Protest and Conflict Escalation

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Abstract

The literature on Civil Conflict has reached a point of maturity in identifying the correlates of conflict; however, the risk factors for conflict are far more common than conflict itself. Even when underlying conditions appear similar, as for the countries impacted by the Arab Spring, diverse outcomes can arise. By modeling the escalation process and incorporating protest as a signal to the government and potential dissidents in society, this paper shows how similar starting conditions can lead to protest, government concessions, or even civil war. This paper also contributes to understanding the relationship between repression and dissent. We argue that repression may reduce overall dissent, but cause dissent that occurs to become more violent. Finally we examine the predictions of the model using data on African countries, by complementing traditional conflict data from Uppsala Conflict Data Program (UCDP) with data on protest from the Social Conflict in Africa Database (SCAD), we examine the basic predictions of the model, and find evidence supporting the modeled relationship between protest and conflict.

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1 Introduction

Civil war is a relatively rare phenomenon, though the risk factors for war are not. As stated in Walter (2009), “existing studies cannot explain variation in the outbreak of violence across countries that are at similar risk of civil war.” She continues to argue that, “By viewing the decision to fight as part of a larger bargaining process and not as an isolated event...scholars can better explain why violence is more likely in some countries” (p. 244).

The events in the Arab Spring demonstrate the accuracy of Walter’s statements and serve to motivate this paper. Protests occurred, to some degree, in more than a dozen countries across Northern Africa and the Middle East. Existing macroeconomic conditions were similar in many of these countries, as was the way in which the mass movements against their ruling regimes started. However, the course the strategic interactions took once the protests started were different, as were the expectations various regimes established for how they would respond to protest. In the end, some regimes stayed in place with little change, some toppled peacefully, others violently, and some still remain embroiled in civil war. This paper provides a potential explanation for the dramatic divergence in results following the initial wave of protest in the Arab Spring.

By incorporating protest as an alternative to conflict, modeled as a signal in a bargaining framework with repression as its cost, we can address Walter’s comments directly. With protest as an option, the conflict payoff becomes an endogenous reservation payoff. This set-up leads to novel conclusions. As with many models, dissent is driven by economic conditions. However, we find the form it takes is driven by expected strategic interactions and non-economic determinants of the relative profitability of conflict. This implies that similar macroeconomic conditions could lead to different outcomes. Additionally, modeling repression as a cost to protest allows us to examine when it is a useful tool to quell dissent. However, we argue that governments may not be capable of quickly lowering the expected level of repression, and too high an expected level of repression can cause dissent to become violent. We also find a counterintuitive, non-monotonic relationship between protest and escalation to conflict, where the likelihood of conflict initially increases in protest size, then drops to zero once protest size surpasses a threshold.

The world depicted in the following model is one where two groups in society, which we label as the government and the rebels, must agree to split a fixed prize. At the beginning of the interaction, an exogenously set policy determines the allocation of resources to each group. After seeing the allocation the rebels have three choices. They can: do nothing and accept that allocation; move immediately to conflict to attempt to claim the entire prize, less what they lose by fighting; or protest to signal their discontent to the government.

Upon observing the protest, the rebel group and the government each learn more about the rebels' strength; however, the rebels get more accurate information than that of the government. After observing the signal, the government is then able to adjust the policy in an attempt to appease the rebel group.

In equilibrium we can see immediate peace, immediate conflict, or protest that either escalates into conflict or results in a peaceful bargain. Immediate conflict occurs in response to governments that are expected to vigourously supress protest, making the cost of protest too high for rebel groups to bother signaling. Protest occurs whenever the exogenously set policy is unfavourable to the rebels and the threat of repression is low. Following protest the interaction ends or escalation occurs. Escalation to conflict occurs after protest only if the government makes too small a concession to a rebel group that was in fact strong. Peace may follow protest in one of two ways: a successful protest, where the protests themselves garner major concessions, or a failed protest by a weak rebel group, where the rebels rationally accept minor concessions.

Other scholars have observed a relationship where protest precedes more violent civil conflict, such as in Gurr (2000). To examine the model's predictions, we combine two datasets with complementary measures of political dissent. The first is the Peace Research Institute at Oslo's (PRIO) Armed Conflict Dataset (ACD), which we use to measure civil conflict; the second is the Social Conflict in Africa Database (SCAD), from which we derive measures of protest. This data covers 42 African countries from 1990-2012.

These data provide a unique opportunity to examine the full spectrum of political dissent, and the determinants of escalation. Using the data as described in Section 5, table (1) provides mean transition rates from one year to the next. We see slightly higher probabilities of conflict originating from a period of protest than peace, but for the most part we do not see that conflict is more likely simply because protest has occurred. A major component of the following analysis is first, exploring conditions that make conflict erupt spontaneously, and second, the conditions that make protest more likely to de-escalate, escalate, or garner concessions. Figure (7) below demonstrates the main relationship predicted in the model of conflict escalation using the PRIO and SCAD data. The largest protests we observe in the sample very rarely lead to conflict escalation. For smaller protests, we tend to see a stable or slightly increasing trend in the likelihood of escalating into conflict. The model predicts that the larger a protest is, the more likely conflict should be, but only up to a threshold. Once this threshold is surpassed, the government should be willing to offer the rebels a large concession and conflict should be avoided. This prediction is a result of the correlation between protest size and rebel strength. A larger protest is more likely to come from a strong rebel group who will escalate protest to conflict if the government does not make a large concession. However, the largest protests convince the government to make a large concession and therefore do not escalate.

Figure 1: Protest Size and Conflict Escalation

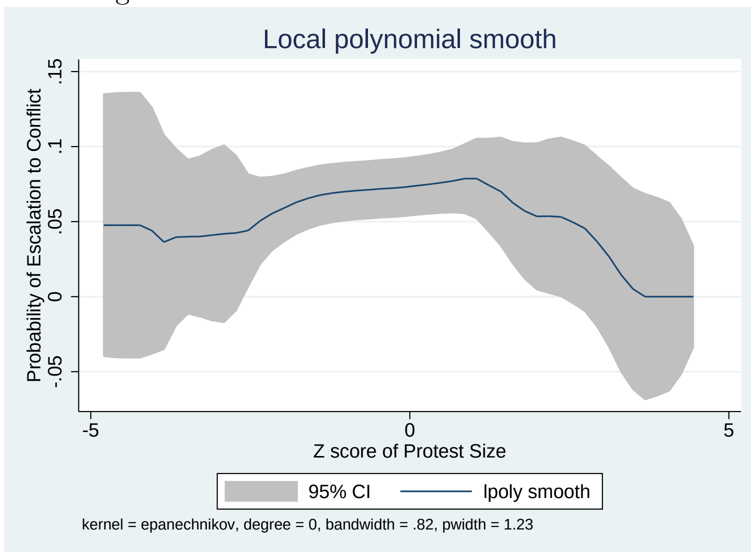


Table 1: Transition Rates

	Peace t+1	Protest t+1	Conflict t+1
Peace t	0.57	0.38	0.05
Protest t	0.15	0.78	0.08
Conflict t	0.06	0.16	0.78

A period is classified by the most extreme political dissent to have occured, any protest event in SCAD qualifies as protest, and PRIO's minor conflict threshold is used for conflict.

We then expand the model and allow the government to set the level of repression strategically. We argue that the baseline model, with repression taken as exogeneous, may be appropriate if the government has a long history of being highly repressive. It may be difficult for a government to take actions to reduce the expected level of repression, but it is not likely to be as difficult to raise that level. Endogenizing repression leads to a similar set of results, and we find that the cost associated with conflict becomes the main determinant of the type of dissent (protest or conflict) the rebel group will use in the first period.

2 Literature Review

There is a vast literature, both theoretical and empirical, examining the causes of civil conflict. Underlying much of this literature is the assumption that conflict is rational, a concept formalized by Fearon (1995). The binding principle among rational conflict models is that some agreement exists that all sides would prefer to avoid conflict; however, some inefficiency prevents an agreement from being reached. In his seminal paper, Fearon (1995) lays out three possible causes of rational conflict: information asymmetries with an incentive to misrepresent, commitment problems, and issue indivisibilities.

Several recent studies, including (Blattman and Miguel, 2010; Walter, 2009), ask why more implications of rational conflict models have not been tested. The basic premise of these arguments is summarized well by Walter (2009):

> Despite these problems, most studies of civil war have focused on the underlying structural conditions that encourage groups to go to war rather than on the bargaining problems that may stand in the way of settlement... By viewing the decision to fight as part of a larger bargaining process and not as a single isolated event, scholars can better explain why bargains are so rare in civil wars and why violence is more likely in some countries than others. (p. 244)

Using protest as a signal in a rational model of conflict allows us to derive and test hypotheses related to the aforementioned bargaining problems, as opposed to the structural conditions which lead to conflict. We argue that the basic conditions that have been found to precipitate conflict, such as poor economic conditions or existing political instability do induce dissent Miguel et al. (2004), Hegre and Sambanis (2006). However, the form of dissent depends on the outcome of actions taken by potential dissidents and the reputation established by the government for reacting to non-violent dissent, specifically the repression of protest.

The theoretical literature on conflict and protest both have a diverse selection of models using asymmetric information as the primary friction driving conflict (Powell, 2002). Models like Chassang and Padro-i Miquel (2009) use inaccurate information on the state of the world to generate conflict, others such as Wittman (1979) or more recently, Baliga and Sjöström (2004), use private information on the military capabilities of each side; our model makes a similar assumption. The focus in this paper, as opposed to much of the literature, is not in examining the conditions under which asymmetric information does and does not lead to conflict, but rather on examining if protest is potentially one way to convey this private information. As pointed out by Fearon (1995), asymmetric information alone is not enough to generate conflict; it requires an incentive to missrepresent that information or an inability to convey it accurately.

Many models also exist which use protest as a signal in a global games setting (Carlsson and Van Damme, 1993; Morris and Shin, 2001). This paper deviates from the traditional set-up of models like Melosh (2012) to focus on the escalation process and the government's response rather than trying to explain how movements overcome problems of collective action. The canonical framework for such a model uses a threshold value for the size of the protest, Granovetter (1978), and generally argues that if such a value is exceeded, the protest movement will grow massive and succeed in obtaining its demands. We agree with the basic intuition behind threshold models: large enough protests do succeed in convincing governments to grant major concessions. However, our model makes a major departure when examining what happens as the protest size increases towards this threshold. We predict that it is in these circumstances, when it is most likely that the government has misidentified a strong rebel group, that conflict is most likely to ensue.

Empirically, this paper contributes to a small but growing literature attempting to view conflict on a greater continuum. Early work such as Miguel et al. (2004) acknowledged measuring only the occurence as a weakness related to the available data. Other recent work such as Chaudoin et al. (2013) and Besley and Persson (2009) have leveraged improvements in available data. Our contribution runs closest to Besley and Persson (2009) in this regard: rather than trying to more accurately predict the breadth or intensity of conflict, we are most interested in examining the determinants of different types of dissent.

An additional contribution of the model in this paper is an attempt to bring together literatures on protest, repression and dissent, and conflict. By doing this we are able to provide a possible explanation for Davenport's 'punishment puzzle' Davenport (2007): the idea that dissent is almost always positively correlated with repression; however, the impact of repression on dissent is highly inconsistent. In particular we provide an answer to one question he highlights: "Under what circumstances can authorities reduce dissent?" Our model argues that depending on the state of the world, repression can have no impact on dissent, eliminate dissent completely, or induce a change in the type of dissent rebel groups will use. We provide potentially testable implications that may help to explain otherwise inconsistent results in the empirical literature examining the impact of repression on dissent.

We also make some key departures from the theoretical literature on repression and dissent. By returning to an earlier viewpoint where repression is meant to impose a cost on acts viewed as threatening to the power of the state, Goldstein (2001), and refine this by arguing specifically that repression is effective only against non-violent dissent. If a group decides to use violence against the government, they must acknowledge that it becomes acceptable for the government to respond in kind.

Similar to Pierskalla (2010), we argue repression is able to quell protest. However, we are able to generate any of the models paths, conflict, peace, or protest, as equilibrium outcomes without needing to introduce a third party. The key departure from previous work for this paper and in Pierskalla (2010), is incorporating this cost into a strategic interaction where both actors, the rebels and the government, decision processes are explicitly modeled. Previous models such as Lichbach (1987) focused on the type of dissent used by rebels, whereas other models such as Moore (2000) focused on the governments decision on how to use repression. The decision process in both of those models was driven by a cost benefit analysis of the choices faced by the models agents.

A recent trend in the empirical literature on dissent has been comparing violent and non-violent dissent (Chenoweth and Cunningham, 2013), this paper also contributes to this literature by distinguishing between the types of dissent used by potential rebel groups Cunningham (2013). Much of the recent work in the literature comparing violent and non-violent dissent has focused on the complementarity of different types of political dissent. We depart from this and examine an empirical observation made in this paper, and in earlier work by Gurr (2000): why does protest so often preceed conflict, and what determines the path it takes.

By joining together intuition from related literatures on repression, protest, and conflict, this paper provides some potential explanations for unresolved questions found in each literature. We provide one potential explanation for inconsistent findings on the impact of repression on dissent, highlight the role of bargaining in explaining why some countries are able to avoid conflict, and move in the direction of testing implications of rational conflict models rather than analyzing what structural conditions encourage dissent. Though we do not provide definitive answers to any of these open questions, we provide direction and highlight the advantages of drawing from the diverse literature encompassing political dissent as a whole rather than focusing solely on one particular type of dissent.

3 The Model

3.1 Baseline Model

The Rebels (R) and Government (G) share a prize normalized to 1, and their respective shares are ω and $1-\omega$. This leads to the following payoff functions

$$U_R = \omega, \text{ and} \tag{1}$$

$$U_G = 1-\omega. \tag{2}$$

To start, $\omega = \omega_0$, and ω_0 is taken as exogenous. For G, strength is set and is public knowledge. However, R's strength is unknown to both R and G. We argue government resources are relatively well known, whereas the actual level of support for those wishing to oppose the government is not likely to be widely shared. Specifically, R is one of two types: strong (R_s) or weak (R_w). G and R share a common prior of α_0 on R's type being R_s[1]. After observing ω_0, R may either pay a cost ν to protest ($\mathcal{P}$), allowing G to shift ω from ω_0 to ω_1, or initiate conflict (C). G may only adjust ω following a protest. This assumption is justified by arguing that seizing more surplus or setting less favorable policies, if not done in response to civil unrest, would impose too high a cost in the form of potential international sanctions against the country. For example some preferential trade agreements tie human rights compliance to their existence, Davenport (2007) Hafner-Burton (2005). This is one example of a cost to repression for the government.

If $\mathcal{P}$ was chosen, R pays a cost ν, learns their type, and a noisy signal, P, is observed by G. P can be thought of as the size of the protest. The signal $P \sim F_i(p)$, where $F_i(p)$ is any CDF that has the monotone likelihood ratio property and an unbounded likelihood ratio. The cost of protest,

[1]This particular information structure is a simplification. What is necessary is R starting with some uncertainty over their own type and receiving a more precise signal than G.

ν, could be thought of as representing many things but is meant to capture the expected level of repression in the government's response to protest[2]. We argue that this repression cost does not impact conflict. The use of violence and drastic reduction of civil liberties against those fighting the government is taken as an inherent part of the cost of conflict. This distinction is important in the results that follow, implying that repression should be thought of as a cost distinct to protest that does not impact the expected payoff to conflict, and is paid even when protest occurs, even if followed by conflict.

Following protest, G makes an offer to R based on G's updated belief of R's type. Should conflict occur, by either R rejecting G's offer or R choosing conflict in the first period, each side incurs a cost that is paid regardless of the conflict's outcome. C_r is the cost of conflict for R, and C_g is the cost of conflict for G. Additionally, T_i is the probability R_i wins. The victor can set ω at any point of their choosing. Setting ω at their preferred point, of 1 or 0, implies the following expected payoffs from conflict[3]

$$E[U_R(C)] = T_i - C_r, \text{ and} \tag{3}$$

$$E[U_G(C)] = 1 - T_i - C_g. \tag{4}$$

Formally, the timing of the game is as follows.

1. The policy ω is exogenously set at ω_0, and nature draws rebel type, either R_s or R_w, with prior α_0 on the type being R_s. At this stage, all players have the same information, with rebel type being unknown.

2. R then has the choice to, initiate conflict (C), protest ($\mathcal{P}$), or stay home ($\varnothing$). Following C or $\varnothing$, the game ends, with each receiving the conflict payoff or payoff determined by ω_0, respectively.

3. If $\mathcal{P}$ was chosen, R pays a cost ν, learns their type and a noisy signal is observed by G.

4. Following the signal, G updates their beliefs of R's type, and is able to change ω_0 to ω_1

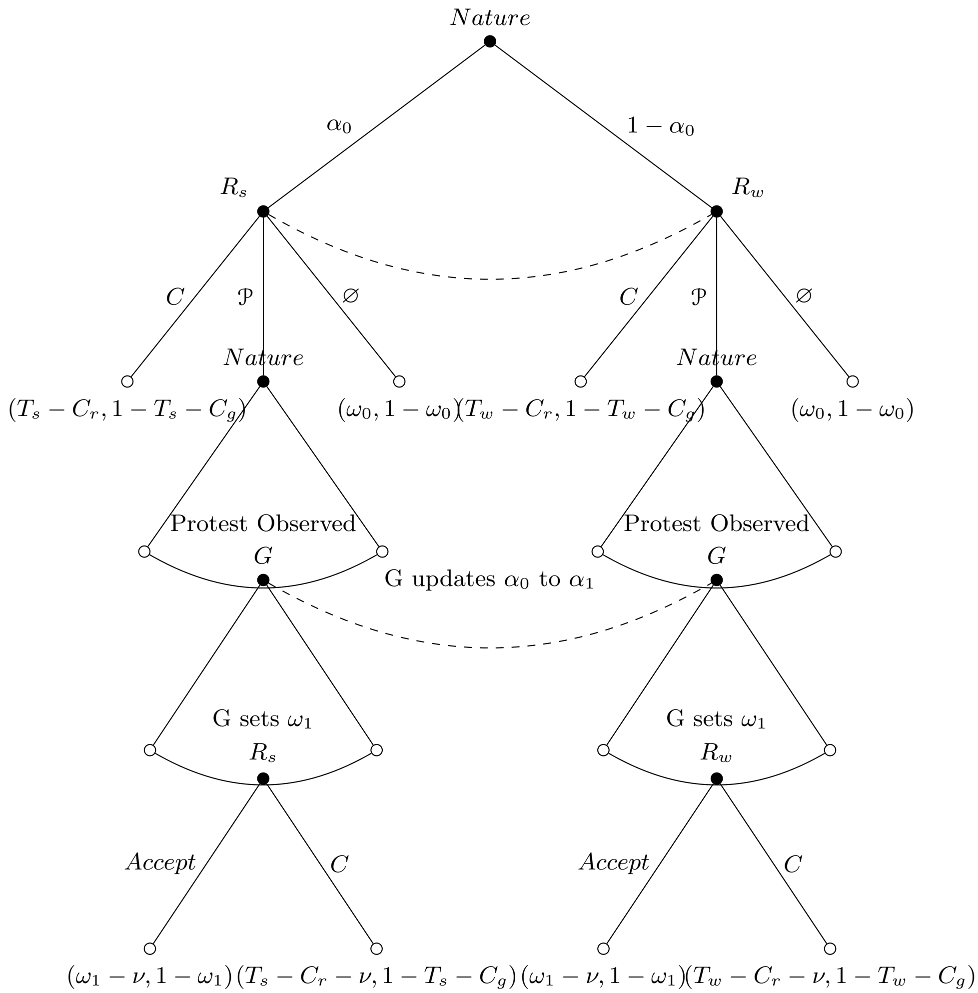
[2]The optimal level of repression is examined in the following section.

[3]A payoff structure like this could be derived from a traditional conflict success function Skaperdas (1996).

anywhere on the unit interval.

5. Finally, R can either accept ω_1 or choose to initiate conflict (C).

The layout of the game can be seen below in figure 1.



3.2 Solution

A perfect Bayesian equilibrium (PBE) of the extensive form game Γ is a strategy profile for R, G, and beliefs. These beliefs are consistent and updated using Bayes' rule. Players first maximize individual payoffs, then minimize the chance of conflict[4]. For R, a strategy consists of an initial decision of $\{\mathcal{P}, C, \varnothing\}$, and a decision to $\{Accept, C\}$ as a function of G's offer following protest, ω_1, and their own type. For G, a strategy consists of an offer $\omega_1 \in (0,1)$ as a function of the signal, where the choice of ω_1 is consistent and rational.

[4] That is, the tie-breaker rule avoids conflict if possible.

In order to look at possible equilibria in the game, it is useful to start by deriving several conditions. Using backwards induction, the offers each rebel type will accept at the final node are

$$R_s : \omega_1 \geq T_s - C_r \equiv \omega'', \text{ and} \tag{5}$$

$$R_w : \omega_1 \geq T_w - C_r \equiv \omega', \tag{6}$$

where these reservation payoff levels come from the conflict option.

Backing up to the previous node, it is clear that G will offer either ω' or ω'' for ω_1. Any offer in the range $(\omega'', 1]$ is dominated by offering ω''. A higher offer would strictly lower G's payoff because either rebel type would accept ω''. For offers $\in (\omega', \omega'')$, G would be better offering ω'. Offers in this range are only accepted by R_w, implying G could raise their payoff by offering the lowest offer accepted by R_w: ω'. Finally, offers in $[0, \omega')$ can be eliminated by comparing G's payoff from guaranteed conflict to offering ω', because offering below ω' guarantees conflict. Using equation (4) and ω' we see that offering ω' and avoiding conflict with R_w improves G's payoff by $C_r + C_g$.

Defining α_1 as G's updated belief of facing the strong type following the realization of the signal P, we can see G will offer ω'' if and only if

$$1 - \omega'' \geq (1 - \alpha_1)\left(1 - \omega'\right) + \alpha_1 \left(1 - T_s - C_g\right). \tag{7}$$

The LHS of the inequality is the guaranteed payoff of making a large concession: offering the strong rebel type's reservation payoff. This is balanced against the RHS, which corresponds to offering ω'. If the rebel type turns out to be weak (probability $1 - \alpha_1$), then the offer is accepted. Otherwise, conflict with the strong type ensues.

Rearranging equation (7) and using equations (5) and (6) to write it in terms of the likelihood ratio yields the following condition for G to make the higher offer:

$$\frac{\alpha_1}{1 - \alpha_1} \geq \frac{T_s - T_w}{C_r + C_g}. \tag{8}$$

Using Bayes' rule, the LHS of equation (8) can be rewritten as a function of the prior, α_1, and protest size, P. This leads to

$$\frac{\alpha_1}{1-\alpha_1} = \frac{\alpha_0}{1-\alpha_0} * \frac{f\left(P|R_s\right)}{f\left(P|R_w\right)} \geq \frac{T_s - T_w}{C_r + C_g}. \tag{9}$$

Defined implicitly in equation (9) is a threshold value for P, call it P^*, which makes equation (9) hold with equality. For values of $P \geq P^*$, G will offer ω'', while for $P < P^*$, G offers ω'. P^* is the smallest protest that convinces the government they are facing a strong rebel group, and rather than risking conflict they offer a large concession both rebel types rationally accept.

Using the government's decision rule, the payoffs to the rebels' strategy choices, C, P, and $\varnothing$ can be derived. The rebels' first-period decision can be characterized by comparing the payoff of the three strategy choices. First, the payoff for doing nothing, $\varnothing$, is fixed at ω_0.

Second, the expected payoff for immediate conflict, C, comes from a weighted average of the conflict payoff for the two possible rebel types because the rebel group does not know its own type before choosing an initial strategy. Using the prior α_0 and each type's expected conflict payoff leads to

$$\alpha_0 * T_s + (1-\alpha_0) * T_w - C_r \equiv \omega_c. \tag{10}$$

Finally, the rebels' payoff to protest can be derived. After protest occurs, the payoff is dependent on G's decision rule only if the rebel group ends up being weak. This is because the strong rebel group will either accept an offer of ω'' or initiate conflict; both pay $T_s - C_r$. However, for the weak rebels their payoff could be $T_s - C_r$ or $T_w - C_r$, depending on the protest's outcome. Using this result and P^* as defined above, we can write the expected payoff for protest as

$$\begin{aligned} \alpha_0(T_s - C_r) + (1-\alpha_0)\left[F_w\left(P^*\right) * T_w + (1 - F_w\left(P^*\right))T_s - C_r\right] - \nu = \\ \omega_c + (1-\alpha_0)\left(1 - F_w\left(P^*\right)\right)\left(T_s - T_w\right) - \nu. \end{aligned} \tag{11}$$

The first term is the probability of a strong rebel group, times their guaranteed payoff of $T_s - C_r$, the second term is the probability of a weak rebel group with differential payoffs depending on protest's outcome. The equation can then be rewritten as equation (11), where we see the expected payoff to protest is the expected conflict payoff plus a premium related to the probability the rebels are weak, less the cost ν. Comparing equations (10) and (11) leads us to the following condition for rebels to prefer protest to conflict:

$$\nu \leq (1 - \alpha_0)(1 - F_w(P^*))(T_s - T_w) \equiv \gamma \tag{12}$$

Examining equation (12) yields intuition as to when R chooses protest or conflict. The LHS ν is the cost one pays for choosing protest, and the RHS is the benefit broken into three pieces. First, $(1 - \alpha_0)$ is the probability R is a weak type who can potentially benefit from protest. Second, $(1 - F_w(P^*))$ is the probability a weak rebel will produce a signal large enough to convince G to offer ω''. Finally, $(T_s - T_w)$ is the actual difference between the strong and weak rebels' offers, $\omega'' - \omega'$.

3.3 Equilibria

We define the potential equilibria with respect to the rebels' initial strategy choice. This is done because the decision rule for the government is not dependent on the strategy choice of the rebels but rather on the outcome of the signal. This leads us to the following potential equilibria:

1. Protest Equilbrium

   Rebels: $\{\mathcal{P}; (R_s : accept\, if\, \omega_1 \geq \omega''; R_w : accept\, if\, \omega_1 \geq \omega')\}$

   G: offer ω'' if $P \geq P^*$, ω' o.w.

2. Immediate Conflict Equilibrium

   Rebels: $\{C; (R_s : accept\, if\, \omega_1 \geq \omega''; R_w : accept\, if\, \omega_1 \geq \omega')\}$

   G: offer ω'' if $P \geq P^*$, ω' o.w.

3. Peace Equilibrium

   Rebels: $\{\varnothing; (R_s : accept\, if\, \omega_1 \geq \omega''; R_w : accept\, if\, \omega_1 \geq \omega')\}$

   G: offer ω'' if $P \geq P^*$, ω' o.w.

Proposition (1) defines when each of the potential equilibria occur.

Proposition 1. *Equilibrium with exogenous repression: There is a unique perfect Bayesian equilibrium determined as follows:*

1. *For* $\omega_0 < \omega_c$ *and* $\nu < \gamma$, *Protest*

2. *For* $\omega_0 < \omega_c$ *and* $\nu > \gamma$, *Immediate Conflict*

3. *For* $\omega_0 > \omega_c$ *and* $\nu < \omega_c + \gamma - \omega_0$, *Protest*

4. *For* $\omega_0 > \omega_c$ *and* $\nu > \omega_c + \gamma - \omega_0$, *Peace*

Figure 1 divides the (ω_0, ν) parameter space according to the rebels' equilibrium strategy choice and can be used to prove Proposition 1 graphically. The three lines in the graph represent the indifference conditions between each pair of strategies and are equivalent to the conditions presented in Proposition 1. The vertical line at ω_c is the expected value of conflict, or the peace-conflict indifference curve. The horizontal line at γ corresponds to the conflict-protest indifference curve. Finally, the downward sloping line is the protest-peace indifference curve.

The figure depicts clearly when each of the potential equilibria occur. For $\omega_0 < \omega_c$, dissent always occurs because conflict dominates peace in this region. Finding that poor conditions generate conflict is not surprising; however, the type of dissent depends on the level of repression expected by the rebels, ν, compared to γ. For too high a level of repression, protest becomes costly to the rebels relative to conflict. This is a key result, that a low state of the world encourages dissent but does not necessarily cause conflict. Furthermore, we generate a counterintuitive result with respect to repression; if conditions are very poor, repression is unlikely to be an effective tool at quelling dissent, defined as protest or conflict. This is because the rebels always have conflict as an option, and although repression may prevent protest, by raising its cost, it leaves conflict as the only viable alternative.

Finally, we see for values of ω_0 greater than ω_c, the rebels choose either peace ($\varnothing$) or protest. Protest is chosen for relatively low combinations of ω_0 and ν. When peace weakly dominates conflict, protest can still achieves higher payoffs than conflict, gross of repression. This results from the premium protest earns over conflict. Here we see another counterintuitve result with repression: only when economic conditions are better than some minimum threshold, ω_c, can repression be used to quell dissent.

Perhaps the most interesting result from this set-up is seeing explicitly how having conflict as a reservation payoff drives when political dissent occurs. However, the form political dissent takes

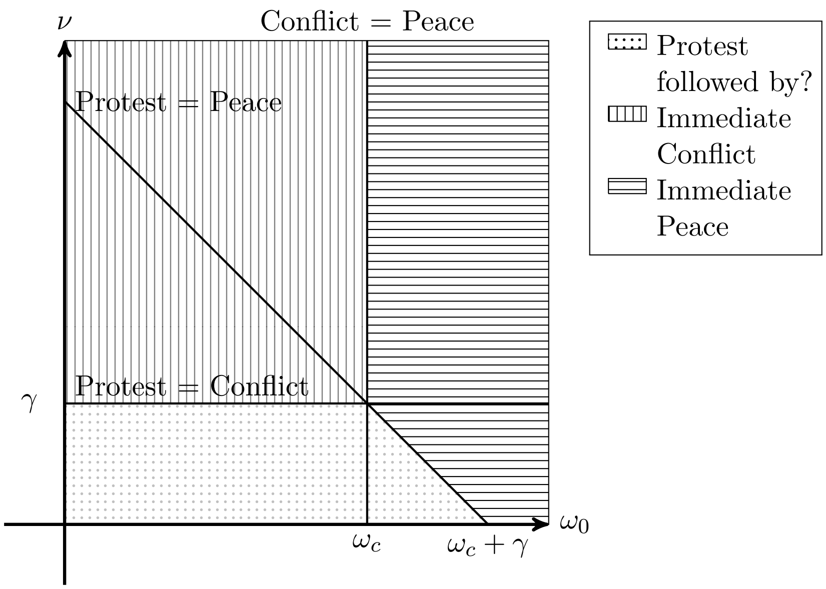


Figure 2: Equilibrium Paths for ν and ω_0

depends on the government's actions. This is interesting because we generate a few counterintuitive results related to the impact of repression, and provide a possible way to explain the variation in conflict outbreak across ostensibly similar countries. Low levels of repression can lead to more political dissent, in the form of protest, but high levels of repression switch the type of dissent to conflict. Additionally, repression is only effective when the state of the world is better than the conflict option. This implies that countries with especially poor conditions may actually want to encourage protest and take actions to prevent conflict from occurring. Ironically, this also implies that countries where conditions are slightly better may want to use repression to prevent any chance of conflict, which could result from failed protests.

These results raise the question as to what the optimal level repression should be, which is analyzed in the following section. However, modeling ν as fixed is appropriate if we are interested in short run changes. Considering that the rebels must make their decision to protest before repression actually occurs, they are likely to place a great deal of weight on past experience interacting with the government. It would be very easy for a government to make the response to a very small incident dramatic and public, raising the expected level of repression, but it could take much longer for a government to convincingly commit to a lower level of repression.

3.4 Optimal Repression

In the literature on repression, two important unanswered questions are: what purpose it serves and what its relationship with dissent is. Some theoretical models have argued that very high levels of repression should quell all dissent, for example Pierskalla (2010). For the purpose of this section, we will examine what the optimal level of repression would be if G could costlessly set ν at the beginning of the game. When a range of values is possible, we assume G chooses the minimum possible level of repression[5].

Examining the use of repression highlights the issue caused by the opposing nature of the preferences for the government and rebels in the game. The government can use repression to impact the type of dissent used by the rebel. Figure 1 highlighted this tradeoff; repression can influence the choice between protest and conflict for values of $\omega_0 < \omega_c$, and the choice between peace and protest for values of $\omega_0 \in [\omega_c, \omega_c + \gamma)$. Using our understanding of how the level of repression impacts the rebels' equilibrium strategy choice, and continuing with the use of backwards induction, we only need to figure out when the government prefers which rebel strategy choice.

We start by deriving the expected payoffs to the government for each rebel strategy. The total payoff available in the game ex-ante is $1 - (C_r + C_g) * P(\text{Conflict Occurs})$.

With peace, conflict does not occur, and the rebels receive a payoff of ω_0. Since R and G share a total payoff of 1, this implies the Government's payoff is

$$Peace : 1 - \omega_0 \tag{13}$$

With protest, conflict occurs if: (1) the rebel group is in fact strong, probability α_0; and (2) the strong rebel group fails to produce a protest larger than P^*, probability $F_s(P^*)$. This leaves an aggregate payoff, gross of repression, of $1 - \alpha_0 F_s(P^*)(C_r + C_g)$, and after subtracting off the rebels' payoff we get

$$Protest : 1 - \omega_c - \gamma - \alpha_0 F_s(P^*)(C_r + C_g). \tag{14}$$

Finally, for conflict, the aggregate payoff is $1 - (C_r + C_g)$. Subtracting off the rebels' expected

[5] This could be done by imposing a small increasing cost for repression, or through the use of lexicographic preferences.

payoff from conflict leaves the government with

$$\text{Immediate Conflict} : 1 - \omega_c - (C_r + C_g). \tag{15}$$

From here, we can compare the payoffs from each to determine when the government prefers each strategy.

We focus first on examining the case when Protest dominates Conflict.Substituting the respective values into the payoffs for each, we see that protest dominates conflict if

$$\frac{C_r + C_g}{T_s - T_w} \geq \frac{(1-\alpha_0)(1-F_w(P^*))}{(1-\alpha_0 F_s(P^*))} \equiv A. \tag{16}$$

It is straightforward to show the RHS of the inequality is always < 1. This gives Lemma 1.

Lemma 1. *For $\frac{C_r+C_g}{T_s-T_w}$ large enough (≥ 1 is sufficient), the government prefers protest to immediate conflict.*

Next we examine when peace dominates protest, this is done by a direct comparison of the government's payoffs for each, and results in the following

$$\omega_0 \leq \omega_c + \gamma + \alpha_0 F_s(P^*)(C_r + C_g). \tag{17}$$

To find the optimal level of repression, it is useful to understand when and how repression impacts the rebels' strategy choice. This is made clear in Proposition 1 and figure 2. For $\omega_0 < \omega_c$, the rebels will only choose between protest and immediate conflict, and repression directly impacts that choice by acting as a cost to protest. For values of $\omega_0 \in (\omega_c, \omega_c+\gamma)$, the rebels will choose either protest or peace, and again this choice depends on the level of repression. Finally, for $\omega_0 > \omega_c + \gamma$, the rebels always choose peace, and the level of repression has no impact on that choice.

This implies there are two cases to examine: $\omega_0 < \omega_c$, and $\omega_0 \in (\omega_c, \omega_c + \gamma)$. If $\omega_0 < \omega_c$, the rebels will only use protest or immediate conflict. So, equation (16) determines the government's preferred strategy choice. Examining equation (16) shows this is independent of ω_0, and that for high enough cost of conflict it is optimal to allow protest, while for low enough conflict costs G will set repression high enough to induce conflict[6]. Because γ is the level of repression which equates

[6]This is most cleary seen using lemma 1 and seeing that this is always true for $C_r + C_g > (T_s - T_w)$, as $(T_s - T_w)$

the payoffs of protest and immediate conflict for the rebels, it can be used to calculate the optimal level of repression for $\omega_0 < \omega_c$. With $C_r + C_g \geq (T_s - T_w) * A$, the optimal level is any value of $\nu \leq \gamma$, or by assumption $\nu = 0$. For $C_r + C_g < (T_s - T_w) * A$, G wishes to induce conflict and needs to set $\nu > \gamma$, implying $\nu = \gamma + \epsilon$.

The second case is for values of $\omega_0 \in (\omega_c, \omega_c + \gamma)$. Here if repression is low enough, the rebels will use protest, otherwise they will choose peace. Examining equation (17), we see that in this range, the government always prefers peace. This implies setting $\nu \geq \omega_c + \gamma - \omega_0$, or $\nu = \omega_c + \gamma - \omega_0$ by assumption. Because ν must be positive, beyond $(\omega_c + \gamma)$ G sets $\nu = 0$. This range of ω_0 is exactly when G would like dissent to occur, so he could lower the rebels' share of resources. However, the rebels choose $\varnothing$ regardless of the level of ν.

Combining these results leads us to the following proposition determining the government's optimal level of repression.

Proposition 2. *Optimal Repression: The minimal optimal level of repression is determined as follows:*

1. *For* $\omega_0 < \omega_c$
   (a) *If* $C_r + C_g \geq (T_s - T_w) * A$, $\nu = 0$
   (b) *If* $C_r + C_g < (T_s - T_w) * A$, $\nu = \gamma + \epsilon$
2. *For* $\omega_0 \geq \omega_c$, $\nu = max\,\{\omega_c + \gamma - \omega_0, 0\}$

This section assumed that it was costless for the government to repress; what if it was not? Repression generates a discrete change to the expected payoff for the government by potentially inducing the rebels to change their strategy. For low values of ω_0 this can change protest to conflict, and for higher values it can prevent protest. Including a cost would not change the levels of repression, unless the level needed to either induce conflict, or prevent protest cost more than the change in expected payoff for the government. For example, it could induce the government to switch to setting $\nu = 0$ in case 1 or 2 of proposition 2. Even with repression endogenous, protest and its associated dynamics are still potential outcomes. The interesting consideration from this discussion would be understanding the impact of policies intended to raise the cost of repression

is actually the upper bound because $A \leq 1$.

for a government. Although this could potentially reduce the likelihood of immediate conflict occurring, such policies raise the level of non-violent dissent, which can escalate.

4 Model Analysis and Implications

Focusing on the baseline model, which takes repression as exogenous, we can derive potentially testable implications which highlight the main contribution of the model: distinguishing not only when dissent occurs, but also what form it takes. For each parameter in the model, we discuss how each potential strategy's payoff is impacted and then how it moves each of the indifference curves. Then the model is examined starting in a state of protest, and the determinants of the potential paths following protest are analyzed. Finally, the determinants of the optimal level of repression, from the model's extension, are explored.

4.1 The use and type of dissent

Consistent with many models of political dissent, as the state of the world improves, overall dissent decreases. In the model, this corresponds with increases in ω_0. Unlike some others, for example Dal Bó and Dal Bó (2011), ω_0 does not influence the payoff of political dissent directly. However, as ω_0 increases, the payoff of either form of dissent, conflict or protest, will fall relative to peace. How the rebels' equilibrium strategies change with ω_0 can be seen in Figure (2) by moving along the horizontal axis.

Similarily, the impact of varying ν, the expected level of repression, can also be seen in Figure (2) by moving along the vertical axis. As ν increases protest becomes less likely, whether that leads to conflict or peace depends on ω_0. For other parameters in the model, it is easiest to examine how they impact γ and ω_c and then move the respective curves in Figure (2).

Starting with the impact of the cost of conflict, the government's portion C_g only impacts the rebels' payoff for protest and does so through its impact on P^*. As C_g increases the likelihood of protest increases, because G lowers the threshold protest size, P^*, at which they will make a large concession. This impact can be seen in Figure (3) by raising γ and shifting the protest-peace indifference curve outward. The figure highlights an interesting implication: increasing C_g raises the overall occurence of dissent. Although the use of conflict in the first period decreases, the overall

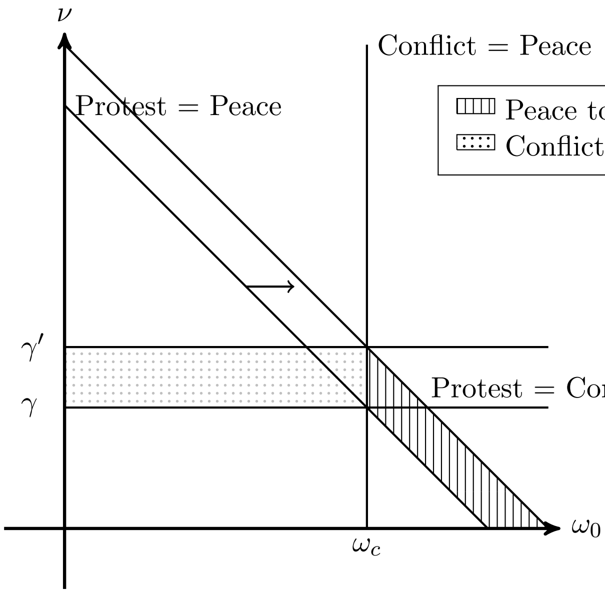


Figure 3: Impact of C_g on Equilibrium Strategies

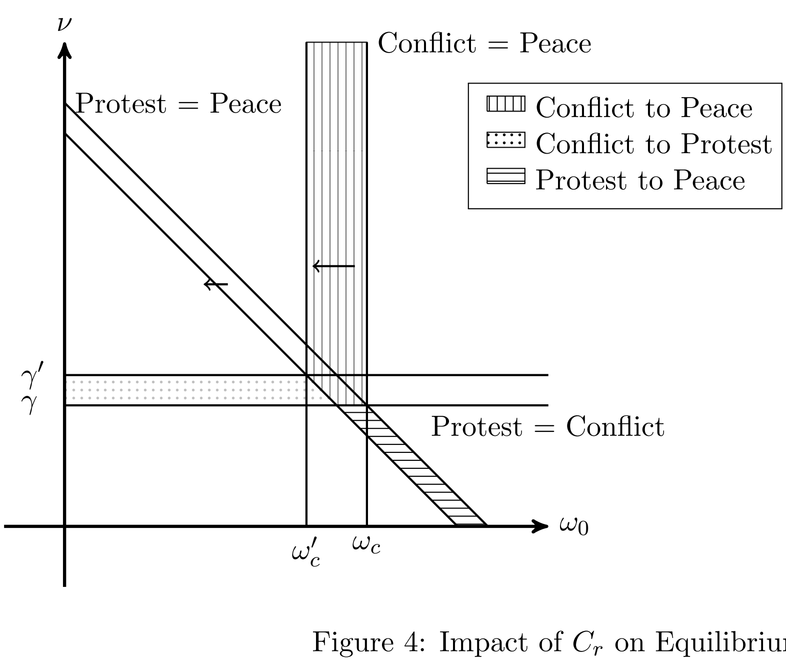


Figure 4: Impact of C_r on Equilibrium Strategies

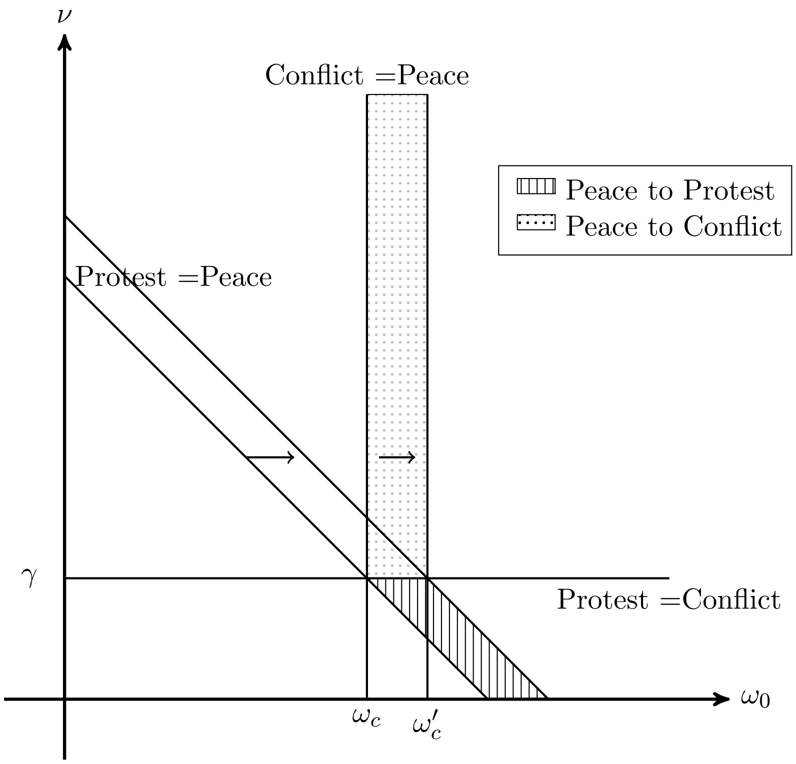


Figure 5: Impact of α_0 on Equilibrium Strategies

chance of conflict occurring may go up or down. This is due to the chance of conflict following protest, and the increased use of protest. Figure (3) shows these changes; the highlighted area to the right of ω_c was previously peace, whereas the area to the left was previously conflict.

The rebels' cost of conflict, C_r, impacts the payoffs for both conflict and protest. For conflict, the prediction is simple, as it directly reduces the payoff. However, for protest the impact has two parts. The first part is a direct reduction equal to C_r. The second part offsets this reduction because the government lowers P^*. In most cases, the direct negative effect dominates. The end result is a much more intuitive one than with C_g: as C_r increases, there is a reduction in the occurence of dissent and a switch from immediate conflict to protest. All of this can be seen in Figure (4).

As the prior probability of being strong, α_0, increases, the rebels' payoff for any type of dissent also increases. The intuition for this is straightforward, whether using conflict or protest, the more likely the rebels are a strong type, the more likely it is they end up with the strong type's reservation payoff. This results in a clear rise in the overall occurence of dissent, as can be seen in Figure (5).

However, the impact of α_0 on γ is ambiguous, implying we can not make any predictions on how the composition of dissent changes with α_0[7].

The last piece to consider is the impact of the rebels' strength parameters, T_s and T_w. We consider two possible changes here: holding $T_s - T_w$ fixed while raising $T_s + T_w$, or holding $T_s + T_w$ fixed while raising $T_s - T_w$. The first case could be thought of as increasing the strength of the rebels relative to the government. This raises the mean value of ω_c, which clearly leads to more dissent overall. However, because the governments decision only takes into account which group he is likely to face, not the level of the average payoff, the mix of dissent will remain unchanged. In other words, the value for P^* is not impacted if we change only the mean value of the rebels strength. Figure (5) is the exact picture of the first scenario.

For the second case, increasing the spread of $T_s - T_w$ rather than the level, the impact on dissent depends on α_0, because the direction in which ω_c moves is also dependent on α_0. It is more interesting to investigate the case where we fix ω_c, while raising the variance in conflicts outcome, the spread of $T_s - T_w$. A change like this should lower P^*, raising the amount of protest. Because ω_c is unchanged this results in more political dissent overall. Although lowering P^* does make dissent that ocurs more likely to be protest, the increased overall level of dissent could still lead to more conflict overall.

4.2 Protest: Escalation or De-Escalation

It is of value to examine when each of the three potential paths following a protest are predicted to occur: peace without concession, escalation, or peace with concession. Here concession refers to the government offering ω'' without conflict occuring. The key determinants of which path occurs are the size of the protest and the threshold protest value, P^*, which is the protest size above which G makes a concession.

This leads to one of the main relationships we test. Above P^*, G should make an offer either type will accept and conflict should not occur. However as protest size increases towards P^* the probability of conflict increases. This is because the larger the protest the higher the likelihood it came from a strong rebel type, but it is not until G sees a protest larger than P^* that they are willing to make a large concession. This implies the probability of escalation first increases, then

[7] Figure (5) fixes γ to show only the increase in overall dissent.

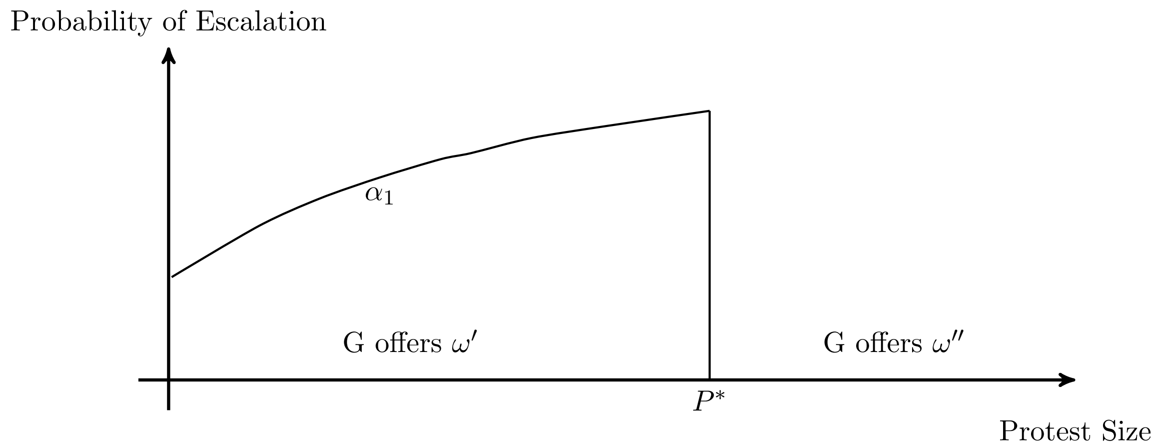


Figure 6: Protest Size and Escalation

decreases in protest size. To be precise figure 6, tracks the probability of conflict occuring as a function of protest size, the increasing portion of the curve is exactly equal to α_1, after P^* the probability of escalation drops to zero as the government will then make a large concession.

Understanding the determinants of P^* is intrumental in understanding the path following protest. P^* decreases in the cost of conflict and α_0, increases in $T_s - T_w$, and is unimpacted by ω_0[8]. This implies, conditional on protest having occurred, higher α_0, C_r, or C_g all increase the likelihood of a major concession by lowering P^*. Additionally, as $T_s - T_w$ increases, the probability of a concession decreases. The intuition for this result is that G stands to gain more by risking conflict as $T_s - T_w$ increases.

5 Data Sources

To investigate the implications of this model, we turn to data from the Social Conflict in Africa Database (SCAD) and PRIO's Armed Conflict Database (ACD). Combining this political dissent data with Freedom House ratings, World Bank World Development Indicators (WDI), and data from the Cingranelli-Richards (CIRI) human rights data project leads us to a sample of 48 countries covering the time period 1990-2012.[9] Combining the non-violent events data from SCAD with more traditional conflict data in the ACD provides a unique way to examine the full continuum of political dissent. It also allows several of the model's key predictions to be examined across a wide spectrum

[8] These can be seen clearly by examining equation (12).

[9] From 1990-1992 there are 47 countries, Eritrea became independent in 1993.

of cases.

To measure conflict, PRIO's ACD database was chosen for two main reasons. First, the SCAD data were meant to be non-overlapping with the PRIO data, so this should reduce the double counting of events between datasets. Second, the PRIO data covers the entire sample in the SCAD data and has available all events at a highly dissagregated level. For protest, there are fewer sources available; SCAD was chosen due to its exhaustive coverage and the ease of identifying non-violent events which involved the government as a target. This paper uses the minor conflict threshold in the ACD to consider a country in conflict; however, years coded as inactive in the ACD are not counted as in conflict.[10] All periods not considered as in conflict are included in the following analysis, regardless of the level of protest that occured. No distinction is made between periods of peace and protest, we only make a distinction for coding periods as in conflict. This paper uses multiple continuous measures of protest intensity and measures protest on a continuum rather than an indicator for occurrence.

Table (2) below displays summary statistics for the political dissent data. The data contains 51 onsets of conflict within the 1101 country years of data, with 10 conflicts that were ongoing in 1990. Overall, 22.1 percent of all periods were coded as being in conflict. For protest several different measures were derived from the event data. The first, *Protest 1*, is the number of events and only captures the occurence of protest, regardless of the size or duration of an event, it adds only one to the count. The second, *Protest 2*, measure counts the number of protest-days in a country-year. The third, *Protest 3*, counts the number of distinct location-days in a country-year. SCAD codes additional data points for locations that are distinctly seperate, for example a protest movement with protests in two major cities would likely end up adding two to the count in this measure. This is the preferred measure, as it captures both the occurence and extent of protest. Longer protest movements covering more area are captured better with this measure. For analysis we focus on results using the natural log of the third measure, to smooth out some of the extreme dispersion present in the data. An ideal measure would contain a strong indication of the number of participants, but a reliable estimate of this is unavailable.

To measure Concessions, changes in the Freedom House (FH) ratings for a country were used.

[10]The definition of conflict used in the ACD is: "a contested incompatibility that concerns government and/or territory where the use of armed force between two parties, of which at least one is the government of a state, results in at least 25 battle-related deaths." Strand et al. (2003) (pg. 1)

Table 2: Political Dissent Data

Variable	Obs	Mean	Std. Dev.	Min	Max
Protest 1	1101	4.74	11.50	0	282
Protest 2	1101	22.72	46.59	0	366
Protest 3	1101	30.70	77.26	0	884
P3 Per capita	1101	0.37	1.17	0	17.33
log of P3	1101	1.77	1.80	0	6.78
Protest Indicator	1101	0.53	0.50	0	1
Conflict Indicator	1101	0.22	0.41	0	1
Means Excluding Conflict Periods					
Variable	Obs	Mean	Std. Dev.	Min	Max
Protest 1	858	4.62	12.10	0	282
Protest 2	858	22.58	47.51	0	365
Protest 3	858	31.77	83.19	0	884
Protest Indicator	858	0.68	0.47	0	1

An ideal set-up would allow us to trace exactly who demanded what and what concessions were made; however, no such data exist. The FH ratings do capture many fundamental rights, for which groups may be willing to fight. Each year they publish two indices for every country, one for Political Rights and another for Civil Liberties. Their index is well suited to measuring concessions within a given country because they use the prior year's score as a benchmark. This could complicate cross-country comparisons, but we are interested in within-country changes. From FH's description of the rating process, "A score is typically changed only if there has been a real-world development during the year that warrants a decline or improvement" House (2014). From the perspective of capturng major concessions, this is ideal. Table (3), which follows, summarizes the levels and frequency of changes to the FH ratings. Each of the two indices is rated on a 1 to 7 scale, with 1 being the most free. A concession is measured as an increase towards greater freedom, on either index, between the current year and the next.[11]

For repression, three main possibilities exist: PRIO's one-sided violence data, restricted to when the violence was committed by the government; the repression indicators included in the SCAD data; and the CIRI ratings of human rights abuses. Table (4) presents the mean values of these measures and table (6) in the appendix compares the measures. Higher values for the CIRI ratings correspond to fewer abuses. The SCAD and PRIO measures are indicators. The CIRI rating is the

[11] The FH data includes 2013, so we are able to create this lag for the entire time period.

Table 3: Freedom House Ratings

Variable	Obs	Mean	Std. Dev.	Min	Max
FH_PR	1101	4.67	1.81	1	7
FH_CL	1101	4.40	1.37	1	7
Con_PR	1101	0.10	0.30	0	1
Con_CL	1101	0.11	0.31	0	1
Con_FH	1101	0.17	0.38	0	1

FH_PR, and FH_CL are the mean values of the actual Political rights and civil liberties ratings, 1 represents the greatest degree of freedom. Con, is an indicator for concession, an improvement in the respective rating, with Con_FH implying an improvement in either rating.

preferred measure; because it does not require major events to occur in order to capture the level of repression. This type of measure more closely aligns with the baseline model's description of ν, which is an expected level of repression that may not be realized.

Table 4: Repression Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
SCAD_repress	1104	0.77	0.84	0	2
SCAD_Nvrepress	1104	0.25	0.43	0	1
SCAD_Vrepress	1104	0.26	0.44	0	1
Prio_1_side	1104	0.25	0.43	0	1
CIRI Rating	984	3.96	1.99	0	8
CIRI Rating lag	1003	4.03	1.77	0	8
CIRI Freedom Assembly	1002	0.84	0.66	0	2

6 Results

The empirics in this paper focus on protest, especially the factors determining the course of events once protest occurs. The data on protest have not reached the same state of maturity as that on conflict, so the results which follow are suggestive and cannot be argued as causal. However, the patterns found are consistent with the predictions of the model: larger protests generate concessions more often, and the largest protests are the least likely to escalate to conflict. Less support is found for other predictions in the model.

The results which follow highlight two main conclusions. First, although we do not reject other theories of protest, such as those in the global games literature highlighting its ability to overcome issues of collective action, we find evidence suggesting it is a potential signaling mechanism used to avoid more violent types of dissent. This implies that policies which allow protest to accurately convey public support may be effective in reducing the occurrence of violent dissent. Second, we need better data on repression and non-violent dissent. An inability to match protest movements to groups, accurately proxy for the expected rather than realized costs of protest, and measure the strength of rebel groups prevents some of the models key predictions from being analyzed. Finally, although the model does provide one interesting explanation for the mixed results with repression and dissent, we do not find convincing empirical support with these data.

6.1 The Impact of Protest

Starting from a period of protest, the model predicts that one of three things could occur: escalation to conflict, a concession, or peace without concession. Equation (9), which defines the government's offer decision, determines when the government would make a concession, defined as offering ω'' in the model. The probability of escalation in the model is closely related to the same equation, however it is also dependent on the rebels' true type. We start by analyzing concession and then move towards predicting escalation to conflict.

The model's set-up can be translated into a latent utility framework to analyze concession. The government is comparing the expected utility from two potential choices: offering ω' and risking conflict with strong types, or offering ω'' and guaranteeing peace. Equation (9) compares this decision. Embedding this condition into a latent utility model requires comparing the expected utility from each of the decision, and the addition of an error term meant to capture unobserved factors influenceing this decision. Doing this, and moving all items to the LHS leads to the following

$$P(\frac{\alpha_0}{1-\alpha_0} * \frac{f\,(P|R_s)}{f\,(P|R_w)} - \frac{T_s - T_w}{C_r + C_g} + \epsilon \geq 0). \tag{18}$$

Equation (18) demonstrates when the utility from making a concession, offering ω'', is large enough relative to risking conflict, offering ω'. Using comparative statics derived in section 4, we know that this probability will increase with increases in α_0, protest size, C_r, or C_g, and will decrease with increases in $T_s - T_w$. The theory does not predict a relationship between concession and ω_0, conditional on protest occurring. Results presented in Table (5) focus on the impact of protest, and find significant results using country and year fixed effects, with standard errors clustered by country. Results are consistent with the theory for all measures and significant for three out of four measures of protest size. No strong proxies exist for α_0, C_r, and C_g that provide consistent coverage for the sample.

Table 5: Predicting Concession

VARIABLES	Con_FH	Con_FH	Con_FH	Con_FH	Con_FH
Protest 1	0.002				
	(0.002)				
Protest 2		0.0008*			
		(0.000)			
Protest 3			0.0004		
			(0.000)		
Log Pro 3				0.0295***	
				(0.010)	
Pro3 Per Capita					0.0267*
					(0.014)
log pop	-0.32	-0.29	-0.31	-0.26	-0.32
	(0.263)	(0.258)	(0.259)	(0.254)	(0.261)
Constant	5.25	4.78	5.05	4.31	5.26
	(4.041)	(3.960)	(3.974)	(3.912)	(4.008)
Country F.E.	Yes	Yes	Yes	Yes	Yes
Year F.E.	Yes	Yes	Yes	Yes	Yes
Observations	858	858	858	858	858
R-squared	0.048	0.051	0.049	0.057	0.051
Countries	47	47	47	47	47

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Despite the wide range of point estimates, the impact of a one standard deviation increase in protest size on the probability of a concession stays within a narrow range of 2.3 to 5.4 percent, on a base of 17 percent. Admittedly, alternative possibilities could explain this relationship. For one, extremely turbulent years may simply cause a reduction of the FH rating for that year. Nonetheless, this aggregate relationship does match the simple predictions of the model and provokes the question of what might be able to be discovered if we could accurately link protest demands, protest groups, and concessions.

The second relationship we analyze is which protests escalate. The relationship between protest size and the probability of escalation is more nuanced. Escalation occurs only with the strong rebel group and only when they fail to produce a large enough signal for the government to offer ω''. Below P^*, this probability matches exactly α_1, and should be increasing in protest size. However once the protest size passes P^*, the government offers ω'' and conflict should be avoided. Taken literally, this implies a probability which increases to a point and then sharply drops off to zero, we look for this non-parametrically and look for an inverted-u shaped relationship with regression specifications. This sudden drop off is not far from what we see in the data. Most specifications show a stable to slightly increasing probability of escalation for protests which cover the bottom 95 percent in terms of size, and rarely if ever do we see escalation beyond this point. These results are seen clearly in non-parametric techniques such as local polynomial regressions.

Using all periods not considered as conflict, and employing STATA's lpoly command, we trace out a locally linear polynomial relationship between protest size and the probability of conflict occurring in the next period. Though results vary, the basic pattern remains consistent. We see a flat or slightly increasing probability of escalation in protest size, and that, regardless of measure used, the largest periods do not escalate to conflict. Some specifications exhibit the sharp drop predicted by the theory, whereas others are more gradual. To some extent, the sharpness of the drop is artificial, but the main takeaway is that the largest protests do not escalate. Figure 8 uses *Protest 3* per capita as the horizontal axis, figure 7 uses the log of *Protest 3*, while figure 9 uses the unaltered measure of *Protest 3*.

The figures just discussed are purely descriptive, as they do not include any sort of control variables. Figure 10 presents results using the natural log of protest size and its square in a fixed effects regression while controlling for country population, the graph shows margins estimates for the range of values protest size takes in the sample. This specification arrives at the same conclusion as the non-parametric estimates used earlier. Taking both results for protest together provides some suggestive evidence motivating the theory, not only are larger protests more likely to gain concessions, the basic pattern of increasing and then decreasing likelihood of conflict escalation is also observed. Although we do not provide any new evidence towards what causes political dissent, we do provide some important evidence suggesting there is merit for bargaining models of conflict, and that asymmetric information may be a contributing factor in pushing some countries towards civil war.

Aside from the common concerns which arise in the empirical literature on conflict including, endogeneity, proper measurement, missing data, and the rarity of conflict, the protest data adds additional concerns of its own. The utmost of these being how it is measured, because we are interested in a highly non-linear relationship between the size of the protest, and escalation to conflict. Protest data tend to be highly over-dispersed, with a mean much larger than the variance. This may be true in reality; however, this creates difficulties for estimation when the primary dependent variable of interest is protest size. In this particular dataset the largest protests can be as many as 25 standard deviations above the mean. Furthermore, protest size is not directly comparable across countries or time, because of biases introduced by how the media covers events and changes in the amount of coverage across time. The fixed effects control for some of these concerns but are unlikely to go far enough.

Acknowledging the previous caveats, the results may be little more than descriptive. Nonetheless, common intuition would often suggest that the largest protests are the ones that escalate into full scale conflict, an intuition rejected here in theory and with data. Perhaps most importantly, we also find the predicted non-monotonic relationship between protest size and escalation, a relationship specific to this model.

7 Conclusion

Examining the escalation to conflict in a rational setting may help us to better understand why conflict occurs in lieu of negotiated settlements. The model presented here is clearly a simplification, and examines only one possible explanation for the roles of protest and repression. Nonetheless, the insight provided by the model, allows us to examine if asymmetric information is a driving force causing conflict. The results in this paper, both theoretical and empirical point towards such a relationship.

If asymmetric information is a driving force for conflict, this should influence the types of policies to encourage in countries moving along the political spectrum towards democracy. Transitions such as those which occurred throughout the sample period covered by the data used in this paper are known to be conflict-prone, (Hegre and Sambanis, 2006; Hegre et al., 2001). If this is the case, helping to create transparent mechanisms for expressing political viewpoints may be a key factor in avoiding conflict. Reducing the cost of using non-violent mechanisms of dissent does lead to more use as shown in Cunningham (2013). However, simply encouraging protest could lead to conflict if the information conveyed through protest is not accurate.

Further research will be needed if we are to truly understand the relationship between violent and non-violent political dissent. The analysis here suffers from several shortfalls, most prominently an inability to break out who the participants in a given event are beyond classifying them as civilians and governments within a country. As better data becomes available we may be able to refine the hypotheses we wish to test, and begin to compare them to alternatives. For example, it would be interesting to compare a model of asymmetric information to a model examining commitment problems. Would this result in similar predictions as to the use of protest and repression? If not, can we compare the two possibilities? In such a case simply advocating transparent mechanisms for expressing political viewpoints would not likely be enough; and creating international mechanisms to enforce agreements may be a preferable path to avoid future conflict. Nonetheless, common intuition would suggest the largest protests are the most likely to escalate to conflict, this intuition is rejected by both the theory and empirical results of this paper.

The literature on civil war has a strong tradition of uncovering relationships, though rarely are the actual causal mechanisms in these relationships pinned down. This paper provides a step in that direction, though issues of endogeneity and an inability to compare to alternative hypotheses make this paper only a small step towards unraveling the underlying mechanisms. Looking earlier in the process of political dissent, and understanding when it is more likely to escalate may help us better understand why negotiations so often fail. Additionally, highlighting the idea that both violent and non-violent political dissent have the same underlying causes, suggests a lot can be learned by examining what differences provoke one over the other.

Figure 7: Escalation versus Protest size

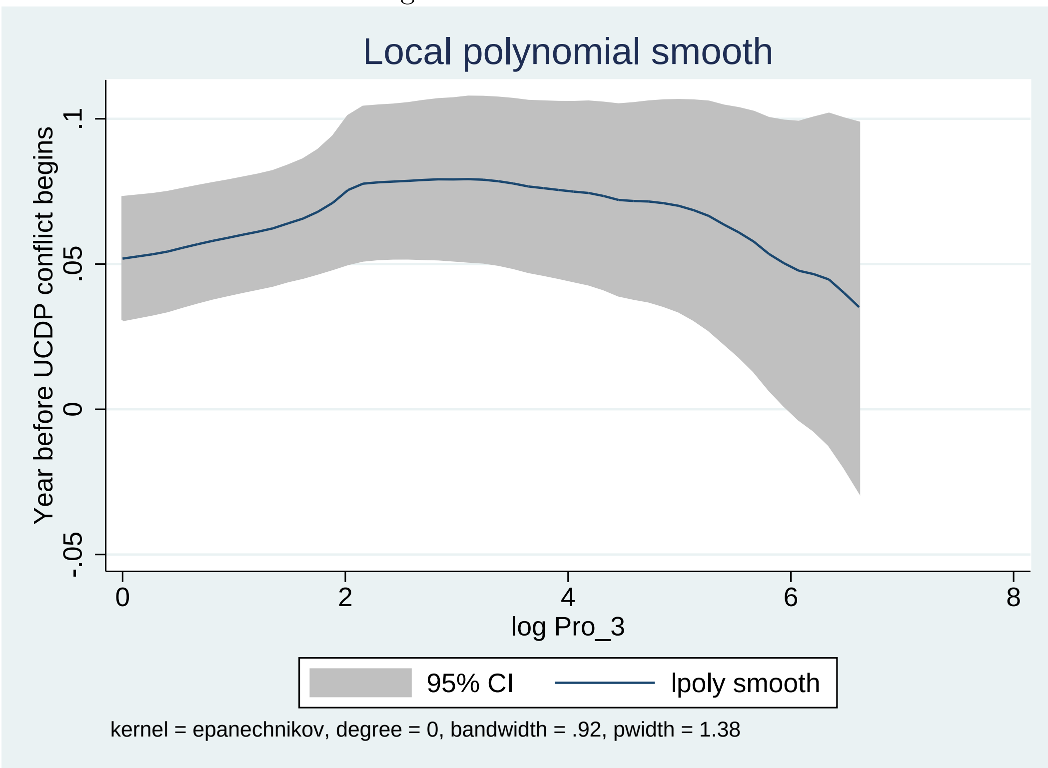


Figure 8: Escalation versus Protest size

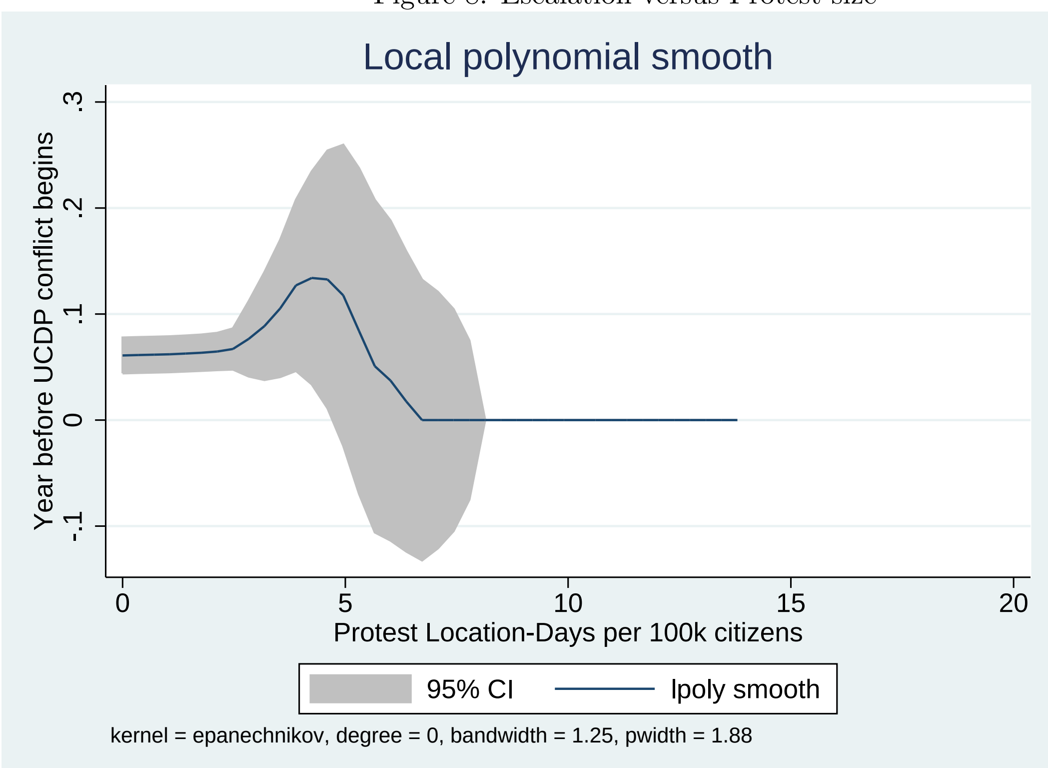


Figure 9: Escalation versus Protest size

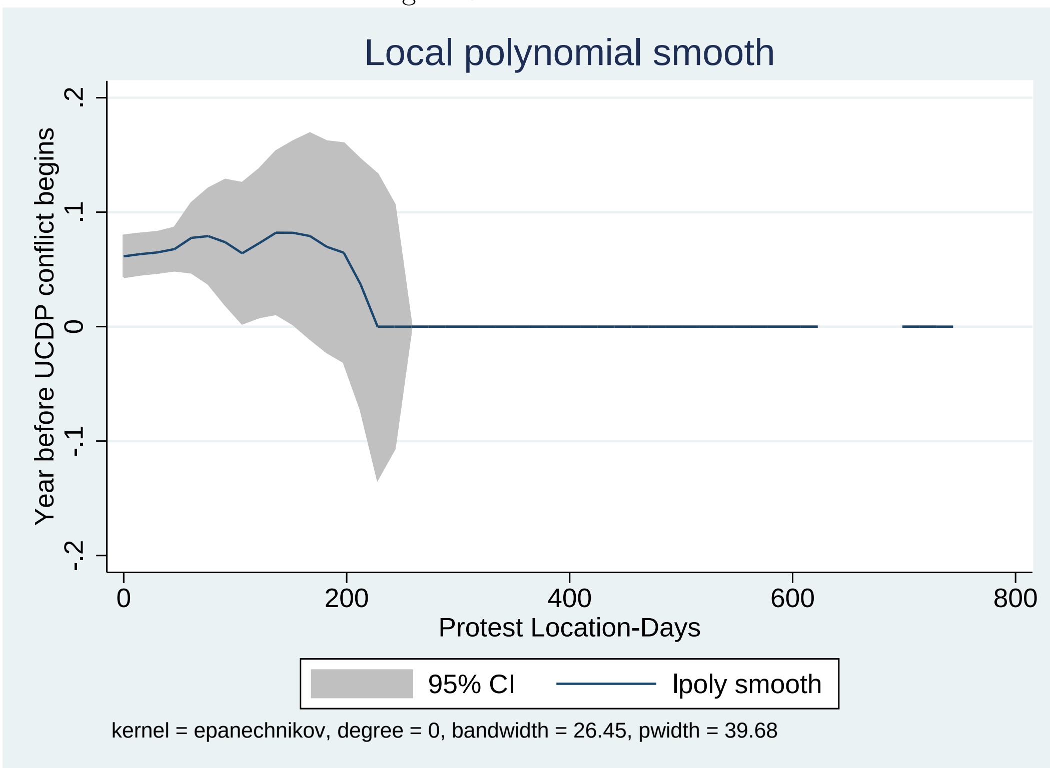
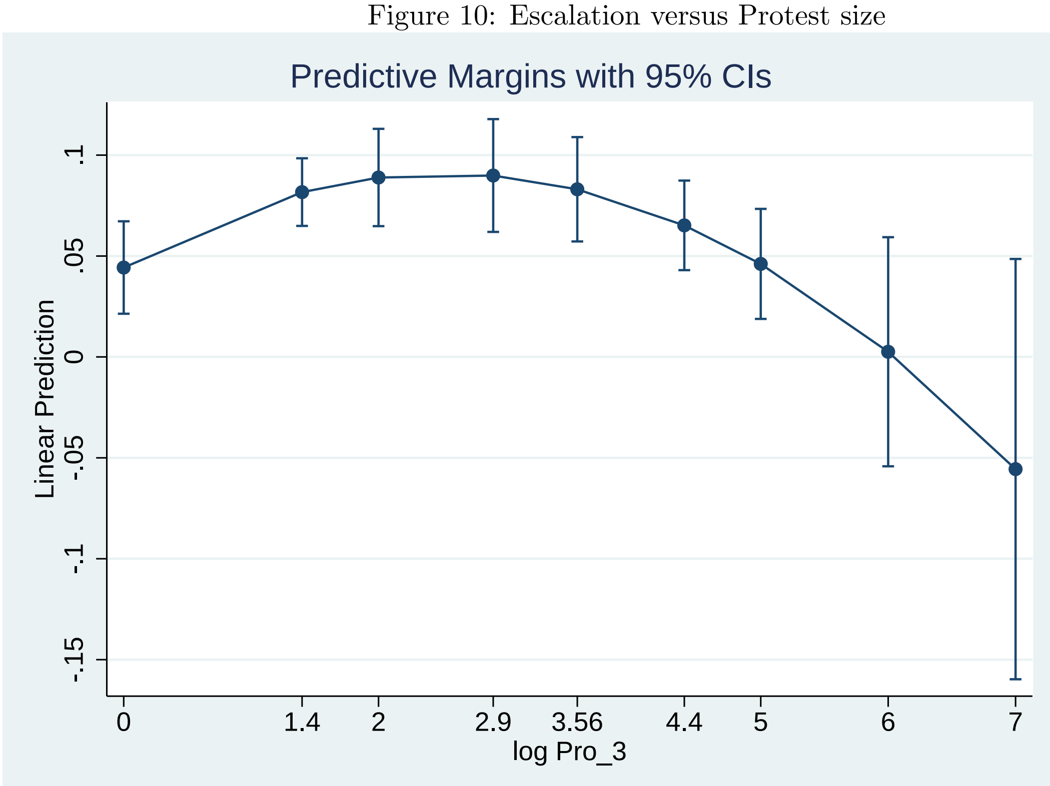


Figure 10: Escalation versus Protest size



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8 Appendix and expanded Derivations

Table 6: Repression Measure Correlations

	SCAD_repress	SCAD_Nvrepress	SCAD_Vrepress	Prio_1_side	CIRI Rating	CIRI Rating lag
SCAD_repress	1					
SCAD_Nvrepress	0.16	1				
SCAD_Vrepress	0.87	-0.34	1			
Prio_1_side	0.24	-0.05	0.26	1		
CIRI Rating	-0.28	0.01	-0.28	-0.50	1	
CIRI Rating lag	-0.20	0.028	-0.20	-0.47	0.74	1
CIRI Freedom Assembly	-0.23	0.02	-0.23	-0.26	0.53	0.55

8.1 P* Comparative Statics

$P*$ is defined implicitly in

$$\frac{\alpha_1}{1-\alpha_1} = \frac{\alpha_0}{1-\alpha_0} * \frac{f\,(P|R_s)}{f\,(P|R_w)} - \frac{T_s - T_w}{C_r + C_g} = 0 \tag{19}$$

this implies one way to find the partial derivatives w.r.t. P^* would be taking the total derivative. Each of the partials are then as follows

$$dP^* = \frac{\alpha_0}{1-\alpha_0} * \frac{f'_{Rs} f_{Rw} - f'_{Rw} f_{Rs}}{(f_{Rw})^2} > 0 \tag{20}$$

The second term in the above derivative is the derivative of the likelihood ratio, which we know to be positive by the MLRP. The remaining terms are positive by definition.

$$dC_r = \frac{(T_s - T_w)}{(C_r + C_g)^2} > 0 \tag{21}$$

$$d\alpha_0 = \frac{1}{(1-\alpha_0)^2} * \frac{f_{Rs}}{f_{Rw}} > 0 \tag{22}$$

using these we can derive the following

$$\frac{\partial P^*}{\partial C_r} = -\frac{dC_r}{dP^*} = -\frac{1-\alpha_0}{\alpha_0} * \frac{(f_{Rw})^2}{f'_{Rs} f_{Rw} - f'_{Rw} f_{Rs}} * \frac{(T_s - T_w)}{(C_r + C_g)^2} < 0 \tag{23}$$

$$\frac{\partial P^*}{\partial \alpha_0} = -\frac{d\alpha_0}{dP^*} = -\frac{f_{Rs} f_{Rw}}{\alpha_0(1-\alpha_0)(f'_{Rs} f_{Rw} - f'_{Rw} f_{Rs})} < 0 \tag{24}$$

8.2 Rebel Payoffs

Protest:

$$\Pi^{Pro} = \alpha_0(T_s) + (1-\alpha_0)\left[F_w\left(P^*\right) * T_w + \left(1 - F_w\left(P^*\right)\right)T_s\right] - \nu - C_r \tag{25}$$

$$\frac{\partial \Pi^{Pro}}{\partial \alpha_0} = f_{Rw}[(T_w - T_s)\frac{\partial P^*}{\partial \alpha_0} + (T_s - T_w)(1+\alpha_0)] > 0 \tag{26}$$

$$\frac{\partial \Pi^{Pro}}{\partial C_r} = (1-\alpha_0) f_{Rw}(T_w - T_s)\frac{\partial P^*}{\partial C_r} - 1 \tag{27}$$

The sign of $\frac{\partial \Pi^{Pro}}{\partial C_r}$ depends on the magnitude of $\frac{\partial P^*}{\partial C_r}$, for most values of the key parameters this derivative is negative. The intuition also corresponds to that, the negative impact of $C - r$ is a one-for-one reduction in payoff, while the positive part is an increased chance of recieving T_s, both from being more likely to be strong, and from a reeduction in $P*$.

8.3 Derivative of γ

$$\gamma = (1-\alpha_0)(1 - F_w(P^*))(T_s - T_w) \tag{28}$$

$$\frac{\partial \gamma}{\partial \alpha_0} = (T_s - T_w)[(\alpha_0 - 1)\frac{\partial P^*}{\partial \alpha_0} f_{Rw} + F_w(P^*) - 1] \tag{29}$$

$$\frac{\partial \gamma}{\partial C_r} = -(1-\alpha_0)F_w(P^*)(T_s - T_w)\frac{\partial P^*}{\partial C_r} > 0 \tag{30}$$

$$\frac{\partial \gamma}{\partial C_g} = -(1-\alpha_0)F_w(P^*)(T_s - T_w)\frac{\partial P^*}{\partial C_g} > 0 \tag{31}$$