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How Does Violence Deter? Functional and Informational Effects of Preemptive Repression

Abstract

Research on the effect of repression on the likelihood of dissent has not provided consistent results. To address this issue, I focus on the mechanisms linking preemptive repression and dissent. I distinguish two distinct channels through which repression can deter dissidents. First, repression used preemptively works through a direct, functional channel by reducing the opposition's capabilities. Second, the presence and the severity of preemptive repression provides information to its target about the capabilities of the government implementing it. I use a formal model to demonstrate how these two distinct channels interact, and how taken together they can change the likelihood, severity and effect of repression. By analyzing both channels together, the model demonstrates how repression can be more commonly observed despite being less effective. Consequently, it highlights distinct processes that lead to the "puzzle of repression": why governments use repression despite its seemingly counterproductive effects.

Keywords: repression, dissent, conflict, repression–dissent nexus, game theory

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1 Introduction

How does repression affect dissent? The scholarly consensus is that governments use repression to stave off political challenges, and keep their hold on power (Carey, 2006; Davenport, 1995, 2007; Earl et al., 2003; Earl, 2011; Nordås and Davenport, 2013). The claim that repression is a response to dissent is so fundamental that it is regarded as the "Law of Coercive Responsiveness" (Davenport, 2007). However, despite the ubiquity of repression as a response to dissent, empirical findings on its effect on dissent are much more inconclusive. As Carey (2006) points out, there is some evidence to support "almost every possible relationship between protest and repression". The ambiguity of the effect of repression, along with its ubiquity, has come to be referred to as the "puzzle of persistent repression" (Davenport, 2007; Davenport and Loyle, 2012; deMeritt, 2016). Why do authorities keep using costly repression despite its at best uncertain—and at worst counterproductive— effects on dissent?

Recent work has made significant progress towards understanding the effect of repression on dissent by moving away from decision-theoric models, and focusing instead on the strategic interaction between governments and dissidents (Moore, 2000; Pierskalla, 2010; Ritter, 2014; Ritter and Conrad, 2016). Dissent and repression are strategic, both governments and their opponents choose their actions in anticipation of what they expect the other side will do. Dissidents expecting repression might refrain from mobilizing in the first place. Governments expecting dissent might repress preemptively, rather than risk facing an open challenge. Indeed, one key empirical finding from this line of inquiry is that governments repress not just to put down active challenges, but also to deter opposition from mobilizing against them in the first place (Nordås and Davenport, 2013; Danneman and Ritter, 2014; Sullivan, 2016; Ritter and Conrad, 2016; Truex, 2019; Slantchev and Matush, 2020).

Despite increased attention to strategic dynamics, mechanisms linking *preemptive*

repression and dissent have received scant attention. Examining *how* repression is linked to dissent is crucial to improve our understanding of repression-dissent nexus. It helps us better understand the intended goal of repression, and its seemingly inconsistent effects on dissent. Repression can succeed or fail to prevent dissent through different pathways. In some cases, repression will be harsh enough to deter potential challengers (Tyson, 2018). In others, repression can succeed simply by convincing the opposition that more and harsher repression is forthcoming should they dissent (Tilly, 1978; Lichbach, 1987; Walter, 2006; Tilly and Tarrow, 2015). Identifying and distinguishing these pathways is essential to interpret existing empirical findings correctly and to guide further research.

To examine these pathways, I develop a formal model that examines two different channels through which preemptive repression works, and can lead to successful deterrence or open conflict: a functional, direct channel, and a signaling, informational channel (Bueno De Mesquita and Tyson, 2020). The first channel—direct, functional— often referred to in the literature on preemptive repression and dissent. Governments might repress preemptively simply because it is more efficient than fighting an open conflict. Preemptive repression tactics such as arrests, torture, and the disappearing of opponents, or similar acts of one-sided violence, decrease the capacity of regime opponents before they can mobilize and challenge the government.

The second channel—informational— is commonly ignored, or lumped together with the direct channel. The extent to which a government can employ preemptive repression provides information to its opponents about its capabilities, which can in turn influence their decision to challenge the regime. Governments might engage in preemptive repression to signal that they are strong enough to defeat any challengers in an open conflict (Walter, 2006).

Although these two channels might be complementary, they need not be. To demonstrate how they might interact in different strategic settings, I model a baseline case of com-

plete information, where preemptive repression works purely through the direct, functional channel. I then introduce uncertainty about the government's strength to demonstrate how the informational channel interacts with the functional channel. I highlight how these two channels are not simply additive or separable, even when they are complementary.

In the model, an opposition group has to decide whether to mobilize against a government whose strength is private knowledge, which results in open conflict. Before the opposition can mobilize, the government can allocate some of its limited resources to preemptive repression, decreasing the opposition's likelihood of victory in the conflict. When the opposition's resolve is low, the government can simply ignore the opposition because it does not pose a credible to threat to mobilize. If the opposition is sufficiently resolved, preemptive repression cannot deter dissent regardless of how much advantage it confers to the government in the upcoming conflict. Between these two points, the opposition's decision to mobilize depends on how much information it can gain from the level of repression the government chooses to employ. This gives rise to interesting signaling behaviors. Weaker governments get the opportunity to bluff strength either by not repressing at all, or by employing high levels of repression at the expense of their conflict fighting capabilities.

The model demonstrates that relative to complete information settings, lower levels of repression become less likely to be observed under asymmetric information. Weak governments bluff strength either by not using preemption at all or by using it at high levels. On the other hand, high levels of repression become more likely to observed, because strong governments are forced to use repression that they could have avoided under complete information. Conditional on observing high levels of preemptive repression, opposition challenges and conflict become more likely as dissidents mobilize in an attempt to call weak governments' bluff. Repression becomes more severe and common, despite its seemingly counterproductive effect.

Observed repression is associated with dissent through two distinct mechanisms.

The first mechanism is when a government lacks the strength to deter an open conflict, but can nevertheless benefit from repressing preemptively to make its victory more likely. In the second mechanism, the opposition's uncertainty and optimism, leads it to believe that the government is weaker than the level of repression might suggest. Consequently, the opposition mobilizes after high levels of repression, which it would not have done under complete information.

This paper makes two contributions to the literature on repression and dissent. It clearly distinguishes between preemptive and responsive repression by modeling these as distinct choices, with different goals and effects. This distinction has been brought up in recent empirical (Ritter and Conrad, 2016; Danneman and Ritter, 2014; Nordås and Davenport, 2013), as well as formal work (De Jaegher and Hoyer, 2019; Rozenas, 2020; Dragu and Przeworski, 2019; Slantchev and Matush, 2020) but different forms of repression have been analyzed separately. Modeling these choices together not only better captures the repression-dissent cycle, but also helps reveal how the informational role of preemptive repression interacts with its functional role. Consequently, the model provides answers to why rational governments consistently engage in repression even when it often fails to deter dissent.

The analysis presented here also highlights some of the challenges facing observational empirical work in the study of repression and dissent. Besides highlighting the different likelihood and severity of repression, it argues the data generating process can be different even when the observed level of repression and outcome—dissent and conflict— are similar. That is, relationship between repression and dissent are equifinal. Distinguishing these pathways and drawing the right lesson from the relationship between repression and dissent is essential because they have different practical implications for people that are targeted by repression.

Repression followed by dissent is not always a case of repression "failing" because

of government miscalculation (Francisco, 1995, 2004; Davenport and Loyle, 2012; deMeritt, 2016). Opposition movements can also make the wrong call by mobilizing after repression in attempt to seize the opportunity of the moment, as the case of Bahrain during the Arab Spring have demonstrated (Weyland, 2012, 2014; Bellin, 2012; Slantchev and Matush, 2020). The most egregious human rights abuses— such as Egypt's crack down on August 14, 2013 that resulted in more than a hundred dead protesters (Shakir, 2014)— tend to occur as instances of reactive repression (Dragu and Lupu, 2021). Thus, drawing the right lessons from the goal and effect of preemptive repression is not simply a matter academic importance.

2 Repression, Preemption, and Signaling

Governments use repression strategically to counter and deter opposition (deMeritt, 2016). Repression often takes the form violation of First-Amendment-type rights such as political arrests, torture, or restriction of movement and expression in an effort to inhibit the capacity to mobilize against the state (Tilly, 1978; Davenport, 2007; Ritter, 2014).

One important direction in the study of the repression-dissent nexus in recent research has been to factor in that governments being rational, forward-looking actors, will repress preemptively to prevent challenges from materializing. Nordås and Davenport (2013) find that governments experiencing "youth bulges" become more repressive, even when controlling for the levels of actual protests. Because young populations are more likely to challenge authority and participate in rebellion —a fact known to governments as well— governments that face rising populations of young adults increase their repressive activity to preempt challenges. Similarly, Danneman and Ritter (2014) point out that governments repress preemptively when their geographic neighborhood is experiencing civil conflict. Because civil conflicts tend to spread—which is, again, a phenomenon recognized by state authorities— governments use preemptive repression to deter challenges at home.

While this line of research provides important evidence that governments do use repression preemptively, it does not examine whether or how preemptive repression works. For example, preemptive repression viewed against the backdrop of a relatively slow-moving trend such as youth bulges might simply be a functional response as the governments target opposition's potentially increased recruitment pool. However, in a setting where neighboring governments are forced to face the opposition in open civil conflicts—such as the Arab Spring—they might resort to preemption both for functional and signaling purposes. On one hand, preemptive repression might be necessary to decrease the capacity of domestic opposition as it gains access to cross-border flows of recruits, arms, and other resources (Salehyan, 2007). On the other hand, governments might also resort to repression for informational purposes. Authorities can also use preemptive repression to signal to the opposition that they are more capable in facing challengers than their neighboring states, thus deterring their citizens from rebellion. Distinguishing these channels and examining how they operate is crucial to understanding both why states repress and the effect of repression on dissent, as the two inescapably interrelated.

Like the aforementioned empirical work, formal literature on repression-dissent has either not distinguished between different channels of repression's effect, or treated them in isolation. Pierskalla (2010) examines a setup in which a government is facing an opposition that can potentially threaten the regime. In his model, similar to the model presented below, governments differ in their capacity, or resolve, to employ repression, which cannot be directly observed by the opposition. One of Pierskalla's key arguments is that strong governments repress protesters to signal their resolve, while weak governments accommodate, fearing escalation to open conflict by the opposition. Thus, in his model, repression has a pure signaling purpose, and with no effect on the likelihood of government victory in open conflict, and should not happen under complete information. The model presented here not only incorporates the direct, functional effect of repression, but also distinguishes between preemptive, and reactive repression. Furthermore, it relaxes the simplifying assumption that repression is binary, and yields insight into the probability and severity of repression and its

effect on the likelihood of dissent.

In contrast, Ritter (2014) presents a bargaining model between opposition and government domestic conflict contexts, where both accommodation and conflict influence the likelihood of the political survival of the government. She demonstrates that while strong leaders are less likely to be challenged, they will face higher levels of dissent, and thus respond with more severe repression when challenges do arise. As executive security decreases, challenges become more common and are met with less severity. While linking the likelihood of observed challenges to severity of repression, this model only considers a complete information setting where repression is not employed until bargaining breaks down and conflict starts. Consequently, the level of repression is a single choice with no informational content.

Similarly, more recent formal work focusing on preventive or preemptive repression typically do not feature reactive repression. De Jaegher and Hoyer (2019) focus on the interaction between the government's expected tenure length and its efforts in preemption. Dragu and Lupu (2021) examine the effect of information and communication technologies on the severity and success of preventive repression. Rozenas (2020) analyzes a situation, where a government facing potential dissent from two different groups chooses a repression policy preventively. Finally, Dragu and Przeworski (2019) focus on moral hazard by security forces tasked with preventive repression. Thus, they do not consider the interaction of informational and functional channels that is the focus of this paper.

Slantchev and Matush (2020) consider both *preventive* and reactive repression, but in their model preventive repression has no informational content: it increases the cost of mobilization, but the government's preventive capacity is independent of its reactive capacity. Consequently, repression does not provide information about the strength of the government. My model includes both preemptive and reactive repression. It incorporates the informational channel of repression, and thus more accurately captures the repression-

escalation-reaction pattern that most civil conflicts demonstrate.

2.1 Motivations & Microfoundations

I take a first-principles approach to developing the model. In order keep the focus on the relationship between the different effects of preemptive repression on dissent, the model presented here excludes mechanisms such as principal-agent problems (Tyson, 2018; Dragu and Lupu, 2018), and the loyalty or autonomy of security forces (Svolik, 2012). Thus, I follow what Paine and Tyson (2019) call the "experimental" approach to formal modeling: my goal is not to capture all aspects of the repression-dissent nexus, but rather to elucidate how functional and informational channels of preemptive repression interact and affect the likelihood of observed dissent.

I motivate the key assumptions: 1) The goal and effect of preemptive repression is different than reactive repression. 2) Preemptive repression has decreasing marginal returns. 3) Governments have limited resources for repression which they must allocate between two forms of repression. 4) Under asymmetric information, opposition does not observe the true effect of preemptive repression.

Goal and effect preemptive repression: I differentiate as follows between preemptive, reactive and preventive use of force, and focus on the first: Preemptive repression acts as a first-strike (Beard and Strayhorn, 2018) on an existing opposition by directly decreasing capacity to mobilize *before* a group can form an overt challenge (Davenport, 2007; Sullivan, 2016). Preemptive repression generally includes coercive tactics such as arrests, disappearances, or torture that are primarily effective before the opposition mobilizes to openly challenge the government. Reactive repression occurs after dissent has mobilized to challenge the state in form of one-sided mass coercion or civil war. Consequently, reactive repression typically does not have the informational element of preemptive repression.[1]

[1] Although there are various works in the IR literature that examine the process of "learning while fighting"

In contrast, preventive repression seeks to avert the opposition from materializing in the first place. While they may be carried out by similar agencies, preventive repression generally entails long-term tactics such as censorship and propaganda against *potential* opposition. Thus, preventive tactics are of little significance in the crisis contexts that are the focus of this paper.[2]

Decreasing effectiveness of preemptive repression: Empirical evidence points to several mechanisms why preemptive repression is increasingly costly relative to its effectiveness: Repression against unarmed citizens, opposition-aligned or otherwise, is increasingly costly for governments. Previous research suggests that while preemptive repression can reduce the opposition's capability, as the level of coercion increases—and its use becomes more indiscriminate— its effect is reduced (Mason and Krane, 1989; Francisco, 1995, 2004). Preemptive repression often relies on low-visibility for its effectiveness (Sullivan, 2016), which becomes increasingly hard to maintain as the level of repression increases. For example, Truex (2019) demonstrates that despite its vast coercive apparatus and military strength, even the Chinese Communist Party (CCP) frequently uses a "catch-and-release" strategy rather than attention-grabbing methods when engaging in preemptive repression in order to avoid backlash. Even when backlash is not a significant concern, increasing resources to organizations tasked with preemptive repression, such as secret police, often leads to more to corruption, and inefficient use of these resources (Dragu and Przeworski, 2019).

Resource Constraints and Fungibility: I assume that resources spent on preemptive repression cannot be used for reactive repression and vice versa.[3] In almost all cases preemptive repression is carried out by specialist agencies, ordinary or secret police,

see Ramsay (2017).

[2]For preventive repression the effect of preventive repression described in this way see Dragu and Przeworski (2019), Slantchev and Matush (2020), Dragu and Lupu (2021).

[3]I show later formally that adding a certain level of fungibility to allocation of resources such that resources allocated to preemption can also be used in reactive repression does not change the substantial findings of the model.

intelligence services, or gendermarie (Dragu and Przeworski, 2019). These organizations are generally adept at the tactics such as intimidation, disappearances, and torture that are commonly associated with repression. However, these tactics, and the organizations tasked with carrying them out, quickly lose effectiveness once the opposition protests en masse, or takes up arms. For example, in almost all Middle Eastern regimes, regular police and intelligence services were quickly overwhelmed by mass protests during the Arab Spring, forcing governments to deploy their military forces for survival (Bellin, 2012). When challenge to regime takes the form of mass, organized opposition military is generally the only force capable of defeating the threat (Svolik, 2012). While the military is capable of defeating mass and/or violent threats, its advantage lies in its size and labor-intensive nature. It is neither trained nor motivated to engage in tactics of preemptive repression (Dragu and Przeworski, 2019; Svolik, 2012). Syria's President al-Assad relied heavily on *shabiba* militias to capture and kill the opposition members in the early days of Arab Spring in effort to intimidate them. Once the conflict started, these groups quickly proved ineffective against mobilized (and armed) masses.

Information from preemptive repression: While preemptive repression provides information about goverment's strength to the opposition, this information is not perfect. The opposition can observe the government's efforts and investments into repression such as the pervasiveness of arrests, curfews, and disappearances but cannot perfectly infer how effective these measures are. That is, how much these efforts actually decrease their likelihood of victory should they challenge the government. While higher levels of repression indicates the government is more likely to be strong, this is not always the case. Similarly, most measures of government repression, such as the CIRI index reflect the prevalence of repression, but not its effectiveness.

3 The Model

3.1 Setup

I analyze a setting with two actors: a government (G, it), and an opposition (O, they). The current government values the benefits of office at $V > 0$. The government has a military capacity normalized to 1 without loss of generality. This represents the totality of the coercive apparatus and the resources it commands. The government can allocate a portion $x \in [0, 1]$ of its coercive apparatus to preemption. The remainder is used for reactive repression if conflict occurs. The government's effectiveness in repression for both forms depends its type $\theta \in \{\theta_W, \theta_S\}$, where $\theta_S > \theta_W$. I refer to type θ_S as the strong type and θ_W as the weak type. The opposition does not observe the government's type, but they have a common prior belief that the government is strong with a probability q.

If the government has chosen to allocate resources to preemptive repression $x > 0$, it pays a cost r. If used, preemptive repression acts as a "first strike" and directly reduces rebel capacity, γ, by $x\theta$ (Beard and Strayhorn, 2018). I assume $\gamma > \theta_S$ throughout the analysis. This not only assures that the contest function described below is well behaved, but enables the analysis to focus on cases where preemptive repression can deter challenges to the government without completely being able to destroy the opposition capacity. Furthermore, preemptive repression is increasingly ineffective in terms of resources allocated. After an allocation of x, the remaining security resources left for reactive repression is $1 - x^2$. [4] Government strength affects both preemptive and reactive repression, and thus the effectiveness of reactive repression is $(1 - x^2)\theta$. [5]

[4] As mentioned earlier adding a certain level of fungibility to allocation of resources would not change the substantial findings of the model. Consider $\beta \in (0, 1)$ such that the reactive repression capacity of the government is $(1 - x^2)\theta + x\beta$ rather than just $(1 - x^2)\theta$. While this would increase the level of allocation to preemption for both types, there would still be a single value of x that maximizes security for both types, which is what is driving the results presented.

[5] Modifying the model so that governments are unable to easily shift their resources to reactive repression

After observing the allocation x, but not its full effect $x\theta$, the opposition decides whether to mobilize to challenge the government $m \in \{0, 1\}$ at a cost $c \in (0, 1)$.[6] Thus, by the time they are deciding whether to challenge the government, the opposition does not know their exact likelihood of victory. The opposition's value for removing the government is normalized to 1, and their payoff for not mobilizing is 0.[7] I occasionally refer to the cost of mobilization of the opponent as resolve, where higher resolve means lower costs for mobilization.

Fighting an open conflict costs the government $k > r$ such that it would rather engage preemptive repression successfully, rather than fight an open conflict. Furthermore, I assume $V > k + r$ to focus on cases where the government would always prefer to engage in both preemption and a successful conflict rather than give up power peacefully.[8]

If the opponent mobilizes, open conflict occurs and the remaining capacity of the opposition is matched against the remainder of the government's security forces that are not allocated to preemption. Since rebel capacity γ is held constant throughout, the likelihood of opposition victory can be expressed through x and θ. The probability of opposition victory $p(x, \theta)$ is a contest function which depends both on the level of allocation to preemption x and the government's type (Skaperdas, 1996). I use the explicit form $p(x, \theta) = \frac{\gamma - x\theta}{(\gamma - x\theta) + (1 - x^2)\theta}$, but the function can be left more general. Figure 1 below illustrates the relationship between x and p for different types of government.

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if they forego preemptive repression does not substantively change the results. Suppose once a government chooses $x > 0$, it can still forego preemptive repression and not pay the cost r. the opposition's likelihood of winning the conflict is $\frac{\gamma}{\gamma + (1-x^2)\theta} > \frac{\gamma}{\gamma + \theta}$. This would make preemptive repression even more attractive for governments, but would not change the substantive findings.

[6] However, changing the model so that the opposition observes the effect but not the resources spent on preemptive repression would not change any of the results. Consider the model, where the effect of preemption is $f(x, \theta) = x\theta = F$, and the opposition only observes F. All the equilibria presented below still hold.

[7] Adding an additional cost for suffering preemptive repression does not change the results.

[8] I consider the possibility of bargaining in the extension in the appendix.

To sum up, the sequence of the game is:

1. Nature chooses θ, where $\theta = \theta_S$, with probability q. θ is revealed to G but not O.
2. G chooses $x \in [0, 1]$. O observes x, but not its effect $x\theta$.
3. O chooses to escalate at a cost c or not: $m \in \{0, 1\}$. If they escalate, open conflict occurs, where O wins with a probability $p(x, \theta) = \frac{\gamma - x\theta}{(\gamma - x\theta) + (1 - x^2)\theta}$.
4. Conflict outcome is decided; payoffs are allocated.

The utilities are:

$$U_G = V - Ir - m((1 - p(x, \theta))V + k)$$
$$U_O = m(p(x, \theta) - c)$$

where, $I = 1$ when $x > 0$ and 0 otherwise. The solution concept is Subgame Perfect Nash Equilibrium when there is symmetric information, and Perfect Bayesian Equilibrium otherwise. An equilibrium is composed of: 1) A strategic mapping of government type to its allocation x; 2) A set of beliefs for the opposition regarding the type of government given observed allocation of x; 3) A decision to mobilize for the opposition. Full definition and proofs are in the appendix.

3.2 Purely Functional Preemption

I begin with the complete information analysis. The complete information case illustrates how both actors would behave if repression had no informational content. It demonstrates what the likelihood and effect of repression will be when it is employed purely for a direct, functional purpose: to reduce the opposition's capacity before they have a chance to mobilize.

First, note that $p(x, \theta)$ is a convex function of x so that for each type of government, there is a unique value of x that maximizes its likelihood of victory. I label the strong type's

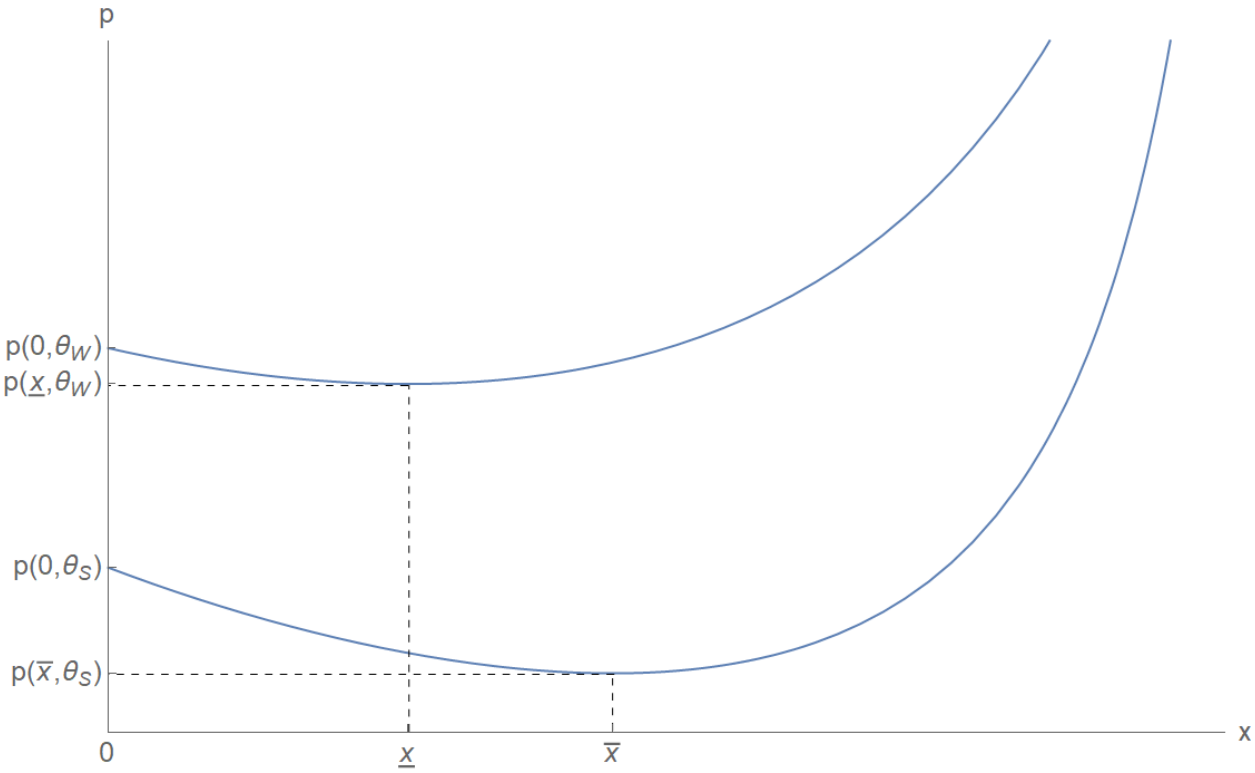

Figure 1: Allocation to preemption x, and likelihood of opposition victory p
where $\gamma = 2$, $\theta_S = 1.5$, $\theta_W = 1$.

optimal allocation as $\bar{x}$, and the weak type's optimal allocation as $\underline{x}$. I refer to $\bar{x}$, as "high level of repression", and $\underline{x}$ as "low level of repression" throughout the text although both levels can be high in a given context. Second, $\bar{x} > \underline{x}$. A strong type allocates relatively more of its resources to preemption if it needs to use it at all. Third, it is more likely to win in an open conflict for any given level of allocation. Formally, $p(x, \theta_S) < p(x, \theta_W)$ for all x.

In a complete information setting, the opposition will perfectly observe the government's type and the effect of preemptive repression if it is used. Consequently their expected utility for mobilizing is simply given by $p(x, \theta)$.[9] Since both types of government will either use their optimal levels of preemption—$\bar{x}$ or $\underline{x}$—or not engage in preemption at all, there are four subgames to consider: 1) The government is a weak type that has repressed at a level $\underline{x}$. 2) The government is a weak type that has not repressed. 3) The government is

[9]I assume that the opposition will not mobilize when indifferent between mobilizing or not.

a strong type and has repressed at a level $\bar{x}$. 4) The government is a strong type and has not repressed. The threshold for opposition's cost to mobilize are thus: $p(\underline{x}, \theta_W) < p(0, \theta_W)$, $p(\bar{x}, \theta_S) < p(0, \theta_S)$. The thresholds of resolve, and both types of government's decisions for each threshold are given in Figure 2 below.[10]

If $c \geq p(0, \theta_W)$ the opposition's cost of mobilization is sufficiently high that it poses no credible threat to either type of government. In this case, neither type will engage in preemption, and the opposition will not mobilize. If the opposition is resolved enough $c < p(0, \theta_W)$, weak government has to use preemption to deter the opposition, which they can do successfully when $c \geq p(\underline{x}, \theta_W)$.

When the opposition is sufficiently resolved—$c < p(\underline{x}, \theta_W)$— weak government cannot deter the opposition even with the most efficient use of its resources. Since conflict is inevitable, a weak government will only use preemption if its cost is lower than the advantage it creates for the upcoming conflict. Formally:

$$V(p(0; \theta_W) - p(\underline{x}; \theta_W)) \geq r \equiv r^{\dagger} \tag{1}$$

Similarly, if $c \geq p(0, \theta_S)$, a strong government has no reason to engage in preemption. A strong government will deter any mobilization by using preemptive repression while $c \geq p(\bar{x}, \theta_S)$. However, when the opposition is highly resolved, $c < p(\bar{x}, \theta_S)$, it has to weigh the cost of preemptive repression against the advantage it confers in the conflict.

$$V(p(0; \theta_S) - p(\bar{x}; \theta_S)) \geq r \equiv r^{\ddagger} \tag{2}$$

Notice that $r^{\ddagger} < r^{\dagger}$, because:

$$p(0, \theta_S) - p(\bar{x}, \theta_S) > p(0, \theta_W) - p(\underline{x}, \theta_W)$$

[10]The functional form does not guarantee that $p(0, \theta_S) > p(\underline{x}, \theta_W)$ as depicted in Figure 2. In the complete information case, this is not significant. I consider both scenarios under asymmetric information below.

While strong governments are less likely to need preemptive repression, they will be more eager to use it if the need arises. Because strong governments are more effective at preemptive as well as reactive repression, they get more advantage from engaging in preemption even when they cannot avoid open conflict.

Lemma 1 *Strong governments are more likely to use preemptive repression when they cannot deter open conflict.*

Since the focus is on the use of preemption and its relation to dissent, I assume $r \leq r^{\ddagger} < r^{\dagger}$.[11]

Lemma 2 ***No repression, no mobilization:***

(i) Neither type of government uses preemption, and the opposition does not mobilize when $c \geq p(0, \theta_W) > p(0, \theta_S)$ *(Region VI).*

(ii) Strong government does not engage in repression, and the opposition does not mobilize if $c \geq p(0, \theta_S)$ *(Region III).*

When opposition's resolve, or capacity is sufficiently low, and government strength is common knowledge, governments do not have to engage in repression. This is not surprising as both previous formal work (Pierskalla, 2010; Ritter, 2014) and inverted-U, or "murder in the middle" theories have argued that stronger authoritarian regimes engage in relatively less violence, because they successfully deter any open challenges to their rule by the *threat* of

[11]This assumption can be less stringent, because under asymmetric information, weak governments can —under certain conditions— mimic strong types and deter conflict, making preemption even more valuable. Even when attempts to mimic fail to deter challenges, as in Proposition 6, the probability of being challenged will be $\sigma_O < 1$. Consequently, weak government engages in preemption even when $r > r^{\dagger}$ under incomplete information.

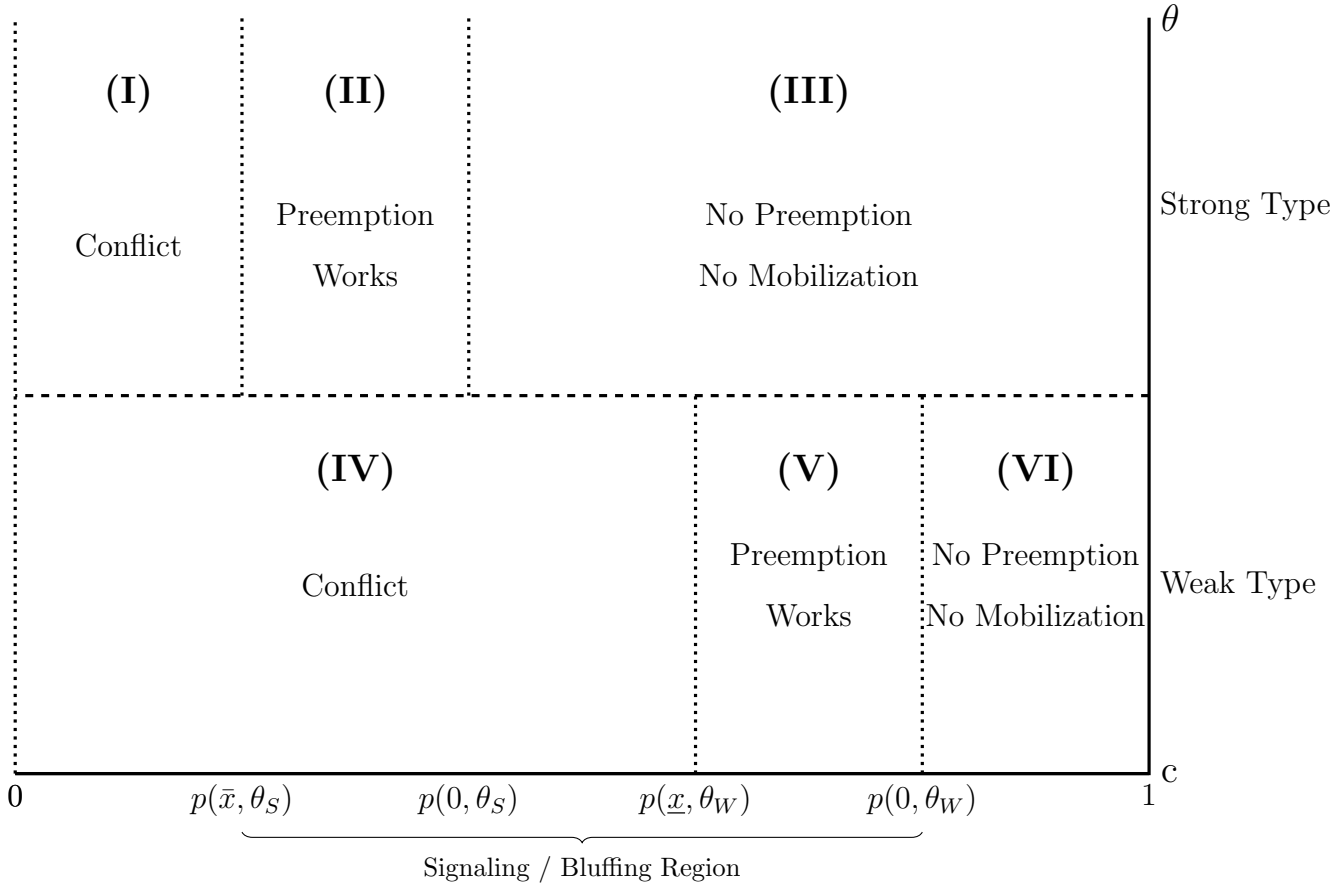

Figure 2: Equilibria under complete information when $r \leq r^{\ddagger} < r^{\dagger}$.

repression.[12] Under complete information stronger a government is, the more it can tolerate, or ignore the opposition.

Nevertheless, governments often do engage in repression to prevent opposition from mobilizing. When the government is successful in preemption, repression will be observed and mobilization will not (Ritter and Conrad, 2016).

Proposition 1 ***Successful functional preemption:***

(i) Weak government chooses $\underline{x}$ *and the opposition does not mobilize if* $p(0, \theta_W) > c \geq$

[12]Inverted-U, or "murder/ violence in the middle" theories have primarily focused on regime type, not capacity. However more recent work finds little empirical support for arguments based on regime type. See Davenport and Armstrong (2004); Jones and Lupu (2018).

$p(\underline{x}, \theta_W)$ *(Region V).*

(ii) Strong government chooses $\bar{x}$ *and the opposition does not mobilize if* $p(0, \theta_S) > c \geq p(\bar{x}, \theta_S)$ *(Region II).*

Within the parameter space of Proposition 1, the opposition is too resolved to be simply ignored and will challenge the government unless targeted by repression. Anticipating this, governments repress preemptively to deter them. In this setting, preemptive repression has a pure functional purpose, reducing the capacity of opposition before they can take up arms, or go to streets en masse. Used preemptively, repressive tactics such mass arrests of suspected dissidents, killings, disappearances, torture are sometimes effective enough to deter overt challenges. Even when governments can not completely —$\theta_S < \gamma$— destroy the opposition's capacity, they can still deter challenges by repressing preemptively. Although preemptive repression is costly, successfully deterring overt challenges through preemption is always preferable for governments.

When the opposition has sufficiently high capacity or resolve, even the application of preemptive repression and the threat of reactive repression will not deter them. In this case, regardless of whether they are targeted preemptively or not, they will mobilize to challenge the government. However, this does not mean that preemptive repression will not be used. Even when a government knows that it cannot avoid an open conflict, it still has an incentive to engage in preemptive repression , which can be still used to reduce the opposition's capacity and make victory in the upcoming conflict more likely.

Proposition 2 ***Failed deterrence:***

(i) If $c < p(\underline{x}, \theta_W)$*: Weak government uses preemptive repression at a level* $\underline{x}$ *if* $r \leq r^{\dagger}$*, or* $x = 0$ *if not. The opposition always mobilizes (Region IV).*

(ii) If $c < p(\bar{x}, \theta_S)$*: Strong government uses preemptive repression at a level* $\bar{x}$ *if* $r \leq r^{\ddagger}$*, or* $x = 0$ *if not. The opposition always mobilizes. (Region I)*

The parameter space of Proposition 2 points to cases where both repression and dissent are observed. Sufficiently resolved opposition will overcome preemptive repression if they face it, and the government will respond with reactive repression. While Proposition 2 represents the cases where preemptive repression fails to deter the opposition, the mechanism is different from the "backlash hypothesis" (Francisco, 1995; Aytaç et al., 2018) which is often invoked to explain the positive association between repression and subsequent dissent. According to this hypothesis, repression fails when it motivates the bystanders to join the opposition, making them even stronger than before.

Here, governments resort to repression preemptively precisely because the opposition is expected to dissent. Repression, when it happens, is followed by mobilization, not because the government errs or miscalculates. Rather by repressing preemptively the government increases the likelihood of victory in the inevitable conflict. Thus, the mechanism presented here is in line with the arguments of Ritter and Conrad (2016) highlighting selection effects: Governments repress preemptively in expectation of dissent. Consequently, conditional on observing preemptive repression, the opposition groups that mobilize will be systematically more resolved than those who do not. Since strong governments can repress more harshly —$\bar{x} > \underline{x}$— only the most resolved opposition— with $c < p(\bar{x}, \theta_S)$— will mobilize after high levels of repression.

To sum up, when the government's strength is common knowledge, preemptive repression is used only for the functional purpose of reducing opposition capacity. Repression is used only when the opposition's cost of mobilization is low. Both weak and strong governments refrain from using preemption if the opposition's resolve is low enough— $c > p(0, \theta_W), c > p(0, \theta_S)$ respectively. Beyond these thresholds, they will resort to preemptive repression to maximize their security: the strong type chooses $\bar{x}$ and the weak type chooses $\underline{x}$. That is, low level of preemptive repression $\underline{x}$ is observed with a probability $(1 - q)$, when $c < p(0, \theta_W)$. Conditional on observing low level of repression, mobilization will only be observed if $c < p(\underline{x}, \theta_W)$. Similarly, high level of preemptive repression, $\bar{x}$ is

observed with a probability q, when $c < p(0, \theta_S)$. Since $p(0, \theta_S) < p(0, \theta_W)$, high levels of preemptive repression are less likely to observed. Conditional on observing high levels of repression, mobilization will be observed if $c < p(\bar{x}, \theta_S)$.

3.3 Preemption with Asymmetric Information

Having examined the model where preemptive repression is only used for the purpose of reducing opposition capacity, I now turn to the asymmetric information setting, where θ is only observed by the government. When the government has private knowledge about its strength, it has the opportunity and the incentive to signal and bluff using preemptive repression. While a strong government has little to hide about its capacities, a weak government might try to allocate more of its forces than is efficient to bluff strength.

Recall from Figure 2 that the informational effect of preemption repression only matters when c is not in Region I or VI. In Region VI—$c > p(0, \theta_W) > p(0, \theta_S)$— the opposition's cost of mobilization is high enough that they do not mobilize for any level of government strength. Similarly, in Region I —$c > p(\bar{x}, \theta_S)$— the opposition will mobilize regardless of government type or level of preemptive repression.

Before moving on to the equilibria of the incomplete information setting, note that the functional form does not guarantee that $p(0, \theta_S) > p(\underline{x}, \theta_W)$. In the complete information case, this has no significance. In the incomplete information case, whether $p(0, \theta_S) > p(\underline{x}, \theta_W)$ or not changes the ranges of equilibria but not their nature or existence. The cases depicted in Figures 3 and 4, demonstrate equilibria of the incomplete information game as a function of the opposition's prior belief q and cost of mobilization c.

First, consider the case when the opposition's cost of mobilization is in Region III or V: $p(0, \theta_S) \leq c < p(0, \theta_W)$. Under complete information, a weak government would be forced to use preemptive repression to deter challenges, but a strong one would not.

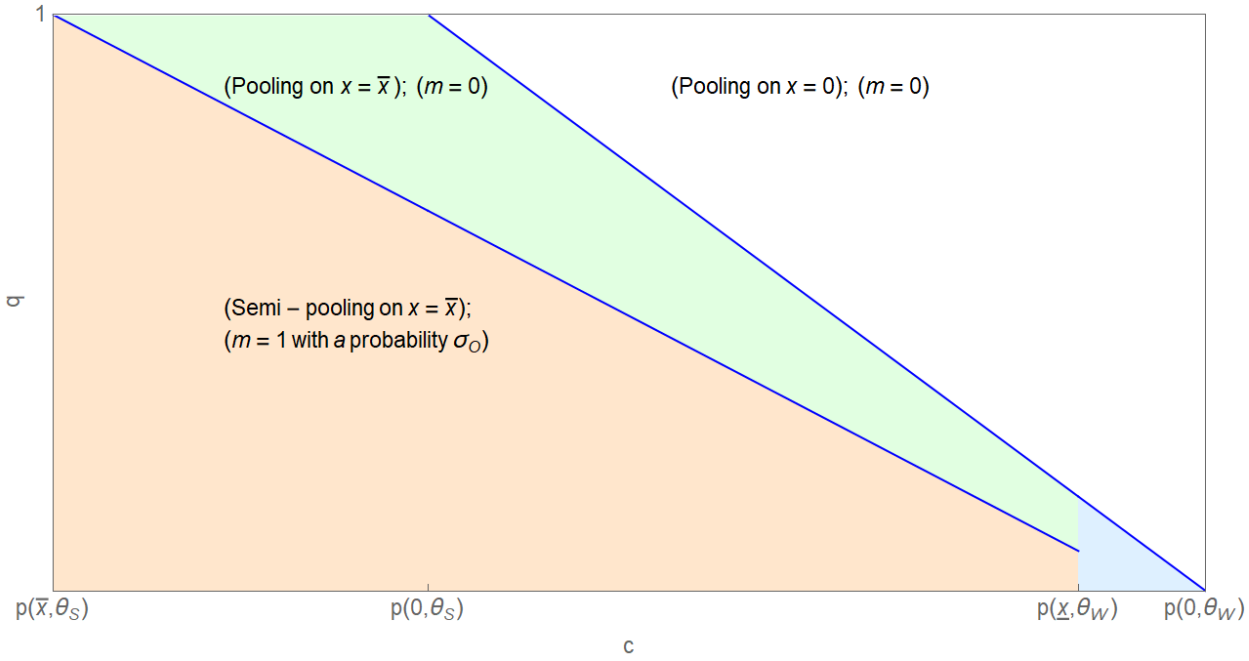

Figure 3: Equilibria of the incomplete information game as a function of q and c, when $p(0, \theta_S) > p(\underline{x}, \theta_W)$. $\gamma = 2$, $\theta_S = 1.5$, $\theta_W = 1$

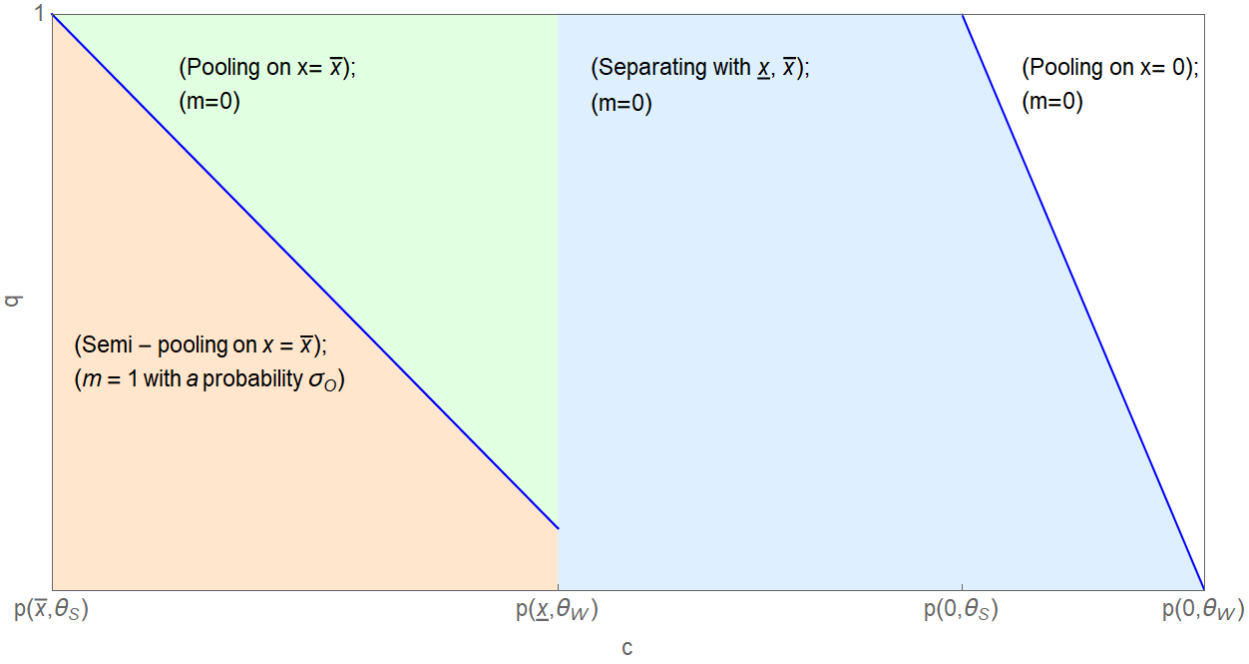

Figure 4: Equilibria of the incomplete information game as a function of q and c, when $p(0, \theta_S) < p(\underline{x}, \theta_W)$. $\gamma = 0.6$, $\theta_S = 0.55$, $\theta_W = 0.5$

This gives an opportunity to bluff strength to weak governments. When the opposition expects with high enough probability that the government is a strong type, they do not mobilize to challenge even if they face no preemption. Anticipating the opposition's cautious reaction, weak governments bluff strength by not using repression at all. This is the ideal scenario for weak governments, who can now deter challenges without paying the cost of preemptive repression r. Furthermore, when the power differential between the weak and strong type governments is sufficiently large—$p(0, \theta_S) > p(\underline{x}, \theta_W)$— bluffing strength by not using preemptive repression will even enable weak governments to avoid mobilization that they could not have deterred otherwise. This is the equilibrium in the white region of Figures 3 and 4.

Researchers on contentious politics have argued that stronger governments induce cooperation and obedience through the threat of violence (Davenport, 2007; Ritter, 2014; Chenoweth, 2021). Provided their opposition is sufficiently pessimistic about their prospects in conflict, governments can hide their weakness by refraining from repression. They can instead opt for less coercive tactics such as limited concessions, or cooptation (Ginkel and Smith, 1999).

Proposition 3 ***Bluffing strength with no preemption:*** *Suppose* $p(0, \theta_S) \leq c \leq p(\underline{x}, \theta_W)$. *If* $q \geq \frac{p(0,\theta_W)-c}{p(0,\theta_W)-p(0,\theta_S)} \equiv \dot{q}$, *neither type of government uses preemptive repression* $x = 0$, *and the opposition does not mobilize,* $m = 0$.

As the cost of mobilization c gets lower, the threshold $\dot{q}$ gets higher, meaning the opposition has to believe with a higher likelihood that the government is a strong type to be deterred. Below this threshold, the opposition will mobilize if they face no preemption. When this is the case, a strong government has to use costly preemption to deter the opposition it could have ignored under complete information. While a weak government can no longer bluff strength by not using repression, it can still deter the opposition when $c \geq p(\underline{x}, \theta_W)$. While this reveals their type to the opposition, because they are using preemption for its

functional purpose and can inflict enough damage, it does not matter.

On the other hand, a strong government will use repression for both its informational and functional elements. If $c \geq p(0, \theta_S)$, preemptive repression serves only a signaling purpose, since the opposition would not have mobilized under complete information. If $p(\underline{x}, \theta_W) \leq c < p(0, \theta_S)$, then preemption will serve a functional purpose, as the opposition would have mobilized under complete if they were not repressed. In either case, observing the level of preemptive repression—$\underline{x}$ or $\bar{x}$— will be sufficient for the opposition to infer the type of government. However, this information will not be of much use, as their resolve will be too low to mobilize after repression. This is the blue region in Figures 3 and 4.

Proposition 4 ***Successful preemption through either direct or informational effect****: Suppose $p(0, \theta_S) \leq c \leq p(\underline{x}, \theta_W)$ and $q < \dot{q}$. The government chooses $\bar{x}$ if it is a strong type, and $\underline{x}$ if it is a weak type. In either case, the opposition does not mobilize, $m = 0$.*

Finally, suppose $p(\bar{x}, \theta_S) \leq c < p(\underline{x}, \theta_W)$, so that a weak government cannot deter challenges even with its optimal level of preemption. However, similar to its strategy in the parameter space of Proposition 3, it can mimic a strong type by allocating more of its security forces to preemption than is efficient and choose $\bar{x}$. While this diminishes its likelihood of victory in a potential conflict—$p(\bar{x}, \theta_W) > p(\underline{x}, \theta_W)$—, it does not have to worry about such a contingency if it bluffs successfully. Once again, if the opposition's expectation that the government is strong is high enough, they will not mobilize after being targeted by high levels of repression $\bar{x}$.

Proposition 5 ***Bluffing strength with high level of repression****: Suppose $p(\bar{x}, \theta_S) \leq c < p(\underline{x}, \theta_W)$. If $\dot{q} > q \geq \frac{p(\bar{x}, \theta_W) - c}{p(\bar{x}, \theta_W) - p(\bar{x}, \theta_S)} \equiv \ddot{q}$, both types of government pool on $\bar{x}$, and the opposition does not mobilize, $m = 0$.*

While bluffing strength by allocating more resources to preemption than is efficient may help a weak government to avoid challenges, it might also backfire. Recall that when

mimicking strong types, weak types render themselves less capable of achieving victory in an open conflict. This creates a conundrum for the opposition. If they are optimistic about their prospects—$q < \ddot{q}$— after observing high levels of repression ($\bar{x}$) they know they are either facing a strong type, or a bluffing weak type. If they never challenge, they miss the chance to challenge a weak government that under complete information they would have taken. If the opposition always challenges, a weak government would never attempt to mimic the strong types, and they would enter conflicts that they would have avoided under complete information. Thus, the opposition adopts a mixed strategy, sometimes challenging the government after observing $\bar{x}$. The opposition's willingness to challenge under these conditions limits the weak type's use of high levels of preemptive repression. This is the equilibrium in the orange region of Figures 3 and 4.

Proposition 6 ***Possible ex post regret for weak government and the opposition:*** *Suppose* $p(\bar{x}, \theta_S) \leq c < p(\underline{x}, \theta_W)$ *and* $q < \ddot{q}$. *Strong government always chooses* $\bar{x}$, *and the weak government chooses* $\bar{x}$ *with probability* $\sigma_W = \frac{q[c - p(\bar{x}, \theta_S)]}{[p(\bar{x}, \theta_W) - c](1-q)}$. *The opposition mobilizes with probability* $\sigma_O = \frac{p(\underline{x}, \theta_W)V + k}{p(\bar{x}, \theta_W)V + k}$.

The central insight from Proposition 6 is that both the weak government and the opposition might suffer from ex post regret. In its attempt to deter challenges a weak government might end up fighting conflicts from a weaker position, having allocated more resources to preemption than is efficient. On the other hand, the opposition sometimes escalates against strong governments and enters conflicts that they would have otherwise avoided.

Having explored the equilibria when both functional and informational elements of repression are at play, we can examine the contributions of the model more closely. Uncertainty about the strength of the government can have a pacifying effect as Proposition 3 illustrates. When the opposition expects the government to be strong, weak governments can both avoid repression and deter challenges by bluffing strength with no preemption:

$x = 0$. When ignoring the opposition is no longer viable, weak governments can similarly bluff strength by using high levels of repression $\bar{x}$, as in the parameter space of Proposition 4. Thus, low levels of preemptive repression $\underline{x}$ become less likely to be observed when there is asymmetric information. Conditional on observing $\underline{x}$, however mobilization becomes less likely.

On the other hand, strong governments are more likely to need preemptive repression to deter challenges than the complete information setting. As the strong governments resort to preemption to signal their strength—Proposition 4—, and weak governments repress more harshly to mimic them—Proposition 5 and 6—, high levels of repression $\bar{x}$ become more likely to be observed. Conditional on observing $\bar{x}$ however, mobilization becomes more likely than the complete information case. Recall from Proposition 2 that under complete information, only the most resolved opposition—those with $c < (\bar{x}, \theta_S)$—mobilizes after being targeted by high levels of repression. When there is uncertainty about the strength of the government, mobilization after high levels of preemption become more likely as the opposition's optimism about their prospects increase—lower q—, possibly leading to ex post regret.

Proposition 7 *Relative to the complete information setting, asymmetric information about government strength leads to lesser likelihood of observing low levels of preemptive repression $\underline{x}$, but greater likelihood of observing high levels of preemptive repression $\bar{x}$.*

Proposition 8 *Under asymmetric information, conditional on observing high levels of preemptive repression $\bar{x}$, conflict becomes more likely.*

Proposition 9 *Under asymmetric information, an increase in the cost of preemptive repression, r, has a more limited effect. An increase in r reduces the likelihood of repression only if it is high enough to discourage the strong type. That is, $r \geq V((p(0; \theta_S) - p(\bar{x}; \theta_S))$.*

Finally, Proposition 9 provides an explanation as to why efforts to raise the cost of repression, such as international human rights treaties, have had mixed effects (Hollyer and Rosendorff, 2011; Conrad and Ritter, 2013). Recall from Lemma 1 that strong governments are more eager to repress should they need to. If a strong government finds it worthwhile to use preemptive repression, a weak government must use it as well if they want to hide their weakness. Consequently, even if the cost of repression were to increase enough overshadow its functional benefit $V((p(0;\theta_W) - p(\bar{x};\theta_W))$, a weak government will still resort to repression. Empirically, Conrad and Ritter (2013) find evidence that this is indeed the case: Signing the United Nations Convention Against Torture (CAT) does not make leaders with low job security less likely to engage in torture than those who did not. This is not to suggest that signing CAT does not increase the cost of torture at all (Hollyer and Rosendorff, 2011). Rather, the effect of CAT and similar efforts depend on how repression is used in a given context.

4 Discussion

Taken together with Proposition 2, Proposition 6 points to a better understanding of a piece of the "puzzle of persistent repression". Why do governments continually resort o repression when dissent is consistently observed following repression? Both demonstrate cases where rational, forward-looking governments will resort to violence, when it can fail to deter the opposition. However, the mechanisms are different. Under Proposition 2, both strong and weak governments repress preemptively purely to reduce the capacity of the opposition when they can, knowing that it will fail to deter the opposition.

In contrast, under Proposition 6, a weak government uses preemptive repression for its informational channel to bluff strength. In this case deterrence through preemptive repression fails, because it fails to signal to the opposition that the government is a strong type, even when it is. The same observed relationship between repression and dissent can

be generated by two different processes depending on how repression affects dissent.

The model's main insights fit within Weyland (2014)'s observation on revolutionary waves, where dissidents lacking information jumped to the conclusion that foreign successes could be emulated at home. In these cases of optimism, they have mistakenly challenged powerful autocrats even after initially facing high levels of repression, often with low levels of success. This dynamic was evident during the Arab Spring. Citizens across the region were inspired by the rapid fall of Tunisian President Zine El Abidine Ben Ali, and were optimistic enough that their governments were similarly weak. Some of these movements, most notably that in Bahrain were quickly and harshly repressed by security forces despite achieving high levels of mobilization (Weyland, 2012, 2014; Slantchev and Matush, 2020; Chenoweth, 2021). In the case of Libya, only outside military intervention prevented Libyan dictator Muammar al-Gaddafi from massive reactive violence.

Of course, the opposition will sometimes catch weak leaders bluffing. Dissidents resolved and optimistic enough to mobilize despite repression will find governments unable to repeat the high levels of repression against mobilized—possibly armed— masses. For example, leading up to and during the 2013-2014 campaign leading to removal of former Ukranian President Yanukovich, activists were targeted by pro-government militias and plainclothes police (Chyzh and Labzina, 2018; Chenoweth, 2021). Despite his best efforts to use high levels of repression to deter mass mobilization, which included kidnapping and torturing activists and journalists, he quickly lost power once the protesters showed up to streets in thousands. Rather than treating Yanukovic's use of repression as a simple blunder, we should see it as an ex-ante rational effort to bluff strength by a weak leader (Chyzh and Labzina, 2018).

Distinguishing these processes is key to improve our understanding of repression-dissent nexus because of their implications for theory and practice. The lack of evidence that repression has a negative effect on the likelihood of dissent (Davenport, 2007; Davenport and

Loyle, 2012; deMeritt, 2016) has often been interpreted along the lines of "repression does not work", making the mass mobilization the locus of research (Slantchev and Matush, 2020; Chenoweth, 2021). It is true that all successful opposition movements— armed or not— have mobilized despite repressive efforts by governments. But history is also full of failed revolutions, where dissidents have made the wrong call and faced more repression than they expected.

The Arab Spring provides a stark example of the different processes and their different consequences. Former Tunisian President Zine El Abidine Ben Ali relied heavily on internal security forces for repression at the expense of the military (Svolik, 2012). While internal security forces helped him quell challenges for decades, they were quickly overwhelmed when mass protests erupted in December 2010. Ben Ali ordered the army to intervene. After the army refused to intervene, Ben Ali was forced to flee to exile. While researches have noted—with some help from hindsight— that Ben Ali's regime was weak (Weyland, 2012; Svolik, 2012), it is hard to tell how much optimism played a role in the Tunisian Uprising.

After the protests escalated in Tunisia, authoritarian regimes responded by ramping up repression in their own countries, in an effort find the "right mix of repression and concessions" (Bellin, 2012) to prevent challenges at home. Yet despite facing increased repression, masses mobilized in protest leading to many cases of authoritarian reactive repression and failed uprisings. The model presented here explains why authoritarians were quick to ramp up repression leading up to and during the Arab Spring protests. Many authoritarian leaders failed to nip the protests in the bud, but nevertheless benefited from repressing preemptively. For example, Bashar al-Assad's brutal campaign carried by internal security forces decimated the urban, civilian, and non-violent campaign by killing community leaders or forcing them into exile (Chenoweth, 2021). This essentially dissolved the civil resistance campaign, making it ripe for take over by violent, sectarian groups that spent significant time and resources fighting among themselves.

Elsewhere in the region protesters similarly took the streets in large numbers despite increased repressive efforts by their governments and found no success. In Bahrain, they were quickly and ruthlessly repressed by security forces (Bellin, 2012). In Libya, Gaddafi's massive push for brutal reactive repression provoked a Western military response. A key reason for this dynamic was the opposition's lack of information about the government's strength. The regime opponents generally lacked informational and organizational structures such as political parties and thus, operated under great uncertainty (Svolik, 2012; Weyland, 2012). This uncertainty, coupled with optimism created by events in Tunisia, led to increased repression by governments, which failed to convince the Bahrainis that their government was sufficiently strong.

5 Conclusion

The effect of repression depends on its purpose and how it is perceived by its target. In this paper, I have suggested two distinct channels through which repression, used preemptively, can help governments deter challenges. These channels have either been lumped together, or studied separately. However, to understand the relationship between repression on dissent, they need to be studied together in a way that focuses on their interaction. When asymmetric information about the strength of governments is a factor, the expected relationship between preemptive repression and dissent becomes much less straightforward.

Repression affects dissent through two distinct channels: reducing opposition capacity before it can mobilize, or by convincing the opposition that the government is strong enough to put down any challenges. As the model presented here demonstrates, these channels are not always complementary and can interact in different ways. Governments can show strength by not repressing at all, or end up making themselves more vulnerable by employing high levels of repression.

Private information can incentivize weak governments to increase repression, in an effort to convince the opposition that equal, or greater repression will be forthcoming if they mobilize. When weak governments rely more on repression for its informational effect— hiding their weakness— stronger governments that use it for purely functional purposes can see their efforts insufficient, and face challenges. As the opposition is more inclined to mobilize after repression in an attempt to call the weak government's bluff, they can end up challenging strong governments as well.

The fundamental problem for most citizens opposing their regime is whether to push forward in an effort to seize the moment, or wait for a more opportune moment that might never come. This problem is more even salient in the current period, where opposition movements are increasingly comprised of spontaneously organized individuals without established organizations (Weyland, 2012; Tufekci, 2017; Chenoweth, 2021). Spontaneous mass movements often need to win quick if they want to win at all. Sometimes this decision will be relatively easy, because the opposition will have the capacity or the resolve to withstand anything the government can throw at it. Or, repression will be harsh enough for them to give up the challenge. Between these extremes however, their decision to mobilize will be made under uncertainty with what limited information they have with regards to government's strength.

The model presented here shows that challenges to inference from observational data is not just endogeneity or censoring (Carey, 2006; Ritter and Conrad, 2016; Hill and Jones, 2014; deMeritt, 2016), but also equifinality. Even when the observed effect on dissent or likelihood of conflict show similar relationships, researchers should be wary of making causal arguments by looking at observed effects alone without accounting for different mechanisms at play. For example, scholars should be very cautious before claiming "repression does not work" after observing positive association between repression and dissent. As the Arab Spring and its aftermath have demonstrated, drawing the right inference from the relationship between repression and dissent has enormous implications, more so for the citizens

than scholars.

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6 Appendix

Definition of Equilibria: A perfect Bayesian equilibrium of the game is a choice of $x \in [0,1]$ for both types of government, a set possibly updated beliefs $\mu = p(\theta = \theta_S|x)$ and a decision to mobilize $m \in \{0,1\}$ with a probability σ_O opposition such that:

$$x^* = \underset{x\in[0,1]}{\operatorname{argmax}} \left[V - r - \sigma_O(p(x,\theta)V + k)\right]$$

$$\sigma_O^* = \underset{\sigma_O\in[0,1]}{\operatorname{argmax}} \left[\sigma_O[(\mu(x)p(x,\theta_S) + (1-\mu(x))p(x,\theta_W)) - c]\right]$$

and beliefs are updated with Bayes' rule where possible. Off the equilibrium path, I assume that the opposition believes that the government is a weak type.

Optimal level of repression for both types: Given the functional form, $p(x,\theta) = \frac{\gamma - x\theta}{(\gamma - x\theta)+(1-x^2)\theta}$, G's utility for conflict is maximized when $(1-p)V$ is at a maximum.

$$\frac{\partial(1-p)}{\partial x} = \frac{\theta\left(\theta x^2 + \theta - 2\gamma x\right)}{\left(\gamma - \theta\left(x^2 + x - 1\right)\right)^2}$$

which equals to zero when $x^* \equiv \frac{\gamma}{\theta} - \sqrt{\frac{\gamma^2-\theta^2}{\theta^2}} = \frac{\gamma - \sqrt{\gamma^2-\theta^2}}{\theta}$.

The second derivative with respect to x is always negative within the given parameter ranges which guarantees that x^* is a maximum for $(1-p)$.

$$\frac{\partial^2(1-p)}{\partial x^2} = \frac{2\theta\left(\gamma^2 - \theta^2\left(x^3 + 3x + 1\right) + \theta\left(\gamma + 3\gamma x^2\right)\right)}{\left(\theta\left(x^2 + x - 1\right) - \gamma\right)^3} < 0$$

Denominator of $\frac{\partial^2(1-p)}{\partial x^2}$ is always negative and the numerator is always positive given the assumption $\theta_W < \theta_S < \gamma$.

$\bar{x} > \underline{x}$, because $x^* = \frac{\gamma - \sqrt{\gamma^2-\theta^2}}{\theta}$ is increasing in θ, so that $\lim_{\theta\to\gamma} \frac{\gamma - \sqrt{\gamma^2-\theta^2}}{\theta} = 1$. Since $\theta_S > \theta_W$ it follows that $\bar{x} > \underline{x}$.

Proof of Lemma 1:

$$p(0,\theta_S) - p(\bar{x},\theta_S) > p(0,\theta_W) - p(\underline{x},\theta_W)$$
$$p(\underline{x},\theta_W) - p(\bar{x},\theta_S) > p(0,\theta_W) - p(0,\theta_S)$$

Suppose not:

$$p(0,\theta_W) - p(0,\theta_S) \geq p(\underline{x},\theta_W) - p(\bar{x},\theta_S)$$
$$\frac{\gamma}{\gamma+\theta_W} - \frac{\gamma}{\gamma+\theta_S} \geq \frac{\theta_W}{2\gamma - 2\sqrt{\gamma^2-\theta_W^2}+\theta_W} - \frac{\theta_S}{2\gamma - 2\sqrt{\gamma^2-\theta_S^2}+\theta_S}$$

Left-hand side is always positive. For right-hand side to be positive it must be the case that:

$$2\gamma - 2\sqrt{\gamma^2-\theta_S^2}+\theta_S > 2\gamma - 2\sqrt{\gamma^2-\theta_W^2}+\theta_W$$
$$-2\sqrt{\gamma^2-\theta_S^2}+\theta_S > -2\sqrt{\gamma^2-\theta_W^2}+\theta_W$$
$$\theta_S - \theta_W > 2\sqrt{\gamma^2-\theta_S^2} - 2\sqrt{\gamma^2-\theta_W^2}$$

Since $\theta_S > \theta_W$ left-hand side is always positive and right-hand side is always negative. A contradiction.

Proof of Proposition 1: Follows from the application of backward induction in the main text.

Proof of Proposition 2: Follows from the application of backward induction in the main text.

Proof of Proposition 3: Subgame at history $x = 0$. Suppose both type of governments pool on $x = 0$ so that $\mu = q$. Opposition will mobilize if the likelihood of facing

a strong government is sufficiently low.

$$\begin{aligned} qp(0,\theta_S) + (1-q)p(0,\theta_W) - c &> 0 \\ q[p(0,\theta_S) - p(0,\theta_W)] + p(0,\theta_W) &> c \\ q[p(0,\theta_S) - p(0,\theta_W)] &> c - p(0,\theta_W) \\ q &< \frac{c - p(0,\theta_W)}{p(0,\theta_S) - p(0,\theta_W)} \\ q &< \frac{p(0,\theta_W) - c}{p(0,\theta_W) - p(0,\theta_S)} \end{aligned}$$

which is positive and in $(0,1)$ as it should be. Because $c < p(0,\theta_W)$ by supposition. And $p(0,\theta_W) > p(0,\theta_S)$. So $\dot{q} \equiv \frac{p(0,\theta_W)-c}{p(0,\theta_W)-p(0,\theta_S)}$. Both types of government get V, their best payoff, so neither has an incentive to deviate. This is the best case scenario for a weak government (outside region V), because they can mimic strength and avoid challenges and save on the cost of preemption r.

Proof of Proposition 4: Follows from the complete information case.

Proof of Proposition 5: Suppose $p(\underline{x},\theta_W) > c \geq p(\bar{x},\theta_S)$. After observing $\bar{x}$, $\mu = q$. So opposition only mobilizes if:

$$\begin{aligned} qp(\bar{x},\theta_S) + (1-q)p(\bar{x},\theta_W) - c &> 0 \\ q[p(\bar{x},\theta_S) - p(\bar{x},\theta_W)] + p(\bar{x},\theta_W) &> c \\ q[p(\bar{x},\theta_S) - p(\bar{x},\theta_W)] &> c - p(\bar{x},\theta_W) \\ q &< \frac{c - p(\bar{x},\theta_W)}{p(\bar{x},\theta_S) - p(\bar{x},\theta_W)} \\ q &< \frac{p(\bar{x},\theta_W) - c}{p(\bar{x},\theta_W) - p(\bar{x},\theta_S)} \end{aligned}$$

which is positive and in $(0,1)$ as it should be. Because $c < p(\underline{x},\theta_W)$ supposition. Call this $\ddot{q} \equiv \frac{p(\bar{x},\theta_W)-c}{p(\bar{x},\theta_W)-p(\bar{x},\theta_S)}$. Again neither type of G has an incentive to deviate because $V - r$ is always greater than $p(x,\theta)V - c$ by assumption. Only possible profitable deviation is to $x = 0$, which is only possible when $p(0,\theta_S) < p(\underline{x},\theta_W)$ and $q > \dot{q} > \ddot{q}$. In which, case both types of government pool on $x = 0$ as in Proposition 3.

Proof Proposition 6: Suppose $p(\underline{x}, \theta_W) > c \geq p(\bar{x}, \theta_S)$, and $q < \ddot{q}$. Mixed-strategy equilibrium.

Opposition's indifference condition:

$$\begin{aligned}
\mu p(\bar{x}, \theta_S) + (1-\mu)p(\bar{x}, \theta_W) - c &= 0 \\
\mu[p(\bar{x}, \theta_S) - p(\bar{x}, \theta_W)] + p(\bar{x}, \theta_W) - c &= 0 \\
\mu &= \frac{c - p(\bar{x}, \theta_W)}{p(\bar{x}, \theta_S) - p(\bar{x}, \theta_W)} \\
\mu &= \frac{p(\bar{x}, \theta_W) - c}{p(\bar{x}, \theta_W) - p(\bar{x}, \theta_S)}
\end{aligned}$$

which is in $(0, 1)$ as it should be. Because $c > p(\bar{x}, \theta_W) > p(\underline{x}, \theta_W)$ by supposition. So numerator between 1 and 0.

Strong types always choose $\bar{x}$. Weak types choosing $\bar{x}$ with a probability σ_W implies:

$$\begin{aligned}
Pr(\theta_S|\bar{x}) = \mu &= \frac{q}{q + (1-q)\sigma_W} \\
\frac{p(\bar{x}, \theta_W) - c}{p(\bar{x}, \theta_W) - p(\bar{x}, \theta_S)} &= \frac{q}{q + (1-q)\sigma_W} \\
q + (1-q)\sigma_W &= \frac{q[p(\bar{x}, \theta_W) - p(\bar{x}, \theta_S)]}{p(\bar{x}, \theta_W) - c} \\
(1-q)\sigma_W &= \frac{q[p(\bar{x}, \theta_W) - p(\bar{x}, \theta_S)] - q[p(\bar{x}, \theta_W) - c]}{p(\bar{x}, \theta_W) - c} \\
(1-q)\sigma_W &= \frac{q[c - p(\bar{x}, \theta_S)]}{p(\bar{x}, \theta_W) - c} \\
\sigma_W &= \frac{q[c - p(\bar{x}, \theta_S)]}{[p(\bar{x}, \theta_W) - c](1-q)}
\end{aligned}$$

Opposition has to make weak types indifferent between $\bar{x}$ and $\underline{x}$:

$$\begin{aligned}
EU_W(\bar{x}) &= EU_W(\underline{x}) \\
\sigma_O[(1-p(\bar{x},\theta_W))V - r - k] + (1-\sigma_O)(V-r) &= [1-p(\underline{x},\theta_W)]V - r - k \\
\sigma_O[(1-p(\bar{x},\theta_W))V - k] + (1-\sigma_O)(V) &= [1-p(\underline{x},\theta_W)]V - k \\
\sigma_O[(1-p(\bar{x},\theta_W))V - k] - \sigma_O V &= -p(\underline{x},\theta_W)V - k \\
\sigma_O[(-p(\bar{x},\theta_W))V - k] &= -p(\underline{x},\theta_W)V - k \\
\sigma_O &= \frac{p(\underline{x},\theta_W)V + k}{p(\bar{x},\theta_W)V + k}
\end{aligned}$$

7 Appendix II: Bargaining

Here I address the possibility of concessions by the Government to the Opposition to avoid challenges, rather than just relying on repression. Denote level of demand by the opposition d, such that the cost of conceding d for the government, is $z(d)$. Assume that $z(d)$ is strictly increasing in d, and $z(0) = 0$. Thus, after concessions the oppositions utility is d, an the government's utility is $V - z(d) - r$, where $r \in \{0, 1\}$ is whether the government engaged in preemptive repression as in the main model.

First, note that when the opposition's resolve is low enough that it can be safely ignored—$p(0, \theta_S) < c$ or, $p(0, \theta_W) < c$— the government has no incentive to offer concessions. When c is sufficiently low, the government can either offer d upfront, or after preemptive repression. In either case, because the concessions are costly, the government will offer no more concessions than is necessary to make the opposition indifferent between mobilizing or not:

$$d^* \equiv p(x, \theta) - c$$

Under complete information, if the government can deter challenges with preemptive repression, it only offers concessions if $r \geq z(d^*)$. So strong governments are less likely to offer concessions, and will offer less concessions when they do so.

Within the parameter space of Proposition 2, the choice of offering concessions is similar to the Conditions 1 and 2 from the main text. That is, if the government cannot deter even with preemptive repression, they offer concessions only when:

$$(1-p)V - k \leq V - z(d^*)$$
$$z(d^*) \leq pV + k$$

Otherwise, conflict occurs as in the baseline model.

Under incomplete information, within the parameter spaces of Propositions 3-5, the opposition does not mobilize to challenge, so the same condition above, $r \geq z(d^*)$ is necessary for concession to occur. Otherwise, the optimal concession is 0.Within the parameter space of Proposition 6, opposition can have a threat to mobilize. However, the results depend on the bargaining protocol because if governments are the only ones making offers, the weak types can mimic the strong types. If opposition offers can make an offer, they can make a screening, take it or leave it offer that the weak type will accept, but not the strong type as long as:

$$z(d) \leq p(\bar{x}, \theta_W)V + k$$
$$z(d) > p(\bar{x}, \theta_S)V + k$$

However, if this is the case because $p(\underline{x}, \theta_W) < p(\bar{x}, \theta_W)$—i.e. the weak government has a better conflict payoff by choosing $\underline{x}$ than $\bar{x}$—the weak government will deviate to $\underline{x}$. Thus, there will be a separating equilibrium where strong governments choose $\bar{x}$, and weak governments choose $\underline{x}$. After preemptive repression, the strong type will offer no concessions or accept no offers. The weak type only accept concessions if $z(d^*) \leq p(\underline{x}, \theta_W)V + k$.