Preventive Repression and Authoritarian Regime Dynamics

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Abstract

Why do authoritarian regimes with different institutional bases vary in durability, violence, and likelihood of democratization? This paper shows how heterogeneous incentives for—and consequences of—preventive repression affect these outcomes. It analyzes an infinite-horizon game between a government that strategically represses and a societal actor that endogenously mobilizes. Preventive repression exerts a short-term effect that deters mobilization but a long-term effect that spurs revolution. However, regimes that are vulnerable to insider coups during mobilization periods (political survival effect) or that accrue large rents under authoritarian rule (predation effect) may repress heavily despite eventually suffering revolutionary overthrow. Personalist authoritarian regimes tend to exhibit these repression-inducing characteristics. Military regimes face favorable exit options to democracy, yielding shorter regimes likely to initiate democratic transitions. Party-based regimes are less vulnerable to insider removal and therefore tolerate societal mobilization, yielding durable and relatively non-violent regimes.

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Why do authoritarian regimes vary widely in durability and in prospects for democratizing? Why do autocracies exhibit considerable variation in violence levels? To answer these questions, considerable scholarship has examined differences in dictators' institutional bases. Specifically, authoritarian regimes in which the dictator personally concentrates power rely upon a distinct support base from regimes that exhibit more dispersed decision-making among collegially organized military officers or within institutionalized party organizations (Huntington, 1993; Bratton and van de Walle, 1994; Geddes, 1999; Geddes, Wright and Frantz, 2014). Existing evidence shows that personalist, military, and party regimes exhibit distinct trajectories on three key regime outcomes. First, party-based authoritarian regimes survive in power on average for the longest periods of time and military regimes for the shortest (Geddes, Wright and Frantz, 2014, 320). Second, personalist authoritarian regimes are the most associated with repression and violence: higher levels of personal liberty violations (Davenport, 2007) and a greater likelihood of experiencing violence upon losing power—observations illustrated in many case studies on "sultanistic" regimes (Chehabi and Linz, 1998, 41-45) and on social revolution (Goodwin and Skocpol, 1989). Finally, military regimes are most likely to democratize (Huntington 1993; Geddes et al. 2014, 325). Section 5 presents these patterns in more detail.

Although existing research has established empirical differences in outcomes among various authoritarian regimes, we lack a general theoretical framework that explains these patterns. The broadest recent attempts at a general theory of regime transitions focus mainly on the effect of economic inequality (Acemoglu and Robinson, 2006; Boix, 2003) and do not analyze differences in authoritarian regime institutions (e.g., Acemoglu and Robinson, 2006, 18). By contrast, pioneering approaches to authoritarian institutions tend to assume dictators vary in their goals depending on their institutional base (Geddes, 1999) or analyze various institutional facets of authoritarian regimes without addressing why personalist, military, and party-based dictators vary on these three key outcome variables (Svolik, 2012).

This paper proposes a new general framework for understanding authoritarian variance by explaining why heterogeneous incentives for—and consequences of—preventive repression affect durability, violence, and democratization.[1] This focus builds off the contention that repression is a foundational survival tool for

[1]Preventive forms of repression such as denying civil liberties and surveillance intend to prevent mass mobilization, as opposed to higher-intensity coercion such as mass imprisonment and executions or firing on protesters.

authoritarian rulers (Svolik 2012, 9; Escribá-Folch and Wright 2015, 50), although departs from the primary focus of recent research on varying patronage strategies across regimes. The paper analyzes an infinite-horizon game between a government that strategically represses and a representative societal actor that in every period chooses whether or not to pay a cost to mobilize. Mobilization enables staging a revolution, which can induce either temporary concessions from the government or an offer to democratize.

The model generates two main results. First, heavy government repression exerts countervailing effects on regime breakdown. Repression makes societal organization less likely in the short-term by raising the costs of mobilization. However, repression also increases the likelihood of revolutionary attempts in the long term by raising society's costs under the status quo regime and by empowering violent revolutionaries over would-be democrats. Therefore, repression can prolong authoritarian regimes by preventing mobilization in the short term, but also increases the likelihood that the regime will end in revolutionary upheaval rather than in negotiated transition to democracy. Second, regimes may nevertheless repress heavily despite eventually suffering revolutionary overthrow. If the regime is vulnerable to insider coup attempts during mobilization periods (political survival effect), accrues large rents under authoritarian rule (predation effect), or has a weak exit option to democratizing, then it may choose a high repression strategy that maximizes short-term gains at the cost of a revolution in the long run.

These strategic incentives for preventive repression help to explain key patterns and puzzles for three types of authoritarian regimes. First, research on social revolutions examines how exclusionary and repressive personalist authoritarian regimes often leave "no other way out" than violence for societal actors, but cannot explain why a regime may deliberately pursue a policy that raises prospects for revolution. The model explains why the political survival and predation effects both encourage high repression in personalist regimes, especially when compared with the low-valued outside option to democratizing. Second, although considerable research associates democracy with rule by a non-elite median voter, democratization in military regimes highlights the opposing consideration that transition is most likely when elites can safeguard themselves under democracy. Although the political survival effect makes it difficult for military regimes to survive long periods of time under stable authoritarian rule, most military juntas survive as intact organizations after democratizing—causing them to choose low repression and eventual democratization. Third, whereas research on personalist regimes treats mass mobilization as a grave threat to regime stability, studies of party-based regimes highlight mass mobilization as a source of authoritarian *durability*. In the model, the

political survival and predation effects are relatively low in party regimes, which generate support through managed popular mobilization. Therefore, party-based dictators repress at low levels and tolerate societal mobilization, yielding durable regimes unlikely to transition to democracy.

These findings contribute to three main literatures upon which the next section elaborates. First, providing a general theory of authoritarian regime dynamics premised on divergent incentives for preventive repression contributes to a vast literature on authoritarian institutions (e.g., Gandhi, 2008; Svolik, 2012) that lacks a theory for jointly understanding outcomes such as durability, violence, and democratization. Developing new general theories is particularly important when considering that broad theories focused on economic inequality such as Acemoglu and Robinson (2006) and Boix (2003) have received limited empirical support in recent tests (Ansell and Samuels, 2014; Haggard and Kaufman, 2016). Second, this paper departs from most existing formal research on repression that examines either agency problems (e.g., Dragu and Przeworski, 2017) or reactionary repression to social movements that have already formed (e.g., Ritter, 2014), although Gibilisco (2017) provides an exception. The present approach instead more closely resembles ideas about a repression-dissent paradox, but addresses why a government may strategically use repression even at the cost of revolution. Third, it contributes to bargaining models of conflict (Fearon, 2004; Powell, 2004; Krainin, 2017) by examining a dynamic strategic environment with endogenous mobilization.

1 Contributions to Existing Research

This paper contributes to three main research agendas. First, a vast literature has emerged in the last two decades that examines differences in authoritarian institutions (Geddes, 1999; Gandhi, 2008; Svolik, 2012). The present contribution is to present a unified theoretical framework—based on incentives for and consequences of repression—for understanding dynamics of various authoritarian regime types, in particular, party regimes, military regimes, and personalist regimes. Many scholars have analyzed how party institutions can effectively solve commitment problems among regime insiders and among the masses to facilitate regime stability (Gandhi, 2008; Wright and Escribà-Folch, 2012; Svolik, 2012; Meng, 2017). These same institutions may help to explain why, in the current model, the political survival effects and predation effects are lower in magnitude for party-based regimes. Debs (2016) argues that military dictators are more likely to transition to democracy than are other types of authoritarian rulers. Military rulers fear punishment by fu-

ture autocrats because generals' comparative advantage in violence makes them a threat to retake power. By contrast, democracies place greater constraints on punishing ex-rulers, and ex-military rulers are less threatening when power is obtained via elections. Geddes (1999) and Finer (2002) offer an alternative argument based on generals' desire to de-politicize the military. Regarding personalist regimes, Bratton and van de Walle (1997) and Chehabi and Linz (1998) describe challenges created by a lack of institutional constraints, which the present model builds upon to generate new insights for regime dynamics. Broadly, the present theory shares some aims as Bueno de Mesquita et al.'s (2003) selectorate theory with regard to developing a unified institutional logic of authoritarian regimes, although the setup and key findings are distinct. Bueno de Mesquita et al. (2003) do not feature strategic repression or endogenous societal mobilization in a repeated game, and rulers never lose power in equilibrium nor is there an option to change institutions (as with democratization in the present model).

Second, a largely separate strand of research posits a "repression-dissent" paradox whereby government repression often spurs societal mobilization and escalates conflict, rather than dampens mobilization prospects (Lichbach, 1987; Moore, 2000), although the empirical evidence for this pattern is mixed (Escribà-Folch, 2013, 545).[2] Closely related, research on social revolution examines how exclusionary and repressive authoritarian regimes often leave "no other way out" than violence for societal actors (Skocpol, 1979; Goodwin and Skocpol, 1989; Goodwin, 2001), as in Russia, China, Cuba, and Nicaragua. However, these accounts do not answer key strategic questions. Why would *raising* the costs of mobilization encourage individuals to protest? If a strategic government fears escalation in response to repression, then why would it repress in the first place—as opposed to accommodating citizens' demands in order to prevent overthrow? Although some of these studies "place the state at the center of analysis of revolutions" (Goodwin, 2001, 24), they treat governments' actions as fixed rather than evaluate governments' strategic incentives for repression.

In response to concerns such as these, a growing formal literature examines strategic considerations related to repression, falling largely into two camps. The first examines agency problems: preventing the guards from overthrowing the ruler (Besley and Robinson, 2010; Acemoglu, Ticchi and Vindigni, 2010; Acemoglu, Vindigni and Ticchi, 2010; Svolik, 2013; Casper and Tyson, 2014; McMahon and Slantchev, 2015; Zakharov, 2016), and inducing coercive agents to exert costly effort protect the regime against threats (Myer-

[2] Ritter and Conrad (2016) describe the inherent challenges posed by selection effects to estimating this relationship and propose a plausible source of exogenous variation in dissent.

son, 2008; Dragu and Polborn, 2013; Tyson, 2017).[3] The second evaluates one-shot interactions in which a government chooses repression levels in response to societal challenges that have already formed, i.e., *reactionary* repression (Pierskalla, 2010; Ritter, 2014; Shadmehr, 2015; Shadmehr and Boleslavsky, 2017; Slantchev and Matush, 2017). The present paper provides new insights by modeling government-society interactions in a dynamic framework that uncovers distinct short-term and long-term effects of *preventive* repression and links these effects to divergent trajectories among authoritarian regime types. It assumes away agency problems to facilitate this focus, although briefly discusses how repression can affect coup likelihood.

Nor do other formal analyses of repression in a dynamic setting generate the same mechanism as the present analysis: governments balance between a short-term gain from repression by deterring mobilization and a long-term cost by making revolution more likely when society does mobilize. In Acemoglu and Robinson's (2006) models of regime transitions, the masses mobilize due to exogenous factors—as opposed to strategically reacting to government repression. Furthermore, whenever applied, repression is assumed to succeed with probability 1, and therefore a long-term repressive strategy does not cause revolution. Gibilisco (2017) evaluates a different setup in which repression in one period is assumed to increase societal grievances in the next period. However, once again, there is no strategic mobilization choice by the masses, and repression—if applied in a particular period—is assumed to prevent revolution with probability 1 in that period.

Acemoglu and Robinson (2006, 215-218) also briefly present an extension in which, with positive probability, repression fails and a revolution is assumed to occur. However, they do not evaluate the strategic actions that relate repression and revolution, as mobilization is exogenous and there is no possibility of bargaining or of negotiating democratization following failed repression. In the present setup, repression fails in any period that society chooses to pay the cost to mobilize, but revolution is only one possible outcome—peaceful authoritarian bargaining or democratization are also possibilities following failed repression. More broadly, although insightful for explaining other empirical patterns, Acemoglu and Robinson's (2006) setup does not enable linking repression strategies to dynamics of different authoritarian regime types, as they mention by treating non-democracies as homogeneous (18).

[3] Gehlbach, Sonin and Svolik (2016) have recently summarized this vast literature. For recent contributions on this topic in the broader literature, see Frantz and Kendall-Taylor (2014) and Escribà-Folch and Wright (2015).

Third, the model contributes to formal conflict bargaining theories. Similar to many existing models, this model features a commitment problem-based explanation for costly fighting (Fearon, 2004; Powell, 2004; Krainin, 2017). The novel elements in the present model are that the challenger mobilizes endogenously and the government's repressive strategy affects the challenger's equilibrium mobilization frequency. By contrast, as Powell (2013, 811-813) describes, most complete information conflict bargaining models with limited commitment ability assume that exogenous shocks enable challengers to mobilize, and therefore are unable to analyze how strategic actions by the government affect the endogenous frequency of mobilization.

2 Baseline Model

2.1 Setup

An authoritarian government (G) and societal group (S) interact over an infinite time horizon in a game of complete and perfect information. Future payoffs are discounted by a common factor $\delta \in (0,1)$ and time is denoted by $t \in \mathbb{Z}_+$. The following presents the sequence of moves, followed by a lengthier discussion of key assumptions.

Repression. At the outset of the game, G chooses a repression spending amount $r_t = r \in [0, 1-\phi_A]$ for all t. Spending is constrained by the per-period budget constraint normalized to 1, minus a guaranteed transfer to S in every period, $\phi_A \in (0,1)$. This parameter captures the degree of institutionalized benefits that the regime provides to society. For example, institutions such as mass parties and legislatures enable limited participation for broad segments of society (Wright and Escribà-Folch, 2012), whereas the absence of such institutions provides rulers with higher discretion to retain rents for themselves. When examining G's payoffs, it will be useful to define $\phi_A^G \equiv 1 - \phi_A$.

Assuming G can commit to the same level of repression spending in every period clarifies the exposition of the main results, but they do not hinge on this assumption. Appendix Section A.3 shows similar findings if G instead chooses r_t in every period upheld by punishments in history-dependent strategy profiles.

Mobilization. After G has set the repression level at the outset of the game, the first strategic move in each period involves S making a binary mobilization choice. There are three components to S's cost of

mobilization. First, a fixed cost $F \in (0, \hat{F})$ that expresses generic difficulties and costs to mobilizing support even in open regimes.[4] Second, a cost determined by G's repression level. This equals $c(r)$, where $c(\cdot)$ is continuous, strictly increasing, and strictly concave.[5] Assumption 1 discusses how this captures existing discussions of preventive repression. Third, Nature draws a stochastic element for the mobilization cost, ϵ_t, that is distributed independently across periods according to a smooth distribution function $H(\epsilon_t)$ with continuous support over $[-F, F]$ and an expected value of 0. The associated probability density function is $h(\epsilon_t)$. Therefore, even though the repression level is constant across periods, S's cost of mobilizing will differ across periods. Substantively, this captures that events outside the government's control impact how effective repression spending is at deterring S from mobilizing. For example, the fall of the Berlin Wall in 1989 suggested to opposition movements in neighboring Eastern bloc countries that the costs of mobilizing were temporarily low. Protests in Tunisia in late 2010 similarly enabled a temporary decrease in the costs of mobilization across the Middle East and North Africa. In sum, S's cost to mobilizing in period t is $C_t \equiv F + c(r) + \epsilon_t$.

After perfectly observing the cost of mobilization, S decides whether or not to mobilize to demand concessions from G. If S does not mobilize, then the period ends and G consumes $\phi_A^G - r$ and S consumes ϕ_A. An identical interaction occurs in period $t+1$, with respective future continuation values denoted as V^G and V^S.

Bargaining. If S mobilizes, then the authoritarian government makes a transfer offer $x_t \in [0, 1 - \phi_A - r]$. Substantively, these are offers above S's minimum consumption ϕ_A, and could range from building desired infrastructure projects to offering a cabinet position to members of a group. However, the concession is temporary because G cannot credibly promise to keep making the concession in future periods in which S does not mobilize. Section 4 presents an extension in which G can also propose to democratize in a mobilization period. S observes G's offer and decides whether to accept or to launch a revolution. Accepting a transfer offer yields consumption of $\phi_A^G - r - x_t$ for G and $\phi_A + x_t - C_t$ for S in period t. If G and S achieve a peaceful bargain, then the final move of the period is a Nature move. With probability $q \in (0, 1)$, G loses power. This is conceived of as insider overthrow facilitated by the turmoil of mass mobilization, as

[4] The proof of Lemma 3 defines the upper bound for the fixed cost, $\hat{F} > 0$.

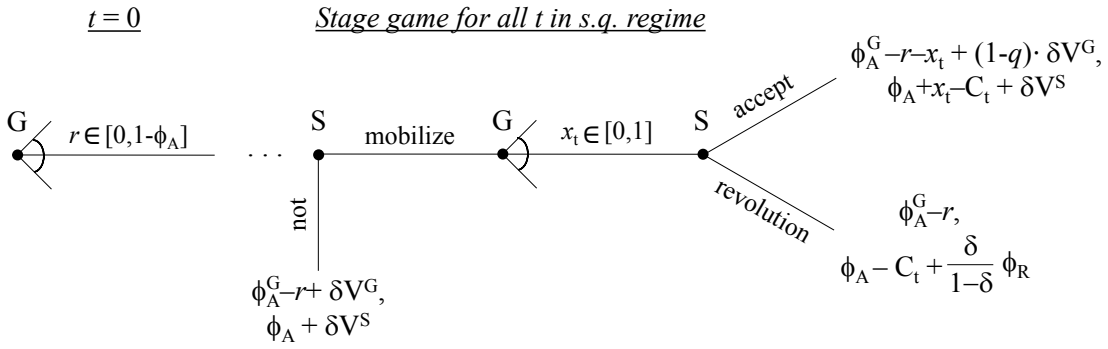
[5] There are several additional technical restrictions: $c(0) = 0$; $\lim_{r \to 0} c'(r) = \infty$; and $\left|c''(r)\right| > \underline{c}''$, for $\underline{c}''$ defined in the proof of Lemma A.2.

Assumption 2 discusses. The parameter q is treated as exogenous for most of the analysis, although Section 3.4 allows q to be endogenous to repression spending. If G retains power following a peaceful bargain, then the continuation values are identical to the case in which S does not mobilize, V^G for G and V^S for S. If an insider overthrows G, then G consumes 0 in all future periods. A new, identical dictator is drawn, and therefore S's future continuation value is still V^S.

Revolution. If instead S launches a revolution in period t, then the revolution succeeds with probability 1 and the game moves to an absorbing state in period $t+1$. S consumes $\phi_A - C_t$ in period t and its continuation value equals $\frac{\phi_R}{1-\delta}$, for $\phi_R \in (\phi_A, 1)$. G consumes $\phi_A^G - r$ in period t and 0 in all future periods. Assumption 3 discusses real-world events to which the revolution choice coincides.

Figure 1 presents G's initial repression choice and the tree of the stage game in each period of the status quo regime. Appendix Table A.1 summarizes every parameter and choice variable.

Figure 1: Game Tree



2.2 Motivation for Key Assumptions

Before solving the model, this section provides substantive motivation for several key aspects of the model setup. The discussion following the model and the extensions examines how key parameters differ across various authoritarian regimes.

Assumption 1. Preventive repression. Assumption 1 concerns the relationship between repression spending and S's mobilization costs. The literature generally categorizes repression into restrictions on civil liberties (i.e., U.S. First Amendment-type rights) aimed at the broad population and physical repression targeted at individuals, ranging from political arrests to mass killings (Davenport, 2007; Escribà-Folch, 2013; Frantz and Kendall-Taylor, 2014). Similarly, Levitsky and Way (2010, 58) distinguish between low-intensity and

high-intensity coercion: "Whereas high-intensity coercion is often a response to an imminent—and highly threatening—opposition challenge, low-intensity coercion is often aimed at preventing such challenges from emerging in the first place." Repression in the present model relates to the low-intensity type because the only role of repression is to raise the costs of mobilizing for S. In addition to broadly denying civil liberties, this also involves surveillance, low-profile physical harassment, and denial of employment or legal opportunities for political reasons. Many of these activities are conducted by internal security organizations such as the army and police, secret police, intelligence bodies, and paramilitary organizations. Related to other models, this way of conceptualizing repression resembles Shadmehr's (2015) concept of a minimum punishment that individuals must pay to join a movement.

Related, it might seem overly simple to model a single societal actor that observes the government's repression and then makes a mobilization decision. However, more complicated ways of modeling social mobilization would not alter the main insights, for example, having multiple or a continuum of societal actors needing to coordinate in order to mobilize. Even with a unitary actor, as shown below, society will choose not to mobilize in some periods because of government repression. Adding coordination problems would lower the benefit of mobilization (because of the possibility that it could fail) but would not qualitatively alter the main tradeoff here regarding how repression affects the likelihood of bargaining breakdown.

Assumption 2. Social mobilization and insider overthrow. Assumption 2 concerns the relationship between social mobilization and insider coups. A social movement may directly facilitate a coup attempt, as with Egypt in 2011 when protesters demanded that the military depose Hosni Mubarak. In other cases, coup opportunities caused by mass mobilization can be distinct from protesters' demands. For example, in Sudan during its two major civil wars against the South, disagreements over how to best prosecute the war often provided excuses for military takeover or for shuffling within the junta (Tartter, 1992, 234-237). Finer (2002, 72-79) argues that civil wars and broader conditions of social unrest create opportunities for military intervention because of increased civilian dependence on the military to stay in power, and several have provided statistical evidence that coups are more likely to be attempted and to succeed under conditions of domestic instability such as general strikes (Powell, 2012; Gassebner, Gutmann and Voigt, 2016) and civil wars (Bell and Sudduth, 2015).

Assumption 3. Societal challenges. Assumption 3 is that S can challenge G with a revolutionary threat. The empirical events that correspond most closely to this conceptualization of revolution are the major social

revolutions described by Skocpol (1979) and Goodwin (2001). Goodwin (2001, 10) defines radical revolutionary movements as "not only seek[ing] to control the state, but also aim[ing] (among other things) to transform more or less fundamentally the national national or some segment therefore, ruled by that state," which naturally corresponds to the incumbent autocrat receiving zero consumption following a successful revolution. However, interpreting the payoffs in relative terms—i.e., treating 0 as the baseline consumption amount for ex-governments—enables classifying a broader range of events into what the model labels as revolutions. For example, protests that cause a dictator to step down on unfavorable terms—perhaps afterwards leading to exile, imprisonment, or even death—create relatively bad fates for leaders as well, as occurred in several African countries after the fall of the Soviet Union. Defeat in civil wars that fall short of radical revolutionary movements also fit this conceptualization of revolution, as in Zaire in 1997.

3 Analysis

This section solves backwards on the stage game to characterize the stationary subgame perfect equilibria of the game, which is shown to be unique. Appendix A proves all the formal results.

3.1 Transfer Offer and Mobilization

If S has mobilized in period t and sunk the cost C_t, then it accepts any transfer offer x_t for which consuming in the current period and remaining in the status quo authoritarian regime in the future yields an expected consumption stream at least as large as from revolting, which enables S to gain control of the government starting in the next period.

$$\underbrace{\phi_A - C_t + x_t + \delta \cdot V^S(r)}_{E[U_S(\text{accept})]} \geq \underbrace{\phi_A - C_t + \frac{\delta}{1-\delta} \cdot \phi_R}_{E[U_S(\text{revolt})]} \tag{1}$$

In equilibrium, G never strictly satisfies Equation 1 because it would have incentives to deviate to a lower offer. Furthermore, because a revolution eliminates G's consumption, G will always propose a transfer that

satisfies Equation 1 if possible. Holding fixed the future continuation value V^S, this yields:

$$x^*(r) = \text{median}\left\{0, \delta \cdot \left[\frac{\phi_R}{1-\delta} - V^S(r)\right], 1 - \phi_A - r\right\} \tag{2}$$

S's optimal mobilization choice weighs the mobilization costs against the benefit from being able to stage a revolution. Its mobilization cost fluctuates across periods because of the stochastic component, ϵ_t. In equilibrium, there exists a unique threshold value of ϵ_t such that S mobilizes if ϵ_t is sufficiently small and does not otherwise. This threshold, denoted as $\underline{\epsilon}^*(r)$, is determined by S's future continuation value from remaining in the status quo authoritarian regime, V^S. In $1 - H(\underline{\epsilon}^*)$ percent of periods, for $H(\underline{\epsilon}^*) = \int_{-F}^{\underline{\epsilon}^*(r)} dH(\epsilon_t)$, S does not mobilize. It consumes ϕ_A in those periods and remains in the status quo authoritarian regime in the next period, yielding future consumption $\delta \cdot V^S$. If instead S mobilizes in period t, then it pays $C_t = F + c(r) + \epsilon_t$. Given the equilibrium mobilization threshold, the average cost that S pays when mobilizing equals:

$$\overline{C}(r) \equiv \frac{\int_{-F}^{\underline{\epsilon}^*(r)} [F + c(r) + \epsilon_t] \cdot dH(\epsilon_t)}{H(\underline{\epsilon}^*(r))} \tag{3}$$

S's lower-bound expected lifetime consumption in a mobilization periods equals $\phi_A - C_t + \frac{\delta}{1-\delta} \cdot \phi_R$ and therefore is dictated by its value to revolution because S can always initiate a revolution after mobilizing. Equation 2 shows that this also equals S's upper bound lifetime consumption from mobilizing. These considerations yield a recursive equation for V^S that solves to:

$$V^S(r) = \frac{(1-\delta) \cdot \phi_A + H\big(\underline{\epsilon}^*(r)\big) \cdot \big[(1-\delta) \cdot \overline{C}(r) + \delta \cdot \phi_R\big]}{(1-\delta) \cdot \Big[1 - \delta \cdot \big[1 - H\big(\underline{\epsilon}^*(r)\big)\big]\Big]} \tag{4}$$

Combining Equations 2 through 4 enables stating the interior optimal transfer offer as a function of parameters. Assuming $\phi_R > \phi_A$ implies that the offer is strictly positive, and below the analysis characterizes the conditions under which it satisfies the per-period budget constraint.

$$x^*(r) = \frac{\delta \cdot \big[\phi_R + H\big(\underline{\epsilon}^*(r)\big) \cdot \overline{C}(r) - \phi_A\big]}{1 - \delta \cdot \big[1 - H\big(\underline{\epsilon}^*(r)\big)\big]} \tag{5}$$

Solving for the future continuation value also enables defining the mobilization threshold, which Lemma 1 states by showing the state of the world in which S is indifferent between mobilizing or not. Remark 1 provides an equivalent statement of the mobilization threshold that equates the contemporaneous cost of

mobilization with the equilibrium transfer offer.

Lemma 1 (Mobilization threshold)**.** *There exists a unique mobilization threshold* $\underline{\epsilon}^*(r) \in (-F, F)$ *such that* S *mobilizes if* $\epsilon_t < \underline{\epsilon}^*(r)$ *and does not mobilize otherwise. This threshold is implicitly defined as:*

$$\Theta\big(\underline{\epsilon}^*(r)\big) \equiv \underbrace{\phi_A - \big[F + c(r) + \underline{\epsilon}^*(r)\big] + \frac{\delta}{1-\delta} \cdot \phi_R}_{E[U_S(\textit{mobilize})]} - \underbrace{\Big[\phi_A + \delta \cdot V^S\big(r, \underline{\epsilon}^*(r)\big)\Big]}_{E[U_S(\textit{not})]} = 0,$$

for V^S *defined in Equation 4.*

Remark 1 (Alternative statement of mobilization threshold)**.** $\Theta\big(\underline{\epsilon}^*(r)\big)$ *can be equivalently stated as:*

$$\Theta\big(\underline{\epsilon}^*(r)\big) = x^*(r) - \big[F + c(r) + \underline{\epsilon}^*(r)\big],$$

for $x^*(r)$ *defined in Equation 5.*

3.2 Countervailing Short-Term and Long-Term Repression Effects

Characterizing optimal choices in the per-period stage game enables analyzing how repression spending affects the equilibrium frequency of mobilization and the equilibrium frequency of revolution. Before analyzing how G chooses the optimal level of r, it is necessary to first analyze the consequences of varying levels of r. A short-term effect makes societal mobilization less likely in a particular period by raising S's costs to organizing. However, this short-term effect also exerts a paradoxical long-term effect by making revolution more likely to occur along the equilibrium path. By increasing the costs that society must pay to gain concessions, the government must offer higher transfers in a period that society does mobilize—decreasing the likelihood of peaceful bargaining.

Formally, analyzing the mobilization threshold from Lemma 1 yields the first key effect of repression spending. Lemma 2 shows that higher r strictly decreases S's equilibrium frequency of mobilization, $H\big(\underline{\epsilon}^*\big)$. The expression in Lemma 1 shows that repression exerts this short-term effect because repression spending raises the cost of mobilizing.

Lemma 2 (Short-term repression effects)**.** *Higher repression spending strictly decreases* S*'s equilibrium mobilization frequency,* $H\big(\underline{\epsilon}^*\big)$*, through its effect on increasing the cost of mobilization,* $c(r)$*.*

However, preventive repression spending also exerts a countervailing long-term effect that facilitates revolution. G can buy off a social revolt in a period that S mobilizes if and only if $x^*(r)$ (defined in Equation 5) meets the per-period budget constraint, $x^*(r) \leq 1 - \phi_A - r$. The second key effect of repression spending makes this inequality harder to satisfy for two reasons. The substantively interesting effect is an indirect effect: higher r increases $x^*(r)$, the amount of transfers necessary to prevent S from revolting. Lemma 2 shows that higher repression causes S to pay higher costs in periods that it mobilizes. By decreasing S's expected consumption under the status quo authoritarian regime, this effect raises S's transfer demand in a period that it mobilizes. Separately, higher r also exerts a direct effect by leaving G with fewer resources to devote to transfers. Lemma 3 shows that there exist a unique $\hat{r} > 0$ such that revolution will occur in equilibrium if $r > \hat{r}$ but not otherwise.[6]

Lemma 3 (Long-term repression effect via mobilization costs)**.** *There exists a unique threshold $\hat{r} > 0$ such that:*

- *If $r < \hat{r}$, then G offers $x_t = x^*$. S accepts any $x_t \geq x^*$ with probability 1 and any $x_t < x^*$ with probability 0.*
- *If $r > \hat{r}$ and S mobilizes, then G offers any $x_t \in [0, 1-\phi_A-r]$ and S launches revolution in response to any offer.*

3.3 Why Repress? Political Survival and Predation Effects

If the government sought solely to prevent revolution, then characterizing its optimal strategy would be straightforward. Lemma 3 shows that revolution will not occur if the dictator spends nothing on repression. However, despite the costliness of revolutions, preventing revolts is the not the only objective of authoritarian rulers. Decreasing the frequency of societal mobilization—which can be achieved via repression (Lemma 2)—provides two benefits to rulers. First, preventing societal mobilization eliminates the possibility of a government insider overthrowing the dictator (political survival effect). Second, the dictator accrues more rents in periods it does not have to buy off society (predation effect). Either effect may push the dictator to choose a high repression strategy—despite eventually causing revolution—therefore highlighting a tradeoff

[6] Although it may seem that higher ϕ_A exerts a similar overall effect, the opposite is instead true. Higher ϕ_A exerts a direct effect that decreases G's available resources to devote to buying off S, but the indirect effect lowers x^* by increasing S's consumption in the status quo authoritarian regime. The indirect effect dominates because S receives ϕ_A in every period regardless of its mobilization decision.

among coups, rents, and revolution.

Equation 6 recursively characterizes G's lifetime expected consumption, V^G, if it chooses the optimal low repression spending amount r_l^*—which, given Lemma 3, implies repression spending no greater than the threshold that triggers revolution in a mobilization period, $\hat{r}$.[7] Choosing low repression enables G to buy off S in a period with societal mobilization. In every period, G pays the repression cost r_l^*. In periods without societal mobilization, G transfers the minimal amount ϕ_A and remains as government in the next period with probability 1. In periods with societal mobilization, G additionally pays the transfer x^* defined in Equation 5 and—following successful bargaining—loses power to an insider after the period ends with exogenous probability q.

$$V^G(r_l^*) = \phi_A^G - r_l^* + \underbrace{\left[1 - H\left(\underline{\epsilon}_l^*\right)\right] \cdot \delta \cdot V^G(r_l^*)}_{\text{Non-mobilization period}} + \underbrace{H\left(\underline{\epsilon}_l^*\right) \cdot \left[- x^* + (1-q) \cdot \delta \cdot V^G(r_l^*)\right]}_{\text{Mobilization period}} \tag{6}$$

Equation 7 recursively characterizes G's lifetime expected consumption if it chooses the optimal high repression spending amount r_h^*—which, given Lemma 3, implies repression spending higher than $\hat{r}$.[8] Therefore, a revolution attempt will occur in the first period with societal mobilization. Periods without societal mobilization are identical to those in Equation 6 except for differences in repression spending. In social mobilization periods, a revolution occurs. Therefore, G pays the repression cost in that period and consumes 0 in the current and in all future periods.

$$V^G(r_h^*) = \phi_A^G - r_h^* + \underbrace{\left[1 - H\left(\underline{\epsilon}_h^*\right)\right] \cdot \delta \cdot V^G(r_h^*)}_{\text{Non-mobilization period}} + \underbrace{H\left(\underline{\epsilon}_h^*\right) \cdot 0}_{\text{Mobilization period}} \tag{7}$$

[7] Lemma A.2 formally characterizes $r_l^* \in [0, \hat{r}]$, which also yields a corresponding mobilization threshold $\underline{\epsilon}_l^* \equiv \underline{\epsilon}^*(r_l^*)$, for $\underline{\epsilon}^*(r)$ defined in Lemma 1.

[8] Lemma A.2 formally characterizes $r_h^* \in (\hat{r}, 1 - \phi_A]$ and demonstrates existence despite the absence of a closed constraint set. This also yields a corresponding mobilization threshold $\underline{\epsilon}_h^* \equiv \underline{\epsilon}^*(r_h^*)$, for $\underline{\epsilon}^*(r)$ defined in Lemma 1.

Combining Equations 6 and 7 shows that G prefers low repression if:

$$\Omega_{l,h} \equiv \underbrace{\frac{\phi_A^G - r_l^* - H(\underline{\epsilon}_l^*) \cdot x^*}{1 - \delta \cdot \left[1 - q \cdot H(\underline{\epsilon}_l^*)\right]}}_{\text{Low repression}} - \underbrace{\frac{\phi_A^G - r_h^*}{1 - \delta \cdot \left[1 - H(\underline{\epsilon}_h^*)\right]}}_{\text{High repression}} > 0 \tag{8}$$

The direct cost of high repression is that G spends more on the military and related coercive organizations in every period. However, high repression causes S's mobilization frequency to decrease from $H(\underline{\epsilon}_l^*)$ percent of periods to $H(\underline{\epsilon}_h^*)$.

Deterring mobilization generates two possible benefits for G. First, high repression may enable G to retain power for longer. By delaying the expected time until the first mobilization period, high repression creates a *political survival* effect by preventing an insider attempt to depose G. However, G's *overall* expected length in power depends not only on the frequency of mobilization, but also on the probability of losing either type of struggle: under low repression, the survival threat is an (exogenous) insider coup whereas under high repression the threat is an (endogenous) revolution, and either can only occur in a mobilization period. The per-period probability of regime failure in a low repression regime is $H(\underline{\epsilon}_l^*) \cdot q$, and is $H(\underline{\epsilon}_h^*)$ in a high repression regime. Given these two terms, it is straightforward to see that if the probability of insider removal is sufficiently high, then more repressive regimes survive longer on average and therefore using repression to prevent mobilization increases prospects for regime survival. Lemma 4 formally states the political survival effect by extending this logic to explain G's optimal repression choice.

Lemma 4 (Political survival effect)**.** *There exists a unique threshold $\tilde{q} \in (0, 1)$ such that:*

- *If $q < \tilde{q}$, then low repression is optimal. Formally, $\Omega_{l,h} > 0$, for $\Omega_{l,h}$ defined in Equation 8.*
- *If $q > \tilde{q}$, then high repression is optimal. Formally, $\Omega_{l,h} < 0$.*

Second, high repression generates a *predation effect* for G because it does not have to offer transfers above ϕ_A in periods that S does not mobilize. The predation effect implies that G may repress at high levels even if it does not facilitate political survival. If ϕ_A^G is high, then G enjoys considerable rents in periods that S does not mobilize, which creates incentives to repress even under parameter values in which minimally repressive regimes are expected to survive longer than highly repressive regimes. G cares about total lifetime expected consumption rather than directly about political survival. Therefore, G may trade off between durability and rents, contrary to the standard assumption that "The basic expected benefit of repression is to increase the

likelihood of staying in power" (Escribà-Folch, 2013, 546). Lemma 5 formally states the predation effect. The equilibrium existence statement is delayed until after analyzing the democratization option.

> **Lemma 5** (Predation effect)**.** *Greater authoritarian rents strictly increase G's incentives to choose high repression. Formally, $\frac{d\tilde{q}}{d\phi_A^G} < 0$, for $\tilde{q}$ defined in Lemma 4.*

3.4 Repression Spending and Coup-Proofing

To connect the model to empirical cases, it is also relevant to briefly consider how repression spending affects prospects for insider coups by shaping the dictator's inner circle. In most circumstances, rulers organize their coercive apparatus to maximize loyalty, which highlights an affinity between repression spending and coup-proofing.[9] Common coup-proofing techniques include providing the military with desired economic concessions, building paramilitaries, and appointing family members or co-ethnics to high-level military positions (Quinlivan, 1999). Formally, the model can express these considerations by assuming that the probability of insider removal in a societal mobilization period, $q(\cdot)$, strictly decreases in r. Rewriting Equation 8 highlights how this alteration affects G's incentives for high versus low repression.

$$\Omega_{l,h} \equiv \underbrace{\frac{\phi_A^G - r_l^* - H(\underline{\epsilon}_l^*) \cdot x^*}{1 - \delta \cdot \left[1 - q(r_l^*) \cdot H(\underline{\epsilon}_l^*)\right]}}_{\text{Low repression}} - \underbrace{\frac{\phi_A^G - r_h^*}{1 - \delta \cdot \left[1 - H(\underline{\epsilon}_h^*)\right]}}_{\text{High repression}} > 0 \tag{9}$$

If $q(\cdot)$ tends to be high when G devotes few resources to its repressive apparatus and has exerted less concerted attempts to coup-proof, then this decreases the viability of low repression. The discussion below on personalist regimes elaborates upon this consideration.

[9] However, there are countervailing empirical examples in which higher repression spending appeared to increase the probability of a coup attempt, such as by building a large army containing soldiers from discontent segments of society.

4 How Does Democratization Affect Repression Incentives?

4.1 Setup and Motivation

In the democratization extension, the stage game is modified so that G can choose to propose democratization rather than to offer S a temporary transfer x_t in a mobilization period. If S accepts the democratization proposal, then the strategic aspect of the interaction ends. S consumes $d(r) \cdot \phi_D$, for $\phi_D \in (\phi_R, 1]$, in every future period, and G consumes $\phi_D^G \equiv 1 - \phi_D$. The function $d(r)$ captures the relationship between repression and the political strength of would-be democrats in society, and intuitively should decrease in r because repression emboldens societal extremists—who place lower value on democracy—over moderates. To simplify the number of cases to evaluate but without qualitatively altering the implications, the analysis assumes $d(r) = 0$ if $r > \hat{r}$ and $d(r) = 1$ if $r < \hat{r}$, for $\hat{r}$ defined in Lemma 3. This implies that if G has repressed at low enough levels to facilitate peaceful bargaining in a period that society organizes, then it is assumed that moderates dominate the societal organization. They value democracy at $\phi_D > \phi_R$, and therefore will accept democratization rather than launch a revolution. By contrast, if G has repressed at high enough levels to undermine prospects for peaceful bargaining in a mobilization period, then it is assumed that extremists who place no value on democracy dominate the social movement. Therefore, the high repression strategy undermines the possibility of substituting democratization for revolution in a societal mobilization period. Appendix Figure A.1 presents the modified game tree.[10]

Assuming that the democratization option is only possible if repression occurs at low enough levels follows from the real-world observation that repression tends to embolden extreme members of society and deter

[10]For technical reasons, as with repression, it greatly simplifies the analysis to assume that G chooses its democratization strategy at the outset of the game: $D = 1$ implies that G will propose to democratize in every mobilization period, whereas $D = 0$ implies that it will not. If instead G chooses D_t in every period and we posit that $D_t = 1$ with probability $p \in [0, 1]$ and $D_t = 0$ with complementary probability, then V^G is non-monotonic in p (see Appendix Equation A.8). This creates the possibility of mixed democratization strategies in equilibrium. However, regarding substantive insights, any $p > 0$ (democratization with positive probability) is qualitatively different than $p = 0$ (never democratize), which is why I prefer a simpler setup that generates a pure strategy equilibrium.

moderates (Della Porta, 2013, 67).[11] Although many models of democratic transitions assume that mass movements necessarily seek democratic concessions (Boix, 2003; Acemoglu and Robinson, 2006), this is often not true. Throughout the 20th century, communist revolutionaries, warlords, and anarcho-syndicalist union leaders have all sought to overthrow authoritarian regimes without replacing them with democracies. Collier (1999) provides examples of anarchist labor unions in Europe and South America in the early 20th century. In Argentina, "the labor movement was generally indifferent or even hostile to democracy, often viewing it as a means of elite co-optation" (45). Skocpol (1979, 206-214) describes the absence of a pronounced liberal movement underpinning the Russian Provisional Government of 1917 that followed the end of the monarchy. Particularly problematic, the government was dependent on the Petrograd Soviet to implement any policy that required worker cooperation (208). Shortly after the October Revolution later in 1917 in which the Bolsheviks seized state power, they dissolved the elected Constituent Assembly and quickly turned to coercive means to establish power (214-218), setting the stage for the long, bloody, and decidedly non-democratically oriented Russian Revolution.

4.2 Analysis

The baseline model characterizes two possible equilibrium paths: low repression and sustained authoritarian rule, or high repression with eventual revolution. The democratization option yields a third possibility, low repression with democratization. Faced with a pernicious political survival effect (i.e., high q), democratization provides the government with another means to avoid insider removal besides high repression to prevent societal mobilization. The government's optimal choice if q is high depends on the magnitude of the predation effect relative to its expected political influence under democracy. Although the possibility of democratization breaks the strict tradeoff between coups and revolutions from the baseline model, the government may still prefer high repression and eventual revolution to maximize rents. This also highlights a second long-term effect of repression: undermining the possibility of democratization in response to a revolutionary threat.

Formally, Equation 10 recursively characterizes G's expected payoff in a strategy profile with low repression and democratization in response to mobilization. The continuation value $V^G(r_d^*)$ characterizes the dictator's

[11] Shadmehr (2015) formalizes this idea by showing that an increase in the minimum punishment that individuals pay to join a movement endogenously creates more extreme demands by the group.

payoff under authoritarian rule along this path that eventually leads to democratization, and G receives ϕ_D^G in every period following the period it offers to democratize. Repressive spending r_d^* and the corresponding mobilization threshold $\underline{\epsilon}_d^*$ differ from the original low repression case because G's payoff differs following a mobilization period, but repression spending is subject to the same constraint $r_d^* \leq \hat{r}$.[12]

$$V^G(r_d^*) = \phi_A^G - r_d^* + \delta \cdot \left\{ \underbrace{\left[1 - H\left(\underline{\epsilon}_d^*\right)\right] \cdot V^G(r_d^*)}_{\text{Non-mobilization period}} + \underbrace{H\left(\underline{\epsilon}_d^*\right) \cdot \frac{\phi_D^G}{1-\delta}}_{\text{Mobilization period}} \right\} \tag{10}$$

Two thresholds determine whether or not democratization will occur in equilibrium. First, the probability of a successful insider coup in a societal mobilization period must be sufficiently high for G to prefer to democratize rather than to bargain under authoritarian rule. In neither case will a revolution occur, but if q is high, then G prefers to grant democracy in response to imperiled authoritarian rule. Equation 11 compares low repression with and without democratization, and Lemma 6 formally presents the political survival effect for democratization.

$$\Omega_{d,l} \equiv \underbrace{\frac{\phi_A^G - r_d^* + \delta \cdot H(\underline{\epsilon}_d^*) \cdot \frac{\phi_D^G}{1-\delta}}{1 - \delta \cdot \left[1 - H(\underline{\epsilon}_d^*)\right]}}_{\text{Democratization}} - \underbrace{\frac{\phi_A^G - r_l^* - H(\underline{\epsilon}_l^*) \cdot x^*}{1 - \delta \cdot \left[1 - q \cdot H(\underline{\epsilon}_l^*)\right]}}_{\text{Low repression}} \tag{11}$$

Lemma 6 (Political survival effect for democratization)**.** *There exists a unique threshold* $\hat{q} \in (0, 1)$ *such that:*

- *If* $q < \hat{q}$*, then democratization is not optimal. Formally,* $\Omega_{d,l} < 0$*, for* $\Omega_{d,l}$ *defined in Equation 11.*
- *If* $q > \hat{q}$*, then* G *prefers democratization to low repression without democratization. Formally,* $\Omega_{d,l} < 0$*.*

Democratization is not the only possible response to the insider coup threat. The second necessary threshold for democratization is that G's utility under democracy must be sufficiently high relative to its rents under authoritarian rule for G to choose a low repression path with eventual democratization over high repression.

[12] Their existence and uniqueness follow from the same logic used to characterize r_l^* and $\underline{\epsilon}_l^*$. This logic also enables characterizing a unique optimal offer x_d^* to which S responds off the equilibrium path if G otherwise pursues the optimal actions in a democratization path of play. Appendix Section A.2 discusses these terms.

The logic of the predation effect in Lemma 5 implies that if ϕ_A^G is high relative to ϕ_D^G, then G loses considerable rents by transitioning to democracy. Alternatively, a favorable democratic exit option could prevent dictators that would otherwise be inclined to pursue high repression—i.e., if $\Omega_{l,h} < 0$ (see Equation 8)—to grant democracy as an alternative to their internal instability problem. Equation 12 compares low repression with democratization to high repression, and Lemma 7 formally states the relative predation effect for democratization.

$$\Omega_{d,h} \equiv \underbrace{\frac{\phi_A^G - r_d^* + \delta \cdot H(\underline{\epsilon}_d^*) \cdot \frac{\phi_D^G}{1-\delta}}{1 - \delta \cdot \left[1 - H(\underline{\epsilon}_d^*)\right]}}_{\text{Democratization}} - \underbrace{\frac{\phi_A^G - r_h^*}{1 - \delta \cdot \left[1 - H(\underline{\epsilon}_h^*)\right]}}_{\text{High repression}} \tag{12}$$

Lemma 7 (Relative predation effect for democratization)**.**

Part a. *There exists a unique threshold $\tilde{\phi}_D^G \in (0, 1 - \phi_R)$ such that:*

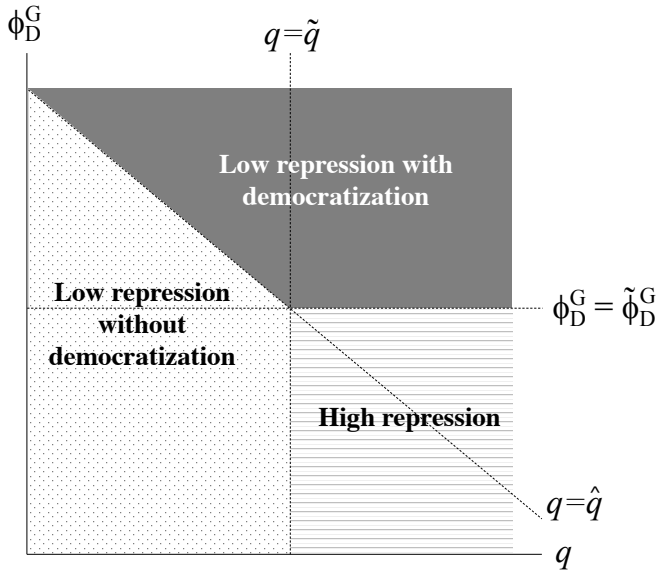
- *If $\phi_D^G < \tilde{\phi}_D^G$, then democratization is not optimal. Formally, $\Omega_{d,h} < 0$, for $\Omega_{d,l}$ defined in Equation 12.*
- *If $\phi_D^G > \tilde{\phi}_D^G$, then G prefers democratization to high repression. Formally, $\Omega_{d,l} < 0$.*

Part b. *Greater authoritarian rents strictly increase G's preference for high repression relative to democratization. Formally, $\frac{d\tilde{\phi}_D^G}{d\phi_A^G} < 0$.*

4.3 Equilibrium Regime Trajectories

Overall, the model generates three distinct regime trajectories. First, the dictator represses at low levels and bargains with society under continued authoritarian rule in mobilization periods. Second, the regime represses at low levels and democratizes in mobilization periods. Third, the dictator represses at high levels and faces revolutionary attempts in mobilization periods. Figure 2 summarizes these trajectories as a function of parameters. For G to repress at low levels without democratizing, the probability of an insider coup in a mobilization period must be low. Otherwise, G will pursue either the democratization or the high repression option to stave off the insider threat. For G to prefer democratization, its expected consumption under democracy must outweigh its expected rents under continued authoritarian rule. Otherwise, G reacts to an insider threat by repressing at high levels to prevent social mobilization, despite eventually facing revolution. Proposition 1 states the equilibrium path of play and the expected duration of each regime type, and Appendix Proposition A.1 states the equilibrium strategy profile.

Figure 2: Optimal Repression and Democratization Strategies



Proposition 1 (Equilibrium path of play)**.**

> ***Case 1. Low repression.*** *Suppose the probability of insider removal is low, formally, $q < \max\{\tilde{q}, \hat{q}\}$, for $\tilde{q}$ defined in Lemma 4 and $\hat{q}$ defined in Lemma 6. Then G represses at low levels and makes a transfer offer in every societal mobilization period, which S accepts. The per-period failure rate of such regimes is $H(\underline{\epsilon}_l^*) \cdot q$, and neither democracy nor revolution occur along the equilibrium path.*
>
> ***Case 2. Democratization.*** *Suppose $q > \hat{q}$ and $\phi_D^G > \tilde{\phi}_D^G$, for $\tilde{\phi}_D^G$ defined in Lemma 7. Then G represses at low levels and offers to democratize in the first mobilization period, which S accepts. The per-period failure rate of such regimes is $H(\underline{\epsilon}_d^*)$, and revolution does not occur along the equilibrium path.*
>
> ***Case 3. High repression and revolution.*** *Suppose $q > \tilde{q}$ and $\phi_D^G < \tilde{\phi}_D^G$. Then G represses at high levels and a revolution occurs in the first mobilization period. The per-period failure rate of such regime is $H(\underline{\epsilon}_h^*)$, and democratization does not occur along the equilibrium path.*

Proposition 2 compares the expected durability of different regime types. For part a, establishing that high repression regimes survive longer than regimes that democratize in equilibrium is straightforward: both regimes end following the first mobilization period, and high repression increases expected time until the first mobilization period. By contrast, without further assumptions, the comparison between low repression and high repression regimes is ambiguous. Although high repression pushes off the first mobilization period, low repression yields the possibility of surviving the first mobilization period—and, crucially, low-repression

regimes are only observed in equilibrium when the probability of surviving the first mobilization period is high (i.e., low q). If the probability of a coup is low enough, then low repression regimes expect to survive longer than high repression regimes. In this circumstance, high repression can still be consistent with equilibrium behavior because of the predation effect. Part b extends this logic by comparing consumption amounts under high and low repression conditional on regime survival. Higher per-period consumption under a high-repression regime is a necessary condition for low repression regimes to survive the longest period of time for all parameter values in which G will optimally choose low repression.

Proposition 2 (Regime durability)**.**

Part a. *For all parameter values, there exists a unique $\overline{q} > 0$ such that $q < \overline{q}$ implies $H(\underline{\epsilon}_l^*) \cdot q < H(\underline{\epsilon}_h^*) < H(\underline{\epsilon}_d^*)$.*

Part b. *There exists $\overline{\phi}_A^G$ such that if and only if $\phi_A^G > \overline{\phi}_A^G$, then for all $q < \tilde{q}$ (for $\tilde{q}$ defined in Lemma 4):*

- $H(\underline{\epsilon}_l^*) \cdot q < H(\underline{\epsilon}_h^*)$
- $\phi_A^G - r_l^* - H(\underline{\epsilon}_l^*) \cdot x^* < \phi_A^G - r_h^*$

5 Implications for Authoritarian Regime Dynamics

The three trajectories implied by the model correspond with three empirically prevalent types of authoritarian institutions: high repression and personalist regimes, democratization with military regimes, and low repression with party-based regimes. After providing brief statistical evidence of the motivating patterns for durability, violence, and democratization, this section shows that these three types of regimes tend to exhibit the conditions implied by the model to generate the different regime trajectories.[13] Personalist regimes repress at high levels because they are most vulnerable to insider removal in a period of societal organization, face low-valued outside options under democracy, and have considerable scope for extracting rents. This explains their relative durability juxtaposed with high violence, high rates of post-tenure leadership punishment, and infrequent democratization. By contrast, military regimes usually face favorable exit options to

[13] Although this institutions-focused scheme for disaggregating authoritarian regimes most closely resembles the distinction in Geddes (1999) and Geddes, Wright and Frantz (2014), many others have discussed a similar typology (e.g., Huntington, 1993; Bratton and van de Walle, 1994; Weeks, 2012).

democracy, yielding shorter regimes more likely to transition to democracy. Finally, party-based regimes are the least vulnerable to insider removals and therefore tolerate societal mobilization, yielding durable and relatively non-violent regimes.

5.1 Patterns Across Authoritarian Regimes

This section presents brief regression evidence to substantiate the main patterns to explain. The sample is all country-years from the Geddes, Wright and Frantz (2014) dataset (1946–2010) in which at least one of personalist, military, or party institutions were central to the regime. This restricts attention to the most prevalent forms of post-1945 authoritarian regimes and to the regime types for which the model generates theoretical implications, and excludes democracies, oligarchies, monarchies, and state collapse years. For hybrid regimes in which Geddes, Wright and Frantz (2014) code multiple institutions as important—for example, military-personal regimes—Panel A codes the regime as the least institutionalized category and Panel B as the most institutionalized. Therefore, conceiving party-based as most institutionalized, followed by military and then personal, military-personal regimes are coded as personal in Panel A and as military in Panel B. Notably, regimes with rulers who were in the military when they came to power can be coded as either military or personalist, depending on the extent to which power is shared within the junta. Geddes, Wright and Frantz (2014) reserve the term "military regimes" for regimes in which a military leader came to power *and* subsequently shared power within a junta, creating collegial military rule. This also relates to Svolik's (2012) distinction between personal and corporate military regimes.

Table 1 presents logit estimates for the binary dependent variables and OLS for the categorical dependent variable. Every specification clusters standard errors by country. The dependent variables differ across columns. Column 1 analyzes regime failure, which equals 1 in a country-year that an authoritarian regime ends and 0 otherwise using Geddes, Wright and Frantz's (2014) data. Given the expectation that party regimes should be the least likely to fail, the column presents coefficient estimates for military regimes and for personalist regimes, leaving party regimes as the omitted basis category to which military and personalist regimes are compared. The next two columns analyze violence, and personalist regime is the omitted category. Column 2 analyzes Freedom House's civil liberties index (Freedom House, 2018), which Davenport (2007) uses as a measure low-intensity, or preventive repression. I rescaled the variable to take values be-

tween 0 and 1, with higher values indicating greater civil liberty protection.[14] Column 3 analyzes a different aspect of violence, and the dependent variable equals 1 if violence occurred during regime change (at least 25 deaths) and 0 otherwise. It restricts the sample to years with regime failure. Geddes, Wright and Frantz (2014) draw from the Armed Conflict Database (Gleditsch et al., 2002) for this variable. Columns 4 and 5 analyze democratization, and military regime is the omitted category. The dependent variable in both equals 1 if the regime in the next year is democratic, and 0 otherwise, using Geddes, Wright and Frantz's (2014) democracy data. The Column 4 sample includes all country-years, and Column 5 truncates the sample to years with regime failure.

Table 1: Patterns Across Authoritarian Institutions

	Panel A. Hybrid regimes coded as least institutionalized type				
DV:	Regime failure	Civil liberties	Violence	Democratization	
	(1)	(2)	(3)	(4)	(5)
Personal	0.897***			-1.088***	-0.416
	(0.183)			(0.259)	(0.307)
Military	1.809***	0.133***	-1.277***		
	(0.235)	(0.0455)	(0.474)		
Party		0.0718	-0.639	-2.077***	-0.606
		(0.0456)	(0.470)	(0.297)	(0.405)
Country-years	3,899	1,110	207	3,899	207
Sample	Full	Full	Failure years	Full	Failure years
Model	Logit	OLS	Logit	Logit	Logit
	Panel B. Hybrid regimes coded as most institutionalized type				
DV:	Regime failure	Civil liberties	Violence	Democratization	
	(1)	(2)	(3)	(4)	(5)
Personal	1.031***			-1.311***	-1.156***
	(0.178)			(0.239)	(0.312)
Military	1.777***	0.137***	-0.786*		
	(0.180)	(0.0450)	(0.406)		
Party		0.0658	-0.356	-2.296***	-1.127***
		(0.0396)	(0.386)	(0.226)	(0.345)
Country-years	3,899	1,110	207	3,899	207
Sample	Full	Full	Failure years	Full	Failure years
Model	Logit	OLS	Logit	Logit	Logit

Notes: Table 1 summarizes a series of regressions with country-clustered standard errors. $^{***}p < 0.01, ^{**}p < 0.05, ^{*}p < 0.1$.

The regression results substantiate the main differences across authoritarian regimes summarized at the beginning of the paper. All the following comparisons use the Panel A estimates. Regarding regime durability,

[14] The present focus on low-intensity repression explains an importance difference from Escribà-Folch and Wright (2015), who present graphical evidence that military regimes repress at higher levels than personalist regimes (59). They use Fariss's (2014) repression measure that incorporates information on high-intensity repression events such as torture and killing, in contrast to the present focus on preventive repression—which relates more closely to civil liberty violations—to prevent mass mobilization.

party regimes fail in 2.4% of years (Column 1). This is 82% lower than military regimes (13.0% of years) and 58% lower than personalist regimes (5.7% of years), and each of these differences are statistically significant in both panels. Regarding violence, compared to personalist regimes, civil liberty scores are 35% higher in military regimes and 19% higher in party regimes (Column 2). Conditional on regime failure, personalist regimes experience violence in 32.1% of years (Column 3). This is 2.8 times the frequency in military regimes (11.7%) and 1.6 times the frequency in party regimes (20.0%). For both violence columns, these differences are statistically significant for military regimes. Regarding democratization, military regimes democratize in 7.1% of years (Column 4) and, conditional on failing, transition to democracy 55% of the time (Column 5). The unconditional figure (Column 4) is 7.5 times the frequency for party regimes (1.0% of years) and 2.8 times the frequency for personalist regimes (2.5% of years), and each of these differences are statistically significant. The conditional figure (Column 5) for military regimes is 38% higher than party regimes (40% of transitions lead to democracy) and 23% higher than personalist regimes (45% of transitions). These differences rise above the 10% significance level in Panel A but remain significant in Panel B.

5.2 Personalist Regimes and the Repression/Revolution Puzzle

The model helps to explain these patterns across authoritarian regime types and addresses puzzles raised by existing research. Existing studies implicitly posit a paradox about personalist regimes. Research on social revolution examines how exclusionary and repressive authoritarian regimes often leave "no other way out" than violence for societal actors (Skocpol, 1979; Goodwin and Skocpol, 1989; Goodwin, 2001), but cannot explain why a regime may deliberately pursue a policy that raises prospects for revolution. The present model explains the paradoxical result that personalist dictators deliberately take actions that *increase* the probability of revolution, given the unpalatable alternative of repressing at low levels and either risking insider coups or democratizing.

Many personalist dictatorships possess the two main characteristics in the model that encourage high repression. First, both aspects of the relative rentier effect encourage prolonging authoritarian rule without making concessions to society. The lack of institutionalized constraints on the dictator, denoted by high ϕ_A^G, provide considerable scope for rent-seeking. There are many famous cases of kleptocratic rule, such as Mobutu's reign in Zaire from 1965 until 1997 in which he amassed an enormous personal fortune by

pocketing a percentage of the country's diamond and copper exports (Bratton and van de Walle, 1997, 67). During this time, Zaire's bureaucracy followed the dictum to "make the quest for wealth and money an obsession" (Evans, 1995, 47). More broadly, Bratton and van de Walle (1994, 458) argue that in personalist, or neopatrimonial regimes: "Leaders occupy bureaucratic offices less to perform public service than to acquire personal wealth and status." Kleptocratic economic controls include selective access to essential services, government-owned monopolies, and property confiscation (Chehabi and Linz, 1998, 22).

The other aspect of the relative rentier effect that encourages the high repression strategy is that personalist dictators expect few privileges under democratic rule. The narrow coalition underpinning many personalist regimes undermines their ability to command political clout following transitions to democracy (Bratton and van de Walle 1994, 465, 475; Snyder 1998). Bratton and van de Walle (1994) argue that this explains differences in the dominant mode of transition between Africa in the 1990s and Latin America in the 1980s and 1990s. Pacted transitions to democracy occurred more frequently in Latin America's military regimes, whereas personalist regimes in Africa tended to concede power only in the face of widespread protests. Some personalist regimes during the Third Wave experienced lengthy and intense periods of violence before the regime fell, as in Uganda, Ethiopia, Zaire, and Liberia. Although democracies occasionally emerge following violence, this tends to be a more difficult path to creating and consolidating democracy than through negotiated transfer (Huntington, 1993, 192-207).

The other main model characteristic that encourages high preventive repression is that personalist dictators have much to fear from societal mobilization. Finer (2002, 72-79) argues that civil wars and broader conditions of social unrest create opportunities for military intervention because of increased civilian dependence on the military to stay in power, which is particularly relevant for personalist regimes. The narrow basis of elite power in such regimes implies that social movements will tend to have broad societal support bases (Goodwin and Skocpol, 1989), which exacerbates dependence on the military to retain power.

The counterfactual consideration raised in Section 3.4 is also relevant here: high insider loyalty in personalist regimes is often endogenous to a high preventive repression strategy. In terms of the model, although the empirically observed $q(r_h^*)$ may be low, the relevant counterfactual term $q(r_l^*)$ should be high. Many personalist regimes have maintained control over their militaries in the face of societal mobilization because high-ranking generals are dependent on the personal patronage of the ruler and are intertwined in the broader structure of coercion (Snyder, 1998). Syria following the Arab Spring protests that began in 2011 illustrates

this point. Despite facing multiple fronts of initially peaceful protests and of insurgent groups, Bashir al-Asad's regime—supported mainly by co-ethnics from his minority Alawite group—has remained intact into 2018. But this induced loyalty is endogenous to the patterns of repression by a regime tightly organized around the person of Bashir al-Asad and, before him, his father Hafiz. By the time Hafiz had become head of state through a series of military coups in the 1960s and early 1970s, almost all of the top officers were co-ethnic Alawites, and their small size ($\sim$10% of the population) has encouraged repressive means for remaining in power (Quinlivan, 1999, 140-1). The poor expected fate of top military officers under a different regime has created incentives for military loyalty even during unrest. Bellin (2012) illustrates a similar point by comparing Middle Eastern countries. Discussing different outcomes during the Arab Spring in 2011, she argues that the military remained loyal in Syria and Bahrain because it was ethnically distinct from the protesters. By contrast, in largely ethnically homogeneous Tunisia and Egypt, the military did not perceive its fate as intrinsically related to the incumbent.

5.3 Military Regimes and the Puzzle of Elite Protections Under Democracy

Although considerable research associates democracy with rule by a non-elite median voter, democratization in military regimes highlights the opposing consideration that transition is most likely when elites can safeguard themselves under democracy. The most important difference between collegially ruled military regimes and personalist regimes is that military dictators usually face a weaker relative predation effect, specifically because of relatively favorable exit options to democratization (Bratton and van de Walle, 1994; Geddes, 1999). Unlike narrowly constructed personalist ruling coalitions, collegial military regimes share power more broadly and expect to survive as an intact institution following democratization, i.e., high ϕ_D^G.[15] For example, Brazil transitioned to democracy in 1985. After a surprise victory by the opposition in national elections, the ruling military junta decided "the costs of accepting a Tancredo Neves presidency were not too great" (Stepan, 1988, 67). Although the military had a weaker bargaining position than when it took over power in 1964, it retained enough institutional coherence that it expected to be able to uphold key goals: preventing retaliation for past human rights violations, and continued development of the arms industry

[15]To de-politicize what is supposed to be a meritocratic and hierarchical organization, generals sometimes prefer to return in the barracks rather than to continue ruling (Geddes, 1999; Finer, 2002), although the model assumes that all dictators have identical goals and, in a given period, are better off being in power than not.

(67).

Not only does democratization usually yield a relatively favorable exit option for military dictators, it also often creates relatively low opportunity costs. The greater degree of institutionalization in collegial military regimes creates lesser scope for predating society than in personalist regimes, i.e., lower ϕ_A^G. Therefore, even though military rulers are usually vulnerable to insider removal, i.e., high $q(\cdot)$, they have incentives to democratize rather to undermine societal mobilization via high preventive repression.

More broadly, this logic highlights similarities between military regimes and seemingly disparate alternative contributors to democracy creation. For example, Ziblatt (2017) discusses elite safeguards under democracy. His analysis of 19th and 20th century Europe produces the paradoxical conclusion that protecting the fates of conservative parties greatly shaped prospects for democratization and democratic consolidation. Counter-majoritarian elements to constitutions, such as reserved rights for the military or unelected upper chambers, can promote democracy by improving elites' fate under majority rule (364). For more recent post-colonial cases, these conditions are more difficult to replicate given stronger norms against countermajoritarian institutions. However, characteristics of the incumbent authoritarian regime can provide a substitute. Regimes that simultaneously fear insider overthrow under prolonged authoritarianism but that can secure favorable fates under democracy—such as collegially organized military regimes—are more likely to negotiate transitions to democracy. Focusing on *political* safeguards for elites under democracy differs from Acemoglu and Robinson's (2006) and Boix's (2003) emphasis on democracies necessarily catering to the masses and their argument that only under the right *economic* conditions—such as low inequality or low asset specificity—will elites acquiesce to democracy.

5.4 Party Regimes and the Mobilization Puzzle

Party regimes pose a final puzzle. Whereas research on personalist regimes treats mass mobilization as a grave threat to regime stability (Bratton and van de Walle, 1994; Snyder, 1998; Goodwin, 2001), studies of party-based regimes highlight mass mobilization as a source of authoritarian *durability* (Magaloni and Kricheli, 2010). The model offers two explanations for this paradox. First, whether or not a period with societal mobilization will correspond with revolution depends on the long-run frequency of societal mobilization periods—which preventive repression spending determines. Societal mobilization as modeled here

is not inherently threatening to the incumbent in the sense of causing a revolution. Instead, sufficiently frequent opportunities for societal organization are necessary in the model to facilitate peaceful bargaining in a mobilization period and to prevent revolution along the equilibrium path. Therefore, low repressive regimes will be invulnerable to revolutions precisely because social mobilization occurs frequently.

The second explanation for the mobilization puzzle is that, empirically, mobilization occurs in various forms. Low $q(\cdot)$ and ϕ_A^G in party-based regimes arise because of alternative mobilization forms that occur in these regimes. Creating mass organizations such as youth party wings and can deter coups (low q) because the party machine can rally citizens to *support* the regime. Party regimes with revolutionary origins often enjoy an additional source of loyalty from their military. By constructing the army from scratch or by radically transforming the existing military, and by commanding the military with cadres from the revolutionary struggle, revolutionary party regimes are largely invulnerable to coups (Levitsky and Way, 2013).

The same sources of mass support for party regimes also correspond with a relatively weak predation effect, i.e., low ϕ_A^G. Perhaps the most commonly discussed mechanism linking authoritarian parties to regime stability is that they solve commitment problems regarding delivering spoils to society (Magaloni and Kricheli, 2010), which the exogenous transfer parameter captures in a reduced form way. Hierarchically organized parties provide lower-level officials with coordination mechanisms that can be used to check authoritarian transgressions, perhaps by disseminating information among party cadres (Gehlbach and Keefer 2011). This off-the-equilibrium threat of anti-regime mobilization enables the ruler to promise high concessions.[16]

6 Conclusion

Why do authoritarian regimes with different institutional bases vary in durability, violence, and likelihood of democratization? This paper shows how heterogeneous incentives for—and consequences of—preventive

[16]Other forms of mobilization can also promote regime stability. For example, Lorentzen (2013) argues that the large number of annual local-level protests in China (roughly 180,000 in 2010) provide information to high-ranking Communist Party officials about the performance of lower-level bureaucrats. By removing bad bureaucrats, the CCP can ensure that, in equilibrium, the protests remain focused on local issues rather than on replacing the central government.

repression affect these outcomes. It analyzes an infinite-horizon game between a government that strategically represses and a societal actor that endogenously mobilizes. Preventive repression exerts a short-term effect that deters mobilization but a long-term effect that spurs revolution. However, regimes that are vulnerable to insider coups during mobilization periods (political survival effect) or that accrue large rents under authoritarian rule (predation effect) may repress heavily despite eventually suffering revolutionary overthrow. Personalist authoritarian regimes tend to exhibit these repression-inducing characteristics. Military regimes face favorable exit options to democracy, yielding shorter regimes likely to initiate democratic transitions. Party-based regimes are less vulnerable to insider removal and therefore tolerate societal mobilization, yielding durable and relatively non-violent regimes.

The analysis offers several possible directions for future theorizing. First, the present analysis focuses entirely on preventive repression, or what Levitsky and Way (2010) denote low-intensity coercion. However, repression spending also affects "high-intensity coercive" techniques such as the ability to forcibly break up protests or to defeat insurgencies. This highlights countervailing long-term repression effects. On the one hand, there is the effect described here that makes revolutions more likely. On the other hand, repression spending can also lower the probability of a revolution succeeding in the model, which makes both revolutionary attempts and successful revolutions less likely. Personalist regimes may be vulnerable to political violence not only for the reasons described here, but also because attempts to coup-proof their militaries have frequently resulted in weakened coercive apparatuses less able to defeat social movements when they arise (Goodwin 2001, 49; Herbst 2004).

Additionally, to focus on the countervailing short-term and long-term effects of preventive repression and on dictators' strategic incentives to use repression, the model parameterized many factors that could be endogenized in future work. For example, an explicit contest could be modeled between societal moderates and extremists as opposed to assuming that moderates automatically lead social movements in contexts of low repression and vice versa for extremists under high repression. An explicit military actor could be included to endogenize the probability of coup attempts. Overall, the model provides a framework rich enough to provide new insights about the relationships among authoritarian institutions, repression, and authoritarian regime dynamics, but future extensions of the framework could provide insight into additional aspects of authoritarian regime survival.

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Online Appendix

A Supplemental Material for Formal Model

Table A.1: Summary of Parameters and Choice Variables

Stage	Variables/description
Primitives	• G: government • S: societal challenger • δ: discount factor • t: time • ϕ_A: S's guaranteed share of spoils in every period of authoritarian rule, exogenously determined • ϕ_A^G: G's pre-repression spending rents in every period of authoritarian rule, equals $1-\phi_A$
Repression	• r: G's repression spending in every period, chosen at outset of game
Mobilization	• F: Fixed mobilization cost • $c(r)$: Repression-affected mobilization cost • ϵ_t: Stochastic element of mobilization cost • C_t: sum of these three costs
Bargaining	• x_t: G's transfer offer • q: Probability of insider overthrow
Revolution	• ϕ_R: S's per-period consumption following a revolution
Democratization	• ϕ_D: S's maximum per-period consumption following democratization, and the complement of G's consumption amount • $d(r)$: Indicator variable that affects S's consumption under democracy and equals 1 if repression is low and 0 if repression is high • ϕ_D^G: G's per-period consumption under democracy, equals $1-\phi_D$
Continuation values	• V^G: G's future continuation value under authoritarian rule • V^S: S's future continuation value under authoritarian rule

A.1 Proofs for Baseline Model

Before proving Lemma 1, it is necessary to specify upper and lower bounds on the cost of mobilizing to rule out strategically uninteresting cases in which S either mobilizes in every period or in no periods—i.e., independently of the stochastic component of the cost function.

Assumption A.1 (Bounds on mobilization costs)**.** *For all* $r \in [0, 1-\phi_A]$:

$$0 < \frac{\delta \cdot (\phi_R - \phi_A)}{1-\delta} - c(r) < (2-\delta) \cdot F$$

Note that every proof uses the statement of $\Theta\big(\underline{\epsilon}^*(r)\big)$ from Remark 1 rather than Lemma 1.

Proof of Lemma 1. Applying the intermediate value theorem demonstrates the existence of at least one $\underline{\epsilon}^*(r)$ that satisfies $\Theta\big(\underline{\epsilon}^*(r)\big) = 0$. The first inequality in Assumption A.1 implies that $\Theta(-F) > 0$

for all $r \in [0, 1-\phi_A]$. The second inequality in Assumption A.1 implies that $\Theta(F) < 0$ for all $r \in [0, 1-\phi_A]$. Finally, the assumed smoothness of the distribution function $H(\cdot)$ implies that $\Theta(\cdot)$ is continuous.

Demonstrating that $\Theta(\cdot)$ strictly decreases in $\underline{\epsilon}^*(r)$ proves the threshold claim.

$$\frac{d\Theta}{d\underline{\epsilon}^*(r)} = -\left(1 - \frac{dx^*(r)}{d\underline{\epsilon}^*(r)}\right),$$

for:

$$\frac{dx^*(r)}{d\underline{\epsilon}^*(r)} = \frac{\delta \cdot h\big(\underline{\epsilon}^*(r)\big)}{1 - \delta \cdot \big[1 - H\big(\underline{\epsilon}^*(r)\big)\big]} \cdot \Big[F + c(r) + \underline{\epsilon}^*(r) - x^*(r)\Big] = 0$$

This term equals 0 because, by definition of $\underline{\epsilon}^*(r)$, $x^*(r) = F + c(r) + \underline{\epsilon}^*(r)$. Therefore, $\frac{d\Theta}{d\underline{\epsilon}^*(r)} = -1$. ■

Proof of Lemma 2. First need to show:

$$\frac{dH(\underline{\epsilon}^*(r))}{dr} = -h(\underline{\epsilon}^*) \cdot \frac{\frac{\partial \Theta}{\partial r}}{\frac{\partial \Theta}{\partial \underline{\epsilon}^*}} = h(\underline{\epsilon}^*) \cdot \frac{-\big(1 - \frac{\partial x^*}{\partial c}\big) \cdot c'(r)}{1 - \frac{\partial x^*}{\partial \underline{\epsilon}^*}} < 0$$

$\frac{\partial x^*}{\partial c} = \int_{-F}^{\underline{\epsilon}^*} dH(\epsilon_t)$, which the fundamental theorem of calculus implies equals $H(\underline{\epsilon}^*)$. Because $H(\cdot)$ is a cumulative density function and because $c'(r) > 0$ by assumption, the numerator is strictly negative. The proof of Lemma 1 showed that the denominator equals 1, and therefore the overall term is $-h(\underline{\epsilon}^*) \cdot \big[1 - H(\underline{\epsilon}^*)\big] \cdot c'(r) < 0$. ■

Proof of Lemma 3. Define $B^*(r) \equiv 1 - \phi_A - r - x^*(r)$. Applying the intermediate value theorem demonstrates the existence of at least one $\hat{r} \in (0, 1-\phi_A)$ such that $B^*(\hat{r}) \equiv 1\text{–}\phi_A\text{–}\hat{r}\text{–}x^*(\hat{r}) = 0$.

- To establish $B^*(0) > 0$, it suffices to show that there exists $\hat{F} > 0$ such that $B^*(0)\big|_{F<\hat{F}} > 0$ because the setup assumes $F < \hat{F}$. This can be established by showing (1) $\lim_{F \to 0} B^*(0) > 0$ and (2) $\frac{dB^*(0)}{dF} < 0$.
  1. If $r = 0$ and $F \to 0$, then $\overline{C} = 0$ because $c(0) = 0$. This implies $x^* = \delta \cdot (\phi_R - \phi_A)$, which in turn implies that $\lim_{F \to 0} B^*(0) > 0$ if and only if $\phi_R < \frac{1-(1-\delta)\cdot\phi_A}{\delta}$. The imposed assumption $\phi_R < 1$ is sufficient for this inequality to hold, which follows from establishing that the lower bound value of $\frac{1-(1-\delta)\cdot\phi_A}{\delta}$ over $\delta \in (0, 1)$ equals 1. It is straightforward to establish that this expression strictly decreases in δ, which implies that it achieves its lower bound at $\delta = 1$. The expression equals 1 at $\delta = 1$.
  2. $\frac{dB^*(0)}{dF} = -\frac{dx^*(0)}{dF}$.
- To establish the upper bound, $B^*(r) < 0$ for any $r > 1 - \phi_A$.
- The assumed continuity of each function in r and applying the theorem of the maximum to prove that $\underline{\epsilon}^*(r)$ is continuous in r demonstrates that $B^*(r)$ is continuous in r.

The threshold $\hat{r}$ is unique because $B^*(r)$ strictly decreases in r, which follows directly from the proof of Lemma 2. ■

The following preliminary results will be used to prove Lemma A.2. Without additional restrictions, a solution to the optimal high repression spending amount, i.e., strictly exceeding $\hat{r}$, may not exist because the constraint set is not closed. Define:

$$V_h^G \equiv \frac{\phi_A^G - r}{1 - \delta \cdot \left[1 - H\left(\underline{\epsilon}^*(r)\right)\right]}$$

Within the set $(\hat{r}, 1 - \phi_A]$, a sufficient condition for the maximum value of $V_h^G\big|_{r>\hat{r}}$ not to occur at $\lim_{r \to \hat{r}^+} r$ is for V_h^G to strictly increase at $r = \hat{r}$, which Assumption A.2 imposes.

Assumption A.2.

$$\left.\frac{dV_h^G}{dr}\right|_{r=\hat{r}} > 0$$

This is not a restrictive assumption because it only rules out a strategically uninteresting case. Lemma A.1 shows that if instead $\left.\frac{dV_h^G}{dr}\right|_{r=\hat{r}} < 0$, then under no parameter values will G have a profitable deviation to high repression. This follows because G experiences a discrete decrease in utility at $r = \hat{r}$, and because V_h^G is strictly concave.

Lemma A.1. *If Assumption A.2 is strictly violated, then $V^G(r_h) < V^G(\hat{r})$ for all $r_h > \hat{r}$.*

Proof. Two results establish the lemma. First, G experiences a discrete drop in lifetime expected consumption at $\hat{r}$: $V^G(\hat{r}) > \lim_{\alpha \to 0^+} V^G(\hat{r} + \alpha)$. Rearranging Equation 8 and recalling that $1 - \phi_A - \hat{r} - x^*(\hat{r}) = 0$ shows that $q < 1$ yields the result. Second, if V^G is strictly concave, then a strict violation of Assumption A.2 implies that V^G strictly decreases in r_h for all $r_h > \hat{r}$. The proof for Lemma A.2 establishes sufficient conditions for the strict concavity of V^G. ■

Lemma A.2 (Unique low and high repression spending maximizers)**.**

Part a. *There exists a unique strictly positive low-repression spending amount r_l^* that maximizes G's lifetime expected utility subject to $r_l^* \in [0, \hat{r}]$.*

Part b. *There exists a unique high-repression spending amount r_h^* that maximizes G's lifetime expected utility subject to $r_h^* \in (\hat{r}, 1 - \phi_A]$.*

Proof of part a. Solving Equation 6 yields:

$$V^G(r_l) = \frac{1 - \phi_A - r_l - H\left(\underline{\epsilon}^*(r_l)\right) \cdot x^*(r_l)}{1 - \delta \cdot \left[1 - q \cdot H\left(\underline{\epsilon}^*(r_l)\right)\right]}$$

Therefore, G's optimization problem with inequality constraints is:

$$\max_{r_l} \quad \frac{1-\phi_A-r_l-H\big(\underline{\epsilon}^*(r_l)\big)\cdot x^*(r_l)}{1-\delta\cdot\big[1-H\big(\underline{\epsilon}^*(r_l)\big)\cdot q\big]}+\lambda_1\cdot r_l+\lambda_2\cdot(\hat{r}-r_l)$$

The KKT conditions characterize the solution:

$$\frac{\partial\mathcal{L}}{\partial r_l}=\underbrace{\frac{h\big(\underline{\epsilon}^*(r_l^*)\big)\cdot x^*}{1-\delta\cdot\big[1-H\big(\underline{\epsilon}^*(r_l^*)\big)\cdot q\big]}\cdot\big[1-H\big(\underline{\epsilon}^*(r_l^*)\big)\big]\cdot c'(r_l^*)}_{\text{MB: decreases frequency of paying } x^*}$$

$$\underbrace{+\frac{\big[1-\phi_A-r_l^*-H\big(\underline{\epsilon}^*(r_l^*)\big)\cdot x^*\big]\cdot\delta\cdot h\big(\underline{\epsilon}^*(r_l^*)\big)\cdot q}{\Big[1-\delta\cdot\big[1-H\big(\underline{\epsilon}^*(r_l^*)\big)\cdot q\big]\Big]^2}\cdot\big[1-H\big(\underline{\epsilon}^*(r_l^*)\big)\big]\cdot c'(r_l^*)}_{\text{MB: decreases \% of periods w/ internal overthrow possibility}}$$

$$\underbrace{-\frac{\delta\cdot\big[H\big(\underline{\epsilon}^*(r_l^*)\big)\big]^2}{\Big[1-\delta\cdot\big[1-H\big(\underline{\epsilon}^*(r_l^*)\big)\cdot q\big]\Big]\cdot\Big[1-\delta\cdot\big[1-H\big(\underline{\epsilon}^*(r_l^*)\big)\big]\Big]}\cdot c'(r_l^*)}_{\text{MC: increases } x^*}$$

$$\underbrace{-\frac{1}{1-\delta\cdot\big[1-H\big(\underline{\epsilon}^*(r_l^*)\big)\cdot q\big]}}_{\text{MC: direct cost of repression spending}}+\lambda_1-\lambda_2=0$$

$$r\geq 0,\ \ \hat{r}\geq r_l,\ \ \lambda_1\geq 0,\ \ \lambda_2\geq 0,\ \ \lambda_1\cdot r_l=0,\ \ \lambda_2\cdot(\hat{r}-r_l)=0 \tag{A.1}$$

Assuming $\lim_{r\to 0}c'(r)=\infty$ implies positive repression spending. The continuity of the objective function over a compact set with a convex constraint set implies a maximum exists, and demonstrating that the objective function is strictly concave implies that Equation A.2 characterizes the unique maximum. Taking the second derivative of the objective function and making the negative term $c''(r)$ large enough in magnitude generates this result, specifically, greater than the threshold $\underline{c}''$ stated in footnote 5.

Part b. Solving Equation 7 yields:

$$V^G(r_h)=\frac{1-\phi_A-r_h}{1-\delta\cdot\big[1-H\big(\underline{\epsilon}^*(r_h)\big)\big]}$$

Assumption A.2 implies that within the set $(\hat{r},1-\phi_A]$, the objective function does not achieve its upper bound at $r_h=\hat{r}$. Therefore, we can pick an arbitrarily small $\alpha>0$ such that the the compact set $[\hat{r}+\alpha,1-\phi_A]$ contains the maximizer. G's optimization problem with inequality constraints is:

$$\max_{r_h} \quad \frac{1-\phi_A-r_h}{1-\delta\cdot\big[1-H\big(\underline{\epsilon}^*(r_h)\big)\big]}+\lambda_1\cdot\big[r_h-(\hat{r}+\alpha)\big]+\lambda_2\cdot\big(1-\phi_A-r_h\big)$$

The KKT conditions characterize the solution:

$$\frac{\partial\mathcal{L}}{\partial r_h}=\underbrace{\delta\cdot\big[1-H\big(\underline{\epsilon}^*(r_h^*)\big)\big]\cdot h\big(\underline{\epsilon}^*(r_h^*)\big)\cdot\frac{1-\phi_A-r_h^*}{\Big[1-\delta\cdot\big[1-H\big(\underline{\epsilon}^*(r_h^*)\big)\big]\Big]^2}\cdot c'(r_h^*)}_{\text{MB: Increase expected time until revolution}}$$

$$\underbrace{-\frac{1}{1-\delta\cdot\left[1-H\left(\underline{\epsilon}^*(r_h^*)\right)\right]}}_{\text{MC: Direct cost of repression spending}}+\lambda_1-\lambda_2=0$$

$$r_h\geq\hat{r},\ \ 1-\phi_A\geq r_h,\ \ \lambda_1\geq 0,\ \ \lambda_2\geq 0,\ \ \lambda_1\cdot(r_h-\hat{r})=0,\ \ \lambda_2\cdot(1-\phi_A-r_h)=0 \tag{A.2}$$

The same conditions as discussed in part a imply that this term yields a unique maximizer. ■

Assumption A.3 places bounds of G's consumption values that ensure that all three equilibrium paths are possible under feasible parameter values. Future drafts will state this assumption in terms of parameter values.

Assumption A.3 (Bounds on G's consumption values)**.**

Part a.

$$\left.\frac{\phi_A^G-r_l^*-H(\underline{\epsilon}_l^*)\cdot x^*}{1-\delta\cdot\left[1-q\cdot H(\underline{\epsilon}_l^*)\right]}\right|_{q=0}>\max\left\{\left.\frac{\phi_A^G-r_h^*}{1-\delta\cdot\left[1-H(\underline{\epsilon}_h^*)\right]}\right|_{q=0},\left.\frac{\phi_A^G-r_d^*+\delta\cdot H(\underline{\epsilon}_d^*)\cdot\frac{\phi_D^G}{1-\delta}}{1-\delta\cdot\left[1-H(\underline{\epsilon}_d^*)\right]}\right|_{q=0}\right\}$$

Part b.

$$\left.\frac{\phi_A^G-r_l^*-H(\underline{\epsilon}_l^*)\cdot x^*}{1-\delta\cdot\left[1-q\cdot H(\underline{\epsilon}_l^*)\right]}\right|_{q=1}<\min\left\{\left.\frac{\phi_A^G-r_h^*}{1-\delta\cdot\left[1-H(\underline{\epsilon}_h^*)\right]}\right|_{q=1},\left.\frac{\phi_A^G-r_d^*+\delta\cdot H(\underline{\epsilon}_d^*)\cdot\frac{\phi_D^G}{1-\delta}}{1-\delta\cdot\left[1-H(\underline{\epsilon}_d^*)\right]}\right|_{q=1}\right\}$$

Part c.

$$\left.\frac{\phi_A^G-r_d^*+\delta\cdot H(\underline{\epsilon}_d^*)\cdot\frac{\phi_D^G}{1-\delta}}{1-\delta\cdot\left[1-H(\underline{\epsilon}_d^*)\right]}\right|_{\phi_D^G=0}<\left.\frac{\phi_A^G-r_h^*}{1-\delta\cdot\left[1-H(\underline{\epsilon}_h^*)\right]}\right|_{\phi_D^G=0}$$

Part d.

$$\left.\frac{\phi_A^G-r_d^*+\delta\cdot H(\underline{\epsilon}_d^*)\cdot\frac{\phi_D^G}{1-\delta}}{1-\delta\cdot\left[1-H(\underline{\epsilon}_d^*)\right]}\right|_{\phi_D^G=1-\phi_R}>\left.\frac{\phi_A^G-r_h^*}{1-\delta\cdot\left[1-H(\underline{\epsilon}_h^*)\right]}\right|_{\phi_D^G=1-\phi_R}$$

Proof of Lemma 4. Applying the intermediate value theorem demonstrates the existence of at least one $\tilde{q}\in(0,1)$ such that $\Omega_{l,h}\big|_{q=\tilde{q}}=0$. $\Omega_{l,h}\big|_{q=0}>0$ follows from part a of Assumption A.3, $\Omega_{l,h}\big|_{q=1}<0$ follows from part b, and continuity follows from assumed continuous functions and from applying the theorem of the maximum. Demonstrating that $\Omega_{l,h}$ strictly decreases in q yields the threshold claim. This can be shown by applying the envelope theorem to the constituent terms of $\Omega_{l,h}$, i.e., the indirect effects of q cancel out:

$$\frac{d\Omega_{l,h}}{dq}=-\frac{\left[1-\phi_A-r_l^*-H(\underline{\epsilon}_l^*)\cdot x^*\right]\cdot\delta\cdot H(\underline{\epsilon}_l^*)}{\left[1-\delta\cdot\left[1-H(\underline{\epsilon}_l^*)\cdot q\right]\right]^2}<0$$

The implicit characterization of $\tilde{q}$ is:

$$\Omega_{l,h}(\tilde{q}) = \frac{\phi_A^G - r_l^*(\tilde{q}) - H\left(\underline{\epsilon}_l^*(\tilde{q})\right) \cdot x^*(\tilde{q})}{1 - \delta \cdot \left[1 - \tilde{q} \cdot H\left(\underline{\epsilon}_l^*(\tilde{q})\right)\right]} - \frac{\phi_A^G - r_h^*}{1 - \delta \cdot \left[1 - H(\underline{\epsilon}_h^*)\right]} = 0 \tag{A.3}$$

■

Proof of Lemma 5. Applying the implicit function theorem yields:

$$\frac{d\tilde{q}}{d\phi_A^G} = \frac{\frac{\partial \Omega_{l,h}(\tilde{q})}{\partial \phi_A^G}}{-\frac{\Omega_{l,h}(\tilde{q})}{\partial q}}$$

The proof for Lemma 4 shows that the denominator is strictly positive. By construction, $sgn\left(\frac{\partial \Omega_{l,h}(\tilde{q})}{\partial \phi_A^G}\right) = -sgn\left(\frac{\partial \Omega_{l,h}(\tilde{q})}{\partial \phi_A}\right)$. Applying the envelope theorem yields:

$$-\frac{\partial \Omega_{l,h}}{\partial \phi_A} < 0 \implies$$

$$\frac{1 + H(\underline{\epsilon}_l^*) \cdot \frac{dx^*}{d\phi_A}}{1 - \delta \cdot [1 - H(\underline{\epsilon}_l^*) \cdot q]} - \frac{1}{1 - \delta \cdot [1 - H(\underline{\epsilon}_h^*)]} < 0 \implies$$

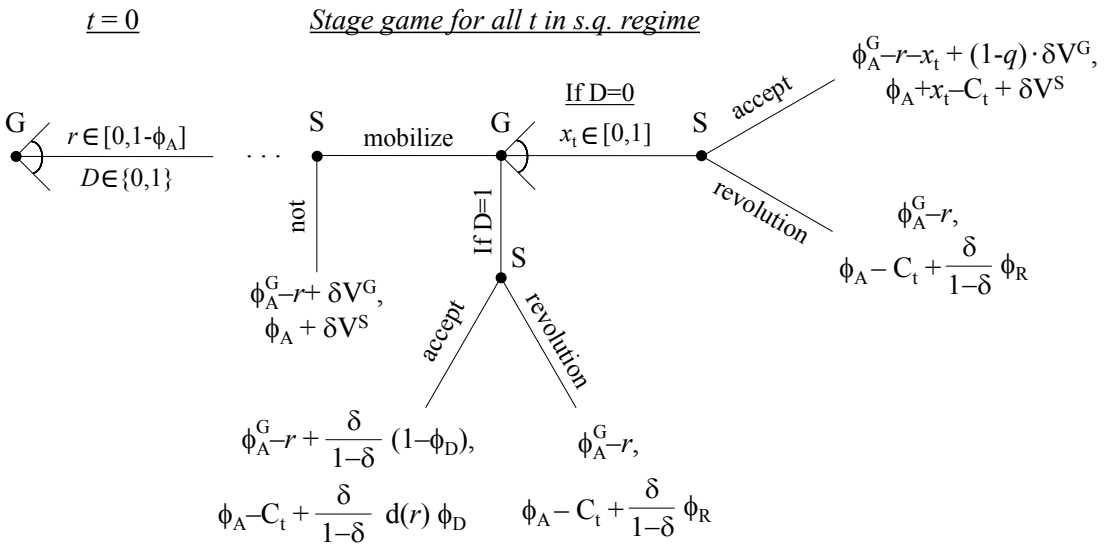
$$\underbrace{\frac{1 - \delta}{1 - \delta \cdot [1 - H(\underline{\epsilon}_l^*) \cdot q]}}_{\equiv Z} \cdot \frac{1}{1 - \delta \cdot [1 - H(\underline{\epsilon}_l^*)]} - \frac{1}{1 - \delta \cdot [1 - H(\underline{\epsilon}_h^*)]} < 0 \implies$$

$$(1 - \delta) \cdot \left(\frac{1}{Z} - 1\right) + \delta \cdot \left[\frac{1}{Z} \cdot H(\underline{\epsilon}_l^*) - H(\underline{\epsilon}_h^*)\right] > 0$$

The result follows from $Z < 1$ and because $H(\cdot)$ strictly decreases in $\underline{\epsilon}^*$. ■

A.2 Extension with Democratization

Figure A.1: Game Tree with Democratization



Before stating and proving the equilibrium strategy profile, it is necessary to define equilibrium choices if $D = 1$. To avoid analyzing strategically irrelevant cases, I do not analyze the case $D = 1$ and $r > \hat{r}$, i.e., G chooses democracy but repression is high enough that S will not accept democracy. If $D = 1$, then equilibrium average costs of mobilizing, S's continuation value, and the mobilization threshold for a given r are slightly different than the terms in the baseline model because S receives ϕ_D rather than ϕ_R in all future periods if it mobilizes. If we denote G's probability of democratizing in a mobilization period as $p \in [0, 1]$, then it is possible to derive general expressions that cover the possible cases. The analogs of Equations 3 and 4 and the term from Lemma 1 are, respectively:

$$\overline{C}(r,p) \equiv \frac{\int_{-F}^{\underline{\epsilon}_p^*(r)} [F + c(r) + \epsilon_t] \cdot dH(\epsilon_t)}{H(\underline{\epsilon}_p^*(r))} \tag{A.4}$$

$$V^S(r,p) = \frac{(1-\delta)\cdot\phi_A + H\big(\underline{\epsilon}_p^*(r)\big)\cdot\Big[(1-\delta)\cdot\overline{C}(r,p) + \delta\cdot\big[p\cdot\phi_D + (1-p)\cdot\phi_R\big]\Big]}{(1-\delta)\cdot\Big[1-\delta\cdot\big[1-H\big(\underline{\epsilon}_p^*(r)\big)\big]\Big]} \tag{A.5}$$

$$\Theta\big(\underline{\epsilon}_p^*(r,p)\big) \equiv \underbrace{\phi_A - \big[F + c(r) + \underline{\epsilon}_D^*(r)\big] + \frac{\delta}{1-\delta}\cdot\big[p\cdot\phi_D + (1-p)\cdot\phi_R\big]}_{E[U_S(\text{mobilize})]} - \underbrace{\Big[\phi_A + \delta\cdot V^S(r,p,\underline{\epsilon}_D^*(r))\Big]}_{E[U_S(\text{not})]} = 0, \tag{A.6}$$

G's future continuation value is determined by:

$$V^G(p) = \phi_A^G - r^*(p) + \delta\cdot\left\{\big[1-H(\epsilon^*(p))\big]\cdot V^G(p) + H(\epsilon^*(p))\cdot\left[p\cdot\frac{\phi_D^G}{1-\delta} + (1-p)\cdot(1-q)\cdot V^G(p)\right]\right\}, \tag{A.7}$$

which solves to:

$$V^G(p) = \frac{\phi_A^G - r^*(p) + \delta \cdot H(\underline{\epsilon}^*(p)) \cdot p \cdot \frac{\phi_D^G}{1-\delta}}{1 - \delta \cdot \left[1 - H(\epsilon^*(p))\right] - \delta \cdot H(\epsilon^*(p)) \cdot (1-p) \cdot (1-q)} \tag{A.8}$$

Given this expression and setting $p = 1$, using the same steps as in Lemma A.2 yields optimal repression spending r_d^*. This, in turn, yields the equilibrium mobilization threshold $\underline{\epsilon}_d^* \equiv \underline{\epsilon}_p^*(r_d^*, p = 1)$.

Proof of Lemma 6. Same proof as for Lemma 4. The implicit definition of $\hat{q}$ is:

$$\frac{\phi_A^G - r_d^* + \delta \cdot H(\underline{\epsilon}_d^*) \cdot \frac{\phi_D^G}{1-\delta}}{1 - \delta \cdot \left[1 - H(\underline{\epsilon}_d^*)\right]} - \frac{\phi_A^G - r_l^*(\hat{q}) - H\left(\underline{\epsilon}_l^*(\hat{q})\right) \cdot x^*(\hat{q})}{1 - \delta \cdot \left[1 - \hat{q} \cdot H\left(\underline{\epsilon}_l^*(\hat{q})\right)\right]} = 0 \tag{A.9}$$

■

Proof of Lemma 7, part a. Applying the intermediate value theorem demonstrates the existence of at least one $\tilde{\phi}_D^G \in (0,1)$ such that $\Omega_{d,h}\big|_{\phi_D^G = \tilde{\phi}_D^G} = 0$. $\Omega_{d,h}\big|_{\phi_D^G = 0} < 0$ follows from part c of Assumption A.3, $\Omega_{d,h}\big|_{\phi_D^G = 1-\phi_R} > 0$ follows from part d, and continuity follows from assumed continuous functions and from applying the theorem of the maximum. Demonstrating that $\Omega_{d,h}$ strictly increases in ϕ_D^G yields the threshold claim. This can be shown by applying the envelope theorem to the constituent terms of $\Omega_{d,h}$, i.e., the indirect effects of ϕ_D^G cancel out:

$$\frac{d\Omega_{d,h}}{d\phi_D^G} = \frac{\delta \cdot H\left(\underline{\epsilon}_d^*\right) \cdot \frac{1}{1-\delta}}{1 - \delta \cdot \left[1 - H\left(\underline{\epsilon}_d^*\right)\right]} > 0$$

The implicit characterization of $\tilde{\phi}_D^G$ is:

$$\frac{\phi_A^G - r_d^*(\tilde{\phi}_D^G) + \delta \cdot H\left(\underline{\epsilon}_d^*(\tilde{\phi}_D^G)\right) \cdot \frac{\tilde{\phi}_D^G}{1-\delta}}{1 - \delta \cdot \left[1 - H\left(\underline{\epsilon}_d^*(\tilde{\phi}_D^G)\right)\right]} - \frac{\phi_A^G - r_h^*}{1 - \delta \cdot \left[1 - H(\underline{\epsilon}_h^*)\right]} = 0 \tag{A.10}$$

Proof of part b.

Proposition A.1 (Equilibrium)**.**

1. *G's repression and democratization choices:*
   (a) *If* $q < \left\{\tilde{q}, \hat{q}\right\}$, *then* $r_t = r_l^*$ *and* $D = 0$.
   (b) *If* $q > \hat{q}$ *and* $\phi_D^G > \tilde{\phi}_d^G$, *then* $r_t = r_d^*$ *and* $D = 1$.
   (c) *Otherwise,* $r_t = r_h^*$ *and* $D = 0$.
2. *S mobilizes in period t if* $\epsilon_t < \underline{\epsilon}_p^*(r, p)$ *and does not mobilize otherwise, for* $\underline{\epsilon}_p^*(r, p)$ *defined in Equation A.6.*
3. *Bargaining (only occurs if S has mobilized):*

(a) If $D = 1$, then G proposes to democratize and S accepts democratization.

(b) If $D = 0$ and $r < \hat{r}$, then G proposes $x_t = x^*$. S accepts any $x_t \in [x^*, 1 - \phi_A - r]$, and initiates a revolution in response to $x_t < x^*$.

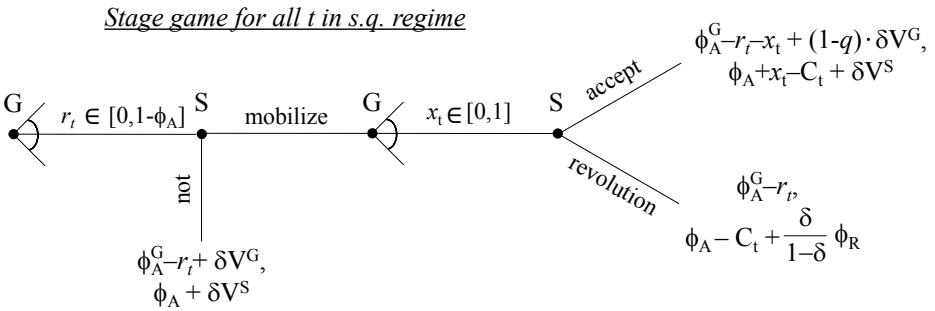
(c) If $D = 0$ and $r > \hat{r}$, then G proposes any $x_t \in [0, 1 - \phi_A - r]$ and S initiates a revolution in response to any $x_t \in [0, 1 - \phi_A - r]$.

Proof of Proposition 2. Part a follows directly from $H(\epsilon_l^*) \cdot q$ strictly decreasing in q and $\lim_{q \to 0} H(\epsilon_l^*) \cdot q = 0$. Part b requires two steps. First, it follows directly from the definition of $\tilde{q}$ that $\phi_A^G - r_l^*(\tilde{q}) - H\left(\underline{\epsilon}_l^*(\tilde{q})\right) \cdot x^*(\tilde{q}) < \phi_A^G - r_h^*$ is a necessary and sufficient condition for $1-\delta \cdot \left[1 - \tilde{q} \cdot H\left(\underline{\epsilon}_l^*(\tilde{q})\right)\right] < 1 - \delta \cdot \left[1 - H(\underline{\epsilon}_h^*)\right]$, and the latter inequality rearranges to $\tilde{q} \cdot H\left(\underline{\epsilon}_l^*(\tilde{q}) < H(\underline{\epsilon}_h^*)\right)$. Therefore, to establish the result at $q = \tilde{q}$, it suffices to demonstrate that $r_l^*(\tilde{q}) + H\left(\underline{\epsilon}_l^*(\tilde{q})\right) \cdot x^*(\tilde{q})$ strictly increases in ϕ_A^G and to set ϕ_A^G high enough. Second, because $H(\epsilon_l^*) \cdot q$ strictly decreases in q, it follows (given the first result) that ϕ_A^G sufficiently high implies $H(\epsilon_l^*) \cdot q < H(\underline{\epsilon}_h^*)$ for all $q < \tilde{q}$. ■

A.3 Self-Enforcing Repression Levels

Assuming that G chooses a repression level r at the outset of the game to which it can subsequently commit simplifies the exposition of the main model results, but also raises questions about whether the model results hinge on this somewhat extreme degree of assumed commitment ability. This section shows this is not the case by relaxing the *assumption* that G can commit to the same repression level in every period, and shows how this can arise endogenously in a non-stationary SPNE. Formally, assume that G chooses $r_t \in [0, 1 - \phi_A]$ as the first move in every period of the game. Figure A.2 presents the modified game tree. This section does not consider the democratization option to minimize notation, although the intuition is similar if democratization is allowed.

Figure A.2: Game Tree with Per-Period Repression Choice



In addition to allowing G to choose r_t in every period, relaxing the stationarity assumption enables examining whether history-dependent punishments can be self-enforcing. Proposition A.2 shows this is indeed possible. In the strategy profile, G chooses the optimal level of repression spending that is low enough to facilitate peaceful bargaining in a mobilization period. If G ever deviates to a higher repression level, then S will punish G by initiating a revolution in the next period that it mobilizes. Therefore, unlike the stationary strategy profiles evaluated above, S's strategy conditions on actions by G in previous periods. The conditions under which this strategy profile constitutes an equilibrium resemble the conditions from Proposition

A.1. Only if the political survival and predation effects are weak is this strategy profile incentive compatible for G. Otherwise, G can profitably deviate to choosing a high level of repression despite eventually causing revolution.

Proposition A.2 (Non-stationary equilibrium with per-period repression choice)**.** *To denote the phase of the game, $\mathbb{P}_t$ is the set of periods between (1) the greater of the first period of the game and the period in which the most recent revolution occurred, and (2) period $t-1$. Assume $q < \tilde{q}$.*

1. *G's repression choice:*
   (a) *If $r_j \leq \hat{r}$ for all $j \in \mathbb{P}_t$, then $r_t = r_l^*$.*
   (b) *If $r_j > \hat{r}$ for any $j \in \mathbb{P}_t$, then $r_t = r_h^*$.*
2. *S's mobilization choice:*
   (a) *If $r_j \leq \hat{r}$ for all $j \in \mathbb{P}_t$ and $r_t \leq \hat{r}$, then S mobilizes if $\epsilon_t < \underline{\epsilon}^*(r_t, r_l^*)$ and does not mobilize otherwise, for r_l^* defined in Lemma A.2 and $\underline{\epsilon}^*(r_t, r^*)$ implicitly defined as:*

$$\underbrace{\phi_A - \left[F + c(r_t) + \underline{\epsilon}^*(r_t, r^*)\right] + \frac{\delta}{1-\delta} \cdot \phi_R}_{E[U_S(\textit{mobilize})]} - \underbrace{\left[\phi_A + \delta \cdot V^S\left(r^*, \underline{\epsilon}^*(r^*)\right)\right]}_{E[U_S(\textit{not})]} = 0.$$

   Lemma 1 defines $\underline{\epsilon}^*(r^*)$ and Equation 4 defines V^S.
   (b) *If $r_j > \hat{r}$ for any $j \in \mathbb{P}_t$ or if $r_t > \hat{r}$, then S mobilizes if $\epsilon_t < \underline{\epsilon}^*(r_t, r_h^*)$ and does not mobilize otherwise, for r_h^* defined in Lemma A.2.*
3. *Bargaining (only occurs if S has mobilized):*
   (a) *If $r_j \leq \hat{r}$ for all $j \in \mathbb{P}_t$ and $r_t \leq \hat{r}$, then G proposes $x_t = x^*$, for x^* defined in Equation 5. S accepts any $x_t \geq x^*$ and otherwise initiates a revolution.*
   (b) *If $r_j > \hat{r}$ for any $j \in \mathbb{P}_t$ or if $r_t > \hat{r}$, then G proposes $x_t = 0$ and S initiates a revolution in response to any proposal.*

Proof of Proposition A.2.

1a. Follows by construction of r_l^* and $\tilde{q}$.

1b. The strategy profile states that S will initiate a revolution in the first strong period in this subgame. By construction, r_h^* maximizes G's lifetime expected consumption in such a subgame.

2a. Follows by construction of S's mobilization indifference condition and because the $r_t = r_l^*$ in all future periods in this subgame.

2b. Follows by construction of S's mobilization indifference condition and because the $r_t = r_h^*$ in all future periods in this subgame.

3a. In this subgame, the strategy profile states that $r_t = r_l^*$ in all future periods. By construction of x^*, S cannot profitably deviate from accepting any offer such that $x_t \geq x^*$. Because $r_l^* < \hat{r}$, by definition of $\hat{r}$, x^* satisfies $B^* \geq 0$. G cannot profitably deviate to $x_t < x^*$ if it is sufficiently patient because

revolution induces strictly lower expected consumption for G in all periods $s > t$. G cannot profitably deviate to a feasible $x_t > x^*$ because this yields strictly lower consumption for G in period t and the same expected consumption for G in all periods $t > s$.

3b. The strategy profile states that $r_t = r_h^*$ in all future periods until the next revolution. Because $r_h^* > \hat{r}$, by definition of $\hat{r}$, S strictly prefers revolution to any offer that satisfies $B^* \geq 0$. Additionally, the existence of $r_t > \hat{r}$ in period t or in $\mathbb{P}_t$ implies that $V_d^S = 0$. G cannot profitably deviate from $x_t = 0$ because all feasible offers will be rejected. ■