Rents from Power for a Dissident Elite and Mass Mobilization

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Abstract

Popular uprisings in autocracies seldom lead to democratic regimes. We propose a model that helps explain this pattern by focusing on how rents from power encourage popular revolts. In particular, we study why citizens would follow a dissident group seeking regime change, if rents from change accrue only to the group. Our model predicts that higher rents may increase the incidence of public mobilization because rents facilitate coordination. The results suggest that cohesive dissident groups may spur seemingly spontaneous mass mobilizations, even when the mass public know that the dissident group is driven by greed rather than a genuine desire to halt incumbent's rent-seeking activities.

JEL: D7, D8, H11, P48.

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1 Introduction

After massive mobilizations in 2011, three longstanding dictators were overthrown in the so-called Arab Spring—Zine El Abidine Ben Ali of Tunisia, Hosni Mubarak of Egypt, and Muammar el-Qaddafi of Libya. Despite the seemingly spontaneous mass participation of ordinary citizens in the mobilizations, three longstanding leaders of dissident groups came into high political office as a result—Moncef Marzouki from the Congress for the Republic party of Tunisia, Mohamed Morsi from the Muslim Brotherhood of Egypt, and Mohammed Magariaf from the National Front for the Salvation of Libya, respectively. Longstanding dissident leaders' ascension to power as a result of collective action seems to be a general pattern, at least in the last decades. Using the Domestic Conflict Event Data from Banks et al. (2015), for example, we find that members of an established and cohesive dissident group (legal or illegal) ended up controlling the new regime in 37 out of 42 cases (88%) in which the country's chief executive was overthrown as a result of collective action between 1979 and 2012.[1] In none of the remaining 5 cases did a citizen who had no significant political or economic connections hold the country's chief position.[2]

In this paper, we study why the mass public follow a dissident group (e.g., an opposition elite) seeking regime change, if the benefits from change accrue only to the group. The key idea in our model is that a sizable opposition group is pivotal if there is support from a large enough number of individual citizens. Each individual by him or herself, in contrast, is too small to drive change. Such difference in mobilization power between the opposition group and each individual grants the former a coordinating role. Coordination is at the core of mass mobilizations because each agent faces strategic uncertainty as to what others will do. For example, in the Iranian Revolution of 1979 "[...]people were constantly guessing at the likelihood that other people would take to the streets, or go on strike, or demand the overthrow of the regime," Kurzman (2009).

Incentives, in the form of net benefits to those who participate in a successful revolution or net costs paid by those who refrain from doing so, are crucial to overcome the protest participation dilemma (Moore 1995). Just as incumbents might punish those who took part in a failed revolution, dissident groups that seize power after a successful revolution might reward former protesters. Dissident groups often seize the rents from power too. Rents come from appropriation of the state apparatus (Tilly 1978) or the monopoly of corruption in states with weak or "extractive" institutions (Acemoglu and Robinson 2012). As a result, rents do not distribute equally among those who mobilize. While the dissident group seizes power, the mass of individuals are often worse off under the new regime (see e.g., Tocqueville 1866; Kuran 1989; Shadmehr and Bernhardt 2011).

As rents can be captured once in power, they encourage the dissident group to mobilize.[3] Thus, higher rents from power signal to the mass public a higher likelihood of mobilization against the regime. As a result, mass public's expectations about regime change depend on the incentives of the dissident group (as well as their individual incentives). Such expectations also depend on whether rents will be easy to attain. That is, expectations are formed based on the information players have about the strength of the regime. Our aim is to study mechanisms through which rents and information affect the mass public's aggressiveness against the current regime. In particular, our model answers the following questions: Is it the case that rents from power induce dissident group's mobilization? If so, do these rents spur mass mobilization? If the dissident group's assessment about the strength of the regime is no better than the individuals' assessment, do rents still induce the dissident group to mobilize? Are individuals in the broader public willing to mobilize in this situation?

Our model of regime change builds upon Corsetti et al. (2004), in which a large dissident group interacts with a continuum of individuals. The dissident group can mobilize a sizable contingent to push for a new regime and it reaps most of the benefits if change occurs. The two types of agents act according to their assessment about the strength of the current regime. Although both types stand to gain when supporting the prevailing regime, the dissident group prefers overthrowing the current regime while individuals weakly favor it (this latter assumption could be relaxed without changing the qualitative results in the paper). This difference in preferences between the group and individuals allows us to gauge the effect of rents from power for the group on players' aggressiveness against the current regime. We also allow the dissident group and individuals to differ in their assessment about the strength of the regime. Both types of agents are well-informed about the underlying strength, but they are not perfectly informed. Therefore, we can also explore the case in which the dissident group is better informed than individuals and *vice versa*. Our model follows, to the extent possible, the notation in Corsetti et al. (2004), but it elaborates on two important departures. First, our focus is on the conflicting interests between the dissident group and the individuals comprising the mass public, while Corsetti et al. (2004) focused on the effect of the large player's size on regime change. Second, we provide analytic comparative static results in the finite case for the parameters representing the conflicting interest (rents from power) between large and small players. This is an important departure because comparative statics may be tested empirically. We provide a preliminary descriptive empirical analysis in Section 6.

We first conclude that high rents from power make it easier for the mass public to predict the behavior of the dissident group. Thus, rents from power for the dissident group are positively related to mass public aggressiveness against the incumbent. Second, increased precision in the dissident group's information makes individuals more aggressive, regardless of the group's action. Finally, when rents from power for the dissident group are directly related to the loss that the mass public faces if regime changes, it is possible to find cases in which rents from power have a negative impact on the incidence of collective action.

2 Related Literature

Our paper relates to the literature on collective action toward political change and the role of the coordination between the dissident group and each individual comprising the mass public. Various structural factors that contribute to this coordination have been studied (see e.g., Skocpol 1979). For example, the ability of the dissident group to draw upon ideologies, norms, and rituals (see e.g., Kuran 1989, Kurzman 2009, and Shadmehr 2012); use international networks (see e.g., Skocpol 1988); utilize existent institutions to manipulate citizens' beliefs about the strength of the regime (see e.g., Little 2012; Gailmard and Patty 2012; Chong 2014); Hollyer, Rosendorff, Vreeland 2015) and cater to grievances and anti-regime sentiments in the population (see e.g., Finer (1962); McCarthy and Zald (1977); Lichbach 1998; Bueno de Mesquita (2010); Passarelli (2013); Casper and Smith 2014) has been at the core of the analysis. We complement this literature by studying how the size of the rents the dissident group extracts from gaining power and the quality of information about the strength of the current regime affect mass protest. We posit that such rents and information have nuanced effects on mass public behavior.

The methodological building block for our model is the global coordination games introduced by Carlsson and Van Damme (1993) and further developed by Morris and Shin (1998). In these type of games, a large number of privately informed agents choose whether to push for regime change when they hold asymmetric information about the strength of the current regime. This approach has spawned a literature on the role that influential players take in coordination of masses towards political regime change. Dewan and Myatt (2008) analyzes information transmission by leaders (see also Morris and Shin, 2002; and Hellwig, 2002 for the role of public information in global games), while Ekmekci (2009) and Edmond (2013) study the implications of strategic information manipulation by a leader. Bueno de Mesquita (2010) considers a vanguard, who uses costly violent actions as signals to mobilize masses. This signaling game features multiple equilibria each of which maps onto different versions of the structural theories of revolution (see also Angeletos, Hellwig and Pavan, 2006). Shadmehr and Bernhardt (2014) find that higher incentives of the vanguard for regime change reduces the likelihood for the citizens to follow the vanguard by differentiating between citizen leaders and committed vanguards. Smith and Tyson (2017) consider the simultaneous interaction between two massive groups when there is inter-group conflict of interest.

There are important differences between these papers and ours. Our set up entails no differences between the strategies used by the dissident group and the individuals comprising the mass public. The only difference is that the dissident group has significantly more mobilization power by virtue of its size. Under this assumption, we provide a rationale for why longstanding dissident groups may be inclined to push for regime change and how rents from power for this group affect mass mobilization. Second, by allowing the dissident group to have a non-negligible size we are able to concentrate on the pivotal role of a cohesive group in regime change. Third, we address the often mentioned but seldom explored effect of differential benefits that regime change brings to those who end up ruling (see e.g., Tilly 1978, ch. 4) and those comprising the mass public on the incidence of collective action (Quinlivan 1999; Boix and Svolik 2013; Dragu and Polborn 2013). Finally, we show that rents from power for dissident elites may increase the incidence of mass public mobilization. This occurs when payoffs from regime change for the opposition group and the mas public are independent. This complements previous results, which suggest that rents should decrease mass aggressiveness, as it is unclear whether the opposition group responds to information or greed.

3 Regime change between 1979 and 2012

In this section, we provide a brief overview of regime change following collective action in recent decades (see Appendix B for the cases). We focus on the overthrown of a country's chief executive leader because this event can be precisely identified.

Dissident elites usually come to power after collective action. In most of the cases of regime change, no significant constraints to the executive were in place prior to regime change.[4] Relatively unlimited power from office allows the new incumbent group to capture rents. For example, Nicaragua's Sandinista revolution in 1979 was followed by the Junta de Reconstrucción Nacional's government (Junta of National Reconstruction) led by Daniel

Ortega. Ortega continued to rule after the initial Junta (1980-1990) and became increasingly corrupt. Despite these accusations and losing the elections in 1990, Ortega remained a powerful political figure. He returned to power in 2007 and his current government is internationally recognized for its nepotism and corruption (see, e.g., The Guardian 'From comandante to caudillo' by A. Anthony 2006 and El Pais 'El poder queda en familia' by C. Salinas 2015).

Kyrgyzstan 2005 and Egypt 2011 provide further examples. Askar Akayev's government in Kyrgyzstan was characterized by widespread corruption and criminal practices. Although the "Tulip revolution" that unseated him was praised internationally (see, e.g., The Washington Times 'Kyrgyzstan's tulip revolution,' March 26, 2005) the new government of Kurmanbek Bakiyev did little (if anything at all) to reduce corruption and criminals' leverage over national politics. Among other reproachable practices, officials in Bakiyev's government allegedly embezzled a large portion of the roughly US$40 million that Kyrgyzstan's major producer and retailer of hydro-power Elektricheskiye stansii reported in annual losses in 2007 (Marat 2008).[5] In Egypt 2011, the Muslim Brotherhood was the most powerful dissident group and played an important role mobilizing its own rank and file members against Mubarak (El-Sherif 2014, p. 11). Rather than attempting to change the dysfunctional and corrupt institutions of the Egyptian state under Mubarak, Mohamed Morsi's government "simply appropriated them" (Miles 2013).

Another aspect of mass mobilization is that participation is risky, as incumbents generally retaliate against demonstrations. Reliable information about the strength of the regime is crucial in the mobilization decisions of both dissident elites and individuals. Closely connected dissident groups are arguably better placed to assess the regime's strength than outsider groups. In the sample of regime changes we use, dissident elites can be one of three types: part of the incumbent government (Georgia 2003; Nepal 2006; and Ivory Coast 2007); part of a preceding government (Kyrgyzstan 2005; Ukraine 2005; Ecuador 2005; Kyrgyzstan 2010; Maldives 2012); or part of a group with little or no connection to the incumbent regime (the rest of the cases in Table of regime changes in Appendix B).[6] The mobilization decisions of each one of these types of dissident groups may influence individuals in different ways. Mobilization by a connected group may provide a stronger signal the regime is weak than mobilization by an outsider group. In Ukraine 2005 and Kyrgyzstan 2010, for example, dissident groups were part of the incumbent regime and, by openly standing against the government, they were able to drive people to the streets. This by no means implies outsider dissident groups exert no influence. Outsider groups may rely on exogenous changes to influence the mass public to mobilize (e.g., outsider dissident groups in the eastern block nations such as Poland 1989, Czechoslovakia 1989, Bulgaria 1989, and Romania 1989 used Gorbachev's decision to abandon the Brezhnev doctrine in 1988 to openly pursue regime change). Suharto's fall in Indonesia 1998 may serve as a further example. Although the role played by opposition elites in the uprising is not clear (see e.g., Noble 2009), it took the mass public only a few weeks to mobilize in large numbers across the country. Rumors about Suharto's health and the Asian economic crisis of 1997 were key exogenous shocks that fueled protests. The former by signaling a weaker regime and the latter by decreasing the living standards of the society at large, even as Suharto and his cronies continued to enjoy the rents of power (see e.g. Fisman 2001). Outsider groups may also seek regime change through less visible means. Revolutions in Tunisia 2011, Egypt 2011, or Romania 2012 were arguably carried out by simultaneous participation of dissident groups and regular citizens. In what follows we describe a model that illustrates a potential mechanism through which rents and information affect mass public mobilization.

4 The Model

A dissident group and a continuum of individuals form the whole society. The dissident group seeks to mobilize the society to overthrow the current regime. The distinguishing feature of the dissident group is that it controls a portion of size λ, $0 < \lambda < 1$, of the society.

In contrast, all the individuals comprising the mass public taken together have a combined size of $1 - \lambda$. This model captures a realistic feature of regime change: the dissident group is the only player who can be pivotal, as each individual's size in the mass public is negligible. In the Online Appendix we consider a model in which both, the dissident group and the mass public, are cohesive players (so both could be pivotal).[7]

We study mobilization decisions when each player decides independently and simultaneously whether to mobilize against the incumbent regime. The strength of the regime is indexed by the random variable θ, which follows the improper uniform distribution over the real line. θ could be interpreted as representing the maximum size of a protest that the current regime is able to repress. Whether the current regime is overthrown depends on its strength and the incidence of the mobilization. Using μ to denote the mobilizing mass, the current regime falls if and only if $\mu \geq \theta$.

We also assume that every player has incentives to support the prevailing regime. The dissident group, however, prefers successful revolution to status quo; whereas individuals prefer status quo to successful revolution.[8] One way to think about this is that no one wants to participate in a failed protest or to refrain from participating in a successful one. The actual cost in each of these situations, however, does not matter for the results. The only thing we need for the model to work is that each player's payoffs for participating in a failed protest are lower than the payoffs for participating in a successful one. Likewise, we also need that the payoffs for not participating in a successful a mobilization are lower than the payoffs for participating. Precisely, we assume that successful revolution yields $1 + \alpha$ to the dissident group, and $1 - \beta$ to each individual, where $\alpha, \beta \in (0, 1)$ are known parameters. The status quo, on the other hand, yields $1 - \alpha$ to the dissident group, and $1 + \beta$ to each individual. We decided to parametrize the payoffs from coordination in terms of α and β to analyze later on how behavior in equilibrium changes with these parameters.[9] Finally, whomever mobilizes in a failed revolution or refrains from mobilizing against an overthrown regime gets 0.

We interpret α to be the total rents that can be appropriated by the dissident group if regime changes. This assumes that the amount of rents captured does not depend on the size of that group. We may think of these rents as the total amount of resources appropriated from corruption or expropriation by, say, Ortega in Nicaragua 1979 or Bakiyev in Kyrgyzstan 2005 and shared with their respective families, friends, cronies, and minions. We interpret β to be the benefits to each individual in the mass public if the status quo prevails. These benefits can come from transfers from the incumbent regime to the individuals or the foregone punishment from the incumbent for not participating in a failed mobilization.

Note that when the current regime is very strong (i.e. $\theta > 1$) regime change is impossible. One could think of this as a regime that is supported by a small, but extremely powerful army (a presidential or royal guard). When the regime is very weak (i.e. $\theta \leq 0$), on the other hand, regime changes even without mobilization. As in Obstfeld (1996), Morris and Shin (1998), and Corsetti et al. (2004), we focus on intermediate regime strengths, i.e. $0 \leq \theta < 1$ as large enough mobilization will bring down the regime, but the regime will survive otherwise.

4.1 Information structure

In reality, players are exposed to news or rumors about the weakness of the regime, which may affect their decision to mobilize. For example, it is likely that the rumors about Suharto's health may have contributed to the mobilization that led to the fall of his regime in Indonesia 1998 (see, e.g., Fisman 2001). We model information in the following standard way: both types of players, the dissident group and the individuals comprising the mass public, receive a private signal about θ. The dissident group observes $y = \theta + \tau\eta$, where τ is a positive real number, and η follows a continuously differentiable and symmetric probability distribution function $g(\cdot)$ with mean 0. $G(\cdot)$ is the corresponding cumulative distribution function. τ therefore reflects how accurate is the dissident group's perception about the strength of the current regime.

Similarly, each individual i from the mass public receives the realization of the random variable $x_i = \theta + \sigma\varepsilon_i$, where σ is a positive number, and ε_i follows a continuously differentiable and symmetric probability distribution function $f(\cdot)$ with mean 0. $F(\cdot)$ is the corresponding cumulative distribution function. As before, σ represents the precision of the signal each individual receives about the strength of the regime. We assume that all the noise variables are independent of each other. All this is common knowledge.

4.2 Equilibrium in threshold strategies

A strategy for each player is a mapping from the realization of his signal to either mobilize or refrain. We focus on Bayesian Nash equilibria in which players choose their actions to maximize expected payoffs conditional on the realization of their signals, when everyone else is following their equilibrium strategies.

As it is standard in global games, suppose that all the individuals comprising the mass public use switching strategies. This is without loss of generality as the equilibrium in threshold strategies is globally unique (see Proposition 1). Players mobilize if they believe the regime is relatively weak. In other words, when the signal realizes below a given threshold, $x_i \leq x^*$, and to refrain otherwise. The probability that any individual mobilizes can be calculated as $F\left(\frac{x^*-\theta}{\sigma}\right)$ (conditional on the strength of the regime θ). The dissident group chooses to mobilize if its private signal about the strength of the current regime is small enough, i.e. $y \leq y^*$, where y^* is the value of the signal that makes the group indifferent between mobilizing or refraining.

Mobilization overthrows the incumbent regime if and only if the total mass of individuals mobilizing is larger than what the regime is able to repress, i.e., when $\mu \geq \theta$. Given that individuals in the public mass are indexed in a continuum, the incidence of mobilization of the public mass coincides with this probability. The proportion of the mass public mobilizing is given by $F\left(\frac{x^*-\theta}{\sigma}\right)$. Following Corsetti et al. (2004), we define $\underline{\theta}_\lambda$ to be the threshold on θ such that if θ is lower than $\underline{\theta}_\lambda$ mobilization by individuals overthrows the regime, regardless of the action by the dissident group. We show that $\underline{\theta}_\lambda$ exists in equilibrium, which means that it may be the case that the mass public drive change if the strength of the regime is low enough. The threshold $\underline{\theta}_\lambda$ is defined by

$$(1-\lambda)F\left(\frac{x^*-\underline{\theta}_\lambda}{\sigma}\right)=\underline{\theta}_\lambda. \tag{1}$$

By virtue of the group's size, stronger regimes fall when the group also mobilizes. In that case, the uprising is successful (conditional on θ) if $\lambda+(1-\lambda)F\left(\frac{x^*-\theta}{\sigma}\right)\geq\theta$. $\bar{\theta}_\lambda$ is defined as the critical value of θ at which mobilization is successful when the dissident group mobilizes:

$$\lambda+(1-\lambda)F\left(\frac{x^*-\bar{\theta}_\lambda}{\sigma}\right)=\bar{\theta}_\lambda. \tag{2}$$

The subindex λ on $\underline{\theta}_\lambda$ and $\bar{\theta}_\lambda$ indicates that equilibrium thresholds are conditional on the size of the dissident group. As the size of the dissident group increases, the decision of the dissident group becomes more important for regime change to happen. At the same time, it is straightforward to show that $\bar{\theta}_\lambda-\underline{\theta}_\lambda<\lambda$ for any strictly positive λ. Therefore, the coordination problem between the public mass and the dissident group scales down the pivotal role that the dissident group plays in regime change, measured by $\bar{\theta}_\lambda-\underline{\theta}_\lambda$.

The dissident group uses $\bar{\theta}_\lambda$ to calculate the probability the regime falls if it decides to mobilize. In other words, the dissident group's posterior probability that $\theta<\bar{\theta}_\lambda$ conditional on the signal y is given by $G\left(\frac{\bar{\theta}_\lambda-y}{\tau}\right)$.

Comparing the expected payoffs from mobilizing and refraining, the indifference condition for the group is

$$(1+\alpha)G\left(\frac{\bar{\theta}_\lambda-y^*}{\tau}\right)+(1-\alpha)G\left(\frac{\underline{\theta}_\lambda-y^*}{\tau}\right)=1-\alpha. \tag{3}$$

This equation makes explicit a key feature of the model. For a fixed $\alpha<1$ and since $\underline{\theta}_\lambda$ and $\bar{\theta}_\lambda$ are both bounded between 0 and 1, y^* is finite. This implies that if the dissident group perceives the regime is very strong ($y > y^*$), it will refrain from mobilizing for any λ. This seems to be consistent with the observation that large dissident groups, such as the Muslim Brotherhood in Egypt, do not seem to maintain a record of frequent mobilizations even when they represent established opposition forces.

Individual i compares the expected payoff to mobilization by using the probability that the mobilization is successful. The threshold x^* can be calculated from the following indifference condition (after re-arranging terms):

$$\frac{1}{\sigma}\int_{-\infty}^{\underline{\theta}_\lambda} f\left(\frac{\theta - x^*}{\sigma}\right) d\theta + \frac{1}{\sigma}\int_{\underline{\theta}_\lambda}^{\bar{\theta}_\lambda} f\left(\frac{\theta - x^*}{\sigma}\right) G\left(\frac{y^* - \theta}{\tau}\right) d\theta = \frac{1+\beta}{2}. \tag{4}$$

Equations (1) and (2) uniquely determine $\bar{\theta}_\lambda$ and $\underline{\theta}_\lambda$ in terms of x^*; equation (3) determines y^* in terms of $\bar{\theta}_\lambda$ and $\underline{\theta}_\lambda$. Once we have $\bar{\theta}_\lambda$, $\underline{\theta}_\lambda$ and y^*, we can determine whether there is a unique x^* such that (4) holds. The Proposition 1 shows that these four equations uniquely define an equilibrium four-tuple $(\bar{\theta}_\lambda, \underline{\theta}_\lambda, y^*, x^*)$.

Proposition 1 *There exists a unique equilibrium. The equilibrium is in threshold strategies.*

We provide the proofs in the Appendix A.

The main goal of this paper is to study the motives that drive the mass public to mobilize against the incumbent even if regime change does not make them better-off. The key motive is coordination with the dissident group. Thus, even though rents accrue to the dissident group if regime changes, rents can actually be indirectly linked to mass public mobilization. The uniqueness of equilibrium result in Proposition 1 allows us to explore whether rents make the dissident group more inclined to mobilize, and perhaps more interestingly, whether rents for the dissident group make the mass public more likely to mobilize: do y^* and x^* increase with α? On the flip side, do higher status quo benefits accruing to individuals make regime change less likely, at a given strength of the regime? That is, does $\bar{\theta}_\lambda$ decrease with β? What about players' aggressiveness: do y^* and x^* decrease with β? The Proposition 2 below answers these questions.

Proposition 2 *The equilibrium thresholds, $\bar{\theta}_\lambda$, $\underline{\theta}_\lambda$, y^*, and x^* strictly increase in α, the bias in the incentives of the dissident group, and strictly decrease in β, the bias in the incentives of individuals comprising the mass public.*

Equation (3) implies that increasing rents α, makes the dissident group eager to mobilize, everything else constant. Thus, as α increases, it is easier for the mass public to predict the dissident group's behavior and therefore to coordinate with it. As a result, exogenously increasing α would make individuals more inclined to protest as well. This result provides a rationale as to why we may observe mass public protests even if they end up ineffectively limiting the extent of corruption and rent appropriation that may have set them off.

Increasing β has two, perhaps intuitive, effects: it decreases the incidence of individual mobilization and makes regime change less likely (see equation (4)). In other words, the cut-off x^* and the critical mass thresholds, $\bar{\theta}_\lambda$ and $\underline{\theta}_\lambda$ decrease. Thus, the dissident group becomes more cautious as collective action is less likely to succeed.

Analytical expressions to asses the impact of the dissident group's information on regime change are not available for general parameter values. From numerical exercises, however, we show how equilibrium thresholds behave as the dissident group's information becomes more precise compared to the public's information. Figure 1 presents the equilibrium response to an increase in the relative precision of the dissident group's information. Note that the dissident group becomes less aggressive (y^* decreases). In addition, the dissident group's cut-off signal converges to the threshold for regime change, $\bar{\theta}_\lambda$. Individuals, on the other hand, become more inclined to mobilize (x^* increases) as the dissident group becomes relatively more informed. Individuals know the dissident group will respond more to information than to rents as its information becomes more precise. This better assessment of the fundamental strength of the regime leads individuals to push for regime change for larger values of the signal, as the dissident group's information precision increases.

Another key parameter is the size of the dissident group, λ. The next result states that an increase in the size of the dissident group makes it more pivotal. Formally,

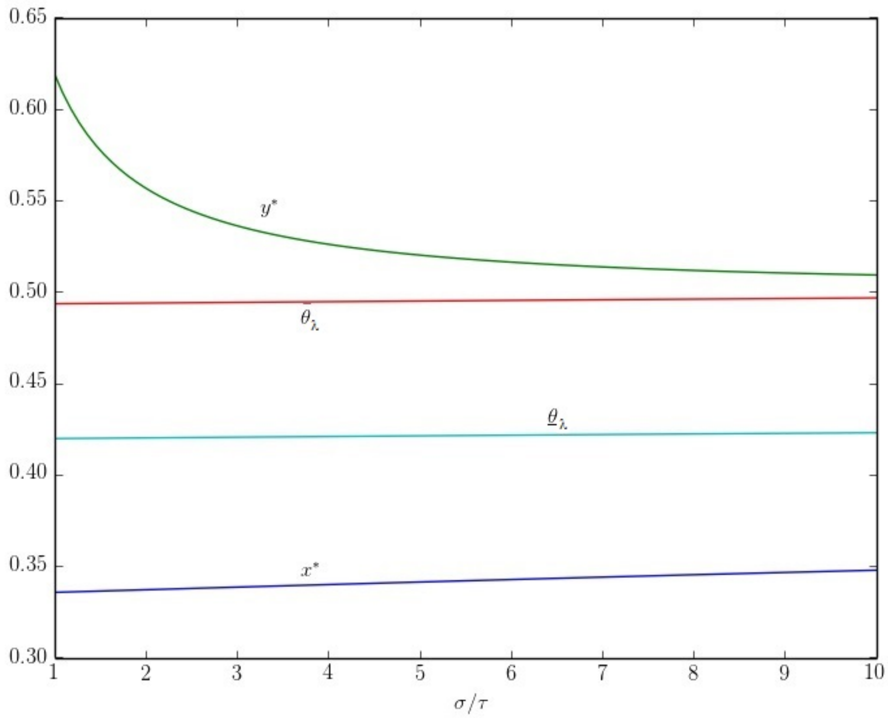

Figure 1: Equilibrium Response to Informational Advantage of the Leader

$\alpha = 0.1$, $\lambda = 0.1$, $\beta = 0.1$.

Proposition 3 *Assume that the noise distribution function $F(\cdot)$ is log-concave. The difference between the critical mass thresholds, $\bar{\theta}_\lambda - \underline{\theta}_\lambda$ increases with λ.*

As λ increases, the dissident group constitutes a larger proportion of the collective movement. This result is not obvious, as in contrast to increasing α, this does not necessarily encourage the dissident group to mobilize. Regime change still requires coordination with the mass public. The individuals in the mass public, on the other hand, become more cautious and their mobilization decisions depend more on the event that regime change occurs by dissident group mobilization only.[10] Figure 2 illustrates how equilibrium thresholds move as λ increases.

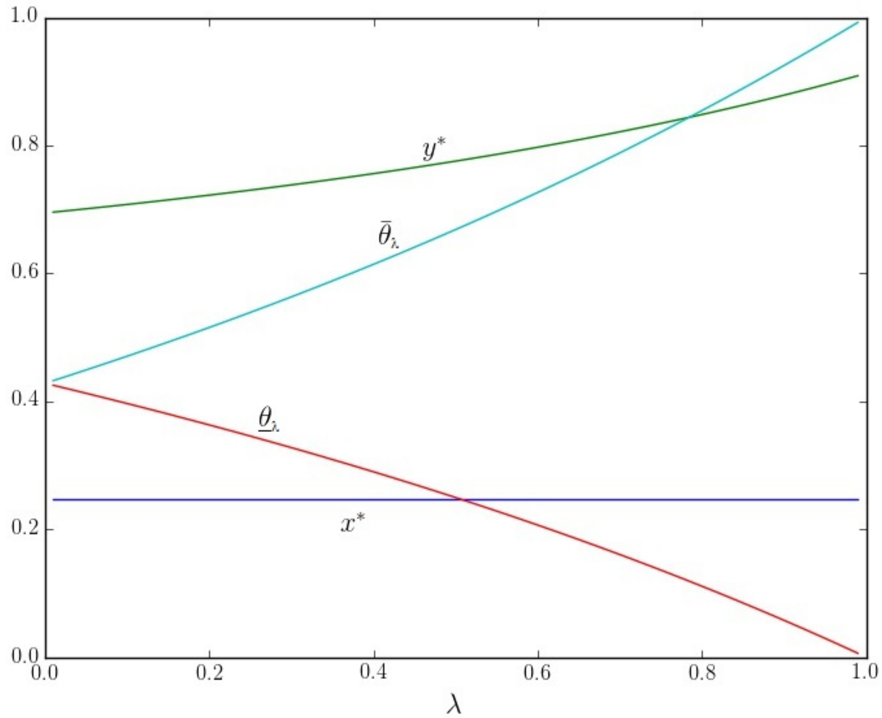

Figure 2: Equilibrium Response to the Size of the Dissident Group

$\alpha = 0.2$, $\beta = 0.2$.

4.3 Behavior in the limit

We consider the limit case in which both types of players have very precise information. This analysis enables us to draw further analytical conclusions about the strategic uncertainty due to coordination frictions by abstracting away from the individual uncertainty that agents face about the regime's strength. When information is very precise, there is little uncertainty regarding the regime's strength. This means that agents can more accurately assess whether the regime is going to change, given the equilibrium critical mass thresholds. For instance, as the information of all agents gets arbitrarily precise and $\theta < \bar{\theta}_\lambda$, both, the share of individuals who refrain from mobilization and the probability that the dissident group refrains from mobilizing, vanish.

Individual certainty about the strength of the regime removes the informational channels through which rents from power induce mobilization. Thus, we can focus on how asymmetric incentives (α and β), information sources (σ/τ), and demographics (λ) affect equilibrium. We find that rents from power α and the informational advantage of the dissident group $\lim \sigma/\tau$ increase the incidence of mobilization.

Assume for the rest of the section that $\sigma \to 0$, $\tau \to 0$, and $\sigma/\tau \to r$, where r can be any positive real number or can diverge to infinity. When signals are extremely precise, both types of players can predict regime strength accurately. Therefore, the probability that the dissident group and each individual mobilize converges to one when the regime is weaker than $\lim \bar{\theta}_\lambda$. In other words, as σ and τ converge to 0, $\lim \bar{\theta}_\lambda = \lim y^* = \lim x^*$. To see this, first re-organize terms in equation (3) as follows

$$G\left(\frac{\bar{\theta}_\lambda - y^*}{\tau}\right) = \frac{1-\alpha}{1+\alpha} G\left(\frac{y^* - \underline{\theta}_\lambda}{\tau}\right). \tag{5}$$

Then, suppose that $\lim y^* > \lim \bar{\theta}_\lambda$, then $G\left(\frac{\bar{\theta}_\lambda - y^*}{\tau}\right) \to 0$, which contradicts equation (5). On the other hand, suppose that $\lim y^* < \lim \bar{\theta}_\lambda$. In this case, the LHS of equation (5) goes to 1 while the RHS is strictly less than 1.

To show $\lim x^* = \lim \bar{\theta}_\lambda$, it is helpful to introduce the following notation. Let $\bar{\delta} = \frac{\bar{\theta}_\lambda - x^*}{\sigma}$, $\underline{\delta} = \frac{\underline{\theta}_\lambda - x^*}{\sigma}$ and $z = \frac{\theta - x^*}{\sigma}$. Using this notation, equation (4) becomes

$$\int_{-\infty}^{\underline{\delta}} f(z)dz + \int_{\underline{\delta}}^{\bar{\delta}} f(z) G\left(\frac{y^* - x^* - \sigma z}{\tau}\right) dz = \frac{1+\beta}{2} \tag{6}$$

As $\sigma \to 0$ it must be the case that $\lim x^* \leq \lim \bar{\theta}_\lambda$, otherwise the LHS of equation (6) goes to zero. As $\sigma \to 0$ and $\tau \to 0$, $\lim x^* \geq \lim y^*$. Otherwise the L.H.S. of equation(6) converges to 1, which is larger than the R.H.S. As a result, $\lim \bar{\theta}_\lambda = \lim y^* = \lim x^*$.

We focus on the case in which the mass public is not big enough to drive regime change by itself, $\lim \bar{\theta}_\lambda > 1 - \lambda$.[11] In this case, $\underline{\delta}$ diverges to $-\infty$, so by equation (1) $\underline{\theta}_\lambda$ converges to $1 - \lambda$, hence $\lim \bar{\theta}_\lambda > \lim \underline{\theta}_\lambda$. Equation (5) becomes $\lim G\left(\frac{\bar{\theta}_\lambda - y^*}{\tau}\right) = \frac{1-\alpha}{1+\alpha}$, so equation (6) can be written as

$$\int_{-\infty}^{\bar{\delta}} f(z) G\left(\frac{\sigma}{\tau}\left(\bar{\delta}-z\right)-G^{-1}\left(\frac{1-\alpha}{1+\alpha}\right)\right) dz=\frac{1+\beta}{2}. \tag{7}$$

The LHS of equation (7) is strictly increasing in $\bar{\delta}$, hence there is a unique solution for $\bar{\delta}$. This establishes the following Proposition 4.

Proposition 4 *As* $\sigma \to 0$, $\tau \to 0$, *and* $\sigma/\tau \to r$, $\lim \bar{\theta}_\lambda = \lim y^* = \lim x^*$. *In addition, if* $\lim \bar{\theta}_\lambda > 1-\lambda$ *then* $\lim \underline{\theta}_\lambda = 1-\lambda$ *and* $\lim \bar{\delta}$ *is uniquely determined by equation* (7).

We are interested in assessing the role of rents and information on both types of players' aggressiveness. By implicitly differentiating equation (7) with respect to α, β and r it follows that $\frac{\partial \bar{\delta}}{\partial r} < 0$, $\frac{\partial \bar{\delta}}{\partial \alpha} < 0$ and $\frac{\partial \bar{\delta}}{\partial \beta} > 0$. The following result comes from expressing equations 1 and 2 as a function of $\underline{\delta}$ and $\bar{\delta}$, $\underline{\theta}_\lambda = (1-\lambda)(1-F(\underline{\delta}))$ and $\bar{\theta}_\lambda = \lambda + (1-\lambda)(1-F(\bar{\delta}))$.

Proposition 5 *If* $\lim \bar{\theta}_\lambda > 1-\lambda$, *as* $\sigma \to 0$, $\tau \to 0$, *and* $\sigma/\tau \to r$, *the equilibrium thresholds* $\lim x^*$, $\lim y^*$, *and* $\lim \bar{\theta}_\lambda$ *increase with* r, α *and decrease with* β.

This result corroborates the importance of rents when both types of players have extremely precise information about the strength of the regime. The dissident group and the individuals comprising the mass public become more likely to mobilize as rents from office for the group increase, and less so when individuals benefit more from the status quo. This result also allows us to assess the role of information in the limit. As uncertainty vanishes, both types of players become more aggressive against the regime when the dissident group has relatively better information. In addition, each individual member of the mass public mobilizes whenever the regime is weaker than his or her private information x_i, which in turn is equal to $\bar{\theta}_\lambda$, the critical state at which regime changes.

5 Fixed Resources

In the main model, economic resources that can be captured in the new regime are independent of those that the mass public receive. However, total resources may be fixed, so there is a trade-off between what the opposition group gets and what the public get. In our notation, this is,

$$(1+\alpha)\lambda + (1-\beta)(1-\lambda) = (1-\alpha)\lambda + (1+\beta)(1-\lambda) \Leftrightarrow \beta = \frac{\lambda}{1-\lambda}\alpha.$$

The group-specific payoff is calculated as the per-member payoff multiplied by the size of that group.[12] When the economic resources are fixed before and after regime change, the gain of the dissident elite is the loss of the public mass and *vice-versa*.

The interdependence of α and β has informational implications as well. When α increases, β increases as well, and therefore, the incentives of the mass public for mobilization decrease. Since these incentives are common knowledge, the dissident group knows that the mass public are less likely to mobilize against the regime when β is high. Thus, with higher α, the dissident group faces a trade-off: higher direct incentives to mobilize *versus* higher risk of coordination failure. The direct effect of α on the incentives of the dissident group can be seen in equation 3. The indirect effect works through the mobilization decision of the mass public, hence through the impact of $\underline{\theta}_\lambda$ and $\bar{\theta}_\lambda$ on y^* in equation (3). The net effect of α on mass public mobilization appears in the following modification of the indifference condition for the mass public:

$$\frac{1}{\sigma}\int_{-\infty}^{\underline{\theta}_\lambda} f\left(\frac{\theta - x^*}{\sigma}\right) d\theta + \frac{1}{\sigma}\int_{\underline{\theta}_\lambda}^{\bar{\theta}_\lambda} f\left(\frac{\theta - x^*}{\sigma}\right) G\left(\frac{y^* - \theta}{\tau}\right) d\theta = \frac{1-\lambda+\lambda\alpha}{2(1-\lambda)}.$$

Whether incentives or coordination motives dominate in equilibrium depends on the relative size of the dissident group λ, and the information precision of the signals that each agent receives. In the main model, the independence of α and β implies that α increases the incidence of mobilization (see Proposition 2). When resources are fixed, however, higher α can reduce the incidence of mobilization, as illustrated by Figure 3. This is an important result because it limits the scope of the monotonic relationship between rents from power and regime change.

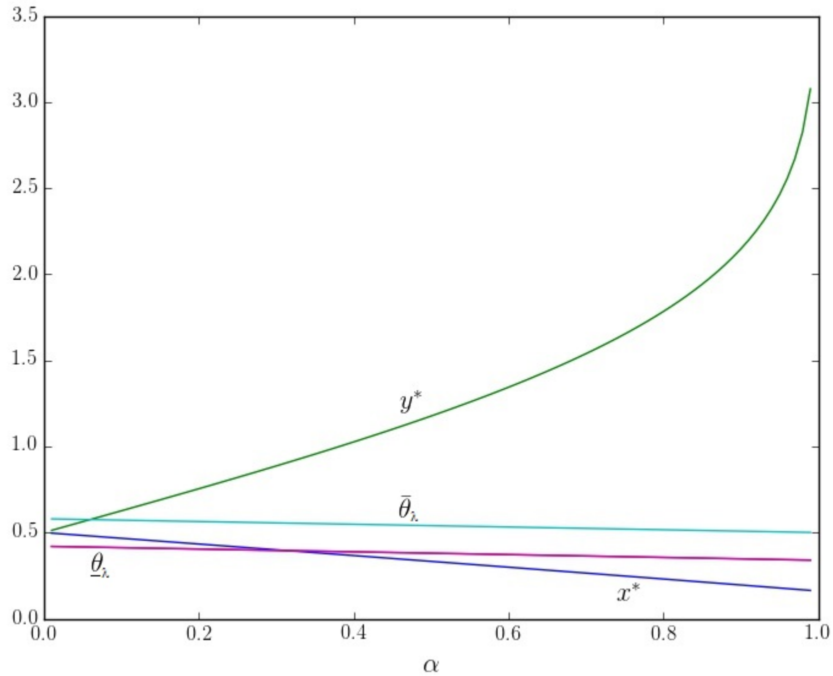

Figure 3: Impact of rents from power, when resources are fixed

6 A proxy for rents from power

We explore a descriptive statistical relation between rents from power and collective action. Although this paper focuses on studying a theoretical mechanism through which rents may affect collective action, we believe it is useful at least to check whether the main theory prescription is qualitatively borne out by available data. A key first step for this task is to define empirical proxies for rents from power that could reflect α in reality. In what follows, we restrict ourselves to estimating correlations and refrain from claiming causal links in our empirical analysis.

A key prescription of the main model is a positive relation between rents from power and mass mobilization (see Proposition 2). However, the relationship could be the opposite if total economic resources are not expected to change if the political regime changes (see Figure 3). An initial correlation analysis as the one we provide below, can help us assess the predictive power of those variations of the model.

We first construct an index of mass public mobilization using the political events data in Banks et al. (2015). Following Bueno de Mesquita and Smith (2010), we calculate a version of their "mass political movements" index. Our index sums the number of events recorded as anti-government demonstrations, riots, general strikes, and revolutions. The total number of events is then divided by 4.[13]

A perhaps natural measure of rents from power is government revenue. Whomever gets to power happens to control these resources. This measure, however, does not take into account that institutions may constrain the use of those revenues. Our preferred measure of rents from power therefore is the interaction between government revenue and an indicator of the lack of constraints that government executives face and the resources available to the government from Polity IV. Precisely, we use the index for the constraints to executives, xconst, from Polity IV, which is a discrete grade variable with range from 1 to 7, 7 being the completely constrained executives. We create a dummy variable that captures the capability of the executive to expropriate resources. This variable is equal to one when the variable xconst in Polity IV is not equal to 7.[14]

We emphasize that this exercise is purely descriptive, and suffers from common empirical limitations. For example, we use aggregate data as opposed to individual decision data. This precludes us from exploring whether movilization decisions by opposition groups and individual citizens differ. Another concern is endogeneity. Omitted variables, such as the strength of the regime, may bias the reported estimates. Despite these and other limitations, we believe that estimating the empirical specification below is still a valuable exercise to assess the basic empirical validity of the model and test the sign of the correlation between rents and mobilization. Concretely, we run the following specification

$$Collective\_action_{it} = C + \beta Revenue_{it} * Few\_Constraints_{it} + \Gamma' X_{it} + \varepsilon_{it},$$

where i denotes country and t years. X_{it} comprises socio-economic controls. The results appear in Table 1. All the variables in are standardized. For completeness, column (1) reports a positive correlation between collective action on government revenues only. Column (2) shows the results when the regressor is rents from power. One standard deviation increase in rents from power leads to a 7% increase in the standardized incidence of mobilization, which is equivalent to 3.6% ($0.07 \times 100 \times 0.50$) increase in the average number of collective action events. The positive and significant association between rents from power and the incidence of collective action is robust to the inclusion of socio-economic controls such as GDP per capita and its growth rate, education level, and population density as reported in column (3). This exploratory results are qualitatively consistent with the conclusions of the main model, suggesting that rents from power for those who occupy positions of power may be related to mass public mobilization.

Simultaneous Coll. Actions			
	Model(1)	Model(2)	Model(3)
GovRev	0.03^{**}		
	(0.01)		
GovRev *FewExeConst		0.07^{***}	0.06^{***}
		(0.02)	(0.02)
GDPpCap			-0.05^{***}
			(0.01)
LitRate			0.09^{**}
			(0.01)
Gr.Rate GDPpC			-0.002
			(0.01)
PopDens			-0.002
			(0.002)
Const	-0.11^{***}	-0.10^{***}	-0.10^{***}
	(0.01)	(0.01)	
N	6003	5545	4323
$\bar{R}^2$	0.006	0.006	0.010

Standard errors statistics in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Table 1: Regression Results

7 Conclusion

Revolutions often give the impression that a large number of ordinary citizens have spontaneously coordinated mass mobilization to oust autocratic leaders. However, evidence suggests that there is often a powerful force behind this coordination—an organized dissident elite group. We study this situation in a theoretical model that features interactions of one large and many small players, because this is a key feature of rebellions across the world, at least in recent decades. We focus on the influence a dissident elite group exerts on mass behavior. Our model provides a framework to explain why rational individuals would join a rebellion even if they expect the new regime will not make them better-off. This is a paradox that arguably describes many post-revolution societies. The dissident group prefers regime change over status quo because of the rents from power. Individual citizens, however, do not expect increased benefits after regime change. We study how rents from power for the dissident elite and information could explain the incidence of mobilization and regime change.

Our theoretical exercise provides some empirical prescriptions. Rents from monopolies, insider deals, expropriation or financial misconduct, which are pervasive in countries with weak institutions, may lure a dissident elite to mobilize, and the mass public to follow suit. The mass public seek to coordinate with the dissident group because they fear punishment if the dissident group captures power. This may be the case even when the mass public know that the dissident group is driven by greed rather than by a desire to constrain the incumbent's rent-seeking activities. New datasets on social networks, for example, could be used to test these predictions (see, e.g., Acemoglu, Hassan and Tahoun, 2014). Another empirical exercise may look for an effect of information about the strength of the regime on regime change. Rumors about the health of presidents (e.g., Fisman 2001, for the case of Suharto in Indonesia), for example, can be readily identified from sources such as Lexis-Nexis and may signal regime weakness, especially in autocratic regimes (e.g., Alvarez, Hernandez-Lagos, Reyes 2016).

Further theoretical research could focus on the role played by other political actors during and after anti-regime mobilizations. An interesting avenue would be to include incumbent's response to the threat of dissident elite and mass mobilization. Although our model does not consider the incumbent responses, it motivates some conjectures. For example, our results suggest that the incumbent would seek to reduce the rents that can be captured from power. Of course, for this conjecture to hold we require the incumbent's action must not convey information about the strength of the regime. This seems to us an interesting area for further research.

Notes

[1]We refer to "collective action" in this case to each situation in which there is at least one instance of general strikes (variable "Domestic 2" in Banks et al. 2015), or riots (variable "Domestic 6"), or anti-government protests (variable "Domestic 8") for each country-year that have preceded, triggered, or caused the overthrown of the country's chief executive during the period 1979-2012. We do not include military coups.

[2]From the remaining 5 cases, 2 of them feature a regime in which the incumbent chief executive swaps its position with another senior member of the incumbent elite (Ecuador 2005; and Yemen 2012); 2 of them feature no clear chief executive (Germany DR 1989; Somalia 1991); and 1 of them (Guinea 2007) features a diplomat (who mediated conflict between incumbent and opposition elites) coming to power. See Table on the cases of regime change in Appendix B for details. This is consistent with the persistence of autocratic regimes documented in Magaloni and Kricheli 2010 and Kricheli and Livne 2011.

[3]Rents have been shown to be important in the extant literature on armed conflict (see e.g. Hirshleifer 2001; Reed, 2003; Collier and Hoeffler, 2004; Humphreys 2005; Blattman and Miguel 2010.

[4]From the 37 cases which the Polity IV dataset contains non-missing information about the "Executive Constraints" (XCONST) variable, only 3 of them (Bolivia 2003; East Timor 2006; and Romania 2012) feature "accountability groups [with] effective authority equal to or greater than the executive in most areas of activities" (XCONST = 7). In all the other cases, the executive has more effective authority than any other accountability group.

[5]Kyrgyzstan had a score of 2.1 in the Transparency International's Corruption Perception Index (ranging from 0 (highly corrupt) to 10 (highly clean)) right after the Tulip revolution in 2007.

[6]It is worth noting that in three cases (Philippines 2001; Iceland 2009; Yemen 2012) the head of the government was ousted, but the government itself was not.

[7]The model with two cohesive players is less tractable and uniqueness of equilibrium is not guaranteed for general specifications of the model. As a result it does not provide analytical comparative statics on the parameters of interest. Nevertheless, numerical calculations suggest the qualitative results in this case are similar to the ones in the paper. We provide the details in the Online Appendix

[8]Individuals in the public mass being indifferent between revolution and status quo is a particular case in our model.

[9]The total resources in the new regime is then

$$Y^{new} \equiv \lambda(1+\alpha) + (1-\lambda)(1-\beta),$$

while the total resources in the old regime is

$$Y^{old} \equiv \lambda(1-\alpha) + (1-\lambda)(1+\beta).$$

We assume at this point that the total amount of resources in the new regime is independent of the amount in the old regime. This assumption captures the cases, in which a change in the political regime is accompanied with a change in the economic policy, and the expected total economic output. We consider the case, in which a regime change does not change the amount of economic resources, and therefore α and β are dependent on each other in Section 5

[10]Log-concavity regulates posterior beliefs of the individuals so that when the dissident group is more likely to be pivotal, the set of signals that are consistent with this increases.

[11]When the mass public is extremely large, the region $[\underline{\theta}_\lambda, \bar{\theta}_\lambda]$, where the dissident group is pivotal, vanishes in the limit. As we focus on the case in which the dissident group is pivotal, we would want to provide a lower bound for the size of the group, λ. From the discussion in the text, the exact lower bound is endogenous and equal to $1 - \lim \bar{\theta}_\lambda$. Using the arguments in Lemma 1 in the Appendix A; however, it is possible to find a (higher) exogenous lower

bound given by $\lambda \geq \min\left\{\frac{1+\beta+(1+\beta)\alpha}{1+\beta+(5+\beta)\alpha}, \frac{1}{2}\right\}$. This provides a condition on the parameters for the case analyzed in the text.

[12]We ignore resources that accrue to the incumbent in the status quo. This only rescales payoffs since adjusting for the incumbent's payoff would not change the direction of the comparative statics.

[13]Bueno de Mesquita and Smith (2010) build an index that averages out the logarithm of 1 + the number of each of these events, instead of the number of events itself. Our results do not change when we use this measure.

[14]Using our model, one can also derive the conclusion that the rents to the mass public (which are indexed by β) have an influence on the mobilization decision of the dissident group. The impact of β on the incidence of collective action can also be tested; however, this requires a measure of the expectations of the individuals regarding collective action and regime change. In contrast to the rents from power α, which represents public resources, measuring β requires an aggregation of individual level expectations of the members of the mass public. Even though, collecting such a data for β is interesting and valuable, it is beyond the scope of this paper as our focus is on the theoretical analysis of the impact of rents from power on collective action.

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Appendices

A Proofs

Proof of Proposition 1 This proof closely follows the proof of Proposition 2 in Corsetti et al. (2004). We include here for the sake of completeness.

We will first show that there exists a unique equilibrium in threshold strategies. Establishing that will help us prove the global uniqueness.

It is straightforward to check that equations (1) and (2) have unique solutions in $\underline{\theta}_\lambda$ and $\bar{\theta}_\lambda$ respectively given x^*, and that equation (3) has a unique solution in y^* given $\underline{\theta}_\lambda$ and $\bar{\theta}_\lambda$. Thus, if equation (4) has a unique solution in x^* as a function of exogenous parameters, the system of equations has a unique solution in terms of the exogenous parameters, which proves the Proposition.

Implicitly differentiating (1) and (2) with respect to x^*:

$$\frac{\partial \underline{\theta}_\lambda}{\partial x^*} = \frac{(1-\lambda) f\left(\frac{x^* - \underline{\theta}_\lambda}{\sigma}\right)}{\sigma + (1-\lambda) f\left(\frac{x^* - \underline{\theta}_\lambda}{\sigma}\right)} \in (0,1)$$

$$\frac{\partial \bar{\theta}_\lambda}{\partial x^*} = \frac{(1-\lambda) f\left(\frac{x^* - \bar{\theta}_\lambda}{\sigma}\right)}{\sigma + (1-\lambda) f\left(\frac{x^* - \bar{\theta}_\lambda}{\sigma}\right)} \in (0,1).$$

Implicitly differentiating (3):

$$\begin{aligned} &\frac{1+\alpha}{\tau} \frac{\partial \bar{\theta}_\lambda}{\partial x^*} g\left(\frac{\bar{\theta}_\lambda - y^*}{\tau}\right) + \frac{1-\alpha}{\tau} \frac{\partial \underline{\theta}_\lambda}{\partial x^*} g\left(\frac{\underline{\theta}_\lambda - y^*}{\tau}\right) \\ &= \left(\frac{1+\alpha}{\tau} g\left(\frac{\bar{\theta}_\lambda - y^*}{\tau}\right) + \frac{1-\alpha}{\tau} g\left(\frac{\underline{\theta}_\lambda - y^*}{\tau}\right)\right) \frac{\partial y^*}{\partial x^*}, \end{aligned} \tag{8}$$

which implies that $\frac{\partial y^*}{\partial x^*} > 0$.

Let us adopt the following notation for simplicity

$$\begin{aligned} z &= \frac{\theta - x^*}{\sigma} \\ \underline{\delta} &= \frac{\underline{\theta}_\lambda - x^*}{\sigma} \\ \bar{\delta} &= \frac{\bar{\theta}_\lambda - x^*}{\sigma}. \end{aligned} \tag{9}$$

Then (4) becomes

$$\int_{-\infty}^{\underline{\delta}} \phi(z) dz + \int_{\underline{\delta}}^{\bar{\delta}} f(z) G\left(\frac{y^* - x^* - \sigma z}{\tau}\right) dz = \frac{1+\beta}{2} \tag{10}$$

Note that

$$\frac{\partial \underline{\delta}}{\partial x^*} = \frac{\frac{\partial \underline{\theta}_\lambda}{\partial x^*} - 1}{\sigma} < 0$$

since $\frac{\partial \theta_\lambda}{\partial x^*} < 1$.

Implicitly differentiation of (1) with respect to x^* implies

$$\frac{\partial \underline{\delta}}{\partial x^*} = -\frac{\frac{\partial \underline{\theta}_\lambda}{\partial x^*}}{(1-\lambda) f(\underline{\delta})} = -\frac{1}{\sigma + 1} < 0.$$

Similarly,

$$\frac{\partial \bar{\delta}}{\partial x^*} = -\frac{1}{\sigma + 1} < 0.$$

Note that the signs of $\frac{\partial \underline{\delta}}{\partial x^*}$ and $\frac{\partial \bar{\delta}}{\partial x^*}$ imply that $\frac{\partial y^*}{\partial x^*} - 1 < 0$.

The derivative of (10) with respect to x^* is

$$\frac{\partial \underline{\delta}}{\partial x^*} f(\underline{\delta}) + \frac{\partial \bar{\delta}}{\partial x^*} f(\bar{\delta}) G\left(\frac{y^* - x^* - \sigma \bar{\delta}}{\tau}\right) - \frac{\partial \underline{\delta}}{\partial x^*} f(\underline{\delta}) G\left(\frac{y^* - x^* - \sigma \underline{\delta}}{\tau}\right)$$
$$+ \int_{\underline{\delta}}^{\bar{\delta}} f(z) g\left(\frac{y^* - x^* - \sigma z}{\tau}\right) \frac{1}{\tau}\left(\frac{\partial y^*}{\partial x^*} - 1\right) dz < 0$$

Now, note that

$$\lim_{x^* \to -\infty} \underline{\theta}_\lambda = 0, \quad \lim_{x^* \to \infty} \underline{\theta}_\lambda = 1 - \lambda, \quad \lim_{x^* \to -\infty} \bar{\theta}_\lambda = \lambda \quad \lim_{x^* \to \infty} \bar{\theta}_\lambda = 1 \Rightarrow$$
$$\lim_{x^* \to -\infty} \underline{\delta} = \lim_{x^* \to -\infty} \bar{\delta} = \infty, \quad \lim_{x^* \to \infty} \underline{\delta} = \lim_{x^* \to \infty} \bar{\delta} = -\infty.$$

Thus, the left-hand side of (10) converges to 1 as x^* diverges to $-\infty$, and converges to 0 as x^* diverges to ∞. By the intermediate-value theorem and implicit function theorem, this proves the Proposition.

Global Uniqueness

The argument for global uniqueness is similar to the standard one in the global games.

First, consider the extreme scenario in which an individual believes that no other individual mobilizes against the regime. Then given the signal

$$x = \theta + \sigma\varepsilon,$$

the probability that the regime changes is the posterior probability that $\theta \le 0$,

$$\frac{1}{\sigma}\int_{-\infty}^{0} f\left(\frac{\theta - x}{\sigma}\right) d\theta,$$

which is strictly decreasing in the signal x. Moreover, as x diverges to $-\infty$, the probability converges to one, and as x diverges to ∞, it converges to zero. Therefore, there exists a unique finite $\underline{x}_0$ such that the payoff from mobilization equals the payoff from refraining. Therefore, for any individual who receives a signal below $\underline{x}_0$ mobilization is a dominant strategy.

Since rationality is common knowledge, no player will expect that an individual who received a signal below $\underline{x}_0$ to refrain from mobilizing. Therefore, every individual and the dissident group will behave accordingly. It is possible to characterize the behavior by thresholds $\underline{\theta}_\lambda(\underline{x}_0)$, $\bar{\theta}_\lambda(\underline{x}_0)$ and $y^*(\underline{x}_0)$ $\underline{x}_1$ that are uniquely defined by the indifference conditions in the form of equations (1), (2), (3) and (4) respectively. For convenience we reproduce these equations below:

$$(1-\lambda)F\left(\frac{\underline{x}_0 - \underline{\theta}_\lambda(\underline{x}_0)}{\sigma}\right) = \underline{\theta}_\lambda(\underline{x}_0),$$

$$\lambda + (1-\lambda)F\left(\frac{\underline{x}_0 - \bar{\theta}_\lambda(\underline{x}_0)}{\sigma}\right) = \bar{\theta}_\lambda(\underline{x}_0),$$

$$(1+\alpha)G\left(\frac{\bar{\theta}_\lambda(\underline{x}_0) - y^*(\underline{x}_0)}{\tau}\right) + (1-\alpha)G\left(\frac{\underline{\theta}_\lambda(\underline{x}_0) - y^*(\underline{x}_0)}{\tau}\right) = 1-\alpha$$

$$\frac{1}{\sigma}\left[\int_{-\infty}^{\underline{\theta}_\lambda(\underline{x}_0)} f\left(\frac{\theta - \underline{x}_1}{\sigma}\right) d\theta + \int_{\underline{\theta}_\lambda(\underline{x}_0)}^{\bar{\theta}_\lambda(\underline{x}_0)} f\left(\frac{\theta - \underline{x}_1}{\sigma}\right) G\left(\frac{y^*(\underline{x}_0)}{\tau}\right) d\theta\right] = \frac{1+\beta}{2}.$$

By implicitly differentiating with respect to $\underline{x}_0$, we can show that the last equation above is strictly decreasing in x_1 and increasing in x_0, which implies that $\underline{x}_1 > \underline{x}_0$. Indeed, by iterated elimination of dominated strategies, it is possible to define an increasing sequence of thresholds:

$$\underline{x}_0 < \underline{x}_1 < \underline{x}_2 < \ldots .$$

A symmetric argument shows that there is a decreasing sequence $\{\bar{x}_0, \bar{x}_1, \ldots\}$ of thresholds that characterizes the signals for that refraining is the dominant strategy. Moreover, by definition of these thresholds, we have the following ordering:

$$\underline{x}_0 < \underline{x}_1 < \underline{x}_2 < \ldots < \ldots < \bar{x}_2 < \bar{x}_1 < \bar{x}_0.$$

Since both sequences are monotonic and bounded, both converge to limiting thresholds $\underline{x} \leq \bar{x}$ respectively. Note that the best reply of all individuals and the dissident group to these limiting thresholds $(\underline{\theta}_\lambda(\underline{x}), \bar{\theta}_\lambda(\underline{x}), y^*(\underline{x}), \underline{x})$ and $(\underline{\theta}_\lambda(\bar{x}), \bar{\theta}_\lambda(\bar{x}), y^*(\bar{x}), \bar{x})$ are solutions to the equations (1), (2), (3) and (4). Since we established in the first step above that this set of equations has a unique solution, $\underline{x} = \bar{x}$. This establishes that the unique equilibrium in threshold strategies is also the unique strategy profile that survives iterative elimination of dominated strategies.

■

Proof of Proposition 2 The analysis in this proof is one of the novel contributions of our paper to the literature on global games.

Let $b \in \{\alpha, \beta\}$. Implicitly differentiating (1) and (2) with respect to b gives

$$\frac{\partial \underline{\theta}_\lambda}{\partial b} = \frac{\frac{1-\lambda}{\sigma} f\left(\frac{x^*-\underline{\theta}_\lambda}{\sigma}\right)}{1 + \frac{1-\lambda}{\sigma} f\left(\frac{x^*-\underline{\theta}_\lambda}{\sigma}\right)} \frac{\partial x^*}{\partial b} \tag{11}$$

$$\frac{\partial \bar{\theta}_\lambda}{\partial b} = \frac{\frac{1-\lambda}{\sigma} f\left(\frac{x^*-\bar{\theta}_\lambda}{\sigma}\right)}{1 + \frac{1-\lambda}{\sigma} f\left(\frac{x^*-\bar{\theta}_\lambda}{\sigma}\right)} \frac{\partial x^*}{\partial b}. \tag{12}$$

There are two important implications of (11) and (12). First, $\frac{\partial \underline{\theta}_\lambda}{\partial b}$ and $\frac{\partial \bar{\theta}_\lambda}{\partial b}$ have the same signs as of $\frac{\partial x^*}{\partial b}$.

Equations (1) and (2) also imply that

$$\frac{\partial \underline{\delta}}{\partial b} = -\frac{\frac{\partial \underline{\theta}_\lambda}{\partial b}}{(1-\lambda) f(\underline{\delta})} \tag{13}$$

$$\frac{\partial \bar{\delta}}{\partial b} = -\frac{\frac{\partial \bar{\theta}_\lambda}{\partial b}}{(1-\lambda) f(\bar{\delta})}, \tag{14}$$

which implies that each of $\frac{\partial \underline{\delta}}{\partial b}$ and $\frac{\partial \bar{\delta}}{\partial b}$ has the opposite sign of $\frac{\partial x^*}{\partial b}$.

Implicit differentiation of (3) gives

$$\frac{\partial y^*}{\partial \alpha} = \frac{\frac{1+\alpha}{\tau} g\left(\frac{\bar{\theta}_\lambda - y^*}{\tau}\right) \frac{\partial \bar{\theta}_\lambda}{\partial \alpha} + \frac{1-\alpha}{\tau} g\left(\frac{\underline{\theta}_\lambda - y^*}{\tau}\right) \frac{\partial \underline{\theta}_\lambda}{\partial \alpha} + 1 + G\left(\frac{\bar{\theta}_\lambda - y^*}{\tau}\right) - G\left(\frac{\underline{\theta}_\lambda - y^*}{\tau}\right)}{\frac{1+\alpha}{\tau} g\left(\frac{\bar{\theta}_\lambda - y^*}{\tau}\right) + \frac{1-\alpha}{\tau} g\left(\frac{\underline{\theta}_\lambda - y^*}{\tau}\right)}. \tag{15}$$

$$\frac{\partial y^*}{\partial \beta} = \frac{\frac{1+\alpha}{\tau} g\left(\frac{\bar{\theta}_\lambda - y^*}{\tau}\right) \frac{\partial \bar{\theta}_\lambda}{\partial \beta} + \frac{1-\alpha}{\tau} g\left(\frac{\underline{\theta}_\lambda - y^*}{\tau}\right) \frac{\partial \underline{\theta}_\lambda}{\partial \beta}}{\frac{1+\alpha}{\tau} g\left(\frac{\bar{\theta}_\lambda - y^*}{\tau}\right) + \frac{1-\alpha}{\tau} g\left(\frac{\underline{\theta}_\lambda - y^*}{\tau}\right)}. \tag{16}$$

Since $\frac{\partial \underline{\theta}_\lambda}{\partial \alpha}$ and $\frac{\partial \bar{\theta}_\lambda}{\partial \alpha}$ both have the same sign, (15) implies that $\frac{\partial y^*}{\partial \alpha}$ is positive if $\frac{\partial x^*}{\partial \alpha}$ is positive and $\frac{\partial y^*}{\partial \beta}$ has the same sign as $\frac{\partial x^*}{\partial \beta}$.

Moreover, if we substitute $\frac{\partial \underline{\theta}_\lambda}{\partial \alpha}$ and $\frac{\partial \bar{\theta}_\lambda}{\partial \alpha}$ from equations (11) and (12), we find that

$$\frac{\partial x^*}{\partial \alpha}(\underline{c} \cdot \underline{d} + \bar{c} \cdot \bar{d}) + 1 + \Delta P = (\underline{c} + \bar{c}) \frac{\partial y^*}{\partial \alpha},$$
$$\frac{\partial x^*}{\partial \beta}(\underline{c} \cdot \underline{d} + \bar{c} \cdot \bar{d}) = (\underline{c} + \bar{c}) \frac{\partial y^*}{\partial \beta}.$$

where

$$
\begin{aligned}
\underline{c} &= \frac{1-\alpha}{\tau} g\left(\frac{\underline{\theta}_\lambda - y^*}{\tau}\right) \\
\bar{c} &= \frac{1+\alpha}{\tau} g\left(\frac{\bar{\theta}_\lambda - y^*}{\tau}\right) \\
\underline{d} &= \frac{\frac{1-\lambda}{\sigma} f\left(\frac{x^* - \underline{\theta}_\lambda}{\sigma}\right)}{1 + \frac{1-\lambda}{\sigma} f\left(\frac{x^* - \underline{\theta}_\lambda}{\sigma}\right)} \\
\bar{d} &= \frac{\frac{1-\lambda}{\sigma} f\left(\frac{x^* - \bar{\theta}_\lambda}{\sigma}\right)}{1 + \frac{1-\lambda}{\sigma} f\left(\frac{x^* - \bar{\theta}_\lambda}{\sigma}\right)} \\
\Delta P &= G\left(\frac{\bar{\theta}_\lambda - y^*}{\tau}\right) - G\left(\frac{\underline{\theta}_\lambda - y^*}{\tau}\right).
\end{aligned}
$$

Since $\bar{d}$ and $\underline{d}$ are in between 0 and 1,

$$
\frac{\underline{c} \cdot \underline{d} + \bar{c} \cdot \bar{d}}{\underline{c} + \bar{c}} \in (0, 1).
$$

Thus if we assume that $\frac{\partial x^*}{\partial \alpha}, \frac{\partial x^*}{\partial \beta} < 0$, then

$$
\left(\frac{\partial y^*}{\partial \alpha} - \frac{\partial x^*}{\partial \alpha}\right) = \frac{1 + \Delta P}{\underline{c} + \bar{c}} + \left(\frac{\underline{c} \cdot \underline{d} + \bar{c} \cdot \bar{d}}{\underline{c} + \bar{c}} - 1\right) \frac{\partial x^*}{\partial \alpha} > 0, \tag{17}
$$

$$
\left(\frac{\partial y^*}{\partial \beta} - \frac{\partial x^*}{\partial \beta}\right) = \left(\frac{\underline{c} \cdot \underline{d} + \bar{c} \cdot \bar{d}}{\underline{c} + \bar{c}} - 1\right) \frac{\partial x^*}{\partial \beta} > 0. \tag{18}
$$

On the other hand, $\frac{\partial x^*}{\partial \beta} > 0$ implies that $\frac{\partial y^*}{\partial \beta} < \frac{\partial x^*}{\partial \beta}$.

Implicit differentiation of (10) with respect to α gives

$$
\begin{aligned}
&\frac{\partial \underline{\delta}}{\partial \alpha} f(\underline{\delta}) + \frac{\partial \bar{\delta}}{\partial \alpha} f(\bar{\delta}) G\left(\frac{y^* - x^* - \sigma \bar{\delta}}{\tau}\right) - \frac{\partial \underline{\delta}}{\partial \alpha} f(\underline{\delta}) G\left(\frac{y^* - x^* - \sigma \underline{\delta}}{\tau}\right) \\
&\qquad \int_{\underline{\delta}}^{\bar{\delta}} f(z) \left(\frac{\partial y^*}{\partial \alpha} - \frac{\partial x^*}{\partial \alpha}\right) \frac{1}{\tau} g\left(\frac{y^* - x^* - \sigma z}{\tau}\right) dz = 0,
\end{aligned} \tag{19}
$$

which implies that the term $\left(\frac{\partial y^*}{\partial\alpha} - \frac{\partial x^*}{\partial\alpha}\right)$ has the opposite sign of $\frac{\partial\underline{\delta}}{\partial\alpha}$ and $\frac{\partial\bar{\delta}}{\partial\alpha}$. However, if $\frac{\partial x^*}{\partial\alpha}$ < 0, then $\frac{\partial\underline{\delta}}{\partial\alpha}$ and $\frac{\partial\bar{\delta}}{\partial\alpha}$ are positive (from (13) and (14)) and from (17), $\frac{\partial x^*}{\partial\alpha} \leq 0$ also implies that $\left(\frac{\partial y^*}{\partial\alpha} - \frac{\partial x^*}{\partial\alpha}\right)$ is positive, which contradicts (19).

On the other hand, implicit differentiation of (10) with respect to α gives

$$\frac{\partial\underline{\delta}}{\partial\beta}f(\underline{\delta}) + \frac{\partial\bar{\delta}}{\partial\beta}f(\bar{\delta})G\left(\frac{y^* - x^* - \sigma\bar{\delta}}{\tau}\right) - \frac{\partial\underline{\delta}}{\partial\beta}f(\underline{\delta})G\left(\frac{y^* - x^* - \sigma\underline{\delta}}{\tau}\right)$$
$$\int_{\underline{\delta}}^{\bar{\delta}} f(z)\left(\frac{\partial y^*}{\partial\beta} - \frac{\partial x^*}{\partial\beta}\right)\frac{1}{\tau}g\left(\frac{y^* - x^* - \sigma z}{\tau}\right)dz = \frac{1}{2}. \tag{20}$$

Equation (20) implies that if $\frac{\partial x^*}{\partial\beta} > 0$,

$$\left(\frac{\partial y^*}{\partial\beta} - \frac{\partial x^*}{\partial\beta}\right) > 0,$$

which is a contradiction since equation (18) implies otherwise.

For any $b \in \{\alpha, \beta\}$, if $\frac{\partial x^*}{\partial b}$ were zero, then $\frac{\partial\underline{\delta}}{\partial b}$ and $\frac{\partial\bar{\delta}}{\partial b}$ would be zero as well. This implies that $\frac{\partial y^*}{\partial\alpha}$ is zero by equation (19). However, equation (17) implies that $\frac{\partial y^*}{\partial\alpha}$ equals to 1, which is again a contradiction.

The equation (18) implies that $\frac{\partial y^*}{\partial\beta}$ is zero; however, equation (20) implies that $\frac{\partial y^*}{\partial\beta} < 0$, which is a contradiction. ■

Proof of Proposition 3

Implicit differentiation of equations (1) and 2 yields

$$\frac{\partial\underline{\theta}_\lambda}{\partial\lambda} = -\frac{\sigma F\left(\frac{x^* - \underline{\theta}_\lambda}{\sigma}\right)}{(1-\lambda)f\left(\frac{x^* - \underline{\theta}_\lambda}{\sigma}\right)} + \frac{\partial x^*}{\partial\lambda}$$
$$\frac{\partial\bar{\theta}_\lambda}{\partial\lambda} = 1 - \frac{\sigma F\left(\frac{x^* - \bar{\theta}_\lambda}{\sigma}\right)}{(1-\lambda)f\left(\frac{x^* - \bar{\theta}_\lambda}{\sigma}\right)} + \frac{\partial x^*}{\partial\lambda}.$$

Then, $\frac{\partial \bar{\theta}_\lambda}{\partial \lambda} - \frac{\partial \underline{\theta}_\lambda}{\partial \lambda} > 0 \Leftrightarrow$

$$1 > \frac{\sigma F\left(\frac{x^* - \bar{\theta}_\lambda}{\sigma}\right)}{(1-\lambda) f\left(\frac{x^* - \bar{\theta}_\lambda}{\sigma}\right)} - \frac{\sigma F\left(\frac{x^* - \underline{\theta}_\lambda}{\sigma}\right)}{(1-\lambda) f\left(\frac{x^* - \underline{\theta}_\lambda}{\sigma}\right)},$$

which always holds, since F is log-concave and therefore

$$\frac{f\left(\frac{x^* - \bar{\theta}_\lambda}{\sigma}\right)}{F\left(\frac{x^* - \bar{\theta}_\lambda}{\sigma}\right)} > \frac{f\left(\frac{x^* - \underline{\theta}_\lambda}{\sigma}\right)}{F\left(\frac{x^* - \underline{\theta}_\lambda}{\sigma}\right)} \Leftrightarrow \frac{\sigma F\left(\frac{x^* - \bar{\theta}_\lambda}{\sigma}\right)}{(1-\lambda) f\left(\frac{x^* - \bar{\theta}_\lambda}{\sigma}\right)} - \frac{\sigma F\left(\frac{x^* - \underline{\theta}_\lambda}{\sigma}\right)}{(1-\lambda) f\left(\frac{x^* - \underline{\theta}_\lambda}{\sigma}\right)} < 0.$$

■

The following lemma provides a condition for dissident group to be pivotal in the limit as the information precision increases indefinitely.

Lemma 1 *Suppose that σ and $\tau \to 0$. $\lim \bar{\theta}_\lambda > \lim \underline{\theta}_\lambda$ if the group size*

$$\lambda \geq \min\left\{\frac{1+\beta+(1+\beta)\alpha}{1+\beta+(5+\beta)\alpha}, \frac{1}{2}\right\}.$$

Proof of Lemma 1 This result is related to Proposition 5 in Corsetti et al. (2004); however, the addition of the rent parameters α and β complicates the analysis.

Suppose that $\lim \bar{\theta}_\lambda = \lim \underline{\theta}_\lambda$. Then by equating equations (1) and (2) and using the assumption that the probability density function $f(\cdot)$ is symmetric gives

$$\begin{aligned} (1-\lambda)F(-\underline{\delta}) = \lambda + (1-\lambda)F(-\bar{\delta}) \Leftrightarrow \\ (1-\lambda)(1-F(\underline{\delta})) = \lambda + (1-\lambda)(1-F(\bar{\delta})) \Leftrightarrow \\ F(\bar{\delta}) - F(\underline{\delta}) = \frac{\lambda}{1-\lambda}, \end{aligned} \tag{21}$$

where $\underline{\delta}$ and $\bar{\delta}$ are defined in equations (9) as follows:

$$\underline{\delta} = \frac{\underline{\theta}_\lambda - x^*}{\sigma}, \quad \bar{\delta} = \frac{\bar{\theta}_\lambda - x^*}{\sigma}.$$

Note that equation (21) requires that $\frac{\lambda}{1-\lambda}$ cannot be greater than 1, or equivalently λ cannot be greater than 1/2.

On the other hand, equation (3) can be written as follows:

$$G\left(\frac{\bar{\theta}_\lambda - y^*}{\tau}\right) = \frac{1-\alpha}{1+\alpha} G\left(\frac{y^* - \underline{\theta}_\lambda}{\tau}\right),$$

which implies

$$\begin{aligned} G\left(\frac{\bar{\theta}_\lambda - y^*}{\tau}\right) &\leq \frac{1-\alpha}{1+\alpha}. \\ \frac{\bar{\theta}_\lambda - y^*}{\tau} &\leq G^{-1}\left(\frac{1-\alpha}{1+\alpha}\right) \end{aligned} \tag{22}$$

Now, to derive the lower bound on λ consider equation (6), which can be rewritten as follows

$$\int_{-\infty}^{\underline{\delta}} f(z)dz + \int_{\underline{\delta}}^{\bar{\delta}} f(z) G\left(\frac{\sigma}{\tau}\left(\bar{\delta} - z\right) - \frac{\bar{\theta}_\lambda - y^*}{\tau}\right) dz = \frac{1+\beta}{2}.$$

Then equations (21) and (22) imply that

$$\begin{aligned} F(\underline{\delta}) + G\left(-G^{-1}\left(\frac{1-\alpha}{1+\alpha}\right)\right)\frac{\lambda}{1-\lambda} &< \frac{1+\beta}{2} \Leftrightarrow \\ F(\underline{\delta}) &< \frac{1+\beta}{2} - \frac{\lambda}{1-\lambda}\frac{2\alpha}{1+\alpha}. \end{aligned}$$

Then since $F(\cdot) \geq 0$,

$$\begin{aligned} \frac{1+\beta}{2} &> \frac{\lambda}{1-\lambda}\frac{2\alpha}{1+\alpha} \Leftrightarrow \\ \lambda &< \frac{1+\beta+(1+\beta)\alpha}{1+\beta+(5+\beta)\alpha}, \end{aligned}$$

which establishes the contra-positive of the hypothesis. ■

B Revolutions between 1979 - 2012

Revolutions between 1979 - 2012

Country	Year	Incumbent	New Ruler	Opposition Group/Party	Year Founded
Chief Executive is Replaced with Opposition Leader					
Iran	1979	Mohammad Reza Pahlavi	Ruhollah Khomeini	Ulama	-
Nicaragua	1979	Anastasio Somoza Debayle	Sandinista NLF	Sandinista NLF	1961
Haiti	1986	Jean-Claude Duvalier	Jean-Bertrand Aristide	Ti Legliz	1974
Philippines	1986	Ferdinand Marcos	Corazon Aquino	United Nationalist Democratic Organization	1980
Bulgaria	1989	Todor Zhikov	Zhelyu Zhelev	Union of Democratic Forces	1989
Czechoslovakia	1989	Gustáv Husák	Václav Havel	Charter 77	1976
Poland	1989	Wojciech Jaruzelski	Lech Wałęsa	Solidarity	1980
Romania	1989	Nicolae Ceauşescu	Ion Iliescu	National Salvation Front	1989
Nepal	1990	Birendra Bir Bikram Shah	Girija Prasad Koirala	Nepali Congress	1947
Zambia	1991	Kenneth D. Kaunda	Frederick Chiluba	Movement for Multi-Party Democracy	1990
Comoros	1997	Mohamed Taki Abdoulkarim (Comoros)	Foundi Abdallah Ibrahim (Anjouan)	Anjouan Liberation Movement	1996

Revolutions between 1979 - 2012 (cont'd)

Country	Year	Incumbent	New Ruler	Opposition Group/Party	Year Founded
Chief Executive is Replaced with Opposition Leader					
Albania	1997	Sali Berisha	Rexhep Meidani	Socialist Party of Albania	1991
Indonesia	1998	Suharto	Abdurrahman Wahid	National Awakening Party	1998
Yugoslavia	1999	Slobodan Milošević (Yugoslavia)	Ibrahim Rugova (Kosovo)	Democratic League of Kosovo	1989
Côte d'Ivorie	2000	Robert Guéï	Laurent Gbagbo	Ivorian Popular Front	1982
Peru	2000	Alberto Fujimori	Alejandro Toledo	Perú Posible	1994
Yugoslavia	2000	Slobodan Milošević	Vojislav Koštunica	Democratic Party of Serbia	1992
Philippines	2001	Joseph Estrada	Gloria Macapagal-Arroyo	Lakas-CMD	1991
Bolivia	2003	Gonzalo Sanchez de Lozada	Eva Morales	Movement for Socialism	1995
Georgia	2003	Eduard Shevardnadze	Mikheil Saakashvil	United National Movement	2001
Liberia	2003	Charles Taylor	Ellen Johnson Sirleaf	Unity Party	1984
Kyrgyzstan	2005	Askar Akayev	Kurmanbek Saliyevich Bakiyev	People's Movement of Kyrgyzstan	2004

Revolutions between 1979 - 2012 (cont'd)

Country	Year	Incumbent	New Ruler	Opposition Group/Party	Year Founded
Chief Executive is Replaced with Opposition Leader					
Ukraine	2005	Viktor Yanukovych	Viktor Yushchenko	Our Ukraine	2001
Nepal	2006	Gyanendra Bir Bikram Shah Dev	Ram Baran Yadav	Nepali Congress	1947
Timor Leste	2006	Mari Alkatiri	José Ramos-Horta	Revolutionary Front for Independent East Timor	1974
Côte d'Ivorie	2007	Charles Konan Banny	Guillaume Soro	Patriotic Movement of Côte d'Ivorie	2002
Thailand	2008	Samak Sundaravej	Abhisit Vejjajiva	Democrat Party	1946
Madagascar	2009	Marc Ravalomana	Andry Rajoelina	Tanora Malagasy Vonona	2007
Iceland	2009	Geir Haarde	Jóhanna Sigurðardóttir	Social Democratic Alliance	2000
Kyrgyzstan	2010	Kurmanbek Saliyevich Bakiyev	Almazbek Atambayev	Social Democratic Party of Kyrgyzstan	1993

Revolutions between 1979 - 2012 (cont'd)

Country	Year	Incumbent	New Ruler	Opposition Group/Party	Year Founded
Chief Executive is Replaced with Opposition Leader					
Egypt	2011	Hosni Mubarak	Mohamed Morsi	Muslim Brotherhood	1928
Libya	2011	Muammar Gaddafi	Mohammed Magariaf	National Front for the Salvation of Libya	1981
Tunisia	2011	Zine El Abidine Ben Ali	Moncef Marzouki	Congress for the Republic	2001
Côte d'Ivorie	2011	Laurent Gbagbo	Alasenna Ouattara	Rally of the Republicans	1994
Maldives	2012	Mohamed Nasheed	Abdulla Yameen	Progressive Party of Maldives	2011
Mali	2012	Amadou Toumani Touré	Ibrahim Boubacar Keïta	Rally for Mali	2001
Romania	2012	Emil Boc	Victor Ponta	Social Democratic Party	1990
Chief Executive is Replaced with Another Ruling Elite					
Ecuador	2005	Lucio Gutiérrez	Rafael Correa	-	-
Yemen	2012	Ali Abdullah Saleh	Abd Rabbuh Mansur Hadi	-	-

Revolutions between 1979 - 2012 (cont'd)

Country	Year	Incumbent	New Ruler	Opposition Group/Party	Year Founded
Chief Executive is Replaced with a Neutral Leader					
Guinea	2007	Eugène Camara	Lansana Kouyaté	United Trade Union Guinean Workers	1995
Chief Executive is Overthrown without Replacement					
German DR	1989	Erich Honecker	-	-	-
Somalia	1991	Siad Barre	-	-	-

Note: There are 1779 collective actions between 1979–2012 that are recorded in Banks et al. data set. We found 42 instances of collective actions that triggered or caused the removal of an incumbent Chief Executive (Prime Minister, President, General Secretary of Central Committee or King). There are 2 cases, where the overthrown incumbent is not replaced with a new leader. There are 2 cases where the new leader was a high-rank executive who served before regime change under the overthrown incumbent. There is only one case, where the new leader was neither part of governing elite nor the opposition. In the remaining 37 cases, an incumbent Chief Executive is replaced with a new leader from opposition.