

Transparency, Protest and Autocratic Instability*

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Abstract

The collapse of autocratic regimes is often brought about through large-scale mobilization and collective action (in the form of strikes and/or protests) by elements of the populace. The willingness of any given member of the public to participate in such actions against her leaders is contingent upon her beliefs about others' willingness to similarly mobilize. In this paper, we examine the effect of a specific form of transparency – the disclosure of economic data by the government to the populace – on citizen belief-formation, and consequently on collective mobilization. We present a theoretical model in which transparency, under autocratic rule, (1) for a range of parameter values, increases the frequency of protests, and, for all parameter values, (2) increases the extent to which protest is correlated with incumbent performance. We find robust support for these claims. Transparency destabilizes autocracies via mass protest.

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More than petards or stilettos, therefore, words – uncontrolled words, circulating freely, underground, rebelliously, not gotten up in dress uniforms, uncertified – frighten tyrants. But sometimes it is the official, uniformed, certified words that bring about the revolution.

– Ryszard Kapuściński, *Shah of Shahs*¹

Autocratic governments, despite their seemingly unconstrained authority, live in the shadow of mass political unrest. At any given moment, the public may reject the existing political order and – through action (strikes/protests) in the streets – impose substantial costs upon their leaders, sometimes even including the ousting of the leadership or upending the regime. This is one of two threats that sitting autocrats must negotiate in their decision-making: Mass mobilization constitutes the threat from below.² Autocratic leaders must also be concerned with threats to the existing regime emerging from within their own ruling coalition.³

However, those who would participate in mass unrest against their political leadership face a critical problem: While protests or strikes that draw universal (or near universal) participation are capable of forcing the hands of their rulers, protests that do not pass this threshold may be put down, often quite violently and at considerable cost to participants. The willingness of any one citizen to participate in anti-regime mobilizations is therefore contingent on the willingness of others to similarly participate (Kuran, 1991; Lohmann, 1993). Participation in mobilization is subject to strategic complementarities – a given citizen grows more willing to engage in protest as she believes others are similarly willing to mobilize. But what then allows citizens to form shared beliefs in a manner that allows for coordinated protest?

In this paper, we examine the role the informational environment plays in facilitating or inhibiting collective action, and how information translates into the stability of autocratic leaders.⁴ In particular, we focus on the presence or absence of publicly observable information on governments' economic performance. Publicly observable information plays an outsized role in interactions characterized by strategic complementarities, since such information allows citizens to not only update their beliefs about government performance, but also to update their higher order beliefs – their beliefs about the beliefs held by other citizens (Morris and Shin, 2002).⁵ Publicly observable

¹p. 103

²Throughout we use the terms mass mobilization, mass unrest, and protests interchangeably. Empirically, we operationalize these terms as strikes or protests.

³Svolik (2012) characterizes these threats as 'the problem of authoritarian control' and 'the problem of autocratic power sharing.'

⁴Throughout, we use the term regime to refer to the sitting leadership – either a party or ruling clique. Empirically, we follow Svobik's (2012) definition of an autocratic regime.

⁵For an early application of higher order beliefs in a different setting, see Przeworski (1998).

economic information thus facilitates the formation of shared expectations about the likely success of mass mobilization, rendering such mobilization feasible where absent such information it would be impossible.

We contend that, under autocratic rule, the availability of public economic information – which we term transparency – facilitates collective action and so renders regimes more vulnerable to threats from below.⁶ In addition, transparency eases mobilization under economically underperforming regimes. Economic growth has a greater influence on the survival of autocratic regimes when transparency is high. For plausible parameter values in our model, the increased provision of information increases the ability of citizens to mobilize, directly reducing the stability of the autocratic leadership.

To anticipate our empirical results, we find support for our main theoretical predictions: transparency is associated with an increased risk of autocrat removal (via mass revolt or democratization). These findings are associational – they do not demonstrate that transparency *causes* increased protests under autocracy. Given the relative infrequency of such events and the cross-national nature of these data, proof of causality is extraordinarily difficult. However, we do conduct a number of additional analyses which serve to strengthen our contention that the mechanisms we describe are, in fact, at work.

In what follows, we demonstrate that: (1) Transparency is associated with an increased risk of regime removal via mass unrest or via a transition to democracy. It is not, however, associated with other forms of autocratic instability. Notably, transparency is associated with a reduced risk of a coup.⁷ (2) Transparency is associated with more frequent protests and strikes. It is *not*, however, associated with other forms of unrest such as assassinations or guerrilla movements. Finally, we note that elsewhere (Hollyer, Rosendorff and Vreeland, 2014), we demonstrate that transparency is associated with democratic stability.

Transparency, therefore, does not merely proxy for an unmeasured source of government weakness – it is only associated with autocratic instability resulting from mass mobilization and is not associated with other forms of threat to the regime. Moreover, transparency is associated with the stability of democratic regimes. For an alternative mechanism to account for this pattern of results, it must have the opposite effect in autocracies and democracies. Finally, autocratic leaders adopt transparency in an attempt to assuage public dissatisfaction through (partial) liberalization, it does not appear that these attempts are fully successful – increased levels of transparency are associated with *more* frequent strikes and anti-government demonstrations.

⁶For reasons of analytical crispness, we adopt a narrowly tailored definition of transparency throughout. We recognize that the term can be used more broadly or defined along other lines. We return to this issue below.

⁷Results regarding the relationship between transparency and coups are presented in the supplemental appendix.

These results cannot fully insulate our findings from the threat of endogeneity. Indeed, we acknowledge that endogeneity persists – our estimates are likely to be biased. These tests do, however, suggest that such biases are unlikely to be large and that plausible alternative explanations for any one result cannot systematically explain *all* our empirical findings. This broad set of results thus lends considerable credence to our claims regarding the mechanisms linking transparency and regime stability. Few alternative mechanisms can credibly explain the patterns we document.

We first outline our argument in greater detail. We then formalize these intuitions using a game theoretic model of collective action and transparency. This model predicts (1) that transparency strengthens the relationship between growth and autocratic instability, (2) that – for a broad range of parameter values – transparency is associated with a greater risk of autocratic collapse (due to pressures from below), and (3) that transparency is specifically associated with mass mobilization (strikes, demonstrations). We then empirically test all three implications, using a measure of transparency that reflects the reporting/non-reporting of economic data to the World Bank.

Argument

Transparency and Unrest

The literature on autocratic regimes has emphasized the role of mass political mobilization in bringing about regime instability. This is particularly true of the literature on democratization, which – insofar as democratization necessitates the removal of autocratic regimes – is a form of instability. Theoretical accounts of democratization often stress the role of revolutionary threats on the part of the masses in securing the extension of suffrage (e.g., [Acemoglu and Robinson, 2006](#); [Boix, 2003](#); [Rosendorff, 2001](#)), a claim given weight by empirical research (e.g., [Przeworski, 2009](#)). The threat that mass mobilization poses for autocratic leaders and ruling cliques – and the importance of attempts to repress or co-opt the masses – has played a prominent role in writings on authoritarian regimes more generally (e.g., [Gandhi, 2008](#); [Svolik, 2012](#); [Wintrobe, 1998](#)).

If mass unrest plays such a critical role in autocratic stability, what factors make unrest more or less likely? How do these factors, in turn, influence the stability of ruling cliques? We address one such factor – government transparency – in this paper.

Our conception of mass unrest begins with the observation – attributable to [Kuran \(1991\)](#) and [Lohmann \(1993\)](#) – that protest is subject to a collective action problem. The costs any citizen faces from engaging in protest are falling in the number of her fellow citizens who similarly choose

to protest – mass unrest is subject to strategic complementarities. These complementarities may arise from the logistics of repression – for a given level of government response, the probability that a particular protester is arrested or physically harmed falls as the number of her fellow protesters rises. Or, it may be that the police/military will be unwilling to respond with force to a sufficiently large mass of civilians on the streets. Regardless, the costs of protests decline, and the odds of meeting the objective of unseating or forcing compromises from the leadership rise, with turnout.

The willingness of any given citizen to turn out in the streets is therefore dependent on her beliefs about whether her fellow citizens will similarly mobilize. In such an environment, publicly observable information will play a particularly important role in citizen behavior. We particularly focus on the role of publicly observable information regarding the economic performance of the sitting government. We contend that citizens are more likely to mobilize when they perceive that the ruling clique is mismanaging the economy, either as a result of its attempts to extract rents for members of the ruling elite or simply as the result of incompetence. Publicly available information plays a critical role as it can (1) confirm or refute citizen perceptions of economic mismanagement and, critically, (2) it can also inform citizens about others' beliefs regarding the extent of mismanagement. Each individual is aware of the fact that public information is also available to her fellow citizens, thus such information allows her to better judge others' perceptions of the ruling elite. As citizens become more aware of one another's perceptions, they become better able to judge the willingness of others to mobilize in protest. Public information thus plays an outsize role in shaping the incentives for mobilization (Morris and Shin, 2002).

Under autocratic rule, elections are either altogether absent or are so heavily manipulated as to ensure the victory of incumbents. Mass unrest is therefore the only mechanism through which pressure from below can unseat incumbent leaders.⁸ The incentives to engage in such unrest are highest when the sitting regime has revealed itself to be either predacious or incompetent – i.e., when its economic performance is poor. As greater amounts of public information on economic performance are made available, citizens are better able to assess the performance of the government. Citizen perceptions align more closely with economic reality. Moreover, when the government's performance is in fact poor, government transparency helps to ensure that citizens share a perception of this poor performance – and that they are aware these beliefs are shared. Consequently, as transparency rises, the economic performance of the sitting government will translate more readily into manifestations of popular unrest. Transparency conditions

⁸Note that we do not assume that such unrest results in democratization, merely that it has the potential to unseat autocratic leaders or regimes.

the relationship between economic outcomes and unrest – making this correlation stronger.

If successfully unseating the sitting government via mass unrest is sufficiently ‘difficult’ – i.e., if the costs to unrest are sufficiently large relative to the benefits of success, or the threshold of participation necessary to unseat the incumbent is sufficiently high – citizens will only engage in protest when highly certain of the government’s under-performance. Moreover, they must be similarly certain that this perception is widely shared. Without public disclosure of economic information, this level of certainty is unlikely to be attained – even when the leadership does perform poorly. As the level of transparency rises, the threshold level of certainty necessary to facilitate unrest – certainty both with regards to individual perceptions of government performance and higher order beliefs that these perceptions are shared – is more likely to be attained. Consequently, the unconditional probability of unrest rises with transparency. Autocratic regimes are therefore more likely to be unseated by threats from below as levels of transparency rise.

Defining Transparency

The definition of transparency used here pertains to the collection and disclosure of credible economic data. Such data must be publicly disclosed – and known to be publicly disclosed – if citizens are to update their beliefs not only about government behavior, but also their higher order beliefs about the perceptions of their fellow citizens. These data must be credible if citizens are to update their beliefs about government actions based upon the disclosed information. And they must be aggregated such that the experiences of a broad swath of the population are reflected in the numbers that are presented.

We draw our empirical measure of transparency from the HRV Index ([Hollyer, Rosendorff and Vreeland, forthcoming](#)) – a continuous measure of data disclosure that accurately captures these three aspects of our theoretical notion of transparency. This index is based upon the reporting/non-reporting of data to the World Bank’s *World Development Indicators* (WDI) data series ([World Bank, N.d.](#)). It summarizes the reporting of 240 variables selected from across the WDI. The reporting of these variables is summarized on a single dimension, through the use of an item response model – where transparency is treated as the latent tendency to report data. The result is a continuous transparency measure (which is unique up to an affine transformation), that covers 125 countries from 1980-2010.

Because the WDI contains aggregate economic data which are collected by national statistical agencies and provided to international organizations, it constitutes a direct measure of the collection and dissemination of aggregate economic data. The disclosure of such data to the World Bank proxies for public disclosure more generally. (In recent years, the World Bank has

provided these data directly to the public.) Finally, these data are credible insofar as they survive the scrutiny of the World Bank's review. Observations that are deemed 'questionable' are deleted from the WDI.⁹ Hollyer, Rosendorff and Vreeland (forthcoming) provide an extensive discussion of this index, and provide evidence of its validity. The HRV measure discriminates well among countries at all levels of transparency, it most strongly reflects the reporting of politically relevant data, and country case studies demonstrate that the index varies as expected with major political events (including episodes of well-known misreporting of data, for instance in Argentina).

Both the notion and measure of transparency that we employ here are thus narrowly defined. We conceive of transparency simply as the disclosure of data, not as a general conception of 'openness,' which may pertain to any aspect of information transmission in a given polity. Broader conceptions of transparency may encompass the structure of political institutions (Broz, 2002; Dahl, 1971), the role of the media (Adserà, Boix and Payne, 2003; Besley and Burgess, 2002; Djankov et al., 2003), the presence or absence of freedom of information laws (Berliner, 2011; Islam, 2006), or even the role of social or ethnic ties in disseminating information (Grief, 2006; Habyarimana et al., 2009). Alternative measures and conceptions of transparency may be well-suited to address other specific questions. We prefer our measure in this instance because it neatly conforms to the notion of transparency developed in our theoretical model. Our hypotheses concern the extent to which economic data are common knowledge, so data dissemination is the appropriate measure of transparency for this analysis.

Contrast with Democracies

Elsewhere (Hollyer, Rosendorff and Vreeland, 2014), we examine the relationship between transparency and mass unrest in democratic regimes. Under democratic rule, our results are turned on their head. Transparency serves to insulate democratic regimes from mass unrest, even as it destabilizes autocracies.

The model we develop in Hollyer, Rosendorff and Vreeland (2014) is identical to that we present below, save only for the presence of elections. In that model, transparency enhances the effectiveness of elections in addressing adverse selection problems in government. Voters are more likely to remove under-performing leaders via the ballot box, and retain those that perform well, as transparency rises. Since elections and unrest serve as substitute mechanisms through

⁹See the World Bank statements regarding the WDI: <http://data.worldbank.org/about/data-programs>, accessed March 7, 2011. In some instances, these data are weeded out by the World Bank itself. In others, international organizations that act as intermediaries between the World Bank and national statistical agencies conduct their own quality review.

which the public may discipline its leaders, the incentive to resort to unrest falls as transparency rises.

Critically, autocracies differ from democracies because of the informational value of elections. As [Fearon \(2011\)](#) notes, the electoral process serves to directly inform citizens of the distribution of discontent with the sitting leadership (see also, [Hyde and Marinov, forthcoming](#); [Little, Tucker and LaGatta, 2013](#)). Thus, *regardless* of the level of transparency, citizens in democracies have a great deal of information about the willingness of their fellows to engage in protest against their leadership.

By contrast, in autocracies, elections are either absent or sufficiently heavily manipulated to be uninformative of the distribution of discontent. Thus, under autocratic rule, transparency plays a direct role in (1) allowing citizens to update their beliefs regarding the quality of the leadership, and (2) allowing citizens to update their higher order beliefs about the perceptions of their fellows. Consequently, transparency facilitates collective action under circumstances where it would otherwise prove difficult or impossible.

Existing Literature

Our paper thus most clearly relates to the literature on protests and mass mobilization – starting with Kuran’s (1991) observation of the collective action problems involved in mass mobilization. [Lohmann \(1993\)](#) explicitly deals with the importance of information in such interactions, and with the role of costly signaling in solving collective action problems. A more recent literature on mass protest and collective action similarly emphasizes the informational problems involved in coordinating protests ([Bueno de Mesquita, 2010](#); [Shadmehr and Bernhardt, 2011](#)).

Like these more recent works, our theoretical treatment of transparency and mass unrest builds on the mechanics of global games ([Carlsson and van Damme, 1993](#); [Morris and Shin, 1998, 2001](#)). Our depiction of the role of transparency owes particularly to [Morris and Shin \(2002\)](#), who emphasize that – in the presence of strategic complementarities – public information plays a dual role, causing observers to update their own beliefs as well as their higher order beliefs about the beliefs of other players.

Our approach differs from existing treatments of protest in that we explicitly focus on the role of publicly available economic information which is informative of leaders’ performance.

Our findings also speak to an expansive literature on mass unrest and autocratic stability. Models of autocratic rule ([Gandhi, 2008](#); [Svolik, 2012](#); [Wintrobe, 1998](#)) often assume that leaders are constrained by the threat of mass unrest, and must employ co-optation or repression to

deal with this threat. Our results suggest when such pressures may be more or less acute. The literature on the stability of political regimes also often assumes the importance of mass (or revolutionary) threats from the populace. This is most obvious in models of democratization, wherein revolutionary activities on the part of the citizenry – or the threat thereof – may give rise either to the direct usurpation of authoritarian regimes or the extension of suffrage (Acemoglu and Robinson, 2006; Boix, 2003; Rosendorff, 2001; Przeworski, 2008).¹⁰ While our results speak to broader forms of autocratic instability than democratization (i.e., we are more concerned with the removal of autocratic cliques via mass unrest than explicitly with the regime-type that follows); our findings are suggestive as to when this revolutionary threat may be more or less powerful.¹¹

Finally, we note that our paper closely relates to an account of autocratic stability and transparency *within* autocratic regimes put forth by Boix and Svolik (2011).¹² Like us, Boix and Svolik examine collective action problems in unseating autocratic leaders, and the role the informational environment plays in shaping these interactions. Unlike our paper, however, Boix and Svolik concentrate on threats that emerge from within the ruling regime – i.e., the threat of coups. Boix and Svolik’s conception of transparency differs radically from ours – in their paper, transparency (which is operationalized as the level of institutionalization of the autocratic regime) consists of clear rules of behavior, the violation of which may mobilize a coup. They conclude that this form of transparency stabilizes autocracies by reducing the frequency of coups. We, by contrast, focus on transparency as the public disclosure of economic information, and on the role this disclosure plays in coordinating mass unrest by the populace. We conclude that transparency destabilizes autocracies by increasing the frequency of revolt and democratization.¹³

¹⁰Bermeo (1997) examines the competing evidence for the role of mass mobilization in promoting or inhibiting democratization.

¹¹Our paper does not speak to the expansive literature on other pressures for regime transition – e.g., structuralist accounts (Huber, Rueschemeyer and Stephens, 1993; Lipset, 1959; Moore, 1966), or the voluntary extension of the franchise (e.g., Lizzeri and Persico, 2004).

¹²Egorov, Guriev and Sonin (2009) and Lorentzen (2014) raise the related point that autocrats may promote transparency to ease the monitoring of lower level officials.

¹³In empirical models, we find that transparency is associated with a reduction in coup and increase in protest frequency. Our results indicate that information plays radically different roles in inspiring mass unrest and intra-regime violence.

Model

Primitives

Consider an interaction between an autocratic leader L and a mass of citizens. Each citizen is denoted i where i is indexed over the unit interval $i \in [0, 1]$.

Citizens seek to infer the leader's type, which may be either 'good' or 'bad.' Our model is one of adverse selection in government. A leader's type may refer to his level of skill, competence, or honesty. 'Good' leaders will therefore return better economic performance than 'bad' leaders. Citizens may therefore seek to remove 'bad' leaders from office, while retaining 'good' types.

So, L may be of one of two types, $\theta \in \{0, 1\}$. Nature chooses L 's type θ where $\theta = 1$ with probability p and $\theta = 0$ with probability $1 - p$. In each period during which she is in office, L chooses whether or not to provide a public good $G_t \in \{0, 1\}$, where $t \in \{1, 2\}$ denotes the period of play. L 's utility from doing so is a function of her type, such that in each period:¹⁴

$$u_{L,t}(G_t; \theta) = \begin{cases} 1 & \text{if } G_t = \theta \\ 0 & \text{otherwise} \end{cases}$$
$$u_L = \sum_{t=1}^2 u_{L,t}(G_t, \theta)$$

L 's choice regarding public goods provision $G_t \in \{0, 1\}$ has implications for economic outcomes in the following manner: Each citizen i receives an income $y_{i,t} = G_t g + \epsilon_{i,t}$, where $\epsilon_{i,t} \underset{\text{iid}}{\sim} N(0, \sigma_y^2) \forall i, t$, and g is a strictly positive constant. The standard deviation of individual outcomes, $\sigma_y > 0$, captures all factors exogenous to government policies that may shift a given citizen's economic welfare. Each citizen observes $y_{i,t}$, but does not observe the value of G_t . In observing first period income, $y_{i,1}$, the citizen is also receiving a signal about the type of government it is facing, which informs its decision about whether to engage in protest to induce the leader's potential removal.

In the first period of play, all citizens *also* receive a publicly observable signal of the state of the economy s . We assume that $s = G_1 g + \rho$, where $\rho \sim N(0, \sigma_s^2)$ and $E[\rho \epsilon_{i,t}] = 0 \forall i, t$, where $\sigma_s > 0$ is the standard deviation of this publicly observed signal. s is meant to depict the role of publicly disclosed aggregate economic data, which enable citizens to form beliefs about government performance. As more information is made available, citizens are better able to discern the role of government policies in shaping economic outcomes – consequently σ_s

¹⁴Actors do not discount over time. The results would be unchanged by including a discount factor.

shrinks.¹⁵ σ_s is thus a measure of the inverse of transparency (i.e., of opacity). As σ_s declines, transparency rises.¹⁶ Since s depicts the public disclosure of *aggregate* economic data, we further assume that $\sigma_s < \sigma_y$.

After receiving her signals (both public and private) of government performance, each citizen i may mobilize in an attempt to overthrow the sitting government, $a_i \in \{0, 1\}$. Let the total number of citizens engaged in collective action be $A \equiv \int_0^1 a_i di$. If A exceeds some exogenous threshold $T \in (0, 1)$, the sitting government will be removed and replaced by a new L , whose type is drawn with the same distribution as the prior leader. We define an indicator function $R(A)$ to denote removal, such that:

$$R(A) = \begin{cases} 1 & \text{if } A \geq T \\ 0 & \text{otherwise.} \end{cases}$$

If a leader is removed, a new one is drawn. The model makes no assumption that democracy emerges.

Engaging in mobilization entails a cost of $\kappa > 0$ for each citizen. However, if the collective protest is successful in removing the sitting leader, each citizen that participates in these protests gains a benefit $\beta > \kappa$. These benefits may be thought of as the psychological returns from participating in the successful overthrow of the *ancien regime*, or as material benefits flowing from the likely favors from any new regime that replaces the old. In either case, β represents a form of ‘selective incentive’ for mobilization (Olson, 1971). Each citizen’s utility function is:

$$u_i(y_{i,1}, y_{i,2}, a_i; A) = y_{i,1} + y_{i,2} + a_i[R(A)\beta - \kappa].$$

The order of play proceeds as follows:

1. Nature chooses L ’s type $\theta \in \{0, 1\}$. The value of θ is revealed to L , but not to any citizen.

¹⁵Values of σ_s remain strictly positive, however. Citizens are never able to perfectly deduce government competence as a result of economic fluctuations – the fluctuations may derive from factors exogenous to government behavior or as a result of decisions made by lower-level officials insulated from direct accountability to the government (Duch and Stevenson, 2008). Our contention is merely that, *ceteris paribus*, σ_s falls as transparency rises.

¹⁶Transparency, and hence disclosure is an exogenous parameter in the model, rather than a choice variable for the government. Our focus here is on the role transparency plays in fostering mobilization – i.e., on citizen belief formation and collective action. We model government’s decisions to disclose – assuming its implications for leader survival – elsewhere (Hollyer, Rosendorff and Vreeland, 2011). Other work has explored the adoption and importation of transparency-enhancing institutional innovations - such as joining international organizations (IOs) with monitoring and adjudicatory devices (Hollyer and Rosendorff, 2012; Mansfield, Milner and Rosendorff, 2002). A general theory endogenizing the level of transparency conditional on its effects of autocrat survival remain part of this broader research agenda.

2. L chooses whether or not to provide the public good $G_1 \in \{0, 1\}$.
3. Nature chooses $\epsilon_{i,1} \forall i$. Nature additionally chooses the value of ρ . $y_{i,1}$ is revealed to each citizen i , but not to any other citizen. s is revealed to all citizens.
4. Each citizen chooses whether or not to engage in collective action $a_i \in \{0, 1\}$.
5. If $R(A) = 1$, L is replaced and Nature draws the type of its replacement $\theta \in \{0, 1\}$, where $Pr(\theta = 1) = p$.
6. The sitting L chooses the value of $G_2 \in \{0, 1\}$.
7. Nature chooses $\epsilon_{i,2} \forall i$. $y_{i,2}$ is realized for all citizens and the game ends.

Equilibrium

While this resembles a global games approach to mass unrest ([Angeletos, Hellwig and Pavan, 2007](#); [Casper and Tyson, 2013](#)) the game presented here does not satisfy the two-sided “limit dominance” condition ([Morris and Shin, 1998](#)) - there is no type of government for which political action is a dominant strategy for any signal (in fact there are only two types in our model). Consequently, multiple equilibria exist. In particular, two equilibria in which citizens do not condition their behavior on any information revealed during the game co-exist: one in which all citizens always mobilize, the other in which no citizen ever mobilizes. In the former instance, given the strategies of all other players, each i prefers to set $a_i = 1$, and thus obtain the benefits $\beta - \kappa > 0$ of participating in the successful mobilization – regardless of her beliefs about the government’s type. Similarly, in the latter, given the strategies of all other citizens, each i prefers to set $a_i = 0$ – and thus avoid the cost $\kappa > 0$ of participating in an inevitably failed mobilization, regardless of her beliefs. We view these equilibria as implausible and/or as uninteresting. It is infeasible for all citizens to believe, with certainty, that their countrymen will all either engage or not-engage in political mobilization; and to believe that this will be the case regardless of the performance of the incumbent government.

We instead focus on a third equilibrium. Specifically, we focus on a pure strategy perfect Bayesian equilibrium (PBE) in which each citizen i conditions her mobilization strategy on both her signals $y_{i,1}$ and s . We also restrict attention to monotone equilibria in which higher signals are interpreted weakly as corresponding to a higher likelihood of a high type leader, and furthermore we restrict attention to equilibria in which each i employs a cut-point strategy: i sets $a_i = 1$ if and

only if $y_{i,1}$ is less than some threshold value \bar{y} (Bueno de Mesquita, 2010). This threshold value \bar{y} will be a function of the publicly observable signal (denoted $\bar{y}(s)$).

An equilibrium involving cut-point strategies has several desirable properties relative to the two ‘pooling’ equilibria.¹⁷ The cut-point equilibrium involves citizens acting upon all available information, and the cut-point equilibrium probabilities of mass mobilization and of regime survival are conditional upon economic performance, which would not be true in the pooling equilibria. This contention enjoys substantial support in the empirical literature (Alesina et al., 1996; Haggard and Kaufman, 1995; Przeworski et al., 2000).

A PBE requires that beliefs of the citizens be consistent with the strategy profile and Bayes’ rule, and that the strategy of any citizen and the leader be sequentially optimal given all the beliefs and the strategies of the other citizens (Fudenberg and Tirole, 1991). A cut-point PBE in monotone strategies is characterized by: (1) A threshold $\bar{y}(s) : \mathbb{R} \rightarrow \mathbb{R} \cup \{-\infty, \infty\}$, where political action occurs whenever $y_{i,1} < \bar{y}(s)$ for all i . Where $\bar{y}(s) = -\infty$, no citizen will ever mobilize; where $\bar{y}(s) = \infty$, all citizens mobilize. (2) A strategy for L from type- to action-space, $G_t : \{0, 1\} \rightarrow \{0, 1\}$. (3) Posterior beliefs $Pr(\theta = 0|y_{i,1}, s)$. We characterize each of these in turn; but first some preliminary definitions are necessary.

Definition 1. Define $\bar{y}^*(s)$ implicitly by the value of $y_{i,1}$ that solves

$$Pr(\theta = 0|y_{i,1}, s)\beta = \kappa. \quad (1)$$

This is the value of the private signal, given a public signal, that would yield posterior beliefs about the type of the leader such that the citizen is indifferent between taking political action and not, given that all the other citizens are behaving the same way. In the appendix, we show that this is well-defined. Using the definition of $\bar{y}^*(s)$ we can now specify $\bar{y}(s)$ as follows (where Φ is the CDF of the standard normal):

Definition 2. Define

$$\bar{y}(s) = \begin{cases} \infty & \text{if } \Phi\left(\frac{\bar{y}^*(s)-g}{\sigma_y}\right) \geq T \\ \bar{y}^*(s) & \text{if } \Phi\left(\frac{\bar{y}^*(s)}{\sigma_y}\right) \geq T > \Phi\left(\frac{\bar{y}^*(s)-g}{\sigma_y}\right) \\ -\infty & \text{if } \Phi\left(\frac{\bar{y}^*(s)}{\sigma_y}\right) < T \end{cases} \quad (2)$$

¹⁷This is not ‘pooling’ in the traditional sense - where actors of different ‘types’ take the same action. In the equilibria to this game where the voters take the same action, they may do so holding differing posterior beliefs. This is not a signaling game; while the first mover has private information, their action is hidden, and only a noisy signal of that action is observed. Nevertheless there are some similarities - the citizens do form posteriors on the type of the first mover, and actions and beliefs must be consistent in equilibrium.

The value of $\bar{y}(s)$ is the cut-point that characterizes the equilibrium, in which all citizens receiving a private signal below the cut-point choose to engage in political action; those with signals higher than $\bar{y}(s)$ stay off the streets. The equilibrium is simply stated as:

Proposition 1. *The following strategies and beliefs constitute a PBE.*

1. $G_t = \theta$ for $t = 1, 2$
2. $a_i = 1$ if $y_{i,1} \leq \bar{y}(s)$ and $a_i = 0$ otherwise, for all i
3. $Pr(\theta = 0 | y_{i,1}, s) = \frac{\phi(\frac{y_{i,1}}{\sigma_y})\phi(\frac{s}{\sigma_s})(1-p)}{p\phi(\frac{y_{i,1}-g}{\sigma_y})\phi(\frac{s-g}{\sigma_s}) + \phi(\frac{y_{i,1}}{\sigma_y})\phi(\frac{s}{\sigma_s})(1-p)}$ for all i (Bayes' rule).

where ϕ is the pdf of the standard normal.

All proofs are in the Appendix.

Intuitions

To develop the intuitions, consider first the leader's decision. The leader always matches his action with his type - this is a dominant strategy. 'Good' leaders maximize both their contemporaneous utility and the probability of retention by providing the public good. 'Bad' types, on the other hand, receive a sufficiently high utility from withholding the public good today to more than offset any reduced probability of retention (and thus the opportunity to withhold the public good tomorrow). Any citizen's problem therefore, is to try to refine her beliefs over the (hidden) action, and hence the type of the leader in office, based on both the private and public signals received.

If $\Phi(\frac{\bar{y}^*(s)}{\sigma_y}) \geq T > \Phi(\frac{\bar{y}^*(s)-g}{\sigma_y})$, the critical mass of protesters needed to remove the incumbent leader is loosely speaking, "moderate". Each citizen, after receiving both her private and public signals, computes her posterior beliefs about the type of leader she is facing, using Bayes' rule. Along the equilibrium path, those citizens receiving a poor signal of the leader's type engage in political action, with the intent to remove him from office. Those receiving a high signal are inclined to believe that the government is of a high type, and would like to preserve the leader in office, and hence do not protest. Figure 1 demonstrates the individual decision made by any citizen.

Recall that there is a continuum of citizens. Therefore, given the equilibrium threshold, we can compute what fraction of the citizens will protest in equilibrium. This of course depends on the distribution of the private signals. If the leader is truly of type 0 – the 'bad' type – the distribution of signals received by the voters has mean zero. Then in Figure 2 we see that the fraction of

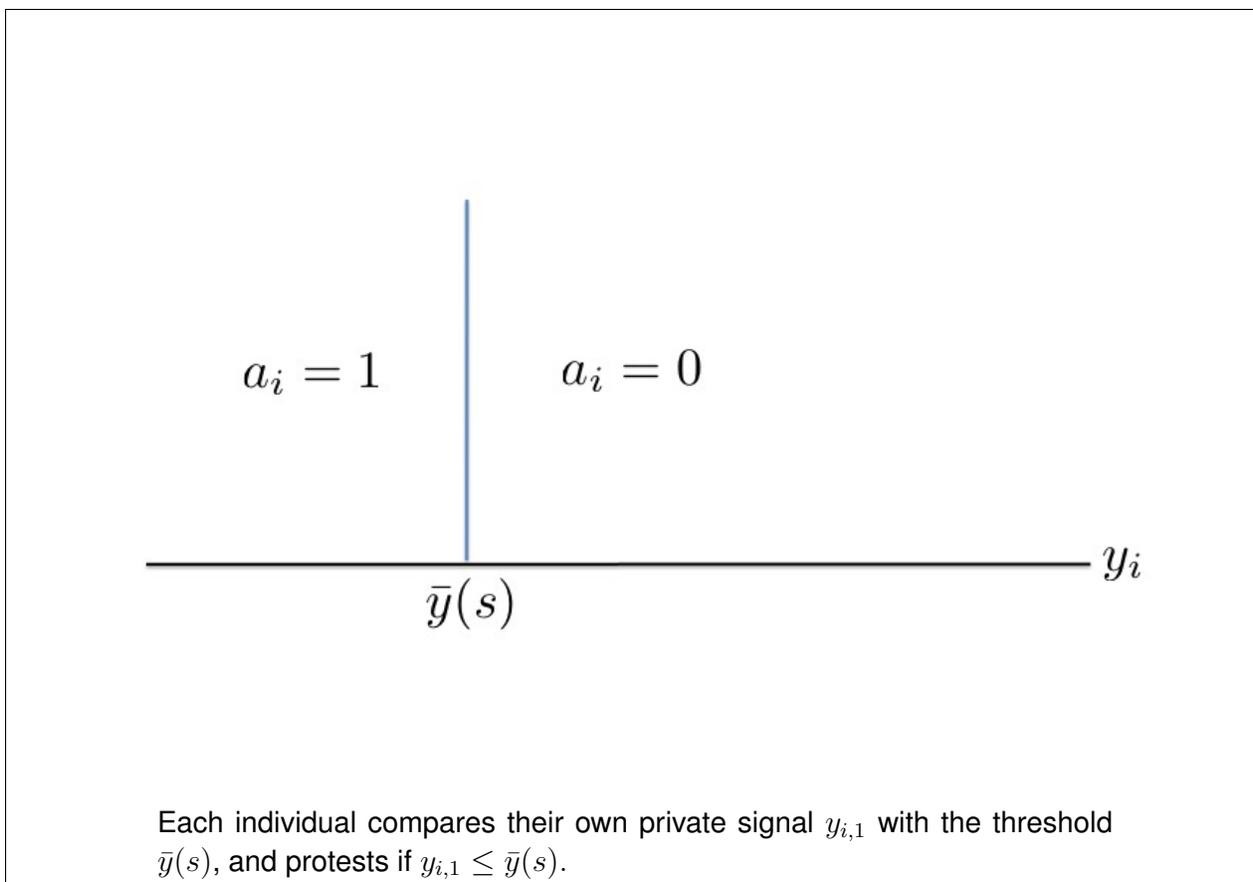


Figure 1: Individual Citizen's Decision

the population that mobilizes when in fact $\theta = 0$ is given by the blue region, or more precisely, $\Phi\left(\frac{\bar{y}^*(s)}{\sigma_y}\right)$, where Φ is the cdf of the standard normal.

If instead, the leader is actually the "good" type – $\theta = 1$ – then the mean of this distribution is given by $g > 0$. The distribution is shifted to the right, and the fraction of the population that is mobilized to protest is smaller. In Figure 3 we see that the fraction of the population that mobilizes when in fact $\theta = 1$ is given by the red region, or more precisely, $\Phi\left(\frac{\bar{y}^*(s)-g}{\sigma_y}\right)$.

If the number protesting when the leader is bad (the blue region) is larger than T , the threshold for leader removal, but the number protesting when the leader is good (the red region) is smaller than T , then under the equilibrium strategies of the citizens, good types are retained and bad types are removed. More precisely, leaders of type $\theta = 1$ are retained, and leaders of type $\theta = 0$ are removed in equilibrium if $\Phi\left(\frac{\bar{y}^*(s)-g}{\sigma_y}\right) \leq T \leq \Phi\left(\frac{\bar{y}^*(s)}{\sigma_y}\right)$.

To ensure that each citizen is playing a best response, we need only check that the threshold is chosen to make recipient of that signal indifferent between mobilization and not. Then $a_i = 1$ if

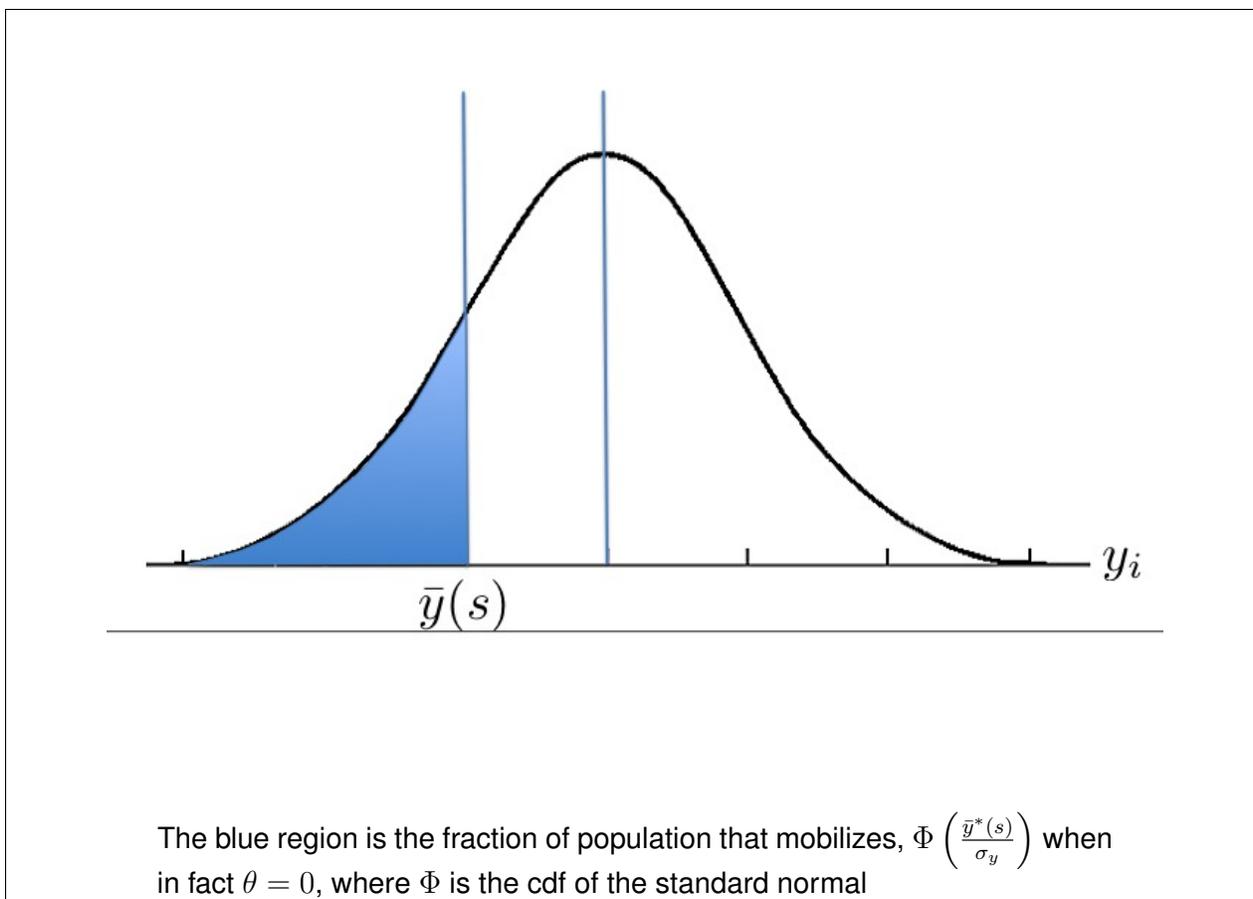


Figure 2: Political action when Leader is 'bad'

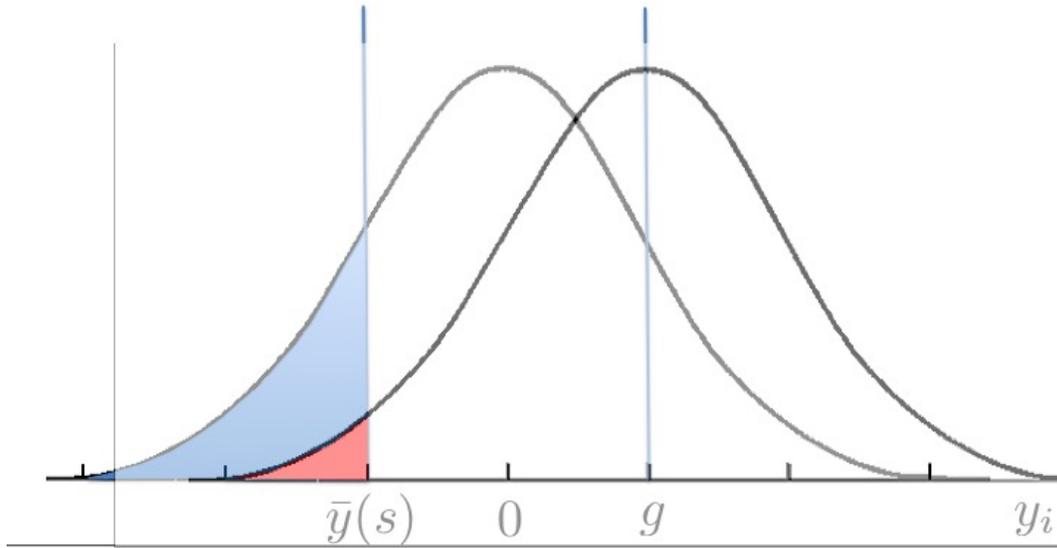
and only if

$$Pr(\theta = 1|y_{i,1}, s)g + Pr(\theta = 0|y_{i,1}, s)[pg + \beta] - \kappa \geq Pr(\theta = 1|y_{i,1}, s)g + Pr(\theta = 0|y_{i,1}, s)pg$$

$$Pr(\theta = 0|y_{i,1}, s)\beta \geq \kappa$$

Considering first the left-hand side of this inequality, the expected utility from engaging in protest: If the leader is "good", $\theta = 1$, then he will be retained and in the second period he will choose $G_2 = g$ – hence the first term on the left hand side. In the instance that the leader is a bad type, $\theta = 0$, the leader is removed in equilibrium. With probability p , a 'good' type enters, and chooses $G_2 = g$; otherwise $G_2 = 0$. In addition, there is benefit of joining a successful insurrection, of an amount β , but protest costs κ in any case.

We now turn our attention to the right-hand side, the expected utility from staying off the streets: Recall that there is a continuum of citizens and hence no citizen is pivotal. Hence good



The red region is the fraction of population that mobilizes when the type is “good”, $\Phi\left(\frac{\bar{y}^*(s)-g}{\sigma_y}\right)$ when in fact $\theta = 1$.

Figure 3: Political action for both types of leader

leaders are still retained, and poor ones are removed. If the leader is good, the citizen will still receive g if she does not protest; if the leader is bad, the leader is still removed, and (non-protesting) citizen receives g if the leader is replaced with a new good leader, which occurs with probability p . Setting these two conditions equal to each other yields the private signal that leaves the citizen indifferent between protesting and not:

$$Pr(\theta = 0|\bar{y}^*(s), s)\beta = \kappa.$$

The citizen receiving private signal $\bar{y}^*(s)$ is indifferent between protesting and not. Therefore, any citizen receiving a private signal $y_{i,1} \leq \bar{y}^*(s) = \bar{y}(s)$ protests (and doesn't otherwise); and this is a best response to the behavior of the other citizens.

What if it is not the case that $\Phi\left(\frac{\bar{y}^*(s)}{\sigma_y}\right) \geq T > \Phi\left(\frac{\bar{y}^*(s)-g}{\sigma_y}\right)$? If $T \leq \Phi\left(\frac{\bar{y}^*(s)-g}{\sigma_y}\right)$, the public signal s is sufficiently extreme (and low) to ensure that – even when the government is in fact a ‘good’ ($\theta = 1$) type – enough of the population will believe the reverse to ensure its removal. Since the

distribution of ϵ_i is common knowledge, all citizens will realize this, and will consequently always choose to mobilize, regardless of their private information. For each citizen, its better to join in an uprising that is guaranteed to be successful than not to do so.

Conversely, if $T > \Phi\left(\frac{\bar{y}^*(s)}{\sigma_y}\right)$, even when the government is in fact a ‘bad’ type ($\theta = 0$), an insufficient portion of the population will believe this to be the case to ensure its removal. The public signal s is sufficiently high that it will be impossible for a group of requisite size to coordinate an uprising. All citizens will realize this, and will never choose to mobilize, regardless of their private information. This leads to the definition of $\bar{y}(s)$ as in Definition 2 above, and the complete specification of the equilibrium in Proposition 1 above.

Comparative Statics: Enhancing Transparency

Notice that the crucial equilibrium threshold $\bar{y}(s)$ is a function of the public signal, s . Recall that we have an interior equilibrium (where some protest, and some do not) when $\Phi\left(\frac{\bar{y}^*(s)}{\sigma_y}\right) \geq T > \Phi\left(\frac{\bar{y}^*(s)-g}{\sigma_y}\right)$.

Definition 3. Define \underline{s} implicitly by $T = \Phi\left(\frac{\bar{y}^*(\underline{s})-g}{\sigma_y}\right)$ and \bar{s} by $T = \Phi\left(\frac{\bar{y}^*(\bar{s})}{\sigma_y}\right)$

In the Appendix, we demonstrate that $\bar{y}^*(s)$ is monotonic and decreasing in s and that $\lim_{s \rightarrow \infty} \bar{y}^*(s) = -\infty$ and $\lim_{s \rightarrow -\infty} \bar{y}^*(s) = \infty$. These \bar{s} and \underline{s} are well-defined such that $\bar{y}(s) = -\infty$ if $s \geq \bar{s}$ and $\bar{y}(s) = \infty$ if $s \leq \underline{s}$.

For a sufficiently extreme and positive public signal of the government’s type ($s \geq \bar{s}$), all citizens will disregard their private information and never mobilize. This is true *regardless* of their beliefs about the government’s type. Even if a given citizen strongly believes that $\theta = 0$, given this extreme and positive public signal, she knows that it is impossible for enough of her fellow citizens to share this belief for mobilization to ever be successful. Conversely, for a sufficiently extreme and negative signal ($s \leq \underline{s}$), all citizens will always mobilize, even if some strongly believe the government to be a ‘good’ type. Each citizen knows, given the extreme value of the public signal, that enough of her fellow citizens believe the government to be adopting poor policies that its removal is inevitable. Given that this is the case, each citizen would rather jump on the bandwagon (and gain the benefits of joining the insurrection), rather than holding firm to her beliefs. Public information thus plays a disproportionate role in shaping citizen behavior. For a similar result, see [Morris and Shin \(2002\)](#).

Notice that, for any $s \geq \bar{s}$, governments of all types are retained. For any $s \leq \underline{s}$, all governments are removed. For any $s \in (\underline{s}, \bar{s})$, governments are removed if they are of type $\theta = 0$ and

retained if they are of type $\theta = 1$. Some mobilization will always take place when the public signal is in this interval, but it is only sufficient to overthrow the government when $\theta = 0$.

We can thus characterize the probability of government removal, conditional on its type. When $\theta = 0$, the government will be removed if $s \leq \bar{s}$, which will occur with probability $\Phi\left(\frac{\bar{s}}{\sigma_s}\right)$. When $\theta = 1$, the government will only be removed if $s \leq \underline{s}$, which will occur with probability $\Phi\left(\frac{\underline{s}-g}{\sigma_s}\right)$. We can thus define the degree to which the public *en masse* effectively separates good from bad types as the *discrimination* = $\Phi\left(\frac{\bar{s}}{\sigma_s}\right) - \Phi\left(\frac{\underline{s}-g}{\sigma_s}\right)$.

Proposition 2. *Discrimination is strictly increasing in transparency (falling in σ_s).*

As σ_s falls (transparency rises), \bar{y}^* shifts to the right while both the probability density functions depicted grow more tightly distributed around their respective means. The net effect of these two forces is such that the blue region unambiguously increases in size. The size of the red region may either rise or fall. But, the increase in the size of the blue region always outpaces any increase in the size of the red region. Hence the difference between the numbers protesting when the leader is a bad type relative to the number of protesters when the leader is good grows with transparency. The “improved” public signal increases the difference in the turnout for protest when leaders are bad relative to when they are good.

Note that the blue region is always larger than the red – under-performing leaders always attract higher levels of protest than over-performing ones (where under- and over-performing refers to the leader type θ). We interpret this equilibrium effect as implying that autocratic leaders who experience poor economic outcomes are always more likely to be removed than those that experience good outcomes. Proposition 2 tells us that this difference should be rising in levels of transparency. That is, transparency moderates the relationship between economic performance and autocratic collapse.

Corollary 1. *In equilibrium, poor economic performance is associated with autocratic removal; and poor economic performance in more transparent environments leads to even higher likelihood of autocratic collapse in equilibrium.*

For a range of parameter values, we can also derive predictions about the unconditional relationship between transparency and leader survival. This unconditional probability can be expressed as $(1 - p)\Phi\left(\frac{\bar{s}}{\sigma_s}\right) + p\Phi\left(\frac{\underline{s}-g}{\sigma_s}\right)$. With probability $1 - p$, the government is of type $\theta = 0$, and it will be removed with probability $\Phi\left(\frac{\bar{s}}{\sigma_s}\right)$. With probability p , the government is of type $\theta = 1$, and it will be removed with probability $\Phi\left(\frac{\underline{s}-g}{\sigma_s}\right)$. For a range of parameter values, increasing values of transparency will increase this unconditional probability of successful mobilization:

Proposition 3. *If $-\frac{\sigma_y}{g} \ln\left(\frac{p\kappa}{(1-p)[\beta-\kappa]}\right) < \Phi^{-1}(T)$, then there exists a level of $\sigma_s \equiv \bar{\sigma}_s$ such that, the unconditional probability of leader removal is increasing for low levels of transparency ($\sigma_s \geq \bar{\sigma}_s$).*

Proposition 3 characterizes a sufficient, not a necessary, condition for transparency to have this effect. Transparency increases the risk of leader removal so long as mass mobilization is not too ‘easy’ – i.e., the threshold for removing the autocrat T is not too low relative to the benefits of successful leader removal. Under these circumstances, the public requires a sufficiently compelling signal of poor government performance in order to mobilize. Remark 1 serves to clarify this requirement:

Remark 1. *As $\beta \rightarrow \kappa$ the probability of leader removal is rising in transparency for all $\sigma_s \in \mathbb{R}_+$ and for all $T \in (0, 1)$.*

In the Appendix we show that as $\beta \rightarrow \kappa$, we can be sure that $\underline{s} < 0$. Recall that \underline{s} defines the level of the signal such that all citizens mobilize, regardless of their individual posterior beliefs about the leader’s type. (Consequently, the leader is removed with certainty.) In other words, as $\beta \rightarrow \kappa$, citizens require a sufficiently poor signal of economic performance to ensure mobilization. If, on the other hand, $\underline{s} > 0$ (which occurs when $\beta \gg \kappa$ or T is low), then all citizens mobilize even when the public signal indicates that the economy is performing relatively well. Then the probability (and hence frequency) of a successful mass demonstration is thus very high. Our model doesn’t allow us to determine the effect of transparency on leader removal unambiguously in this case. Since incidences of successful mass protest are relatively rare, it therefore seems safe to assume that – at least in the vast majority of cases – the conditions of Proposition 3 are satisfied, and transparency will empirically be associated with an increase in the unconditional probability of autocratic collapse. Similarly, it seems reasonable that the private benefits of participating in a successful insurrection are not that large, suggesting that the conditions of Remark 1 are satisfied, and transparency is associated with increased autocratic leader removal.

Empirics

Data Description

Our theoretical model depicts authoritarian collapse as the removal (via mass protest) of the authoritarian regime or ruling clique. Empirically, we define such instances of collapse using Svoboda’s (2012) dataset on the duration of authoritarian regimes. Following Svoboda, we define an instance of authoritarian collapse as the removal of an autocratic leader by an alternative leader or

coalition not politically affiliated with the sitting clique. Since our theoretical mechanism operates via mass unrest, we focus particularly on instances of leader removal brought about by mass revolt or that lead to democratization.

An expansive literature examines the causes of democratization – and a considerable portion of this literature treats democratization as the result of the manifestation or threat of popular unrest (for instance, [Acemoglu and Robinson, 2006](#); [Boix, 2003](#); [Przeworski, 2009](#); [Rosendorff, 2001](#)). Others (e.g., [Ansell and Samuels, 2010](#); [Lizzeri and Persico, 2004](#); [Llavador and Oxoby, 2005](#)) contest this claim. Adjudicating this dispute is well beyond the scope of this paper. We group these two forms of autocrat removal – via mass unrest and via democratization – together simply because separate analyses run on each form of collapse produce similar results (and similar results to the pooled estimates – though with correspondingly increased standard errors owing to the reduced number of failures). Interested readers can find analyses in which we separate these two forms of removal in the Appendix.

We draw several control variables pertaining to autocratic institutions from the *Democracy and Development* (DD) dataset ([Cheibub, Gandhi and Vreeland, 2010](#)). In all specifications, we control for an indicator variable $Party \in \{0, 1\}$ equal to one if multiple parties hold positions in the legislature.¹⁸ We include this control given evidence that autocratic regimes that consist of multiple parties face substantially different risks, and exhibit different behaviors, than those that do not ([Gandhi, 2008](#); [Gandhi and Przeworski, 2006, 2007](#); [Svolik, 2012](#)). We also draw upon an indicator $Military \in \{0, 1\}$, equal to one if the head of government is a representative of the military, given that autocracies headed by the military exhibit differential behaviors from those controlled by civilians ([Svolik, 2012](#); [Wright, 2008](#)).¹⁹

In all specifications involving incidents of mass mobilization and unrest, we draw our outcome variables from the *Cross National Time Series Archive* ([Banks, 1979](#)), as made available by [Bueno de Mesquita et al. \(2003\)](#). These data consist of counts of the number of anti-government demonstrations, strikes, riots, guerrilla movements, revolutions, assassinations and coups in a given country in a given year. The Banks dataset derives these counts from archives of the *New York Times*. We consider anti-government demonstrations and strikes to be clear manifestations of mass mobilization directed at the government. And we consider coups and assassinations to be clear examples of instability *not* requiring popular mobilization.²⁰

¹⁸This variable is a recoding of an analogous trichotomous indicator $\{0, 1, 2\}$ that appears in the DD dataset.

¹⁹Given the correlation between these institutional features and the method with which the regime represses and co-opts the populace ([Gandhi, 2008](#)), we also help to adjust for the possibility that the repressive nature of the autocratic regime induces a spurious correlation between transparency and the risk of protest and collapse.

²⁰Riots may also be considered a form of mass mobilization, but often the government is not the target of rioting. Often riots involve clashes between communities and ethnic groups ([Scacco, 2008](#)). Consequently, we do not

Our measure of transparency is drawn from the HRV Index (Hollyer, Rosendorff and Vreeland, forthcoming). The HRV index treats transparency as a latent term that determines whether or not a given variable (of 240 variables in the model) is reported to the World Bank's World Development Indicators (WDI) in a given year – measures of this latent term are extracted based on a item response (IRT) model. The IRT model provides a continuous measure of transparency (which is unique up to an affine transformation) along this scale – which reflects a given government's tendency to disclose the type of data predominant in the WDI. The HRV index thus reflects the disclosure of credible aggregate economic information – disclosed data must be credible insofar as they survive the World Bank's data review process. Observations of this index are available at the country-year level for 125 countries over the 1980-2010 interval.

We additionally control for a variety of economic factors. Importantly, we control for GDP *per capita*, measured in thousands of purchasing power parity 2005 US Dollars. This measure is included given the significant debate over modernization theory – the role of economic development in facilitating democratization (see, for instance Acemoglu et al., 2007; Ansell and Samuels, 2010; Boix, 2003; Przeworski and Limongi, 1997; Przeworski et al., 2000). Additionally, we include this term due to the possibility that states' capacity to collect and disseminate data may increase with economic development, so *per capita* income may act as a confound in our specifications. We additionally include measures of economic growth (the percentage change in real GDP *per capita*) in all models as a measure of government's economic performance. Finally, we include a measure of economic openness ($\frac{Exports+Imports}{GDP}$). This control is valuable given potential linkages between economic and political liberalization, and given that open economies are more likely to be subject to exogenous shocks to economic performance than closed, and thus economic performance may be less valuable a signal of government competence as trade dependence rises (Duch and Stevenson, 2008).

These measures are all drawn from the Penn World Table (PWT) version 6.3 (Heston, Summers and Aten, 2009). The PWT offers several advantages as a measure of economic performance for this study: First, the PWT data are adjusted and interpolated by external researchers with no affiliation to reporting governments (though, the underlying data are still based on national accounts).²¹ The PWT can thus be seen as a proxy for true economic performance (G_t or – equivalently – the incumbent's type θ in our model) rather than as a realization of the public signal s .

consider rioting to be a manifestation of the type of unrest documented in our model.

²¹Specifically, the PWT relies on both national accounts subcomponents from benchmark countries and information collected by the United Nations International Comparisons Program (ICP) and the US State Department. For details, see Summers and Heston (1991).

Second, country time-series included in the PWT are uninterrupted. This is important when employing a measure of data missingness – such as the HRV index – as an explanatory variable. Were missing data present in the PWT, it is likely that missing values would correlate with transparency levels. Listwise deletion would therefore censor variation in a key explanatory variable, potentially inflating standard errors and understating measures of model fit.

Finally, we include a control for fuel exports, drawn from [Easterly and Sewadeh \(2001\)](#). This control is included given the resource curse hypothesis, which finds that fuel exports are strongly negatively correlated with democracy and may promote autocratic longevity ([Ross, 1999](#); [Jensen and Wantchekon, 2004](#)).

Transparency, Mass Unrest and Autocratic Instability

In this section of the paper, we test our claims that (1) transparency is associated with an increased probability of the collapse of autocratic leaders and (2) that transparency enhances the association between growth and regime instability. Economic growth maps into the parameter G_t (or, equivalently, the leader's type θ) in our model. In equilibrium, leaders of low-type who perform more poorly in office are more likely to be removed – poor growth should predict regime collapse. [Proposition 2](#) establishes that this relationship between growth and collapse should grow stronger as transparency rises. And [Proposition 3](#) establishes that transparency should have a direct effect on increasing the risk of regime removal.

Our empirical interest is in the threat autocratic leaders face from below – the danger that mass mobilization will lead to removal of the ruling clique. Our model does not speak to the threat leaders face from within their own ranks – i.e., the threat of coups or military interventions, nor does it speak to the risks of intervention by foreign powers or resulting from civil wars.²² Our analysis therefore relies on a Cox competing hazards model of regime removal.²³ Our model estimates the hazard that a regime collapses due to pressures from below – the probability that the ruling clique is unseated by a revolt or transitions to democracy in year t conditional on not

²²We obtain analogous results, in which coefficients are estimated somewhat more precisely, if we instead focus on autocratic to democratic transitions, as defined by the DD dataset ([Cheibub, Gandhi and Vreeland, 2010](#)). Results are available from the authors on request.

²³We prefer the Cox specification over alternatives (e.g., logit models with parametric controls for time, or other parametric survival models) for two reasons: First, unlike logit models, the Cox model readily incorporates censoring in a manner that is particularly critical given the competing hazards faced by autocratic regimes. Second, unlike parametric methods, the Cox specification deals with time dependence in a non-parametric manner ([Beck, Katz and Tucker, 1998](#)). Note finally that the binary nature of our outcome variable argues strongly against the use of fixed-effects or a conditional logit model. Such a model would only be identified off of regimes that experienced failures in the data – which constitute less than 25 percent of our sample. All other regimes (75 percent of the sample) would be dropped from any fixed-effects estimation.

already having done so – conditional on covariates. Since authoritarian regimes may also be unseated by other methods, these alternatives act as competing risks. We estimate our model on all autocratic regimes in Svoblik’s (2012) dataset, but those regimes that exit via other methods are treated as censored after their death.²⁴ The unit of observation is the autocratic regime-year, where autocratic regimes are defined in accordance with Svoblik (2012). (For simplicity, we refer to instances of failure as autocratic collapse below. Except when explicitly noted otherwise, these references are to collapse via revolt or democratization.)

More precisely, our model assumes that covariates shift the baseline hazard up or down according to the function $h_l(t) = h_0(t)e^{\mathbf{X}_{l,t}\beta}$ where l denotes autocratic regime l , t denotes time, $h_0(t)$ is the baseline hazard function, and $\mathbf{X}_{l,t}\beta$ is the product of the data matrix and a corresponding vector of coefficients.²⁵ Time, in this instance, is defined as the number of years the autocratic regime has served in office.²⁶

Our analysis is complicated by the presence of autocratic regimes that have experienced prior instances of instability in the data. Past instability may well influence current stability. Our preferred approach to dealing with this issue is to employ conditional gap time models, in which the baseline hazard is estimated separately for autocratic regimes in states that experienced prior autocratic collapses and those in states that have not (Box-Steffensmeier and Zorn, 2002). In so-doing, we allow both the level and the shape of the baseline hazard to vary depending on past experiences of instability, thereby flexibly modeling the non-Markovian nature of changes in regimes.²⁷ In one set of models, we separately estimate the baseline hazard conditional on whether or not there has been a prior autocratic collapse; in another, we estimate separate baseline hazards based on the number of instances of collapse;²⁸ and in a final specification we simply control for whether or not there has been a prior collapse. Prior collapses are coded as any instance of regime removal (by any method) as coded by Svoblik (2012) – i.e., the removal of one

²⁴For an empirical application and discussion of the competing hazards model see Goemans (2008). This model assumes that hazard of one form of removal is conditionally independent of other forms of removal, an assumption analogous to the IIA assumption in multinomial logit specifications (Gordon, 2002).

²⁵We test the assumption that covariates alter the level, but not the shape, of the baseline hazard using Grambsch-Thorneau and Harrell’s rho tests of the Schoenfeld residuals. Where these tests indicate violations of the proportional hazards assumption, we adjust the model according to the recommendations of Box-Steffensmeier and Jones (2004) and Keele (2010).

²⁶The duration in office is actually recorded to the day. We divide the number of days served in office by 365.25 to rescale time in a more meaningful fashion.

²⁷For an empirical application of conditional gap time models in a different context, see Tiernay (2011).

²⁸Given the substantial variation in the history of instability in our sample, we code the number of past regime removals as a categorical variable. This variable takes the value 1 if there has never been a prior collapse, 2 if there has been one collapse, 3 if there have been between 2 and 4 collapses, and 4 if there have been more than 4 collapses.

autocratic leader and his replacement by another leader unaffiliated with the incumbent regime.

Our theoretical expectations are as follows: (1) The probability of collapse (via mobilization) will be higher in more transparent than in less transparent autocracies. (2) Regime collapse grows more likely as economic performance worsens. (3) Economic performance is likely to play a greater role in autocratic survival in transparent, as opposed to opaque, autocracies. We thus fit a model of the form:

$$h_i(t) = h_0(t) \exp(\gamma Transparency_{i,t-1} + \delta Growth_{i,t-1} + \mu Transparency_{i,t-1} \times Growth_{i,t-1} + \mathbf{X}_{i,t-1} \beta) \quad (3)$$

where $\mathbf{X}\beta$ is a matrix of controls and associated coefficients. All errors are clustered by autocratic regime, to allow for inter-temporal correlation of the error term within autocratic regime spells.

Results from the model described by equation 3 are presented in Table 1. The table reports coefficient values – not hazard ratios – so a positive coefficient indicates that a given covariate increases the risk of autocratic collapse (via revolt or democratization); while a negative coefficient indicates the reverse. The three first columns contain the results from conditional gap time models where the baseline hazard is estimated separately for autocratic-spells that experienced a prior regime collapse (as defined above) and those that did not. The results in the next three columns present coefficients from conditional gap time models where the baseline hazard is separately estimated based on the number of prior regime collapses. And, results in the final three columns are from models that simply control for whether or not there was a prior instance of regime collapse. In all models, we include controls for higher order polynomials of economic openness ($\frac{Ec.Openness^2}{100}$, $\frac{Ec.Openness^3}{10,000}$) to adjust for violations of the proportional hazards assumption, in keeping with the recommendations of Keele (2010).

The estimated coefficient on *Transparency* is large and positive in all models. While the coefficient on this term is not statistically significant in every specification, all estimates place the bulk of the posterior probability mass above zero – p-values range from a high of 0.17 to a low of .05 across all specifications. Our point estimates suggest that a one standard deviation increase in the level of *Transparency* increases the hazard of autocratic collapse by between 40 and 50 percent.

The coefficient on economic growth is negative and significant in all models. In keeping with theoretical expectations, autocratic governments that inspire rapid economic growth are at lower risk of collapse than those that do not achieve economic success. A one standard deviation increase in the growth rate is associated with a reduction in the risk of revolt of between 30 and

Table 1: Cox Models, Autocrat Removal from Below

	Cond. Past Collapse			Cond. Hist. Instability			Control Past Collapse		
Transparency	0.234 [-0.076,0.543]	0.278* [-0.025,0.581]	0.259** [0.005,0.513]	0.245 [-0.056,0.545]	0.245* [-0.045,0.534]	0.239* [-0.040,0.517]	0.221 [-0.087,0.530]	0.265* [-0.041,0.572]	0.262* [-0.008,0.531]
Growth	-0.034* [-0.069,0.001]	-0.033* [-0.068,0.002]	-0.028* [-0.061,0.005]	-0.050** [-0.099,-0.002]	-0.049** [-0.096,-0.002]	-0.042* [-0.086,0.002]	-0.036* [-0.075,0.003]	-0.034* [-0.073,0.005]	-0.029 [-0.065,0.007]
Transparency × Growth	-0.004 [-0.041,0.033]	-0.006 [-0.043,0.030]	-0.006 [-0.036,0.025]	-0.002 [-0.047,0.043]	-0.005 [-0.051,0.041]	-0.007 [-0.042,0.028]	-0.002 [-0.043,0.038]	-0.005 [-0.046,0.035]	-0.005 [-0.040,0.030]
GDP per capita	0.195 [-0.325,0.715]			0.090 [-0.476,0.655]			0.145 [-0.282,0.571]		
Ec. Openness	-0.033 [-0.077,0.011]			-0.031 [-0.074,0.013]			-0.043* [-0.090,0.003]		
Ec. Openness ²	0.026 [-0.013,0.065]			0.022 [-0.016,0.061]			0.034 [-0.009,0.077]		
Ec. Openness ³	-0.005 [-0.014,0.003]			-0.004 [-0.012,0.004]			-0.007 [-0.017,0.002]		
Party	-0.004 [-0.915,0.906]	-0.105 [-1.010,0.800]		-0.216 [-1.245,0.813]	-0.282 [-1.272,0.708]		0.112 [-0.816,1.039]	-0.002 [-0.940,0.935]	
Military	0.703* [-0.116,1.523]	0.616 [-0.164,1.397]		0.521 [-0.293,1.335]	0.500 [-0.262,1.262]		0.683 [-0.134,1.501]	0.593 [-0.174,1.361]	
Ever Collapse							0.614 [-0.387,1.616]	0.562 [-0.424,1.547]	0.723 [-0.213,1.658]
# of Subjects	137	137	143	137	137	143	137	137	143
# of Failures	30	30	31	30	30	31	30	30	31

Cox competing hazards regressions of the hazard of autocratic removal via revolt or democratization. The models depicted in the first three columns, the middle three columns, and the last three columns differ in the manner in which they deal with countries that experienced multiple autocratic failures. Those in the first three columns report a conditional gap time model wherein the baseline hazard is separately estimated for regimes that experience a prior regime failure and for those that did not. Those in the next two columns estimate separate baseline hazards based on a categorical measure that reflects the number of prior collapses. Those in the final three columns simply control for prior collapses, rather than stratifying the baseline hazard. In all models, * denotes significance at the 10 percent level, ** denotes significance at the 5 percent level, and *** denotes significance at the 1 percent level. 95 percent confidence intervals are presented in brackets. All standard errors have been clustered by autocratic regime.

50 percent.

Our theoretical expectations, as outlined in Proposition 2, further contend that the relationship between growth and the hazard of regime collapse should be conditional on the level of transparency. We thus include interactions of growth and transparency in all models. This estimate is negative in all nine models estimated, and is substantively meaningful. Point estimates indicate that a shift in transparency from its median to its maximum values is predicted to increase the marginal effect of growth by between 25 and 100 percent. However, this coefficient is imprecisely estimated and never reaches levels of statistical significance.

Note, however, that the functional form of the Cox model implies an interactive effect of transparency and growth. Because the covariate values shift the hazard rate according to the function $e^{\mathbf{X}_{1,t}\beta}$, a change in a given covariate k has a marginal effect equal to $\beta_k e^{\mathbf{X}_{1,t}\beta}$ – i.e., the marginal effect of a change in any given covariate is conditional on the values of all other covariates. Because the coefficient on *Transparency* is positive, this implies that a change in *Growth* will have a larger effect on the probability of collapse as *Transparency* rises.²⁹ That is, even without the interactive term, the functional form of our model assumes that the relationship between growth and regime removal is conditional on transparency in the manner expected theoretically.³⁰ For this reason, it is important to note that a significant coefficient on an interaction term is neither “necessary nor sufficient” to imply a conditional relationship in a nonlinear model (Berry, DeMeritt and Esarey, 2010, 248).³¹ To better grasp the relationship between transparency, growth, and autocratic collapse, we plot smoothed estimates of the hazard function – based on Model 8 – for different values of growth and transparency in Figure 4, holding all other variables (with the exception of *Party* and *Military*, which are held at 0, and *Ever Collapse*, which is held at 1) at their means.

As can be seen in Figure 4, a shift from the 10th to the 90th percentile of growth reduces the risk of collapse both when transparency levels are high and low. A shift from the 10th to the 90th percentile of transparency increases the risk of collapse for all values of growth. And the gap between the hazard of autocratic collapse when growth is poor and when it is high increases in magnitude as transparency rises, as is consistent with the prediction of Proposition 2.

In the Appendix, we present analogous models of the relationship between transparency, economic growth and other forms of regime collapse. The results from these models indicate that

²⁹More precisely, a change in the growth rate will have a roughly constant effect on the percentage change in the risk of autocratic collapse. Because that risk is elevated when *Transparency* is high, the absolute value of the change in the risk of collapse for a given change in *Growth* will rise with *Transparency*.

³⁰Estimates without the interaction term are broadly similar to those in which it is included. Results are available from the authors on request.

³¹On this point, also see Ai and Norton (2003), Greene (2010), and Nagler (1991).

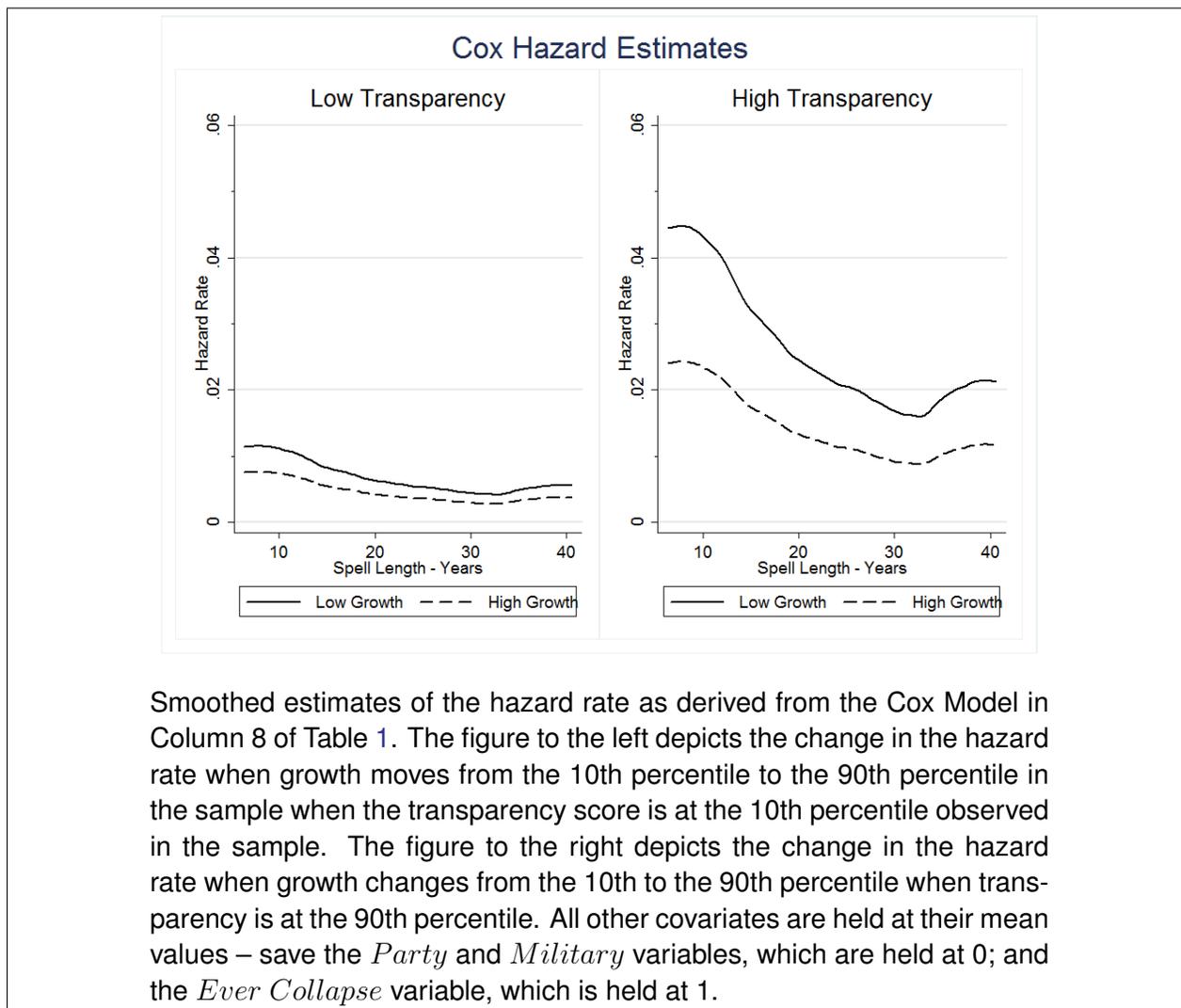


Figure 4: Hazard Rates as a Function of Transparency and Growth

while our findings hold with respect to autocratic collapse as brought about via mass mobilization or democratization, they do not hold for other forms of regime instability. Indeed, transparency appears to be negatively associated with the risk of a coup (as is consistent with the argument of Boix and Svobik (2013) and with the implications of Egorov, Guriev and Sonin (2009)). These results help to rule out alternative mechanisms which might generate the empirical relationships we document here. It is not the case that those autocratic regimes who disclose data are systematically 'weak' – it appears that transparency is specifically associated with threats to the regime originating from the mobilization of the populace.

Transparency and Unrest

We have thus established that (1) more transparent autocracies are more likely to experience regime failures (in the form of revolts or democratization) than less transparent autocracies and (2) the magnitude of the relationship between growth on the hazard of regime collapse is greater under more transparent regimes. These findings are consistent with theoretical predictions regarding the role of data dissemination, but they constitute only indirect evidence that transparency can lead to mass unrest under autocracy – via revolt or democratization.

To more directly test the model's mechanisms, we examine the relationship between transparency, economic growth and the frequency of various forms of domestic unrest under autocratic rule: namely, general strikes and anti-government demonstrations. If the theoretical mechanisms we posit are correct, we should observe that mass mobilization is (1) more common in relatively transparent autocracies, and (2) more strongly related to growth when levels of transparency are high.

We also examine the relationship between transparency and forms of unrest *not* involving mass mobilization, such as assassinations, coups, guerrilla warfare, and revolutions, which tend to be executed by a small elite or counter-elite. Our model offers no predictions regarding the relationship between transparency and these alternative forms of unrest. Nonetheless, confidence that our results are driven by the posited mechanism should be reinforced if we do *not* find a systematic relationship between transparency and forms of unrest that do not involve mass mobilization. Were similar relationships to hold across all forms of domestic unrest, it is possible that alternative mechanisms may link transparency to regime instability. If we are able to rule out a relationship between transparency and forms of unrest not involving mass mobilization, we will also rule out a variety of possible mechanisms that might confound our results.

It is particularly important to examine this relationship given the danger of a form of selection bias in our results. One could imagine a competing theoretical account, which holds that citi-

zens demand transparency from autocratic governments. When these governments are relatively weak, they may capitulate to these demands in exchange for greater citizen support. Increases in transparency may be part of more general reform efforts launched by weak autocrats in an effort to buy the complacency of the masses. If these relatively weak autocrats are also more prone to collapse, one might imagine that our results from the previous section were driven by omitted variable bias.

Our results in this section speak to this concern in two ways. First, if weak governments capitulate to citizen demands by granting transparency, the relationship between mass mobilization and transparency will tend to be biased toward zero. Governments only increase levels of transparency to drive down the risk of citizen unrest and would presumably cease such reform efforts if these prove systematically ineffective. So, if we find a positive relationship between transparency and mass-unrest, one must conclude that any such bias must be relatively small – insufficient to overwhelm the mechanisms we examine in our theory. Second, weak autocrats are likely to be prone to a variety of forms of instability – such as coups, guerrilla movements, and revolutions – not just to protests and strikes. Consequently, if we do not observe a relationship between transparency and these other forms of unrest, we can say with increased confidence that the relationship between transparency and democratization is mediated by mobilization.

To test the relationship between transparency, growth and the incidence of unrest, we rely on country fixed-effects negative binomial regressions of the Banks measures of unrest on the previously described measures of transparency, growth, and their interaction, as well as a host of controls. We employ a negative binomial because the Banks data are measured as count variables (they can assume non-negative integer values only), and because the data are likely to be over-dispersed due to the large number of zero-valued observations.

A fixed-effects negative binomial regression allows the value of the over-dispersion parameter of the negative binomial to vary across panels. Consequently, the expected number of instances of unrest for a given set of covariate values is constant across countries, but the variance around that expectation will differ. Note that this type of ‘fixed-effects’ model differs from typical settings.

Our empirical model is thus:

$$\begin{aligned} unrest_{c,t} = FENegBin(\rho unrest_{c,t-1} + \eta Transparency_{c,t-1} + \zeta Growth_{c,t-1} \\ + \xi Transparency_{c,t-1} \times Growth_{c,t-1} + \mathbf{X}_{c,t-1}\nu + \mathbf{T}\iota) \end{aligned} \quad (4)$$

where c denotes country c , t denotes year t , \mathbf{T} denotes a cubic polynomial of time and ι is a vector of associated coefficients, $\mathbf{X}_{c,t-1}$ is a matrix of controls and ν is a vector of associated

coefficients. We include a cubic polynomial of time to control for the potential confounding effects of time trends using a very general functional form. And we include a lagged dependent variable in all specifications to adjust for the dynamics of the data generating process (Beck and Katz, 2011).

Results from the model specified in equation 4 are reported in Table 2. To ensure our results are robust to possible over-fitting, we also present results from models dropping controls in Table 3. Our regressions alternatively use the number of general strikes, riots, demonstrations, revolutions, guerrilla movements, coups, and assassinations as the outcome variable.

As is evident from these results, increased levels of transparency are robustly associated with more frequent general strikes and demonstrations. The direct association between transparency and the frequency of revolutions, guerrilla movements, coups and assassinations, however, is not significantly different from zero. Transparency seems to therefore have the greatest influence on the frequency of mass protest – and little direct influence on forms of unrest that do not involve similar types of collective action.

As noted above, the interpretation of transparency’s role in conditioning the effect of growth on unrest is not straightforward in non-linear models. More precisely, when the estimated coefficient on the *Transparency* term is large and positive, the functional form of the model contains an implicit interactive effect in which the marginal effect of a change in *Growth* will be large when values of *Transparency* are high. Given these difficulties of interpretation, we plot the contemporaneous association between a change in growth rates and unrest at different levels of *Transparency* in Figures 5-8 below.³²

As is evident from Figures 5 and 6, transparency plays an important conditioning role with respect to the association between growth rates and the frequency of general strikes and demonstrations. Both strikes and demonstrations are substantially more frequent under transparent regimes. The role of growth in predicting these forms of unrest is also accentuated when levels of transparency are high. This is most notably true for the frequency of strikes. Demonstrations grow more frequent as transparency rises, but they are not more highly sensitive to economic performance.

By contrast, transparency seems to play little or no conditioning role with respect to the relationship between economic growth and the frequency of assassinations. Assassinations occur with similar frequency in both transparent and non-transparent autocracies. And while assassi-

³²These are contemporaneous marginal associations. Note that the inclusion of the lagged dependent variable ensures that the long-term equilibrium associations between unrest and covariates of interest will be several multiples of those depicted in the figures below. Any differences in the marginal effect of growth between highly transparent and highly non-transparent country-years will thus grow in absolute magnitude.

Table 2: Fixed-Effects Negative Binomial Models, Unrest

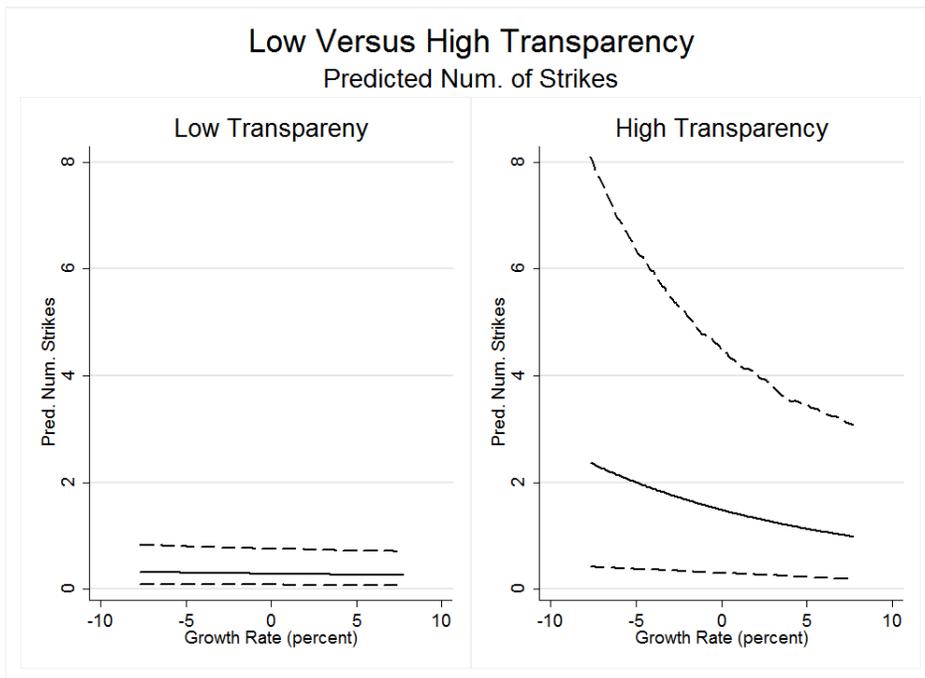
	General Strikes	Riots	Demonstrations	Revolutions	Guerrilla	Coups	Assassinations
Lag Unrest	0.215* [-0.001,0.430]	0.084*** [0.039,0.128]	0.097*** [0.063,0.131]	0.182*** [0.103,0.260]	0.558*** [0.359,0.756]	-0.156 [-1.034,0.721]	0.030 [-0.050,0.110]
Transparency	0.650*** [0.170,1.130]	0.193** [0.010,0.376]	0.332*** [0.167,0.497]	0.023 [-0.086,0.133]	0.015 [-0.106,0.137]	-0.185 [-0.647,0.277]	0.064 [-0.154,0.282]
Growth	-0.030* [-0.061,0.000]	0.003 [-0.018,0.025]	-0.011 [-0.029,0.006]	0.001 [-0.012,0.014]	0.005 [-0.009,0.020]	-0.047* [-0.095,0.001]	-0.041*** [-0.065,-0.018]
Transparency × Growth	-0.017 [-0.044,0.010]	-0.006 [-0.018,0.006]	0.002 [-0.010,0.013]	0.002 [-0.004,0.008]	0.002 [-0.005,0.009]	-0.019** [-0.037,-0.002]	-0.012* [-0.023,0.000]
GDP <i>per capita</i>	0.480 [-1.228,2.188]	0.519 [-0.328,1.367]	0.316 [-0.432,1.064]	1.007* [-0.014,2.027]	0.245 [-1.030,1.519]	-5.611 [-17.015,5.794]	0.883* [-0.121,1.886]
Ec. Openness	0.001 [-0.018,0.020]	-0.008* [-0.016,0.001]	-0.001 [-0.008,0.006]	-0.005** [-0.010,-0.000]	-0.003 [-0.008,0.003]	0.003 [-0.014,0.019]	-0.008 [-0.019,0.003]
Party	0.799* [-0.020,1.619]	-0.007 [-0.447,0.434]	-0.114 [-0.511,0.284]	-0.012 [-0.334,0.310]	0.216 [-0.220,0.653]	1.157*** [0.384,1.930]	0.765*** [0.214,1.315]
Military	0.343 [-0.529,1.215]	-0.215 [-0.707,0.277]	-0.131 [-0.586,0.324]	-0.345* [-0.743,0.052]	-0.503* [-1.064,0.059]	-0.270 [-1.175,0.635]	0.035 [-0.654,0.724]
Fuel Exports	-1.509 [-3.983,0.966]	0.468 [-0.698,1.633]	-0.323 [-1.235,0.590]	2.751 [-1632.841,1638.343]	0.659 [-378.747,380.064]	1.488 [-673.296,676.273]	-0.807 [-2.053,0.439]
Constant	-2.868** [-5.159,-0.578]	-0.640 [-1.801,0.522]	-0.723 [-1.774,0.328]	16.280 [-1577.942,1610.503]	11.352 [-88.470,111.175]	7.892 [-87.565,103.348]	0.102 [-1.699,1.903]
Cubic Time	✓	✓	✓	✓	✓	✓	✓
Polynomial	590	986	1014	1002	671	514	635
#Obs	42	66	70	65	43	33	41
#Countries							

Fixed-effects negative binomial regressions of levels of unrest as a function of transparency and growth. Measures of unrest are drawn from (Banks, 1979). All models include a lagged dependent variable, the coefficient on which is reported in the first row of the table. * denotes significance at the 10 percent level, ** denotes significance at the 5 percent level, and *** denotes significance at the 1 percent level. 95 percent confidence intervals are presented in brackets.

Table 3: Fixed-Effects Negative Binomial Models, Unrest

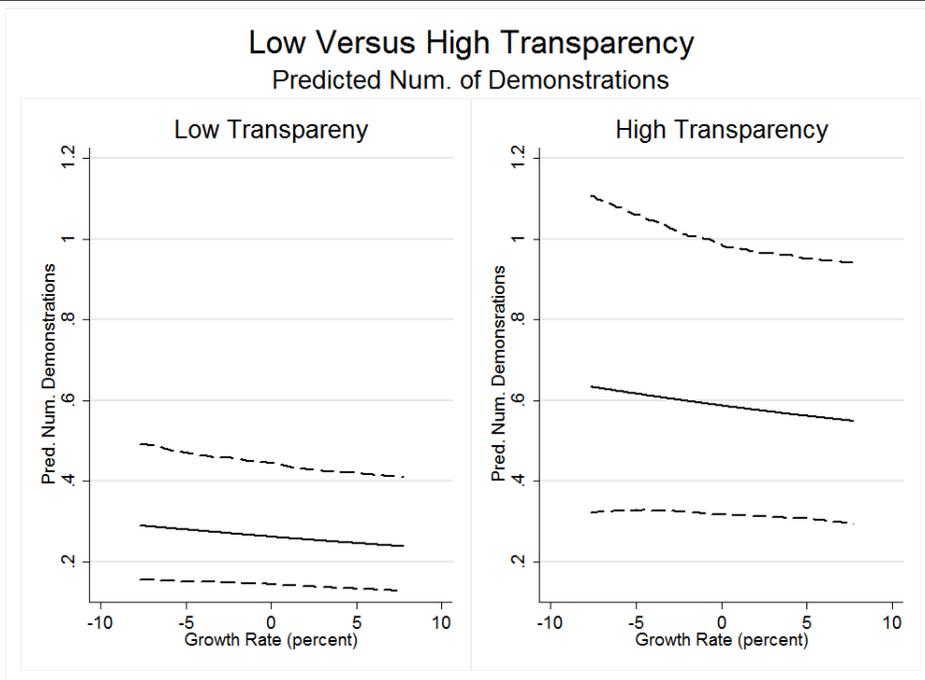
	General Strikes	Riots	Demonstrations	Revolutions	Guerrilla	Coups	Assassinations
Lag Unrest	0.302*** [0.102,0.502]	0.087*** [0.043,0.130]	0.085*** [0.053,0.116]	0.216*** [0.139,0.292]	0.548*** [0.359,0.736]	-0.196 [-1.009,0.618]	0.065* [-0.010,0.139]
Transparency	0.610*** [0.204,1.016]	0.176** [0.007,0.346]	0.359*** [0.210,0.508]	-0.031 [-0.137,0.075]	-0.019 [-0.127,0.089]	-0.179 [-0.606,0.248]	0.085 [-0.106,0.275]
Growth	-0.029* [-0.058,0.000]	0.002 [-0.019,0.024]	-0.010 [-0.028,0.008]	0.005 [-0.008,0.018]	0.003 [-0.011,0.017]	-0.063*** [-0.110,-0.017]	-0.037*** [-0.062,-0.013]
Transparency × Growth	-0.012 [-0.038,0.014]	-0.006 [-0.018,0.006]	0.004 [-0.008,0.016]	0.004 [-0.002,0.009]	0.001 [-0.005,0.007]	-0.022*** [-0.039,-0.006]	-0.009 [-0.023,0.005]
Constant	-1.097*** [-1.782,-0.412]	-1.244*** [-1.568,-0.920]	-1.261*** [-1.550,-0.973]	2.841** [0.036,5.646]	14.148 [-429.290,457.587]	11.207 [-781.071,803.486]	-0.985*** [-1.430,-0.540]
#Obs	590	986	1014	1002	671	514	635
#Countries	42	66	70	65	43	33	41

Fixed-effects negative binomial regressions of levels of unrest as a function of transparency and growth. Measures of unrest are drawn from (Banks, 1979). All models include a lagged dependent variable, the coefficient on which is reported in the first row of the table. * denotes significance at the 10 percent level, ** denotes significance at the 5 percent level, and *** denotes significance at the 1 percent level. 95 percent confidence intervals are presented in brackets.



Plots of the contemporaneous expected number of strikes as a function of growth and transparency. Note that these figures represent contemporaneous associations, not differences in the steady-state. The expected number of strikes are plotted on the y-axis, the growth rate is plotted on the x-axis. The graph to the left depicts this relationship when transparency is at its 10th percentile in the sample, the graph to the right depicts the relationship when transparency is at its 90th percentile in the sample. Solid lines depict expected values, dashed lines depict 95 percent confidence intervals.

Figure 5: Expected Number of Strikes as a Function of Growth and Transparency



Plots of the contemporaneous expected number of anti-government demonstrations as a function of growth and transparency. Note that these figures represent contemporaneous associations, not differences in the steady-state. The expected number of anti-government demonstrations are plotted on the y-axis, the growth rate is plotted on the x-axis. The graph to the left depicts this relationship when transparency is at its 10th percentile in the sample, the graph to the right depicts the relationship when transparency is at its 90th percentile in the sample. Solid lines depict expected values, dashed lines depict 95 percent confidence intervals.

Figure 6: Expected Number of Demonstrations as Function of Growth and Transparency

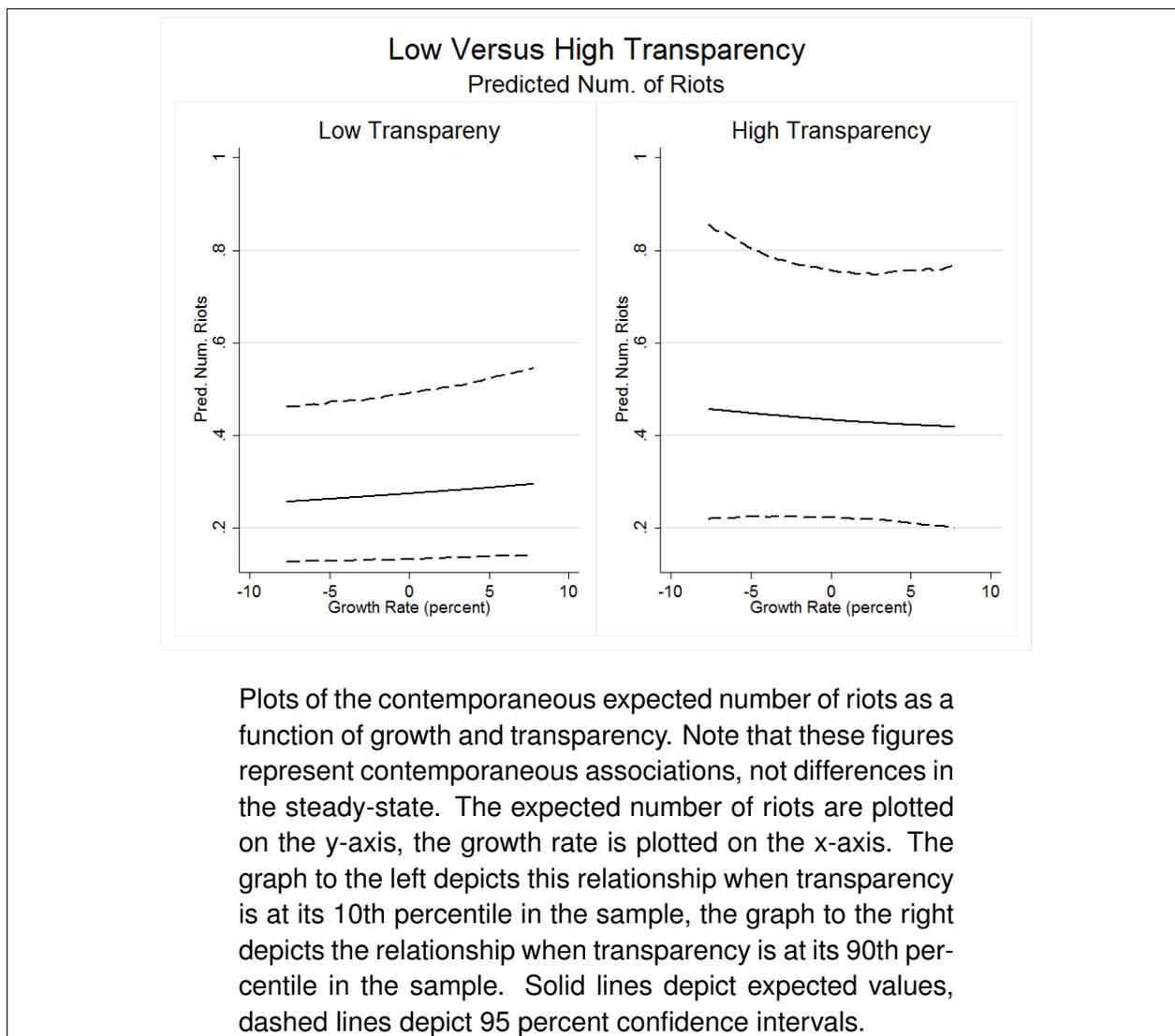
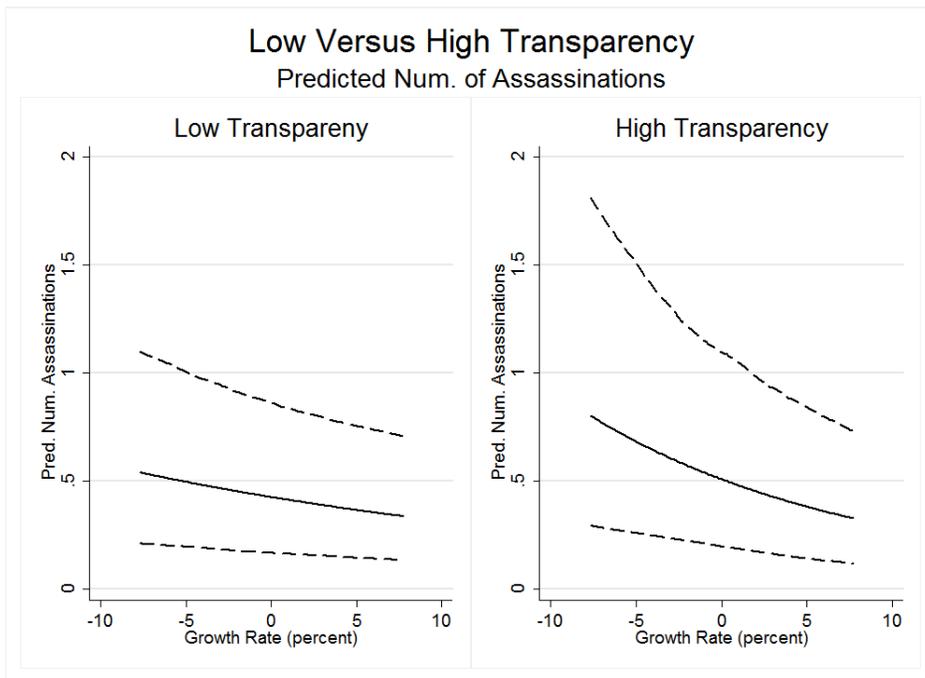


Figure 7: Expected Number of Riots as a Function of Growth and Transparency

nations are more common when growth is poor, this is true to a nearly equal extent under both transparent and opaque autocracies.

These findings are broadly in keeping with the mechanisms posited by our theory. Transparency appears to increase the frequency of – and to enhance the role of economic outcomes in driving – mass mobilization, as manifested in the number of strikes and demonstrations. By contrast, transparency plays little role in predicting the number of assassinations or guerrilla movements and coups.



Plots of the contemporaneous expected number of assassinations as a function of growth and transparency. Note that these figures represent contemporaneous associations, not differences in the steady-state. The expected number of assassinations are plotted on the y-axis, the growth rate is plotted on the x-axis. The graph to the left depicts this relationship when transparency is at its 10th percentile in the sample, the graph to the right depicts the relationship when transparency is at its 90th percentile in the sample. Solid lines depict expected values, dashed lines depict 95 percent confidence intervals.

Figure 8: Expected Number of Assassinations as a Function of Growth and Transparency

Conclusion

Increased transparency – in the form of data dissemination – is thus robustly associated with the instability of autocratic regimes. Transparent autocracies experiencing low levels of economic growth are particularly prone to collapse brought about either via mass revolt or transition to democracy. This association between transparency and regime instability appears to be driven by increased levels of mass mobilization. Transparency is associated with more frequent demonstrations and strikes under autocratic rule, but is not associated with more frequent coups, assassinations, or guerrilla movements.

These empirical findings are supportive of our theoretical account, which stresses the importance of data disclosure in coordinating citizen beliefs. Following the collective action accounts of mass mobilization pioneered by [Kuran \(1991\)](#), we argue that unrest is facilitated by focal mechanisms that coordinate citizen beliefs. Without such information, citizens are likely to be highly uncertain not only of the performance of their leaders, but also of other citizens' willingness to mobilize. The information contained in publically available aggregate economic data can serve to coordinate beliefs under autocratic rule.

These findings have implications for three literatures. First, they reinforce collective action-based accounts of mass mobilization – as opposed to those stressing the importance of structural factors or popular dissatisfaction with the incumbent government alone. Second, they have implications for a substantial literature on democratic transitions. Finally, we contribute to a growing literature on the role of transparency. We stress a novel mechanism by which transparency may affect political processes and government accountability (on transparency and accountability see also [Adserà, Boix and Payne, 2003](#)).

When taken in combination with our results with regard to democracies in [Hollyer, Rosendorff and Vreeland \(2014\)](#), our findings have an additional implication: The relationship between mass unrest and information is critically mediated by political institutions. Under democracy – an institutional arrangement that ensures citizens both have access to a mechanism other than unrest to discipline leaders and that citizens are well-informed of the distribution of discontent – transparency serves to stabilize the regime. Transparency might be said to enhance democratic legitimacy – elections are better able to police agency problems in government when transparency is high, reducing citizen incentives to engage in unrest. By contrast, when alternative outlets for discontent are absent, and alternative sources of information are lacking, transparency serves to increase the frequency of unrest. Thus, under autocratic rule, increased levels of transparency raise the frequency of mass unrest, destabilizing the regime.

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Appendix: Proofs of Theoretical Propositions

Transparency in Autocracies

Lemma 1. $\bar{y}^*(s)$ is well-defined and monotone in s .

Proof. Definition 2 gives us $Pr(\theta = 0|\bar{y}^*(s), s)\beta = \kappa$. Substituting the posterior probability, conditional on signals s and $\bar{y}^*(s)$, generated by Bayes' rule, yields

$$\frac{\phi\left(\frac{\bar{y}^*(s)}{\sigma_y}\right)\phi\left(\frac{s}{\sigma_s}\right)(1-p)}{p\phi\left(\frac{\bar{y}^*(s)-g}{\sigma_y}\right)\phi\left(\frac{s-g}{\sigma_s}\right) + \phi\left(\frac{\bar{y}^*(s)}{\sigma_y}\right)\phi\left(\frac{s}{\sigma_s}\right)(1-p)}\beta = \kappa$$

where ϕ is the pdf of the standard normal. Rearranging yields $\bar{y}^*(s) = \frac{g}{2}\left(1 + \frac{\sigma_y^2}{\sigma_s^2}\right) - \frac{s\sigma_y^2}{\sigma_s^2} - \frac{\sigma_y^2}{g} \ln\left(\frac{p\kappa}{(1-p)[\beta-\kappa]}\right)$ which is monotone in s . \square

Proof of Equilibrium Existence

Proof of Proposition 1. The leader has a dominant strategy to match his type. Since $u_{L,t}(G; \theta) = 1$ if $G_t = \theta$, zero otherwise, for $t \in \{1, 2\}$, it is always optimal to set $G_t = \theta$ in each period $t \in \{1, 2\}$ of the game. Following these equilibrium strategies, citizen i sets $a_i = 1$ if $y_{i,1} \leq \bar{y}^*(s)$. Since there is a continuum of citizens, the proportion of citizens that mobilize, i.e. set $a_i = 1$ is either $Pr\{y_{i,1} \leq \bar{y}^*(s)|\theta = 0\}$ or $Pr\{y_{i,1} \leq \bar{y}^*(s)|\theta = 1\}$ depending on the type of leader. That is the proportion of citizens that protest is either $\Phi\left(\frac{\bar{y}^*(s)}{\sigma_y}\right)$ or $\Phi\left(\frac{\bar{y}^*(s)-g}{\sigma_y}\right)$ where Φ is the cdf of the standard normal. If $\Phi\left(\frac{\bar{y}^*(s)}{\sigma_y}\right) \geq T > \Phi\left(\frac{\bar{y}^*(s)-g}{\sigma_y}\right)$, L is removed if and only if $\theta = 0$. Then for any citizen i , given the actions of other citizens, and the leader, i will prefer to set $a_i = 1$ iff:

$$Pr(\theta = 1|y_{i,1}, s)g + Pr(\theta = 0|y_{i,1}, s)[pg + \beta] - \kappa \geq Pr(\theta = 1|y_{i,1}, s)g + Pr(\theta = 0|y_{i,1}, s)pg$$

$$Pr(\theta = 0|y_{i,1}, s)\beta \geq \kappa$$

The left hand side is the expected earnings to citizen i of protesting after receiving both her private and public signals. If the leader is a good type, in equilibrium he will survive the protest and implement policies that yield the citizen payoff g in expectation in the second period (the first term). If, on the other hand the leader is a bad type, he is removed for sure, and replaced with a good type with probability p that implements g (a bad type would implement 0). There is also a benefit of β for participating in a successful protest (the second term). Of course political action incurs fixed costs κ . If the citizen does not protest, her payoffs are as on the right hand side.

Since there is a continuum of citizens, no citizen is pivotal. Hence a good leader will survive the protest and implement g in the second period; a poor leader will fall, and be replaced with a good leader with probability p who will institute good policy g .

Therefore, when $\Phi(\frac{\bar{y}^*(s)}{\sigma_y}) \geq T > \Phi(\frac{\bar{y}^*(s)-g}{\sigma_y})$, each citizen optimally protests (given the other citizens and the leader's actions) when $y_{i,1} \leq \bar{y}^*(s)$. If, on the other hand, $\Phi(\frac{\bar{y}^*(s)}{\sigma_y}) < T$, and each citizen i is adopting a strategy of $a_i = 1$ if and only if $y_{i,1} \leq \bar{y}^*(s)$, then L would never be removed. Given that this is the case, the utility from setting $a_i = 1$ is $-\kappa < 0$, and so this cannot be a best response. Thus, $a_i = 0 \forall i$ if $\Phi(\frac{\bar{y}^*(s)}{\sigma_y}) < T$. We write this as $\bar{y}(s) = -\infty$ when $\Phi(\frac{\bar{y}^*(s)}{\sigma_y}) < T$.

Conversely, if $\Phi(\frac{\bar{y}^*(s)-g}{\sigma_y}) \geq T$, and each citizen i is adopting a strategy of $a_i = 1$ if and only if $y_{i,1} \leq \bar{y}^*(s)$, then L would always be removed, regardless of type. Given that this is the case, the utility from setting $a_i = 1$ is $\beta - \kappa > 0$, the return from not participating. Hence $a_i = 1 \forall i$ if $\Phi(\frac{\bar{y}^*(s)-g}{\sigma_y}) \geq T$ is a best response. We write this as $\bar{y}(s) = \infty$ when $\Phi(\frac{\bar{y}^*(s)-g}{\sigma_y}) \geq T$.

Together these yield a best response for any citizen as $y_{i,1} \leq \bar{y}(s)$ where $\bar{y}(s)$ is as defined in Definition 2.

Finally, beliefs follow directly from Bayes' rule. □

Lemma 2. \bar{s} and \underline{s} are well-defined

Proof. Recall from Lemma 1 that $\bar{y}^*(s)$ is monotonic (and decreasing) in s . Further $\lim_{s \rightarrow \infty} \bar{y}^*(s) = -\infty$ and $\lim_{s \rightarrow -\infty} \bar{y}^*(s) = \infty$. Since $\Phi(\frac{\bar{y}^*(s)}{\sigma_y})$ ($\Phi(\frac{\bar{y}^*(s)-g}{\sigma_y})$) are monotonic and increasing in $\bar{y}^*(s)$ and limited below by zero and above by 1, it follows that there exist two values of s , which we define as \bar{s} and \underline{s} , such that $T = \Phi(\frac{\bar{y}^*(\bar{s})-g}{\sigma_y})$ and $T = \Phi(\frac{\bar{y}^*(\bar{s})}{\sigma_y})$. □

Transparency Improves Discrimination

Proof of Proposition 2. Discrimination = $\Phi(\frac{\bar{s}}{\sigma_s}) - \Phi(\frac{\underline{s}-g}{\sigma_s})$. Firstly, recall that $\Phi(\frac{\bar{y}^*(\bar{s})}{\sigma_y}) = T$. Substituting $\bar{y}^*(s)$ from Lemma 1, and solving we get $\bar{s} = \frac{g}{2}(\frac{\sigma_s^2}{\sigma_y^2} + 1) - \frac{\sigma_s^2}{g} \ln(\frac{p\kappa}{(1-p)[\beta-\kappa]}) - \frac{\sigma_s^2}{\sigma_y} \Phi^{-1}(T)$. Similarly, since $\Phi(\frac{\bar{y}^*(\underline{s})-g}{\sigma_y}) = T$, substituting and rearranging leads to $\underline{s} = \frac{g}{2}(1 - \frac{\sigma_s^2}{\sigma_y^2}) - \frac{\sigma_s^2}{g} \ln(\frac{p\kappa}{(1-p)[\beta-\kappa]}) - \frac{\sigma_s^2}{\sigma_y} \Phi^{-1}(T)$. Then $\frac{\partial}{\partial \sigma_s}(\frac{\bar{s}}{\sigma_s}) = \frac{g}{2}(\frac{1}{\sigma_y^2} - \frac{1}{\sigma_s^2}) - \frac{1}{g} \ln(\frac{p\kappa}{(1-p)[\beta-\kappa]}) - \frac{1}{\sigma_y} \Phi^{-1}(T)$ and $\frac{\partial}{\partial \sigma_s}(\frac{\underline{s}-g}{\sigma_s}) = \frac{g}{2}(\frac{1}{\sigma_s^2} - \frac{1}{\sigma_y^2}) - \frac{1}{g} \ln(\frac{p\kappa}{(1-p)[\beta-\kappa]}) - \frac{1}{\sigma_y} \Phi^{-1}(T)$. To conserve on notation, we will label

$Z \equiv \frac{1}{g} \ln\left(\frac{p\kappa}{(1-p)[\beta-\kappa]}\right) + \frac{1}{\sigma_y} \Phi^{-1}(T)$, and hence

$$\begin{aligned}\frac{\partial}{\partial \sigma_s} \left(\frac{\bar{s}}{\sigma_s} \right) &= \frac{g}{2} \left(\frac{1}{\sigma_y^2} - \frac{1}{\sigma_s^2} \right) - Z \\ \frac{\partial}{\partial \sigma_s} \left(\frac{s-g}{\sigma_s} \right) &= \frac{g}{2} \left(\frac{1}{\sigma_s^2} - \frac{1}{\sigma_y^2} \right) - Z\end{aligned}$$

while $\frac{g}{2} \left(\frac{1}{\sigma_s^2} - \frac{1}{\sigma_y^2} \right) > 0 > \frac{g}{2} \left(\frac{1}{\sigma_y^2} - \frac{1}{\sigma_s^2} \right)$, given that $\sigma_s < \sigma_y$. Notice too that

$$\begin{aligned}\frac{g}{2} \left(\frac{1}{\sigma_s} + \frac{\sigma_s}{\sigma_y^2} \right) - \sigma_s Z &= \frac{\bar{s}}{\sigma_s} \\ -\frac{g}{2} \left(\frac{1}{\sigma_s} + \frac{\sigma_s}{\sigma_y^2} \right) - \sigma_s Z &= \frac{s-g}{\sigma_s}\end{aligned}$$

Since $\phi(\cdot)$ is the pdf of a standard normal, we can also notice that

$$\phi\left(\frac{\bar{s}}{\sigma_s}\right) \begin{matrix} \geq \\ \leq \end{matrix} \phi\left(\frac{s-g}{\sigma_s}\right) \Leftrightarrow Z \begin{matrix} \geq \\ \leq \end{matrix} 0. \quad (5)$$

Now consider a change in discrimination due to a change in σ_s :

$$\begin{aligned}\frac{\partial}{\partial \sigma_s} \left[\Phi\left(\frac{\bar{s}}{\sigma_s}\right) - \Phi\left(\frac{s-g}{\sigma_s}\right) \right] < 0 &\Leftrightarrow \\ \phi\left(\frac{\bar{s}}{\sigma_s}\right) \left[\frac{\partial}{\partial \sigma_s} \left(\frac{\bar{s}}{\sigma_s} \right) \right] < \phi\left(\frac{s-g}{\sigma_s}\right) \left[\frac{\partial}{\partial \sigma_s} \left(\frac{s-g}{\sigma_s} \right) \right] &\quad (6)\end{aligned}$$

Having defined these preliminaries, we can now evaluate condition 6. Let us first assume $\frac{\partial}{\partial \sigma_s} \left(\frac{\bar{s}}{\sigma_s} \right) > 0$. Notice that, since $\frac{g}{2} \left(\frac{1}{\sigma_y^2} - \frac{1}{\sigma_s^2} \right) < 0$, this implies that $Z < 0$. Condition 6 can thus be expressed as:

$$\frac{\phi\left(\frac{\bar{s}}{\sigma_s}\right)}{\phi\left(\frac{s-g}{\sigma_s}\right)} < \frac{\frac{g}{2} \left(\frac{1}{\sigma_s^2} - \frac{1}{\sigma_y^2} \right) - Z}{\frac{g}{2} \left(\frac{1}{\sigma_y^2} - \frac{1}{\sigma_s^2} \right) - Z}$$

Since $Z < 0$, we know from equation (5) that the LHS of this inequality is strictly less than one. We similarly know that the RHS of this inequality must be strictly greater than one, given that $\sigma_s < \sigma_y$ and the denominator is positive. Thus, this inequality must hold.

Let us now consider the case where $\frac{\partial}{\partial \sigma_s}(\frac{\bar{s}}{\sigma_s}) < 0$. Then condition 6 can be rewritten as:

$$\frac{\phi(\frac{\bar{s}}{\sigma_s})}{\phi(\frac{s-g}{\sigma_s})} > \frac{\frac{g}{2}(\frac{1}{\sigma_s^2} - \frac{1}{\sigma_y^2}) - Z}{\frac{g}{2}(\frac{1}{\sigma_y^2} - \frac{1}{\sigma_s^2}) - Z}$$

When $\frac{\partial}{\partial \sigma_s}(\frac{\bar{s}}{\sigma_s}) < 0$, $\frac{\partial}{\partial \sigma_s}(\frac{s-g}{\sigma_s})$ may be either positive or negative. If it is positive, it is immediately apparent that this inequality must hold – the RHS will be strictly negative, while the LHS (by the definition of a pdf) is strictly positive.

Let us now consider the final possible case, in which $\frac{\partial}{\partial \sigma_s}(\frac{s-g}{\sigma_s}) < 0$. Since $\frac{g}{2}(\frac{1}{\sigma_s^2} - \frac{1}{\sigma_y^2}) > 0$, this implies that $Z > 0$ and $\frac{\frac{g}{2}(\frac{1}{\sigma_s^2} - \frac{1}{\sigma_y^2}) - Z}{\frac{g}{2}(\frac{1}{\sigma_y^2} - \frac{1}{\sigma_s^2}) - Z} \in (0, 1)$. $Z > 0$ implies that $\frac{\phi(\frac{\bar{s}}{\sigma_s})}{\phi(\frac{s-g}{\sigma_s})} > 1$. Thus, the inequality holds.

Hence condition 6 holds for all possible parameter values. Discrimination is therefore be rising in transparency. \square

Corollary 1 follows directly from the strategies identified in the equilibrium in Proposition 1.

Proof of Proposition 3

Proof of Proposition 3. The unconditional probability of autocratic removal is given by $(1-p)\Phi(\frac{\bar{s}}{\sigma_s}) + p\Phi(\frac{s-g}{\sigma_s})$. This probability is increasing in transparency if the quantity above is decreasing in σ_s . Thus, the unconditional probability of democratization is rising in transparency iff

$$(1-p)\phi(\frac{\bar{s}}{\sigma_s})[\frac{\partial}{\partial \sigma_s}(\frac{\bar{s}}{\sigma_s})] + p\phi(\frac{s-g}{\sigma_s})[\frac{\partial}{\partial \sigma_s}(\frac{s-g}{\sigma_s})] < 0. \quad (7)$$

As we saw in the proof of Proposition 2 above, $\frac{\partial}{\partial \sigma_s}(\frac{s-g}{\sigma_s}) > \frac{\partial}{\partial \sigma_s}(\frac{\bar{s}}{\sigma_s})$. Thus, a sufficient condition for condition 7 to hold is that $\frac{\partial}{\partial \sigma_s}(\frac{s-g}{\sigma_s}) \leq 0$. Recall that

$$\frac{\partial}{\partial \sigma_s}(\frac{s-g}{\sigma_s}) = \frac{g}{2}(\frac{1}{\sigma_s^2} - \frac{1}{\sigma_y^2}) - Z$$

which is monotonic and decreasing in σ_s and converges to $-Z$ as $\sigma_s \rightarrow \sigma_y$. Thus, if $Z > 0$, there exists a value $\bar{\sigma}_s$ such that this expression is negative for all $\sigma_s \geq \bar{\sigma}_s$. Finally, $Z > 0$ implies that $\frac{1}{g} \ln(\frac{p\kappa}{(1-p)[\beta-\kappa]}) + \frac{1}{\sigma_y} \Phi^{-1}(T) > 0$ or $\Phi^{-1}(T) > -\frac{\sigma_y}{g} \ln(\frac{p\kappa}{(1-p)[\beta-\kappa]})$. \square

Proof of Remark 1

Proof of Remark 1. From the proof of Proposition 3 above, a sufficient condition for the unconditional probability of autocratic removal to be rising in transparency (falling in σ_s) is $\frac{\partial}{\partial \sigma_s} \left(\frac{s-g}{\sigma_s} \right) \leq 0$. Now $\frac{\partial}{\partial \sigma_s} \left(\frac{s-g}{\sigma_s} \right) = \frac{g}{2} \left(\frac{1}{\sigma_s^2} - \frac{1}{\sigma_y^2} \right) - Z$ and $Z = \frac{1}{g} \ln \left(\frac{p\kappa}{(1-p)[\beta-\kappa]} \right) + \frac{1}{\sigma_y} \Phi^{-1}(T)$. Then $\lim_{\beta \rightarrow \kappa} Z = \infty \forall T > 0$ and hence $\lim_{\beta \rightarrow \kappa} \frac{\partial}{\partial \sigma_s} \left(\frac{s-g}{\sigma_s} \right) < 0 \forall \sigma_s, T > 0$. \square

Appendix: Empirical Appendix

Transparency and Autocrat Removal Via Revolt and Democratization Separately

Here we present the results of competing hazards regressions in which we separately model the risk of autocratic regime removal via mass protest and autocratic regime removal via processes leading to democratization. As in the main empirical section of the paper, we fit conditional gap time competing hazards regressions. For regressions in which the outcome is regime removal only via mass revolt (the results of which are presented in Table 4), we code a binary indicator which takes the value of 1 in the year a given autocratic regime is removed (via revolt). All autocratic regimes enter the data, those that are removed by other methods are treated as censored. In regressions in which the outcome is regime removal via processes leading to democratization (the results of which are presented in Table 5), we code a binary indicator which takes the value of 1 in the year a given autocratic regime is removed (via democratization). All autocratic regimes enter the regression, those that exit via other methods are treated as censored. In both instances, we stratify the baseline hazard based on the history of past autocratic transitions: results in the first three columns of both tables stratify based on whether there was a prior autocratic collapse in a given country, results in the next three columns stratify based on the number of prior collapses, and results in the final three columns control for an indicator of past collapse.

Results from both sets of regressions reveal similar patterns to one another, and to the main results in the text. Transparency is associated with an increased risk of collapse (via either revolt or democratization) and economic growth with a reduced risk of collapse. In some specifications, these results rise to the level of statistical significance, in others, they do not. However, both sets of models rely on very small samples of regime collapses: there are six such failures via mass revolt in our sample, and 24-25 instances of failures via democratization. Given the similarity of the estimates across both forms of regime collapse, and the small sample size, we prefer to combine these two forms of collapse for our main presentation in the text.

Table 5: Cox Model, Autocrat Removal via Democratization Only

	Cond. Past Collapse		Cond. Hist. Instability		Control Past Collapse	
Transparency	0.210	0.231	0.211	0.214	0.209	0.215
	[-0.128,0.548]	[-0.100,0.562]	[-0.110,0.532]	[-0.112,0.540]	[-0.130,0.548]	[-0.054,0.484]
Growth	-0.024	-0.023	-0.050**	-0.050**	-0.022	-0.018
	[-0.061,0.013]	[-0.060,0.015]	[-0.097,-0.003]	[-0.097,-0.003]	[-0.061,0.016]	[-0.054,0.018]
Transparency × Growth	0.004	0.005	-0.006	-0.006	0.008	0.007
	[-0.035,0.043]	[-0.036,0.045]	[-0.049,0.037]	[-0.048,0.037]	[-0.033,0.048]	[-0.032,0.045]
GDP per capita	0.254		0.113		0.145	
	[-0.321,0.829]		[-0.535,0.761]		[-0.289,0.579]	
Ec. Openness	-0.003		-0.001		-0.002	
	[-0.013,0.008]		[-0.012,0.010]		[-0.013,0.009]	
Party	-0.038	-0.098	-0.161	-0.193	-0.041	-0.080
	[-1.136,1.060]	[-1.149,0.954]	[-1.338,1.016]	[-1.283,0.897]	[-1.171,1.090]	[-1.171,1.010]
Military	0.740	0.676	0.668	0.648	0.648	0.611
	[-0.252,1.733]	[-0.274,1.627]	[-0.261,1.596]	[-0.237,1.533]	[-0.297,1.593]	[-0.295,1.516]
Ever Collapse					0.542	0.672
					[-0.537,1.622]	[-0.454,1.484]
# of Subjects	137	143	137	137	137	143
# of Failures	24	25	24	24	24	25

Cox competing hazards regressions of the hazard of autocratic removal by democratization only. The models depicted in the first three columns, the middle three columns, and the last three columns differ in the manner in which they deal with countries that experienced multiple autocratic failures. Those in the first three columns report a conditional gap time model wherein the baseline hazard is separately estimated for regimes that experience a prior regime failure and for those that did not. Those in the next two columns estimate separate baseline hazards based on a categorical measure that reflects the number of prior collapses. Those in the final three columns simply control for prior collapses, rather than stratifying the baseline hazard. In all models, * denotes significance at the 10 percent level, ** denotes significance at the 5 percent level, and *** denotes significance at the 1 percent level. 95 percent confidence intervals are presented in brackets. All standard errors have been clustered by autocratic regime.

Transparency and Other Forms of Autocrat Instability

Are relatively weak autocratic regimes – those most prone to removal via any method – simply more likely to be transparent? Might the above results be explained by the reform efforts of relatively weak regimes attempting to stave off their ouster?

We assess this possibility below. We do so by examining the relationship between transparency, economic growth, and autocratic instability resulting from threats not involving mass unrest or democratization. Our methods are broadly similar to those described above. Table 6 presents the results of a Cox competing hazards model of the hazard autocratic regimes face from removal via a coup. In contrast to the results in the prior section, a regime fails if a sitting autocratic leader is removed via a coup (which, in Svoboda's (2012) data involves a plot by either the military or other elites involving the threat or use of force). Regimes removed via other methods enter the dataset until they collapse, after which they are treated as censored. Table 7 presents the results of Cox regressions of autocratic regime removal (via any method) on transparency, growth and their interaction. As in the above section, we fit conditional gap time models in which the baseline hazard is stratified by whether or not there has been a prior regime collapse, on the number of prior regime collapses, and a final model in which we simply control for prior collapse.

Tables 6 and 7 show starkly contrasting results from those in Table 1, which examines removal via mass unrest or democratization. Table 6 demonstrates that transparency is associated with a *reduced* threat of coups. The coefficient on transparency is negative and large in all specifications, and significant at the 90 percent level or above in all specifications that do not control for GDP *per capita* and economic openness. Furthermore, the coefficient on growth (and its interaction with transparency) is consistently positive in all specifications. That is, growth, transparency, and their interaction have the opposite association with instability as brought about via coups as with instability brought about via unrest.

Table 7 shows that these starkly contrasting results offset one another when one considers the risk autocratic regimes face from all possible threats. Coefficients on transparency, growth and their interaction are never significant. Moreover, the point estimate of the coefficient on transparency is consistently small – approximately equal to zero – and switches signs across the various specifications. Transparency is associated with increased autocratic instability only via threats from below – its relationship to threats emerging from within the regime follows starkly different patterns. This finding argues against the notion that transparency is simply higher in weak autocratic regimes.

Table 6: Cox Models, Autocrat Removal via Coup

	Cond. Past Collapse		Cond. Hist. Instability		Control Past Collapse				
Transparency	-0.163 [-0.477,0.151]	-0.293* [-0.586,0.000]	-0.239** [-0.451,-0.028]	-0.243 [-0.765,0.280]	-0.320* [-0.691,0.050]	-0.315* [-0.676,0.046]	-0.200 [-0.523,0.122]	-0.294** [-0.579,-0.009]	-0.240** [-0.443,-0.037]
Growth	0.042 [-0.020,0.105]	0.041 [-0.016,0.097]	0.041 [-0.011,0.094]	0.068* [-0.009,0.146]	0.056* [-0.004,0.116]	0.057* [-0.003,0.116]	0.029 [-0.025,0.082]	0.034 [-0.020,0.089]	0.035 [-0.014,0.085]
Transparency × Growth	-0.001 [-0.044,0.042]	0.014 [-0.028,0.055]	0.015 [-0.007,0.037]	0.021 [-0.049,0.090]	0.028 [-0.024,0.080]	0.024 [-0.021,0.068]	0.001 [-0.040,0.042]	0.009 [-0.030,0.048]	0.013 [-0.007,0.034]
GDP per capita	-1.411* [-3.083,0.262]			-1.421 [-3.131,0.288]			-1.324 [-3.010,0.362]		
Ec. Openness	0.034 [-0.030,0.098]			0.039 [-0.022,0.101]			0.023 [-0.038,0.083]		
Ec. Openness ²	-0.011 [-0.062,0.040]			-0.013 [-0.061,0.034]			-0.004 [-0.057,0.048]		
Ec. Openness ³	0.001 [-0.010,0.012]			0.001 [-0.008,0.011]			-0.001 [-0.012,0.011]		
Party	-0.140 [-1.230,0.950]	0.031 [-1.139,1.201]		-0.406 [-1.529,0.717]	0.045 [-1.010,1.100]		-0.185 [-1.375,1.005]	-0.005 [-1.226,1.216]	
Military	0.389 [-0.581,1.359]	0.672 [-0.318,1.662]		0.362 [-0.531,1.256]	0.660 [-0.266,1.585]		0.398 [-0.628,1.423]	0.680 [-0.364,1.725]	
Ever Collapse							0.482 [-0.551,1.516]	0.318 [-0.679,1.316]	0.470 [-0.553,1.493]
# of Subjects	137	137	143	137	137	143	137	137	143
# of Failures	16	16	18	16	16	18	16	16	18

Cox competing hazards regressions of the hazard of autocratic removal via coup. The models depicted in the first three columns, the middle three columns, and the last three columns differ in the manner in which they deal with countries that experienced multiple autocratic failures. Those in the first three columns report a conditional gap time model wherein the baseline hazard is separately estimated for regimes that experience a prior regime failure and for those that did not. Those in the next two columns estimate separate baseline hazards based on a categorical measure that reflects the number of prior collapses. Those in the final three columns simply control for prior collapses, rather than stratifying the baseline hazard. In all models, * denotes significance at the 10 percent level, ** denotes significance at the 5 percent level, and *** denotes significance at the 1 percent level. 95 percent confidence intervals are presented in brackets. All standard errors have been clustered by autocratic regime.

Table 7: Cox Models, Autocrat Removal via All Methods

	Cond. Past Collapse		Cond. Hist. Instability		Control Past Collapse	
Transparency	0.014 [-0.159,0.187]	0.040 [-0.117,0.197]	0.010 [-0.171,0.190]	-0.029 [-0.218,0.160]	0.012 [-0.170,0.194]	0.001 [-0.192,0.193]
Growth	-0.005 [-0.030,0.020]	-0.009 [-0.034,0.015]	-0.006 [-0.039,0.027]	-0.007 [-0.038,0.024]	-0.008 [-0.034,0.019]	-0.008 [-0.033,0.017]
Transparency × Growth	0.015 [-0.011,0.042]	0.006 [-0.010,0.022]	0.013 [-0.019,0.045]	0.011 [-0.020,0.042]	0.017 [-0.011,0.045]	0.012 [-0.016,0.040]
GDP <i>per capita</i>	-0.265 [-0.705,0.174]		-0.330 [-0.796,0.135]		-0.274 [-0.709,0.161]	
Ec. Openness	-0.040*** [-0.066,-0.014]		-0.031** [-0.057,-0.006]		-0.046*** [-0.071,-0.021]	
Ec. Openness ²	0.034*** [0.009,0.059]		0.027** [0.003,0.050]		0.038*** [0.015,0.062]	
Ec. Openness ³	-0.008** [-0.015,-0.002]		-0.006** [-0.012,-0.001]		-0.009*** [-0.015,-0.003]	
Party	0.392 [-0.101,0.884]	0.364 [-0.122,0.850]	0.272 [-0.239,0.784]	0.262 [-0.225,0.748]	0.414 [-0.095,0.923]	0.371 [-0.125,0.867]
Military	0.060 [-0.406,0.525]	0.094 [-0.360,0.548]	0.026 [-0.426,0.478]	0.076 [-0.363,0.516]	0.071 [-0.397,0.540]	0.098 [-0.360,0.556]
Ever Collapse					0.283 [-0.227,0.793]	0.288 [-0.237,0.813]
# of Subjects	137	143	137	137	137	137
# of Failures	87	93	87	87	87	87

Cox regressions of the hazard of autocratic removal via any method. The models depicted in the first three columns, the middle three columns, and the last three columns differ in the manner in which they deal with countries that experienced multiple autocratic failures. Those in the first three columns report a conditional gap time model wherein the baseline hazard is separately estimated for regimes that experience a prior regime failure and for those that did not. Those in the next two columns estimate separate baseline hazards based on a categorical measure that reflects the number of prior collapses. Those in the final three columns simply control for prior collapses, rather than stratifying the baseline hazard. In all models, * denotes significance at the 10 percent level, ** denotes significance at the 5 percent level, and *** denotes significance at the 1 percent level. 95 percent confidence intervals are presented in brackets. All standard errors have been clustered by autocratic regime.