.9198024	0.7700918	+ 14.97%
	Military & Communist	0.01317287	0.002843921	+ 1.03%
% of World Democracy	Non-military & Non-communist	0.5381644	0.2005765	+ 20.05%
	Non-military & Communist	0.4834942	0.4829099	+ 0.06%
	Military & Non-communist	0.8325404	0.6801299	+ 15.24%
	Military & Communist	0.4846728	0.4839377	+ 0.07%
Multiple Parties	Non-military & Non-communist	0.6818909	0.4357605	+ 26.61%
	Non-military & Communist	0.486008	0.4851843	+ 0.08%
	Military & Non-communist	0.9711593	0.9029219	+ 0.68%
	Military & Communist	0.487628	0.486976	+ 0.06%

1.6 Statistical Testing for Other Hypotheses

Here, I report the results of testing two additional hypotheses. The following results are from running logistic regression with the Matching Frontier technique.

Hypothesis 1. *As the opposition's collective action capacity increases, dictators are less likely to establish an* Cheap Legislature

Figures 7, 8, and 9 report the effects of Urban Concentration, world democracy, and multiple parties on the likelihood of instituting an *Cheap Legislature* respectively. As expected in H2, the coefficients are negative in most of sample size ranges.

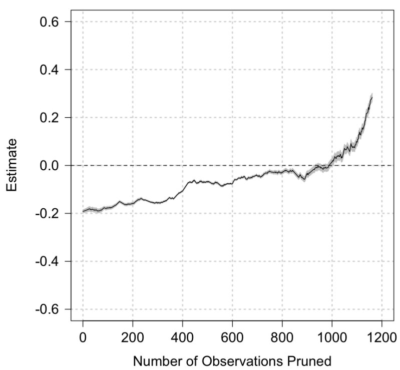

Figure 7: Urban Concentration

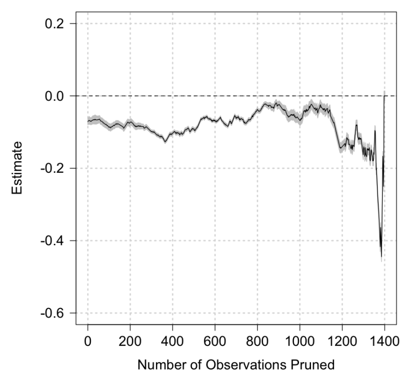

Figure 8: World Democracy

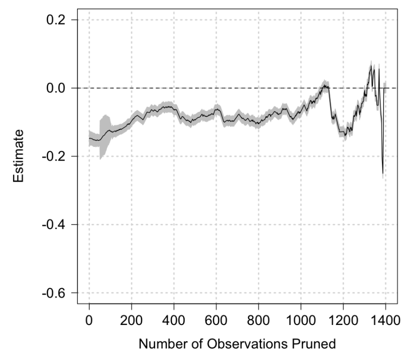

Figure 9: Multiple parties

Hypothesis 2. *The opposition's collective action capacity does not affect the likelihood of establishing a* Desperate Legislature

Figures 10, 11, and 12 report the effects of Urban Concentration, world democracy, and multiple parties on the likelihood of instituting a *Desperate Legislature*. Results are mixed. Null effect is shown with Urban Concentration in sample sizes between 1200 and 1000 (i.e., 0-200 observations are pruned), and again between 400 and 2. The null effect is more obvious with the percent of world democracy. When multiple parties are instituted, we see positive coefficients.

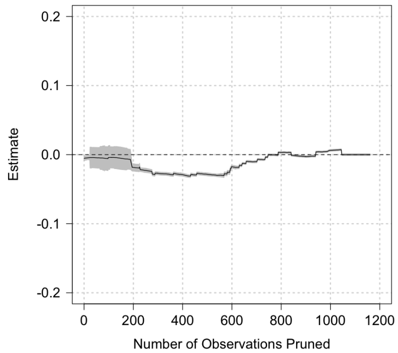

Figure 10: Urban Concentration

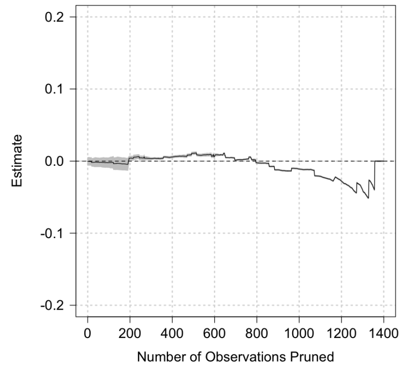

Figure 11: World Democracy

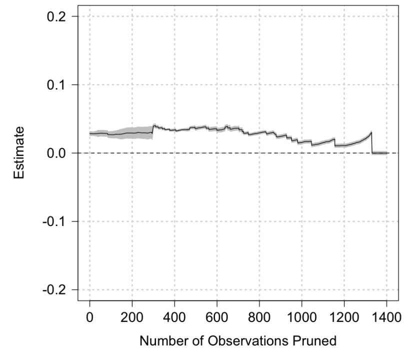

Figure 12: Multiple parties

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