Power-sharing and Exclusion: How a Leader's Opportunity to Exploit a Commitment Problem Leads to War

Hye-Sung Kim and Shawn L. Ramirez

Abstract

Why would a leader politically exclude a group, when exclusion makes war more likely? We use a formal model to establish the relationship between power-sharing, exclusion, and war. The model generates the theory that since war turns power-sharing into an all-or-nothing game and a high capacity group cannot commit to peace if power is reduced, a leader will incite a war by excluding a group as a gamble for full control. We specify conditions for exclusion, political downgrades, and war. We show that the likelihoods of war and exclusion for politically relevant ethnic groups from 1946 to 2010 are accurately predicted. Our use of generalized additive models flexibly demonstrates the anticipated non-monotonic effects of capacity and prior power in two dimensions. This research implies that power-sharing must overcome the commitment problem, giving incentives to high capacity groups to maintain peaceful power-sharing even with diminished power, to promote democratic stability.

keywords: ethnic conflict; power sharing; exclusion; leaders; war; democracy.

1 Introduction

Research finds that when political leaders exclude ethnic groups, civil wars are more likely (Asal et al. 2015; Cederman, Wimmer, and Min 2010; Gurr 2000; Roessler 2011; Wimmer, Cederman, and Min 2009; Gurr 1993). Further, the exclusion of large groups involves greater risks than small ones, due to their higher capacities for mobilization (Cederman, Buhaug, and Rød 2009; Cederman, Wimmer, and Min 2010). In addition, recent research shows that leaders can downgrade ethnic group members from senior to junior positions, or by altering administrative, cabinet, and ministerial seats (Cederman, Wimmer, and Min 2010; Grossman and Lewis 2014; Lijphart 2000). Given these relationships, one puzzle is why a leader would exclude an ethnic group, especially a large group, if this makes civil war more likely? Further, why would a leader exclude, rather than downgrade a group, if downgrading might keep all parties satisfied and avert a war?

Roessler (2011) provides a first answer in analyzing sub-Saharan Africa where a leader faced with an imminent coup will exclude a group to remove its access to the state's coercive apparatus, even though this raises the risk of war. This explains cases where coup threats are high and the leader trades her own imminent exclusion against an uncertainty future war. However, this does not provide an answer where there is no coup threat. In other words, the more general relationship between exclusion and war is missing.

In this paper, we develop a bargaining model in which a leader decides whether to downgrade, exclude, or make no change to a group's political power, and the group decides whether or not to go to war. The results show that a leader excludes under two conditions, and only one of these leads to war. First, a group with low mobilization capacity is excluded because of its insufficient ability to deter the leader, and no war occurs. Second, a group with high capacity is excluded if its prior political power is disproportionately great and its mobilization capacity is not quite high enough to deter the leader. There, the underlying reason for exclusion is that civil war turns power-sharing into an all-or-nothing game. Since a high capacity group launches a war if its power is downgraded at all, but its capacity is not high enough to deter the leader, the leader can exclude that group to gamble for full control of the state. Thus, when a group

is both politically powerful and insufficiently capable, the leader uses exclusion to prompt an opportunity that can lock in a permanent advantage.

The results establish testable implications in showing that exclusion and war depend non-monotonically on both a group's mobilization capacity and its level of power-sharing. Leaders exclude two types of groups from power: (1) low capacity groups, and (2) politically powerful high capacity groups. War results only against those high capacity groups, once excluded. To demonstrate these non-monotonic relationships in the two dimensions of capacity and power-sharing, we analyze the likelihoods of exclusion and war using use generalized additive models. We find support for the model using data on politically relevant ethnic groups from 1946 to 2010. Low capacity groups are likely to be excluded and war is unlikely. High capacity are excluded and war is likely. Meanwhile, highest capacity groups are unlikely to be excluded. Our robustness checks add support and raise new questions.

Finally, we discuss implications for power-sharing to promote democratic representation and political stability. Our results suggest that power-sharing ought to include provisions that prevent the downgrades of small groups. Second, power-sharing must create incentives for high capacity groups to remain committed to political outcomes, even if a leader diminishes their political power. If groups remain committed to politics, then the leader's political opportunity is removed to sever link between power-sharing and war.

One contribution is that we show that exclusion and war can be explained within the bargaining model framework. Thus far, no theoretical models for exclusion and ethnic civil war exist. This paper develops a first model to answer theoretically how exclusion and war occur, and tests these results empirically. The results also help to answer the puzzle of why large groups are excluded even though this is likely to result in war.

2 Power and Ethnic Conflict

Significant empirical research finds that political exclusion makes ethnic conflict more likely (Asal et al. 2015; Cederman, Buhaug, and Rød 2009; Cederman, Wimmer, and Min 2010; Gurr 2000; Roessler 2011; Wimmer, Cederman, and Min 2009; Gurr 1993). Further, these risks are greater for large-sized groups than small-sized ones, due to differences in mobilization capacities.

There are also several theoretical reasons that an ethnic group is likely to go to war if excluded. Scholars argue that political conflicts are likely to emerge along ethnic lines, because ethnic identities are frequently related to inequalities, politicized cleavages, resentment, and a security dilemma – supplying motivation and opportunity for war (Cederman, Wimmer, and Min 2010; Weidmann 2009; Gurr 1993; Gurr 2000; Horowitz 1985; Collier and Hoeffler 1998; Buhaug, Cederman, and Gleditsch 2014). Ethnic groups have advantages in overcoming collective action problems and coordinating rebellion. For example, Habyarimana et al. (2007) find that ethnic identities facilitate coordination through faster information transmission. Gates (2002) shows that homogeneous ethnic groups can induce members to mobilize with non-monetary rewards. In addition since ethnic identities are relatively stable in comparison to class or other social identities, ethnicity can enhance coalition-building (Robinson 2003; Caselli and Ii 2006). As Bates (1983) writes, this stability in distributing goods along ethnic lines contributes to the stability of ethnic identities in the contest over goods and services.[1]

Given these, a leader ought to anticipate that an ethnic group is likely to go to war if deprived of political power. Yet, as Roessler (2011) points out: political exclusion is a deliberate choice. Echoing Roessler (2011) criticism, the literature that explains the

[1] "Ethnic groups persist largely because of their capacity to extract goods and services from the modern sector and thereby satisfy the demands of their members for the components of modernity. Insofar as they provide these benefits to their members, they are able to gain their support and achieve their loyalty."

relationship between political leaders and ethnic conflict is undertheorized. He offers a first explanation in studying sub-Saharan Africa. He argues that a leader who faces a likely coup excludes to remove a group's access to the state's military, even though this can increase the risk of a future war. This provides a clear explanation when coup threats are high, however, recent research raises new dimensions to this question.

Recent scholarship shows that leaders can downgrade a group's political power – a minor adjustment to power-sharing that might avert a war. Cederman, Wimmer, and Min (2010) show that conflict is *less likely* when groups are downgraded to junior level positions, rather than excluded (see also Lijphart 2000). Grossman and Lewis (2014) find that political leaders dole out administrative, cabinet, and ministerial positions to share power, especially with politically and economically marginalized groups. The literature on peace studies shows that alternative power-sharing arrangements can reduce war and encourage political cooperation (Sriram 2016; Sisk 1996). Since a leader can make minor adjustments that include downgrading a group, and exclusion is likely to result in war, why would a leader exclude?

To answer this, we develop a variant of a bargaining model in which a political leader and a group share power. The leader decides whether to downgrade, exclude, or do nothing to alter a group's power, and the group either accepts this or responds with violence. If the leader chooses to downgrade the group, then the amount of that downgrade is a choice variable that the leader chooses optimally. The group's capacity for fighting will be based on its size as in the existing literature. Further, we assume that players have complete and perfect information to reflect the established link that excluded groups are likely to go to war: the leader knows the threshold beyond which a group will mobilize if excluded. This model will allow for predications about when exclusion and war occur based on the group's capacity and the existing power-sharing regime.

3 Model

Consider a model of in which two actors, a leader and an ethnic group, share political power. At the start, let $\lambda \in [0, 1)$ represent the group's proportion of political power, and $1 - \lambda$ represent the leader's proportion.[2] Political power allocates control over a state budget, $\beta > 0$. Both players prefer more control to less control. The group has a 'mobilization capacity' for war given by $\kappa(\psi) \in [0, 1]$, where a group's capacity is increasing in its population size, $\psi > 0$.

The sequence is given by two moves. First, the leader decides whether to *Exclude*, *Downgrade*, or *Do nothing* to alter the group's power. Let λ' be the group's new allocation of political power: to *Exclude* means the leader assumes full control, $\lambda' = 0$. *Do nothing* means that the group's power remains the same, $\lambda' = \lambda$. *Downgrade* means that the leader chooses a new level of political power to give to the group, λ' where $0 < \lambda' < \lambda$.

Second, if the group is downgraded or excluded, then the group chooses whether to use *Violence* or *Not*. If the leader did nothing to the group, then the group does nothing.

When the group uses violence, a war occurs. War is modeled as a winner-take-all costly lottery, where victory gives the winner full control over the state and the loser is removed from power. The probability that the ethnic group wins is given by its capacity $\kappa(\psi)$. Each side pays a cost of war, $c > 0$. The ethnic group's expected war payoff is $\kappa(\psi)\beta - c$, and the leader's expected war payoff is $[1 - \kappa(\psi)]\beta - c$. If the group does not use violence, then each side receives its political payoff, given λ', for maintaining power-sharing. Figure 1 depicts this stylized game. We normalize β to one without loss of generality. The solution is a subgame perfect Nash equilibrium.

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[2]We ignore the case where the group has full control, $\lambda = 1$, which would imply that the leader and group are of the same ethnicity, and the exclusion question does not make sense.

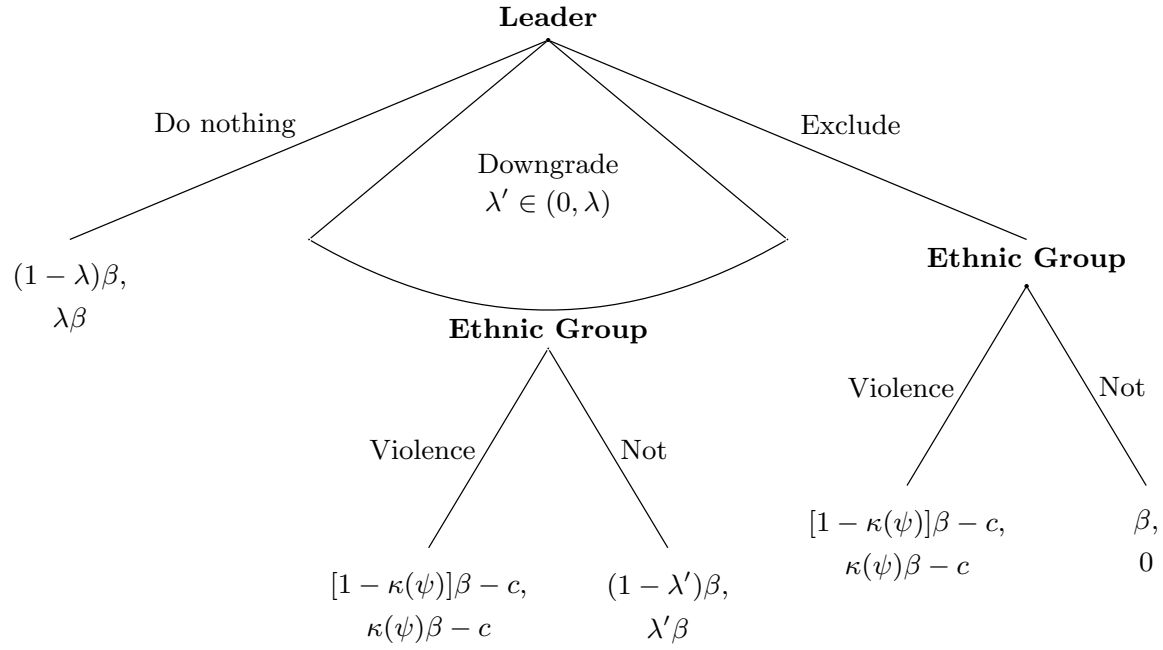

Figure 1: Model

3.1 Results

In equilibrium, the leader decides whether and how to alter the group's power based on whether the group will respond with violence. The group's best response is determined by whether it has sufficient capacity to withstand the costs of war relative to the amount of power that the leader has offered. For an excluded group, the group will fight if war is preferred to retaining zero power, $\kappa(\psi) - c > 0$. We can write this as: an excluded group fights if $\kappa(\psi) > \kappa_1^*$ where $\kappa_1^* = c$. Similarly, a downgraded group fights if $\kappa(\psi) - c > \lambda'$, which we can write as $\kappa(\psi) > \kappa_2^*$ where $\kappa_2^* = \lambda' + c$. Since $\kappa_1^* < \kappa_2^*$, we can picture the group's best response is given by three "types." *Low* capacity groups, $\kappa(\psi) < \kappa_1^*$, do not use violence even if excluded. *Medium* capacity groups, $\kappa(\psi) \in [\kappa_1^*, \kappa_2^*)$, use violence following exclusion, but not following a sufficiently small downgrade. *High* capacity groups, $\kappa(\psi) > \kappa_2^*$, use violence if downgraded or excluded.

The leader's decision given these responses is to exclude a low capacity group, because that group has no deterrent threat. Against a medium capacity group, the leader prefers to downgrade and avoid war, rather than exclude. To see this, note that the leader can offer the group the amount that keeps it indifferent between fighting and not, which we can denote as $\lambda'_\kappa = \kappa(\psi) - c$. The leader strictly prefers to downgrade rather than exclude if:

$$U_L(Downgrade) > U_L(Exclude)$$
$$1 - \lambda'_\kappa > 1 - \kappa(\psi) - c$$

Substitution of λ'_κ indicates that the leader downgrades a medium capacity group since war is costly.

Lastly, against a high capacity group, the leader's decision boils down to two choices. Either the leader does nothing and keeps her own share of power, $1 - \lambda$, or the leader incites a war to receive $1 - \kappa(\psi) - c$. Given this, the leader prefers to incite a war if:

$$\kappa(\psi) < \lambda - c \equiv \kappa_3^*, \tag{1}$$

where $\kappa_2^* < \kappa < \kappa_3^*$. This means that a high capacity group that the leader will fight exists, if and only if:

$$\lambda > \lambda' + 2\tfrac{c}{\beta}. \tag{2}$$

Equations (1) and (2) indicate that the leader's preference depends on both a group's capacity, $\kappa(\psi)$, and its prior level of power-sharing, λ. For a group with sufficiently high capacity, $\kappa(\psi) > \kappa_3^*$, the leader is deterred and will do nothing regardless of that group's prior power. However, for an *insufficiently high* capacity group, $\kappa(\psi) \in (\kappa_2^*, \kappa_3^*)$, the leader incites war when its political power is *disproportionately high*, as given by Eqn. (2). Given the leader's indifference between exclusion and downgrade, we assume that a leader who prefers to incite a war will exclude.[3]

The equilibrium is stated in Proposition 1. The outcomes are pictured in Figure 2 according to group capacity and its prior level of power-sharing.

Proposition 1. *When $\kappa(\psi) < \kappa_1^*$, the leader excludes, and the group does not use violence. When $\kappa(\psi) \in (\kappa_1^*, \kappa_2^*)$, the leader downgrades the group's power to $\lambda'(\kappa) = \kappa(\psi) - c$, and the group does not use violence. When $\kappa(\psi) \in (\kappa_2^*, \kappa_3^*)$, the leader excludes the group, and the group uses violence. When $\kappa(\psi) > \kappa_3^*$, the leader does nothing, and the group uses violence (off the equilibrium path).*

[3]We view the question of whether the leader will downgrade or exclude, when the leader is indifferent between these choices, as an empirical one. Our empirical analysis gives support for the assumption that the leader excludes these high capacity groups.

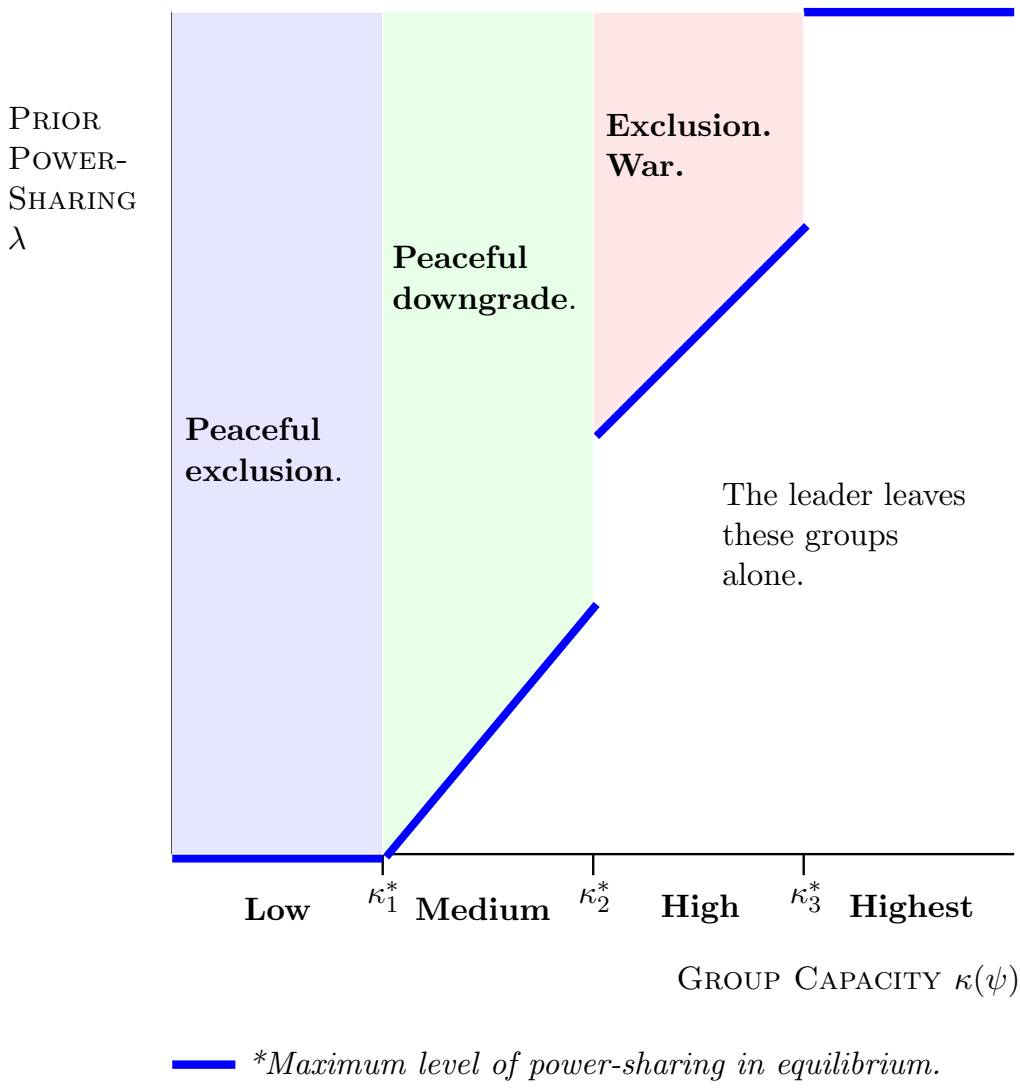

Figure 2: Equilibrium Outcomes

Why do leaders exclude groups if exclusion makes war more likely? The model shows that exclusion occurs under two conditions, and only one of these leads to war. First, when a group has insufficient capacity to deter the leader, the leader excludes the group. This is the same as in Acemoglu and Robinson (2005), where the political elite allow for mass representation only when the masses can credibly threaten to revolt. Since low capacity groups have no credible threat, any amount of shared power is too high and the leader has no incentive to grant these weak groups political power.

Second, when a group has disproportionate political power and insufficiently high mobilization capacity, then the leader opts for war as a profitable gamble to increase political control. Note that the ability to use *downgrades reduces war*. As seen against medium capacity groups, who use violence if excluded but not if downgraded, the leader strictly prefers to downgrade. War is an unnecessary cost to revise the political status quo, and the downgrade keeps all parties satisfied. This is stated briefly in Result 1.

Result 1 (Peaceful Downgrades)**.** *The leader's ability to downgrade a group's power reduces war by maintaining peace against a medium capacity group,* $\kappa(\psi) \in (\kappa_1^*, \kappa_2^*)$.

Since a high capacity group uses violence even if power is downgraded, the leader sees that a sacrifice is unavoidable. The leader can either continue to sacrifice her own political power in power-sharing, or pay the costs of war.

War occurs when the group's commitment problem meets the leader's political opportunity for its exploitation. A high capacity group cannot credibly commit to peace if its power is adjusted to levels commensurate with its bargaining capacity. This forces the leader to choose between her potential outcome in a civil war and the status quo political outcome given the group's control. When that group's capacity is sufficiently high, the leader is deterred by the risk that she will lose the war: the group's commitment problem is present, but the leader's opportunity is not.

However, when a group has insufficiently high capacity, the sacrifice of foregone political control is a cost that need not be paid. The group's commitment problem gives the leader an opportunity, that can be brought about by war, to secure a political advantage over the group – full control over the state. Power-sharing causes war when the group's

commitment problem meets the leader's political opportunity, as stated in Result 2.[4]

Result 2 (Power-sharing And War)**.** *When an* insufficiently high *capacity group,* $\kappa(\psi) \in (\kappa_2^*, \kappa_3^*)$*, holds disproportionate political power,* $\lambda > \kappa(\psi) + c$*, a leader who shares power incites a war.*

The model also gives the amount of power-sharing a leader will permit given a group's capacity. In Figure 2, we indicate the maximum amount of power-sharing permitted in equilibrium in bold. Intuitively, a group's permissible power is increasing in group capacity: this relationship is non-linear due to the critical thresholds generated by the strategic interactions in the model. Empirically, this means that when a leader downgrades or excludes, one can expect that group's new level of power is shifted to its maximum permissible power; further, a group left alone can have power up to that threshold.

Result 3 (Permissible Power)**.** *A group's maximum level of permissible power is non-linearly increasing in group capacity.*

How might these results change if we incorporated the ability for a leader to *upgrade* a group's power? First note that it is unlikely that a leader would upgrade her opponent's political power. However, if upgrades are allowed, one possibility is that the leader might increase the power of a group up to its permissible level.

The model also provides two testable results. First, exclusion occurs non-monotonically in the capacity of the group: the leader excludes low and high capacity groups, but not medium or highest capacity groups. Further, the relationship between exclusion and a group's prior level of political power is not straightforward: medium and highest capacity groups are not excluded for any level of political power, low capacity groups are excluded

[4]This is different from standard commitment problems in the sense that there is no time inconsistency problem. We discuss this in relation to the larger literature on commitment problems following our empirical analysis (Powell 2006; Powell 2004; Fearon 1998; Fearon 1994; Garfinkel and Skaperdas 2000).

at all levels, and high capacity groups are excluded for only higher levels of political war. Put simply, we expect exclusion to be non-monotonic in both a group's mobilization capacity and its prior level of power-sharing, as stated in Result 4. To see this, one needs to examine exclusion across both dimensions simultaneously.

Result 4 (Exclusion)**.** *Political exclusion is non-monotonic in a group's mobilization capacity and its prior level of political power.*

Second, war is non-monotonic in group capacity and prior power. War occurs against high capacity groups that are excluded from top political positions. No war (peace) occurs if a low-capacity group is excluded from any position. To put this simply, we expect war to be non-monotonic in both a group's capacity and prior power, conditional on that group being excluded, as stated in Result 5. In examining two dimensions, one should observe war against high capacity excluded groups, and peace against low capacity excluded groups.

Result 5 (War)**.** *War is non-monotonic in in a group's mobilization capacity and its prior level of political power, conditional on exclusion.*

One challenge is that in reality, a leader confronts not just one but multiple ethnic groups, or coalitions of groups, that are not accounted for by this model. In the Appendix, we argue that under certain conditions [when ethnic groups do not form coalitions; or when coalitions form, but the leader can consider each coalition by the joint capacities of its members] the equilibrium would bear similarity to the one here – leaving the intuition and major results unchanged. Further, we describe why it might be difficult for cross-ethnic group coalitions to form. The literature on ethnic group stability implies that cross-ethnic groups coalitions are likely to face significant collective action problems (Robinson 2003; Caselli and Ii 2006). If so, a leader may use the promise of political power to play any potential coalition member against each other – allowing each group to compete to be the cheapest to buy off, and ultimately allotting zero power to any coalition member – resulting in no cross-ethnic coalitions.[5]

[5]See Ferejohn (1986) for a similar argument where voter influence over incumbents is

4 Empirical Analysis

To find support, we empirically test the results for the likelihood of political exclusion and war, as implied by Results 4 and 5, on all politically relevant groups from 1946 to 2010. We use the Ethnic Power Relations dataset v. 3.01 where a group is politically relevant "if at least one significant political actor claims to represent the interests of that group in the national political arena, or if members of an ethnic category are systematically and intentionally discriminated against in the domain of public politics (Wimmer, Cederman, and Min 2009, 325)." The unit of analysis is group-country-year, and the final dataset includes 32,879 observations.

4.1 Model Specification

To observe the non-monotonic effects of group capacity and prior power-sharing, simultaneously, on the likelihoods of exclusion and war, we take two steps. First, we employ a flexible empirical model, generalized additive models (GAMs), that allows one to investigate hypothesized nonlinearities by specifying covariates in terms of smoothing functions that are estimated non-parametrically.[6] This allows the empirical results to be highly sensitive to non-linearities at the risk of over-fitting and reducing interpretability. In our case over-fitting strengthens our empirical test by exposing observations that the theory cannot explain. Further, the problem of reduced interpretability given non-monotonicities is not relevant here, since our non-monotonic expectations are given by the formal model: we are simply looking to see where theoretical expectations are met, or not.

Second, GAMs allows us to estimate the model in terms of two equations: one for the leader's decision to exclude, and the other for the group's decision to use violence. In other words, the equations correspond to exclusion and war, respectively, and are

hindered with heterogeneous voters.

[6] As Wood (2006) writes, a GAM is a "a generalized linear model with a linear predictor involving a sum of smooth functions of covariates."

estimated simultaneously. The leader's exclusion decision is given by:

$$y_{ijt} = \alpha + X_{ijt}\beta + m(z_{ijt}, w_{ijt-1}) + s(t) + \epsilon_{ijt},$$

where i, j, t, indicate the group, country, and time. The outcome y is a binary variable that takes a value of 1 if a leader excludes the group, and 0 otherwise. Our main predictors are a group's capacity, z_{ijt}, and its prior share of power, w_{ijt-1}. We use a tensor product smoother, $m(\cdot)$, to smooth over these two dimensions simultaneously, $m(z_{ijt}, w_{ijt-1})$. Here, an additional advantage of using GAMs is that we can focus on inferences about this smoothing function across both dimensions, simultaneously, to observe any non-linear effects. In addition, we account for temporal dependencies and relevant control variables using a smoothing function of time, $s(t)$, and a parametric vector of covariates, X, with coefficients, β.

In the model, a war occurs if the leader excludes the group and the group responds with violence. We model the group's response with:

$$v_{ijt} = \alpha + U_{ijt}\gamma + m(z_{ijt}, w_{ijt-1}) * c_{ijt} + s(t) + \epsilon_{ijt},$$

where v is a binary variable that takes a value of 1 if the group uses violence, and 0 otherwise. Since the decision to use violence in the formal model depends on whether the leader excludes the group, c_{ijt} is a binary variable coded a 1 if the group is excluded from central power between the current period and the previous period, and 0 otherwise.[7] We interact the smoothing function $m(z_{ijt}, w_{ijt-1})$ with the binary indicator, c_{ijt}, to account for the expected interaction in which violence is conditional on political exclusion. Again, we account for temporal dependencies and control variables with a smoothing function of time, $s(t)$, and a parametric vector of covariates, U, with coefficients, γ.

[7]All other notation remains the same as in the leader's equation.

4.2 Variables

For our dependent variables, we code *Exclusion* to be a 1 if a group's power was downgraded from any level of central-power in the previous year to no central-power in the current year. *Exclusion* is coded a 0 if a group maintains central power this year, and in line with the model, "no exclusion" includes cases when a group is downgraded but continues to share power.[8] We code *Conflict* as a 1 if a conflict begins in the current year to indicate conflict onset, and 0 otherwise.

For our independent variables, we follow the literature by using *Group Size* to operationalize its mobilization capacity (Cederman, Wimmer, and Min 2010; Roessler 2011). Size is given by the proportion of the group's population relative to the country's population in the current year. We code *Prior Power* as an ordered categorical variable to represent a group's central power in the previous year. This is coded given a group's status as a Junior partner (1), Senior partner (2), Dominant power (3), or Monopoly power (4), where higher numbers indicate more central power.[9]

We include several control variables prominent in the conflict literature. *War History* indicates the number of conflicts involving a given group prior to this year. *NGroups*

[8]We carefully code this based on the *Status* variable: we first categorize different levels of power-sharing into four categories in the order of central or regional power, and then check whether there was a decrease in power-sharing between the previous and current year and whether that decrease led to no central power.

[9]We include Monopoly power, which is where a group has a monopoly over the executive position to the exclusion of other ethnic groups, since empirically it is possible for a newly-elected leader to exclude a group that had a monopoly last year, which can result in war. EPR also codes groups if they are Discriminated, Irrelevant, Powerless, or have Regional or Separatist autonomy: we exclude these categories since they represent having no central power, and cannot be further excluded.

indicates the number of groups in a given country. We use *Log GDP Per Capita* and *Log Population*, each lagged by one year. We include regional dummies for *East Europe*, *Latin America*, *Asia*, *North Africa/Middle East*, and *Sub-Saharan Africa* with the Western states as the reference category.[10] We use a non-parametric smoothing function with thin-plate regression splines over time, s(t), where t indicates the number of years since 1950, the first year in the dataset.

4.3 Results

Our data include 32,879 group-country-year observations, in which 104 groups (0.32%) were excluded, and 123 groups (0.37%) started a conflict.[11] Most groups do not share central power: only 35% of groups (11,501 observations) share power in period $t-1$. Of those who share power, almost half share power as Junior Partner (5,341 observations). At a preliminary level, we find a positive relationship between exclusion and conflict: 4.81% of excluded groups started a conflict, whereas only 0.36% of non-excluded groups started a conflict (Pearson $\chi^2(1) = 55.03$, and p-value = 0.000): at a naive level, exclusion makes war 13 times more likely.

The main results are shown in Table 1. The "Exclusion" column shows the results for the leader's exclusion decision. The "Conflict" column shows the results for the group.[12]

[10]Western states include Australia, Austria, Belgium, Canada, Finland, France, Greece, Italy, Japan, Netherlands, New Zealand, Spain, Switzerland, United Kingdom, United States of America.

[11]Descriptive statistics are found in the Appendix.

[12]We carried out several model specification tests. For the "exclusion" decision, variables $WarHistory$ and regional dummies were kept despite their statistical insignificance, because the overall model fit given by the AIC score (AIC=1063.473) was better with these variables than without them (AIC=1067.679). By contrast, $NGroups$ was dropped

The GAM reports a coefficient for any covariate parametrically estimated, along with the effective degrees of freedom (Edf.) and corresponding p-value for non-parametric effects.[13]

The table shows that the smoothing function of group size and prior power, $\widehat{m(\cdot)}$, is a significant predictor for both the decisions of the leader and group. The Edf. in both equations is greater than 1 indicating that the effects of size and power are non-linear, and the p-value indicates this relationship is statistically significant at the 95% level for the leader's decision, and at the 99% level for the group's decision. Since these non-linear effects are statistically significant, we provide a graphical illustration to better interpret these non-parametric results shortly.

First, Table 1 also shows that Exclusion is less likely in countries with higher GDP, and countries with large populations: both effects are significant at the 99% level. Groups

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because the estimate was not statistically significant and including *NGroups* gave a higher AIC (2185.210) than without (AIC=1063.473).

[13]This is because $\widehat{m(x)}$ is the linear combination of multiple smoothing functions of x. In GLMs, knowing the estimated β_j gives us $\beta_j \times x_j$, allowing us to evaluate whether and to what extent x affects the outcome variable. By contrast in GAMS, $m(x) = \sum_{i=1}^{q} b_j(x)\beta_j$ where $b_j(x)$ is one basis function, where knowing a single β_j or $b_j(x)\beta_j$ does not help us much evaluate the extent to which x affects the dependent variable. Rather, what we need to know the overall $\widehat{m(x)}$. Hence, the GAMs estimation do not report a single estimated coefficient for non-parameteric (smoothing) terms. In fact, the coefficient for $m(x)$ is set to 1 by construction. Instead, it reports whether the overall $\widehat{m(x)}$ is statistically significant based on the Bayesian confidence interval, as well as the overall relationship between x and the outcome variable by providing the effective degrees of freedom (edf), e.g. whether x affects the outcome variable linearly (edf=1) or non-linearly (edf>1).

with a history of civil war are not more likely to be excluded, however these groups are significantly more likely to initiate conflict (significant at the 99% level). Further, in a country that contains a higher number of ethnic groups, it is less likely any particular group will go to war (significant at the 99% level).[14] Finally, groups in Sub-saharan Africa as well as North Africa/Middle East are more prone to conflict than the groups in Western countries: both coefficients are significant at the 95% level.

[14]It is possible that the relationship between the number of groups and the likelihood of conflict might not be linear, which would be consistent with our additional estimation result that includes a smoothing function of $NGroups$: there, the likelihood of war increases at first and then decreases with a greater number of groups.

	Exclusion		**Conflict**	
Variables	Estimate	Standard Error	Estimate	Standard Error
constant	-131.2	(1172000)	-6.888	(1.798)***
$m(Size, PriorPower)$	Edf: 19.481, p-value < 0.05			
$m(Size, PriorPower) * Exclusion$			Edf: 9.525, p-value < 0.01	
War History	0.452	(0.240)	0.640	(0.145)***
log GDPpc (lagged)	-0.62	(0.135)***	-0.194	(0.136)
log Population (lagged)	-0.401	(0.083)***	0.139	(0.088)
NGroups			-0.037	(0.013)***
Eastern Europe	39.89	(1176000)	1.338	(0.826)
Latin America	39.19	(1176000)	0.747	(0.866)
Sub-saharan Africa	38.68	(1176000)	1.897	(0.856)**
Asia	38.82	(1176000)	1.552	(0.830)
North Africa/Middle East	38.26	(1176000)	1.811	(0.792)**
s(time)	Edf: 4.934, p-value < 0.01		Edf: 8.186; p-value < 0.01	

** p-value < 0.05 *** p-value < 0.01

Table 1: Estimation Results

To interpret the non-linearities, which support or falsify our main theoretical results, we present the likelihood of exclusion in Figure 3, and the likelihood of conflict (conditional on exclusion) in Figure 4.[15] Each figure gives Response and Contour plots, where a higher likelihood is given by higher points along the Response-axis (left), and a corresponding lighter area in the contour plot (right).

Before we interpret these, it is important to note that the median group in the dataset is only 5% of its country's population: most groups are small. However, since the average group is 17% of the population, the data are highly skewed – some groups are quite large, making up nearly the entire populations of their respective countries. We provide a kernel density plot in the Appendix. Here, it is only important to note that groups exist all along the Size-axis, and since the median group is only 5% of the population and the average is 17% of the population, we consider a mid-sized group to be at roughly the 0.05 to 0.17 markers in each graph since this denotes the "average" group. Low-capacity (small-sized) groups are smaller than average, and high-capacity (large-sized) groups are larger than average. A "high" capacity group is far more to the left in each figure than one might presume.

Figure 3 shows that two groups are likely to be excluded: small groups that are politically powerful, and mid-to-large sized groups with considerable (mid-to-high) political power. These are consistent with the predictions that leaders exclude groups with low-capacity, and high-capacity groups with significant political power. While the theory predicted that low-capacity groups would be excluded regardless of power, the non-constant effect – in which small groups are excluded from dominant-to-monopoly positions, but not from junior-to-senior positions – could be because if these small groups receive any political power in the first place, it might only be at these high levels from which they are likely to be excluded.

The second group likely to face exclusion is a mid-to-large sized group that enjoys a

[15]Figure 4 shows the predicted probability of conflict at time t initiated by a group as function of its size and prior power given that it has been excluded between $t-1$ and t.

senior-to-dominant position, whereas those with lower political positions are left alone. Further, highest capacity groups are also left alone. These fit with the model's predictions that only those high, but not too high, capacity groups with disproportionate political power are likely to be excluded; and further, that the leader is deterred from excluding those highest capacity groups.

What about the likelihood of going to war if excluded? Figure 4 shows that two-sets of groups are likely to enter conflict once excluded: medium capacity groups excluded from junior-to-senior positions, and higher capacity groups with senior-to-dominant levels of power. The latter of these fits the prediction that groups with high, but not highest, capacity will initiate conflict following exclusion. For medium-capacity groups, the results are unclear: recall from Figure 3 that these groups are not as likely to be excluded (the contour plot in this region is dark). In conjunction with this Figure 4, we see that when these groups are excluded, unexpectedly, they tend to go to war. Since the theory predicted that these groups would be downgraded, and not excluded, which is supported by Figure 3, we leave this puzzle of their exclusion and violent reaction for future research.

What about for low-capacity groups? As predicted by the theory, even though low-capacity groups are likely to be excluded, as seen in Figure 3, they are unlikely to enter conflict. This supports the theoretical prediction that leaders exclude low-capacity groups who hold no deterrent threat.

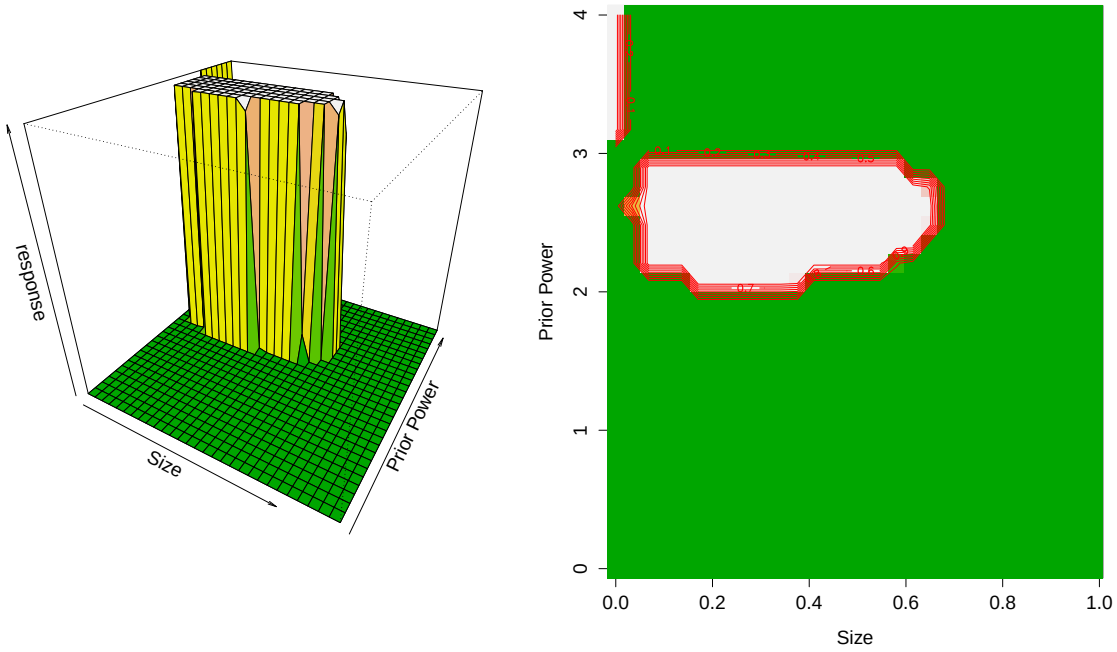

Figure 3: Likelihood of Exclusion

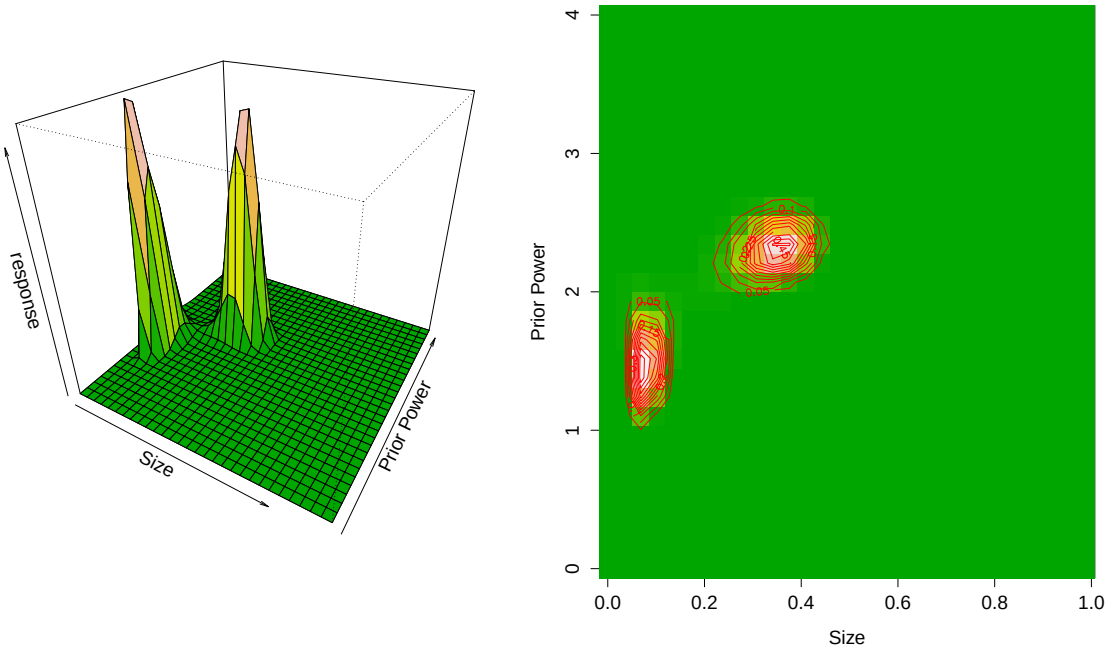

Figure 4: Likelihood of Conflict

4.4 Robustness Checks

We included covariates in separate regressions for whether a group is rural or urban, a group's population density per square-kilometer, and whether a group borders transnational ethnic kin (Vogt et al. 2015). None of these factors were statistically significant in either equation. Our main results for group size and prior power were unaffected.

In addition, we investigated an alternative operationalization in which we lagged *Exclusion* and *Prior Power* by five years. Rather than considering exclusion from one year to the next, *prompt exclusion*, this asks what causes *slow political exclusion* – exclusion drawn out over time – and when is conflict likely from that slow exclusion. The results are given in Table 2 with corresponding Figures 5 and 6.

We find that low-capacity groups, who were likely to face prompt exclusion, are *unlikely* to be excluded slowly. This makes sense given the theory: a leader is not deterred from excluding a low-capacity group, and immediately removes them from power. Figure 5 also shows that high capacity groups that were likely to face prompt exclusion, are also likely to face slow exclusion: for these groups, political exclusion can occur in an immediate or extended process.

Interestingly, conflict is unlikely from these high capacity groups, as seen in Figure 6. This indicates that a high capacity group is more likely to go to war after a prompt exclusion, rather than a slow removal from power. The results also show that, overall, conflict is unlikely from a slow exclusion process – with one notable exception. Conflicts occur against *highest capacity groups* that are excluded slowly, and *unexpectedly*, form monopoly positions of power: these are *unexpected* in the sense that their slow exclusion is unlikely as seen in Figure 5.

	Exclusion		**Conflict**	
Variables	Estimate	Standard Error	Estimate	Standard Error
constant	-688.4	(1172000)	-7.158	$(1.789)^{***}$
$m(Size, PriorPower)$	Edf: 22.740; p-value < 0.01			
$m(Size, PriorPower)Exclusion$			Edf: 5.561; p-value < 0.01	
War History	0.768	$(0.105)^{***}$	0.592	$(0.145)^{***}$
log GDPPC (lagged)	-0.709	$(0.067)^{***}$	-0.174	(0.136)
log Polulation (lagged)	-0.410	$(0.040)^{***}$	0.145	(0.086)
NGroups			-0.035	$(0.012)^{***}$
Eastern Europe	528	(1172000)	1.333	(0.826)
Latin America	527.2	(1172000)	0.770	(0.866)
Sub-saharan Africa	526.9	(1172000)	1.869	$(0.856)^{**}$
Asia	526.9	(1172000)	1.563	(0.832)
North Africa / Middle East	526.1	(1172000)	1.846	$(0.792)^{**}$
s(time)	Edf: 7.284; p-value < 0.01		Edf: 8.401; p-value < 0.01	

** p-value < 0.05 *** p-value < 0.01

Table 2: Estimation for Slow Exclusion

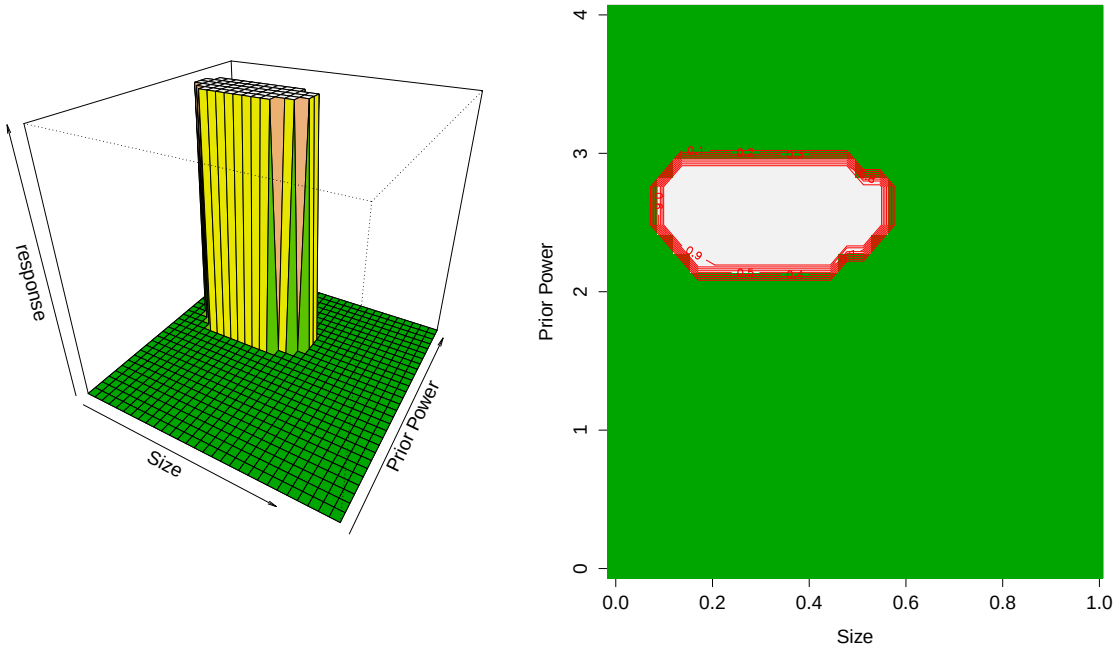

Figure 5: Likelihood of Slow Exclusion

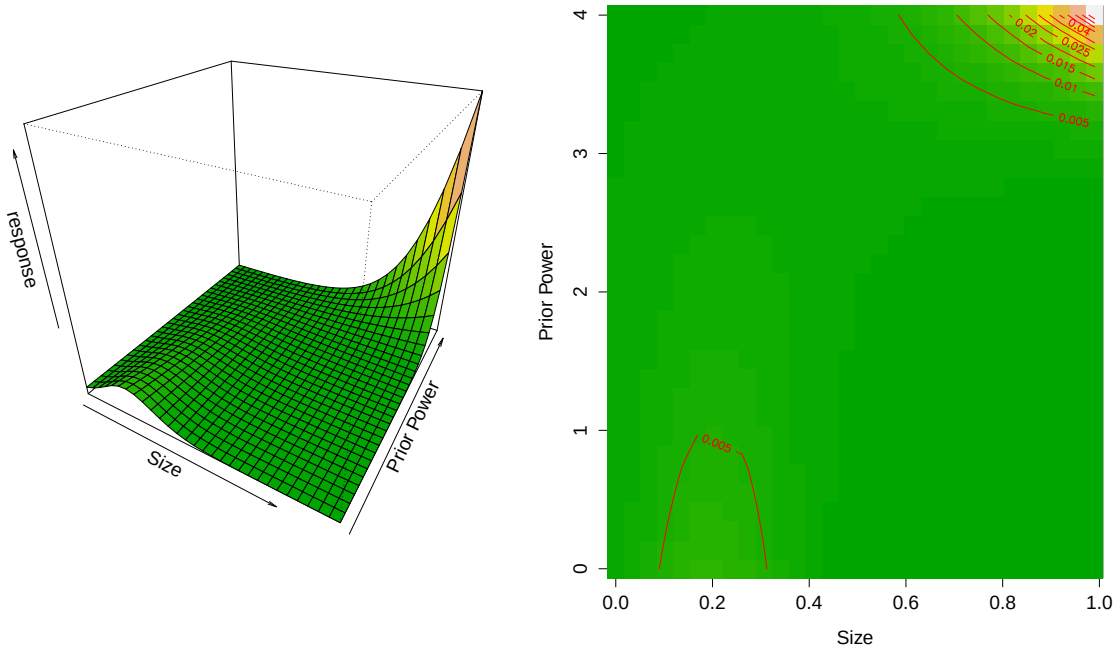

Figure 6: Likelihood of Conflict from Slow Exclusion

5 Discussion

Why would a leader exclude a group if exclusion makes civil war more likely, and if minor adjustments might keep all parties satisfied? The model and empirics show that leaders exclude in two situations, and one of these leads to war. First, a leader excludes a low capacity group that lacks credible threat to use violence, and peace is maintained. Second, the leader uses exclusion to incite a war against a high, but not too high, capacity group with disproportionate political power, which results in war. The model also shows that downgrades do increase peace: since a medium capacity group remains peaceful if downgraded, but not if excluded, the leader downgrades to adjust power-sharing without war.

War requires both a group's commitment problem and the leader's opportunity (see also Powell 2004; Powell 2006; Fearon 1995). Since a group with sufficiently high capacity cannot commit to peace if its power is adjusted, the leader faces a choice between the war that will ensue if she adjusts and her political losses should she maintain the status quo. The model and empirics concur that against a highest capacity group, the leader is deterred: the commitment problem is present, but the leader's opportunity is not, and thus, here, the commitment problem is not sufficient for war. However, when a group is both politically powerful and insufficiently capable of mobilization, the leader uses exclusion to incite war as a gamble for full control over the state. As in Garfinkel and Skaperdas (2000), the presence of the commitment problem and the all-or-nothing nature of war means that the leader cannot forego her opportunity to secure a permanent advantage.

The empirics support the model in showing how the likelihoods of exclusion and war operate in two dimensions, capacity and prior power. Low capacity groups are likely to be excluded, and unlikely to respond with violence. High capacity groups are likely to be excluded when they hold powerful political positions, but not with less political power. Further, when these high capacity groups are excluded, war is likely. Groups with the highest capacity are left alone. All of these results fit with the anticipated non-monotonic effects across both dimensions, capacity and prior power-sharing, as predicted

by the model.

The robustness checks also support the theoretical intuition, while raising new questions. Leaders promptly exclude low capacity groups (within a year), and both promptly or slowly (over the course of five years) exclude high capacity groups. This aligns with the intuition that leaders weigh the chances that a group will respond with violence, given capacity, in deciding whether and how to exclude.

Novel to this literature, we find that high capacity groups are violent only when they are excluded promptly; and peaceful when excluded slowly. Further, only those highest capacity groups (unexpectedly removed from top positions) go to war following their unlikely (and slow) exclusions. Since we know of no literature on slow political exclusions, our results raise the following question for future research: since war may hinge upon the speed of political adjustments, what are slow exclusions and how are they used?

Overall, our findings speak to conceptions that power-sharing increases democratic representation and stability. For example, as Fearon (1998) argues, when a minority is threatened by the tyranny of a majority and prefers an immediate war over an unequal future peace, the promise of power-sharing can provide a democratic solution. The minority will put down its weapons knowing that its future bargaining power is institutionally secured.

Our paper shows that power-sharing, once instituted, can fail to provide representation and stability in two ways. First, since low capacity groups are excluded and unlikely to go to war, our paper implies that leaders can block minority representation – often without consequence. Thus, even though one hopes that power-sharing will mitigate one layer of a commitment problem – when a majority (or powerful leader) cannot commit to share power with a minority, as Fearon (1998) highlights – power-sharing often fails once implemented. One solution for this might be to include provisions in which minority groups are elected *firmly* into political positions – allowing neither the leader nor majority to alter the powers of sufficiently small groups.

Second, since high capacity groups face exclusion and war, this paper shows that

power-sharing can increase *instability* by creating opportunities for leaders to incite wars against powerful groups. Further, to the extent that a group's participation in war might make political re-entry difficult, a leader might use exclusion to keep these powerful groups *locked out* of the political arena. Should the leader remain in power, and the group remain locked out, this phenomenon may result in continued violence against a group with high capacity for rebellion. While not tested here, this provides one potential explanation for why certain democracies fail to consolidate, why nascent democracies tend to be unstable, and why power-sharing may fail to resolve ethnic conflict (Mainwaring and O'Donnell 1992; Linz and Stepan 2011; Cederman, Wimmer, and Min 2010; Gurr 2000; Wimmer, Cederman, and Min 2009; Gurr 1993).

To prevent this, power-sharing must entail provisions that prevent a high capacity group's commitment problem – the gateway through which the leader discovers this opportunity. If instead, the group were committed to long-term power-sharing, even with diminished political power, then the leader would not have opportunity to invoke war. We can assert this since the model shows that the leader will adopt a peaceful downgrade, where possible, without war. Thus, *counter-intuitively* – and what has gone unnoticed in previous literature – is that for power-sharing to be stable, power-sharing must create incentives for *high capacity groups* to remain committed to political outcomes.

One solution might be, for example, if downgrades are expected to be *short-term* – because elections ensure political alternation, and the group can anticipate its own future adjustments – then the leader's opportunity to invoke war is removed. In other words, one conclusion of these results is in support of Schumpeter, or Przeworski's minimalist definition of democracy: democratic processes must ensure that politicians can lose elections and will leave office if they do (Przeworski 2000).

However, the model also gives warning: should power-sharing not entail provisions to prevent these two types of exclusion, then power-sharing alone, even with flexibility to make minor adjustments to political power, poses significant challenges for democracy and stability – namely, layers of commitment problems and political opportunism. Since the relationship between power-sharing, exclusion, and war is non-monotonic in both

group capacity and prior power, power-sharing is sometimes beneficial and other times not. Straightforwardly, these non-monotonicities make it difficult to judge whether power-sharing improves or worsens politically tenuous situations.

6 Conclusion

This paper generalizes the relationship between power-sharing, political exclusion, and war by formalizing a leader's decision to exclude, and an ethnic group's response to use violence or not. The model establishes a theory to explain how power-sharing causes both exclusion and war. Since civil wars turn power-sharing into an all-or-nothing game, and a group with high capacity cannot commit to peace with *any* reduction in power, a leader will incite a war by excluding that group as a gamble for full control. Thus, when a leader faces a politically powerful and insufficiently capable group, power-sharing leads to exclusion and war.

By specifying the conditions for exclusion, downgrade, and war, the model addresses several existing puzzles. Why do leaders exclude groups, especially large groups, if exclusion makes war more likely? Why exclude, if a political downgrade might keep all parties satisfied? The model shows that a leader uses exclusion in two cases, and only one of these leads to war. Leaders exclude low capacity groups, *peacefully*, and intentionally spur wars by excluding high capacity groups. Further, peaceful downgrades occur against medium capacity groups – when there is no commitment problem. Highest capacity groups deter the leader from making any adjustment – when there no opportunity for a profitable gamble. The resulting non-monotonic effects align with the theory: war occurs when the group's commitment problem meets a leader's political opportunity. Further, we find evidence of the anticipated non-monotonic effects across both dimensions of group capacity and prior power on the likelihoods of exclusion and war.

This adds to recent scholarship that views ethnic conflict to be the result of political struggles between the state and an ethnic group by providing a rationalist explanation of exclusion and war (Cederman, Wimmer, and Min 2010; Roessler 2011; Wimmer, Ced-

erman, and Min 2009). It also explains why exclusion occurs in a *least likely* case: when a leader knows *with certainty* that exclusion will result in war, and can make any minor adjustment to keep both parties satisfied. Further, the theory fits more closely with relevant contemporary situations given the recent literature on political downgrades.

This research identifies that power-sharing's relationship with democracy and stability faces two key challenges. First, to ensure democratic representation, power-sharing must prevent a leader, or majority, from politically downgrading or excluding members of small minority groups. Second, power-sharing must create incentives for high-capacity groups to remain committed to continue to peacefully share power, even when power is reduced. Without addressing these concerns, the resulting non-monotonicities make it hard to tell how power-sharing, on the whole, affects democracy and stability.

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7 Online Appendix

7.1 Theoretical Extensions

One challenge to the model is that in reality, a leader confronts not just one but multiple ethnic groups, $k = 1, 2, ..., n$, that are not accounted for in the formal model. Under specific conditions, one can consider the model here to represent the interaction with multiple ethnic groups.

Consider first the chance that ethnic groups do not form coalitions. In such a model, λ_k represents the share of power for ethnic group k, and the leader's total power is represented by $1 - \sum_k \lambda_k$. The results of this interaction between the leader and each ethnic group remains the same: the leader permits a specific level of power for each group k given that group's capacity, $\kappa_k(\psi)$. Since the interaction concerns only two actors at any time (the leader vs. one ethnic group among many), the equilibrium is unchanged: some high capacity groups will be too strong to remain satisfied if their power is adjusted, but not strong enough to deter the leader.

Let us now alter that condition to account for coalitions of ethnic groups, who agglomerate resources and rebel together (assume that there is no collective action problem here, and that groups will coordinate). In this model, a coalition of ethnic groups, $c \subseteq k$, threatens to coordinate to form a larger rebellion. Assume that this coordinated rebellion occurs if the coalition's total political power allotment falls below a threshold θ_c, so that rebellion occurs if $\sum_c \lambda'_k < \theta_c$. Assume further that each group's capacity is different, such that the groups can be ordered according to their capacities, $(\kappa_1, \kappa_2, ..., \kappa_N)$. In this case, the leader must satisfy the minimal majority of groups to prevent a coalition that maintains the peace, wherever the leader prefers that peace be maintained. And where the leader does not prefer that peace be maintained, the leader will exclude the coalition members and fight a war for the entire state. This equilibrium would bear similarity to the results here, except that in this case, one might observe small ethnic groups fighting alongside higher capacity groups: the leader gambles on war when faced with a high-but-not-too-high capacity *coalition* that demands a disproportionately high proportion

of power, θ_c. In this case, the theoretical mechanism that leads to ethnic conflict remains the same.

However, there is reason to believe that cross-ethnic coalitions are unlikely. Given the literature on ethnic group stability, cross-ethnic groups are likely to collective action problems (Robinson 2003; Caselli and Ii 2006). When collective action problems make forming cross-ethnic coalitions difficult, suppose that the leader could offer a group some minimal amount of political power, to keep it from joining the coalition, and that each group preferred some power to none. This situation is similar to Ferejohn (1986), in which the incumbent seeks to satisfy the minimum coalition of voters necessary to retain power. In that model, as long as each voter prefers to be in the winning coalition, and prefers some policy satisfaction to none, then the incumbent can play voters off against each other to push each voter's satisfaction toward zero. Each voter is essentially competing to be part of the leader's wining coalition. As Ferejohn (1986) states that "In the face of heterogeneous preferences, then, the incumbent has both the opportunity and motivation to play off the voters against one another. The result is that the incumbent is entirely *uncontrolled* by the electorate (21, emphasis added)." Given this logic, if ethnic groups face collective action problems in forming coalitions, and have heterogeneous preferences, then the leader can play any potential coalition members against each other – ultimately allotting zero political power to any coalition member, and resulting in no cross-ethnic coalitions.

7.2 Empirical Appendix

Table 3 and Figure 7 describe the data. The mean number of ethnic groups is 14.56, and the maximum number of ethnic groups is 58 for Russia.

As for group population size, most groups are quite small relative to the country's population as seen in the kernel density plot of group size in Figure 7. The median group is only 5% of the country's population. Thus, we consider a group with 5% of the entire population to be mid-sized group. The average group is only 17% of the country's population, which is larger than a median group because the size of ethnic

groups are highly skewed. Note that in robustness checks (with five year lags) the data were restricted to 1950 to 2010, however, for the main tests the data are from 1946 to 2010.

Variable	No. Obs	Mean	Std. Dev.
NGroups	32879	14.557	17.625
Exclusion	32879	.003	.056
Conflict	32879	.004	.061
Prior Power-Sharing			
Level0 (No Central Power)	32879	.650	.477
Level1 (Junior Partner)	32879	.162	.369
Level2 (Senior Partner)	32879	.087	.282
Level3 (Dominant Power)	32879	.059	.236
Level4 (Monopoly)	32879	.041	.197
Group Size	32878	.169	.259

Table 3: Descriptive Statistics

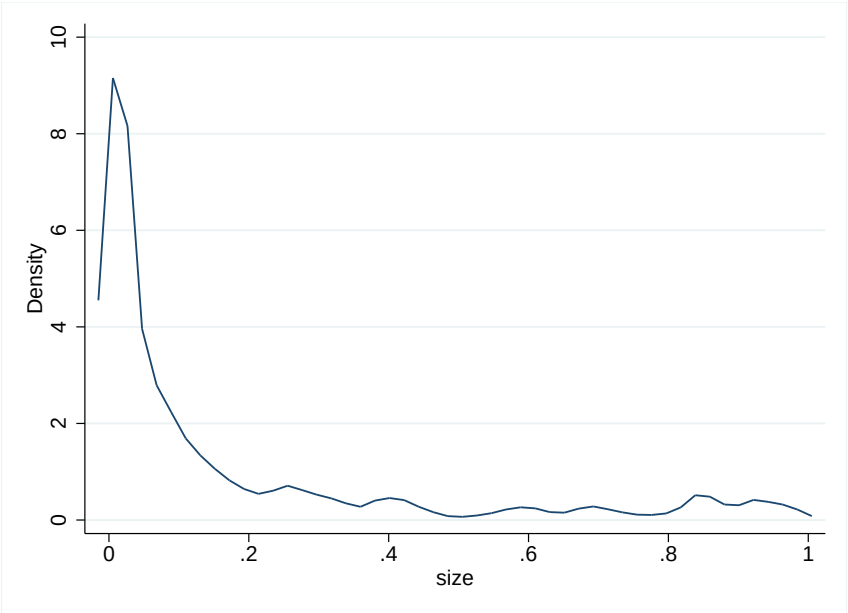

Figure 7: Kernel Density Plot of Group Size

To examine whether how ethnic group's size and prior power-sharing affect the leader's decision to exclude an ethnic group and the ethnic group's decision to resort to an ethnic war is robust to including other potentially important factors of exclusion and ethnic conflict, we have included potentially important variables in the estimation. In particular, we considered an ethnic group's rural vs. urban status, an ethnic group's population density per km^2 as well as whether a group is a transnational ethnic kin (Vogt et al. 2015). We found that while the smooth function of ethnic group's size and their prior power level continued to be important both in the exclusion and ethnic conflict models, none of these factors were statistically significant in both equations.

Also, we estimated the exclusion and ethnic conflict models by changing the operationalization of $Exclusion$ and and $PriorPower$. That is, instead of defining the exclusion as a decrease in power from some level of central-power in the previous year to no central-power sharing in the current period, we considered the decrease in power for the past five years. Also, instead of using one year lag of power status to define $PriorPower$, we consider a five-year lag. The estimation results using these alternative operationalization of main variables are shown in Table 2. The table shows that for the effects of all control variables were substantively similar to our main results, although having a civil war experience in the past ($WarHistory$) now increase the group's likelihood of being excluded from central power in the alternative model.

The probability of exclusion given the tensor product smoothing terms for the group size and levels of prior power-sharing $m(Size, Conflict)$ with the alternative operationalization of $Exclusion$ and $PriorPower$, is presented in Figure 5. The groups whose size is between 15% and 60% whose prior power are either at "Senior Partner" or "Dominant Power" levels are highly likely to be excluded from central power, which can be considered to be large-capacity group given the kernel density of group size. While the high likelihood of exclusion of the high-capacity group with disproportionately high level of prior power is consistent with the formal model and with the main estimation result, this model with an alternative measure of exclusion did not identify the small-sized or small-capacity groups as being highly prone to exclusion.

The alternative measures of exclusion and prior power led to a substantively different result of the predicted probability of ethnic-conflict at time t compared to the main result. Figure 6 shows that with alternative measures, the largest sized groups with disproportionately large central power (at level 4) has the largest probability of engaging an ethnic conflict once excluded from power. Recall that the formal model's prediction was that ethnic-conflict would result from the exclusion of high-capacity, powerful groups.