Mobility and Conflict

Sourav Bhattacharya Joyee Deb Tapas Kundu*

February 2014

Abstract

We study the role of inter-group mobility in the emergence of conflict. Two groups compete for the right to allocate society's resources. We allow for costly inter-group mobility. The winning group offers an allocation, that the opposition can accept, or reject and wage conflict. Agents can also switch group membership. Expropriating a large share of resources increases political strength by attracting opposition members, but implies a higher threat of conflict. Our main finding is that the possibility of inter-group mobility affects the likelihood of conflict in a non-monotonic way: Open conflict can arise at intermediate costs of mobility.

*Bhattacharya: University of Pittsburgh, 4528 Wesley W. Posvar Hall Pittsburgh, PA 15260, sourav@pitt.edu Deb: New York University, 44 W 4th St. New York, NY 10014, joyee.deb@nyu.edu Kundu: University of Tromsø, School of Business and Economics, Email: tapas.kundu@uit.no **Acknowledgements**. We are grateful to Bård Harstad, David Hugh-Jones, Alessandro Lizzeri, Espen Moen, Kalle Moene, Debraj Ray, Ragnar Torvik and seminar participants at Indian Statistical Institute, Michigan State University, NYU Stern, University of Oslo, UECE meetings in Lisbon, European Economic Association conference at Oslo, The Game Theory World Congress in Istanbul and Conference in New Direction in Applied Microeconomics in Florence for many suggestions. While carrying out part of this research, Tapas Kundu was associated with the Centre of Equality, Social Organization, and Performance (ESOP) at the Department of Economics at the University of Oslo. ESOP is supported by the Research Council of Norway. An earlier version of the paper was circulated under the title "Conflict and Mobility: Resource Sharing Among Groups."

Keywords: Conflict, inter-group mobility, political competition, resource allocation

In divided societies, the group in power often engages in rent expropriation, and the opposition mobilizes its members in conflict to alter the balance of political power. The starting point for this paper is the observation, that a ruling group's ability to expropriate and the opposition's incentive to organize in conflict can depend on the extent of mobility between groups. The ease of inter-group mobility varies widely, and is determined by the specific dimension of social cleavage: For example, while racial groups are watertight, it is easier for people to convert from one religion to another or to switch party allegiance. It is well-recognized that the nature of social cleavages affects the nature and frequency of political conflict, but existing literature does not provide a unified theory connecting conflict with mobility.[1] Our main objective is to provide a framework that explains the relationship between conflict and the extent of inter-group mobility. While there is a large body of literature that studies redistribution and conflict, our point of departure is that we study resource sharing in settings in which group membership is a costly, endogenous choice of people in society.

In a world with inter-group mobility, there are two possible responses to a policy of economic expropriation pursued by the group in power. First, the opposition can collectively mobilize in conflict to overthrow the current regime, and this threat can constrain the ruling group's rent-seeking incentive. Second, opposition members may choose to move over to the group in power to access more resources. This also constrains the ruling group as such infiltration reduces the per-capita rents of the ruling group. We characterize the extent of expropriation that arises in equilibrium

[1] See, for instance, Caselli and Coleman (2013), Esteban and Ray (1994, 1999, 2011), Esteban, Mayoral and Ray (2011), Gurr and Harff (1994), Horowitz (1985, 2001), Fearon (1999, 2006), who present evidence of conflict along various social cleavages, such as race, ethnicity, religion, caste, language, geography or ideology.

as a result of these two forces. We show that the extent of expropriation is non-monotonic and may be highest at moderate levels of inter-group mobility.

Most importantly, one the key insights from our analysis is that possibility of endogenous mobility across groups can increase the likelihood of conflict in society. Put differently, if mobility were very costly (or impossible), then conflict would not arise in equilibrium. Rather, we would see the incumbent sharing resources with the opposition in order to prevent conflict. Indeed, we show that conflict arises only at intermediate levels of mobility.

To establish these results, we develop a simple model with four main features, that capture a typical situation of distributional conflict.

i) First, society is divided into two groups that compete for political power. The winner of the political contest proposes how to allocate society's resources.

This is commonly assumed in the literature on redistributive conflict (Acemoglu and Robinson (2000), (2001), Padró i Miquel (2007)). The underlying logic is that, redistribution is a result of a bargaining process between different groups, with the group in control of the state apparatus having the ability to set its terms within limits acceptable to the other groups. We assume that in each period, the ruling group gets chosen either through a default political process or as a result of conflict, and proposes how society's resources are shared.

ii) Second, transfers can be targeted to specific groups, but not to specific individuals.[2]

The group in power decides how society's resources will be divided among the two groups. Examples of group-based resource allocation are ubiquitous. A

[2] Acemoglu and Robinson (2006) provide a discussion of redistributive politics with transfers that can be targeted to groups with fixed sizes. See Pages 107, 207.

prime example is India, where different religious, caste-based groups compete for group-based reservation of limited resources, such as government jobs or access to higher education (See Chandra (2004)). In addition, there are examples of other social cleavages, including language, ethnicity, profession, party allegiance or geographic location, being used as a basis of distributing economic resources (See, Laitin (2007)).

iii) Third, members of the group without political power can wage conflict or change group membership in order to improve their current or future share of resources.

After observing the resource allocations, the opposition members can collectively mobilize in conflict or choose to individually switch groups by incurring a personal cost. These are both costly response mechanisms. The opposition's cost of conflict is an opportunity cost: It gives up the opportunity to enjoy its share of surplus in the current period. Conflict can also potentially destroy economic resources. In case of no conflict, the ruling group's resource allocation decision can still affect which group people in society want to belong to. For example, the allocation of jobs based on party allegiance may influence individuals' choices of switching membership between parties. Redistribution of resources based on geography can affect the incentives for people to migrate.[3] Barth (1969) provides evidence of people changing ethnic identities in response to certain circumstances. Caselli and Coleman (2013) provide many other examples of endogenous choice of group affiliation (e.g., Tamil parents in Sri Lanka giving Sinhalese names to their children, or African-Americans who passed into the white community). But, switching group identity can be costly: One might have to invest in a new social network, incur

[3]Other examples include sectoral redistribution of resources between the agricultural and industrial sector affecting the opportunity costs of individuals and their decision to work in their respective sectors.

moving costs, learn an unfamiliar trade, or suffer the hostility of members of one's current group.[4] At the same time, the option of moving across groups increases the opposition's opportunity cost of rising in conflict. The substitutability between conflict and mobility as responses is akin to the "exit and voice" mechanism that has been studied in different socio-political contexts.

iv) Fourth, conflict increases the chances of the opposition gaining power in the future, and the influx of new members into a group increases the probability of winning political power in the next period, but reduces the current per capita payoff of the existing members of the group.

We model conflict as any collective action by the opposition that increases its chance of gaining power compared to the default political process. In practice, collective action can be varied–ranging from peaceful political mobilization to violent resistance.[5] Endogenous inter-group mobility has two effects: Infiltration of people into a group dilutes per capita share of resources, but also serves as a political investment, since an increase in the size boosts a group's chances in the political contest in the future. This is consistent with the view of political groups as minimum winning coalitions that are large enough to gain power, but still maximize their per capita rents.[6]

[4]For a given social cleavage, we take the cost of mobility to be fixed. In practice, cost of mobility may also be endogenous. For instance, groups can build very strong identities that make it hard for outsiders to penetrate, or impose a social cost on members who are likely to switch (Laitin (2007)). An example of the second type of behavior is the "acting white" phenomenon among African American and Hispanic students. See, for instance, Austen-Smith and Fryer (2005).

[5]For example, in the Dravidian movement in South Asia, the backward castes organized electorally against the Brahminical control of the Indian National Congress by forming a party called DK (Dravidar Kazhagham) under Periyar E.V. Ramaswamy. In contrast, the Jaffna Tamils in Sri Lanka attempted to use violence under the leadership of LTTE to protest against the dominant Sinhalese. Caste politics in North India combines elements of both.

[6]Bates (1983) emphasizes this trade-off in his argument for the political salience of ethnicity: "Ethnic groups are, in short, a form of minimum winning coalition, large enough to secure benefits in the competition for spoils but also small enough to maximize the per capita value of these benefits."

We present a tractable two-period model with these features: In a key result of the paper, we provide a complete characterization of the resource allocations, group membership decisions and conflict decisions that arise in equilibrium. We find that sharing does occur in equilibrium. The two mechanisms of conflict and mobility act as constraints to expropriation, and the optimal sharing is dictated by whether and which constraint binds. In the unique equilibrium, three different regimes can arise. The first type of regime, which we call *no-conflict regime*, is one in which the opposition does not engage in conflict, and the ruling group allocates resources to induce the optimal amount of switching. The second possible regime is called *open-conflict regime*, and here, the ruling group keeps everything for itself. The opposition responds by engaging in conflict. Finally, there may be a *peaceful-belligerence regime*, in which the opposition does not engage in conflict, and the incumbent shares just enough resources with the opposition to prevent them from engaging in conflict.

Switching across groups occurs in equilibrium in both the no-conflict and peaceful-belligerence regimes. The conflict constraint plays a role in the open-conflict and peaceful-belligerence regimes: In the open-conflict regime, both the ruler and the opposition get a higher payoff from conflict, and, therefore, conflict emerges. In the peaceful-belligerence regime, the ruler strictly prefers to avoid conflict, and so shares enough to make the opposition indifferent between conflict and no conflict.

The main contribution of this paper is to show that the possibility of endogenous mobility affects the likelihood of conflict in society in a non-monotonic way. The driving force is the fact that agents can always switch group membership after they see the proposed allocation: This constrains the set of allocations that can be implemented. In particular, we see conflict arise in our framework when it would not have arisen with fixed group sizes. The allocations that Pareto dominate the conflict outcome in an environment with fixed group sizes, cannot be implemented because they would induce people to switch membership, in a world with mobility: Opposition members would infiltrate the incumbent group, thus reducing per capita share and making these allocations sub-optimal.

In fact, at the extreme, when endogenous mobility is impossible, (the cost of switching groups is prohibitive), then, conflict does not arise in equilibrium. Rather, we see the peaceful belligerence regime, where the ruling group prefers to share resources with the opposition to avoid conflict. It turns out that peaceful belligerence is more likely to occur when a majority rules. Empirical evidence suggests many examples of societies divided along lines of ethnicity or race (in which cost of mobility is naturally very high), where there is no conflict over resources, and indeed, resource sharing occurs. To illustrate, one example is democratic politics in India, where there is a wide range of reservation policies for backward castes and religious minorities (by which economic resources are shared), that have mitigated the threat of conflict. Padró i Miquel (2007) also cites examples of some autocratic regimes (such as Houphouet-Boigny in Ivory Coast) where, somewhat surprisingly, rulers even from majority ethnic groups transfer resources to the opposition. To the best of our knowledge, this paper is the first to provide a theoretical foundation for this phenomenon.

We show that open conflict arises only at an intermediate cost of mobility. The intuition is that a high cost of mobility implies a high premium from gaining power in the future: This means that the opposition's incentive to engage in conflict is high when the cost of mobility is high, and the ruling group's incentive to induce conflict is high when cost of mobility is low. Open conflict thus occurs when the cost of mobility is in an intermediate range. We also show that a small ruling group would be more prone to instigate conflict as its short-term per capita gain from full appropriation is high.

When moving across groups is easy, then mobility acts as a low-cost substitute to waging conflict: The opposition's opportunity cost of conflict becomes high, as its members can switch their group identity at low cost. In this situation, our model predicts that no conflict occurs. The mobility constraint dictates the optimal sharing rule. The group in power aims to maintain an optimal size, large enough to increase the probability of staying in power, but small enough to still have a high per capita share of resources. This optimal group size is endogenously determined, and if the initial size of the ruling group is below the optimal group size, we observe switching in equilibrium. Examples of switching towards the powerful group is not uncommon in history. Post-Reform Europe witnessed a series of religious switching (back and forth between Catholicism and Protestantism), depending on which denomination had the stronger political alliance. Caselli and Coleman (2013) obtain a result that is similar in spirit.

In most of the paper, we consider a setting in which people cannot switch groups during times of open conflict. This is consistent with the stylized fact that members within a group behave more cohesively during times of conflict. However, in an extension, we also discuss how equilibrium outcomes might change if people could also switch groups during conflict.[7]

Finally, in this paper, we treat the extent of inter-group mobility (measured by the cost of mobility) as exogenous–a primitive that depends on the existing social cleavages. However, our framework allows us to ask how much mobility across groups an incumbent would ideally permit, if this were an endogenous choice. For instance, people in society may differ in ethnicity and language, and the ruling group may be able to choose the dimension along which resources will be split. Since the cost of mobility effectively increases a group's premium from being in power, we should expect ruling groups to always prefer a maximal cost of mobility. However, we find that incumbents may prefer a social division with an intermediate

[7] See Section III.G for a detailed discussion.

cost of mobility: This happens when conflict is a strong threat, i.e., it sufficiently reduces the chances of the incumbent retaining power.

Related Literature

This paper contributes to the large literature on conflict in divided societies. The existing literature argues that inter-group differences can matter in political coalition formation and, thereby, in political conflict. Fearon (2006) argues that inter-group heterogeneity and intra-group homogeneity help political entrepreneurs mobilize people based on group identities. Bates (1983) suggests that group identities matter for forming coalitions in distributional conflict over political goods. Closer to our work are Fearon (1999) and Caselli and Coleman (2013), who consider the possibility of inter-group mobility. Fearon suggests that distributive politics favors coalitions based on unchangeable characteristics "because it makes excluding losers from the winning coalition relatively easy." Caselli and Coleman (2013) are the first to develop a model that allows inter-group mobility. They find that the likelihood of conflict increases with the cost of mobility. We generate a starkly different set of predictions. We find that the ease of mobility actually increases the likelihood of conflict. In particular, unlike in Caselli and Coleman (2013), conflict would not arise in our model if mobility were impossible. In a situation with a high cost of mobility, while the opposition has a strong incentive to engage in conflict to seize power, the incumbent wants to share resources to mitigate conflict. This tension can result in a peaceful-belligerence equilibrium–an aspect consistent with empirical observation, but not captured in previous work. Our work suggests that conflict (and consequent expropriation) arises when excessive mobility threatens to dilute the incumbent's per capita share – this happens at intermediate levels of cost of mobility. These predictions are driven by a substantive difference in how conflict and mobility are modeled. Caselli and Coleman (2013) study a model in which one group can exclude another from a public good, and the members of the excluded group may switch to the other group. Exclusion is synonymous with conflict. On the contrary, in our model, economic exclusion and conflict are separate phenomena determined endogenously in equilibrium. Caselli and Coleman (2013) do not consider the possibility that if enough resources are shared with the opposition, it might be prevented from engaging in conflict.

This paper is also connected to the literature on the relationship between conflict and measures of fragmentation in societies. One class of such measures depends on the distribution of group size alone. For example, the Hirschman-Herfindahl *fractionalization index* (Hirschman (1964)) is widely used in empirical studies on conflict.[8] Subsequent work introduced *polarization indices* that incorporate inter-group heterogeneity through a notion of inter-group distance (Esteban and Ray (1994)).[9] Recent work by (Esteban and Ray (2011)) argues that fractionalization measures that do not depend on variations in inter-group differences cannot capture the extent of division in societies, and find that the polarization measure is significant in predicting social conflict. We view our work as complementary to this literature. Our model suggests that measures of division in societies, as a predictor of conflict, must incorporate information on both group sizes and inter-group differences.

We also contribute to the literature on conflict and rent seeking (e.g. Grossman (1991), Hirshleifer (1995), Azam (1995), Azam (2001), Esteban and Ray (1999), Esteban and Ray (2008), Acemoglu and Robinson (2001)).[10] However, our paper is substantively different in that we are interested in relating inter-group mobility to conflict.

---

[8]Though widely used, the empirical connection is not always strong (Collier and Hoeffler (2004), Fearon and Laitin (2003), Miguel, Satyanath and Sergenti (2004).

[9]For other references on measures of polarization, please see Esteban, Gradín and Ray (2007).

[10]Garfinkel and Skaperdas (2007) provide a comprehensive survey of this literature.

Finally, our work is related to a vast empirical literature on inter-group conflict. Collier (2001) and Alesina and La Ferrara (2005) provide useful surveys of this literature. In our framework, conflict and economic rent seeking are simultaneously determined, and the equilibrium amount of rent seeking varies non-monotonically with respect to inter-group mobility. These results have testable implications, and a systematic empirical analysis would be very interesting.

The rest of the paper is organized as follows. Section I contains the model. In Section II, we characterize the resource allocations and the regimes that arise in equilibrium. In Section III, we discuss the key implications and empirical predictions of our paper. Section IV concludes. Most proofs are in the Appendix.

I Model

Consider the following two-period game. There is a continuum of agents of measure 1. Members of society are divided into two groups A and B. In each period, a fixed amount of resources (normalized to 1) must be divided between the two groups.[11] Agents can participate in some economic activity, and the resources are productive inputs that agents can use to enhance their payoffs from economic activity.

Each period ($t = 1, 2$) starts with a ruling group W_t. (We use the terms ruling group, winning group and incumbent interchangeably). At the start of period 1, suppose that the size of the winning group is π_0. Without loss of generality, we assume that the group with political power at the start of the game is group A. The winning group proposes a sharing rule α_t, where α_t is the fraction of resources to be retained by the ruling group. Once the ruling group announces the split α_t, the

[11] Our results are unchanged as long as the size of resources in each period is independent of the group sizes.

losing group (opposition) L_t can choose to either accept its share or reject it.

If the opposition rejects the sharing rule, the ruling group retains all the resources in the current period, and the opposition mobilizes its members in conflict. Engaging in conflict is a group decision taken by the opposition.[12] In terms of current-period payoffs, conflict is socially wasteful: A fraction $(1 - k)$ of the entire surplus gets destroyed. The opposition group gets zero economic payoff in the current period, and the incumbent group enjoys the remaining surplus.[13] The game moves to the next period with a possibility of regime change. The ruling group stays in power with probability $p_c(\pi_t)$ where π_t denotes the size of the ruling group in the current period. We call $p_c(\cdot)$ the conflict success function.

If the opposition accepts the sharing rule, each individual (in W_t and L_t) decides whether to remain in his own group or to switch to the other group.[14] Individuals can change groups at a cost $\phi \in [0, 1]$. The parameter ϕ measures how difficult it is to assimilate into a different group. For example, ϕ may represent the cost associated with entry barriers such as language-based discrimination. In other contexts, ϕ may measure the extent to which groups are able to discriminate; for instance, it is easy to discriminate based on skin color or racial identity, making such groups hard to infiltrate (high ϕ).[15] Here, while switching groups is costly, the cost is bounded. In particular, $\phi \leq 1$ implies that if the ruling group keeps all resources for itself, it

[12]We ignore the collective-action problem here. Think of a leader being able to coordinate the decision to wage conflict.

[13]We could have an alternative specification of the model in which the incumbent can retain $k\alpha_t$ in conflict rather than simply k. Here, the interpretation is that after the incumbent decides the allocation, the opposition chooses to either consume its share of resources in productive economic activity or to invest it to mobilize conflict. It can be easily shown that, also, in this case, $\alpha_1 = 1$ is the *strictly* optimal allocation for the incumbent.

[14]Here, switching is allowed only if the sharing rule is accepted. Our results would be qualitatively unchanged if we allowed mobility also after conflict. Please see Section III.G for a detailed discussion.

[15]As mentioned before, in reality, ϕ may be endogenous: A group can decide to discriminate against members who have infiltrated from a different group and effectively increase the cost of mobility. In this paper, we take ϕ as exogenous.

would be profitable for all members of the other group to switch over.[16]

Switching changes the size of the groups. Let π_t and $1-\pi_t$ denote the sizes of the groups at the end of period t, after individuals have taken group membership decisions. If a group of size π_t gets fraction α_t of society's resources, the per capita payoff that its members get from economic activity is given by $\frac{\alpha_t}{\pi_t}$ (the assumption of linear payoff from resources is made for simplicity).[17] The game then moves to the next period with a possibility of regime change. One group is chosen as the ruler for the next period through a default political process. We abstract from the institutional details of the political contest, and simply assume that the ruler W_t remains in power with the probability $p_d(\pi_t)$. We assume that the political contest success function $p_d(\pi)$ is increasing in group size $\pi \in [0,1]$, and is continuous and twice differentiable. For tractability, we also assume that $p_d(\pi)(1-\pi)$ is single-peaked, and the maximum is attained at $\tilde{\pi} \in (0,1)$.[18]

In our model, a change of regime can take place either through the default political process or through conflict. We interpret conflict as any kind of political activism undertaken by the opposition group that is costly in the short-run–such as violent protests, demonstrations, or mobilization of voters–but can lead to a change of regime with a higher probability. We therefore restrict attention to the case where $p_c(\cdot) \leq p_d(\cdot)$.[19]

[16]We also discuss the case in which moving across groups is "prohibitively" costly for some groups. See Section III.A.1 for a detailed discussion.

[17]We assume that a group's resources are evenly divided among its members. In many contexts, it may be reasonable to assume that resources are shared unequally, based on a hierarchy in the group. We do not address this issue here.

[18]Our assumptions on $p_d(\cdot)$ allow for many common contest functions such as S-shaped contest functions and proportional representation. "First-past-the-post" functions are a limit case of the class of functions we consider.

[19]It is also worthwhile to note that our results do not rely on the implicit assumption that probability of retaining power depends on the group size. We can obtain a qualitatively similar equilibrium characterization, if p_c and p_d are both constants with $p_c < p_d$. The key difference is that a constant p_d implies that there is no benefit of having a larger group, which in turn implies that the incumbent has no reason to induce switching. We thank an anonymous referee for pointing this out.

The solution concept is sub-game perfect Nash equilibrium. Note that there are two kinds of decisions being made: The winning group makes a collective decision on the allocation rule, and the opposition makes a collective decision on whether or not to accept the proposed allocation. When groups make collective decisions, they seek to maximize the expected long-run payoff of their members.[20] Since we consider a finite number of periods, we assume that the long-run payoff is simply the sum of per-period payoffs. However, group members make individual switching decisions that are based on maximizing their short-term payoffs. We interpret periods as generations and, hence, treat individual members as myopic and the groups as long-lived. The qualitative results are unchanged if we considered non-myopic agents. Please refer to Section III.B for a detailed discussion. We make the tie-breaking assumption that when the opposition is indifferent between accepting and rejecting an offer, it accepts.

II Analysis

We solve the two-stage game by backward induction.

II.A Equilibrium play in period 2

Consider play in period 2, after a ruling group has been chosen. Any subgame is described by the identity and size of the group in power. Let $W_2 \in \{A, B\}$ denote the ruling group and let π_1^W denote its size. To characterize equilibrium play, we proceed in three steps. We first characterize the switching rule in period 2 (and resulting group sizes) as a function of the announced allocation. Next, we show

[20]In order to focus on the key issue, we ignore collective-action problems despite assuming a continuum of agents. This is a reasonable here, since individuals in a group are identical, and so decisions can be unanimous.

that conflict never arises in period 2. Finally, we characterize the optimal allocation for the ruling group, and show that it induces no switching by either group in the second period.

It is easy to see that it is impossible to have a situation where members of both groups want to switch to the other group. Further, if the group compositions are such that members of one group have a strict incentive to switch to the other group, the size of that group continues to decrease until the incentive to switch no longer exists. Consequently, in equilibrium, members of neither group can have a strict incentive to switch to the other group.[21] Notice that since the share of surplus remains unchanged, as individuals switch from, say, group B to group A, the per capita payoff of the members of group B increases and that of members of group A decreases. The two above conditions together imply that the size of group B reduces to the point where the members are indifferent between switching and not switching.

The following lemma characterizes the group compositions that obtain in equilibrium at the end of period 2 (as a result of potential switching), for any given allocation α_2^W: If the incumbent retains a very high (very low) share of the resources, this induces switching from the opposition (incumbent) group to the other group. If the allocation is close to the proportional allocation, then no switching occurs.

Lemma 1 (Group Switching Decisions in Period 2). *Suppose that the ruling group W_2 is of size π_1^W at the start of period 2, and offers an allocation α_2^W. Define functions $f(\pi) \equiv \pi + \phi\pi(1-\pi)$ and $g(\pi) \equiv \pi - \phi\pi(1-\pi)$. The following describes the resulting group size π_2^W at the end of period 2, given that the offer of*

[21] This description of equilibrium group sizes is similar to the long-run entry and exit conditions for firms in a perfectly competitive market.

an allocation α_2^W is accepted.

$$\begin{aligned}
&\textit{If } \alpha_2^W < g(\pi_1^W), \textit{ then} && \pi_2^W = g^{-1}(\alpha_2^W) \\
&\textit{If } \alpha_2^W \in [g(\pi_1^W), f(\pi_1^W)], \textit{then} && \pi_2^W = \pi_1^W \\
&\textit{If } \alpha_2^W > f(\pi_1^W), \textit{ then} && \pi_2^W = f^{-1}(\alpha_2^W)
\end{aligned}$$

The proof of the lemma is in the appendix. We can now characterize the optimal offer made by group W_2 in period 2. Since there is no gain from conflict in the second period, any offer $\alpha_2^W > 0$ would be accepted by group L_2. So, the ruling group W_2 chooses α_2^* to maximize the per capita payoff $\frac{\alpha_2^W}{\pi_2^W(\alpha_2^W)}$ of its current members. The following lemma establishes that the per capita payoff attains a maximum at the point where switching is just prevented.

Lemma 2. *Suppose that the size of group W_2 at the beginning of period 2 is π_1^W. The per capita payoff of members of group W_2 is maximized at $\alpha_2^* = f(\pi_1^W) \equiv \pi_1^W + \phi\pi_1^W(1 - \pi_1^W)$.*

The proof is in the appendix. To see the intuition, notice that for switching to occur, the group that attracts new members must offer a higher per capita payoff: The group attracting members should have a payoff higher than 1, while the other group must have a payoff lower than 1.[22] Therefore, any allocation in which the incumbent induces its own members to switch to the opposition is strictly dominated by the allocation $\alpha^W = \pi^W$. The incumbent may, however, attract members by increasing its own allocation, but in this case, switching ensures that the group size of the incumbent increases at a rate faster than the increase in its share of surplus. This decreases the per capita share. Since there is no political benefit from an increased group size in the terminal period, inducing switching is not attractive in this period.

[22]Since $\pi^W \left(\frac{\alpha^W}{\pi^W}\right) + (1 - \pi^W)\left(\frac{1-\alpha^W}{1-\pi^W}\right) = 1$.

This argument directly yields the next proposition which characterizes play in the second period.

Proposition 1 (Equilibrium Behavior in Period 2). *Suppose that the ruling group is of size π_1^W at the start of period 2.*

i) The ruling group allocates a fraction $\alpha_2^* = \pi_1^W + \phi\pi_1^W(1 - \pi_1^W)$ to itself and the remainder $(1 - \alpha_2^*)$ to the opposition.

ii) The opposition does not engage in conflict.

iii) No switching occurs across groups. In particular, members of the ruling group strictly prefer to remain in the group, and members of the opposition are indifferent between switching and not switching.

iv) The per capita payoff of the ruling group in period 2 is given by $1+\phi(1-\pi_1^W)$ and that of the opposition is $1 - \phi\pi_1^W$.

The crux of the result is that even though there is no threat of conflict in the last period, the incumbent still leaves some surplus for the opposition. The amount of sharing is driven by the "switching constraint." The ruling group shares just enough resources to make the opposition indifferent between switching and not. Endogenous inter-group mobility acts as a disciplining device for the incumbent and prevents total expropriation of resources. In equilibrium, there is no switching.[23]

Proposition 1 says that for a group of size π_1 at the end of period 1, the per capita payoff in period 2 is $1 + \phi(1 - \pi_1)$ if it wins political power in period 2, and $1 - \phi(1 - \pi_1)$ if the other group wins political power. Notice that if mobility across groups were costless, then all members of society would enjoy an equal payoff of

[23] If we were to introduce some heterogeneity in switching costs, switching would occur in equilibrium. We make the assumption of uniform costs of mobility just for simplicity.

1 regardless of which group was in power. With a positive cost of mobility, there is a premium from being in power. For a group with size π_1, the per capita payoff premium from winning political power is $2\phi(1 - \pi_1)$, which is increasing in the cost of mobility and decreasing in group size.

This has two important implications. First, as the cost of mobility increases, the opposition in period 1 has a higher propensity to launch conflict, while the incumbent has a stronger incentive to avoid conflict. Thus, at a high cost of mobility, the threat of conflict is more salient in society: Either there will be actual conflict in equilibrium, or the allocation of surplus will be driven by the necessity to prevent conflict. Second, while an increase in group size increases the probability of winning power in the next period, it also reduces the value of political power by diluting the per capita premium earned. The decision to attract switchers in period 1 then involves a tradeoff between an increased probability of winning and a loss in per capita payoffs.

II.B Equilibrium play in the first period

Next, we characterize equilibrium behavior in period 1. Without loss of generality, suppose that group A is the winning group at the start of the game–i.e., $W_1 = A$. Group A must choose an optimal allocation of resources α_1^A. Once the allocation is announced, the opposition can either accept it or reject it. If the allocation is accepted, we say that play proceeds along the "economic path," or the path of economic activity (in which switching can take place). If the allocation is rejected, we say that play proceeds along the "conflict path." Let $E_A(\alpha_1^A, \pi_1^A)$ and $E_B(\alpha_1^A, \pi_1^A)$ denote the per capita payoffs to members in group A and B, respectively, when play proceeds along the economic path, given allocation α_1^A and induced new group size π_1^A. Similarly, let P_A and P_B denote the per capita payoffs, when play proceeds along the path of conflict, given α_1^A and π_0^A.

II.B.1 Play along economic path in period 1

Consider the node in period 1, where the ruling group A offers an allocation α_1^A that group B accepts. By offering different allocations, the ruling group can induce switching activity and change the group size. The following lemma characterizes the new group size π_1^A as a function of the offered allocation α_1^A, for any given incumbent size π_0^A.

Lemma 3. ***[Group Switching Decisions in Period 1]*** *Assume that A is the incumbent group in period 1 with size π_0^A. If the announced allocation α_1^A is accepted, then the new size of group A is given by*

$$\pi_1^A(\alpha_1^A) = \begin{cases} \pi_0^A & \text{if } \alpha_1^A \in [g(\pi_0^A), f(\pi_0^A)] \\ f^{-1}(\alpha_1^A) & \text{if } \alpha_2^A > f(\pi_0^A) \\ g^{-1}(\alpha_1^A) & \text{if } \alpha_2^A < g(\pi_0^A), \end{cases}$$

where f and g are defined as before: $f(\pi) \equiv \pi + \phi\pi(1-\pi)$ and $g(\pi) \equiv \pi - \phi\pi(1-\pi)$.

Since switching decisions are based only on current-period payoffs, Lemma 3 is a replica of Lemma 1, and, hence, we omit the proof. As before, switching occurs from B to A (A to B) if the A retains a high (low) share of the resources. Along the economic path, the incumbent will choose an allocation that induces its most-preferred group size.

The next lemma characterizes this optimal group size π_1 and the corresponding allocation (denoted by α^e). It turns out that the incumbent's payoff on the economic path is maximized at an intermediate group size. To see why, recall that increasing group size has two opposing effects: It increases the incumbent's probability of retaining power on the economic path, and it reduces the per capita payoff. For low π_1, the first effect dominates, and so, economic payoff is increasing in π_1. For values of π_1 close to 1, the opposite effect dominates. Since we assume $p_d(\pi)(1-\pi)$ is single-peaked, the unique maximum payoff is attained at $\pi_1^A = \tilde{\pi}$. In particular, Lemma 4 shows that if $\pi_0^A < \tilde{\pi}$, then the incumbent shares more to induce some switching so that the new group size $\pi_1^A = \tilde{\pi}$. If the initial group size π_0^A is already larger than $\tilde{\pi}$, then the maximal payoff on the economic path is reached when the opposition members are indifferent between switching and not switching–i.e., at $\alpha_1^A = f(\pi_0^A)$. The lemma also shows that the payoff on the economic path for group B is single-peaked in the share of surplus.

Lemma 4 (Maximal Payoff on Economic Path). *Assume that A is the incumbent group in period 1 with size π_0^A. Suppose that its offered allocation α_1^A is accepted by B. Then, the payoffs along the economic path to each group $E_A(\alpha_1^A, \pi_1(\alpha_1^A))$ and $E_B(\alpha_1^A, \pi_1(\alpha_1^A))$ are single-peaked in α_1^A. The payoff for group A is maximized at $\alpha_1^A = \alpha^e$, given by*

$$\alpha^e = f(\overline{\pi}^A), \text{ where } \overline{\pi}^A = \max\{\pi_0^A, \tilde{\pi}\}.$$

The proof of the lemma, in the appendix, builds on an intuition similar to that of Lemma 2.

II.B.2 Opposition's preference for conflict in period 1

We have characterized group compositions induced by each allocation conditional on acceptance and the corresponding payoffs for each group on the economic path. Next, in order to determine which path of play will be chosen in equilibrium, we analyze each group's preferences over going down the path of conflict. Consider, first, the preferences of the opposition.

Lemma 5 (Opposition's Conflict Threshold). *Assume that A is the incumbent group in period 1 with size π_0^A.*

i) There is a threshold $\bar{\alpha} \in [0, 1]$ such that group B accepts an allocation α_1^A, proposed by group A, if and only if the allocation satisfies $\alpha_1^A \leq \bar{\alpha}$.

ii) The threshold allocation $\bar{\alpha}$ is decreasing in the cost of mobility, and there exists a threshold $\phi_1 > 0$ such that $\bar{\alpha} = 1$ if $\phi \leq \phi_1$. Thus, all allocations are accepted if $\phi < \phi_1$.

The interested reader may refer to the Appendix for the formal proof. The two thresholds ϕ_1 and $\bar{\alpha}$ completely describe the opposition's preferences over conflict. The decision to reject the incumbent's offer and launch conflict may be thought of as an investment. By rejecting an offer, the opposition gives up its payoff in the current period, but raises the probability of winning power in the next period. If the cost of intergroup mobility is below the threshold ϕ_1, then even if the incumbent group offers nothing to the opposition, the opposition finds it more profitable to simply switch sides and share the incumbent's surplus rather than launch conflict. However, if the cost is above ϕ_1, the premium from winning power is large enough so that the current-period benefit must be high enough for the allocation to be accepted.

II.B.3 Incumbent's preference for conflict in period 1

Lemma 5 tells us that $E := [0, \bar{\alpha}]$ is the set of allocations that induces the opposition to follow the economic path, and the complement (which we denote by P) is the set of allocations that induces the opposition to engage in conflict.[24] To understand which path of play the incumbent would prefer, we need to compare the incumbent's

[24] Notice that, if $\phi \leq \phi_1$, then P is an empty set.

payoff along the path of conflict with its maximum possible payoff along the economic path–i.e., we compare P_A with $\max_{\alpha_1^A \in E} E_A(\alpha_1^A) \equiv E_A(\alpha^e, \pi_1^A(\alpha^e, \pi_0^A))$. We show in the following lemma that there is a threshold such that the incumbent's maximal payoff on the economic path is higher than that on the conflict path if and only if the cost of mobility is above the threshold.

Lemma 6 (Incumbent's Conflict Threshold). *Assume that A is the incumbent group in period 1 with size π_0^A. There exists a threshold ϕ_2 such that group A's maximal payoff along the economic path is weakly greater than its payoff along the conflict path, if and only if the cost of mobility $\phi \geq \phi_2$.*

The proof of the lemma is in the Appendix. The intuition is straightforward. By inducing the path of conflict, the incumbent can enjoy the entire surplus in the current period, but there is a reduction in the probability of retaining power in the next period. Therefore, inducing conflict is worthwhile only if the premium from winning power in the next period is low–i.e., the cost of mobility is below a threshold.

Note that ϕ_2 can lie outside $[0, 1]$. Since the attractiveness of conflict is increasing in k, the threshold ϕ_2 is strictly increasing in k. If $k > \pi_0^A$, it is possible that $\phi_2 > 1$. However, if conflict is very destructive, then $\phi_2 < 0$. Lemmas 5 and 6 together characterize the equilibrium behavior for any ϕ up to $\max\{\phi_1, \phi_2\}$: If $\phi < \phi_1$, then the incumbent follows the economic path, and for ϕ between ϕ_1 and $\max\{\phi_1, \phi_2\}$, the incumbent follows the path of conflict.

It remains to characterize the equilibrium for $\phi > \max\{\phi_1, \phi_2\}$. In this range, the incumbent prefers the economic path, and its most preferred allocation is α^e. Next, we characterize the conditions under which the opposition does, indeed, accept α^e. We show that there is a threshold ϕ_3, above which α^e is not feasible along the economic path. If ϕ is very high ($\phi > \phi_3$), then there is a high premium from power in the second period. This increases the propensity of the opposition to engage in conflict. In this case, a split of α^e leaves too little for the opposition to accept and is, therefore, not feasible on the economic path. To induce the opposition to follow the economic path, the incumbent needs to offer a higher share. The "best" allocation for the incumbent that still induces economic activity is then $\overline{\alpha}$, where the opposition is given just enough to make it indifferent between the economic path and conflict.

Lemma 7 (Feasibility of α^e on economic path). *Assume that A is the incumbent group in period 1 with size π_0^A. There exists a threshold $\phi_3 > 0$, such that*

i) Group B accepts allocation α^e if and only if the cost of mobility ϕ is weakly less than the threshold ϕ_3.

ii) If $\phi > \phi_3$, allocation α^e will be rejected by group B. In this case, the maximum share that group A can retain, while still inducing the economic path, is $\bar{\alpha}$, where $\bar{\alpha} < \alpha^e$.

The interested reader may refer to the Appendix for the proof. This lemma implies that if $\phi > \phi_3$, then the incumbent must choose between inducing the economic path (by offering $\bar{\alpha}$) and inducing conflict. Recall, that as the cost of mobility increases, there are two opposing effects: On the one hand, there is a large premium from gaining power in the next period, and so the incumbent would prefer to induce economic activity. On the other hand, as ϕ increases, the incumbent has to offer more to the opposition in the current period to induce economic activity. The incumbent's choice is driven by this tradeoff across periods. It turns out that for large enough ϕ, the first effect dominates the second. In other words, there is a threshold cost of mobility ϕ_4 above which the incumbent prefers $E_A(\overline{\alpha}, \pi_1^A(\overline{\alpha}, \pi_0^A))$ to P_A. The following lemma states this formally.

Lemma 8 (Sharing to prevent conflict). *Assume that A is the incumbent group in period 1 with size π_0^A. There exists a threshold $\phi_4 \geq \max\{\phi_2, \phi_3\}$, such that, if $\phi \geq \phi_4$, then A prefers to induce the economic path (by offering $\overline{\alpha}$) rather than the conflict path.*

The proof of the lemma is in the Appendix.

II.B.4 Incumbent's optimal allocation choice in period 1

Now, we can fully characterize the resource allocations that arise in equilibrium. There are two factors that determine how the incumbent decides to allocate resources. First, if the incumbent keeps too much surplus for itself, it may attract switchers from the opposition, which would increase its political strength, but reduce the per capita share for the original members of the group. Thus, the incumbent will decide its allocation so as to achieve its optimal group size. Second, the ruling group might also want to share resources with the opposition so that the economic path is sufficiently attractive for the opposition, and they do not engage in conflict. These two constraints on expropriation–the switching constraint and the conflict constraint–together determine how resources are shared on the economic path. In the unique equilibrium, three different regimes arise depending on parameter values.

- **No-Conflict regime**: In this regime, play proceeds on the economic path, and the switching constraint determines the allocation. The optimal allocation choice is $\alpha_1^* = \alpha^e$. If $\pi_0^A < \tilde{\pi}$, the incumbent induces opposition members to switch and achieve the target group size $\tilde{\pi}$. If $\pi_0^A > \tilde{\pi}$, then there is no switching, and the incumbent shares enough to keep the opposition indifferent between switching and not switching.[25]

[25]Here, we have considered a two-period game for tractability. Further, any group size can be

- **Peaceful-Belligerence regime**: In this regime also, play proceeds along the economic path, but the extent of sharing is driven by the imperative to prevent the opposition from engaging in conflict. Here, $\alpha_1^* = \overline{\alpha}$. The incumbent shares just enough resources to make the opposition indifferent between the economic path and conflict. If $\pi_0^A < \pi_1^A(\overline{\alpha}) \leq \tilde{\pi}$, then there is some switching, and otherwise, there is no switching.

- **Open-Conflict regime**: In this regime, play proceeds along the conflict path. The incumbent implements conflict through full exploitation of resources– i.e., $\alpha_1^* = \alpha^P = 1$. Neither the conflict constraint nor the switching constraint binds, and the incumbent prefers to allow conflict.

The next proposition characterizes equilibrium play in the first period.

Proposition 2 (**Equilibrium Allocation Choice in Period 1**). *Assume that A is the incumbent group in period 1 with size π_0^A. The equilibrium regimes (and respective allocations α_1^*) that arise in period 1, are characterized as follows:*

- *If $\phi \leq \phi_1$, then the no-conflict regime prevails (with equilibrium allocation $\alpha_1^* = \alpha^e$).*

- *If $\phi \in (\phi_1, \phi_2]$, then the open-conflict regime occurs (with $\alpha_1^* = 1$).*

- *If $\phi \in (\max\{\phi_1, \phi_2\}, \phi_3]$, then the no-conflict regime prevails (with $\alpha_1^* = \alpha^e$).*

achieved in the current period by appropriate choice of allocation. It would be an interesting line of research to consider a multi-period game, and study the dynamics of group-sizes. A comprehensive analysis of the multi-period game is much beyond the scope of this paper. We conjecture that in the dynamic game, whenever there is no conflict, the incumbent would increase its size unless already larger than its optimal size. Moreover, as power alternates, group sizes would swing in opposite directions, but the size of each group would vary within an upper and a lower limit.

- *If $\phi \in (\max\{\phi_2, \phi_3\}, \phi_4)$ then peaceful-belligerence regime occurs (with $\alpha_1^* = \bar{\alpha}$) if k is lower than a certain threshold, and open conflict prevails (with $\alpha_1^* = 1$) otherwise.*

- *If $\phi \geq \phi_4$, then peaceful-belligerence prevails (with $\alpha_1^* = \bar{\alpha}$).*

The proof is in the Appendix. The intuition is as follows. When the cost of mobility is low, the incumbent wants to induce conflict by retaining the entire surplus in the current period. However, its ability to induce conflict is limited by the opposition's preference for conflict. When the cost of mobility is sufficiently low, even if the incumbent retains a very high share, the opposition finds it more profitable to switch groups. However, at an intermediate range of ϕ, the opposition does respond by engaging in conflict. When the cost of mobility is high, the premium from gaining power in the second period is high. So, the incumbent wants to avoid conflict to retain power, while the opposition wants to engage in conflict. Ideally, the incumbent wants to induce economic activity by retaining α^e. But, when the cost of mobility is sufficiently high, the incumbent needs to offer more to the opposition to prevent conflict.

The reader may wonder whether these equilibrium regimes all exist for different parameters and choices of primitives. It is easy to show that as long as waging conflict results in a strictly positive increase in the chances of winning power, all three regimes can arise in equilibrium.

Corollary 1. *Suppose there exists $d \in (0,1)$ such that $p_d(\pi_0) - p_c(\pi_0) \geq d$ for all π_0. Then, there exists $\pi^* \in (0,1)$ and $k^* \in (\pi_0^A, 1)$ such that for $\pi_0^A > \pi^*$ and $k > k^*$, we have $0 < \phi_1 < \phi_2 < \phi_3 = \phi_4 < 1$.*

Proof. Set $\pi^* = \max\left\{\widetilde{\pi}, \frac{1}{2d+1}\right\}$. This implies that for all $\pi_0 > \pi^*$, we must have $\overline{\pi}_0^A = \pi_0^A$ and $\frac{1}{2}\left[\frac{1}{\pi_0^A} - 1\right] < p_d(\pi_0^A) - p_c(\pi_0^A)$. These together imply $0 < \phi_3 =$

$\phi_4 < 1$. Moreover, we have $0 < \phi_1 < \phi_3 = \phi_4$. Now, as k changes from π_0 to 1, ϕ_2 monotonically increases from 0 to ϕ_3. Setting k^* such that $\phi_2 = \phi_1$, we have the ordering $0 < \phi_1 < \phi_2 < \phi_3 = \phi_4 < 1$. □

Below, we present a specific example.

Example 1. Suppose that the contest success functions are $p_d(\pi) = \pi(\pi + d(1-\pi))$, and $p_c(\pi) = \pi(\pi + c(1-\pi))$. Both functions increase in π and satisfy our concavity condition for all $d \geq 0$. Also, $d \geq c \Rightarrow p_d(\pi) \geq p_c(\pi)$. If $d = 1$, $p_d(\pi) = \pi$–i.e., the success probability is measured by the group size. If $d > 1$, the ruling group enjoys an incumbency advantage, in addition to the size effect, along the economic path. Figure 1 plots the success probabilities and the equilibrium regimes for any ϕ and π_0 (for $d = 2, c = 0.5$ and $k = 0.9$). Notice that open conflict does not necessarily occur at a high cost of mobility. Further, peaceful belligerence occurs for high values of π_0 and ϕ. The dotted line shows the optimal group size $\tilde{\pi}$. If the initial incumbent group size is below $\tilde{\pi}$, switching happens in the no-conflict regime. These observations hold quite generally. See Section III for a discussion. ◇

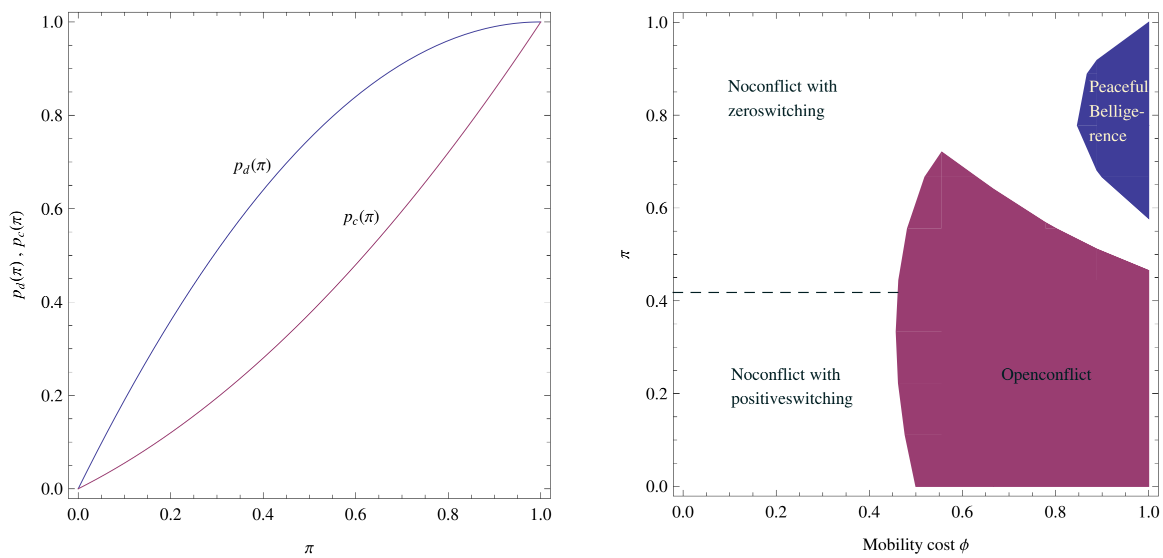

Figure 1: Incumbent's success probabilities (left) and equilibrium regimes(right)

III Implications and Empirical Predictions

Below, we discuss some important implications and empirical predictions of our framework.

III.A Mobility as a source of conflict

Conflict is an inefficient activity in our framework. The standard rational explanation for observing inefficient conflict appeals to asymmetric information and limited commitment with the use of power (see Fearon (1995), Garfinkel and Skaperdas (2007), Powell (2004)). A key insight in this paper is that we identify a new source of conflict: The possibility of mobility. It turns out that the possibility of inter-group mobility can actually *increase* the likelihood of conflict in society.

To see why, we present two extensions of our model. In the first, we completely shut down the possibility of moving across groups. In particular, we relax the assumption $\phi \in [0,1]$, and, instead assume that the cost of mobility is so large that there is no incentive to switch group membership at any allocation. We show that in this case, conflict does not arise in equilibrium. In this sense, the possibility of mobility gives rise to conflict in our framework.

Second, we consider an extension in which agents can commit to not switch group membership, even when mobility is possible (ϕ is low). Again, we find that open conflict does not arise in equilibrium. Below we discuss these extensions in detail.

III.A.1 No open conflict when inter-group mobility is limited

Suppose that the cost of mobility, ϕ, is large enough that there is no incentive to change groups: In effect, there is no possibility of moving across groups. We show that, open conflict does not arise, and the unique equilibrium is peaceful belligerence.

Proposition 3. *Suppose that* $\phi > \max\left\{\frac{1}{\pi_0^A}, \frac{1}{1-\pi_0^A}\right\}$. *Then we must have peaceful belligerence without switching in equilibrium. The equilibrium offer in the first period is* $\alpha^* = 1 - (p_d(\pi_0^A) - p_c(\pi_0^A))$ *and there is full extraction in the second period.*

The proof is straightforward, and is in the Appendix. The intuition is as follows. Suppose mobility is prohibitively costly, i.e. $\phi > \max\left\{\frac{1}{\pi_0^A}, \frac{1}{1-\pi_0^A}\right\}$.[26] This effectively means that there is no switching constraint on the incumbent, i.e. $a^e = 1$. Clearly, in the second (last) period, the ruling group will extract all surplus. This means that, by engaging in conflict in the first period, the opposition can increase its second period payoff by $p_d(\pi_0^A) - p_c(\pi_0^A)$. Thus, the maximal feasible first period

[26]This assumption on ϕ ensures that even if one group keeps all the surplus to itself, it is not in the interest of the members of the other group to switch.

offer on the economic path is $\overline{\alpha} = 1 - (p_d(\pi_0^A) - p_c(\pi_0^A))$. Now consider the decision of the first period incumbent. If conflict were not destructive, the incumbent would be indifferent between the economic path and the conflict path: He would get $(p_d(\pi_0^A) - p_c(\pi_0^A))$ less in period 1, and the same amount more in expected terms in period 2. However, since conflict also destroys an amount $(1 - k)$ of surplus, the incumbent is strictly worse off on the conflict path.

Therefore, when there is no mobility, there is no open conflict in equilibrium. This contrasts sharply with work by Caselli and Coleman (2013) which predicts that conflict is more likely to occur in societies divided along lines of race or ethnicity where mobility is very costly. The main reason they obtain such a result is that they do not consider the possibility that if enough resources are shared with the opposition, they might be prevented from engaging in conflict. In fact, our work suggests that conflict only arises when excessive mobility threatens to dilute the incumbent's per capita share of the allocation required to prevent conflict. Therefore, we predict that conflict (and consequent expropriation) arises only at lower or moderate levels of cost of mobility.

As mentioned in the introduction, our prediction is consistent with casual empirical observation. There are examples of societies divided along ethnicity or caste (high cost of mobility) where there is no conflict, and, indeed, resource sharing occurs. For instance, Padró i Miquel (2007) mentions Ivory Coast as an example, where the opposition is strong enough that it needs to be bought off: Houphouet-Boigny's regime in Ivory Coast was known to actually transfer resources to the minority opposition ethnic groups. Another example is India, where resources are shared with backward castes through a range of reservation policies, which have helped in mitigating conflict. Such sharing in the shadow of conflict arises in equilibrium in our model. In fact, empirical evidence suggests that there is no simple monotonic relationship between mobility and conflict (see Collier and Hoeffler

(2004) and Fearon and Laitin (2003)).[27] There are examples in which intense conflict arises between groups where the cost of mobility is low (e.g., language-based discrimination), as well as others where cost of mobility is very high, and yet conflict does not arise. Our model yield equilibrium predictions that are consistent with these diverse examples.

III.A.2 No open conflict if agents commit to not switch groups

In our model, agents cannot commit to staying in their own group, but can choose to switch groups after observing the allocation choice. This lack of commitment related to switching group membership indeed restricts the allocation choices that can be implemented on the economic path. In particular, an allocation that can Pareto improve upon the conflict outcome may require groups to retain their original sizes. But, since agents cannot commit to not switch, the incumbent is left with fewer allocation choices that are implementable. Note that the highest allocation that the incumbent can retain in the first period, while avoiding conflict, is $\overline{\alpha}$. However, if the cost of mobility is not very high, then $\overline{\alpha}$ induces too much switching from the opposition, thus reducing the incumbent's per capita share so much that the expected payoff on the economic path is no longer worth avoiding conflict. Therefore, there is an intermediate range where the incumbent prefers to induce conflict.

To better understand how the possibility of mobility is really a source of conflict, it is useful to ask what would happen if agents *could commit* to not changing groups. Consider a hypothetical game where, in the first period, the opposition can choose to commit to not switching after observing the allocation. In this "new game,"

[27] Fearon and Laitin (2003) write "...it appears not to be true that a greater degree of ethnic or religious diversity-or indeed any particular cultural demography-by itself makes a country more prone to civil war. This finding runs contrary to a common view among journalists, policy makers, and academics, which holds "plural" societies to be especially conflict-prone due to ethnic or religious tensions and antagonisms."

first, nature chooses the incumbent; then, the opposition decides whether or not to commit; and then, the original game is played.[28] Consider the situation in this new game where the opposition does not commit not to switch. Clearly, this subgame is the "original game," and whenever the open conflict equilibrium exists, the payoffs are

$$P_A = \frac{k}{\pi_0^A} + 1 + \phi(1-\pi_0^A)(2p_c(\pi_0^A)-1) \qquad \text{and} \qquad P_B = 1 + \phi\pi_0^A(1-2p_c(\pi_0^A)).$$

Now, suppose that the opposition commits to not switch after any allocation α is announced. Then, the payoffs of the groups on the economic path are

$$E_A^{NS}(\alpha) = \frac{\alpha}{\pi_0^A} + 1 + \phi(1-\pi_0^A)(2p_d(\pi_0^A)-1) \qquad \text{and} \qquad E_B^{NS}(\alpha) = \frac{1-\alpha}{1-\pi_0^A} + 1 + \phi\pi_0^A(1-2p_d(\pi_0^A)).$$

Notice that group A's (B's) payoff is strictly increasing (decreasing) in α. The incumbent will, therefore, offer α^*, where α^* is the maximum share that it can retain without inducing conflict ($E_B^{NS}(\alpha^*) = P_B$). A comparison of the above payoffs yields the result that the allocation α^* strictly Pareto-dominates the conflict outcome. In particular, at allocation α^*, the opposition is at least as well off as under conflict, and the incumbent is strictly better off. So, if the opposition has the choice to commit to not switching, conflict does not arise in equilibrium. Further, it is easy to check that, in the original game with no commitment, the allocation α^* would not be optimal, as it would induce "too much" switching and reduce the per capita payoff of the incumbent. We state this formally in the proposition below. The proof is in the Appendix.

Proposition 4. *Assume that A is the incumbent group in period 1. Consider a new game where, in period 1, group B has the option to commit not to switch before A*

[28] Here, we allow a commitment decision only in period 1. A similar result holds if we allow commitment in both periods.

offers an allocation.

i) Open conflict cannot arise in equilibrium in this game.

ii) Whenever the open conflict equilibrium exists in the original game, the equilibrium in the corresponding new game Pareto-dominates the open conflict outcome.

III.B Inefficient switching

Like conflict, switching is also inefficient in our model. Individuals incur cost in switching, but the aggregate surplus remains fixed. There are two factors that explain why we observe inefficient switching in equilibrium in our model: Uncertainty about the future distribution of power and myopic agents. Because of the uncertainty, the incumbent has a motive to induce opposition members to switch over, in order to increase its chances of retaining power. However, even in the presence of this uncertainty, switching may have been prevented if agents were non-myopic. With non-myopic agents, any equilibrium allocation that causes switching would have to leave the switchers and non-switchers in the opposition with the same expected two-period payoff.

The incumbent would get no benefit from inducing switching, since any increase in second-period payoff from increased political strength would have to be exactly offset by an increase in the first-period share to be given to the non-switchers in the opposition. But, with myopic agents, the incumbent need not internalize the cost of switching, and this together with the uncertainty about the distribution of power drives switching in equilibrium.[29]

[29] A detailed analysis of the setting with non-myopic agents is available from the authors. In this setting, even though there is no actual switching in equilibrium, the threat of switching still restricts the set of implementable allocations. In particular, in the no-conflict regime, the switching constraint

III.C Deterrents to conflict

In our setting, there are two factors that affect incentives to engage in conflict. First, as conflict becomes more destructive, (i.e., as k decreases), the incumbent wants to avoid conflict. Second, as the potential gains (success probability) from conflict increase, (i.e., as $p_d(\pi) - p_c(\pi)$ increases), the opposition is more prone to conflict. For open conflict to arise, both groups must want it to occur. To understand better what drive conflicts, it useful to look at comparative statics with respect to k and $p_d(\pi) - p_c(\pi) = 0$.

We find the intuitive result that, the range of mobility costs for which open conflict can arise increases with k. But equilibrium allocations are independent of k. In other words, conflict is observed only when it is not very destructive. In particular, if $k = 0$ and conflict were completely destructive, then open conflict would never arise. This is, indeed, a feature of all models where agents have perfect information about the cost of conflict and the success probability.[30]

The role of the success probability of conflict is more subtle, as it affects equilibrium allocations as well. Consider the extreme case of $p_d(\pi) - p_c(\pi) = 0$. This means that conflict does not give the opposition any gain in terms of increased chance of winning. We should expect that this would eliminate conflict in equilibrium. However, it turns out that if the opposition is large enough, it may still wage conflict in order to preserve its group size and prevent an erosion of political power.

binds. The binding switching constraint also implies that, if there were some heterogeneity in ϕ among agents, inefficient switching would arise again, even with non-myopic agents. This would be entirely driven by the uncertainty about the future distribution of power.

[30]To this extent, our model does not explain why we observe highly destructive conflict such as civil wars. Highly destructive conflict could arise in equilibrium if there were some incomplete information about cost or success parameters. See, for example, Wärneryd (forthcoming), Collier and Hoeffler (2007), Garfinkel and Skaperdas (2007) for discussion of the role of information in conflict.

III.D Peaceful belligerence does not arise with small incumbents

A prediction of our model is that if the incumbent group is a small minority of elites, then only two situations can arise in equilibrium: Either, there is open conflict, or there is no conflict, with the equilibrium allocation being driven by the switching constraint.

Proposition 5. *Assume that A is the incumbent group in period 1 with size π_0^A. There exists a threshold $\underline{\pi}$, such that, if $\pi_0^A \leq \underline{\pi}$, then peaceful belligerence does not occur in equilibrium. This threshold is increasing in k.*

The proof of the result is in the Appendix. If the initial group size is low enough, full expropriation leads to a large pie being shared among a small number of individuals, raising the per capita payoff. In such a situation, the incumbent will prefer full expropriation to the maximal payoff obtainable on the economic path for any value of ϕ.

Indeed, Propositions 2 and 5 together imply that peaceful belligerence occurs only for high values of both π and ϕ. In other words, in a society with a high cost of mobility, if a majority group assumes power, then it will share spoils with the minority to retain power and prevent conflict, but if the minority is in power, then it will have an incentive to extract all surplus.

It is worthwhile to ask if this predicted relationship between size of incumbent group, destructive nature of conflict (parameter k) and the prevalence of conflict is borne out in data. There are many qualitative studies that provide evidence of repressive minority regimes that engage in economic exclusion (See, for instance, Rabushka and Shepsle (1972) and Gellner (1983)). However, to the best of our knowledge, there are no quantitative empirical studies that focus on this specific question. The most closely related empirical literature on group sizes considers the relationship between conflict and different characteristics of the group size distribution such as measures of polarization or fractionalization.[31] These existing empirical studies cannot be connected in an obvious way with our predictions. First, existing empirical literature does not consider the practice of economic exclusion, and does not measure the relative strength of the minority regime during conflict. Further, the measures of fractionalization and polarization are inadequate to distinguish between small and large incumbent groups in a two-group setting such as ours. There is a recent literature that asks whether these measures are appropriate predictors of conflict in settings with minority incumbents, and the results are not unambiguous. Cederman and Girardin (2007) point out the inadequacy of the fractionalization measures to capture the effect of minority incumbents, and provide evidence that the states with minority rules are vulnerable to civil war, while Fearon, Kasara and Laitin (2007) find weak support for the conclusions of Cederman and Girardin (2007).

III.E Non-monotonic equilibrium allocations

Our model implies that the equilibrium allocation is non-monotonic in the cost of mobility. This result has testable implications, and a systematic empirical analysis would be interesting.

Proposition 6. *The equilibrium allocation is increasing in the cost of mobility in the no-conflict regime, decreasing in the peaceful-belligerence regime, and constant in the open-conflict regime.*

The result follows directly from Lemmata 4 and 5. The intuition is straightforward: In the no-conflict regime, the ruling group retains just enough surplus to induce optimal switching. So, as switching becomes more costly, the incumbent

[31] See Fearon and Laitin (2003), Collier and Hoeffler (2004), Montalvo and Reynald-Querol (2005) etc.

can keep more for itself. In the peaceful-belligerence regime, the equilibrium allocation is the maximum that the incumbent can keep without provoking conflict. An increase in the cost of mobility raises the premium from winning political power and, thus, enhances the opposition's incentive for conflict. The opposition has to be offered more to be prevented from engaging in conflict, and, hence the equilibrium allocation is decreasing. Finally, in the open-conflict regime, the incumbent induces conflict by full expropriation.

III.F Ruling group's preferred cost of mobility

In this paper, we assume that the cost of mobility is exogenous. We can ask what the incumbent's preferred cost of mobility would be, if he could choose it. Think of two groups that can be distinguished based on multiple characteristics. For example, two ethnic groups may develop different professional skills or different religious practices. These different characteristics are associated with different costs of mobility. The group in power can decide the characteristic on the basis of which resources would be allocated. Which social cleavage would the incumbent choose?[32] Since the premium from power increases with the cost of mobility ϕ, we may expect the incumbent to choose a maximal cost of mobility. However, it turns out that if conflict is sufficiently likely to change the regime, then the incumbent may prefer an intermediate cost of mobility.

Proposition 7. *Assume that A is the incumbent group in period 1 with size π_0^A.*

i) If A's success probability in conflict $p_c\left(\pi_0^A\right)$ is above a threshold, then it's expected two-period per capita payoff is maximized at $\phi = 1$.

[32] The incumbent may also be able to take measures to change the cost of mobility between the groups. We can ask what its preferred level of mobility would be.

ii) Otherwise, there can be an interior cost of mobility at which A's expected two-period per capita payoff is maximized.

The proof of the result is in the Appendix. The intuition is as follows. The cost of mobility has two contrasting effects on the incumbent's payoff. On the one hand, a high cost of mobility means that the incumbent can retain a larger share of resources along the economic path. This effect pushes the incumbent towards preferring higher costs of mobility. On the other hand, a high cost of mobility means that the opposition is more inclined to engage in conflict and will expropriate more if the incumbent loses power. This force pushes the incumbent towards preferring a low cost of mobility. Together, it turns out that, if the incumbent is more likely to retain power in conflict, then it prefers a cleavage with maximal cost of mobility. If, on the other hand, it is less likely to retain power in conflict, then its equilibrium payoff can be maximized at an interior cost of mobility.[33]

Horowitz (1985) recounts how color slowly became the preferred form of differentiation compared to religion, between English and African slaves in seventeenth century North America, as conversion to Christianity become more common.[34] The English perceived no threat of losing power in conflict. This enabled them to sustain an extreme form of discrimination for a long time.

[33] It is important to note that at this interior optimal cost of mobility, we may observe peaceful belligerence (if $\phi_4 < 1$) or open conflict (if $\phi_2 < 1 < \phi_3$) in equilibrium.

[34] Horowitz (1985, p 43) states that "...the English were originally called 'Christians,' while the African slaves were described as 'heathens.' The initial differentiation of groups relied heavily on religion. After about 1680, however, a new dichotomy of 'whites' and 'blacks' supplanted the former Christian and heathen categories, for some slaves had become Christians. If reliance had continued to be placed mainly on religion, baptism could have been employed to escape from bondage." See also Caselli and Coleman (2013).

III.G Inter-group mobility along the path of conflict

One of the implicit assumptions in our setting is that agents do not have the option of switching group membership along the path of conflict. We make this assumption for two reasons. First, it provides greater tractability, as we can ignore an additional parameter - the cost of mobility during conflict. Second, the assumption is consistent with the stylized fact that groups are more cohesive during times of conflict. Stein (1976) documents findings from across disciplines and finds positive support for the hypothesis that external conflict increases inter-group cohesion, especially in cases when conflict can affect the group as a whole, and when the groups share a pre-existing identity (both being basic features of our setting). Lewis (1961) and Murphy (1957) also find strong association between in-group solidarity and conflict in their studies on social conflict among people of Zaer society in Morocco and among people of Mundurucu society respectively.[35]

In this section, we relax the assumption and examine if the possibility of mobility on the conflict path changes our results. In particular, we are interested in understanding how ease of mobility during conflict affects the incidence of conflict itself.[36] We consider an alternative setting in which, agents can choose to switch groups both along the economic path and on the path of conflict by incurring an individual cost of ϕ_d and ϕ_c respectively. Recall, that we restricted ϕ_d to lie in the range $(0, 1)$ so that the optimal allocation rule along the economic path lies in the open interval (0,1). However, we allow ϕ_c to be unrestricted (but strictly positive) to get a fuller picture of the effects.

The possibility of switching in conflict makes the opposition less inclined to

[35] See also recent theoretical work by Hugh-Jones and Zultan (2013) and della Porta (2006) that argue that levels of within-group cooperation can be high during periods of external conflict. There are also psychological studies on individual behavior at wartime, which provide support for increased social cohesion at the time of conflict. See Lang (1972) for a survey of the literature.

[36] We thank an anonymous referee for raising this question and pushing us in the direction.

wage conflict, relative to the original model. For the incumbent, there are two opposite effects. On the one hand, switching by opposition members along the conflict path reduces the per capita payoff in the current period. On the other hand, the probability of retaining power in conflict increases. Thus, we cannot say a priori whether mobility on the conflict path makes the incidence of conflict more or less likely.

The following proposition shows that an analog of our main result in the original model still holds.[37] In other words, we still get the same three regimes in equilibrium depending on whether ϕ_d lies above or below certain thresholds; but, these thresholds now depend on ϕ_c.

Proposition 8. *Assume that A is the incumbent group in period 1 with size π_0^A. Suppose that on the path of conflict, a share $k \in (0,1)$ of the surplus is retained. As before, let $\phi_d \in (0,1)$ denote the cost of mobility along the economic path. Let $\phi_c > 0$ denote the cost of mobility on the conflict path. There exist thresholds ϕ_1^c, ϕ_2^c and ϕ_3^c (each a function of ϕ_c) such that the equilibrium regimes (and respective allocations α_1^*) that arise in period 1, can be characterized as follows.*

i) If $\phi_d \leq \phi_1^c$, then the no-conflict regime prevails (with allocation $\alpha_1^* = \alpha^e$).

ii) If $\phi_d \in (\phi_1^c, \phi_2^c)$, then the open-conflict regime prevails (with $\alpha_1^* = 1$).

iii) If $\phi_d \in (\max\{\phi_1^c, \phi_2^c\}, \phi_3^c)$, then the no-conflict regime prevails (with $\alpha_1^* = \alpha^e$).

iv) If $\phi_d > \max\{\phi_2^c, \phi_3^c\}$, then either the peaceful belligerence regime occurs or the open-conflict regime occurs.

[37] We omit the proof of the results in this section, as it is very similar to that in the main model. The proof is available on the authors' websites.

To understand how mobility on the conflict path affects the outcome, we study the thresholds ϕ_i^c $(i = 1, 2, 3)$ in the proposition above, and compare them to the thresholds ϕ_i $(i = 1, 2, 3)$ in the original model, i.e., when mobility is not allowed on the conflict path. Since the thresholds ϕ_i and ϕ_i^c, $i = 1, 2, 3$ are functions of the group size of the incumbent, henceforth, we explicitly write the argument for these functions, $\phi_i(\cdot)$ and $\phi_i^c(\cdot)$, $i = 1, 2, 3$.

Denote the group size of the incumbent on the conflict path at the end of the first period by π_c^A. When there is no mobility on the path of conflict, we must have $\pi_c^A = \pi_0^A$. However, if switching is possible on the conflict path, π_c^A is weakly larger than π_0^A. Those who switch on the conflict path enjoy a current period per capita surplus $\frac{k}{\pi_c^A}$, while those who do not, get zero economic payoff in that period. Therefore, the extent of switching depends on a comparison of the cost ϕ_c with the benefit $\frac{k}{\pi_c^A}$. For large enough cost of mobility, there is no switching on the conflict path and $\pi_c^A = \pi_0^A$. On the other hand, when cost of mobility is low enough, everyone in the opposition group switches to the incumbent and $\pi_c^A = 1$. In the intermediate range, π_c^A is strictly decreasing in ϕ_c. Formally,

$$\pi_c^A(\phi_c) = \begin{cases} 1 & \text{if} \quad \phi_c \leq k \\ \frac{k}{\phi_c} & \text{if} \quad k < \phi_c \leq \frac{k}{\pi_0^A} \\ \pi_0^A & \text{if} \quad \phi_c > \frac{k}{\pi_0^A} \end{cases}$$

The corollary below specifies the relationship between the thresholds $\phi_i^c(\cdot)$ for the model with mobility during conflict and the thresholds $\phi_i(\cdot)$ in the original model.

Corollary 2. *Assume that A is the incumbent group in period 1 with size* π_0^A. *Suppose that on the path of conflict, a share* $k \in (0, 1)$ *of the surplus is retained. As before, let* $\phi_d \in (0, 1)$ *and* $\phi_c > 0$ *denote the costs of mobility along the economic path and conflict path respectively. The thresholds* $\phi_1^c(\cdot)$, $\phi_2^c(\cdot)$ *and* $\phi_3^c(\cdot)$ *(from*

Proposition 8) satisfy

$$\phi_i^c(\pi_c^A(\phi_c)) = \phi_i(\pi)|_{\pi=\pi_c^A}, \textit{ for } i = 1, 2, 3$$

where $\pi_c^A(\phi_c)$ *is the post-conflict group size and* $\phi_i(\pi)|_{\pi=\pi_c^A}$ *denotes the threshold* ϕ_i *of the original model if the initial incumbent size were* π_c^A*. In particular, if* $\phi_c \leq k$ *and* $p_d(1) = p_c(1) = 1$*, then* $\phi_1^c = 1$*.*

The result above simply says that, the conflict thresholds in this new setting are the same as the thresholds we would have got in the original model, not for π_0^A but corresponding to a larger group size. The intuition is simple. In the absence of mobility on the conflict path, the initial group size π_0^A is the relevant group size during conflict. But, when switching is possible on the path of conflict, π_0^A is replaced by π_c^A, the post-switching group size on the path of conflict, which is (weakly) larger than π_0^A.

We can use these thresholds to see how mobility on the conflict path affects the incidence of conflict. First we observe that, even though the post-conflict group size $\pi_c^A(\phi_c)$ is (weakly) decreasing in ϕ_c, the thresholds (in particular, the regions of conflict) do not vary monotonically with π_c^A, the group size on the conflict path. Therefore, we cannot say, for instance, that every decrease in ϕ_c leads to a shrinking of the parameter zone for which conflict occurs.

It turns out that when ϕ_c is large enough ($\phi_c > \frac{k}{\pi_0^A}$), there is no switching, and therefore, we get exactly the same results as in the original model. In particular, all three regimes can arise in equilibrium. On the other hand, when ϕ_c is small ($\phi_c < k$), everyone in the opposition has an incentive to switch, and we have $\pi_c^A = 1$. Clearly, in this case, the opposition is forced to accept any allocation on the economic path, and open conflict does not arise in equilibrium. Finally, when ϕ_c is in an intermediate range ($k < \phi_c \leq \frac{k}{\pi_0^A}$), the analysis is more subtle. In this range, agents have an incentive to switch along the conflict path, but conflict may or may not arise in equilibrium (depending on how ϕ_d compares with endogenously determined thresholds given in Proposition 2). When conflict arises in this case, the incumbent group size grows from π_0^A to $\pi_c^A = \frac{k}{\phi_c}$, as a result of switching.

To summarize, in a broad sense, we can say that if mobility is sufficiently easy on the conflict path, then conflict is less likely in equilibrium. For instance, the open conflict region (ϕ_1^c, ϕ_2^c) vanishes whenever $\phi_c \leq 1$.[38] In this case, either open conflict does not arise at all, or arises only under special parameter specifications (covered under Case (iv) of Proposition 8). It is also worth highlighting the special case, in which the costs of mobility on the conflict path and economic path are identical. When $\phi_c = \phi_d = \phi < 1$, the threshold ϕ_2 is negative, which again implies, that the first open conflict region (ϕ_1, ϕ_2) vanishes. Again, open conflict can arise only under limited circumstances.

The figure below presents an example with the different equilibrium regimes as functions of ϕ_d and ϕ_c. We have adapted Example 1, to include mobility on the conflict path. Figure 1 showed that open conflict is associated with small incumbent groups in the original model. Since a reduction in the cost of mobility during conflict has the same effect on thresholds as that of an increase in π_0^A, we would expect conflict to occur less frequently as mobility becomes easier on the path of conflict.

In light of the discussion above, we can see that while increased mobility on the economic path increases the likelihood of conflict, increased mobility on the conflict path has the opposite effect. In this sense, the baseline model of the paper applies in environments where mobility is substantially more difficult during times

[38] Note that $\phi_c \leq 1$ is equivalent to the post-conflict group size π_c^A being weakly larger than k. This is analogous to the original setting, where the open conflict region (ϕ_1, ϕ_2) disappears when $\pi_0^A \geq k$.

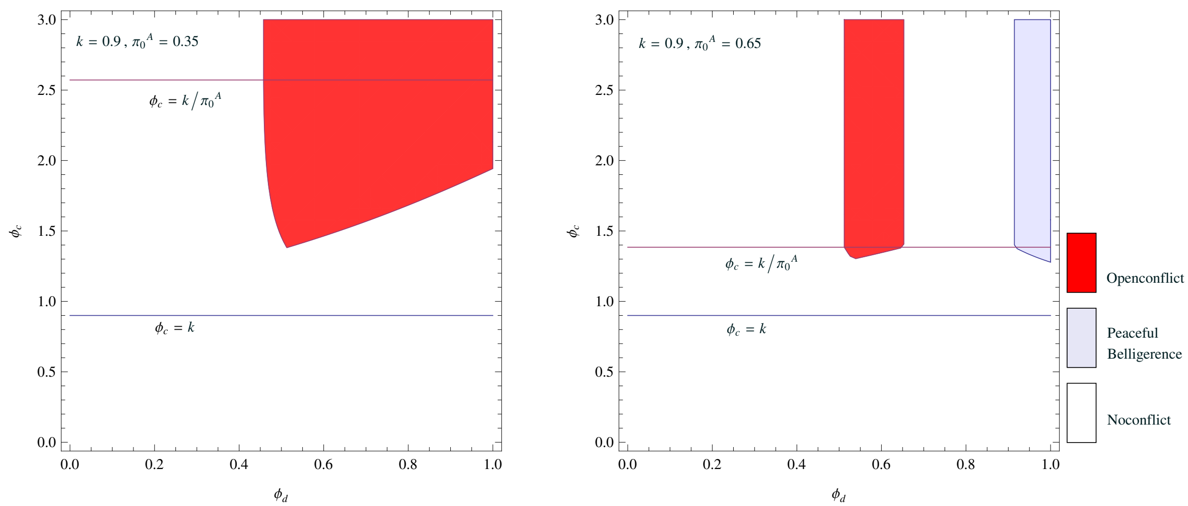

Figure 2: Equilibrium regimes when mobility is allowed on the conflict path

of conflict than peace. As mentioned above, this is consistent with many examples in practice.

IV Concluding Remarks

In this paper, we study group-based politics in divided societies, with the central objective of developing a coherent model that explains the relationship between intergroup mobility in conflict. We present a model of political competition between two groups, where political power implies the right to allocate society's resources and allows the possibility of engaging in economic exclusion based on group identities. We model group membership to be endogenous: Individuals can switch groups by incurring a cost, where this cost of mobility varies based on the nature of social cleavage.

The main substance of the analysis is in showing (i) how the extent of intergroup mobility determines the level of economic exclusion that a ruling group can exercise; and (ii) how these factors, in turn, determine the emergence of inter-group conflict. We characterize how resources are shared in equilibrium and when conflict arises.

Our analysis provides some new insight into why conflict may arise in equilibrium. We show that the possibility of endogenous group membership affects the likelihood of conflict in society in a non-monotonic way: In particular, conflict can arise for an intermediate range of cost of mobility. We also derive several predictions that are consistent with stylized facts, and that have not been shown earlier. For instance, we show that open conflict does not arise if inter-group mobility were impossible. In particular, we can show that in equilibrium, a majority incumbent may choose to transfer resources to the opposition to avoid conflict. We also show that open conflict occurs at an intermediate cost of mobility.

However, many interesting questions remain unanswered. In this paper, since we were interested in isolating the effect of inter-group mobility, agents were assumed to be homogeneous except for their initial group membership. In many contexts, it is more realistic to allow some within-group hierarchy: For instance, new members and original members may be treated differently. Allowing a richer action space that allows heterogeneous treatment may lead to new insights. Another assumption made for tractability is that the game lasts for two periods. While we conjecture that many of the qualitative insights will carry over to an infinite-horizon model, a fully dynamic model will allow us to analyze the dynamics of regime changes and how group sizes evolve over time. Finally, a promising line of investigation is related to the broader question of what constitutes the basis for group formation in politics. For instance, when do groups form along ethnic lines (with a high cost of mobility) and when do they form along ideological lines (a relatively low cost)? Is there a theory that explains widespread politicization of ethnic or religious identities? We leave these questions for future research.

A Appendix

A.1 Proofs of Results on Equilibrium Play in Period 2

A.1.1 Proof of Lemma 1

Proof. It is straightforward to check that the functions $f(\cdot)$ and $g(\cdot)$ are strictly increasing on $[0,1]$, and so, their inverses are well-defined. Consider an allocation $\alpha_2^W > f(\pi_1^W)$. In this range, we have

$$\alpha_2^W > f(\pi_1^W) \Leftrightarrow \frac{\alpha_2^W}{\pi_1^W} - \phi > \frac{1-\alpha_2^W}{1-\pi_1^W}.$$

In other words, for a given incumbent group size π_1^W, the per capita payoff of members of W_2 exceeds that of members of L_2 by more than ϕ. Group W_2 retains such a large share of the resources that it will attract switchers from the opposition. The size of W_2 would now increase to ensure that

$$\frac{\alpha_2^W}{\pi_2^W} - \phi = \frac{1-\alpha_2^W}{1-\pi_2^W} \Leftrightarrow \alpha_2^W = f(\pi_2^W).$$

The left-hand side is the second-period payoff of agents who switch from L_2 to W_2, and the right-hand side is that for those who stay back in L_2. Switching would occur so that the group size adjusts to ensure that the two are the same. Analogously, if the ruling group leaves too little for itself ($\alpha_2^W < g(\pi_1^W)$), there is an incentive for its own members to switch to the opposition:

$$\alpha_2^W < g(\pi_1^W) \Leftrightarrow \frac{\alpha_2^W}{\pi_1^W} < \frac{1-\alpha_2^W}{1-\pi_1^W} - \phi,$$

and the size of group W_2 decreases to ensure indifference between those who switch and those who do not. In this case, we have $\alpha_2^W = g(\pi_2^W)$. Finally, there is an intermediate range, $\alpha_2^W \in [g(\pi_1^W), f(\pi_1^W)]$, where members of neither group wants to switch. $\alpha_2^W \leq f(\pi_1^W) \Leftrightarrow \frac{\alpha_2^W}{\pi_1^W} - \phi \leq \frac{1-\alpha_2^W}{1-\pi_1^W}$ and $\alpha_2^W \geq g(\pi_1^W) \Leftrightarrow \frac{\alpha_2^W}{\pi_1^W} \geq \frac{1-\alpha_2^W}{1-\pi_1^W} - \phi$. In this case, no switching occurs and $\pi_2^W = \pi_1^W$. □

A.1.2 Proof of Lemma 2

Proof. For $\alpha_2^W < g(\pi_1^W)$, the per capita payoff is given by $\frac{\alpha_2^W}{\pi_2^W} = 1 - \phi[1 - \pi_2^W(\alpha_2^W)]$, which is increasing in $\pi_2^W(\alpha_2^W)$ and, consequently, in α_2^W. In the range $\alpha_2^W \in [g(\pi_1^W), f(\pi_1^W)]$, $\frac{\alpha_2^W}{\pi_2^W(\alpha_2^W)} = \frac{\alpha_2^W}{\pi_1^W}$, which increases linearly in α_2^W. For $\alpha_2^W > f(\pi_1^W)$, the per capita payoff is $\frac{\alpha_2^W}{\pi_2^W} = 1 + \phi[1 - \pi_2^W(\alpha_2^W)]$ which is decreasing in $\pi_2^W(\alpha_2^W)$ and, therefore, in α_2^W. It follows that the per capita share of surplus $\frac{\alpha_2^W}{\pi_2^W(\alpha_2^W)}$ for group W has a unique maximum, which occurs at $\alpha_2^W = f(\pi_1^W)$. □

A.2 Proofs of Results on Equilibrium Play in Period 1

We first derive expressions for the payoffs along the economic and conflict paths, respectively.

$$\begin{aligned} E_A(\alpha_1^A, \pi_1^A) &= \frac{\alpha_1^A}{\pi_1^A} + p_d(\pi_1^A)[1 + \phi(1 - \pi_1^A)] + [1 - p_d(\pi_1^A)][1 - \phi(1 - \pi_1^A)] \\ &= \frac{\alpha_1^A}{\pi_1^A} + 1 + \phi(1 - \pi_1^A)[2p_d(\pi_1^A) - 1] \end{aligned}$$

Similarly, we derive

$$\begin{aligned} E_B(\alpha_1^A, \pi_1^A) &= \frac{1-\alpha_1^A}{1-\pi_1^A} + 1 + \phi\pi_1^A[1 - 2p_d(\pi_1^A)] \\ P_A &= \frac{k}{\pi_0^A} + 1 + \phi(1 - \pi_0^A)(2p_c(\pi_0^A) - 1) \\ P_B &= 1 + \phi\pi_0^A(1 - 2p_c(\pi_0^A)). \end{aligned}$$

A.2.1 Proof of Lemma 4

Proof. We first show show that $E_A\left(\alpha_1^A, \pi_1^A(\alpha_1^A)\right) = \frac{\alpha_1^A}{\pi_1^A} + 1 + \phi(1-\pi_1^A)(2p_d(\pi_1^A) - 1)$ is single-peaked. Consider $E_A\left(\alpha_1^A, \pi_1^A(\alpha_1^A)\right)$ in the range $\left\{\alpha : \alpha \leq g\left(\pi_0^A\right)\right\}$. By Lemma 3, when $\alpha_1^A < g(\pi_0^A)$, this induces switching from A to B and the new size of A is $\pi_1^A = g^{-1}(\alpha_1^A)$. Substituting, we have,

$$E_A\left(\alpha_1^A, \pi_1^A(\alpha_1^A)\right) = \ 2 - 2\phi(1-\pi_1^A)\left(1 - p_d\left(\pi_1^A\right)\right),$$

which is increasing in π_1^A. We know that g is increasing, and so $\pi_1^A = g^{-1}(\alpha_1^A)$ is increasing in α_1^A. It follows that $E_A\left(\alpha_1^A, \pi_1^A(\alpha_1^A)\right)$ is increasing in α_1^A.

Now, for $\alpha_1^A \in [g(\pi_0^A), f(\pi_0^A)]$, we know that no switching occurs and $\pi_1^A(\alpha_1^A) = \pi_0^A$. Therefore, $E_A(\alpha_1^A, \pi_1^A(\alpha_1^A))$ is increasing in α in this range.

Finally, we show that E_A first increases and then decreases in α_1^A over the range $\left\{\alpha_1^A : \alpha_1^A \geq f_1\left(\pi_0^A\right)\right\}$. Consider $\alpha_1^A > f_1(\pi_0^A)$. We know, again from Lemma 3, that this would induce switching from group B to group A and the new size of group A would be $\pi_1^A = f^{-1}(\alpha_1^A)$. So, we have,

$$E_A\left(\alpha_1^A, \pi_1^A(\alpha_1^A)\right) = \ 2 + 2\phi p_d(\pi_1^A)(1-\pi_1^A),$$

which decreases in π_1^A above $\tilde{\pi}$, and so decreasing in α_1^A above $\max\left\{f(\pi_0^A), f\left(\tilde{\pi}\right)\right\}$ in the range $\left\{\alpha_1^A : \alpha_1^A > f_1(\pi_0^A)\right\}$. Recall that $\max\left\{\pi_0^A, \tilde{\pi}\right\} = \overline{\pi}^A$. It follows immediately that the function E_A is single-peaked and maximized at $\alpha_1^A = f\left(\overline{\pi}^A\right)$.

Next, consider $E_B\left(\alpha_1^A, \pi_1^A(\alpha_1^A)\right) = \frac{1-\alpha_1^A}{1-\pi_1^A} + 1 + \phi\pi_1^A(1 - 2p_d(\pi_1^A))$. Since $p_d(\pi)(1-\pi)$ is single-peaked, this implies that $\pi(p_d(1-\pi))$ is single-peaked. Let $\tilde{\tilde{\pi}}$ denote the value at which the maximum is attained. Consider the range where $\alpha_1^A < g(\pi_0^A)$. In this case, switching leads to $\pi_1^A = g^{-1}(\alpha_1^A)$. Substituting for $\alpha_1^A = g(\pi_1^A)$, we find $E_B\left(\alpha_1^A, \pi_1^A(\pi_0^A)\right) = 1 + 1 + 2\phi\pi_1^A(1 - p_d(\pi_1^A))$, which increases in π_1^A up to $\tilde{\tilde{\pi}}$, and so increasing in α_1^A up to $\min\left\{g(\pi_0^A), g\left(\tilde{\tilde{\pi}}\right)\right\}$ in the range $\left\{\alpha_1^A : \alpha_1^A < g(\pi_0^A)\right\}$. Now consider $\alpha_1^A \in [g(\pi_0^A), f(\pi_0^A)]$. In this range, no switching occurs ($\pi_0^A = \pi_1^A$). So, E_B is decreasing in α_1^A. Finally, when $\alpha_1^A > f(\pi_0^A)$, switching occurs along the economic path, and $\pi_1^A = f^{-1}(\alpha_1^A)$. Substituting for $\alpha_1^A = f(\pi_1^A)$, we find $E_B\left(\alpha_1^A, \pi_1^A(\pi_0^A)\right) = 1 + 1 - 2\phi\pi_1^A p_d(\pi_1^A))$, which decreases in π_1^A and, therefore, also in α_1^A. Thus, $E_B\left(\alpha_1^A, \pi_1^A(\alpha_1^A)\right)$ is also single-peaked in α_1^A with the peak occurring at $\alpha_1^A = \min\left\{g(\pi_0^A), g\left(\tilde{\tilde{\pi}}\right)\right\}$. □

A.2.2 Proof of Lemma 5

Proof. We start by comparing the function $E_B\left(\alpha_1^A, \pi_1^A(\alpha_1^A)\right)$ with P_B. We have

$$E_B\left(\alpha_1^A, \pi_1^A(\alpha_1^A)\right) = \begin{cases} 2 + 2\phi\pi_1^A(1 - p_d(\pi_1^A)) & if \quad \alpha_1^A < g(\pi_0^A) \\ \frac{1-\alpha_1^A}{1-\pi_0^A} + 1 + \phi\pi_0^A(1 - 2p_d(\pi_0^A)) & if \quad \alpha_1^A \in [g(\pi_0^A), f(\pi_0^A)] \\ 2 - 2\phi\pi_1^A p_d(\pi_1^A)) & if \quad \alpha_1^A > f(\pi_0^A) \end{cases}$$

$$P_B = 1 + \phi\pi_0^A(1 - 2p_c(\pi_0^A))$$

If $\alpha_1^A = 0$, switching would occur from A to B and $\pi_1^A = g^{-1}(0) = 0$. Consequently, $E_B(0, \pi_1^A(0, \pi_0^A)) = 1 + 1$. At $\alpha_1^A = 0$, $E_B = 2 > P_B$. Moreover, Lemma 4 shows that the function E_B first increases and then decreases. This implies that either P_B intersects E_B at exactly one point (which is given by $\overline{\alpha}$) or E_B lies entirely above P_B, in which case $\overline{\alpha} = 1$.

First consider the case where $\overline{\alpha}$ is given by the intersection between P_B and E_B. We know that there cannot be two such intersections. Note, now, that at $\alpha = g(\pi_0^A)$, $E_B > 2 > P_B$. Therefore, $\overline{\alpha} > g(\pi_0^A)$. If $\overline{\alpha} \in (g(\pi_0^A), f(\pi_0^A))$, then $\overline{\alpha}$ is given by

$$\frac{1 - \overline{\alpha}}{1 - \pi_0^A} + 1 + \phi\pi_0^A(1 - 2p_d(\pi_0^A)) = 1 + \phi\pi_0^A(1 - 2p_c(\pi_0^A))$$
$$\overline{\alpha} = 1 - 2\phi\pi_0^A(1 - \pi_0^A)[p_d(\pi_0^A) - p_c(\pi_0^A)],$$

which is decreasing in ϕ since $\pi_0^A \in (0,1)$ and $p_d(\pi_0^A) \geq p_c(\pi_0^A)$. However, if $\overline{\alpha} > f(\pi_0^A)$, then $\overline{\alpha}$ is given implicitly by the group composition $\widehat{\pi}$ that satisfies

$$\begin{aligned} 2 - 2\phi\pi_1^A p_d(\pi_1^A)) &= 1 + \phi\pi_0^A(1 - 2p_c(\pi_0^A)) \\ \pi_1 p_d(\pi_1^A) &= \frac{1}{2}\left[\frac{1}{\phi} - \pi_0^A(1 - 2p_c(\pi_0^A))\right] \end{aligned}$$

Since the LHS is strictly increasing in π_1 and the RHS is constant, there is a unique solution to the equation. Also, since $\pi_1^A(\alpha)$ is increasing in the range $\alpha > f(\pi_0^A)$, there is a unique $\overline{\alpha}$ that corresponds to $\widehat{\pi}$. Notice that $\widehat{\pi}$ and, hence, $\overline{\alpha}$ is decreasing in ϕ. Therefore, whenever $\overline{\alpha} < 1$, it is decreasing in ϕ. At $\alpha_1^A = 1$, $\pi_1^A = f^{-1}(1) = 1$. Therefore, $E_B = 1 + 1 - 2\phi p_d(1)$. By comparing P_B with E_B at $\alpha_1^A = 1$, it is easy to see that $E_B \geq P_B$ for all α_1^A with strict equality only at $\alpha_1^A = 1$ if and only if

$$\phi \leq \frac{1}{2p_d(1) + \pi_0^A(1 - 2p_c(\pi_0^A))} := \phi_1.$$

Since $p_d(\cdot)$ is increasing and a probability, $p_d(1) > p_c(\pi_0^A)$. This implies that $\phi_1 > 0$. □

A.2.3 Proof of Lemma 6

Proof. We know that group A's payoff along the economic path is maximized at α^e. So, we compare $E_A\left(\alpha_1^e, \pi_1^A(\alpha_1^e)\right)$ with P_A. Notice that $\alpha_1^e = f(\overline{\pi}^A) = \overline{\pi}^A + \phi\overline{\pi}^A(1 - \overline{\pi}^A)$ from Lemma 4. Therefore, at the allocation α_1^e, E_A is given by $E_A\left(\alpha_1^e, \pi_1^A(\alpha_1^e)\right) = 2 + 2\phi p_d(\overline{\pi}^A)(1 - \overline{\pi}^A)$. So, E_A is greater than P_A if and only if $2 + 2\phi p_d(\overline{\pi}^A)(1 - \overline{\pi}^A) \geq \frac{k}{\pi_0^A} + 1 + \phi(1 - \pi_0^A)(2p_c(\pi_0^A) - 1)$. Simplifying, we get $\phi \geq \left[\frac{\left(\frac{k - \pi_0^A}{1 - \pi_0^A}\right)}{\pi_0^A\left(1 + 2p_d(\overline{\pi}^A)\frac{1 - \overline{\pi}^A}{1 - \pi_0^A} - 2p_c(\pi_0^A)\right)}\right] := \phi_2.$ □

A.2.4 Proof of Lemma 7

Proof. From Lemma 4, $\alpha^e = f_1(\overline{\pi}^A)$. Hence, we have

$$\begin{aligned} \alpha^e \in E \quad &\iff \quad E_B(\alpha^e, \pi_1^A(\alpha^e, \pi_0^A)) \geq P_B \\ &\iff \quad \phi \leq \frac{1}{\pi_0^A(1 + 2p_d(\overline{\pi}^A)\frac{\overline{\pi}^A}{\pi_0^A} - 2p_c(\pi_0^A))} := \phi_3. \end{aligned}$$

Since the denominator $\pi_0^A(1 + 2p_d(\overline{\pi}^A)\frac{\overline{\pi}^A}{\pi_0^A} - 2p_c(\pi_0^A)) > \pi_0^A(1 + 2p_d(\overline{\pi}^A) - 2p_c(\pi_0^A)) > \pi_0^A(1 + 2p_d(\overline{\pi}^A) - 2p_d(\pi_0^A)) > 0$, we must have $\phi_3 > 0$. Now, if $\phi > \phi_3$, clearly, $\alpha^e \notin E$. From Lemma 5, $\alpha^e > \overline{\alpha}$. Also, since $E_A(\alpha, \pi_1^A(\alpha, \pi_0^A))$ is single-peaked in α with the peak occurring at α^e, we must have $E_A(\alpha, \pi_1^A(\alpha, \pi_0^A))$ strictly increasing in α in the range $[0, \overline{\alpha}]$. □

A.2.5 Proof of Lemma 8

Proof. Define

$$\phi_4 := \frac{1}{\pi_0^A\left(1 + 2p_d(\pi_0^A) - 2p_c(\pi_0^A)\right)}.$$

First, we establish that $\phi_4 \geq \max\{\phi_2, \phi_3\}$. To see that, notice that

$$\phi_2 < \frac{1}{\pi_0^A\left(1 + 2p_d(\overline{\pi}^A)\frac{1-\overline{\pi}^A}{1-\pi_0^A} - 2p_c(\pi_0^A)\right)} \leq \frac{1}{\pi_0^A\left(1 + 2p_d(\pi_0^A)\frac{1-\pi_0^A}{1-\pi_0^A} - 2p_c(\pi_0^A)\right)} = \phi_4,$$

and

$$\phi_3 = \frac{1}{\pi_0^A(1 + 2p_d(\overline{\pi}^A)\frac{\overline{\pi}^A}{\pi_0^A} - 2p_c(\pi_0^A))} \leq \frac{1}{\pi_0^A(1 + 2p_d(\pi_0^A)\frac{\pi_0^A}{\pi_0^A} - 2p_c(\pi_0^A))} = \phi_4.$$

Now, if $\phi \geq \phi_4$, we must have $\phi \geq \max\{\phi_2, \phi_3\}$. Thus, the incumbent has to choose between $\overline{\alpha}$ and α^P. Now, when $\overline{\alpha} \in (g(\pi_0^A), f(\pi_0^A))$, then $\overline{\alpha}$ is given by

$\overline{\alpha} = 1 - 2\phi\pi_0^A(1-\pi_0^A)[p_d(\pi_0^A) - p_c(\pi_0^A)]$. Substituting for $f(\pi_0^A)$, for $\overline{\alpha}$, we have $\pi_0^A + \phi\pi_0^A(1-\pi_0^A) = 1 - 2\phi\pi_0^A(1-\pi_0^A)[p_d(\pi_0^A) - p_c(\pi_0^A)]$, or $\phi = \phi_4$. Since $\overline{\alpha}$ is continuous and strictly decreasing in ϕ, $\overline{\alpha} < f(\pi_0^A)$ for $\phi \geq \phi_4$. Therefore, $\pi_1^A(\overline{\alpha}, \pi_0^A) = \pi_0^A$ for $\phi \geq \phi_4$. Now, $E_A(\overline{\alpha}, \pi_1^A(\overline{\alpha}, \pi_0^A)) - P_A$ is equal to

$$\frac{\alpha_1^A - k}{\pi_0^A} + \phi(1-\pi_0^A)(2p_d(\pi_0^A) - 2p_c(\pi_0^A)) = \frac{1-k}{\pi_0^A} > 0$$

since $\alpha_1^A = 1 - 2\phi\pi_0^A(1-\pi_0^A)[p_d(\pi_0^A) - p_c(\pi_0^A)]$. □

A.2.6 Proof of Proposition 2

Proof. First, by Lemma 5, if ϕ is below ϕ_1, the opposition will accept any allocation, and, therefore, in this range, the incumbent is forced to choose α^e. The choice of the incumbent matters only when $\phi > \phi_1$. Now, as Lemma 6 shows, when $\phi \leq \phi_2$, the incumbent actually prefers conflict to any allocation implementable along the economic path. If we have $\phi \in [\phi_1, \phi_2)$, the incumbent then induces conflict by offering $\alpha^P = 1$. When $\phi > \max\{\phi_1, \phi_2\}$, then the incumbent prefers economic activity if α^e, is accepted. By Lemma 7, α^e is accepted if and only if $\phi < \phi_3$. Therefore, the incumbent offers α^e and induces economic activity if $\phi \in (\max\{\phi_1, \phi_2\}, \phi_3]$. For $\phi > \phi_3$, the incumbent must make a larger offer $\bar{\alpha}$ to induce the economic path. For $\phi > \max\{\phi_2, \phi_3\}$, the incumbent has to choose between $\bar{\alpha}$ and α^P. If $\overline{\pi}^A = \pi_0^A$, then it is easy to check that $\phi_4 = \phi_3$, and then, by Lemma 4, for $\phi > \phi_4$, the incumbent offers $\bar{\alpha}$, which is just enough to prevent the opposition from launching conflict. However, if $\overline{\pi}^A < \pi_0^A$, then we have another range $(\max\{\phi_2, \phi_3\}, \phi_4)$ where the choice between open conflict and peaceful belligerence depends on the cost and benefit of conflict.

Suppose that $\phi \in (\max\{\phi_2, \phi_3\}, \phi_4)$. Since $\phi > \max\{\phi_2, \phi_3\}$, the optimal choice is either $\bar{\alpha}$ or α^p, depending on the sign of $E_A(\overline{\alpha}, \pi_1^A(\overline{\alpha}, \pi_0^A)) - P_A$. From

Lemma 5, $\overline{\alpha}$ is continuous and strictly decreasing in ϕ. From the proof of Lemma 8, we know that when $\phi = \phi_4$, $\overline{\alpha} = f(\pi_0^A)$. Therefore, for $\phi < \phi_4$, $\overline{\alpha} > f(\pi_0^A)$. Moreover, when $\overline{\alpha} > f(\pi_0^A)$, we know that there is switching, and the consequent group size $\pi_1^A(\overline{\alpha}, \pi_0^A)$ is strictly increasing in $\overline{\alpha}$, and, therefore, strictly decreasing in ϕ. Now, we express $E_A(\overline{\alpha}, \pi_1^A(\overline{\alpha}, \pi_0^A)) - P_A$ as $Z(\phi)$, and examine its sign as a function of ϕ. Just for notational convenience, we write $\pi_1^A(\overline{\alpha}, \pi_0^A)$ simply as $\widehat{\pi}(\phi)$

$$\begin{aligned} Z(\phi) &= E_A(\overline{\alpha}, \pi_1^A(\overline{\alpha}, \pi_0^A)) - P_A \\ &= -\frac{k}{\pi_0} + \phi(1 - 2p_c(\pi_0)) + 2\phi p_d(\widehat{\pi}(\phi)). \end{aligned}$$

It is easy to see that $Z(\phi) \geq 0$ if and only if $k \leq \phi\pi_0^A \left(1 + 2p_d(\pi_1^A(\bar{\alpha}, \pi_0^A)) - 2p_c(\pi_0^A)\right)$. Open conflict prevails otherwise. When $k = 0$, $Z(\phi) = \phi(1-2p_c(\pi_0))+2\phi p_d(\widehat{\pi}(\phi)) > 0$. We now show that $Z(\phi) < 0$ when $k = 1$. $Z(\phi)$ at $k = 1$ is

$$\begin{aligned} &-\frac{1}{\pi} + \phi[1 + 2p_d(\widehat{\pi}) - 2p_c(\pi)] \\ =& \left(\frac{\widehat{\pi} - \pi}{\widehat{\pi}}\right)\left(\phi[1 - 2p_c(\pi)] - \frac{1}{\pi}\right) \end{aligned}$$

Since $\widehat{\pi} - \pi > 0$, if $1 - 2p_c(\pi) < 0$, then $Z(\phi)$ is negative. Now, suppose that $1 - 2p_c(\pi) > 0$. We have $\phi < \phi_4$, implying that $\phi < \frac{1}{\pi[1-2p_c(\pi)+2p_d(\pi)]} \frac{1}{\pi[1-2p_c(\pi)]}$. This simplifies to $\phi[1 - 2p_c(\pi)] < \frac{1}{\pi}$. Again, $\left(\frac{\widehat{\pi}-\pi}{\widehat{\pi}}\right)\left(\phi[1 - 2p_c(\pi)] - \frac{1}{\pi}\right) < 0$. Therefore, $Z(\phi)$ at $k = 1$ is negative. □

A.3 Proof of Proposition 3

Suppose group A has group size π_0^A in period 1. Note that $\phi > \frac{1}{\pi_0^A} \Leftrightarrow \frac{1}{\pi_0^A} - \phi < \frac{0}{1-\pi_0^A}$ which implies that even if group A retains all the surplus, no member of group B finds it profitable to switch. Similarly, $\phi > \frac{1}{1-\pi_0^A}$ implies that if group B keeps all surplus to itself, no member of group A finds it profitable to switch. Since there is no switching in period 1, the group sizes remain the same in period 2, therefore the same no-switching result holds. Therefore, $\alpha^e = 1$. The ruling group in period 2 keeps all surplus. Assuming that group A is in power in period 1,

$$E_A(\alpha) = \frac{\alpha}{\pi_0^A} + \frac{p_d}{\pi_0^A} \qquad \text{and} \qquad E_B(\alpha) = \frac{1-\alpha}{1-\pi_0^A} + \frac{1-p_d}{1-\pi_0^A}.$$

$$P_A = \frac{k}{\pi_0^A} + \frac{p_c}{\pi_0^A} \qquad \text{and} \qquad P_B = \frac{1-p_c}{1-\pi_0^A}.$$

Now, $E_B(\alpha^e) = \frac{1-p_d}{1-\pi_0^A} < \frac{1-p_c}{1-\pi_0^A} = P_B$. Therefore, an offer of α^e will be rejected. The offer that will keep group B indifferent is given by

$$\frac{1-\overline{\alpha}}{1-\pi_0^A} + \frac{1-p_d}{1-\pi_0^A} = \frac{1-p_c}{1-\pi_0^A} \Rightarrow \overline{\alpha} = 1-(p_d - p_c)$$

To see that group A prefers $\overline{\alpha}$ on the economic path to $\alpha^P = 1$ on the political path, note that

$$E_A(\overline{\alpha}) - P_A = \left[\frac{\overline{\alpha}}{\pi_0^A} + \frac{p_d}{\pi_0^A}\right] - \left[\frac{k}{\pi_0^A} + \frac{p_c}{\pi_0^A}\right] = \frac{1-k}{\pi_0^A} > 0$$

A.4 Proof of Proposition 4

Proof. Consider the subgame where the opposition does not commit not to switch. Clearly, this subgame is precisely the "original game." Let C denote the range of ϕ, for which open conflict arises in equilibrium in the original game. From Proposition 2, we know that $C = (\phi_1, \phi_2) \cup \{\phi : k > \phi\pi_0^A \left(1 + 2p_d(\pi_1^A(\bar{\alpha}, \pi_0^A)) - 2p_c(\pi_0^A)\right)$ and $\phi < \phi_4\}$. For $\phi \in C$, the equilibrium payoffs are

$$P_A = \frac{k}{\pi_0^A} + 1 + \phi(1-\pi_0^A)(2p_c(\pi_0^A) - 1) \qquad \text{and} \qquad P_B = 1 + \phi\pi_0^A(1 - 2p_c(\pi_0^A)).$$

Now, consider the subgame where the opposition commits not to switch. The payoffs to each group on the economic path in this subgame are given by

$$E_A^{NS}(\alpha) = \frac{\alpha}{\pi_0^A}+1+\phi(1-\pi_0^A)(2p_d(\pi_0^A)-1) \qquad \text{and} \qquad E_B^{NS}(\alpha) = \frac{1-\alpha}{1-\pi_0^A}+1+\phi\pi_0^A(1-2p_d(\pi_0^A)).$$

We show that in equilibrium, the incumbent offers α^*, where α^* is defined as by $E_B^{NS}(\alpha^*) = P_B$.

First, note that α^* exists as long as $\phi \in (\phi_1, \phi_2)$. From the definition of α^*, we have

$$\alpha^* \;\; = \;\; 1 - 2\phi\pi_0^A(1-\pi_0^A)(p_d(\pi_0^A) - p_c(\pi_0^A)).$$

Since $p_d(\pi_0^A) > p_c(\pi_0^A),\ \alpha^* < 1$. For $\alpha^* > 0$, we need $\phi < \frac{1}{2\pi_0^A(1-\pi_0^A)(p_d(\pi_0^A)-p_c(\pi_0^A))} := \overline{\phi}$. Now,

$$\frac{1}{\phi_4} - \frac{1}{\overline{\phi}} = \pi_0^A + 2\left(\pi_0^A\right)^2(p_d(\pi_0^A) - p_c(\pi_0^A)) > 0 \Rightarrow \overline{\phi} > \phi_4.$$

Since $\phi_2 < \phi_4$, we must have $\phi < \overline{\phi}$. Therefore, $\alpha^* \in (0,1)$. Any $\alpha > \alpha^*$ will be rejected, and will result in payoffs $\{P_A, P_B\}$. We show that $E_A^{NS}(\alpha^*) > P_A$.

$$E_A^{NS}(\alpha^*)-P_A = \frac{1-k}{\pi_0^A}-2\phi(1-\pi_0^A)(p_d(\pi_0^A)-p_c(\pi_0^A))+2\phi(1-\pi_0^A)(p_d(\pi_0^A)-p_c(\pi_0^A)) = \frac{1-k}{\pi_0^A} > 0.$$

Therefore, the incumbent prefers offering α^* (and inducing the economic path) to conflict. Moreover, α^* is the maximal share implementable on the economic path.

Since $\phi \in C$, if the opposition does not commit, it earns a payoff of P_B. On committing not to switch groups, it earns the same amount. We assumed that the the economic path is chosen when the opposition is indifferent. So, the opposition commits not to switch in equilibrium. Finally, note that $\alpha^* - f(\pi_0^A) = (1-\pi_0^A)[1-$

$\phi\pi_0^A\{2(p_d(\pi_0^A) - p_c(\pi_0^A)) + 1\}] > 0$, since $\phi < \phi_4$. □

A.5 Proof of Proposition 5

Proof. Suppose that $\pi_0^A \leq \underline{\pi} = 2 - \sqrt{4-k}$. Since $k \in (0,1)$, $\underline{\pi} \in (0, 2-\sqrt{3})$. Moreover, $\pi_0^A < k$. To see that, notice that, since $0 < k < 1$

$$k > 2 - \sqrt{4-k} \Leftrightarrow \sqrt{4-k} > 2-k \Leftrightarrow 4-k > 4-4k+k^2 \Leftrightarrow 3 > k$$

which is always true. Since $\pi_0^A < k$, we must have $\phi_2 > 0$. Moreover, we have $\phi_2 > 1$ if

$$\begin{aligned} 2p_d(\overline{\pi}^A)\frac{1-\overline{\pi}^A}{1-\pi_0^A} - 2p_c(\pi_0^A) &< \frac{k-\pi_0^A}{\pi_0^A(1-\pi_0^A)} - 1 \\ or\ 2p_d(\overline{\pi}^A)(1-\overline{\pi}^A) - 2p_c(\pi_0^A)(1-\pi_0^A) &< \frac{k}{\pi_0^A} + \pi_0^A - 2 \end{aligned}$$

Since the left hand expression is always less than 2, a sufficient condition for $\phi_2 > 1$ is $\frac{k}{\pi_0^A} + \pi_0^A - 2 > 2$, i.e. $\frac{k}{\pi_0^A} + \pi_0^A > 4$.

Notice that the derivative of the left hand side is $-\frac{k}{(\pi_0^A)^2} + 1 < 0$ since $k > \pi_0^A > (\pi_0^A)^2$. The admissible solution to $\frac{k}{\pi_0^A} + \pi_0^A = 4$ is $\underline{\pi} = 2 - \sqrt{4-k}$. Therefore, if $\pi_0^A \leq \underline{\pi}$, we must have $\frac{k}{\pi_0^A} + \pi_0^A > 4$, which implies that $\phi_2 > 1$. If $\phi_2 > 1$, peaceful belligerence does not occur in equilibrium. Moreover, it is easy to see that $\underline{\pi} = 2 - \sqrt{4-k}$ is increasing in k. □

A.6 Proof of Proposition 7

To prove this result, we need the following lemma, which describes how the incumbent's expected two-period per capita payoff varies with the cost of mobility in the different equilibrium regimes.

Lemma 9. *Suppose that A is the incumbent group in period 1 with size π_0^A, and let $V_A(\phi)$ denote A's expected two-period per capita payoff as a function of the cost of mobility ϕ. In the no-conflict equilibrium regime, V_A is increasing in ϕ. In the open-conflict regime and in the peaceful-belligerence regime with no switching, V_A is increasing in ϕ if and only if $p_c\left(\pi_0^A\right) \geq \frac{1}{2}$. In the peaceful-belligerence regime with switching, a sufficient condition for V_A to be increasing in ϕ is that $p_c\left(\pi_0^A\right) \geq \frac{1}{2}$.*

Proof. $V_A(\phi)$ denotes A's expected two-period per capita payoff as a function of ϕ.

$$V_A(\phi) = \begin{cases} E_A(\alpha_1^e, \pi_1^A(\alpha_1^e)) & \text{in the no-conflict regime} \\ P_A & \text{in the open-conflict regime} \\ E_A(\overline{\alpha}, \pi_1^A(\overline{\alpha}, \pi_0^A)) & \text{in the peaceful-belligerence regime} \end{cases} .$$

It is easy to see that $E_A\left(\alpha_1^e, \pi_1^A(\alpha_1^e)\right)$ is strictly increasing in the cost of mobility ϕ and P_A is strictly increasing in ϕ if and only if $p_c(\pi_0^A) > \frac{1}{2}$.

The relationship between the incumbent's payoff in the peaceful-belligerence regime and the cost of mobility depends on whether or not switching occurs in equilibrium. First, consider peaceful belligerence without switching. Such a case arises if $\overline{\alpha} \in \left[g(\pi_0^A), f(\pi_0^A)\right]$. In this case, $E_A(\overline{\alpha}, \pi_1^A(\overline{\alpha}, \pi_0^A)) = \frac{1}{\pi_0^A} + 1 + \phi(1 - \pi_0^A)\left(2p_c(\pi_0^A) - 1\right)$, which is increasing in ϕ if and only if $p_c(\pi_0^A) > \frac{1}{2}$.

Next, consider the peaceful-belligerence regime with switching. Such a case arises if $\overline{\alpha} > f(\pi_0^A)$. In this case, $\overline{\alpha}$ satisfies $E_B\left(\alpha, \pi_1^A(\alpha)\right) = P_B$. As derived in the proof of Lemma 5, we see that $\overline{\alpha}$ is given implicitly by the group composition $\widehat{\pi}$ ($= \pi_1^A(\overline{\alpha}, \pi_0^A)$) that satisfies $\pi_1 p_d(\pi_1) = \frac{1}{2}\left[\frac{1}{\phi} - \pi_0^A(1 - 2p_c(\pi_0^A))\right]$, and $\widehat{\pi}$ is decreasing in ϕ. In this case, we have $\widehat{\pi} E_A(\overline{\alpha}, \pi_1^A(\overline{\alpha}, \pi_0^A)) + (1 - \widehat{\pi})\, E_B(\overline{\alpha}, \pi_1^A(\overline{\alpha}, \pi_0^A)) = 2.$

Therefore, substituting for $E_B(\cdot)$ we get

$$E_A(\overline{\alpha}, \pi_1^A(\overline{\alpha}, \pi_0^A)) = 1 + \frac{1}{\widehat{\widehat{\pi}}} + \left(\frac{1}{\widehat{\widehat{\pi}}} - 1\right) \phi \pi_0^A (1 - 2p_c(\pi_0^A)). \tag{A.1}$$

As $\widehat{\pi}$ is decreasing in ϕ, and if $p_c(\pi_0^A) > \frac{1}{2}$, all the terms in (A.1) are positive and increasing in the cost of mobility ϕ. Therefore, a sufficient condition for $E_A(\overline{\alpha}, \pi_1^A(\overline{\alpha}, \pi_0^A))$ (in the peaceful-belligerence regime with switching) to be increasing in ϕ is that $p_c(\pi_0^A) > \frac{1}{2}$. □

Proof of Proposition 7

Proof. We can re-write $V_A(\phi)$ as follows:

$$V_A(\phi) = \max\{E'_A(\phi), P'_A(\phi)\}$$

$$\text{where } E'_A(\phi) = \begin{cases} E_A(\alpha^e, \pi_1^A(\alpha^e)) & for \quad \phi \in [0, \phi_3] \\ E_A(\overline{\alpha}, \pi_1^A(\overline{\alpha})) & for \quad \phi \in (\phi_3, 1] \end{cases}$$

$$\text{and } P'_A(\phi) = \begin{cases} 0 & for \quad \phi \in [0, \phi_1] \\ P_A & for \quad \phi \in (\phi_1, 1] \end{cases}$$

For the first part of the proposition, we show that if $p_c(\pi_0^A) > \frac{1}{2}$, $V_A(\phi)$ is maximized at $\phi = 1$. As $E_A(\alpha^e, \pi_1^A(\alpha^e)) = E_A(\bar{\alpha}, \pi_1^A(\bar{\alpha}))$ at $\phi = \phi_3$, it follows that $E'_A(\phi)$ is continuous in $\phi \in [0, 1]$. By Lemma 9, if $p_c(\pi_0^A) > \frac{1}{2}$, $E_A(\alpha^e, \pi_1^A(\alpha^e))$ is strictly increasing in $\phi \in [0, \phi_3]$, $E_A(\bar{\alpha}, \pi_1^A(\bar{\alpha}))$ is strictly increasing in $\phi \in (\phi_3, 1]$ and P_A is strictly increasing in ϕ. Therefore, if $p_c(\pi_0^A) > \frac{1}{2}$, the function $E'_A(\phi)$ is strictly increasing in $\phi \in [0, 1]$, and $P'_A(\phi)$, by construction, is constant over $[0, \phi_1]$

and strictly increasing over $(\phi_1, 1]$. Notice that if there are real valued functions f and g that are strictly (weakly) increasing over the same range, then the function $\max\{f, g\}$ will also be strictly (weakly) increasing over the same range. This indicates that $V_A(\phi)$ is weakly increasing over $[0, \phi_1]$ and strictly increasing over $(\phi_1, 1]$. Moreover, since $V_A(\phi) = \max\{E_A(\alpha^e, \pi_1^A(\alpha^e)), 0\} = E_A(\alpha^e, \pi_1^A(\alpha^e))$ for $\in [0, \phi_1]$, $V_A(\phi)$ is strictly increasing over $[0, \phi_1]$. Therefore, $V_A(\phi)$ is strictly increasing (possibly discontinuously) over the entire range of ϕ.

To prove the second part of the proposition, we show that there may exist local maxima in $(0, 1)$ if $p_c(\pi_0^A) < \frac{1}{2}$. By Lemma 9, $V_A(\phi)$ is strictly decreasing over $(\phi_1, \phi_2]$. As $V_A(\phi)$ is increasing up to $\phi = \phi_1$, we may have a local maximum at ϕ_1. A sufficient condition for this local maximum to be a global maximum is that $\phi_2 \geq 1$. Similarly, one can derive other sufficient conditions for $\phi = 1$ not to be a global maximum. For example, if $\phi_4 < 1$, by Proposition 2, we know that peaceful-belligerence regime without switching prevails in $(\phi_4, 1]$. Further, as $p_c(\pi_0^A) < \frac{1}{2}$, by Lemma 9, $V_A(\phi)$ is decreasing in $(\phi_4, 1]$. Therefore, $\phi = 1$ cannot even be a local maximum in this case. □

References

Acemoglu, Daron, and James Robinson. 2000. "Why Did the West Extend the Franchise?" *Quarterly Journal of Economics*, 115(November): 1167–1199.

Acemoglu, Daron, and James Robinson. 2001. "Inefficient Redistribution." *American Political Science Review*, 95: 649–661.

Acemoglu, Daron, and James Robinson. 2006. *Economic Origins of Dictatorship and Democracy.* Cambridge University Press.

Alesina, Alberto, and Eliana La Ferrara. 2005. "Ethnic Diversity and Economic Performance." *Journal of Economic Literature*, 63(September): 762–800.

Austen-Smith, D., and Roland G. Fryer. 2005. "An Economic Analysis of 'Acting White'." *Quarterly Journal of Economics*, 120(2): 551–583.

Azam, Jean-Paul. 1995. "How to Pay for the Peace?" *Public Choice*, 83(April): 173–184.

Azam, Jean-Paul. 2001. "The Redistributive State and Conflicts in Africa." *Journal of Peace Research*, 38(4): 429–444.

Barth, F. 1969. *Ehtnic Groups and Boundaries.* Universitetforlaget, Oslo.

Bates, Robert H. 1983. "Modernization, Ethnic Competition, and the Rationality of Politics in Contemporary Africa." In *State versus Ethnic Claims: African Policy Dilemmas*. , ed. Donald Rothchild and Victor A. Olunsorola. Boulder, CO: Westview Press.

Caselli, Francesco, and Wilbur John Coleman. 2013. "On the Theory of Ethnic Conflict." *Journal of the European Economic Association*, 11(S1): 161–192.

Cederman, Lars-Erik, and Luc Girardin. 2007. "Beyond Fractionalization: Mapping Ethnicity into Nationalist Insurgencies." *American Political Science Review*, 101: 173–185.

Chandra, Kanchan. 2004. *Why Ethnic Parties Succeed.* Cambridge University Press.

Collier, Paul. 2001. "Ethnic Diversity: An Economic Analysis of its Implications." *Economic Policy,*, 32: 129–166.

Collier, Paul, and Anke Hoeffler. 2004. "Greed and Grievance in Civil War." *Oxford Economics Papers*, 56(4): 563–595.

Collier, Paul, and Anke Hoeffler. 2007. "Civil War." In *Handbook of Defense Economics*. , ed. Todd Sandler and Keith Hartley. Elsevier.

della Porta, D. 2006. *Social Movements, Political Violence and the State: A Comparative Analysis of Italy and Germany.* . 2nd ed., Cambridge University Press.

Esteban, Joan, and Debraj Ray. 1994. "On the Measurement of Polarization." *Econometrica*, 62: 819–852.

Esteban, Joan, and Debraj Ray. 1999. "Conflict and Distribution." *Journal of Economic Theory*, 87: 379–415.

Esteban, Joan, and Debraj Ray. 2008. "On the Salience of Ethnic Conflict." *American Economic Review*, 98(5): 2185–2202.

Esteban, Joan, and Debraj Ray. 2011. "Linking Conflict to Inequality and Polarization." *American Economic Review*, forthcoming.

Esteban, Joan, Carlos Gradín, and Debraj Ray. 2007. "An Extension of a Measure of Polarization, with an application to the income distribution of five OECD countries." *Journal of Economic Inequality*, 5(1): 1–19.

Esteban, Joan, Laura Mayoral, and Debraj Ray. 2011. "Ethnicity and Conflict: An Empirical Study." working paper.

Fearon, James D. 1995. "Rationalist explanations for war." *International Organization*, 49(3): 379–414.

Fearon, James D. 1999. "Why Ethnics Politics and 'Pork' Tend to Go Together." *Mimeo, Stanford University*.

Fearon, James D. 2006. "Ethnic Mobilization and Ethnic Violence." In *Oxford Handbook of Political Economy*. , ed. Barry R. Weingast and Donald Wittman. Oxford University Press.

Fearon, James D., and David D. Laitin. 2003. "Ethnicity, Insurgency, and Civil War." *American Political Science Review*, 97(1): 75–90.

Fearon, James D., Kimuli Kasara, and David D. Laitin. 2007. "Ethnic Minority Rule and Civil War Onset." *American Political Science Review*, 101(1): 187–193.

Garfinkel, Michelle, and Stergios Skaperdas. 2007. "Economics of Conflict: An Overview." In *Handbook of Defense Economics*. , ed. Todd Sandler and Keith Hartley. Elsevier.

Gellner, Ernest. 1983. *Nations and Nationalism.* Cornell University Press.

Grossman, Herschel I. 1991. "A General Equilibrium Model of Insurrections." *American Economic Review*, 81(4): 912–921.

Gurr, Ted Robert, and Barbara Harff. 1994. *Ethnic Conflict in World Politics.* Westview Press.

Hirschman, Albert O. 1964. "The Paternity of an Index." *American Economic Review*, 54(5): 761–762.

Hirshleifer, J. 1995. "Anarchy and its Breakdown." *Journal of Political Economy*, 103(February): 26–52.

Horowitz, Donald. 1985. *Ethnic Groups in Conflict.* Berkeley and Los Angeles: University of California Press.

Horowitz, Donald. 2001. *The Deadly Ethnic Riot.* Berkeley and Los Angeles: University of California Press.

Hugh-Jones, D., and Ro'i Zultan. 2013. "Reputation and Cooperation in Defense." *Journal of Conflict Resolution*, 57(2): 327–355.

Laitin, David D. 2007. *Nations States and Violence.* Oxford University Press.

Lang, K. 1972. "Military Institutions and the Sociology of War: A Review of the Literature with Annotated Bibliography."

Lewis, William H. 1961. "Feuding and Social Change in Morocco." *Journal of Conflict Resolution*, 43–54.

Miguel, Edward, Shanker Satyanath, and Ernest Sergenti. 2004. "Economic Shocks and Civil Conflict: An Instrumental Variables Approach." *Journal of Political Economy*, 112(4): 725–753.

Montalvo, Jose G., and Marta Reynald-Querol. 2005. "Ethnic Polrization, Potential Conflict and Civil Wars." *American Economic Review*, 95: 796–816.

Murphy, R.F. 1957. "Intergroup Hostility and Social Cohesion." *American Anthropologist*, 59: 1018–1036.

Padró i Miquel, Gerard. 2007. "The Control of Politicians in Divided Societies: The Politics of Fear." *Review of Economic Studies*, 74: 1259–1274.

Powell, Robert. 2004. "The Inefficient Use of Power: Costly Conflict With Complete Information." *American Political Science Review*, 98(2): 231–241.

Rabushka, Alvin, and Kenneth A. Shepsle. 1972. *Politics in Plural Societies: A Theory of Democratic Instability.* Columbus, OH: Merrill.

Stein, Arthur A. 1976. "Conflict and Cohesion: A Review of the Literature." *Journal of Conflict Resolution*, 20(1): 143–172.

Wärneryd, Karl. forthcoming. "Informational Aspects of Conflict." In *Oxford Handbook of the Economics of Peace and Conflict.* , ed. Michelle Garfinkel and Stergios Skaperdas. Oxford University Press.