Transparency, Protest and Democratic Stability*

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Abstract

Democratic rule can only be maintained so long as all actors in the political system comply with the institutional rules of the game. Since constitutions cannot be enforced by external actors, democratic institutions must be self-enforcing – democracy must be an equilibrium. In this paper, we examine the role of transparency in supporting a democratic equilibrium. We contend that transparency improves the functioning of elections – in transparent polities, elections effectively resolve adverse selection problems between the public and their rulers. Consequently, transparency increases the legitimacy of electoral institutions and reduces the incentive for citizens to resort to mass mobilization as a means of removing under-performing politicians. We illustrate these arguments through a game-theoretic model, and test these claims and find they enjoy robust support. Transparency stabilizes democratic rule.

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When and why do democratic regimes enjoy periods of stable rule, free from the twin threats of mass mobilization or elite coups? When, contrastingly, will democracy be prone to instability and autocratic reversions? Recent events in Egypt, the Ukraine, and Thailand render these questions, which have long been at the center of political science, all the more relevant.

Existing work stresses the importance of a consensus in which all political actors agree to comply with the ‘rules of the game’ for the maintenance of democratic rule (Linz, 1978; Schedler, 1998; Schmitter, 1992). Since no external parties can be called upon to enforce this consensus, it must be self-enforcing. When all other actors choose to comply with democratic norms, no one actor can have an incentive to unilaterally deviate. Democracy must be an equilibrium (Przeworski, 1991, 2005; Weingast, 1997).

Recent work in this vein focuses on the compliance of political elites. Two theoretical perspectives dominate this literature: One emphasizes intertemporal trade-offs faced by political leaders. For democracy to remain stable, elites facing electoral defeat must prefer to accept this (temporary) set-back and await the (uncertain) prospect of future electoral victory, rather than resorting to force to implement their preferred agenda (e.g., Przeworski, 1991, 2005; Przeworski, Rivero and Xi, 2013; Scartascini and Tommasi, 2012; Wantchekon, 2004). The other perspective follows Weingast (1997) in emphasizing the populace’s role in preventing encroachments by the elite on democratic freedoms. Notably, Fearon (2011) notes that elections can play an informational role, enabling the public to mobilize against leaders who fail to comply with electoral rules. Others, have built upon these results, characterizing the conditions under which elections may play this role (Hyde and Marinov, forthcoming; Little, Tucker and LaGatta, 2013).

In this paper, we take a different tack. Here we focus on the *public’s* compliance with electoral rules. For democracy to remain an equilibrium, members of the electorate must prefer to accept election results, rather than turning to forms of mass mobilization – protests, strikes, or even violence – as a means of enforcing their will. For this to be the case, citizens must be confident that elections can perform their intended role in disciplining politicians who are widely perceived as under-performing. Perceptions that elections did not – or could not – play this role were central to recent incidents mass mobilization (and, in some instances, autocratic reversal) in Egypt, the Ukraine and Thailand.

We particularly emphasize the importance of transparency – which we define as the availability of policy-relevant information on aggregate outcomes – to ensuring popular compliance with election results.¹ High levels of transparency ensure that elections are more effective in disci-

¹Our definition of transparency used throughout is a narrow one. We provide greater detail, and an explanation of our empirical measure of transparency, below.

plining democratic leaders. Leaders who have performed poorly are more likely to be removed, and those who perform well are more likely to be retained, as transparency rises. Since elections and mass mobilization act as substitute mechanisms by which the populace might discipline their leaders, as elections perform better, the need for mass mobilization declines.² What might be termed as ‘democratic legitimacy’ emerges as an equilibrium concept.

In what follows, we flesh out – and empirically test – this argument. First, we present our (informal) argument in detail. We then relate this argument to the existing literature. We then develop a formal model incorporating elections, mass protest and transparency. Finally, we empirically test the implications of this argument for democratic survival.

Argument

Transparency and the Legitimacy of Elections

Democracy may be overthrown by members of the elite. Fairly elected leaders may choose to subvert democratic institutions and secure themselves in power via an *autogolpe*. Alberto Fujimori’s regime in 1990s Peru is a prominent example. Perhaps more commonly, those defeated in an electoral contest may attempt to undermine democratic laws and impose their rule through alternative means. These may involve resorting to civil war or coups.

However, democracy is also threatened by the risk of mass mobilization on the part of citizens dissatisfied with democratic outcomes. Citizens may be motivated to turn to the streets due to the perception that democratic institutions have proved to be insufficient in ensuring their leaders pursue the popular interest.³ Such mass mobilization may directly lead to the subversion of democratic rule, or may open the door for other political actors to assume political authority and establish authoritarian rule.

Theorists of democratic consolidation have long noted this possibility and thus stressed the importance of public attitudes toward democracy.⁴ Linz (1978), for instance, notes that the break-

²This result stands in stark contrast to the role of transparency in autocracies, where transparency increases the likelihood of mass protest (Hollyer, Rosendorff and Vreeland, 2014). We discuss this contrast below.

³For instance, many Egyptians pointed to the Morsi administration’s incompetence and consolidation of power as causes for the protests that ultimately led to his ousting. (See “Egypt’s Tragedy,” *The Economist*, July 6, 2013.) Thai protesters similarly claimed that democracy proved an insufficient means of limiting the claimed abuses of the Shinawatra government. (See, “A Symbolic Exercise,” *The Economist*, February 2, 2014.)

⁴We use the ‘narrow’ definition of democratic consolidation in this paper, as laid out by Schedler (1998). We define consolidation as simply reflecting the stability, or predicted stability, of electoral rule. We do not consider more expansive definitions, which might include the extension of civil rights, or the institutionalization of democracy (O’Donnell, 1996). We thus use the terms ‘democratic stability’ and ‘democratic consolidation’ interchangeably.

down of democracy typically involves some element of mass mobilization, coupled with military support for the challengers of democracy. Consequently, the attitudes of the populace play a critical role. Diamond (1994, 15) contends that, “*Consolidation* is the process by which democracy becomes so broadly and profoundly legitimate among its citizens that it is very unlikely to break down.” Linz (1978, 17) argues that, “Democratic legitimacy ... requires adherence to the rules of the game by *both a majority of citizens* and those in positions of authority...” (emphasis added).

While the literature on democratic consolidation has devoted substantial attention to the role of public attitudes in sustaining democracy, it has paid less attention to the forces that promote democratic legitimacy. It is our contention that attitudes toward democracy will depend on the ability of elections to serve their most fundamental role: disciplining elected leaders (Przeworski, Stokes and Manin, 1999). Elections serve as a mechanism by which citizens may ‘throw the bums out,’ should their leaders, in fact, prove to be bums. Formally, elections serve to resolve an agency problem between the citizenry and their leaders – a problem of adverse selection.⁵ Should politicians prove themselves unwilling, or unable, to govern in the interests of a majority of citizens, elections provide a means through which these leaders might be removed and replaced with more palatable alternatives.

We thus follow Diamond (1999) in stressing the relationship between the performance of electoral institutions, and the legitimacy of these bodies. As he notes, “the democratic system must produce sufficiently positive policy outputs to build broad political legitimacy,” (Diamond, 1999, 76). We acknowledge legitimacy may take on a broader definition, encompassing a logic that is not merely instrumental.⁶ Our contention here is merely that, *ceteris paribus*, elections are more likely to prove legitimate when they adequately solve issues of adverse selection.

Elections are most likely to function ‘well’ when levels of transparency are high. Citizens are best able to condition their voting decisions on government behavior when they are well-informed of that behavior. Thus, the more information citizens have about the performance of their leaders in office, the more likely it is that under-performing leaders will be voted out of office. An expansive literature notes the importance of information for improving citizen welfare and resolving agency problems between a populace and its elected representatives (Adserà, Boix and Payne, 2003; Besley and Burgess, 2002; Brunetti and Weder, 2003; Ferraz and Finan, 2008).

Elections and mass unrest serve as substitute mechanisms for the removal of under-performing

⁵Alternative models (Barro, 1973; Ferejohn, 1986) emphasize the importance of moral hazard problems in controlling politicians. However, as Fearon (1999) notes, so long as there is any possibility that some elected leaders are ‘better’ than others (from the perspective of the median voter), elections become a problem of adverse selection rather than moral hazard.

⁶Experimental evidence suggests that elections may confer legitimacy, regardless of their outcomes (Grossman and Baldassarri, 2012; Olken, 2008).

leaders. When elections serve this role well – i.e., when transparency is high – the need to resort to the streets is low. Consequently, the frequency of mass mobilization – with the attendant risk of autocratic reversion – declines as the level of transparency rises. In essence, democratic legitimacy emerges due to the rational behavior of the electorate. We illustrate these intuitions in a model of political agency, elections and mass unrest, below. We further empirically test the assertion that rising levels of transparency stabilize democracies, and find that this proposition enjoys robust support.

Definition of Transparency

The definition of transparency we use throughout this paper is a narrow one. Here we use the term transparency to mean the public disclosure of information, which is relevant to policy outcomes, to the mass public. Information must be pertinent to public policy if it is to enable citizens to update their beliefs regarding government performance, and thus influence their voting behavior. Citizens must be able to access such information. Moreover, it must be common knowledge that such information is disclosed if any individual citizen is to believe that *others* are similarly able to make informed voting decisions.

We particularly emphasize the importance of the availability of information on aggregate policy outcomes. Previous theoretical work has demonstrated that information on policy-outcomes unambiguously improves government accountability – in contrast to information about the policies that are adopted or on details of the policy-making process, the effects of which are ambiguous (Prat, 2005; Stasavage, 2004). Information on aggregate outcomes is most likely to be useful when policies are complex and have consequences for the broad populace – rather than highly targeted groups (Hollyer, Rosendorff and Vreeland, 2013). Since our emphasis is on the broad performance of the government – and we will particularly focus on economic performance – the disclosure of information takes on particular significance.

Our empirical measure of transparency is drawn from the HRV Index (Hollyer, Rosendorff and Vreeland, forthcoming). This measure treats transparency as a latent predictor of the reporting/non-reporting of data to the World Bank's World Development Indicators (WDI) data series, which is extracted using an item response model. It presents a continuous measure of transparency which summarizes the missingness of 240 variables from the WDI. The HRV Index not only matches our theoretical conception of transparency well, it also provides broad temporal and geographic coverage: 125 countries between 1980 and 2010.

We acknowledge, however, that our definition of transparency is a narrow one. Broader definitions can pertain to any aspect of information transmission within a given policy. These might

include the openness of political institutions (Broz, 2002; Dahl, 1971), freedom of the press or circulation of the press (Adserà, Boix and Payne, 2003; Brunetti and Weder, 2003), or the presence of freedom of information laws (Berliner, 2011; Islam, 2006). We prefer a narrow conception of transparency here for reasons of conformity with our theoretical model. We also note that definitions that incorporate political openness may create a tautological relationship between our explanatory (transparency) and outcome (democratic collapse) variables.

Contrast with Autocracies

The effect of transparency in democracies stands in stark contrast to its role in autocracies, where higher levels of transparency result in increased mass mobilization and the risk of regime *instability*. We document the role of transparency under autocratic rule elsewhere (Hollyer, Rosendorff and Vreeland, 2014).

The model we present in Hollyer, Rosendorff and Vreeland (2014) is identical to that we develop below, save only for the absence of elections. Two similar models can produce such contrasting results for a simple reason: the informational value of elections. Citizens under autocracy are faced with a poor informational environment. Citizens are uncertain of the distribution of discontent with the sitting leadership. Since mass mobilization is subject to strategic complementarities – the willingness of any one citizen to mobilize is contingent on the willingness of others to mobilize – this lack of information serves as an impediment to the organization of protests and strikes (Kuran, 1991; Lohmann, 1993). Transparency helps to offset this informational scarcity, enabling mobilization where it would otherwise prove infeasible.

By contrast, democracies are an information rich environment, even when levels of transparency are low. As Fearon (2011) points out, elections serve to directly inform citizens of the distribution of discontent with the sitting leadership (see also, Little, Tucker and LaGatta, 2013). Since any one citizen is well-informed of her fellows beliefs' *regardless* of the level of transparency, further information plays at best a minor role in the organization of protest. Rather, as we describe above, transparency serves to inform citizens of the government's performance *before* they enter the voting booth. Each citizen is consequently better able to align her vote with the government's performance when transparency is high than when it is low. Election results are thus more responsive to government performance as transparency rises, improving their effectiveness is mitigating adverse selection issues and enhancing democratic legitimacy.

Existing Literature

This paper relates to a literature on democratic consolidation that is far too vast to fully survey here. We note, however, that our emphasis on the importance of the legitimacy of elections in the eyes of the citizenry is widely shared in this literature. A consensus holds that democracies become consolidated as political actors come to accept the ‘rule of the [democratic] game’ (Diamond, 1994, 1999; Linz, 1978; O’Donnell, 1996; Schedler, 1998; Schmitter, 1992). Differences emerge, however, as to what factors promote such legitimation. Some emphasize the importance of civil society (Diamond, 1994) or associational groups (Schmitter, 1992), others the extent of participation in electoral processes (Wright, 2008). We share an emphasis on the importance of agency problems (government efficacy) under democracy with Linz (1978) and Diamond (1999). Our contribution is to stress the role transparency plays in redressing such problems, and thus in stabilizing democracy.

Other authors emphasize the importance of structural factors to democratic survival (Huber, Rueschemeyer and Stephens, 1993; Lipset, 1959; Moore, 1966). Most significantly, economic development is strongly (positively) correlated with democratic survival (Przeworski et al., 2000). We abstract away from such concerns in our theoretical account. We do so not because we think structural factors unimportant, but because they are tangential to the mechanisms that are our focus.⁷

Finally, this paper draws heavily on a literature that emphasizes the informational problems inherent in mass mobilization, and the role of elections in addressing these problems. Early models of protest noted the coordination issues inherent in mobilization (Kuran, 1991; Lohmann, 1993).⁸ A growing literature, starting with Fearon (2011), points to the role of elections in resolving these problems. Fearon points out that elections can thus enable citizens to discipline rulers who infringe on the democratic rules of the game (building on the insights of Weingast, 1997). Little, Tucker and LaGatta (2013) further build on this claim, noting that the conditions under which elections are likely to prove self-enforcing are only likely to be consistent with majoritarian electoral outcomes when elections are free from fraud – a point empirically tested by Hyde and Marinov (forthcoming). Egorov and Sonin (2012) note that elections can serve to discipline leaders even under ‘contested authoritarian’ rule. Empirical observations from Tucker (2007) and Bunce and Wolchik (2011) – which find that contested election results often give rise to protest – give weight

⁷Our empirical specifications, however, all control for levels of economic development.

⁸A more recent literature employs a global games (Morris and Shin, 2001) informational structure to model protests. Our approach share much in common with these models. Examples include Bueno de Mesquita (2010), Shadmehr and Bernhardt (2011) and Little, Tucker and LaGatta (2013).

to these theoretical claims.

We similarly note the importance of elections in coordinating protest. However, in contrast to these papers, our emphasis is on the compliance of the *populace* with the democratic rules of the game, not on the ability of citizens to discipline leaders. Our model abstracts away from leader's compliance with democratic results – we assume leaders who are voted out of office step down. Our focus is on the decision of *citizens* to comply with democratic results, given that other actors behaving in a manner consistent with a democratic equilibrium.

Model

Model Primitives

Consider an interaction between a democratic 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:⁹

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

$$u_L = \sum_{t=1}^2 u_{L,t}(G_t, \theta)$$

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 $y_{i,t} = G_t\gamma + \epsilon_{i,t}$, where $\epsilon_{i,t} \sim N(0, \sigma_y^2) \forall i, t$, and γ 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 goes not observe the value of G_t . In

⁹Actors do not discount over time. The results would be unchanged by including a discount factor.

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 how to vote and 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 $s = G_1\gamma + \rho$, 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 shrinks.¹⁰ σ_s is thus a measure of the inverse of transparency (i.e., of opacity). As σ_s declines, transparency rises.¹¹ Since s depicts the public disclosure of *aggregate* economic data, we further assume that $\sigma_s < \sigma_y$.

After receiving both her signals (public and private), each citizen may cast a vote for or against the incumbent $v_i \in \{0, 1\}$, where $v_i = 1$ denotes a vote for removal. Let the mass of citizens voting for removal be $V \equiv \int_0^1 v_i di$. If $V \geq \frac{1}{2}$, L is removed from office; if $V < \frac{1}{2}$, L is retained. Citizens suffer no direct cost, nor enjoy any direct benefit, from their voting decision. After voting takes place V is revealed to all citizens and to L .

If L is retained in office, each citizen i may mobilize in an attempt to bring about her ouster.¹² Let $a_i \in \{0, 1\}$ denote the decision to mobilize, where $a_i = 1$ indicates mobilization. Denote the total mass of citizens who engage in unrest as $A \equiv \int_0^1 a_i di$. 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 $R(A)$

¹⁰Values 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.

¹¹Transparency, 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 democratic stability. 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.

¹²While we recognize that such mobilization is 'unthinkable' in many advanced democracies, we do not restrict the scope of our analysis to 'new' democracies. We believe that democratic consolidation is a condition that should be derived from the equilibrium of the model – not a condition to be assumed by restricting the action space of citizens. Thus, citizens in all democracies have the ability to mobilize, even if some choose – in equilibrium – never to exercise this ability. We would like to thank John Freeman for clarifying this point.

to denote removal, such that:

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

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 owing to the likelihood of 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 is:

1. Nature chooses L ’s type, $\theta \in \{0, 1\}$. The value of θ is revealed to L , but not to any citizen.
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 also chooses 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 $v_i \in \{0, 1\}$. $V = \int_0^1 v_i di$ is revealed to all citizens. If $V \geq \frac{1}{2}$, L is removed and replaced by another government, whose type θ is chosen by Nature.
5. If $V < \frac{1}{2}$, each citizen may choose whether or not to engage in collective action $a_i \in \{0, 1\}$. If $A \geq T$, L is removed and replaced by another government, whose type θ is chosen by Nature.
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 revealed to each citizen and the game ends.

Equilibrium

This game gives rise to a multiplicity of perfect Bayesian equilibria (Fudenberg and Tirole, 1991). With a continuum of citizens, voting decisions may be non-strategic. Moreover, coordination

problems in the mobilization stage of the game similarly give rise to multiple equilibria.¹³

We narrow the set of equilibria to our model by restricting player strategies in the following manner: First, we assume that citizens vote sincerely. That is, a citizen i will vote to remove the incumbent (set $v_i = 1$) if and only if $Pr(\theta = 1|y_{i,1}, s) \leq p$. Second, we assume that a citizen i will only mobilize to overthrow the sitting leader if she believes with some positive probability that the leader is a bad type. That is, we require that $a_i = 0$ if $Pr(\theta = 1|V, s) = 1$. This rules out (perverse) equilibria in which all citizens coordinate on removing a leader known – with certainty – to be a good type.

Specifically, an equilibrium will consist of the following: (1) A threshold $\tilde{y}(s) : \mathbb{R} \rightarrow \mathbb{R}$, where a voter votes against the incumbent whenever $y_{i,1} < \tilde{y}(s)$. (2) A strategy for L from type- to action-space, $G_t : \{0, 1\} \rightarrow \{0, 1\}$. (3) A vote total, $V(s, \theta) : \mathbb{R} \times \{0, 1\} \rightarrow [0, 1]$, where mobilization take place if and only if $V < V(s, 1)$. (4) Posterior beliefs $Pr(\theta = 1|y_{i,1}, s)$ and $Pr(\theta = 1|V, s)$. We characterize each of these in turn, but first, a definition is necessary.

Definition 1. Define $\tilde{y}(s)$ implicitly by $Pr(\theta = 1|\tilde{y}(s), s) = p$, and define

$$V(s; \theta) = \begin{cases} \Phi\left(\frac{\tilde{y}(s)}{\sigma_y}\right) & \text{if } \theta = 0 \\ \Phi\left(\frac{\tilde{y}(s) - \gamma}{\sigma_y}\right) & \text{if } \theta = 1. \end{cases}$$

where Φ is the cdf of the standard normal distribution.

In the appendix we show that $\tilde{y}(s)$ is well defined.

Proposition 1. The following strategies and beliefs constitute a PBE. For the leader, $G_t = \theta$ for $t = 1, 2$. For the citizens, their voting and mobilization strategies are

$$v_i = \begin{cases} 1 & \text{if } y_{i,1} \leq \tilde{y}(s) \\ 0 & \text{otherwise.} \end{cases}$$

$$a_i = \begin{cases} 1 & \text{if } V > V(s; 1) \\ 0 & \text{otherwise.} \end{cases}$$

Beliefs are $Pr(\theta = 0|y_{i,1}, s)$, posteriors after both the private and public signals but before the

¹³While the mobilization stage of our game resembles a ‘global game,’ it lacks the two-sided limit dominance typical of global game models (Morris and Shin, 2001). Thus, as with coordination games, there always exist pure strategy equilibria in which citizens either always mobilize or fail to mobilize irrespective of their signals. This approach most closely resembles that of Bueno de Mesquita (2010), which also deals with unrest.

vote, and after the vote, but before political action:

$$Pr(\theta = 1|V, s) = \begin{cases} 0 & \text{if } V > V(s, 1) \\ 1 & \text{otherwise.} \end{cases}$$

Along the equilibrium path, each citizen makes a voting decision conditional on their beliefs about the type of leader they face - based on both their private and public signals. If the posterior beliefs are low - in that the current leader is unlikely to be a ‘good’ type, the citizen votes to remove the leader from office.

After the vote, each citizen sees how many voted to remove; since there is a continuum of citizens, and each citizen is using the same cut-point strategy, the number of votes to remove is either $V(s, 0) = \Phi(\frac{\tilde{y}(s)}{\sigma_y})$ or $V(s, 1) = \Phi(\frac{\tilde{y}(s)-\gamma}{\sigma_y})$, with $V(s; 1) < V(s; 0)$ for all s . That is the number of votes to remove a bad type is always larger than the number of votes to remove a good type. If the voter observes the former, she knows the leader is of the bad type, $\theta = 0$; on observing the latter, the voter infers perfectly that $\theta = 1$. The vote totals from the election – when coupled with the public signal – are thus fully informative of the leader’s type. Posterior beliefs are thus either $Pr(\theta = 1|V, s) = 0$ or $Pr(\theta = 1|V, s) = 1$.

The outcome of the vote however maybe that a ‘bad’ leader is reelected if the combination of private and public signals happened to be good draws. In which case, the voters all mobilize to remove the (bad) leader from office. By contrast, voters do not mobilize against a good leader should she be reelected. Democratic legitimacy emerges in equilibrium *if* elections adequately serve their role in resolving adverse selection problems in representative government.

Comparative Statics

We would like to explore the effect of transparency on the degree to which the political institutions are able to discriminate between the survival in office of ‘good’ versus ‘bad’ types. Since citizens engage in mobilization if and only if a ‘bad’ incumbent is reelected, the question becomes: Does transparency enhance the likelihood that ‘bad’ types are removed via the electoral process? The answer is yes.

Definition 2. Define $\tilde{s}$ implicitly by $\Phi(\frac{\tilde{y}(\tilde{s})}{\sigma_y}) = \frac{1}{2}$ and define $\underline{s}$ implicitly by $\Phi(\frac{\tilde{y}(\underline{s})-\gamma}{\sigma_y}) = \frac{1}{2}$.

We show in the appendix that $\tilde{s}$ and $\underline{s}$ are well defined. If $s \geq \tilde{s}$, governments of all types will be reelected. If $s \leq \underline{s}$, governments of all types are voted out of office. If $s \in (\underline{s}, \tilde{s})$, then governments are voted out of office if and only if $\theta = 0$. We can thus define the probability that a

government of type $\theta = 0$ is voted out of office as $\Phi(\frac{\tilde{s}}{\sigma_s})$. And we can define the probability that a government of type $\theta = 1$ is voted out of office as $\Phi(\frac{\tilde{s}^{-\gamma}}{\sigma_s})$. The extent to which electoral survival is conditioned on policy decisions or, equivalently, a government's type is thus $\Phi(\frac{\tilde{s}}{\sigma_s}) - \Phi(\frac{\tilde{s}^{-\gamma}}{\sigma_s})$. We term this quantity the level of *electoral discrimination*.

Proposition 2. *The level of electoral discrimination is strictly rising in transparency (falling in σ_s).*

As transparency rises, the probability that a government of type $\theta = 0$ is voted out of office rises; while the probability that a government of type $\theta = 1$ is voted out falls. Empirically, as transparency rises, the extent of economic voting also rises.

In equilibrium, if a low type leader survives in office, the voters mobilize for his “non-conventional” removal. We will use the shorthand “democratic collapse” to describe the instance where a leader is removed by means other than the electoral process. Since mass mobilization to remove the incumbent only takes place when poor leaders are reelected, this probability is given by $(1 - p)[1 - \Phi(\frac{\tilde{s}}{\sigma_s})]$ – i.e., the *ex ante* probability that L is a ‘bad’ type $\theta = 0$ multiplied by the probability that such a type survives the electoral process.

Increases in transparency – reductions in σ_s – will reduce the likelihood of democratic collapse. Since the probability a ‘bad’ government is retained via an election is falling in transparency, so too is the risk of democratic collapse. Transparency improves the role of elections in addressing adverse selection problems in government. And, because protests and elections are substitute mechanisms for addressing such problems, the risk to democracy fall as elections grow more effective.

Proposition 3. *The probability of mass unrest is strictly falling in transparency (rising in σ_s).*

Empirics

Data Description

Since the upending of democratic rule via street protest, by definition, entails the replacement of elected by un-elected leaders (for some period of time), we treat democratic collapse as the transition from democratic to autocratic rule.¹⁴ Our definition of democracy for this purpose is drawn from the *Democracy and Development Revisited* (DD) dataset compiled by [Cheibub, Gandhi and](#)

¹⁴[Linz \(1978\)](#) also notes that popular mobilization may open the door for other actors to subvert democracy, leading to an autocratic reversion. Egypt provides a recent example.

Vreeland (2010). The DD dataset uses the coding scheme pioneered in Alvarez et al. (1996), in which democracy is coded as a binary $\{0, 1\}$ indicator equal to 1 if both the legislative and executive branches are selected via competitive elections between contesting political parties. For a country to be considered a democracy, there must be at least one change in the party in power. All years under the same constitutional regime prior to this transfer of power are retroactively coded as democratic.

In addition to the democracy indicator, we draw several control variables from the DD data. A much contested literature points to differences in the stability of parliamentary and presidential regimes (e.g. Cheibub, 2007; Lijphart, 1992). We therefore control for a binary indicator of whether the government is run via a parliamentary system, and another indicator equal to one if the political regime involves a mixed parliamentary/presidential style system.

Transparency enters into our theoretical model as the (inverse of) the standard deviation of the publicly observable signal of government performance witnessed by all citizens σ_s . Transparency thus pertains to information that is (1) publicly observable – and known to be publicly observable by all actors – and (2) allows citizens to draw accurate inferences regarding government performance. Our empirical measure of this parameter is the HRV Index (Hollyer, Rosendorff and Vreeland, forthcoming), which measures the extent to which governments collect and disseminate aggregate economic data. The HRV Index is based on the reporting/non-reporting of information to the World Bank’s World Development Indicators (WDI) data series. In recent years, these data are made publicly available by the World Bank and, throughout our sample, the disclosure of economic information to the Bank proxies the public dissemination of such data more generally.¹⁵ These data allow citizens to make more nuanced inferences about government performance than would be possible in their absence. As more aggregate economic data are made available, citizens will be better able to discern the performance of the economy beyond their given circle of friends, family and acquaintances; to assess the distributional consequences of this performance; and to assess the government’s role relative to that of cyclical fluctuations. While these inferences will always be imperfect ($\sigma_s > 0$), increases in the dissemination of aggregate economic data imply that these inferences will improve (σ_s will fall).¹⁶

The HRV index treats transparency as a latent term that determines whether a given variable

¹⁵We do not expect that many members of the public access such data directly. However, we do expect citizens, absent such disclosures, to be relatively uninformed of aggregate economic performance.

¹⁶Elsewhere, Hollyer, Rosendorff and Vreeland (forthcoming), we note that this measure of transparency is a reflection of both states’ ability (capacity) and their willingness to disclose data. In this instance, our theoretical interest is only in the amount of information available to citizens, not in the rationale for its provision. (We examine such questions elsewhere, e.g. Hollyer, Rosendorff and Vreeland, 2011). Since, however, state capacity may influence the likelihood of regime collapse, we control for GDP *per capita* in our specification.

(of 240 variables in the model) is reported to the 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. Observations of this index are available at the country-year level for 125 countries over the 1980-2010 interval. For a complete description of our transparency variable, see [Hollyer, Rosendorff and Vreeland \(forthcoming\)](#).

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 control is vitally important given the strong role income plays in reinforcing the stability of democratic rule ([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). 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 .¹⁷

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.

¹⁷Specifically, the PWT constructs its measures based on subcomponents of the national accounts data of ‘benchmark’ countries, and data from the United Nations International Comparisons Program. Data from non-benchmark countries are imputed, additionally employing information from the US State Department. For details, see [Summers and Heston \(1991\)](#).

Finally, we include a control for fuel exporters, 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 ([Ross, 1999](#); [Jensen and Wantchekon, 2004](#)).

Empirical Model and Results

Proposition 3 contends that transparency should be associated with the stabilization of democratic regimes. Transparent democracies should face a lower hazard of collapse (and transition to authoritarianism) than opaque democracies. Since mass unrest to unseat democratically elected leaders is driven by the perception that electoral rules fail to unseat rent-seeking or incompetent politicians, enhancing the effectiveness of elections serves to decrease the likelihood of unrest. We test this claim below.

We begin by examining the relationship between the survival of democratic spells and levels of transparency. Our outcome of interest is a democratic-to-autocratic transition, which we define using the DD dataset ([Cheibub, Gandhi and Vreeland, 2010](#)). The unit of observation is the democratic spell-year, where a democratic spell is defined as one or more continuous years of democratic rule.

We test this relationship using Cox proportional hazards regressions, where the baseline hazard rate is estimated using conditional gap time models. Conditional gap time models stratify the baseline hazard rate based on some (potentially multichotomous) indicator variable. In so doing, they flexibly control for the manner in which this term may shift the hazard rate – both the shape and the level of the baseline hazard may differ across strata ([Box-Steffensmeier and Zorn, 2002](#)).

Specifically, we stratify the baseline hazard rate based on the frequency with which previous a given country has experienced democratic collapses in the past. Substantial evidence exists that past instability predicts future instability – the transition process between political regimes is non-Markovian ([Gandhi and Przeworski, 2007](#)). We thus estimate models where we stratify the baseline hazard rate based on an indicator for whether there has been a prior transition, or, alternatively, an ordered variable based on the number of prior transitions. As a final robustness test, we drop all cases that had experienced a prior democratic collapse from the model.

Our empirical hypothesis holds that the hazard of democratic collapse should fall in trans-

parency. To test this hypothesis, we estimate models of the following form:

$$h_d(t) = h_0(t)e^{\mathbf{X}_{d,t}\beta}$$

$$\mathbf{X}_{d,t}\beta = \beta_0 + \beta_1 \text{Transparency}_{d,t-1} + \beta_2 \text{Growth}_{d,t-1} + \beta_3 \text{Transparency}_{d,t-1} \times \text{Growth}_{d,t-1} + \mathbf{Z}\psi \quad (1)$$

where d denotes democratic-spell d , t denotes time (measured in years), and $\mathbf{Z}\psi$ is a matrix of controls and associated coefficients. $h_0(t)$ is the baseline hazard rate, which is estimated separately based on the history of past democratic collapses. t is defined in the number of years of continuous democratic rule. All standard errors are clustered by democratic-spell, to adjust for inter-temporal correlations. Our hypothesis holds that $\beta_1 < 0$.

Results from these regressions are presented in Table 1. The first two columns present coefficient estimates from a conditional gap time model in which the baseline hazard rate is stratified by whether or not there was a prior transition, the next two present similar models stratified based on the number of prior transitions, and the final two present estimates from a model run on democracies that did not experience a prior transition to autocracy between 1870 and 2008. Table 1 presents estimates of coefficient values, not hazard ratios.

As can be seen from Table 1, the coefficient on transparency is consistently negative, large, and significant at the 10 percent level or above. The point estimates suggest that a one standard deviation increase in transparency serves to reduce the hazard of democratic collapse by between roughly 65 to 95 percent. Even with the small number of democratic-to-autocratic transitions in our sample, these estimates are significant at the 90 percent level or above in every specification.

Figure 1 presents estimates of the smoothed hazard function from the model in column 5 of Table 1. The figure to the left presents estimates from when transparency is at its 10th percentile in the sample; while, the figure to the right presents the smoothed hazard when transparency is at its 90th percentile. Dashed lines depict the estimated hazard when growth is at its 10th percentile; solid lines depict the same when growth is at its 90th percentile. As can be readily seen, an increase in transparency is associated with a marked decline in the estimated hazard rate.

These results thus offer support for Proposition 3 – as levels of transparency rise, the risk of democratic collapse sharply declines. Transparency reinforces democracy even as it destabilizes autocracies. Moreover, these results lend increased plausibility to the mechanisms we discuss throughout the paper. While we cannot claim to test any causal relationships, for any mechanism to systematically confound our results, it must have opposing effects in democracies and autocracies.

Figure 1: Dem. Hazard Rates as a Function of Transparency and Growth

Conclusion

Thus, transparency stabilizes democracy or, equivalent, facilitates the consolidation of democratic rule. It does this through a particular mechanism: Increases in levels of transparency enhance the popular legitimacy of elections. As transparency rises, elections become more effective means of resolving adverse selection problems in representative government. Citizens, when confident that elections serve to hold their leaders to account, have a diminished incentive to resort to extra-constitutional means of disciplining their leaders.

This paper contributes to two literatures. First, and most clearly, it contributes the literature on democratic stability and consolidation. Our emphasis on the *popular* legitimacy of elections

shifts the focus of much recent work, which concentrates on the behavior of elites. In essence, this constitutes a return to an earlier literature on democratic consolidation, which stressed the importance of both popular and elite legitimation if democracy is to survive. In contrast to this earlier literature, however, we introduce a novel mechanism through which democracy might achieve mass legitimation, and thus introduce a novel predictor of democratic stability – namely transparency. Moreover, legitimacy in this context arises from the rational equilibrium strategies of citizens as deduced from a formal model – it is not merely a description of behavioral responses or of (possibly irrational) attitudes.

This paper, in combination with our companion work on transparency and mass mobilization in autocracies (Hollyer, Rosendorff and Vreeland, 2014), also contributes to a growing literature on the coordination of protest. Like much of this literature, we are centrally concerned with the informational difficulties inherent in coordinating mass unrest. Others have focused on the role that election returns (Fearon, 2011; Hyde and Marinov, forthcoming; Little, Tucker and LaGatta, 2013) or revolutionary entrepreneurs (Bueno de Mesquita, 2010) might play in resolving these difficulties. We focus on the role of transparency. However, our results across these two papers go on to demonstrate that the role of information in coordinating protests is moderated by the institutional environment. Whereas transparency facilitates mass unrest in autocracies, it inhibits the same behavior in democracies.

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Proofs of Theoretical Propositions

Lemma 1. $\tilde{y}(s)$ is well defined

Proof. Recall $Pr(\theta = 1|\tilde{y}(s), s) = p$. From Bayes rule,

$$Pr(\theta = 1|\tilde{y}(s), s) = \frac{p\phi\left(\frac{\tilde{y}(s)-\gamma}{\sigma_y}\right)\phi\left(\frac{s-\gamma}{\sigma_s}\right)}{p\phi\left(\frac{\tilde{y}(s)-\gamma}{\sigma_y}\right)\phi\left(\frac{s-\gamma}{\sigma_s}\right) + (1-p)\phi\left(\frac{\tilde{y}(s)}{\sigma_y}\right)\phi\left(\frac{s}{\sigma_s}\right)}.$$

Then $\tilde{y}(s) = \frac{\gamma}{2}\left(\frac{\sigma_y^2}{\sigma_s^2} + 1\right) - \frac{s\sigma_y^2}{\sigma_s^2}$. □

Proof of Equilibrium Existence

Proof of Proposition 1. As before the leader has a dominant strategy to match her type: L ’s best response is to set $G_t = \theta$ in $t \in \{1, 2\}$. In the voting stage, given the equilibrium strategies of the leader and the other voters, voter i votes against the incumbent (set $v_i = 1$) if and only if $Pr(\theta = 1|y_{i,1}, s) \leq p$. Substituting the equilibrium interim beliefs and simplifying yields the condition that $v_i = 1$ iff $y_{i,1} < \tilde{y}(s)$. So the voter is playing a best response and consistent with beliefs. After the voting is complete, and given these strategies by the voters, the number of votes to remove L is given by $V(\theta; s)$, as defined in Definition 1. Notice that, for any value of s , $V(1, s) < V(0, s)$ – the vote share of the incumbent is strictly lower if she is of type $\theta = 0$ than if she is of type $\theta = 1$. This then implies that – given the public signal – each citizen i can deduce L ’s type with certainty based on her vote share. More precisely, each citizen i ’s posterior beliefs

will be given by:

$$Pr(\theta = 1|V, s) = \begin{cases} 0 & \text{if } V > V(1, s) \\ 1 & \text{otherwise.} \end{cases}$$

Given these posterior beliefs, in equilibrium, all voters will mobilize if $V > V(1, s)$. If all other voters are mobilizing it is optimal for the $i'th$ voter to mobilize too in order to benefit from participating in a successful uprising; if the other voters are not mobilizing (which happens when $V \leq V(1, s)$), then there is no benefit to protesting. Hence for voter i a best response is $a_i = 1$ if $V > V(1, s)$ and 0 otherwise. Finally both interim and posterior beliefs follow Bayes' rule. $\square$

Democratic Discrimination and Transparency

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

Proof. $\Phi(\frac{\tilde{y}(\tilde{s})-\gamma}{\sigma_y}) = \frac{1}{2}$ and $\tilde{y}(s) = \frac{\gamma}{2}(\frac{\sigma_y^2}{\sigma_s^2} + 1) - \frac{s\sigma_y^2}{\sigma_s^2}$ from Lemma 1. Substituting and solving yields $\frac{\gamma}{2}(1 + \frac{\sigma_s^2}{\sigma_y^2}) = \tilde{s}$. Similarly, $\Phi(\frac{\tilde{y}(\underline{s})-\gamma}{\sigma_y}) = \frac{1}{2}$. Substituting and solving yields $\frac{\gamma}{2}(1 - \frac{\sigma_s^2}{\sigma_y^2}) = \underline{s}$. $\square$

Proof of Proposition 2. Electoral discrimination = $\Phi(\frac{\tilde{s}}{\sigma_s}) - \Phi(\frac{\underline{s}-\gamma}{\sigma_s})$. $\frac{\partial}{\partial \sigma_s}[\Phi(\frac{\tilde{s}}{\sigma_s}) - \Phi(\frac{\underline{s}-\gamma}{\sigma_s})] = \phi(\frac{\tilde{s}}{\sigma_s})\frac{\partial}{\partial \sigma_s}[\frac{\tilde{s}}{\sigma_s}] - \phi(\frac{\underline{s}-\gamma}{\sigma_s})\frac{\partial}{\partial \sigma_s}[\frac{\underline{s}-\gamma}{\sigma_s}]$. Now the first term $\phi(\frac{\tilde{s}}{\sigma_s})\frac{\partial}{\partial \sigma_s}[\frac{\tilde{s}}{\sigma_s}] = \phi(\frac{\tilde{s}}{\sigma_s})\frac{\gamma}{2}(\frac{1}{\sigma_y^2} - \frac{1}{\sigma_s^2}) < 0$ since $\sigma_s < \sigma_y$. The second term $\phi(\frac{\underline{s}-\gamma}{\sigma_s})\frac{\partial}{\partial \sigma_s}[\frac{\underline{s}-\gamma}{\sigma_s}] = \phi(\frac{\underline{s}-\gamma}{\sigma_s})\frac{\gamma}{2}(\frac{1}{\sigma_s^2} - \frac{1}{\sigma_y^2}) > 0$ again since $\sigma_s < \sigma_y$. Hence $\frac{\partial}{\partial \sigma_s}[\Phi(\frac{\tilde{s}}{\sigma_s}) - \Phi(\frac{\underline{s}-\gamma}{\sigma_s})] < 0$. $\square$

Proof of Proposition 3. Mass unrest takes place in equilibrium if and only if an incumbent of type $\theta = 0$ survives the electoral stage of the game. From the proof of Proposition 2, this probability is $1 - \Phi(\frac{\tilde{s}}{\sigma_s})$. Then $\frac{\partial}{\partial \sigma_s} [1 - \Phi(\frac{\tilde{s}}{\sigma_s})] = -\phi(\frac{\tilde{s}}{\sigma_s})[\frac{\partial}{\partial \sigma_s} \frac{\tilde{s}}{\sigma_s}]$. From the proof of Proposition 2 above, $\frac{\partial}{\partial \sigma_s} \frac{\tilde{s}}{\sigma_s} < 0$. Since ϕ is the pdf of the standard normal (and hence positive), $\frac{\partial}{\partial \sigma_s} [1 - \Phi(\frac{\tilde{s}}{\sigma_s})] > 0$. The probability of unrest under democracy is falling in transparency. $\square$

Table 1: Transparency and the Hazard of Democratic Collapse

	Cond. Prior Transition	Cond. Num. Transitions	No Prior Transition
Transparency	-0.642** [-1.227,-0.057]	-0.697*** [-1.121,-0.273]	-1.564*** [-2.608,-0.520]
Growth	-0.141*** [-0.208,-0.073]	-0.109*** [-0.165,-0.054]	-1.533*** [-2.475,-0.591]
Transparency × Growth	0.031 [-0.047,0.109]	0.037 [-0.059,0.132]	0.029 [-0.102,0.143]
GDP <i>per capita</i>	-2.089* [-4.323,0.146]	-0.634*** [-1.028,-0.241]	0.172** [0.028,0.317]
Ec. Openness	-0.001 [-0.021,0.019]	-0.103*** [-0.158,-0.048]	0.177** [0.033,0.320]
Parliamentary	2.103*** [0.842,3.364]	0.060*** [0.015,0.105]	-0.965 [-7.695,5.766]
Mixed System	0.691 [-0.585,1.967]	-0.004 [-0.025,0.016]	-0.022 [-0.076,0.032]
		1.959*** [0.846,3.072]	0.946 [-0.208,2.101]
		0.628 [-0.697,1.953]	0.102 [-1.397,1.601]
# of Subjects	88	88	53
# of Failures	19	19	8

Cox proportional hazards regressions of the hazard of democratic collapse. The models depicted in the first two columns, the middle two columns, and the last two columns differ in the manner in which they deal with countries that experience multiple autocratic spells. Those in the first two columns report a conditional gap time model wherein the baseline hazard is separately estimated for regimes that experience a prior transition and for those that did not. Those in the next two columns estimate separate baseline hazards based on the number of prior transitions. Those in the final two columns examine only autocratic spells that did not experience a prior transition. 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 democratic spell.