The Authoritarian Wager:
Mass Political Action and the Sudden Collapse of Repression

Branislav L. Slantchev*
Department of Political Science, University of California – San Diego

Kelly S. Matush
Department of Political Science, University of California – San Diego

July 19, 2016

Abstract Authoritarian rulers sometimes repress mass political action against their regimes and sometimes allow it to happen even if it leads to social conflict and their ouster. The sudden collapse of repression in regimes that had formerly relied on it is especially puzzling when governments have well-funded and reliable security forces that could have been used. We develop a game-theoretic model that explores the incentives of authoritarian rulers to repress and allow more open contestation. Rulers who do not know the distribution of preferences among the citizens must employ indiscriminate repression that makes any political action costly. If rulers have the capacity to fully repress any political action, then they create despotic regimes. But if their capacity is constrained and they expect that some challenges might occur, then they might prefer to make contestation as open as possible. Because the regime survives unless challenged by opponents, there is a status quo bias in favor of its supporters, which makes them less likely to come to its defense. We identify conditions under which this emboldens opponents sufficiently to overcome the costs and risks of taking action against the regime. In these cases, rulers can be better off abandoning repression in order to encourage their supporters to act. In doing so, they must wager their survival on the outcome of the ensuing conflict.

*Corresponding author. E-mail: slantchev@ucsd.edu. We gratefully acknowledge financial support from the National Science Foundation (grant SES-1153441). Presented at the 2016 meeting of the Network of European Peace Scientists (Milan, Italy). Cum aliquid mathematicorum sit altum viditur.

Revolutions are not made; they come.

Wendell Phillips, 1852

It is not true that nobody foresaw the 1989 revolutions that toppled the communist governments in Eastern Europe. Setting aside the arguments for the inevitable collapse of communism — arguments that would submit to no time-table for the event they purported to predict, that contained large elements of wishful thinking, and that at any rate still envisioned long-haul containment right up to the fall — we have the analyses of specialists who had noted the economic stagnation, the fall in consumption, the deteriorating social conditions since the late 1970s, and who were forecasting popular upheavals and political crises by the mid 1980s.[1] As these analysts duly noted, all structural factors were pointing to an impending systemic shakeup, but even they usually assumed that the Soviet government (and its satellite regimes) would use violence to keep itself in power and maintain the integrity of the union and the bloc. After all, this was exactly what had happened in East Germany (1953), Hungary (1956), Czechoslovakia (1968), and Poland (1981). It was because of that assumption that even as late as May 1988 the intelligence services estimated that the likelihood of serious challenges to Party control in Eastern Europe over the next five years ranged from remote to low. This was the consensus among academic Sovietologists as well (Howard and Walters, 2014). There was a real surprise in 1989 but it was not that people took to the streets — they had done so before. It was that the East European communist governments did not defend themselves vigorously like the Chinese government had done just months prior.

The mass uprisings that swept the Middle East in 2011 were foreseeable as well — after all, the region had been mired in high unemployment, low wages, and social injustice for decades — even if many were still caught by surprise as the region had also always seemed "ever on the verge of explosion that never occurs" (Waterbury, 1970, 61). Moreover, the sudden collapse of repression in Eastern Europe had imbued mass political action with almost mystical powers: it seemed that as long as enough people could get organized, they could take on even the most dictatorial regimes. Unfortunately, the Velvet Revolutions proved to be unreliable analogies for what transpired next. Despite determined attempts to usher democracy, the people could not repeat the feat of 1989. Instead, aside from Tunisia, where their efforts led to shaky democratization, the outcomes ranged from dismal to disastrous: a military coup (Egypt), a failed state (Libya), a drastic repression (Bahrain), a prolonged strife (Yemen), and a bloody civil war (Syria). One could also easily add to this list the resilient authoritarianism in some of the Soviet successor states, and the Iranian revolution-that-wasn't (2009). People taking to the streets, in numbers never before seen, did not topple all dictators, and even when they did, all they got was another ruler of the same stripe. When they failed, they often ended up far worse than before.

The research that sought to explain the outcomes in Eastern Europe studied how the early stages of protests could trigger behavioral or informational cascades that induced even more people to join them, producing a snowballing effect that pressured governments to change. Elaborations analyzed how protest participants coordinate their efforts, and emphasized communications technologies, net-

[1] For a sober assessment of what the Central Intelligence Agency did and did not predict, see MacEachin (1996). The declassified national intelligence estimates, including NIE 11/12-9-88, May 1988, *Soviet Policy Toward Eastern Europe Under Gorbachev*, are available in Fischer (1999).

work linkages, and cross-border contagion.[2] In a way, these studies sought to supplant the older structuralist theories that explained successful regime change as the result of the state's inability to repress the discontent because of some debilitating weakness arising from a fiscal crisis or a military disaster, among others.[3] But the melancholy record of the Arab Spring occasioned the return of structuralism with a vengeance, albeit with a renewed, and doubtless well-placed, emphasis on the role of the military as a (dis)loyal tool of the regime (Gause, 2011).[4]

It is fascinating, however, that for all their differences these research traditions are very similar in one respect: they do not consider repression to be a matter of choice for the government. The citizen-based tradition assumes that the ruler would not be able to repress popular protests that become sufficiently large. The state-based tradition assumes that the ruler would always want to repress them (but might be prevented from doing so). Neither considers seriously the possibility that the ruler might deliberately abandon repression and run the risk of open political contestation even when the coercive apparatus shows no signs of disloyalty. Yet, there are good reasons to think that this is precisely what happened in Eastern Europe, where the governments disposed of extensive security forces. It is imperative that we study what makes repression more or less desirable for an authoritarian government concerned with its survival in power.[5]

We present a model of the interaction between a ruler, who can use repression to increase the costs of any political action, and citizens, who must decide whether to engage in such action, and if so, whether to support or oppose the ruler, or do nothing at all. We show that the status quo bias in favor of supporters weakens their incentive to come to the defense of the regime when it is threatened by dissidents who stand to lose unless they act. We then demonstrate how these asymmetric incentives result in different responses to repression: supporters become strictly more likely to abstain from any action, whereas under some conditions opponents might become even more emboldened.

We find that if the government cannot repress sufficiently severely to deter all but the most extreme dissidents, then it might be strictly better off abandoning repression altogether. By doing so, it puts the well-being of its supporters at significant risk, which provides them with an incentive to act to prevent the ouster of the ruler. This authoritarian wager is the bet the government takes that unleashing mass political action could work out in its favor. How this wager plays out is uncertain: if it turns out that the dissidents are not, after all, fully committed against the regime, the ruler remains in power (regime reassertion); if it turns out that the government has overestimated how supportive the citizens are of the regime, then the ruler is ousted (velvet revolution); and if there are enough committed opponents and supporters, then a costly conflict ensues and the ruler survives it with probability that depends on the regime's coercive power.

The model further shows how even a relatively modest deterioration of capacity could cause the sudden collapse of repression, which could lead anything from a reassertion of regime's authority to

[2] See Kuran (1991), Lohmann (1994) on cascades, and Beissinger (2007), Maves and Braithwaite (2013) on coordination and contagion.

[3] This tradition starts with Skocpol (1979).

[4] Among the factors that are said to determine whether the military remains loyal to the regime or stands aside or even joins he dissidents, one finds their professionalization and bureaucratization (Bellin, 2012), hierarchical organization (Albrecht and Ohl, 2016), relationship with the opposition (Nepstad, 2011), and the nature of leadership succession (Brownlee, Masoud, and Reynolds, 2013).

[5] Svolik (2012), Lee (2015) and McMahon and Slantchev (2015) study how the government can provide incentives to the military to remain loyal, which can in turn affect whether it resorts to repression. They do not study the effectiveness of repression itself.

regime change to civil war. Because of the risks involved and the possibility of conflict, only rulers who are relatively confident in their power choose to gamble with open political contestation. Those whose position is already shaky will prefer to keep repressing up to their capacity and take their (now lower) odds of survival in a despotic regime. This could imply that the sudden collapse of repression is a signal of regime strength rather than weakness, which in turn improves the chances of the ruler who opts for that strategy. In the end, the answer to the question why rulers might abandon repression even when they can still engage in it is simple: because they expect to benefit from doing so. The trick, of course, is figuring out why this might be the case.

1 Authoritarian Regimes and Mass Political Action

Every analysis of regime collapse that involves some sort of mass political action must start with the grievances that drive citizens into open resistance. Gurr (1970) argued that relative deprivation — the discrepancy between what individuals believe they are entitled to and what they actually have — is the fundamental source of popular discontent, and that the angry psychological response to frustration is what drives people to political violence. Almost immediately, this hypothesis came under fire for focusing on the wrong motivation and for neglecting the capacity for action.[6]

Muller (1972) found that groups resorted to violence when they did not trust the political authorities and when they believed that violence might be fruitful. Anger, that is, was not nearly enough to drive them into the streets — people needed solid reasons for costly political action, and an unresponsive or illegitimate government was as good a reason as any (Muller, 1979). The only problem is that people can be quite aggrieved and live in a system widely perceived as unjust for a very long time without mounting any political action against it (Tarrow, 1993; Portes, 1995).

Why do potential rebels fail to rebel? It could be that the necessary action is very risky and costly to those who undertake it while any benefits it realizes are available to participants and non-participants alike. This gives it the flavor of a public good and raises the familiar collective action problem (Olson, 1971). While all potential rebels would enjoy the fruits of a successful rebellion, each has individual incentives to free-ride on the efforts of others (Taylor, 1987). Moreover, dissidents face tremendous coordination problems because they operate in environments where information about intentions of others is both scarce and likely wrong because of preference falsification (Kuran, 1995*b*). One is tempted to conclude that these obstacles would render mass political action nearly impossible. Not so, argued Lichbach (1995), who catalogued these problems and identified strategies (e.g., the use of revolutionary vanguards) that could be employed to overcome them.[7] Lichbach (1994) concluded that the existence of these strategies indicates that we should focus on the struggle between opponents trying to implement them and a regime trying to impede them.

Even then, potential rebels might confront debilitating capacity constraints. Tilly (1978) argued that dissidents without the necessary resources and organizational capacity to mobilize would not be capable of political action irrespective of the power of their motives. From there it was but a short step to note that resource mobilization by the aggrieved and their repertoire of political action might both depend on the political system and the government's strategy for dealing with opposition (Sharman,

[6] Brush (1996) documents the weak empirical support of the relative-deprivation hypothesis.

[7] Ginkel and Smith (1999) show how dissidents who are better informed about the power of the regime than the rest of the public could signal to the latter when it is appropriate to mobilize. Bueno de Mesquita (2010) provides a mechanism in which revolutionary vanguards use violence to coordinate the beliefs of potential protesters.

2003). Regimes that are closed to political participation and highly repressive offer no channel for collective action to express grievances and demand changes, leaving violence as the only option. But since their repressiveness makes it very difficult for dissidents to organize, the likelihood of any such action is very small. Regimes that are open to political participation and non-repressive offer numerous channels for collective action, making violence unnecessary. As a result, the probability of such action is also very small. It is in intermediate regimes with their unhealthy mix of having too few political channels but not possessed of the strength to repress harshly enough that political violence is most likely (Eisinger, 1973; Muller, 1985).[8]

Thus, the two strands of research — one studying the microfoundations of rebel participation, and the other focusing on group resource mobilization — converge on the point that to understand violent political action, one must analyze how the government prepares for it, and how it acts on it. Tilly (1993, 5) is emphatic: "whatever else they involve, revolutions include forcible transfers of power over states, and therefore any useful account of revolutions must concern, among other things, how states and uses of force vary in time, space and social setting."

This might appear self-evident, but it is striking to what extent research has assumed away the role of the state even, paradoxically, when it has made it the central part of the arguments. The absent state is most noticeable in the mechanisms that explain mass political action as the result of behavioral (Kuran, 1991) or informational — whether it is about the regime (Lohmann, 1994) or the preferences of other citizens (Kricheli, Livne, and Magaloni, 2011) — cascades. In these models, people will only act if they believe enough others will join them, which means that inaction can be a self-fulfilling prophecy irrespective of the true distribution of preferences in the population. Small groups of early participants could, however, persuade more abstainers to join them, and the swelling crowd might, under certain condition, trigger an avalanche creating a mass protest. But where is the state in all of this? Why would the government not disperse the initial small protests? Would the government respond with concessions or coercion when confronted with the large protests? It is not even clear how aggregated individual grievances would cause the demise of a repressive regime while the coercive apparatus remains loyal to it. As Portes (1995) put it in reference to the abortive Russian revolution of 1905, "so long as tsarist troops were willing to fire, the autocracy was secure." The revolutionary bandwagon (Kuran, 1991) might be part of the explanation of why people turn out in the streets but the outcome depends on whether the state represses (Tilly, 1993). History is littered with failed revolutions, and even though these attacks on coercive regimes were often unforeseen, their dismal wrecking was far more predictable.[9]

This, of course, is the essence of the traditional structuralist approaches to explaining revolutions: as long as the state retains its capacity to repress, dissidents have no chances of success. These political movements can only achieve anything when the state is disabled somehow by a fiscal crisis, international pressure, or military overextension (Skocpol, 1979), or when its ability to coordinate a response is compromised because the elites are split on how to confront the challenge (Goldstone,

[8] In all fairness, Gurr (1970, Chpts. 5-6) did discuss the role of the balance between the aggrieved groups' capacity to act and the government's capacity to either channel their discontent or repress them. Unfortunately, this discussion appeared as an afterthought and was mostly ignored by his critics and proponents alike.

[9] One cannot simply side-step this problem by arguing that cascades provide an explanation of mass political action instead of successful revolutions. The core of the mechanism relies on strength in numbers: the more people show up, the more likely is that they will prevail, which in turn encourages more to show up (DeNardo, 1985). If the correspondence between numbers and probability of success is broken, the mechanism falls apart.

1991; Lachmann, 1997), or when its coercive apparatus is of dubious loyalty (Gause, 2011). We can set aside the fact that many societies are often ripe for revolution according to these factors but never see one, and instead note that even though these models make the state the focus of analysis, they deny it any agency (Kiser, 1995). Repression seems important but it is taken as a given — a background condition or a regime characteristic — and the analysis proceeds toward factors that determine it. But nowhere here is the government doing that determining. The implicit assumption seems to be that, barring cosmetic concessions to placate some of the malcontent, repression in authoritarian regimes is a no-brainer: if the rulers could repress, then they would. When they do not, it is because they cannot, not because they might not want to.

Why should that matter? Because regimes often retain sufficient capacity to repress largely disorganized and unarmed crowds, especially if they are small as they would have to be before they trigger a cascade. Now, one could argue that there are structural reasons that might force a government to relax its repression, as Collins (1995) does in the case of the Soviet Union. And one could assert that it was the "removal of the Soviet threat, with Gorbachev's unwillingness to commit Soviet troops to support East European Communist governments" that precipitated their downfall (Coleman, 1995). But the evidence for this is thin: the Soviet troops did fire on protesters in Lithuania when ordered to do so, the security forces in East Germany did disperse demonstrators when ordered to do so, and even in Czechoslovakia the repressive apparatus kept dissidents at bay when ordered to do so. It is by no means clear that the security forces would have disobeyed orders or lacked the capacity to quell any disturbances. Repression collapsed because the governments chose not to order the internal security forces and the armies to suppress the demonstrations. It is this choice that needs explaining:

Why does the ruling regime choose not to repress even though it could?

One possible response would be to press into service the studies that ask why authoritarian rulers allow elections (Gandhi and Lust-Oskar, 2009).[10] It has been argued that they could do so (i) to signal their competence in order to deter potential protesters (Egorov and Sonin, 2014); (ii) to reveal the likely consequences of conflict in order to prevent mutual overconfidence (Londregan and Vindigni, 2006); (iii) to find out how powerful their rivals are in order to avoid a violent bargaining breakdown (Cox, 2009); (iv) to change public perceptions of regime's popularity in order to prevent threats to its rule (Rozenas, 2012). As Little, Tucker, and LaGatta (2015, 1142) aptly summarize this approach, for these regimes "an election is nothing but a public signal of the incumbent's popularity." For these types of arguments to work, however, elections have to be informative; that is, their results have to reflect the true distribution of support more or less accurately. This requires regime opponents to self-identify through their votes in sufficiently large numbers. But why would they do so? After all, authoritarian rulers might disregard outcomes they do not like, and then these voters would be at the mercy of the very regime they had just declared against.[11] Perhaps more importantly, the citizens

[10] We are only interested in explanations that relate to mass political action. There are other reasons authoritarian rulers might allow elections or create institutions that facilitate collective action. For example, they could do so (i) to commit not to expropriate in order to encourage private investment (Gehlbach and Keefer, 2011); (ii) to induce the opposition to compete in elections in order to keep it divided (Magaloni, 2006); (iii) to involve the opposition in a legislature in order to give it a stake in the survival of the regime (Gandhi and Przeworski, 2007); (iv) to resolve intra-regime conflicts in order to signal that opposition to the regime would be futile (Geddes, 2006); (v) to obtain information about the loyalty and competence of their own supporters in order to distribute benefits (Blaydes, 2010); (vi) figure out where the opposition's bases of support are in order to target them later (Brownlee, 2007).

[11] See on making elections self-enforcing.

have to believe that either the ballot is secret or that they would not suffer terrible repercussions for casting the wrong vote. Needless to say, it is highly unlikely that citizens of authoritarian countries would sustain such beliefs given the nature of their governments. Citizens who could slip under the radar by keeping their preferences private instead opt to paint a target on their backs by revealing them through their behavior. Moreover, if citizens do act strategically, estimating each others' willingness to participate in risky political action can become exceedingly difficult (Kurzman, 2005, 170). The models get around all of this by simply asserting that elections provide some kind of noisy signal, treating citizens as non-strategic actors who cast votes with predetermined probabilities, or assuming that citizens sincerely vote their preferences. In a world where preference falsification is the norm and the possibility of coercion an ever-present shadow, this amounts to assuming the explanation the mechanism is seeking to provide. It is, therefore, the dissidents' choice that we need to explain:

> *Why do dissidents choose to reveal their opposition to the regime by participating in a political action?*

Even mechanisms that do analyze the strategic choices of dissidents tend to ignore the regime supporters. It is very common to give citizens the binary choice between protesting against the regime and doing nothing without allowing that some of them might have a preference for that regime in the first place. This might be due to normative bias: the explanations tend to assume that regimes are evil and imposed on their citizens. However, this might not be the case from the perspective of many of those citizens (Yurchak, 2005). Even Kuran (1991, 31) acknowledges that "It would be an exaggeration to suggest that *all* East European supporters of communist rule were privately opposed to the status quo." The group of regime supporters would include hardened ideologues, people who benefited from the system, and people who thought any alternative would be even worse. But if we are not in a world where everyone is a secret opponent of the regime, then we must reckon with the reaction of all those who stand to lose from regime change. For regime opponents to succeed, regime supporters must fail.[12] It is this choice, then, that we also need to explain:

> *Why do regime supporters choose not to defend the system from which they benefit?*

It is important to realize that regime supporters are not easily identifiable *a priori* for the same reason regime opponents are impossible to know: the government has no magic way of peering into peoples' minds to uncover their true preferences. Arguments based on preference falsification tend toward explaining why it is not possible for both citizens and the government to know the extent of real discontent with the regime — because people are loath to reveal it when they are afraid of reprisals (Kuran, 1995*a*). This is doubtless correct. But so is the other side of that coin: there is no way for both citizens and the government to know the extent of real support for the regime — because everyone shouts the appropriate slogans and is vying for a preferred position in the system. One might have been surprised by the abrupt collapse of communist regimes in Eastern Europe, but probably less so than the communist rulers amid the "spectacular miscalculation of the regimes'

[12] Chong (1991) offers a model with dissidents, supporters, and a ruling regime. It is, however, fundamentally non-strategic since actors have "propensities" to join, oppose, or respond to collective action, and although these might be related to other variables (e.g., the bandwagon rate increases with the level of supply of opponents), they are not deliberate choices.

assessments of their own popularity" (Sharman, 2003, 129). This might seem like a trivial restatement of the same problem but it is not because self-identifying as an opponent carries one set of costs and risks while self-identifying as a supporter carries another, which means that their incentives to engage in political action are different. At the very least, if the status quo prevails, as it will in the absence of decisive political action against it, the opponents lose and the supporters win. This suggests that regime supporters would find it less pressing to turn out, which could be a problem for a government that cannot identify them reliably enough to incentivize them. The government, then, has more things to worry about than who its enemies are. Including both sides in the contest that could seal the fate of the regime makes protests and revolutions part of the political process, which is consistent Moore's (1966) argument that they are not discontinuous events.

To address the three central questions we have posed for ourselves, out model must have several features. It must admit variation in citizen preferences for the regime and allow for preference falsification; that is, citizens can freely choose to act in support of the regime, against it, or abstain from any political action whatsoever, and their real preferences are private information. The citizens must face a coordination problem and, potentially, free-riding incentives because of the uncertainty of the intentions of others. The regime can only selectively target those who identify themselves through their actions; any other repressive choices must be indiscriminate in the sense that they would have to apply to real opponents and real supporters alike. The success of dissident political action must depend on the structural power of the regime but also on whether there is active citizen support for it or not.

In order to focus on the interaction between repression and mass political action, we shall abstract away from intra-elite conflicts, potential disloyalties of security forces, or possibilities for coups. Since we are interested in explaining the sudden collapse of repression as a choice, we shall bias the model a bit by assuming that repression is costless to the ruler, and that it is immediately effective. If we find that even under these conditions rulers sometimes prefer to abandon repression, our results would be more convincing.

2 The Model

A ruler faces potential political action from two citizens, $i \in \{1, 2\}$.[13] Let $t_i \in [0, 1]$ be citizen i's preference for the regime, so that her preference against it is $1 - t_i$. We shall refer to a citizen with higher values of t_i as a regime *supporter* (or being on the "right"), and a citizen with a lower value of t_i as a regime *opponent* (or being on the "left"). These labels are merely for convenience and are not meant to indicate the political orientation of the ruling regime or the opposition. Citizen i's preferences are privately known only to herself; the ruler and citizen j both believe that t_i is distributed uniformly over the range of possible values.

Before the citizens can act, the ruler implements a level of repression, $k \in (0, 1)$, which determines how costly any political action is going to be. For now, we shall assume that the ruler can choose any k he wishes. We shall introduce capacity constraints ($k_{\mathrm{L}} > 0$, possibly arbitrarily close to zero, to indicate the smallest cost the ruler can ensure, and $k_{\mathrm{H}} \in (k_{\mathrm{L}}, 1)$ to indicate the highest cost he can impose) after the unconstrained analysis reveals why they might matter. Since the ruler cannot reliably distinguish among supporters and opponents *ex ante*, preventive repressive measures that

[13] We refer to an arbitrary citizen as "she" and the ruler as "he".

		2		
		L	A	R
1	L	$1-t_1-k, 1-t_2-k$	$1-t_1-k, 1-t_2$	$W(t_1)-k, w(t_2)-k$
	A	$1-t_1, 1-t_2-k$	t_1, t_2	t_1, t_2-k
	R	$w(t_1)-k, W(t_2)-k$	t_1-k, t_2	t_1-k, t_2-k

FIGURE 1: The Citizen Political Action Game.

increase the cost of political action must be applied indiscriminately; that is, citizens pay k whenever they act irrespective of what they do. These measures are observable by both citizens.

The citizens simultaneously choose whether to *support* the ruler (R), *oppose* the ruler (L), or *abstain* (A) from any political action. If no citizen opposes the ruler, the ruler stays. If at least one citizen opposes him and nobody supports him, he is removed. If one citizen opposes him but the other supports him, a conflict occurs.

In this conflict, the regime prevails with probability $\pi \in (0,1)$, which for now we assume to be common knowledge. Conflict imposes an unconditional cost, $c > 0$, and a conditional cost, $\theta > 0$, on the citizens. The unconditional one reflects the fact that engaging in conflict is costlier than taking unopposed political action. Both citizens pay it. The conditional one reflects the fact that whereas a regime cannot punish or reward citizens based on their privately known preferences, it can certainly do so on the basis of their observable behavior. Only the citizen who ends up on the losing side in the conflict pays it, so we shall refer to it as a *targeted penalty*.[14] We shall explain later why the ruler chooses k but not θ at the outset. The expected conflict payoff to citizen i is $w(t_i) = \pi t_i + (1-\pi)(1-t_i-\theta) - c$ if she supports the ruler, and $W(t_i) = \pi(t_i-\theta) + (1-\pi)(1-t_i) - c$ if she opposes him. If even the most extreme regime supporter is unwilling to take a risk to prevent the certain victory of the opposition, then the analysis would not be very interesting. We rule out such a possibility with the following assumption.[15]

ASSUMPTION 1. If the most extreme regime supporter is certain that the other citizen will actively oppose the regime, then she prefers to engage in conflict than to abstain:

$$\overline{w} \equiv w(1) > 0.$$

Since $\theta > 0$, this assumption also requires that $\pi > c$. The overall game payoffs for the citizens are given in Figure 1.

We wish to assume that the ruler only cares whether he stays in office or not irrespective of how this is achieved. To this end, we assume that the ruler pays neither the cost of conflict nor any of the costs

[14] The conflict outcome is the only one that permits someone to be on the "wrong side" behaviorally. Since we assume that the regime stays unless there is unchallenged opposition, nobody is on the "wrong side" when it falls because of such action.

[15] We characterize the equilibria without assuming anything about this. The only role the restriction will play has to do with allowing the equilibrium to take different form depending on the cost of action k. Without such an assumption, no supporter ever does anything in equilibrium.

he can impose on the citizens. Although one could argue that these assumptions are not unrealistic, we are content to note that introducing positive costs for the ruler will not alter our general results (we shall explain why), and will therefore merely clutter the analysis. Thus, the ruler simply maximizes the probability of political survival.

The solution concept is Bayesian Nash equilibrium.

3 Common Knowledge of Citizen Preferences

To get some intuition about the role of privately known preferences, consider the model under complete information. If citizen $-i$ abstains, citizen i never supports the regime. She opposes it if, and only if, $1 - t_i - k > t_i$, or

$$t_i < \frac{1}{2} - \frac{k}{2} \equiv t_{\mathrm{M}}, \tag{1}$$

and abstains otherwise. If $-i$ supports the regime, citizen i never supports it herself. She opposes it if, and only if, $t_i > W(t_i) - k$, or

$$t_i < \frac{1}{2} - \frac{\pi\theta + c + k}{2(1-\pi)} \equiv t_{\mathrm{L}} < t_{\mathrm{M}}, \tag{2}$$

and abstains otherwise. Note that if the regime is actively supported, $t_i \in (t_{\mathrm{L}}, t_{\mathrm{M}})$ would "falsify her preferences" by abstaining while the extremists $t_i < t_{\mathrm{L}}$ would not (they act). Finally, if $-i$ opposes the regime, citizen i never opposes it herself. She supports it if, and only if, $w(t_i) - k > 1 - t_i$, or

$$t_i > \frac{1}{2} + \frac{(1-\pi)\theta + c + k}{2\pi} \equiv t_{\mathrm{R}} > t_{\mathrm{M}}, \tag{3}$$

and free-rides by abstaining otherwise. These cut-point types allow us to fully characterize the equilibrium of the political action game.[16]

PROPOSITION 1. *Consider the partition of preferences characterized by $t_L < t_M < t_R$. The political action game with complete information has a Nash equilibrium, where the strategies are as follows:*

- *if both $t_i \leq t_M$, then each citizen i opposes with probability*

$$\lambda_D = \frac{1 - 2t_{-i} - k}{1 - 2t_{-i}}$$

  and abstains with complementary probability;

- *if $t_i \leq t_M$ and $t_{-i} \in (t_M, t_R]$, then citizen i opposes and $-i$ abstains;*

- *if $t_i \leq t_M$ and $t_{-i} \in (t_R, 1]$, then (a) if $t_i \leq t_L$, then citizen i opposes, and $-i$ supports, and (b) if $t_i \in (t_L, t_M]$, then citizen i opposes with probability λ_A and abstains with $1 - \lambda_A$, while $-i$ opposes with probability φ_A and abstains with $1 - \varphi_A$, where*

$$\lambda_A = \frac{k}{w(t_{-i}) - (1 - t_{-i})} \quad \textit{and} \quad \varphi_A = \frac{1 - 2t_i - k}{1 - t_i - W(t_i)};$$

[16] All proofs and supporting results are in Appendix B.

- *if both $t_i > t_M$, then each citizen i abstains.*

This equilibrium is unique except when $t_i \leq t_M$ where there exist two additional asymmetric pure-strategy equilibria with one citizen opposing and the other abstaining. □

The existence of multiple equilibria when both $t_i \leq t_M$ poses a coordination problem for the citizens. Since we have assumed no pre-play communication, it is not reasonable to expect them to coordinate on one of the two asymmetric equilibria. Instead, we should expect them to play the mixed-strategy equilibrium. Figure 2 provides a compact illustration of the equilibrium in the political action game.

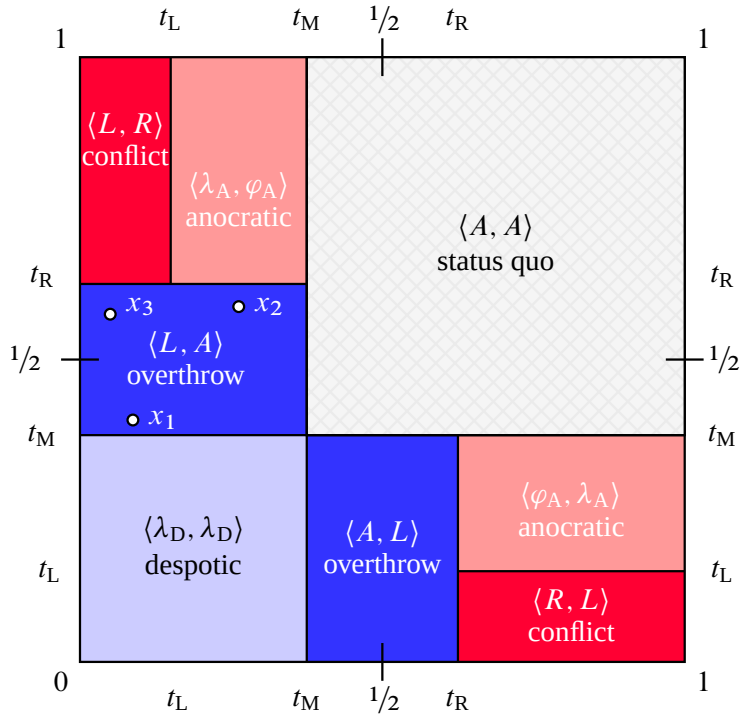


FIGURE 2: Political Action Equilibrium with Complete Information.

Consider the *status quo* region where both citizens abstain. Since it is bound by $t_M < 1/2$, it always covers the majority of preference profiles. The regime is practicing perfect deterrence, so none of the conflict-related parameters are relevant. Since t_M is decreasing in k, the ruler can always expand it to cover even more preference profiles. Because $\lim_{k\to 1} t_M = 0$, the ruler can ensure his survival regardless of the preference of the citizens by making repression sufficiently severe. This illustrates the crucial role that structural capacity constraints must play in this model: if the ruler cannot increase repression beyond k_H, and the preference profile is outside the status quo region at that limit, he must face different consequences. This is where things get interesting.

Consider a preference profile that lies outside the *status quo* region even at $k = k_H$, so the ruler cannot induce both citizens to abstain. What is he to do? Should he repress anyway, and if so, should he go all the way up to the capacity constraint k_H? Or should he repress less, and if so, should he go

all the way down to the lowest possible level k_{L}? The following is easier to follow with the help of Figure 2 if we take it to depict the situation when $k = k_{\mathrm{H}}$.

In the *conflict* and *overthrow* regions where citizens play pure-strategies, the level of repression has no effect on the outcome: the ruler either survives with probability π in the *conflict* region or is toppled with certainty in the *overthrow* region. However, since the bounds of these regions depend on t_{L} and t_{R}, which are functions of k, the ruler might be able to cause the preference profile to end up in a different region. To see how this can happen and analyze whether he would want to do it, note first how region bounds depend on repression:

$$\frac{\mathrm{d}\, t_{\mathrm{L}}}{\mathrm{d}\, k} = -\frac{1}{2(1-\pi)} < -\frac{1}{2} = \frac{\mathrm{d}\, t_{\mathrm{M}}}{\mathrm{d}\, k} < 0 < \frac{1}{2\pi} = \frac{\mathrm{d}\, t_{\mathrm{R}}}{\mathrm{d}\, k}.$$

If Figure 2 shows the configuration when $k = k_{\mathrm{H}}$, these imply that the *status quo* and *overthrow* regions are at their maximum extents, while the *conflict* and *despotic* regions are at their minimum extents. If a preference profile is in a *conflict* region now, there is nothing the ruler can do: repression cannot alter the outcome, and he simply has to take his chances.

Similarly, if the preference profile is in the *despotic* region, then it must remain there regardless of the level of repression. The outcome, however, does depend on repression because the probability that the opponents are active, λ_{D}, is decreasing in k. This means that the ruler's chance of survival is strictly increasing in k, and so for any such profile the ruler will go all the way and impose the highest repression his capacity will allow: $k = k_{\mathrm{H}}$.

Suppose now that the preference profile is in an *anocratic* region, where the ruler survives with probability $\Omega_{\mathrm{A}} = 1 - \lambda_{\mathrm{A}} + \pi\lambda_{\mathrm{A}}\varphi_{\mathrm{A}}$. It is evident from inspection that λ_{A} is increasing while φ_{A} is decreasing in k, which implies that

$$\frac{\mathrm{d}\,\Omega_{\mathrm{A}}}{\mathrm{d}\, k} = \pi\lambda_{\mathrm{A}} \cdot \frac{\mathrm{d}\,\varphi_{\mathrm{A}}}{\mathrm{d}\, k} - (1 - \pi\varphi_{\mathrm{A}}) \cdot \frac{\mathrm{d}\,\lambda_{\mathrm{A}}}{\mathrm{d}\, k} < 0.$$

Thus, if the ruler expects the anocratic outcome, then he is strictly better off reducing repression.

There are two aspects of this result that merit discussion because they appear counter-intuitive and because, as we shall see, they extend to the incomplete information setting as well. First, how come repression makes dissidents *more likely* to oppose the regime while its supporters *less likely* to defend it? In this region, one of the citizens is known to be rather favorable to the regime but the dissident is not sufficiently extremist to induce certain conflict. But if the dissident is not going to become active with certainty, then the supporter has no reason to act on behalf of the regime with certainty either; after all, she stands to benefit when the other abstains even if she does nothing. But if she abstains with positive probability, then the dissident has a stronger incentive to act. The strategies balance these incentives but the effect of repression is different because the incentives are different.

To understand the asymmetric effect of repression, think of the outcomes as being either good or bad for the citizens. For regime supporters, the ruler staying (status quo) is good, and his removal is bad, whereas for opponents, the ruler staying (status quo) is bad, and his removal is good. When a citizen acts, she gets the good outcome with the probability that the other does not act, and a lottery between the good and bad outcomes if she does (the weights in that lottery depend on π). When a citizen does not act, however, the incentives are different. The supporter gets the good outcome with the probability that the other citizen does not act, and the bad outcome otherwise. The opponent, on

the other hand, gets the bad outcome with certainty. Because abstention causes the ruler to remain in power, the status quo privileges the regime supporter, and gives the regime opponent a stronger incentive to act.

When repression increases the cost of political action, the supporter's willingness to come to the defense of the regime decreases, and if the risk of inaction were to remain the same, she would abstain. The only reason for her willingness to act must be that the risk of an outright loss in case of inaction is increasing (i.e., λ_{A} is going up). Thus, repression discourages supporters but the fact that dissidents are more emboldened keeps supporters in the political game. Increasing the cost of political action also decreases the opponent's willingness to challenge the regime, and the only reason she might still want to do it must be that the that the probability of her most preferred outcome is increasing (i.e., φ_{A} is going down). By weakening the incentive of supporters to act, repression is strengthening the incentive of dissidents to do so. As we have seen, this in turn puts pressure on supporters to remain active, which then limits just how bold the dissidents will be. The first key result can be summarized as follows:

RESULT 1 *Repression has direct and indirect effects in the anocratic equilibrium. The direct effect is* deterrent*: it discourages regime supporters and dissidents alike from political action. The indirect effect is* catalytic*: it encourages dissidents to take political action. The status quo bias in favor of supporters gives dissidents a stronger overall incentive to act, and as a result the catalytic effect is dominant for them. But since repression makes supporters less likely to act and dissidents more likely to do so, its total effect is to worsen the ruler's chances of survival.*

Since t_{R} is increasing in k, reducing repression can never induce an *overthrow* for an anocratic profile. It could, however, induce *conflict*. The ruler would only be willing to do that if $\pi > \Omega_{\mathrm{A}}$, or

$$\pi > \frac{1-\lambda_{\mathrm{A}}}{1-\lambda_{\mathrm{A}}\varphi_{\mathrm{A}}},$$

at the lowest level of repression that maintains the profile in the *anocratic* region. In other words, if the regime is sufficiently strong, then the ruler can reduce repression all the way to the minimum possible level, $k = k_{\mathrm{L}}$ even if doing so induces certain conflict. Weak regimes (for whom π is not sufficiently high) will also reduce repression although without setting it so low as to guarantee conflict. Overall, then, in the *anocratic* region the ruler always has an incentive to reduce repression, and that incentive is stronger for more powerful regimes. This leads us to the second key result:

RESULT 2 *The ruler's incentives to repress go in opposite directions depending on what equilibrium he expects to induce among the citizens: he wants to decrease repression in the* anocratic *region but increase it in the* despotic *region.*

As we shall see, these contradictory incentives will turn out to be fundamental to the incomplete information results.

The final observation we wish to make about the complete information case concerns a profile in the *overthrow* region, where the ruler is toppled with certainty. If the ruler could induce any other

outcome, he would be strictly better off. Since t_R is increasing but t_M decreasing in k, the ruler can shrink this region by *decreasing* repression.

If the profile is such that both $t_i < 1/2$ (e.g., x_1), then the ruler could induce the *despotic* equilibrium. As we have seen, his survival here increases in repression, which means that the ruler would only decrease k just enough to ensure that outcome but no further. At first glance, the difference between the *overthrow* and *despotic* profiles might appear paradoxical: why would the ruler be better off in the case where both citizens are known to be more intensely opposed to him? Looking at the incentives of the citizens reveals why this should be so. When it is common knowledge that both are quite opposed to the ruler, it is also common knowledge that they both want him deposed. But this creates a coordination problem because each has incentives to free-ride on the costly action of the other. The ruler can exploit this and aggravate the collective action problem by increasing repression. In contrast, when only one of the citizens is intensely opposed but the other only lukewarmly so, the opponent knows that unless she acts the ruler will stay in power. There is no incentive to remain inactive, which in turn means that the moderate has no incentive to act, and so the ruler is toppled. The intriguing implication of this logic is that *coopting citizens might not always be the best strategy for the ruler because it also resolves the coordination problem for the remaining extremists*.

If the profile is such that some $t_i > 1/2$ and $t_{-i} > t_L$ (e.g., x_2), then the ruler can then induce the *anocratic* equilibrium. As we have already seen, here the ruler does better by reducing repression even further, possibly all the way down to $k = k_L$. The same thing happens if the profile is such that some $t_i < t_L$ (e.g., x_3) because reducing repression induces *conflict*. Since k has no further impact, the ruler might as well go all the way down to $k = k_L$ here too.

This leads us to the third key result that highlights the incentive for a ruler to either go fully repressive, or, when his repressive capacity is too constrained, to go in the opposite direction instead.

RESULT 3 *A ruler who cannot increase repression enough to avoid* overthrow *by inducing the fully deterrent* status quo *equilibrium will decrease repression, possibly to its lowest feasible level, to induce either the* conflict *or* anocratic *equilibrium, or else just enough to create a coordination problem in the* despotic *equilibrium.*

Of course, all of these interesting findings are predicated on the preferences of the citizens being common knowledge, and we have gone to some lengths to agree with scholars who argue that this cannot be the case in authoritarian regimes. Consequently, we now turn to the incomplete information setting. Somewhat surprisingly, the analysis of that setting not only supports the same implications but in fact amplifies them because it shows them to hold generally irrespective of the true distribution of citizen preferences. Not knowing what citizens like turns out to be not so much of a problem for the citizens themselves as for the ruler because it makes his survival so much more problematic.

4 Private Information about Citizen Preferences

4.1 The Citizen Political Action Game

We now analyze the political action game played by the citizens when they are uncertain about each other's preferences. Since the level of repression is already set, they take all parameters as given

in Figure 1. We first show that in every equilibrium citizens partition themselves behaviorally into active opponents, abstaining moderates, and active supporters. Let λ_i denote the probability with which citizen i opposes the regime, and φ_i denote the probability with which she supports it.

LEMMA 1. *Fix some* $(\lambda_{-i}, \varphi_{-i})$*, and define* $t_L(\lambda_{-i}, \varphi_{-i}) < 1/2 < t_R(\lambda_{-i})$ *such that*

$$t_L(\lambda_{-i}, \varphi_{-i}) = \frac{1}{2} - \frac{(\pi\theta + c)\varphi_{-i} + k}{2(1 - \lambda_{-i} - \pi\varphi_{-i})}$$
$$t_R(\lambda_{-i}) = \frac{1}{2} + \left(\frac{1}{2\pi}\right)\left[(1-\pi)\theta + c + \frac{k}{\lambda_{-i}}\right].$$

In every equilibrium, citizen i *chooses* $\lambda_i = 1$ *if* $t_i < t_L(\lambda_{-i}, \varphi_{-i})$*, chooses* $\lambda_i = \varphi_i = 0$ *if* $t_i \in [t_L(\lambda_{-i}, \varphi_{-i}), t_R(\lambda_{-i})]$*, and chooses* $\varphi_i = 1$ *if* $t_i > t_R(\lambda_{-i})$. □

To find an equilibrium, we need to partition the type space for each citizen such that type $t_{\mathrm{L}}(\lambda_{-i}, \varphi_{-i})$ is indifferent between opposing and abstaining, whereas type $t_{\mathrm{R}}(\lambda_{-i})$ is indifferent between supporting and abstaining, and the probabilities, $(\lambda_{-i}, \varphi_{-i})$, reflect where these types are. Lemma 1 considerably simplifies this task because it implies that $\lambda_{-i} = \Pr(t_{-i} < t_{\mathrm{L}}(\lambda_i, \varphi_i)) = \max(0, t_{\mathrm{L}}(\lambda_i, \varphi_i))$, and that $\varphi_{-i} = \Pr(t_j > t_{\mathrm{R}}(\lambda_i)) = \max(0, 1 - t_{\mathrm{R}}(\lambda_i))$. This is sufficient to establish the following important result, which further eases equilibrium analysis.

LEMMA 2. *The regime opponents are active in every equilibrium:* $t_L > 0$. □

Lemma 2 means that the large stable region where both citizens abstain with certainty under complete information does not exist here. This implies that the only possibilities we need to consider turn on whether someone would support the regime; that is, whether $t_{\mathrm{R}} < 1$ for at least one of the citizens. Since the citizens are faced with a coordination problem and are assumed to be effectively anonymous (so cannot use pre-play communication), it is natural to restrict attention to symmetric equilibria. In particular, it is not reasonable to expect the citizens to coordinate expectations on precisely one of them supporting the regime with positive probability. We shall therefore require that $t_{\mathrm{R}} < 1$ is either true for both citizens or for neither. By analogy with the complete information case, we shall refer to an equilibrium where no citizen supports the ruler with positive probability as *despotic*, and to an equilibrium where someone could do so with positive probability as *anocratic*.

In a despotic equilibrium the least-committed supporter, t_{L}, must be indifferent between opposing the ruler and abstaining knowing that the other citizen will not support him ($\varphi_{-i} = 0$). Thus, $\lambda_i = \Pr(t_i \leq t_{\mathrm{L}}(\lambda_{-i}, 0)) = t_{\mathrm{L}}(\lambda_{-i}, 0)$, where the second equation follows from the uniform distribution assumption. A symmetric solution must therefore satisfy:

$$\lambda = t_{\mathrm{L}}(\lambda, 0), \tag{4}$$

whose unique positive solution is:

$$\lambda_{\mathrm{D}} = \frac{3 - \sqrt{1 + 8k}}{4} < \frac{1}{2}. \tag{5}$$

This defines the equilibrium probability of opposition in the despotic equilibrium. To complete the characterization, we must ensure that no supporter wants to be active: $\varphi_i = 0$. Since this will be the

case if, and only if, $t_{\mathrm{R}}(\lambda_{-i}) \geq 1 \Leftrightarrow k \geq \overline{w}\,\lambda_{\mathrm{D}}$, we obtain a necessary and sufficient condition for the despotic equilibrium:

$$k \geq \overline{w} \cdot h(\overline{w}) \equiv k^* \in (0, 1/2), \tag{D}$$

where

$$h(\overline{w}) = \frac{3 + \overline{w} - \sqrt{(3+\overline{w})^2 - 8}}{4} \in \left(1 - \sqrt{\frac{1}{2}}, \frac{1}{2}\right),$$

where we obtain the bounds by noting that $h(\overline{w})$ is decreasing and $\overline{w} \in (0, 1)$. This means that $k^* < \overline{w}/2 < 1/2$, yielding the upper bound on k^* reported in (D). We can now summarize our reasoning thus far as follows.

LEMMA 3. *In the unique* despotic *equilibrium, only the opponents of the regime are active with probability λ_D from* (5)*, and everyone else abstains. The equilibrium exists if, and only if, $k \geq k^*$.* □

What happens when condition (D) is violated? In this case some regime supporters will have a strict incentive to become active. In a symmetric equilibrium, this means that $\lambda = \Pr(t \leq t_{\mathrm{L}}(\lambda, \varphi)) = t_{\mathrm{L}}(\lambda, \varphi)$ and $\varphi = \Pr(t > t_{\mathrm{R}}(\lambda)) = 1 - t_{\mathrm{R}}(\lambda)$ must obtain. This yields a system of two equations and two unknowns:

$$\begin{aligned} \lambda &= t_{\mathrm{L}}(\lambda, \varphi) \\ \varphi &= 1 - t_{\mathrm{R}}(\lambda), \end{aligned} \tag{6}$$

This system also has a unique solution, $(\lambda_{\mathrm{A}}, \varphi_{\mathrm{A}})$, with both strictly less than $1/2$ and positive if, and only if, (D) is not satisfied. This is established in the proof of the following claim.

LEMMA 4. *In the unique* anocratic *equilibrium, opponents are active with probability λ_A, supporters are active with probability φ_A, where (λ_A, φ_A) is the solution to* (6)*, and everyone else abstains. The equilibrium exists if, and only if, $k < k^*$.* □

We can now formally state the result that follows directly from lemmata 3 and 4.

PROPOSITION 2. *The political action game with incomplete information has a unique symmetric equilibrium that takes the anocratic form when $k < k^*$ and the despotic form otherwise.* □

Comparing Proposition 2 with Proposition 1 shows that when we assume that preferences are private information, the multiplicity of forms the equilibrium can take is reduced from eight to just two. The forms that are eliminated all involve pure-strategy equilibrium play, which turns out to have been predicated on the knowledge of the distribution of preferences. It is the *despotic* and *anocratic* regions where citizens play mixed strategies with complete information that are representative of the general incomplete information case. This will be less surprising if one interpreted these mixed strategies in the sense of Harsanyi (1973): they are representations of what the citizens would do if their payoffs were randomly perturbed in ways known only to themselves.[17] Since it is tedious to write "equilibrium that takes the despotic (anocratic) form," we shall simply refer to despotic (anocratic) equilibria.

[17] See Govindan, Reny, and Robson (2003) for a general proof.

4.2 Status Quo Bias and the Asymmetric Effect of Repression

One might expect that indiscriminate repression should deter opponents from political action, but we now show that this is not always the case, and that the reason for this has to do with the fact that the deterrent effect of repression is dominant for regime supporters:

LEMMA 5. *Increasing repression makes regime supporters* less likely *to be active in the anocratic equilibrium.* □

This result, which echoes what we found with complete information, provides a crucial insight into the authoritarian dilemma of using indiscriminate repression to deter political action: *repressive measures deter supporters from engaging in action on behalf of the regime*. This might not be problematic for the regime if they are even more effective in deterring opponents, as is the case in the despotic equilibrium:

$$\frac{\mathrm{d}\,\lambda_{\mathrm{D}}}{\mathrm{d}\,k} = -\frac{1}{\sqrt{1+8k}} < 0. \tag{7}$$

In the anocratic equilibrium, on the other hand, repression weakens the incentive for political participation by supporters and opponents alike, and whereas supporters get unequivocally deterred from action, the opponents might not, as the following result shows.

LEMMA 6. *Increasing repression makes regime opponents* more likely *to be active in the anocratic equilibrium if, and only if,*

$$\theta + \frac{c}{\pi} + \sqrt{1+8k^*} > 2 \tag{P}$$

is satisfied. □

This result would not be too persuasive if (P) were difficult to satisfy. It turns out, however, that it is fairly easy to do so, especially under conditions that are likely to prevail in authoritarian regimes. That is so because a *sufficient* condition for (P) to obtain is $c > (1-\theta)\pi$, which is satisfied for many parameter configurations.[18] Figure 3 shows graphically the two possibilities identified in Lemmata 5 and 6. Thus, the indirect effect of repression can have the catalytic impact on dissidents that we found under complete information. The question now is whether the opposing tendencies of repression that we found with complete information also persist in this setting.

4.3 The Opposing Incentives to Repress

Turning now to the ruler, recall that he maximizes and probability of political survival and consider his initial choice of repression. In the despotic equilibrium, this probability is

$$\Omega_{\mathrm{D}} = (1-\lambda_{\mathrm{D}})^2, \tag{8}$$

that is, it is the likelihood that no citizen becomes an active dissident. It is immediately obvious from Figure 3 that repression is good for survival here because it suppresses opposition, the only relevant quantity.

[18] This is because $\sqrt{1+8k^*} > 1$. Note also that for this condition to obtain while Assumption 1 is satisfied, it is necessary that $\pi > 1/2$. In this case, the left-hand side of (P) is also strictly increasing in θ (Lemma D).

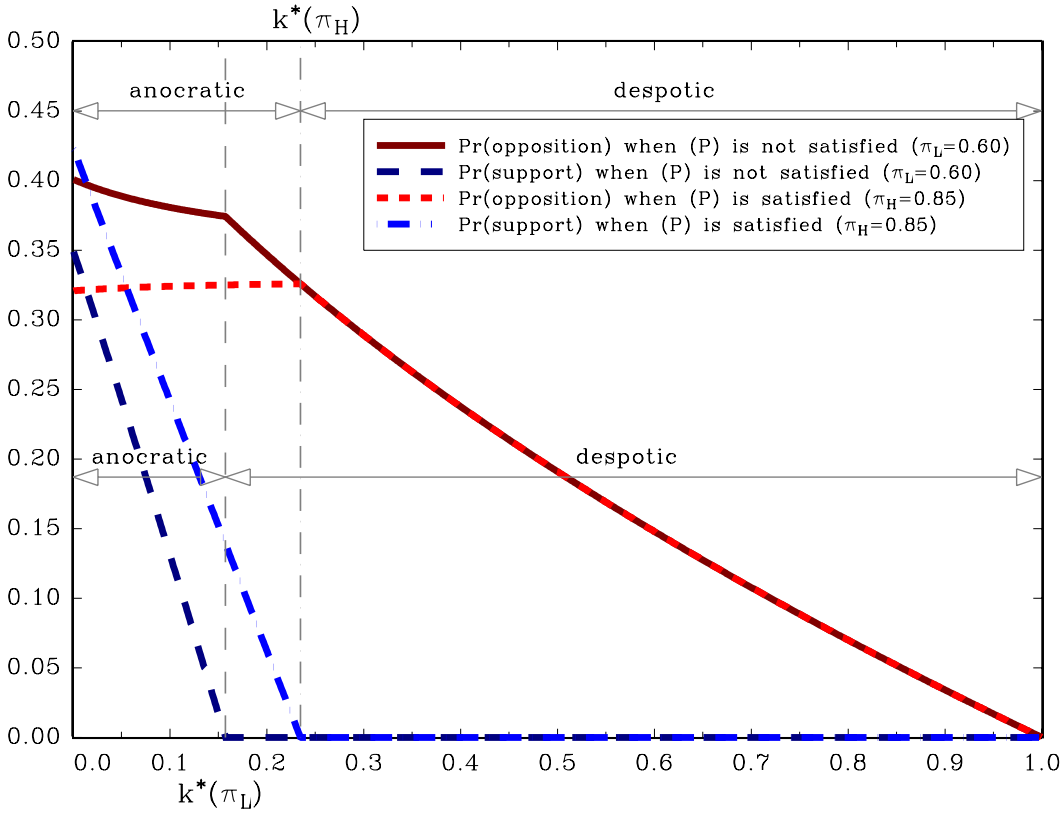


FIGURE 3: Repression and Political Action.
Parameters: $c = 0.1, \theta = 0.2$ and, $\pi_L = 0.60$ (weak regime) or $\pi_H = 0.85$ (strong regime). Condition (P) is satisfied for the strong regime but not for the weak one.

In the anocratic equilibrium, however, things are not so simple. The probability of survival here is

$$\Omega_A = (1 - \lambda_A)^2 + 2\lambda_A \varphi_A \times \pi, \tag{9}$$

where the first term is the probability that the ruler remains in power unopposed (analogous to the quantity in the despotic equilibrium), and the second is the probability that he survives the conflict when it occurs. One can immediately see that it increases if supporters are more likely to be active. Figure 3 suggests that repression should make the ruler worse off in this equilibrium. It would certainly do so when (P) is satisfied because then it results in higher opposition while depressing support. It seems to also do that even when (P) is not satisfied because the support is dropping much faster than opposition, so the loss of support should dominate the benefit from suppressing opposition. The following lemma shows that this is indeed the case.

LEMMA 7. *Increasing repression* increases *the probability of survival in the despotic equilibrium but* decreases *it in the anocratic equilibrium.* □

This replicates the main result from the complete information case: the ruler's incentives to repress run in opposite directions depending on the form the equilibrium of the political action game. This

means that if he expects the anocratic equilibrium, he will always choose the lowest feasible level of repression. Conversely, if he expects the despotic equilibrium, the ruler will always choose the highest feasible level of repression. Which equilibrium he expects depends on which one he is willing to induce, which in turn depends on the maximum level of repression he is capable of implementing. To establish this, we first note that any survival probability the ruler can attain in an anocratic equilibrium can be attained in a despotic equilibrium as well:

LEMMA 8. *For every anocratic repression, $k < k^*$, there exists a unique* despotic equivalent *repression, $\Delta(k) \in (k^*, 1)$, such that $\Omega_A(k) = \Omega_D(\Delta(k))$. The lower the anocratic repression, the higher its despotic equivalent.* □

Note the second claim of this lemma: the less repressive an anocratic ruler is, the more the equivalent despot has to repress in order to achieve the same probability of survival. Two other things follow from this result. First, anything the ruler can do for political survival (in expectation) in an anocratic equilibrium can be had with more, sometimes a lot more, repression in a despotic equilibrium. Second, the converse is not true: if the ruler can implement sufficiently high levels of repression, the survival probability in the despotic equilibrium will be strictly higher than anything he can attain in an anocratic equilibrium.[19] We can now establish the central result of this article, which is that under certain circumstances rulers strictly prefer to abandon repression and allow political contestation even though, in principle, they could still have chosen to repress.

PROPOSITION 3 (BANG-BANG). *Let $k_L \in (0, k^*)$ denote the lowest feasible cost of political action, let $k_H \in (k_L, c)$ denote the maximum level of repression the regime is capable of. The optimal level of repression takes one of these two extreme values: If $k_H > \Delta(k_L)$, then the ruler sets repression to k_H and the equilibrium takes the despotic form; otherwise, the ruler sets repression to k_L and the equilibrium takes the anocratic form.* □

If the ruler has sufficient capacity, he always prefers to repress any political action and induce the despotic equilibrium where he survives with high probability and no conflict occurs. If, however, his capacity is somehow constrained, he is strictly better off abandoning repression to make the authoritarian wager:

RESULT 4 *The* authoritarian wager *is the gamble a ruler takes by opening up the regime to contestation. When he reduces the costs of political action, the dissidents are encouraged to act, which threatens the status quo and provides an incentive to regime supporters to act in its defense. Thus, emboldening the opposition can, paradoxically, improve the ruler's chances of survival.*

The opening up to political contestation cannot be merely a sop to the dissidents that tries to fob them off with cosmetic changes in an attempt to provide a façade of popular legitimacy for the ruler.[20] It cannot work that way without offering a real, albeit not very large, prospect for change. But this very prospect creates a risk for regime beneficiaries, whose privileged position now comes under

[19] This follows from the fact that $\Delta(k) < 1$, which holds even as $k \to 0$. Any repression that exceeds this level will yield survival probabilities strictly higher than anything that can be achieved in an anocratic equilibrium.

[20] Magaloni (2006) and Schedler (2006), among others, have made this claim with respect to autocrats holding elections.

threat. This causes them to rally in support of the ruler, and the effect can sometimes be so strong that it overwhelms the dissidents, making them *less likely* to act even though repression is gone (when (P) is not satisfied). But even when the opponents are more likely to act (when (P) is satisfied), the ruler still expects to come out on top in the open contest even though its outcome is uncertain. Indeed, this is why he allows it.

It is important to realize that the wager entails risks to the ruler as well. On one hand, if he has overestimated just how committed his opponents are, the gamble will pay off handsomely as it will merely reassert the ruler's authority. On the other hand, if he has overestimated how popular the regime is with the citizens, the ruler will be in for a terrible surprise when nobody turns out to defend him. This is how a velvet revolution could come to pass. Finally, if the citizens are sufficiently divided in their preferences about the regime, the wager will bring costly conflict.

To understand the incentive behind the wager, it is useful to separate the anocratic outcomes into (i) *regime reassertion:* no dissidents are active, and the ruler stays in power peacefully; (ii) *civil conflict:* both dissidents and supporters are active; and (iii) *velvet revolution:* only dissidents are active and the ruler is deposed peacefully.[21] The most attractive outcome for the ruler is regime reassertion, and its probability depends on how repression affects dissidents. If (P) is satisfied — meaning that relaxing repression makes dissidents less likely to be active — then abandoning repression increases the chances that the ruler will reassert his power (Lemma A). Since the danger of a velvet revolution is minimized by abandoning repression as well (Lemma C), it is not surprising that the ruler would opt to do so under these circumstances irrespective of how this affects the risk of costly conflict.[22]

Things are a bit more involved when (P) is not satisfied — meaning that relaxing repression makes dissidents more likely to be active. In this case abandoning repression actually minimizes the chances that the ruler will reassert his power (Lemma A) and strictly increases the risk of civil conflict (Lemma B). Neither of these outcomes is particularly attractive to the ruler. However, since the probability of a velvet revolution is increasing with repression (Lemma C), the ruler can at least ensure the lowest possible chance of the worst possible outcome for him. In other words, by opening the system up for political contestation, the ruler is substituting the uncertainty of conflict for the risk of being overthrown in a velvet revolution. That he would do so even though it hurts the chances of outright reassertion of power indicates just how crucial the behavior of his supporters is.

In the ensuing conflict, the ruler could still be deposed but the odds are that he will survive this because the only rulers who take the bet are those who are sufficiently strong to prevail in that conflict with high probability. To see this, we need to examine the relationship between the regime's power and the propensity to choose the authoritarian wager.

4.4 Power and the Structural Causes of the Authoritarian Wager

Consider now two regimes that are equivalent in every respect except that one is stronger than the other in the sense that it has a higher probability of prevailing in a conflict. It should come as no surprise that the stronger regime is in a strictly better condition whenever conflict is expected with

[21] The probabilities are $(1-\lambda)^2$ for regime reassertion, $2\lambda\varphi$ for civil conflict, and $1-[(1-\lambda)^2+2\lambda\varphi]$ for velvet revolution.

[22] The risk of conflict could be concave or decreasing in repression when (P) is satisfied (Lemma B), but since Lemma 7 is unconditional, the influence of reducing the probability of a velvet revolution and increasing the probability of regime reassertion dominate the incentives.

positive probability:

LEMMA 9. *Stronger regimes are as likely to survive as weaker ones in the despotic equilibrium, and more likely to do so in the anocratic equilibrium:*

$$\frac{\mathrm{d}\,\Omega_D}{\mathrm{d}\,\pi} = 0 \quad \textit{and} \quad \frac{\mathrm{d}\,\Omega_A}{\mathrm{d}\,\pi} > 0. \qquad \square$$

This, of course, is what our third observation in the complete information case already should have made us expect since more powerful regimes have stronger incentives to reduce repression when they cannot ensure the fully despotic stability. What might be surprising is the implication this has for the structural causes of repression collapse. We begin by noting that the fact that stronger regimes have strictly higher expected probabilities of survival in an anocratic equilibrium (Lemma 9) means that they have strictly higher despotic equivalences too (Lemma E). But then Proposition 3 implies that *stronger regimes will be more sensitive to changes in repressive capacity* in the sense that a moderate degradation in that capacity can cause the ruler of a strong regime to abruptly abandon repression whereas the ruler of a weak regime would respond by scaling repression down to the new maximum capacity.

Figure 4 illustrates this. The two regimes are equivalent except that the weak one's probability of winning the conflict is π_{L}, and the strong one's probability is $\pi_{\mathrm{H}} > \pi_{\mathrm{L}}$. Consider first the case where they both have high repressive capacity, say, k_{H}^1. This is higher than the despotic equivalents of k_{L} for both regimes, so they both repress at k_{H}^1 and the despotic equilibrium prevails for both.

Suppose now that for some reason their capacity to repress drops to some moderate level, say $k_{\mathrm{H}}^2 < k_{\mathrm{H}}^1$. This is less than the repressive equivalent of k_{L} for the strong regime. This means that its ruler is strictly better off abandoning the despotic equilibrium and switching to low repression at k_{L} and taking his chances in the probable conflict in the resulting anocratic equilibrium. The moderate repressive capacity, however, still exceeds the despotic equivalent of k_{L} for the weak regime. This means that its ruler is strictly better off reducing repressing to the new maximum capacity and maintaining the despotic equilibrium. In other words, this structural change in capacity will cause repression to collapse suddenly in the strong regime but will only cause some moderation of the weaker regime without changing its nature.

Does this mean that stronger regimes are more susceptible to instability? Are they colossi on clay feet? It depends on how one defines instability. If one defines it as the probability of conflict, then yes, stronger regimes are more likely to experience conflict because of the switch to the anocratic equilibrium. However, their rulers are willing to risk that conflict because they have better chances of prevailing than those of weak regimes. Thus, if one defines instability as the probability that the regime will collapse, then no, stronger regimes are not more likely to collapse.

This can be easily seen in Figure 4, where the structural reduction of repressive capacity leaves the weak regime with best survival probability of $\Omega_{\mathrm{D}}(k_{\mathrm{H}}^2; \pi_{\mathrm{L}}) = 0.58$ in the despotic equilibrium, while the strong regime still has a survival probability of $\Omega_{\mathrm{A}}(k_{\mathrm{L}}; \pi_{\mathrm{H}}) = 0.68$ in the anocratic equilibrium. While both regimes are worse off compared to what they could achieve when they are more capable of repression, $\Omega_{\mathrm{D}}(k_{\mathrm{H}}^1; \cdot) = 0.76$, the capacity constraint impact on the stronger regime is less pronounced. Far from signifying an impending fall of the regime, the sudden collapse of repression is a sign of strength. This leads us to ask whether the ruler can benefit from reducing repression when citizens are uncertain about the strength of the regime: can abandoning repression be a signal of regime power?

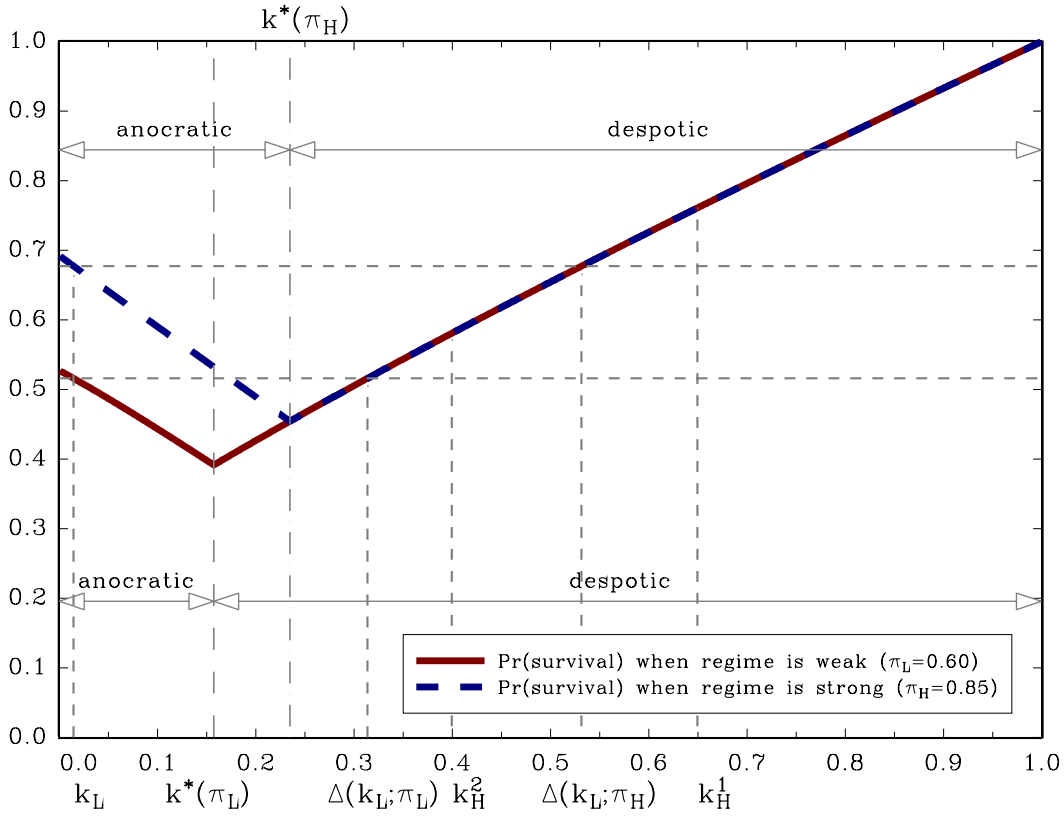


FIGURE 4: The Sudden Collapse of Repression.

Parameters: as in Figure 3. For both regimes, the least cost of political action is at $k_{\mathrm{L}} = 0.015$, and the repression constraint is either at $k_{\mathrm{H}}^{1} = 0.65$ (high capacity) or $k_{\mathrm{H}}^{2} = 0.40$ (moderate capacity).

5 Can the Collapse of Repression Signal Regime Strength?

Consider a version of the model where the ruler knows the true probability of prevailing in a conflict, but the citizens do not. All other parameters, including any capacity constraints, are the same. Assume that the ruler can be either strong, in which case he wins with probability p_{H}, or weak, in which case he wins with probability $p_{\mathrm{L}} < p_{\mathrm{H}}$. The citizens have a common belief $s \in (0,1)$ that he is strong. If we let $\hat{s}$ denote the posterior belief after the ruler sets k, then the citizens' expected probability of him winning is $\pi = \hat{s}\,p_{\mathrm{H}} + (1-\hat{s})\,p_{\mathrm{L}}$. With this notation, Proposition 2, as well as lemmata 5 and 6, remain unchanged.

We now wish to ascertain whether it is possible to construct a separating equilibrium in which the ruler reveals his actual strength by choosing different levels of repression. To make the model interesting, assume that the capacity constraint, k_{H}, is binding for the strong regime but not for the weak one. (For example, $k_{\mathrm{H}} = k_{\mathrm{H}}^{2}$ in Figure 4.) Consider now a strategy profile, in which the strong ruler induces the anocratic equilibrium by choosing the least-cost solution (k_{L}) and the weak one induces the despotic equilibrium by choosing at the capacity constraint (k_{H}). That is, $(\lambda_{\mathrm{A}}, \varphi_{\mathrm{A}})$ are

the action probabilities when k_{L} is chosen and the citizens believe $\pi = p_{\mathrm{H}}$, whereas $(\lambda_{\mathrm{D}}, 0)$ are the action probabilities when k_{H} is chosen and citizens believe $\pi = p_{\mathrm{L}}$.

It should be clear that the strong ruler has no incentive to change his strategy: he is getting the highest possible payoff in the anocratic equilibrium. The weak ruler, on the other hand, might be tempted to deviate because his expected payoff in the anocratic equilibrium where the citizens incorrectly attribute strength $\pi = p_{\mathrm{H}}$ to him is strictly increasing (Lemma F). This is because these beliefs induce supporters to turn out with a higher probability. The equilibrium can only be sustained if this temptation is not that alluring, as the following result shows.

PROPOSITION 4. *Let k_L denote the lowest feasible cost of political action for both regimes, and let $k_H \in (\Delta(k_L; p_L), \Delta(k_L; p_H))$ denote their capacity constraint. The strategy profile in which the ruler chooses k_L when he is strong and k_H when he is weak is a separating equilibrium for any*

$$p_L \leq \frac{(2 - \lambda_D - \lambda_A)(\lambda_A - \lambda_D)}{2\lambda_A \varphi_A}$$

irrespective of beliefs off the path of play. □

The sufficient condition can be satisfied in two ways. First, one could fix p_{H} and make p_{L} small enough: in effect this ensures that however large the benefit from inducing the supporters to action under false pretenses, it will be outweighed by the fact that the ruler is actually unlikely to prevail in the conflict their presence generates. For example, setting $p_{\mathrm{L}} = 0.45$ and keeping the other parameters as in Figure 4 supports the separating equilibrium (for any $p_{\mathrm{L}} \lesssim 0.48$). Second, one could fix p_{L} and reduce p_{H} enough: in effect this ensures that even if the ruler still has decent chances of prevailing in the conflict, the benefit from inducing the wrong beliefs is relatively small. For example, setting $p_{\mathrm{H}} = 0.75$ and keeping the other parameters as in Figure 4 supports the separating equilibrium (any $p_{\mathrm{L}} \lesssim 0.62$ will do).

It is worth noting that since we assumed repression to be costless to the ruler irrespective of regime strength, the separation is sustained by the riskiness of reducing repression: while the weak regime could exploit the benefit of supporters coming to its defense by feigning strength, it would still have to face its real, and not that great, odds of survival in the ensuing conflict. If it were the case that weak regimes also face higher costs of repression, then the incentive to permit separation would be diminished.

If we take k_{L} to be sufficiently close to zero, the choice to abandon repression in this model could approximate permitting elections if we took π to represent the citizens' expectations of regime's popularity, and hence the underlying probability of winning these elections. Since the choice to "vote" for or against the ruler are endogenous, the model could provide one possible set of microfoundations for theories of authoritarian elections that assume elections to be informative of the true distribution of preferences among the citizens. It could also provide a signaling-based rationale for allowing these elections.

6 Conclusion

Research on the surprises of the Velvet Revolutions of 1989 and the Arab Spring of 2011 sometimes veers between two extremes: it either ascribes decisive role to mass political action (Kuran, 1991)

or explains why it is singularly unsuccessful (Stacher, 2012). In reviewing many of these studies, Howard and Walters (2014) complain that they just do not take popular mobilization seriously, and we tend to agree: the former group neglects the repressive capacity of the regime, and the latter overemphasizes it. We do not think, however, that the resolution to these disagreements will be found on studying "why previous assessments of public quiescence in the face of widespread oppression were so dramatically wrong" (Howard and Walters, 2014, 400). Instead, we argue that it is the government's response to public opposition to the regime that needs further attention, and we show that repression truly can be a double-edged sword.

The fundamental problem for an authoritarian government is that it cannot reliably assess the preferences of its citizens and gauge the extent of support and opposition to the regime. Moreover, because the absence of overt political action against an authoritarian regime simply perpetuates its rule, there is a strong status quo bias that favors regime supporters, which tends to dampen their incentive to engage in costly political action in its defense. If the regime has great repressive capacity, none of that matters: its ruler becomes a despot and represses almost any political expression save the occasional low-probability outburst of opposition. If, however, the regime labors under some constraint that limits its ability to repress sufficiently harshly, then the differential incentives do matter: the ruler can be strictly better off abandoning repression altogether and allowing open political contestation. Even though he is forced to reduce the costs to political action for both dissidents and opponents, and even though this might encourage the dissidents to engage against him with higher probability, it puts the well-being of regime supporters at risk, and gives them an incentive to come to his defense. The result might be serious social conflict and instability, but the ruler's wager is that he would remain in power. Thus, authoritarian rulers abandon repression because in expectation doing so gives them an advantage.

We do not mean to provide a monocausal explanation of regime collapse or mass political action, only to highlight how repression interacts with other features of authoritarian regimes (preference falsification and status quo bias) in ways that make its use as a tool of power less straightforward. We have also, somewhat ironically, ended up buttressing the case for structuralist explanations with a model of endogenous choice although our contribution is to reveal a mechanism that would lead from structural factors to contested outcomes through the choices of the participants.

Some Eastern European leaders were not squeamish about unleashing the security forces on the populace in 1989, but they wanted the Soviet Union to backstop any repression under the Brezhnev Doctrine. When Gorbachev quashed all hopes of that, he effectively imposed an upper limit of what repression could accomplish in the satellites. Even though the more rash of rulers — GDR's Honecker, for instance — pressed on with repression, most realized that opening up the political field to contestation might be a better bet. They disregarded the Tiananmen Square precedent — the Chinese government, after all, had not relied on external support to do its repression — and ordered the security forces to stand down (and, in GDR's case, overruled the ruler). This is when the grim reality of communist rule was finally exposed: in most cases nobody came to defend the regime. Even the regimes' erstwhile power monopolists, the Communist parties, quickly sought to re-brand themselves following a belated realization of their massive unpopularity. There is perhaps no better illustration of the depth of delusion than the outcome of the June elections in Poland. Just days prior, the Party's Central Committee had discussed how the West would react if the opposition failed to gain a single seat in the system that only opened 35% of the seats in Sejm (and all 100 seats in the Senate) to

contestation. Instead, the opposition took all seats in the Senate and all but one of the available seats in Sejm. Nobody came to defend the government although many abstained from any political action (37% in the first round, and 75% in the second). Sovietologists might have been wrong in 1989 when they saw system continuity, but they had thought the regime would actually defend itself. It would have been a reckless forecast that predicted that Gorbachev would suddenly jettison 45 years of foreign policy for the whimsically named "Sinatra Doctrine" that left the satellite government to rule as best they could.[23]

Popular mass actions might acquire momentum and might be contagious, but it is dangerous — for the participants more so than the scholars studying them — to mistake the cause of their success to be the pressure of the masses instead of the failure of the regime to stand firm. The Hungarians did not draw the right inferences from the Polish October in 1956 and ended up with a Soviet invasion. The Bahraini misread what happened in Egypt in 2011 and ended up repressed by their own government and the Saudis. It is not enough for people to take to the streets; the regime must decide not to disperse them. Otherwise, any political gains people make will be illusory and temporary.

[23]Linz and Stepan (1996) attribute the simultaneity and success of the revolutions to the collapse of ideological confidence and will to use coercion in the USSR. Sharman (2003) also endorses this view and notes that the relevant collapse of legitimacy was among the elites, not the population that had long abandoned whatever faith it had in the ideological tenets of communism. It was this that deprived the regime from capacity to defend itself.

A The Case of Targeted Penalties

While indiscriminate repression can be effective whenever the ruler can implement it at sufficiently high levels, it is distinctly inimical to the ruler's survival when he cannot. Perhaps he could do better with targeted penalties? After all, unlike indiscriminate repression, which penalizes any political action irrespective of its content or consequences, targeted penalties are costs imposed only when conflict actually occurs, and then only on the side that happens to lose it. It is important to bear in mind that the model assumes that the opponents cannot credibly commit not to punish the supporters if the ruler is toppled. This assumption is fairly realistic when the new ruler is another authoritarian but it is also not out of the question if the new regime is a (transitional) democracy.

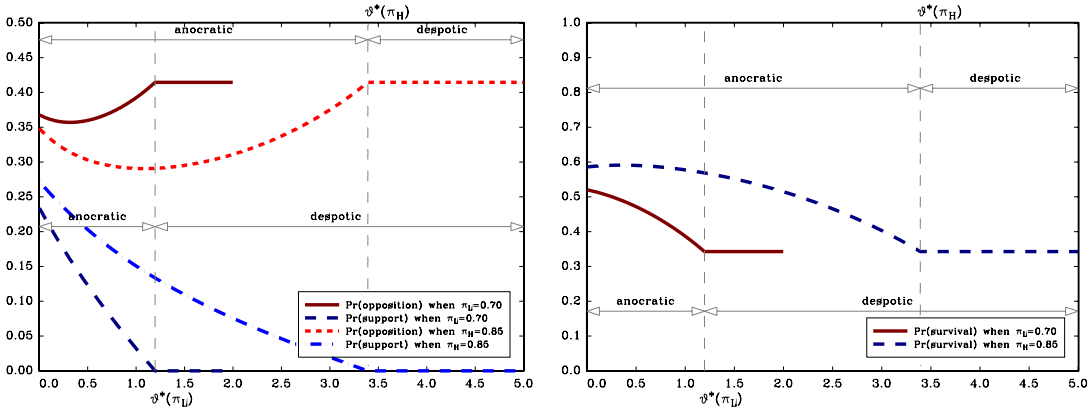
We first establish the analogue to Lemma 5: as it turns out, targeted penalties also deter supporters from taking action.

LEMMA 10. *Increasing targeted penalties makes regime supporters* less likely *to be active in the anocratic equilibrium.* □

The effect on regime opponents is a bit more complicated because it turns out that λ_{A} might not be monotonic in θ as it is in k. It is possible for some relatively modest targeted penalties can cause opponents to be less likely to act in the anocratic equilibrium. However, this deterrent effect is quickly outweighed by the incentive to act provided by regime supporters dropping out at even higher rates. This makes targeted penalties relative unattractive to the ruler in the anocratic equilibrium except perhaps at very low levels, as the following result shows.

LEMMA 11. *Increasing targeted penalties in the anocratic equilibrium might initially cause regime opponents to be less likely to act, but always makes them more likely to do so once the penalties become sufficiently severe. Nevertheless, the probability that opponents act is always smaller in the anocratic equilibrium than in the despotic one (where it is constant):* $\lambda_A < \lambda_D$. □

Figure 5(a) illustrates the result from Lemma 11 for a weak and a strong regime. Note especially the fact that the probability of opposition in the anocratic equilibrium is always *lower* than the corresponding probability in the despotic equilibrium. It is easy to see that the latter must be constant because the targeted penalties can only be imposed on the losing side when conflict occurs, and no conflict occurs in that equilibrium. In other words, targeted penalties are essentially useless to a despot, and as result the probability of opposition is actually higher. This limits their usefulness as a policy tool. Consider the anocratic equilibrium where $\lambda_{\mathrm{A}} < \lambda_{\mathrm{D}}$ and $\varphi_{\mathrm{A}} > 0$. Since the ruler's survival probability is decreasing in λ_{A} but increasing in φ_{A}, as evident from (9), it follows that the ruler maximizes his chances of surviving by choosing some $\theta \in [0, \theta^*)$ and inducing the anocratic equilibrium. Figure 5(b) illustrates a case where a strong regime chooses a strictly positive targeted penalty but the weak regime ends up with no penalties at all in the anocratic equilibrium.



(a) Political Action (b) Political Survival

FIGURE 5: The Effect of Targeted Penalties.

Parameters: $c = 0.1$, $k = 0.1$, and $\pi_{\mathrm{L}} = 0.7$ (weak regime) or $\pi_{\mathrm{H}} = 0.85$ (strong regime). The relatively high value for π_{L} is necessary to ensure that Assumption 1 is satisfied despite θ being allowed to be relatively high.

B Proofs

Proof of Proposition 1 Given the cut-points, the best responses are as follows:

- $t_i < t_{\mathrm{L}}$: L if $s_{-i} \in \{A, R\}$, and A if $s_{-i} = L$;
- $t_i \in (t_{\mathrm{L}}, t_{\mathrm{M}})$: L if $s_{-i} = A$, and A if $s_{-i} \in \{R, L\}$;
- $t_i \in (t_{\mathrm{M}}, t_{\mathrm{R}})$: A;
- $t_i > t_{\mathrm{R}}$: A if $s_{-i} \in \{A, R\}$, and R if $s_{-i} = L$.

Suppose that both citizens are at least moderately opposed, $t_i < t_{\mathrm{M}}$. The game has two pure-strategy Nash equilibria, in which i opposes while $-i$ abstains. This, of course, means that there is also a mixed-strategy Nash equilibrium where each player i opposes with probability λ_{D} defined in the proposition and abstains with complementary probability.[24]

Suppose only one citizen has $t_i < t_{\mathrm{M}}$. If $t_{-i} \in (t_{\mathrm{M}}, t_{\mathrm{R}})$, then in the unique equilibrium i opposes and $-i$ abstains. If $t_{-i} > t_{\mathrm{R}}$, then there are two cases: if $t_i < t_{\mathrm{L}}$, then in the unique equilibrium i opposes, $-i$ supports, and conflict occurs; if $t_i \in (t_{\mathrm{L}}, t_{\mathrm{M}})$, then no pure-strategy equilibrium exists. In the unique mixed-strategy equilibrium, i opposes the regime with probability λ_{A} and abstains with complementary probability, whereas $-i$ supports the regime with probability φ_{A} and abstains with complementary probability, where the probabilities are defined in the proposition and easily verifiable to be valid.[25] (If $t_{-i} \in (t_{\mathrm{M}}, t_{\mathrm{R}})$, then the mutual abstention case obtains.)

Suppose both citizens have $t_i > t_{\mathrm{M}}$. The game has a unique equilibrium, in which each citizen abstains.

Suppose only one citizen has $t_i \in (t_{\mathrm{M}}, t_{\mathrm{R}})$. If $t_{-i} < t_{\mathrm{M}}$, then in the unique equilibrium i abstains and $-i$ opposes. (If $t_{-i} > t_{\mathrm{R}}$, then the mutual abstention case obtains.)

Suppose only one citizen has $t_i > t_{\mathrm{R}}$. If $t_{-i} < t_{\mathrm{L}}$, then in the unique equilibrium i supports, $-i$ opposes, and conflict occurs. (If $t_{-i} \in (t_{\mathrm{L}}, t_{\mathrm{M}})$, then the analogue to the unique mixed-strategy equilibrium case obtains. If $t_{-i} \in (t_{\mathrm{M}}, t_{\mathrm{R}})$, then the mutual abstention case obtains.) ∎

Proof of Lemma 1. If citizen i opposes the regime, her payoff is:

$$U_i(L; t_i) = \varphi_{-i}(W(t_i) - k) + (1 - \varphi_{-i})(1 - t_i - k).$$

If she abstains, her expected payoff is:

$$U(A; t_i) = \lambda_{-i}(1 - t_i) + (1 - \lambda_{-i})t_i.$$

[24] Since $t_i < t_{\mathrm{M}} < t_{\mathrm{R}}$, abstention strictly dominates support. But then in the mixed-strategy equilibrium, $U_i(L) = 1 - t_i - k = \lambda_{-i}(L)(1 - t_i) + (1 - \lambda_{-i}(L))t_i = U_i(A)$, which yields the mixing probabilities.

[25] Since $t_i \in (t_{\mathrm{L}}, t_{\mathrm{M}})$, abstention strictly dominates supporting the regime for i, and since $t_{-i} > t_{\mathrm{R}}$, abstention strictly dominates opposing the regime for $-i$. It is easy to verify that no pure-strategy equilibrium exists. In the unique mixed-strategy equilibrium, $U_i(L) = \varphi_{-i}(W(t_i) - k) + (1 - \varphi_{-i})(1 - t_i - k) = t_i = U_i(A)$, and $U_{-i}(A) = \lambda_i(1 - t_{-i}) + (1 - \lambda_i)t_{-i} = \lambda_i(w(t_{-i}) - k) + (1 - \lambda_i)(t_{-i} - k) = U_{-i}(R)$. The solutions are given in the text. It is easy to verify that they are valid probabilities under the suppositions.

She prefers opposing the regime (to abstaining) if, and only if, $t_i < t_{\mathrm{L}}(\lambda_{-i}, \varphi_{-i})$. If citizen i supports the regime, her expected payoff is:

$$U(R; t_i) = \lambda_{-i}(w(t_i) - k) + (1 - \lambda_{-i})(t_i - k).$$

She prefers supporting the regime (to abstaining) if, and only if, $t_i > t_{\mathrm{R}}(\lambda_{-i})$. Since $t_{\mathrm{L}}(\lambda_{-i}, \varphi_{-i}) < {}^1\!/_2 < t_{\mathrm{R}}(\lambda_{-i})$, where the first inequality follows from $1 - \pi\varphi_{-i} - \lambda_{-i} > 1 - \varphi_{-i} - \lambda_{-i} \geq 0$ and $c > k$, and the second inequality follows from inspection, we conclude that any equilibrium must be in cut-point strategies:

- $t_i < t_{\mathrm{L}}(\lambda_{-i}, \varphi_{-i}) \Rightarrow U(L; t_i) > U(A; t_i) > U(R; t_i)$, so play $\lambda_i = 1$;
- $t_i \in (t_{\mathrm{L}}(\lambda_{-i}, \varphi_{-i}), t_{\mathrm{R}}(\lambda_{-i})) \Rightarrow U(A; t_i) > U(L; t_i)$ and $U(A; t_i) > U(R; t_i)$, so play $\lambda_i = \varphi_i = 0$;
- $t_i > t_{\mathrm{R}}(\lambda_{-i}) \Rightarrow U(R; t_i) > U(A; t_i) > U(L; t_i)$, so play $\varphi_i = 1$.

Type $t_{\mathrm{L}}(\lambda_{-i}, \varphi_{-i})$ is indifferent between opposing and abstaining, and type $t_{\mathrm{R}}(\lambda_{-i})$ is indifferent between supporting and abstaining. Only these two types can possibly mix in equilibrium. Since the type space is continuous, it is immaterial what these types actually do (they have measure zero). We shall assume that they abstain. ∎

Proof of Lemma 2. Suppose that in equilibrium player $-i$ does not oppose: $\lambda_{-i} = 0 \Leftrightarrow t_{\mathrm{L}}(\lambda_i, \varphi_i) \leq 0$. This implies that $U(A; t_i) = t_i > t_i - k = U(R; t_i)$, which means that player i will not support: $\varphi_i = 0$. We can now write

$$t_{\mathrm{L}}(\lambda_i, 0) = \left(\frac{1}{2}\right)\left(1 - \frac{k}{1 - \lambda_i}\right) \leq 0 \Rightarrow \lambda_i \geq 1 - k > 0.$$

If one of the players does not oppose, then the other player must oppose with a sufficiently high probability. We now show that this leads to a contradiction because this probability cannot possibly be that high. Since $\lambda_i = \Pr(t_i \leq t_{\mathrm{L}}(0, \varphi_{-i}))$, we obtain:

$$t_{\mathrm{L}}(0, \varphi_{-i}) \geq 1 - k \Leftrightarrow 2k - \frac{(c + \pi\theta)\varphi_{-i} + k}{1 - \pi\varphi_{-i}} \geq 1,$$

which cannot be because $k < 1$, a contradiction. Therefore, $\lambda_{-i} = 0$ cannot occur in equilibrium. Since $-i$ was arbitrarily chosen, the claim follows. ∎

Proof of Lemma 3. Since (4) expands to

$$\lambda = \frac{1}{2} - \frac{k}{2(1 - \lambda)},$$

which is a quadratic, we need to select the root. Since $k < 1$, of the two roots, only the smaller is a valid probability (the larger exceeds 1), so we conclude that the probability is symmetric and unique. Since this probability equals the cut-point type, we obtain the λ_{D} defined in (5). To ensure that $\varphi = 0$, we require that $t_{\mathrm{R}}(\lambda_{\mathrm{D}}) \geq 1 \Leftrightarrow k \geq \overline{w}\,\lambda_{\mathrm{D}}$. Since the left-hand side is increasing in k and the right-hand side decreasing, there will be at most on k^* for which this is satisfied with equality. To find it we solve for k, which yields the quadratic $2k^2 - (3 + \overline{w})\overline{w}k + \overline{w}^2 = 0$, where we note that a solution can only exist if $3\overline{w} - 4k > 0$, and only the smaller root satisfies this. This yields (D) and implies that this condition is necessary and sufficient for the existence of this equilibrium. ∎

Proof of Lemma 4. It will be convenient to rewrite the system of equations (6) as:

$$2\lambda = \frac{1-\lambda-\zeta\varphi-k}{1-\lambda-\pi\varphi} \tag{10}$$

$$2\pi\varphi = \overline{w} - \frac{k}{\lambda}, \tag{11}$$

where $\zeta \equiv (1+\theta)\pi + c > \pi$, or

$$3\lambda - 2\lambda^2 - 2\pi\lambda\varphi = 1-k-\zeta\varphi \tag{12}$$

$$2\pi\lambda\varphi = \overline{w}\,\lambda - k. \tag{13}$$

It is easy to verify that neither endogenous variable can exceed $1/2$ at the solution. This system yields the cubic:

$$G(\lambda) = -2\lambda^3 + (3-\overline{w})\,\lambda^2 - \left(1-2k-\frac{\overline{w}\zeta}{2\pi}\right)\lambda - \frac{k\zeta}{2\pi} = 0. \tag{14}$$

Since the coefficient of the cubic term is negative, it follows that

$$\lim_{\lambda\to-\infty} G(\lambda) = +\infty \quad \text{and} \quad \lim_{\lambda\to+\infty} G(\lambda) = -\infty.$$

Since $G(0) < 0$, these imply that (14) must have at least one root, $\lambda_1 < 0$. Because the solution must be positive and cannot exceed $1/2$, we need to show that the equation has another real root, $\lambda_2 \in (0,\, 1/2)$. (This, of course, means it will have three real roots.) A sufficient condition that ensures the existence of the required middle root is $G(1/2) > 0$, which also guarantees that $\lambda_3 > 1/2$, so the admissible solution is unique.[26] It is easy to show that this is the case whenever (D) is not satisfied. Suppose that $k < \overline{w}\,\lambda_{\mathrm{D}}$, which implies that $\overline{w} > 2k$ because $\lambda_{\mathrm{D}} < 1/2$. But then

$$G(1/2) = \left(\frac{1}{4}\right)\left[4k - \overline{w} + \left(\frac{\zeta}{\pi}\right)(\overline{w}-2k)\right] = \left(\frac{1}{4}\right)\left[2k + (\overline{w}-2k)\left(\frac{\zeta}{\pi}-1\right)\right] > 0$$

follows because $\zeta > \pi$ implies that the bracketed term is positive whenever $\overline{w} > 2k$. Thus, if (D) fails, then $\lambda_{\mathrm{A}} \in (0,\, 1/2)$ exists and is unique, which in turn means that $\varphi_{\mathrm{A}} < 1/2)$ also exists and is unique.

We now need to establish that $\varphi_{\mathrm{A}} > 0$ only if (D) fails. Recall that $\lambda_{\mathrm{A}}(k^*) = \lambda_{\mathrm{D}}$ and $\varphi_{\mathrm{A}}(k^*) = 0$. Consider some $k > k^*$ so that (D) is satisfied and, seeking contradiction, suppose that $\varphi_{\mathrm{A}}(k) \geq 0$. But then it must be that $\lambda_{\mathrm{A}}(k) > \lambda_{\mathrm{A}}(k^*)$:

$$2\pi\varphi_{\mathrm{A}}(k^*) = \overline{w} - \frac{k^*}{\lambda_{\mathrm{A}}(k^*)} = 0 > \overline{w} - \frac{k}{\lambda_{\mathrm{A}}(k^*)},$$

but then

$$2\pi\varphi_{\mathrm{A}}(k) = \overline{w} - \frac{k}{\lambda_{\mathrm{A}}(k)} \geq 0 > \overline{w} - \frac{k}{\lambda_{\mathrm{A}}(k^*)} \Rightarrow \lambda_{\mathrm{A}}(k) > \lambda_{\mathrm{A}}(k^*).$$

[26] The fact that the solution occurs at the middle root also tells us that

$$\left.\frac{\partial G}{\partial \lambda}\right|_{\lambda_{\mathrm{A}}} > 0.$$

We now obtain:

$$2\lambda_{\mathrm{A}}(k^*) = \frac{1-\lambda_{\mathrm{A}}(k^*)-\zeta\varphi_{\mathrm{A}}(k^*)-k^*}{1-\lambda_{\mathrm{A}}(k^*)-\pi\varphi_{\mathrm{A}}(k^*)} > \frac{1-\lambda_{\mathrm{A}}(k^*)-\zeta\varphi_{\mathrm{A}}(k^*)-k}{1-\lambda_{\mathrm{A}}(k^*)-\pi\varphi_{\mathrm{A}}(k^*)}$$
$$> \frac{1-\lambda_{\mathrm{A}}(k)-\zeta\varphi_{\mathrm{A}}(k^*)-k}{1-\lambda_{\mathrm{A}}(k)-\pi\varphi_{\mathrm{A}}(k^*)} \geq \frac{1-\lambda_{\mathrm{A}}(k)-\zeta\varphi_{\mathrm{A}}(k)-k}{1-\lambda_{\mathrm{A}}(k)-\pi\varphi_{\mathrm{A}}(k)} = 2\lambda_{\mathrm{A}}(k),$$

where the inequalities follow from the $k > k^*$, $\lambda_{\mathrm{A}}(k) > \lambda_{\mathrm{A}}(k^*)$, and $\varphi_{\mathrm{A}}(k) \geq \varphi_{\mathrm{A}}(k^*) = 0$, and the fact that the right-hand side of (12) is decreasing in each of these variables. But this means that $\lambda_{\mathrm{A}}(k^*) > \lambda_{\mathrm{A}}(k)$, a contradiction. Therefore, it cannot be the case that $\varphi_{\mathrm{A}}(k) \geq 0$ when $k > k^*$.

Since $k < k^*$ is sufficient to ensure a valid λ_{A} and necessary to ensure a valid φ_{A}, it is necessary and sufficient for this equilibrium to obtain. ∎

Proof of Lemma 5. Consider the anocratic equilibrium. Since both (12) and (13) must hold in equilibrium, we differentiate both their sides with respect to k:

$$\left(3-4\lambda_{\mathrm{A}}-2\pi\varphi_{\mathrm{A}}\right)\cdot\frac{\mathrm{d}\,\lambda_{\mathrm{A}}}{\mathrm{d}\,k}+1 = -\left(\zeta-2\pi\lambda_{\mathrm{A}}\right)\cdot\frac{\mathrm{d}\,\varphi_{\mathrm{A}}}{\mathrm{d}\,k} \tag{15}$$

$$-\left(\overline{w}-2\pi\varphi_{\mathrm{A}}\right)\cdot\frac{\mathrm{d}\,\lambda_{\mathrm{A}}}{\mathrm{d}\,k}+1 = -2\pi\lambda_{\mathrm{A}}\cdot\frac{\mathrm{d}\,\varphi_{\mathrm{A}}}{\mathrm{d}\,k} \tag{16}$$

Since $3-4\lambda_{\mathrm{A}}-2\pi\varphi_{\mathrm{A}} > 0$ and $\zeta-2\pi\lambda_{\mathrm{A}} > 0$, (15) implies that

$$\frac{\mathrm{d}\,\lambda_{\mathrm{A}}}{\mathrm{d}\,k} \geq 0 \Rightarrow \frac{\mathrm{d}\,\varphi_{\mathrm{A}}}{\mathrm{d}\,k} < 0.$$

Since (11) tells us that $\overline{w}-2\pi\varphi_{\mathrm{A}} > 0$, (16) further implies that

$$\frac{\mathrm{d}\,\lambda_{\mathrm{A}}}{\mathrm{d}\,k} \leq 0 \Rightarrow \frac{\mathrm{d}\,\varphi_{\mathrm{A}}}{\mathrm{d}\,k} < 0,$$

we conclude that $\frac{\mathrm{d}\,\varphi_{\mathrm{A}}}{\mathrm{d}\,k} < 0$. ∎

Proof of Lemma 6. Consider the anocratic equilibrium. We shall show that λ_{A} is monotonic. At the optimum,

$$\left.\frac{\mathrm{d}\,G}{\mathrm{d}\,k}\right|_{\lambda=\lambda_{\mathrm{A}}} = \left.\frac{\partial G}{\partial\lambda}\right|_{\lambda=\lambda_{\mathrm{A}}}\cdot\left.\frac{\mathrm{d}\,\lambda}{\mathrm{d}\,k}\right|_{\lambda=\lambda_{\mathrm{A}}} + \left.\frac{\partial G}{\partial k}\right|_{\lambda=\lambda_{\mathrm{A}}} = 0.$$

Since

$$\frac{\partial G}{\partial\lambda} = -6\lambda^2+2(3-\overline{w})\lambda-\left(1-2k-\frac{\overline{w}\zeta}{2\pi}\right),$$

using the fact that (14) holds at the optimum tells us that

$$\left.\frac{\partial G}{\partial\lambda}\right|_{\lambda=\lambda_{\mathrm{A}}} = (3-\overline{w}-4\lambda_{\mathrm{A}})\lambda_{\mathrm{A}}+\frac{k\zeta}{2\pi\lambda_{\mathrm{A}}} > 0,$$

where the inequality follows from $\overline{w} < \pi$ and $\lambda_A < 1/2$, which imply that $3-\overline{w}-4\lambda_A > 3-\pi-2 > 0$. Letting $f(k) = \left.\frac{\partial G}{\partial k}\right|_{\lambda=\lambda_A}$, we conclude that

$$\operatorname{sgn}\left(\left.\frac{\mathrm{d}\lambda}{\mathrm{d}k}\right|_{\lambda=\lambda_A}\right) = -\operatorname{sgn}\left(f(k)\right).$$

Since

$$f(k) = 2\lambda_A - \frac{\zeta}{2\pi}, \tag{17}$$

differentiating it with respect to k yields

$$\frac{\mathrm{d}f}{\mathrm{d}k} = 2 \cdot \left.\frac{\mathrm{d}\lambda}{\mathrm{d}k}\right|_{\lambda=\lambda_A},$$

which implies that

$$\operatorname{sgn}\left(\frac{\mathrm{d}f}{\mathrm{d}k}\right) = -\operatorname{sgn}(f(k)).$$

That is, $f(k) > 0$ requires that f is decreasing, whereas $f(k) < 0$ requires that it is increasing. But this implies that f cannot change sign. To see this, suppose that $f(k) > 0$ at some k so it is decreasing, and suppose that it can change sign; that is, that there exists some $\hat{k} > k$ such that $f(\hat{k}) < 0$. Since the function is continuous, this implies that there exists $\widetilde{k} \in (k, \hat{k})$ such that $f(\widetilde{k}) = 0$, which implies there must be a critical point at $\widetilde{k}$ because $f(k) = 0 \Rightarrow \left.\frac{\mathrm{d}\lambda}{\mathrm{d}k}\right|_{\lambda=\lambda_A} = 0 \Rightarrow \frac{\mathrm{d}f}{\mathrm{d}k} = 0$. But this cannot be: $f(\hat{k}) < 0$ requires that f decrease for $k \in (\widetilde{k}, \hat{k})$ so that $f(k) < 0$, but the latter requires that f be increasing, a contradiction. A similar argument establishes the case for $f(k) < 0$. We conclude that f is either always positive or always negative, which implies that $\left.\frac{\mathrm{d}\lambda}{\mathrm{d}k}\right|_{\lambda=\lambda_A}$ must be monotonic as well.

We now use the fact that $\lambda_A(k^*) = \lambda_D$ and examine $f(k^*)$: since f is monotonic, the sign at $f(k^*)$ is going to tell us the sign everywhere. Now we obtain

$$f(k^*) = 2\lambda_D - \frac{\zeta}{2\pi} = \left(\frac{1}{2}\right)\left(3 - \sqrt{1+8k^*} - \frac{\zeta}{\pi}\right) < 0.$$

Substituting for ζ yields (P). Thus, if (P) is satisfied, $f(k) < 0$, so λ_A is increasing; otherwise, it is decreasing.[27] ∎

Proof of Lemma 7. Using the definition of Ω_D from (8), we show that it is strictly increasing in repression:

$$\frac{\mathrm{d}\Omega_D}{\mathrm{d}k} = \frac{\partial\Omega_D}{\partial\lambda_D} \cdot \frac{\mathrm{d}\lambda_D}{\mathrm{d}k} = -2(1-\lambda_D) \cdot \frac{\mathrm{d}\lambda_D}{\mathrm{d}k} > 0,$$

where the inequality follows from the fact that in this equilibrium λ_D is decreasing in k.

[27] Since $\sqrt{1+8k^*} > 1$, an easy sufficient condition for $f(k^*) < 0$ is that $\zeta > 2\pi$ (this can also easily be seen from (17) by observing that $\lambda_A < 1/2$).

The survival probability in the anocratic equilibrium is given by (9). Since

$$\frac{\mathrm{d}\,\Omega_{\mathrm{A}}}{\mathrm{d}\,k} = 2\left[\pi\lambda_{\mathrm{A}} \cdot \frac{\mathrm{d}\,\varphi_{\mathrm{A}}}{\mathrm{d}\,k} - (1 - \lambda_{\mathrm{A}} - \pi\varphi_{\mathrm{A}}) \cdot \frac{\mathrm{d}\,\lambda_{\mathrm{A}}}{\mathrm{d}\,k}\right],$$

we need to show that

$$\pi\lambda_{\mathrm{A}} \cdot \frac{\mathrm{d}\,\varphi_{\mathrm{A}}}{\mathrm{d}\,k} < (1 - \lambda_{\mathrm{A}} - \pi\varphi_{\mathrm{A}}) \cdot \frac{\mathrm{d}\,\lambda_{\mathrm{A}}}{\mathrm{d}\,k}.$$

We use (15) and (16) to obtain

$$2\pi\gamma\lambda_{\mathrm{A}} \cdot \frac{\mathrm{d}\,\lambda_{\mathrm{A}}}{\mathrm{d}\,k} = \zeta - 4\pi\lambda_{\mathrm{A}}$$
$$2\pi\gamma\lambda_{\mathrm{A}} \cdot \frac{\mathrm{d}\,\varphi_{\mathrm{A}}}{\mathrm{d}\,k} = 4(\lambda_{\mathrm{A}} + \pi\varphi_{\mathrm{A}}) - 3 - \overline{w}$$

where

$$\gamma = 3 - 4\lambda_{\mathrm{A}} - \overline{w} + \frac{(\overline{w} - 2\pi\varphi_{\mathrm{A}})\zeta}{2\pi\lambda_{\mathrm{A}}} > 0. \tag{18}$$

Thus, we need to show that

$$\pi\lambda_{\mathrm{A}}\Big[4(\lambda_{\mathrm{A}} + \pi\varphi_{\mathrm{A}}) - 3 - \overline{w}\Big] < (1 - \lambda_{\mathrm{A}} - \pi\varphi_{\mathrm{A}})(\zeta - 4\pi\lambda_{\mathrm{A}}). \tag{19}$$

We now decompose the left-hand side as follows:

$$\pi\lambda_{\mathrm{A}}\Big[4(\lambda_{\mathrm{A}} + \pi\varphi_{\mathrm{A}}) - 3 - \overline{w}\Big] = (1 - \overline{w})\pi\lambda_{\mathrm{A}} - 4\pi\lambda_{\mathrm{A}}(1 - \lambda_{\mathrm{A}} - \pi\varphi_{\mathrm{A}}),$$

which allows us to simplify (19) to

$$(1 - \overline{w})\pi\lambda_{\mathrm{A}} < (1 - \lambda_{\mathrm{A}} - \pi\varphi_{\mathrm{A}})\zeta,$$

which holds because $\pi < \zeta$ and

$$(1 - \overline{w})\lambda_{\mathrm{A}} < \frac{1}{2} - \frac{\overline{w}}{2} < \frac{1}{2} - \pi\varphi_{\mathrm{A}} < 1 - \lambda_{\mathrm{A}} - \pi\varphi_{\mathrm{A}},$$

where the first and third steps follow from $\lambda_{\mathrm{A}} < 1/2$, and the second step from $\overline{w} > 2\pi\varphi_{\mathrm{A}}$. Thus, Ω_{A} is strictly decreasing in k in the anocratic equilibrium. ∎

Proof of Lemma 8 We know from the proof of Proposition 2 that the equilibrium probabilities of political action are continuous at k^*, which in turn implies that the probability of survival is continuous at k^* as well. Since the probability of regime survival is continuous in k, with $\Omega_{\mathrm{A}} = \Omega_{\mathrm{D}}$ at k^*, Lemma 7 tells us that it is V-shaped. In other words, the despotic equivalent must exist, and we only need to make sure that it is feasible (that is, it does not exceed 1). But this follows immediately from the fact that as k approaches 1, the survival probability in the despotic equilibrium is strictly greater than anything that can be attained in the anocratic equilibrium:

$$\lim_{k \to 1} \Omega_{\mathrm{D}} = 1 > 1 - \Big[2(1 - \pi\varphi_{\mathrm{A}}) - \lambda_{\mathrm{A}}\Big]\lambda_{\mathrm{A}} = \Omega_{\mathrm{A}}.$$

The fact that $\Delta(k)$ is decreasing follows directly from Lemma 7: since $\Omega_{\mathrm{A}}(k)$ is decreasing, it follows so must $\Omega_{\mathrm{D}}(\Delta(k))$, and since $\Omega_{\mathrm{D}}(\cdot)$ itself is increasing, it must be that $\Delta(k)$ is decreasing. ∎

Proof of Proposition 3. This is a direct consequence of lemmata 7 and 8, which guarantee that $\Omega_{\mathrm{A}}(k_{\mathrm{L}}) > \Omega_{\mathrm{A}}(k)$ for any $k \in (k_{\mathrm{L}}, k^*)$ and $\Omega_{\mathrm{A}}(k_{\mathrm{L}}) > \Omega_{\mathrm{D}}(k)$ for any $k \in [k^*, \Delta(k_{\mathrm{L}}))$, and that $\Omega_{\mathrm{D}}(k) > \Omega_{\mathrm{A}}(k_{\mathrm{L}})$ for any $k > \Delta(k_{\mathrm{L}})$. ∎

Proof of Lemma 9. The first claim follows directly from the fact that λ_{D} does not depend on π:

$$\frac{\mathrm{d}\,\Omega_{\mathrm{D}}}{\mathrm{d}\,\pi} = -2(1-\lambda_{\mathrm{D}}) \cdot \frac{\mathrm{d}\,\lambda_{\mathrm{D}}}{\mathrm{d}\,\pi} = 0.$$

To prove the second claim, note that since (12) and (13) must hold in equilibrium, we can differentiate both sides with respect to π to obtain:

$$\Big(3 - 4\lambda_{\mathrm{A}} - 2\pi\varphi_{\mathrm{A}}\Big) \cdot \frac{\mathrm{d}\,\lambda_{\mathrm{A}}}{\mathrm{d}\,\pi} + (1 + \theta - 2\lambda_{\mathrm{A}})\varphi_{\mathrm{A}} = -\Big(\zeta - 2\pi\lambda_{\mathrm{A}}\Big) \cdot \frac{\mathrm{d}\,\varphi_{\mathrm{A}}}{\mathrm{d}\,\pi} \tag{20}$$

$$\Big(\overline{w} - 2\pi\varphi_{\mathrm{A}}\Big) \cdot \frac{\mathrm{d}\,\lambda_{\mathrm{A}}}{\mathrm{d}\,\pi} + (1 + \theta - 2\varphi_{\mathrm{A}})\lambda_{\mathrm{A}} = 2\pi\lambda_{\mathrm{A}} \cdot \frac{\mathrm{d}\,\varphi_{\mathrm{A}}}{\mathrm{d}\,\pi} \tag{21}$$

Observe now that (20) tells us that

$$\frac{\mathrm{d}\,\varphi_{\mathrm{A}}}{\mathrm{d}\,\pi} \geq 0 \Rightarrow \frac{\mathrm{d}\,\lambda_{\mathrm{A}}}{\mathrm{d}\,\pi} < 0$$

and sice (21) tells us that

$$\frac{\mathrm{d}\,\varphi_{\mathrm{A}}}{\mathrm{d}\,\pi} \leq 0 \Rightarrow \frac{\mathrm{d}\,\lambda_{\mathrm{A}}}{\mathrm{d}\,\pi} < 0,$$

we conclude that

$$\frac{\mathrm{d}\,\lambda_{\mathrm{A}}}{\mathrm{d}\,\pi} < 0. \tag{22}$$

We now need to show that

$$\frac{\mathrm{d}\,\Omega_{\mathrm{A}}}{\mathrm{d}\,\pi} = 2\lambda_{\mathrm{A}}\varphi_{\mathrm{A}} - 2(1 - \lambda_{\mathrm{A}} - \pi\varphi_{\mathrm{A}}) \cdot \frac{\mathrm{d}\,\lambda_{\mathrm{A}}}{\mathrm{d}\,\pi} + 2\pi\lambda_{\mathrm{A}} \cdot \frac{\mathrm{d}\,\varphi_{\mathrm{A}}}{\mathrm{d}\,\pi} > 0.$$

We can rewrite this using (21) as

$$2\lambda_{\mathrm{A}}\varphi_{\mathrm{A}} - 2(1 - \lambda_{\mathrm{A}} - \pi\varphi_{\mathrm{A}}) \cdot \frac{\mathrm{d}\,\lambda_{\mathrm{A}}}{\mathrm{d}\,\pi} + \Big(\overline{w} - 2\pi\varphi_{\mathrm{A}}\Big) \cdot \frac{\mathrm{d}\,\lambda_{\mathrm{A}}}{\mathrm{d}\,\pi} + (1 + \theta - 2\varphi_{\mathrm{A}})\lambda_{\mathrm{A}} > 0,$$

which simplifies to

$$(1 + \theta)\lambda_{\mathrm{A}} > \Big[2(1 - \lambda_{\mathrm{A}}) - \overline{w}\Big] \cdot \frac{\mathrm{d}\,\lambda_{\mathrm{A}}}{\mathrm{d}\,\pi},$$

which holds because $2(1 - \lambda_{\mathrm{A}}) - \overline{w} > 1 - \overline{w} > \pi - \overline{w} > 0$, and so (22) implies that the right-hand side is negative. This yields the second part of the claim. ∎

LEMMA A. *Increasing repression causes the probability of a* reassertion of power *to increase in the anocratic equilibrium if, and only if, condition* (P) *is not satisfied. This probability is always increasing in the despotic equilibrium.* □

Proof of Lemma A The probability of reassertion of power is just the probability of neither citizen being actively opposed, $(1-\lambda_{\mathrm{A}})^2$ in the anocratic equilibrium, and $(1-\lambda_{\mathrm{D}})^2$ in the despotic equilibrium. Thus, its behavior is the inverse of λ_{A} and λ_{D}, respectively. The claim follows immediately from Lemma 6 for the anocratic equilibrium, and (7) for the despotic one. ■

LEMMA B. *If* (P) *is not satisfied, the probability of a costly* civil conflict *is decreasing in repression in the anocratic equilibrium. If* (P) *is satisfied, then it is decreasing if, and only if,*

$$1+\sqrt{3} \geq \left[3\left(\frac{\zeta}{\pi}-1\right)+\sqrt{3}\right]\overline{w},$$

otherwise it is concave (increasing for low values of k, and then decreasing). In the despotic equilibrium, the probability is always zero. □

Proof of Lemma B. For civil conflict to occur, both dissidents and regime supporters have to be active, for which the probability is $2\lambda_{\mathrm{A}}\varphi_{\mathrm{A}}$, so:

$$\frac{\mathrm{d}\,\text{Conflict}}{\mathrm{d}\,k} = 2\left(\varphi_{\mathrm{A}}\cdot\frac{\mathrm{d}\,\lambda_{\mathrm{A}}}{\mathrm{d}\,k}+\lambda_{\mathrm{A}}\cdot\frac{\mathrm{d}\,\varphi_{\mathrm{A}}}{\mathrm{d}\,k}\right)\gtrless 0.$$

Since $\frac{\mathrm{d}\,\varphi_{\mathrm{A}}}{\mathrm{d}\,k} < 0$ by Lemma 5, if $\frac{\mathrm{d}\,\lambda_{\mathrm{A}}}{\mathrm{d}\,k} \leq 0$, that is, (P) does not hold, then this derivative is negative, which establishes the first part of the claim. Suppose now that (P) obtains, so $\frac{\mathrm{d}\,\lambda_{\mathrm{A}}}{\mathrm{d}\,k} > 0$. From the proof of Lemma 7, we can rewrite the derivative

$$(\zeta-4\pi\lambda_{\mathrm{A}})\varphi_{\mathrm{A}}+\Big[4(\lambda_{\mathrm{A}}+\pi\varphi_{\mathrm{A}})-3-\overline{w}\Big]\lambda_{\mathrm{A}}\gtrless 0,$$

which we can simplify to

$$\zeta\varphi_{\mathrm{A}} \gtrless (3-4\lambda_{\mathrm{A}}+\overline{w})\lambda_{\mathrm{A}}.$$

Substituting (11) into (10) and simplifying yields

$$\zeta\varphi_{\mathrm{A}} = 1-2k-(3-2\lambda_{\mathrm{A}}-\overline{w})\lambda_{\mathrm{A}},$$

which means that we need to determine

$$1-2k-(3-2\lambda_{\mathrm{A}}-\overline{w})\lambda_{\mathrm{A}} \gtrless (3-4\lambda_{\mathrm{A}}+\overline{w})\lambda_{\mathrm{A}},$$

which simplifies to

$$\frac{1-2k}{6} \gtrless (1-\lambda_{\mathrm{A}})\lambda_{\mathrm{A}}.$$

Observe now that the left-hand side is decreasing in k while the right-hand side is increasing (because $\lambda_{\mathrm{A}} < 1/2$ means that it is increasing in λ_{A}, and λ_{A} is increasing in k by our supposition), we conclude that the sign can change at most once. Moreover, since

$$\lim_{k\to k^*}\frac{1-2k^*}{6} < \lim_{k\to k^*}(1-\lambda_{\mathrm{A}})\lambda_{\mathrm{A}} = (1-\lambda_{\mathrm{D}})\lambda_{\mathrm{D}} \Leftrightarrow 0 < 1+2k^*(4-k^*),$$

it follows that for high enough k, the probability of conflict is decreasing. But this and the fact that the sign can change at most once imply that there are only two possibilities: either this probability is always decreasing or it is increasing for some $k \in (0, \hat{k})$ and decreasing for $k \in (\hat{k}, k^*)$. This probability can be strictly decreasing if, and only if,

$$\lim_{k\to 0} \frac{1-2k}{6} = \frac{1}{6} \leq \lim_{k\to 0} (1-\lambda_A)\lambda_A \Leftrightarrow \lim_{k\to 0} \lambda_A \geq \frac{1-\sqrt{1/3}}{2}.$$

Since (11) tells us that

$$\lim_{k\to 0} \varphi_A = \frac{\overline{w}}{2\pi},$$

we can use (10) to obtain the quadratic in the limit as $k \to 0$:

$$-2\lambda_A^2 + (3-\overline{w})\lambda_A - \left(1 - \frac{\zeta\overline{w}}{2\pi}\right) = 0,$$

whose discriminant is

$$(3-\overline{w})^2 - 8\left(1 - \frac{\zeta\overline{w}}{2\pi}\right) > 0.$$

Since the larger root exceeds $1/2$, the only admissible solution is

$$\lim_{k\to 0} \lambda_A = \frac{3-\overline{w} - \sqrt{(3-\overline{w})^2 - 8\left(1-\frac{\zeta\overline{w}}{2\pi}\right)}}{4}$$

Thus, the necessary and sufficient condition for the probability of conflict to be decreasing is

$$3-\overline{w} - \sqrt{(3-\overline{w})^2 - 8\left(1-\frac{\zeta\overline{w}}{2\pi}\right)} \geq 2\left(1-\sqrt{1/3}\right),$$

which simplifies to the condition stated in the lemma. If this condition is not satisfied, then the probability must be concave. ■

LEMMA C. *Repression causes the probability of a* velvet revolution *to increase in the anocratic equilibrium and decrease in the despotic equilibrium.* □

Proof of Lemma C. The probability of a velvet revolution (only regime opponents are active with positive probability) in the anocratic equilibrium is $\lambda_A^2 + 2\lambda_A(1-\lambda_A-\varphi_A) = 2\lambda_A - \lambda_A^2 - 2\lambda_A\varphi_A$, so we need to show that

$$\frac{\mathrm{d}\,\mathrm{VR}}{\mathrm{d}\,k} = 2\left[(1-\lambda_A-\varphi_A)\cdot\frac{\mathrm{d}\,\lambda_A}{\mathrm{d}\,k} - \lambda_A\cdot\frac{\mathrm{d}\,\varphi_A}{\mathrm{d}\,k}\right] > 0.$$

Since $\frac{\mathrm{d}\,\varphi_A}{\mathrm{d}\,k} < 0$ (Lemma 5), the inequality obtains whenever $\frac{\mathrm{d}\,\lambda_A}{\mathrm{d}\,k} \geq 0$. We now establish that it also does when $\frac{\mathrm{d}\,\lambda_A}{\mathrm{d}\,k} < 0$. Recall from the proof of Lemma 7 that

$$\frac{\mathrm{d}\,\Omega_A}{\mathrm{d}\,k} = 2\left[\pi\lambda_A\cdot\frac{\mathrm{d}\,\varphi_A}{\mathrm{d}\,k} - (1-\lambda_A-\pi\varphi_A)\cdot\frac{\mathrm{d}\,\lambda_A}{\mathrm{d}\,k}\right] < 0.$$

But now we obtain

$$\lambda_{\mathrm{A}} \cdot \frac{\mathrm{d}\,\varphi_{\mathrm{A}}}{\mathrm{d}\,k} < \pi\lambda_{\mathrm{A}} \cdot \frac{\mathrm{d}\,\varphi_{\mathrm{A}}}{\mathrm{d}\,k} < (1 - \lambda_{\mathrm{A}} - \pi\varphi_{\mathrm{A}}) \cdot \frac{\mathrm{d}\,\lambda_{\mathrm{A}}}{\mathrm{d}\,k} < (1 - \lambda_{\mathrm{A}} - \varphi_{\mathrm{A}}) \cdot \frac{\mathrm{d}\,\lambda_{\mathrm{A}}}{\mathrm{d}\,k},$$

where the first inequality follows from $\frac{\mathrm{d}\,\varphi_{\mathrm{A}}}{\mathrm{d}\,k} < 0$, the second from $\frac{\mathrm{d}\,\Omega_{\mathrm{A}}}{\mathrm{d}\,k} < 0$ above, and the third from our supposition that $\frac{\mathrm{d}\,\lambda_{\mathrm{A}}}{\mathrm{d}\,k} < 0$.

In the despotic equilibrium, the probability of a velvet revolution is just $\lambda_{\mathrm{D}}^2 + 2\lambda_{\mathrm{D}}(1 - \lambda_{\mathrm{D}})$, which means that

$$\frac{\mathrm{d}\,\mathrm{VR}}{\mathrm{d}\,k} = 2(1 - \lambda_{\mathrm{D}}) \cdot \frac{\mathrm{d}\,\lambda_{\mathrm{D}}}{\mathrm{d}\,k} < 0,$$

where the inequality follows from (7). ∎

LEMMA D. *If $\pi > 1/2$ then* (P) *is monotonic in θ: there exists $\widetilde{\theta}$ such that it holds if, and only if, $\theta > \widetilde{\theta}$.* □

Proof. Taking the derivative of the left-hand side with respect to θ yields:

$$1 + \frac{4}{\sqrt{1 + 8k^*}} \cdot \frac{\mathrm{d}\,k^*}{\mathrm{d}\,\theta} > 0,$$

where we establish the inequality as follows. Since

$$\frac{\mathrm{d}\,h}{\mathrm{d}\,\theta} = \frac{(1 - \pi)h(\overline{w})}{\sqrt{(3 + \overline{w})^2 - 8}},$$

we obtain:

$$\frac{\mathrm{d}\,k^*}{\mathrm{d}\,\theta} = \overline{w} \cdot \frac{\mathrm{d}\,h}{\mathrm{d}\,\theta} - (1 - \pi)h(\overline{w}) = (1 - \pi)h(\overline{w}) \left[\frac{\overline{w}}{\sqrt{(3 + \overline{w})^2 - 8}} - 1 \right] < 0,$$

where the inequality follows from the fact that $\overline{w} < \sqrt{(3 + \overline{w})^2 - 8}$. We thus need to show that

$$4(1 - \pi)h(\overline{w}) \left[1 - \frac{\overline{w}}{\sqrt{(3 + \overline{w})^2 - 8}} \right] < \sqrt{1 + 8\overline{w}\,h(\overline{w})}. \tag{23}$$

We first show that the left-hand side is decreasing in $\overline{w}$. We can rewrite it as

$$4(1 - \pi) \left[\frac{h(\overline{w})}{\sqrt{(3 + \overline{w})^2 - 8}} \right] \left[\sqrt{(3 + \overline{w})^2 - 8} - \overline{w} \right],$$

and we note that since $h(\overline{w})$ is decreasing,

$$\frac{\mathrm{d}\,h}{\mathrm{d}\,\overline{w}} = \left(\frac{1}{4} \right) \left[1 - \frac{3 + \overline{w}}{\sqrt{(3 + \overline{w})^2 - 8}} \right] < 0,$$

the first bracketed term is decreasing. It suffices to show that so does the second bracketed term. Taking the derivative with respect to $\overline{w}$ yields

$$(1-\pi)\left[1-\frac{3+\overline{w}}{\sqrt{(3+\overline{w})^2-8}}\right]=4(1-\pi)\cdot\frac{\mathrm{d}\,h}{\mathrm{d}\,\overline{w}}<0,$$

which holds. Since $\overline{w}\,h(\overline{w})$ is increasing, it will be sufficient to establish (23) as $\overline{w}\to 0$. But then (23) reduces to $2(1-\pi)<1$, which holds under the assumption that $\pi>{}^1\!/_2$. ∎

LEMMA E. *Stronger regimes have higher despotic equivalent repression levels.* □

Proof of Lemma E. Take any $k<k^*(\pi)$ at some π, and consider some $\hat{\pi}>\pi$. Since k^* is increasing in π, it follows that $k<k^*(\pi)<k^*(\hat{\pi})$, so k induces the anocratic equilibrium under $\hat{\pi}$ as well. Lemma 9 implies that $\Omega_{\mathrm{A}}(k;\hat{\pi})>\Omega_{\mathrm{A}}(k;\pi)$. We need to show that $\Delta(k;\hat{\pi})>\Delta(k;\pi)$.

There are two cases to consider. If $\Delta(k;\pi)<k^*(\hat{\pi})$ — that is, the despotic equivalent under π induces the anocratic equilibrium under $\hat{\pi}$ — then $\Omega_{\mathrm{D}}(\Delta(\Delta(k;\pi);\hat{\pi});\hat{\pi})=\Omega_{\mathrm{A}}(\Delta(k;\pi);\hat{\pi})>\Omega_{\mathrm{D}}(k^*(\hat{\pi});\hat{\pi})=\Omega_{\mathrm{D}}(k^*(\hat{\pi});\pi)>\Omega_{\mathrm{D}}(\Delta(k;\pi);\pi)$, where the first inequality follows from Ω_{A} decreasing in k, and the second inequality from Ω_{D} increasing in k. But then $\Omega_{\mathrm{A}}(k;\hat{\pi})=\Omega_{\mathrm{D}}(\Delta(k;\hat{\pi});\hat{\pi})>\Omega_{\mathrm{D}}(\Delta(\Delta(k;\pi);\hat{\pi});\hat{\pi})$, where the inequality follows from Lemma 8 because $k<\Delta(k;\pi)$, yields the result.

If $\Delta(k;\pi)>k^*(\hat{\pi})$ — that is, the despotic equivalent under π also induces the despotic equilibrium under $\hat{\pi}$ — then the fact that $\Omega_{\mathrm{A}}(k;\hat{\pi})\geq\Omega_{\mathrm{D}}(k^*(\hat{\pi});\hat{\pi})$ and $\Omega_{\mathrm{D}}(k^*(\hat{\pi});\hat{\pi})<\Omega_{\mathrm{D}}(\Delta(k;\pi);\hat{\pi})=\Omega_{\mathrm{D}}(\Delta(k;\pi);\pi)$ implies that there exists $\widetilde{k}\in(k,\Delta(k;\pi))$ such that $\Omega_{\mathrm{A}}(\widetilde{k};\hat{\pi})=\Omega_{\mathrm{A}}(k;\pi)=\Omega_{\mathrm{D}}(\Delta(k;\pi);\pi)=\Omega_{\mathrm{D}}(\Delta(\widetilde{k};\hat{\pi});\hat{\pi})$. That is, $\Delta(\widetilde{k};\hat{p})=\Delta(k;\pi)$. But then Ω_{A} decreasing in k implies that $\Omega_{\mathrm{A}}(k;\hat{\pi})>\Omega_{\mathrm{A}}(\widetilde{k};\hat{\pi})$, which, by Lemma 8, means that $\Delta(k;\hat{\pi})>\Delta(\widetilde{k};\hat{\pi})=\Delta(k;\pi)$, yielding the result. ∎

Proof of Lemma 10. Consider the anocratic equilibrium. Since both (12) and (13) must hold in equilibrium, we differentiate both their sides with respect to θ:

$$\left(3-4\lambda_{\mathrm{A}}-2\pi\varphi_{\mathrm{A}}\right)\cdot\frac{\mathrm{d}\,\lambda_{\mathrm{A}}}{\mathrm{d}\,\theta}+\pi\varphi_{\mathrm{A}}=-\left(\zeta-2\pi\lambda_{\mathrm{A}}\right)\cdot\frac{\mathrm{d}\,\varphi_{\mathrm{A}}}{\mathrm{d}\,\theta}\tag{24}$$

$$-\left(\overline{w}-2\pi\varphi_{\mathrm{A}}\right)\cdot\frac{\mathrm{d}\,\lambda_{\mathrm{A}}}{\mathrm{d}\,\theta}+(1-\pi)\lambda_{\mathrm{A}}=-2\pi\lambda_{\mathrm{A}}\cdot\frac{\mathrm{d}\,\varphi_{\mathrm{A}}}{\mathrm{d}\,\theta}\tag{25}$$

Since $3-4\lambda_{\mathrm{A}}-2\pi\varphi_{\mathrm{A}}>0$ and $\zeta-2\pi\lambda_{\mathrm{A}}>0$, (24) implies that

$$\frac{\mathrm{d}\,\lambda_{\mathrm{A}}}{\mathrm{d}\,\theta}\geq 0\Rightarrow\frac{\mathrm{d}\,\varphi_{\mathrm{A}}}{\mathrm{d}\,\theta}<0,$$

and since $\overline{w}-2\pi\varphi_{\mathrm{A}}>0$, (25) implies that

$$\frac{\mathrm{d}\,\lambda_{\mathrm{A}}}{\mathrm{d}\,\theta}\leq 0\Rightarrow\frac{\mathrm{d}\,\varphi_{\mathrm{A}}}{\mathrm{d}\,\theta}<0.$$

Since $\frac{\mathrm{d}\,\varphi_{\mathrm{A}}}{\mathrm{d}\,\theta}<0$ must obtain in every possible case, the claim holds. ∎

Proof of Lemma 11. We need to show that λ_A is convex. We can simplify (24) and (25) to obtain:

$$\gamma \cdot \frac{\mathrm{d}\,\lambda_A}{\mathrm{d}\,\theta} = \lambda_A\Big[(1-\pi)\zeta - 2\pi\big((1-\pi)\lambda_A + \pi\varphi_A\big)\Big] \equiv \lambda_A f(\theta)$$
$$\gamma \cdot \frac{\mathrm{d}\,\varphi_A}{\mathrm{d}\,\theta} = -(\overline{w} - 2\pi\varphi_A)\pi\varphi_A - (1-\pi)(3 - 4\lambda_A - 2\pi\varphi_A)\lambda_A,$$

where $\gamma \equiv (\overline{w} - 2\pi\varphi_A)\zeta + 2\pi\lambda_A(3 - 2\overline{w} - 4\lambda_A) > 0$. This tells us that

$$\operatorname{sgn}\left(\frac{\mathrm{d}\,\lambda_A}{\mathrm{d}\,\theta}\right) = \operatorname{sgn}\big(f(\theta)\big) \quad \text{and} \quad \frac{\mathrm{d}\,\lambda_A}{\mathrm{d}\,\theta} = 0 \Leftrightarrow f(\theta) = 0.$$

We now obtain:

$$\frac{\mathrm{d}\,f}{\mathrm{d}\,\theta} = \pi\left[(1-\pi)\left(1 - 2\cdot\frac{\mathrm{d}\,\lambda_A}{\mathrm{d}\,\theta}\right) - 2\pi\cdot\frac{\mathrm{d}\,\varphi_A}{\mathrm{d}\,\theta}\right],$$

and since $\frac{\mathrm{d}\,\varphi_A}{\mathrm{d}\,\theta} < 0$, this tells us that

$$\frac{\mathrm{d}\,\lambda_A}{\mathrm{d}\,\theta} \le 0 \Rightarrow \frac{\mathrm{d}\,f}{\mathrm{d}\,\theta} > 0 \quad \Rightarrow \quad f(\theta) \le 0 \Rightarrow \frac{\mathrm{d}\,f}{\mathrm{d}\,\theta} > 0.$$

But since f is continuous, the fact that it is increasing whenever it is negative and increasing when it crosses the zero line implies that it can only cross the zero line once. In other words, $f(\theta)$ can change signs at most once, going from negative to positive. But since $\frac{\mathrm{d}\,\lambda_A}{\mathrm{d}\,\theta}$ has the same sign, we conclude that λ_A must be convex: it decreases until some $\widetilde{\theta}$, where $f(\widetilde{\theta}) = 0$, and then increases. This, of course, provided that $\widetilde{\theta} > 0$ — if not, then λ_A is strictly increasing.

We have concluded that λ_A is strictly increasing if, and only if, $f(0) \ge 0$. We now establish the conditions that ensure that. Solving $f(\theta) \ge 0$ gives us $(1-\pi)(\zeta - 2\pi\lambda_A) \ge 2\pi^2\varphi_A$, and using (11), we can write this as

$$(1-\pi)(\zeta - 2\pi\lambda_A) \ge \pi\left(\overline{w} - \frac{k}{\lambda_A}\right),$$

which yields the quadratic

$$2\lambda_A^2 - \left(\frac{\zeta}{\pi} - \frac{\overline{w}}{1-\pi}\right)\lambda_A - \frac{k}{1-\pi} \le 0,$$

whose discriminant is

$$D = \left(\frac{\zeta}{\pi} - \frac{\overline{w}}{1-\pi}\right)^2 + \frac{8k}{1-\pi} > 0.$$

Since the smaller root is negative, the solution is at the larger root:

$$\widetilde{\lambda_A} = \frac{\frac{\zeta}{\pi} - \frac{\overline{w}}{1-\pi} + \sqrt{D}}{4}.$$

The necessary and sufficient condition is that it is satisfied at $\theta = 0$, in which case:

$$\widetilde{\lambda_A} = \left(\frac{1}{4}\right)\left[\frac{\pi + c}{\pi} - \frac{\pi - c}{1-\pi} + \sqrt{\left(\frac{\pi + c}{\pi} - \frac{\pi - c}{1-\pi}\right)^2 + \frac{8k}{1-\pi}}\right],$$

so the condition must obtain whenever

$$\lim_{\theta \to \mathbf{0}} \lambda_{\mathrm{A}} \leq \widetilde{\lambda_{\mathrm{A}}}$$

because the quadratic is a parabola and the solution is at the larger root. Thus, if this condition is satisfied, λ_{A} must be strictly increasing; otherwise, it will decrease first, and then increase.

We now show that $\lambda_{\mathrm{A}} < \lambda_{\mathrm{D}}$. First, we establish that λ_{A} is increasing as $\theta \Rightarrow \theta^*$. Observe that λ_{D} is independent of θ, and recall that θ^* is such that (D) is satisfied with equality, which yields

$$\lim_{\theta \to \theta^*} f(\theta) = (1-\pi)(\zeta - 2\pi\lambda_{\mathrm{D}}) > 0,$$

because $\lambda_{\mathrm{A}} \to \lambda_{\mathrm{D}}$ and $\varphi_{\mathrm{A}} \to 0$. Thus, λ_{A} is increasing when the anocratic equilibrium switches to the despotic one. Since λ_{A} is convex this implies that it can only possibly exceed λ_{D} as $\theta \to 0$. But this cannot be: the incentive to oppose when there is a positive probability of conflict is strictly weaker than when there is no such probability (even when targeted penalties are at zero):

$$U_{\mathrm{A}}(L;t) = \varphi_{\mathrm{A}} W(t) + (1-\varphi_{\mathrm{A}})(1-t) - k < 1 - t - k = U_{\mathrm{D}}(L;t),$$

where the inequality follows from the fact that any opponent must be some $t < 1/2 \Rightarrow t < 1-t \Rightarrow W(t) = \pi(t-\theta) + (1-\pi)(1-t) < 1-t$. If this type abstains, she would get $U_{\mathrm{A}}(A;t) = \lambda_{\mathrm{A}}(1-t) + \lambda_{\mathrm{A}} t$ in the anocratic equilibrium and $U_{\mathrm{D}}(A;t) = \lambda_{\mathrm{D}}(1-t) + \lambda_{\mathrm{D}} t$ in the despotic equilibrium. Thus, if $\lambda_{\mathrm{A}} \geq \lambda_{\mathrm{D}}$, the fact that $t < 1-t$ would imply that $U_{\mathrm{A}}(A;t) \geq U_{\mathrm{D}}(A;t)$. Suppose now that $\lambda_{\mathrm{A}} \geq \lambda_{\mathrm{D}}$, which implies that $t_{\mathrm{L}}(\lambda_{\mathrm{A}}, \varphi_{\mathrm{A}}) \geq t_{\mathrm{L}}(\lambda_{\mathrm{D}}, 0)$. Recall that $t_{\mathrm{L}}(\lambda_{\mathrm{A}}, \varphi_{\mathrm{A}})$ is the type that is precisely indifferent between opposing and abstaining, so

$$U_{\mathrm{A}}(L; t_{\mathrm{L}}(\lambda_{\mathrm{A}}, \varphi_{\mathrm{A}})) = U_{\mathrm{A}}(A; t_{\mathrm{L}}(\lambda_{\mathrm{A}}, \varphi_{\mathrm{A}})) \geq U_{\mathrm{D}}(A; t_{\mathrm{L}}(\lambda_{\mathrm{A}}, \varphi_{\mathrm{A}})) \geq U_{\mathrm{D}}(L; t_{\mathrm{L}}(\lambda_{\mathrm{A}}, \varphi_{\mathrm{A}})),$$

where the first inequality follows from the supposition that $\lambda_{\mathrm{A}} \geq \lambda_{\mathrm{D}}$ (per argument above), and the second inequality follows from the fact that $t_{\mathrm{L}}(\lambda_{\mathrm{D}}, 0)$ is the highest type to oppose in a despotic equilibrium, which implies that $t_{\mathrm{L}}(\lambda_{\mathrm{A}}, \varphi_{\mathrm{A}})$ cannot have a strict incentive to oppose. But this then implies that $U_{\mathrm{A}}(L; t_{\mathrm{L}}(\lambda_{\mathrm{A}}, \varphi_{\mathrm{A}})) \geq U_{\mathrm{D}}(L; t_{\mathrm{L}}(\lambda_{\mathrm{A}}, \varphi_{\mathrm{A}}))$, a contradiction to $U_{\mathrm{A}}(L;t) < U_{\mathrm{D}}(L;t)$. Therefore, it must be that $\lambda_{\mathrm{A}} < \lambda_{\mathrm{D}}$ even as $\theta \to 0$, which establishes the claim. ■

LEMMA F. *The weak ruler strictly benefits from citizens believing that he is strong.* □

Proof of Lemma F. To see this, consider the probability of survival after this deviation from (27). Taking the derivative with respect to π yields:

$$\frac{\mathrm{d}\,\Omega_{\mathrm{A}}(\pi; p_{\mathrm{L}})}{\mathrm{d}\,\pi} = 2p_{\mathrm{L}}\lambda_{\mathrm{A}} \cdot \frac{\mathrm{d}\,\varphi_{\mathrm{A}}}{\mathrm{d}\,\pi} - 2(1 - \lambda_{\mathrm{A}} - p_{\mathrm{L}}\varphi_{\mathrm{A}}) \cdot \frac{\mathrm{d}\,\lambda_{\mathrm{A}}}{\mathrm{d}\,\pi} > 0,$$

where we establish the inequality as follows. Using (21), we note that

$$2p_{\mathrm{L}}\lambda_{\mathrm{A}} \cdot \frac{\mathrm{d}\,\varphi_{\mathrm{A}}}{\mathrm{d}\,\pi} = \left(\frac{p_{\mathrm{L}}}{\pi}\right)\left[(\overline{w} - 2\pi\varphi_{\mathrm{A}}) \cdot \frac{\mathrm{d}\,\lambda_{\mathrm{A}}}{\mathrm{d}\,\pi} + (1 + \theta - 2\varphi_{\mathrm{A}})\lambda_{\mathrm{A}}\right],$$

so we can rewrite the inequality above as

$$(1+\theta-2\varphi_{\mathrm{A}})\lambda_{\mathrm{A}} > \left[2(1-\lambda_{\mathrm{A}}-p_{\mathrm{L}}\varphi_{\mathrm{A}}) - \left(\frac{p_{\mathrm{L}}}{\pi}\right)(\overline{w}-2\pi\varphi_{\mathrm{A}})\right]\cdot\frac{\mathrm{d}\,\lambda_{\mathrm{A}}}{\mathrm{d}\,\pi}.$$

Since the proof of Lemma 9 establishes that $\frac{\mathrm{d}\,\lambda_{\mathrm{A}}}{\mathrm{d}\,\pi} < 0$, it will be sufficient to show that the bracketed term is positive. Since $p_{\mathrm{L}} < p_{\mathrm{H}} = \pi$, it is sufficient to show that $2(1-\lambda_{\mathrm{A}}-p_{\mathrm{L}}\varphi_{\mathrm{A}}) > \overline{w}-2\pi\varphi_{\mathrm{A}}$, which can be written as $2-2\lambda_{\mathrm{A}}-\overline{w}+2(\pi-p_{\mathrm{L}})\varphi_{\mathrm{A}} > 0$, which holds because $\lambda_{\mathrm{A}} < 1/2$ and $\overline{w} < \pi < 1$. Thus, the weak ruler unequivocally benefits from the citizens believing he is strong. ∎

Proof of Proposition 4. In an equilibrium, neither type wants to mimic the strategy of the other:

$$1+\lambda_{\mathrm{A}}^2-2(1-p_{\mathrm{H}}\varphi_{\mathrm{A}})\lambda_{\mathrm{A}} \geq 1+\lambda_{\mathrm{D}}^2-2\lambda_{\mathrm{D}} \tag{26}$$

$$1+\lambda_{\mathrm{D}}^2-2\lambda_{\mathrm{D}} \geq 1+\lambda_{\mathrm{A}}^2-2(1-p_{\mathrm{L}}\varphi_{\mathrm{A}})\lambda_{\mathrm{A}}. \tag{27}$$

Since $k_{\mathrm{H}} < \Delta(k_{\mathrm{L}}; p_{\mathrm{H}})$ by assumption, (26) holds with strict inequality, and the strong regime has no incentive to deviate. Rewriting (27) as specified in the proposition yields the condition that prevents the weak regime from deviating as well. The off-the-path beliefs are immaterial. The strong regime is at the highest possible survival probability in equilibrium already. If the weak regime deviates to any $k \in [k^*(p_{\mathrm{H}}), \Delta(k_{\mathrm{L}}; p_{\mathrm{L}}))$, the payoff will be the same irrespective of the beliefs about π (because the despotic equilibrium prevails). If it deviates to any $k \in (k_{\mathrm{L}}, k^*(p_{\mathrm{H}}))$, then the most it can expect is that the citizens infer that the regime is strong, which would induce the anocratic equilibrium. But then choosing k_{L} maximizes the survival probability, so the only relevant deviation is to k_{L}, which the condition makes unprofitable. ∎

References

Albrecht, Holder, and Dorothy Ohl. 2016. "Exit, Reistance, Loyalty: Military Behavior during Unrest in Authoritarian Regimes." *Perspectives on Politics* 14(March): 38–52.

Beissinger, Mark R. 2007. "Structure and Example in Modular Political Phenomena: The Diffusion of Bulldozer/Rose/Orange/Tulip Revolutions." *Perspectives on Politics* 5(2): 259–76.

Bellin, Eva. 2012. "Reconsidering the Robustness of Authoritarianism: Lessons from the Arab Spring." *Comparative Politics* 44(2): 127–149.

Blaydes, Lisa. 2010. *Elections and Distributive Politics in Mubarak's Egypt*. Cambridge: Cambridge University Press.

Brownlee, Jason. 2007. *Authoritarianism in an Age of Democratization*. New York: Cambridge University Press.

Brownlee, Jason, Tarek Masoud, and Andrew Reynolds. 2013. "Why the Modest Harvest?" *Journal of Democracy* 24(October): 29–44.

Brush, Stephen G. 1996. "Dynamics of Theory Change in the Social Sciences: Relative Deprivation and Collective Violence." *Journal of Conflict Resolution* 40(December): 523–545.

Bueno de Mesquita, Ethan. 2010. "Regime Change and Revolutionary Entrepreneurs." *American Political Science Review* 104(August): 446–466.

Chong, Dennis. 1991. *Collective Action and the Civil Rights Movement*. Chicago: The University of Chicago Press.

Coleman, James S. 1995. "Comment on Kuran and Collins." *American Journal of Sociology* 100(May): 1616–1619.

Collins, Randall. 1995. "Prediction in Macrosociology: The Case of the Soviet Collapse." *American Journal of Sociology* 100(May): 1552–1593.

Cox, Gary W. 2009. "Authoritarian Elections and Leadership Succession, 1975–2004." Working paper, Department of Political Science, Stanford University.

DeNardo, James. 1985. *Power in Numbers*. Princeton: Princeton University Press.

Egorov, Georgy, and Konstantin Sonin. 2014. "Incumbency Advantage in Non-Democracies." NBER Working Paper 20519.

Eisinger, Peter K. 1973. "The Conditions of Protest Behavior in American Cities." *American Political Science Review* 67(March): 11–28.

Fischer, Benjamin B., ed. 1999. *At Cold War's End: US Intelligence on the Soviet Union and Eastern Europe, 1989-1991*. Washington, D.C.: Central Intelligence Agency.

Gandhi, Jennifer, and Adam Przeworski. 2007. "Authoritarian Institutions and the Survival of Autocrats." *Comparative Political Studies* 40(November): 1279–1301.

Gandhi, Jennifer, and Ellen Lust-Oskar. 2009. "Elections Under Authoritarianism." *Annuals Review of Political Science* 12(June): 403–422.

Gause, III, F. Gregory. 2011. "Why Middle East Studies Missed the Arab Spring: The Myth of Authoritarian Stability." *Foreign Affairs* 90(July/August): 81–84.

Geddes, Barbara. 2006. "Why Parties and Elections in Authoritarian Regimes?" Working paper, Department of Political Science, UCLA.

Gehlbach, Scott, and Philip Keefer. 2011. "Investment without Democracy: Ruling-party Institutionalization and Credible Commitment in Autocracies." *Journal of Comparative Economics* 39(June): 123–139.

Ginkel, John, and Alastair Smith. 1999. "So You Say You Want a Revolution: A Game Theoretic Explanation of Revolution in Repressive Regimes." *Journal of Conflict Resolution* 43(June): 291–316.

Goldstone, Jack A. 1991. *Revolution and Rebellion in the Early Modern World*. Berkeley: The University of California Press.

Govindan, Srihari, Philip J. Reny, and Arthur J. Robson. 2003. "A Short Proof of Harsanyi's Purification Theorem." *Games and Economic Behavior* 45(November): 369–374.

Gurr, Ted Robert. 1970. *Why Men Rebel*. Princeton: Princeton University Press.

Harsanyi, John C. 1973. "Games with Randomly Disturbed Payoffs: A New Rationale for Mixed-Strategy Equilibrium Points." *International Journal of Game Theory* 2(1): 1–23.

Howard, Marc Morjé, and Meir R. Walters. 2014. "Explaining the Unexpected: Political Science and the Surprises of 1989 and 2011." *Perspectives on Politics* 12(June): 394–408.

Kiser, Edgar. 1995. "What Can Socilogical Theories Predict? Comment on Collins, Kuran, and Tilly." *American Journal of Sociology* 100(May): 1611–1615.

Kricheli, Ruth, Yair Livne, and Beatriz Magaloni. 2011. "Taking to the Streets: Theory and Evidence on Protests under Authoritarianism." Working paper, Department of Political Science, Stanford University.

Kuran, Timur. 1991. "Now Our of Never: The Element of Surprise in the East European Revolution." *World Politics* 44(October): 7–48.

Kuran, Timur. 1995*a*. "The Inevitability of Future Revolutionary Surprises." *American Journal of Sociology* 100(May): 1528–1551.

Kuran, Timur. 1995*b*. *Private Truths, Public Lies: The Social Consequences of Preference Falsification*. Cambridge: Harvard University Press.

Kurzman, Charles. 2005. *The Unthinkable Revolution in Iran*. Cambridge: Harvard University Press.

Lachmann, Richard. 1997. "Agents of Revolution: Elite Conflicts and Mass Mobilization from the Medici to Yeltsin." In *Theorizing Revolutions*, ed. John Foran. London: Routledge.

Lee, Terence. 2015. *Defect or Defend: Military Responses to Popular Protests in Authoritarian Asia*. Baltimore: The Johns Hopkins University Press.

Lichbach, Mark Irving. 1994. "Rethinking Rationality and Rebellion: Theories of Collective Action and Problems of Collective Dissent." *Rationality and Society* 6(January): 8–39.

Lichbach, Mark Irving. 1995. *The Rebel's Dilemma*. Ann Arbor: The University of Michigan Press.

Linz, Juan J., and Alfred Stepan. 1996. *Problems of Democratic Transition and Consolidation*. Baltimore: The Johns Hopkins University Press.

Little, Andrew T., Joshua A. Tucker, and Tom LaGatta. 2015. "Elections, Protest, and Alternation of Power." *Journal of Theoretical Politics* 77(October): 1142–1156.

Lohmann, Susanne. 1994. "The Dynamics of Informational Cascades: The Monday Demonstrations in Leipzig, East Germany, 1989–91." *World Politics* 47(October): 42–101.

Londregan, John, and Andrea Vindigni. 2006. "Voting as a Credible Threat." Working paper, Woodrow Wilson School, Princeton University.

MacEachin, Douglas J. 1996. *CIA Assessments of the Soviet Union: The Record Versus the Charges*. Washington, D.C.: Central Intelligence Agency.

Magaloni, Beatriz. 2006. *Voting for Autocracy: Hegemonic Party Survival and Its Demise in Mexico*. Cambridge: Cambridge University Press.

Maves, Jessica, and Alex Braithwaite. 2013. "Autocratic Institutions and Civil Conflict Contagion." *Perspectives on Politics* 75(2): 259–76.

McMahon, R. Blake, and Branislav L. Slantchev. 2015. "The Guardianship Dilemma: Regime Security *through* and *from* the Armed Forces." *American Political Science Review* 109(May): 297–313.

Moore, Jr, Barrington. 1966. *Social Origins of Dictatorship and Democracy: Lord and Peasant in the Making of the Modern World*. Boston: Beacon Press.

Muller, Edward N. 1972. "A Test of a Partial Theory of Potential for Political Violence." *American Political Science Review* 66(September): 928–959.

Muller, Edward N. 1979. *Aggressive Political Participation*. Princeton: Princeton University Press.

Muller, Edward N. 1985. "Income Inequality, Regime Repressiveness, and Political Violence." *American Sociological Review* 50(February): 47–61.

Nepstad, Sharon Erickson. 2011. "Nonviolent Resistance in the Arab Spring: The Critical Role of Military-Opposition Alliances." *Swiss Political Science Review* 17(December): 485–491.

Olson, Mancur. 1971. *The Logic of Collective Action: Public Goods and the Theory of Groups*. Revised ed. Cambridge: Harvard University Press.

Portes, Alejandro. 1995. "On Grand Surprises and Modest Certainities: Comment on Kuran, Collins, and Tilly." *American Journal of Sociology* 100(May): 1620–1626.

Rozenas, Arturas. 2012. "Forcing Consent: Information and Power in Non-Democratic Elections." Working paper, Department of Politics, New York University.

Schedler, Andreas. 2006. "The Logic of Electoral Authoritarianism." In *Electoral Authoritarianism: The Dynamics of Unfree Competition*, ed. Andreas Schedler. Boulder, CO: Lynne Rienner.

Sharman, Jason C. 2003. *Repression and resistance in Communist Europe*. London: RoutledgeCurzon.

Skocpol, Theda. 1979. *States and Social Revolutions: A Comparative Analysis of France, Russia, and China*. Cambridge: Cambridge University Press.

Stacher, Joshua. 2012. *Adaptable Autocrats: Regime Power in Egypt and Syria*. Stanford, CA: Stanford University Press.

Svolik, Milan W. 2012. *The Politics of Authoritarian Rule*. Cambridge: Cambridge University Press.

Tarrow, Sidney. 1993. "Cycles of Collective Action: Between Moments of Madness and the Repertoire of Contention." *Social Science History* 17(Summer): 281–307.

Taylor, Michael, ed. 1987. *Rationality and Revolution*. Cambridge: Cambridge University Press.

Tilly, Charles. 1978. *From Mobilization to Revolution*. Reading, MA: Addison-Wesley.

Tilly, Charles. 1993. *European Revolutions, 1492–1992*. Oxford: Blackwell.

Waterbury, John. 1970. *The Commander of the Faithful: The Moroccan Political Elite – A Study in Segmented Politics*. New York: Columbia University Press.

Yurchak, Alexei. 2005. *Everything Was Forever, until It Was No More: The Last Soviet Generation*. Princeton: Princeton University Press.