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A global game of diplomacy

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Abstract

Diplomacy always occurs in the shadow of domestic political competition. We develop a model of top-level diplomatic exchange between an incumbent and a foreign leader, embedded within a global game of regime change, and examine four mechanisms that induce a relationship between diplomatic visits and regime survival. First, the foreign leader chooses to visit incumbents who are *ex ante* more secure in office (a selection effect). Second, because the foreign leader's decision is based partly on private information, the citizens update on the revelation of that information (a learning effect) and are discouraged from mounting a challenge. Third, the foreign leader can bolster the incumbent's strength in office with a transfer of material support (a strengthening effect). The latter two effects are then amplified by the complementarities in the citizens' strategies (a multiplier effect). Contrary to standard global games results, we show that increased precision in the public information transmitted strategically by the foreign power induces a unique equilibrium, as citizens coordinate on the foreign leader's action. Our findings explain why leaders are so eager to receive state visits from major world powers.

Keywords

Diplomacy; diplomatic visits; global game; leader survival; state visits

1. Introduction

Diplomacy always occurs in the shadow of domestic political competition. Existing accounts of diplomatic activity between heads of state look overwhelmingly to international threats and hostilities as causes and consequences of such activity (Druckman and Wallensteen, 2017; Galtung, 1964; Kastner and Saunders, 2012; McManus, 2018; McManus and Yarhi-Milo, 2017; Trager, 2016). Yet despite the frequency of diplomatic exchange—diplomatic visits take up one-third of recent

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US presidents' days in office, by our count[1]—violent interstate conflicts are exceedingly rare events. Either diplomacy is exceptionally effective at deterring interstate conflict, or there are other motives that warrant consideration.

In this paper, we examine the relationship between international diplomacy and domestic political contestation. Above all else, leaders seek to maintain office (Bueno de Mesquita et al., 2003); the primary challenge they face arises not from foreign adversaries but from opponents within their own country.[2] To explain diplomatic interactions among heads of state, the struggle for political survival seems a logical starting point. Our analysis departs from a standard global game of regime change (Carlsson and Van Damme, 1993; Morris and Shin, 2003). Citizens who wish to overthrow their political leadership are incompletely informed as to the incumbent's strength. They receive utility from participating in a successful revolution but face costs for participating in a failed one, and must coordinate in the face of uncertainty as to which outcome will come to pass. Into this context, we introduce a foreign leader as a strategic actor who decides whether to offer diplomatic support to the incumbent, in the form of a diplomatic visit, which may be accompanied by a transfer (or future commitment) of material assistance. Diplomatic support is a costly investment for the foreign power; but if the recipient leader survives in office, he reciprocates the foreign power with a policy concession that more than offsets the cost. Thus the foreign leader, analogously to the citizens, is incentivized to support strong regimes, but to keep a distance from weak ones.

Four mechanisms induce a relationship between diplomatic exchange and regime survival. First, a correlation arises between state visits and leader survival via a *selection* effect, whereby the foreign leader chooses to support incumbents who are sufficiently stable in office. Second, because of this selection process, the show of support (or lack thereof) is revealing of the foreign leader's private assessment of the incumbent's strength, so the citizens update on this new information—a *learning* effect—and are discouraged from challenging the regime. Third, symbolic support may be accompanied by a transfer of material support to the regime, making it more durable in the face of domestic opposition and further driving down the citizens' incentives to rebel (a *strengthening* effect). Finally, the impact of these mechanisms on regime survival is amplified by the complementarities in the citizens' strategies, inducing a *multiplier* effect. We seek to examine how each of these mechanisms operates, independently and interactively, and to draw useful inferences for empirical examination of diplomatic visits and related forms of statecraft.

Our study makes two primary contributions, one formal and one substantive. Formally, the model presented here adds to the rich and growing body of global game models, which have been applied broadly to the study of financial investments (Sakovics and Steiner, 2012), currency crises (Angeletos et al., 2006), party leadership (Dewan and Myatt, 2007), and, most commonly in political science, coups and popular revolutions (Aldama et al., 2019; Boix and Svolik, 2013; Casper and Tyson, 2014; Edmond, 2013; Egorov and Sonin, 2017; Little, 2012; Shadmehr and Bernhardt, 2015; Tyson and Smith, 2018). The particular innovation we offer is the introduction of an endogenous information structure resulting from a strategic signal sent by a third party to the conflict, in the form of a foreign power granting diplomatic support to the incumbent regime. This feature of our model proves centrally important for the determinacy of its predictions. A standard global game result is the existence of multiple equilibria under sufficiently precise public information, as agents can coordinate on either the 'high' or 'low' action of rebelling or abstaining (Shadmehr, 2019). A foreign leader's diplomatic decision functions as a public signal of regime strength to all citizens. Yet, we show that if the foreign leader has very precise information about regime strength, the strategic decision to visit or not induces a unique equilibrium in which the citizens coordinate on the visitor's action. This result follows from the strategic nature of this form of public information, and from the monotonicity of the foreign power's strategy with respect to the state variable. The substantive contribution of our study is to provide a microfounded explanation for a pervasive and puzzling phenomenon in international politics. We know that leaders spend a great deal of time traveling abroad to meet with one another face to face, and we know that these exchanges attract a great deal of public attention, but we have little understanding of why this is the case. Our theory, focused on leaders' fundamental objective of political survival, explains how the high volume of in-person diplomatic activity that we observe is incentive compatible for all parties involved. This framework provides insight into why various forms of material exchange, from arms sales to defense alliances to investment treaties, are accompanied by signing ceremonies, summits, and other forms of fanfare and pageantry. More broadly, it allows for a comparison between overt and covert support, or between material and symbolic support, that one leader may grant to another. A foreign power's public demonstration of support for an incumbent proves to be a source of regime strength on par with foreign aid, weapons transfers, and other material forms of assistance.

2. The puzzle of in-person diplomacy

Casual observation suggests that top-level diplomatic visits among heads of state is both a common and a strategically complex interaction. This phenomenon is puzzling in light of the high opportunity cost of leaders' time; the disparity in policy expertise between leaders and their diplomatic agents; and, particularly in recent years, the ease of direct leader-to-leader communication through technological channels that do not require traveling outside of one's own country. However, to our knowledge, there exists no formal, rationalist analysis of why leaders engage in such interactions with the frequency that they do.

A number of empirical studies have examined the causes and consequences of diplomatic visits, often with only passing reference to the theoretical logic underpinning their conduct (Druckman and Wallensteen, 2017; Ekmekci and Yildirim, 2013; Kastner and Saunders, 2012; Nitsch, 2007). Historical and firsthand accounts of practitioners are generally vague on theoretical mechanisms as well. The Office of the President of Germany states that, in negotiations over certain international concerns, 'it is often only through face-to-face talks between leaders that productive outcomes fair to both sides can be found' (quoted in Nitsch, 2007, p 1798).

Likewise, to convince the Queen to partake in an otherwise distasteful visit with the Romanian dictator in 1978, the British government advised that ‘the importance of imminent aircraft and arms sales to Romania made such hospitality mandatory’ (quoted in Goldstein, 2008, p. 169). The implicit assumption underlying these accounts is that the recipient of a state visit is willing to make some material concession which they would be unwilling to make in the absence of a visit—which, it seems, would require that the recipient leader enjoy some compensatory benefit from the visit itself. Exactly what that benefit is remains an open question.

To explain this phenomenon, we look to the political survival of the recipient leader. Put simply, we propose that the benefit that the recipient leader enjoys from a diplomatic visit is the public observation of the visit, and of the visiting leader’s choice to conduct the visit. Insofar as the visitor has some private information regarding the incumbent’s strength, and the visitor’s subsequent payoff from the visit is conditional on the incumbent’s survival in office, then the occurrence of the visit provides a public signal which enters into the strategic calculus made by the incumbent’s domestic opponents. The incumbent benefits from the visible and credible demonstration of being someone in whom a foreign power is rationally investing diplomatic capital.

Our theoretical model is an extension of a global coordination game of regime change (Carlsson and Van Damme, 1993; Morris and Shin, 2003). This class of games is characterized by a large number of agents independently deciding whether to take an aggressive action to upend a status quo regime. Each agent’s decision is based on her private belief, formed by noisy public and/or private signals, of a fundamental parameter of interest—regime strength—which determines the threshold for the proportion of agents needed to successfully overthrow the regime. Global games have been applied to a broad array of substantive contexts, ranging from investments (Sakovics and Steiner, 2012) and currency crises (Angeletos et al., 2006) to party leadership (Dewan and Myatt, 2007) and political revolution (Aldama et al., 2019; Boix and Svolik, 2013; Casper and Tyson, 2014; Edmond, 2013; Egorov and Sonin, 2017; Little, 2012; Shadmehr and Bernhardt, 2015; Tyson and Smith, 2018). In our model, the global game characterizes the domestic backdrop against which international diplomacy occurs. With this setup, we demonstrate how public displays of support between leaders, with or without any material exchange, can prove highly consequential for an incumbent’s survival in office.

3. Model setup

The players in our model consist of a foreign power, F, and a unit mass of citizens, indexed $i \in [0, 1]$. To clarify terminology, we refer to the domestic leader ruling over this mass of citizens as the incumbent or the regime, in contrast to the foreign leader who can offer diplomatic support to the domestic incumbent. The foreign power’s baseline affinity for the incumbent regime is represented as u. A strictly positive value of u indicates that the foreign power is supportive of the incumbent, or at least prefers the incumbent to his likely replacement or to the instability associated with regime change. F enjoys a payoff of u when the regime stays in power, regardless of F's own action, and his payoff from regime change is normalized to 0.

F must decide whether or not to visit the regime. If F visits and the incumbent stays in power, the incumbent offers a policy concession in exchange for the visit, which provides F with an additional payoff of η. This concession can take the form of a grant of market access to F's exporting firms or investors; an arms purchase; a vote of support in an intergovernmental organization; military basing or refueling rights in the incumbent's territory; or any other concession that the incumbent can offer which advances a policy objective that F hopes to accomplish. Importantly, the delivery of this concession is conditional on the incumbent's remaining in office: if the incumbent is overthrown, F cannot expect the new regime to follow through on its predecessor's commitments.[3]

In addition to losing out on the concession, if the regime is overthrown following a diplomatic visit, F pays a reputational cost of λ. This cost represents the normative sanctioning that F faces for having shown public support to an illegitimate ruler, or punishment that he suffers from his domestic audience for having revealed himself inept at conducting diplomacy and influencing political developments abroad. As one example, consider the US relationship with the Somoza regime in Nicaragua: the USA provided the regime with a steady stream of covert support up until its deposition in 1979, but top-level diplomatic visits were cut off after 1973; while successive US administrations wanted to prop up the Somoza regime, they evidently sought to avoid public demonstrations of support once Somoza's hold on power became tenuous.[4] Alternatively, we can interpret λ as an opportunity cost for conducting the visit, with η representing the value of the policy concession less this opportunity cost.

Each citizen i must decide whether or not to participate in a revolution. Each citizen's payoff for regime change is $\zeta \in \mathbb{R}$. If the status quo is maintained, each citizen's payoff is normalized to 0. In addition, each citizen who participates in a successful revolution receives a benefit δ, representing either selective benefits awarded by the new regime, or the intrinsic utility of participating in social change. Each participant of a failed revolution pays a cost k, the expectation value of retribution from the regime.

The players' payoffs are represented in Table 1.

Table 1. Outcomes and Payoffs.

	StatusQuo	RegimeChange
Foreign Power		
Visit	$u + \eta$	$-\lambda$
No Visit	u	0
Citizen		
Rebel	$-k$	$\zeta + \delta$
Abstain	0	ζ

The conflict technology is as follows. Regime survival depends upon underlying regime strength; any material support, m, offered by the foreign leader; and the proportion of people who challenge the regime. The level of m is taken to be exogenous. Let $\theta \in \mathbb{R}$ represent the inherent regime strength—the ability of the regime to withstand a revolution. Suppose that $\mathcal{R}$ proportion of the citizens rebel against the regime and let $\rho \in \{0, 1\}$ represent the extent to which regime survival depends on the citizens' actions. Absent any material support from F, the regime survives if and only if

$$\rho\mathcal{R} < \theta.$$

If F provides material support m, then the regime survives if and only if

$$\rho\mathcal{R} < \theta + m.$$

If the size of the rebellion overwhelms the regime's strength, then regime change occurs.

Suppose that the regime receives no material support from F. If the regime is very weak ($\theta \leq 0$), then the regime fails regardless of whether or not the citizens rebel. In contrast, if the regime is very strong ($\theta > \rho$), then it can survive even if all the citizens rise up against it. Any citizen who believes that $\theta \leq 0$ has a dominant strategy to rebel, so as to gain the benefit, δ, of having participated in the regime's downfall. Likewise, the belief that $\theta > \rho$ yields a dominant strategy of abstaining, so as to avoid the retribution cost, k. The presence of these extreme cases is typically referred to as two-sided limit dominance, a feature of the game which enables us to restrict attention to threshold strategies without loss of generality.[5] The interesting case occurs between these extremes, where regime change depends upon the ability of citizens to coordinate rebellion against the government.

We adopt a global games approach to understanding the coordination of the citizens. Citizens decide to rebel based upon private and public signals of regime strength. In particular, we assume all citizens and the foreign leader observe a common signal of regime strength, Q. We model the public signal as a normally distributed random variable which has a mean value of θ and variance $\frac{1}{\alpha}$: $Q \sim N(\theta, \frac{1}{\alpha})$. Under such a parameterization it is common to refer to α as the precision of the public signal. We assume a flat prior distribution for θ; hence, by Bayes rule, having seen the public signal Q, all actors share the belief that regime strength is normally distributed with mean Q and variance $\frac{1}{\alpha}$: $\theta | Q \sim N(Q, \frac{1}{\alpha})$.Throughout we let $\Phi(x) = \int_{-\infty}^{x} \frac{1}{\sqrt{2\pi}} e^{-\frac{z^2}{2}} dz$ represent the CDF of a standard normal random variable and let $\phi(x) = \frac{1}{\sqrt{2\pi}} e^{-\frac{x^2}{2}}$ represent the associated probability density.

In addition to the public signal, each citizen receives an independent (but identically distributed) private random signal, Z_i, of regime strength. In particular we assume $Z_i \sim N(\theta, \frac{1}{\beta})$. The foreign leader also receives an independent private signal $Y \sim N(\theta, \frac{1}{\gamma})$. Via Bayes rule, having observed public signal Q and private signal Z, a citizen believes that θ is normally distributed with mean $\mu = \frac{\alpha Q + \beta Z}{\alpha + \beta}$ and variance $\frac{1}{\alpha + \beta}$: $\theta | Z, Q \sim N\left(\frac{\alpha Q + \beta Z}{\alpha + \beta}, \frac{1}{\alpha + \beta}\right)$. For the foreign leader, $\theta | Y, Q \sim N\left(\frac{\alpha Q + \gamma Y}{\alpha + \gamma}, \frac{1}{\alpha + \gamma}\right)$.

To summarize, the sequence of the game is as follows:

1. Citizens and F receive public and private signals, and form beliefs about θ.
2. F decides whether or not to visit.
3. Citizens decide independently whether or not to rebel, with $\mathcal{R}$ representing the proportion who rebel.
4. Absent a visit, regime change (RC) occurs if and only if $\rho\mathcal{R} \geqslant \theta$; following a visit, regime change occurs if and only if $\rho\mathcal{R} \geqslant \theta + m$.

4. Analysis

We focus on threshold strategies and examine Perfect Bayesian equilibria. A strategy profile of (y, z_0, z_v) denotes the following:

- F, the foreign leader, visits if and only if $Y > y$.
- Absent a visit, a citizen rebels if and only if she receives a private signal $Z_i < z_0$.
- Following a visit, she rebels if and only if $Z_i < z_v$.

It is important to note that in equilibrium these thresholds depend on the public signal Q, but to simplify, we suppress that dependence from notation.

If the citizens use a threshold strategy z and the regime's true strength is θ, then the proportion of citizens who see a signal below the threshold, and hence rebel, is

$$R(\theta, z) = Pr(Z < z | \theta) = \Phi(\sqrt{\beta}(z - \theta)).$$

Suppose that following no visit, the citizens use the threshold strategy z_0. The proportion of citizens who rebel is $\Phi(\sqrt{\beta}(z_0 - \theta))$. If $\theta \leq 0$, then the regime is replaced whatever the citizens do. If $\theta > \rho$, then the regime survives independent of citizen actions. The interesting cases occur when $\theta \in (0, \rho]$. Given the Conflict Technology, within this range, the regime is replaced if

$$\theta \leq \rho\Phi(\sqrt{\beta}(z_0 - \theta)). \tag{1}$$

Let $\hat{\theta}_0(z_0)$ be the value of θ that solves equation (1) with equality. If the citizens use the threshold z_0, then $\hat{\theta}_0(z_0)$ is the critical state: the regime survives if θ is above this level, and fails otherwise. Similarly, after a visit, let $\hat{\theta}_v(z_v) \in (-m, \rho - m]$ be the critical state that solves the following expression with equality:

$$\theta + m \leq \rho\Phi(\sqrt{\beta}(z_v - \theta)).$$

Each citizen forms an expectation about the likelihood of regime change from the private and public signals she observes and from the information conveyed in

F's visit decision. By Bayes' rule, having seen private and public signals, Z and Q, a citizen believes that $\theta \sim N(\frac{\alpha Q+\beta Z}{\alpha+\beta}, \frac{1}{\alpha+\beta})$. Then, given that F uses a threshold strategy of visit if and only if $Y > y$, the citizen infers from the occurrence of a visit that F saw a signal $Y > y$, infers from the absence of visit that $Y \leq y$.

Suppose a citizen has a conjecture that, absent a visit, the regime will collapse if and only if $\theta \leq \bar{\theta}_0$. Let $\bar{\theta}_v$ represent the conjectured critical state following a visit. We can then define the citizen's perceived probability of regime change to be

$$P_0(z, y, \bar{\theta}_0) = Pr(\text{RegimeChange}|Z = z, \text{novisit}, \bar{\theta}_0) = Pr(\text{RC}|Z = z, Y \leq y, \bar{\theta}_0)$$

and

$$P_v(z, y, \bar{\theta}_v) = Pr(\text{RegimeChange}|Z = z, \text{visit}, \bar{\theta}_v) = Pr(\text{RC}|Z = z, Y > y, \bar{\theta}_v).$$

If a citizen rebels after no visit, then her expected payoff is $P_0(z, y, \bar{\theta}_0)(\zeta + \delta) + (1 - P_0(z, y, \bar{\theta}_0))(-k)$. If she abstains, then her expected payoff is $\zeta P_0(z, y, \bar{\theta}_0)$. Hence a citizen is indifferent between rebelling and abstaining if $P_0(z, y, \bar{\theta}_0) = \frac{k}{k+\delta}$. Likewise, after a visit, a citizen is indifferent if $P_v(z, y, \bar{\theta}_v) = \frac{k}{k+\delta}$.

The following lemma characterizes citizen beliefs:

Lemma 1. *Given the conjectures about the critical states, $\bar{\theta}_0$ following no visit and $\bar{\theta}_v$ following visit, then a citizen has the following beliefs*:

$$P_0(z, y, \bar{\theta}_0) = \int_{-\infty}^{\bar{\theta}_0} \frac{\sqrt{\alpha+\beta}\,\phi(\sqrt{\alpha+\beta}(\theta - \frac{\alpha Q+\beta z}{\alpha+\beta}))\Phi(\sqrt{\gamma}(y-\theta))}{\Phi(\sqrt{\frac{(\alpha+\beta)\gamma}{\alpha+\beta+\gamma}}(y - \frac{\alpha Q+\beta z}{\alpha+\beta}))} d\theta \tag{2}$$

and

$$P_v(z, y, \bar{\theta}_v) = \int_{-\infty}^{\bar{\theta}_v} \frac{\sqrt{\alpha+\beta}\,\phi(\sqrt{\alpha+\beta}(\theta - \frac{\alpha Q+\beta z}{\alpha+\beta}))\Phi(\sqrt{\gamma}(\theta-y))}{\Phi(\sqrt{\frac{(\alpha+\beta)\gamma}{\alpha+\beta+\gamma}}(\frac{\alpha Q+\beta z}{\alpha+\beta} - y))} d\theta \tag{3}$$

Lemma 2. *For fixed z, $\bar{\theta}_0$ and $\bar{\theta}_v$, as $y \to \infty$,*

$$P_0(z, y, \bar{\theta}_0) \to \Phi\left(\sqrt{\alpha+\beta}\left(\bar{\theta}_0 - \frac{\alpha Q+\beta z}{\alpha+\beta}\right)\right) \text{ and } P_v(z, y, \bar{\theta}_v) \to 0$$

and as $y \to -\infty$,

$$P_0(z, y, \bar{\theta}_0) \to 1 \text{ and } P_v(z, y, \bar{\theta}_v) \to \Phi\left(\sqrt{\alpha+\beta}\left(\bar{\theta}_v - \frac{\alpha Q+\beta z}{\alpha+\beta}\right)\right)$$

The proofs are provided in the appendix. Since $P_0(z, y, \bar{\theta}_0)$ is strictly decreasing in z, there is a unique signal $Z = \bar{z}_0(\bar{\theta}_0)$, which makes a citizen indifferent between rebel and abstain:

$$P_0(\bar{z}_0(\bar{\theta}_0), y, \bar{\theta}_0) = \frac{k}{k + \delta}. \tag{4}$$

The key to characterizing equilibria is that from a conjecture about the critical state $\bar{\theta}_0$ we can find the optimal threshold strategy $\bar{z}_0(\bar{\theta}_0)$ via equation (4); and for any threshold strategy z_0 we can derive the critical state $\hat{\theta}_0(z_0)$ via equation (1). The conjecture $\bar{\theta}_0$ is part of an equilibrium only if $\bar{\theta}_0 = \hat{\theta}_0(\bar{z}_0(\bar{\theta}_0))$. This is to say, the threshold strategy and the critical threshold are consistent with each other via the conflict technology and citizen indifference. Using analogous notation for the visit case, the conjecture $\bar{\theta}_v$ is part of an equilibrium only if $\bar{\theta}_v = \hat{\theta}_v(\bar{z}_v(\bar{\theta}_v))$.

The foreign leader's decision to visit depends upon his expectation of regime change:

$$Pr(\text{RC}|\text{novisit}, Y) = Pr(\theta \leq \bar{\theta}_0|Y) = \Phi(\sqrt{\alpha + \gamma}(\bar{\theta}_0 - \frac{\alpha Q + \gamma Y}{\alpha + \gamma})) \tag{5}$$

and

$$Pr(\text{RC}|\text{visit}, Y) = Pr(\theta \leq \bar{\theta}_v|Y) = \Phi(\sqrt{\alpha + \gamma}(\bar{\theta}_v - \frac{\alpha Q + \gamma Y}{\alpha + \gamma})) \tag{6}$$

F's threshold strategy is thus defined as the signal y that makes F indifferent between visiting and not:

$$Pr(\text{RC}|\text{visit}, Y = y)(\lambda + \eta + u) - \eta = Pr(\text{RC}|\text{novisit}, Y = y)u. \tag{7}$$

F's decision is motivated by two factors. First, there is the beauty-contest motivation common in global games,[6] or F's desire to be on the 'right side of history': F wants to visit incumbents that he believes will survive, but avoid visits to incumbents that he expects to fail. Second, a visit by F reduces the likelihood of regime collapse. In addition to providing material support to the incumbent, a visit provides a public signal to all citizens that F's private information gave him sufficient confidence in the regime's likelihood of survival. F's decision to support the incumbent is both cause and consequence of the incumbent's strength in office.

Given the exposition above, we can directly state our main proposition.

Proposition 1. *A Perfect Bayesian Nash equilibrium is an n-tuple* $(\theta_0^*, \theta_v^*, z_0^*, z_v^*, y^*)$ *that satisfies the following five conditions*:

Conflict Technology y_0

$$\theta_0^* - \rho\Phi(\sqrt{\beta}(z_0^* - \theta_0^*)) = 0 \tag{CT0}$$

Conflict Technology$_v$

$$\theta_v^* + m - \rho\Phi(\sqrt{\beta}(z_v^* - \theta_v^*)) = 0 \tag{CTv}$$

Citizen Indifference$_0$

$$P_0(z_0^*, y^*, \theta_0^*) - \frac{k}{k+\delta} = 0 \tag{CI0}$$

Citizen Indifference$_v$

$$P_v(z_v^*, y^*, \theta_v^*) - \frac{k}{k+\delta} = 0 \tag{CIv}$$

Foreign Indifference

$$\Phi\left(\sqrt{\alpha+\gamma}\left(\theta_v^* - \frac{\alpha Q + \gamma y^*}{\alpha+\gamma}\right)\right)(\lambda+\eta+u) - \eta - \Phi\left(\sqrt{\alpha+\gamma}\left(\theta_0^* - \frac{\alpha Q + \gamma y^*}{\alpha+\gamma}\right)\right)u < 0 \tag{FI}$$

As $\gamma \to 0$, a sufficient condition for a unique equilibrium is that $\alpha < \sqrt{2\pi}\sqrt{\beta}$. As $\gamma \to \infty$, there is a unique equilibrium for any α.

The proof of existence and uniqueness is provided in the appendix.

To focus on the implications of the theory and to differentiate between different mechanisms, our analysis proceeds through examination of a series of limiting cases, considering different combinations of the foreign leader being 'strong' or 'weak' ($m > 0$ or $m = 0$) and being 'informed' or 'ignorant' ($\gamma > 0$ or $\gamma = 0$) and the extent to which citizen coordinate affects outcomes ($\rho = 0$ or $\rho = 1$). These comparisons allow us to isolate the various mechanisms relating diplomatic support to regime survival, and to identify the empirical implications that follow from each one. We begin with a brief overview of these mechanisms.

The first mechanism relating state visits to regime survival is a simple selection mechanism based on public information: the foreign power wants to visit leaders likely to survive, and to avoid visiting leaders likely to fail. This selection effect exists even when the visiting leader is weak and uninformed, and even when the citizens' actions are inconsequential. If the regime is susceptible to rebellion ($\rho = 1$), the game is equivalent to a standard global game of regime change, with the diplomatic exchange occurring orthogonally to the domestic power struggle—despite a naive observation of correlation in the equilibrium outcomes of the two interactions.

The selection effect then gives rise to an additional informational mechanism in the case that the foreign power has private information about regime strength ($\gamma > 0$). Again the foreign leader visits those regimes likely to survive, but since his decision is based on his private information about regime strength, the citizens learn from the foreign leader's diplomatic decision and update their beliefs of regime strength accordingly. This learning effect influences citizens' actions. If citizen actions are consequential, the learning effect is amplified by strategic complementarities, as each citizen's incentive to challenge the regime increases with each other citizen's incentive to do so. This interaction of the visitor's private information with the citizens' strategic coordination opens the possibility for the foreign power to 'bluff,' or to visit some regimes that would otherwise collapse in the counterfactual world without diplomatic visits, because the public signal of strength conveyed by the visit becomes a source of regime strength in itself.

Separate from the learning effect, an uninformed foreign power may still enhance regime survival through a commitment of material support. In the case that the visitor is strong ($m > 0$) but uninformed ($\gamma = 0$), the foreign power will again prefer to support incumbents likely to survive, and the material support will translate directly into an increased likelihood of incumbent survival. This strengthening effect will also be amplified by the citizens' strategic coordination when citizen actions are consequential: each citizen's incentive to rebel is individually depressed by the enhanced regime strength, and depressed even further by the knowledge of each other citizen's decreased likelihood of rebelling.

5. Uninformed visits

We begin with an analysis of limiting cases in which the foreign leader is uninformed.

Corollary 1. (Trivial Case, or Pure Beauty Contest: $m = 0$, $\gamma = 0$ and $\rho = 0$). *If F is weak and ignorant ($m = 0$ and $\gamma = 0$) and citizens' actions are inconsequential ($\rho = 0$), then there is a unique equilibrium in which the regime survives if and only if $\theta > 0 = \theta_0^* = \theta_v^*$. A citizen rebels if she receives a signal $Z < z_0^* = z_v^* = -\frac{\alpha}{\beta}Q - \sqrt{\alpha + \beta}\Phi^{-1}\left(\frac{k}{k+\delta}\right)$. F visits if and only if $\Phi(-\sqrt{\alpha}Q)(\lambda + \eta) - \eta \leq 0$.*

The trivial case is a pure beauty contest: everyone wants to pick the wining side, and neither F's decision to visit nor the citizens' decisions to rebel affect regime survival. The citizens want to rebel when the regime is sufficiently likely to fail, and these decisions are driven entirely by their private signals (Z) and public information (Q). The relative influence of public and private information on the citizens' action depends only on the relative precision of the two signals. F visits only when the public signal of regime strength is sufficiently strong.

Under these assumptions, we would expect to observe an empirical association between diplomatic visits and regime survival, due to the pure selection mechanism based on public information. This correlation arises despite the fact that visits are fully inconsequential for regime survival. However, if an empirical analysis could fully control for public information (Q) regarding regime strength, then visits would not be found to have an independent relationship with leader survival.

Corollary 2. Generic Global Game of Regime Change: $m = 0$, $\gamma = 0$ and $\rho = 1$. *Suppose F is ignorant ($\gamma = 0$) and weak ($m = 0$), but the citizens' actions affect regime survival ($\rho = 1$). If $\alpha < \sqrt{2\pi}\sqrt{\beta}$, then, for all Q, there is a unique Perfect Bayesian equilibrium characterized by the tuple (θ^*, z^*, Q^*), that solves equations CT and CI, $\theta^* = \theta_v^* = \theta_0^*$ and $z^* = z_v^* = z_0^*$:*

Conflict Technology

$$\theta^* = \Phi(\sqrt{\beta}(z^* - \theta^*)) \quad \text{(CT)}$$

Citizen Indifference

$$Pr(RegimeChange) = Pr(\theta \leq \theta^{*}|Z = z^{*}) = \Phi\left(\sqrt{\alpha + \beta}\left(\theta^{*} - \frac{\alpha Q + \beta z^{*}}{\alpha + \beta}\right)\right) = \frac{k}{k + \delta} \tag{CI}$$

F visits if and only if $\Phi(\sqrt{\alpha}(\theta^{*} - Q)) - \frac{\eta}{\lambda + \eta} < 0$

The generic global game model of regime change illustrates the importance of strategic coordination between citizens. In the trivial case above, citizens' decisions were based only on their individual beliefs about θ. A shift in the public information changed citizens' beliefs and hence shifted the critical signal, z^{*}, such that $\frac{dz^{*}}{dQ} = -\frac{\alpha}{\beta}$, but it did not affect the critical threshold θ^{*}. In the global game context, however, an important factor in a citizen's choice is how that citizen believes other citizens will behave. As such, the public information has a disproportionately large impact on regime survival because, in addition to shifting citizens' individual beliefs, it also shifts the critical threshold. In particular,

$$\frac{d\theta^{*}}{dQ} = \frac{\alpha\phi(\Phi^{-1}(\theta^{*}))}{\alpha\phi(\Phi^{-1}(\theta^{*})) - \sqrt{\beta}} < -1$$

While a shift in private information can affect on which side of the threshold z^{*} a given citizen's belief will fall, the private signal has no effect on the determination of that threshold. The public signal not only changes an individual's belief about θ, but also changes her beliefs about *other* citizens' beliefs, and consequently, their actions. Morris and Shin (2003) refer to this latter effect as the publicity multiplier. An increase in Q makes a citizen believe the regime to be stronger, $\frac{dE[\theta|Q,Z]}{dQ} = \frac{\alpha}{\alpha + \beta} \in (0, 1)$, and this perception makes that citizen more reluctant to rebel. Other citizens are then discouraged by the first citizen's unwillingness to rebel: as each citizen anticipates that fewer of her compatriots will take to the street, she is in turn less willing to participate. An increase in Q thus decreases the citizens' critical threshold, and it does so by more than its simple informational content due to the strategic coordination among citizens:

$$\frac{dz^{*}}{dQ} = \frac{\alpha(\sqrt{\beta}\phi(\Phi^{-1}(\theta^{*})) + 1)}{\sqrt{\beta}(\alpha\phi(\Phi^{-1}(\theta^{*})) - \sqrt{\beta})} \in \left(\frac{\alpha(\sqrt{2\pi} + \sqrt{\beta})}{\alpha\sqrt{\beta} - \sqrt{2\pi\beta}}, -\frac{\alpha}{\beta}\right)$$

The statement of Corollary 2 characterized a condition for uniqueness, namely that the (exogenous) public signal not be too precise. It is useful to examine the derivation of this uniqueness condition, as later we contrast it with the endogenous public signal transmitted by the foreign power's visit.

The proof of uniqueness considers the conflict technology (CT) and the citizen indifference (CI) conditions, and for each examines the critical signal as a function of the critical state. The equilibria correspond to the values of the critical state at which these functions intersection. Using a single-crossing argument, the proof proceeds by showing that one of these functions is always steeper than the other. In particular, from CT, we have that $z^*_{CT} = \theta^* + \frac{1}{\sqrt{\beta}}\Phi^{-1}(\theta^*)$, so

$$\left.\frac{dz^*}{d\theta^*}\right|_{CT} = 1 + \frac{1}{\sqrt{\beta}\phi(\Phi^{-1}(\theta^*))}$$

From CI, $z^*_{CI} = \frac{(\alpha+\beta)\theta^* - \alpha Q - \sqrt{\alpha+\beta}\Phi^{-1}\left(\frac{k}{k+\delta}\right)}{\beta}$, so

$$\left.\frac{dz^*}{d\theta^*}\right|_{CI} = \frac{\alpha+\beta}{\beta}$$

Provided $\alpha < \sqrt{2\pi}\sqrt{\beta}$, it follows that $\left.\frac{dz^*}{d\theta^*}\right|_{CI} < \left.\frac{dz^*}{d\theta^*}\right|_{CT}$. Since, as a function of θ^*, z^*_{CT} has a steeper slope than z^*_{CI} (and checking appropriate limits), these functions can cross only once; hence a unique fixed point.

If the public information is too precise, multiple equilibria occur. By way of intuition, suppose that the public information is perfectly precise (and $\theta \in (0,1)$). Everyone knows the true state of the world so there are two equilibria: one in which all citizens rebel and the regime fails, and the other in which no citizens rebel and the regime survives. Without such precise public information, the citizens converge on a unique, common threshold strategy based on the private signals they receive.

5.1. Uninformed visits with material support

Next we examine cases in which a diplomatic visit is made in conjunction with a delivery of material assistance which enhances the incumbent's ability to withstand a domestic challenge. We still assume that the foreign power is uninformed, so his decision is based solely on publicly observable information. We first consider the case where $\rho = 0$, such that the citizens' actions are inconsequential for regime change.

Corollary 3. Material Strength: $m > 0$, $\gamma = 0$ and $\rho = 0$. *If $\gamma = 0$ and $\rho = 0$ then there is a unique equilibrium with critical thresholds $\theta^*_0 = 0$ and $\theta^*_v = -m$. Absent a visit, citizens rebel if and only if*

$$Z < z^*_0 = -\frac{\alpha}{\beta}Q - \frac{\sqrt{\alpha+\beta}}{\beta}\Phi^{-1}\left(\frac{k}{k+\delta}\right)$$

Following a visit, citizens rebel if and only if

$$Z < z^*_v = -m\frac{\alpha+\beta}{\beta} - \frac{\alpha}{\beta}Q - \frac{\sqrt{\alpha+\beta}}{\beta}\Phi^{-1}\left(\frac{k}{k+\delta}\right)$$

The foreign leader visits if and only if

$$\Phi(\sqrt{\alpha}(-m-Q))(\lambda+\eta+u) - \eta - \Phi(\sqrt{\alpha}(-Q))u < 0$$

As in the case of Corollary 1, the actions of the citizens are driven here solely by beauty contest incentives. They want to align their action with the ultimate outcome, but they have no influence over that outcome individually or collectively. The foreign power also faces the beauty contest incentive, but in addition he has the ability to enhance the regime's survival through a grant of material support m. From F's perspective, this support reduces the likelihood of regime change from $\Phi(\sqrt{\alpha}(-Q))$ to $\Phi(\sqrt{\alpha}(-m-Q))$. The critical signal, z_m^*, and critical threshold, θ_v^*, are negatively and linearly related to the level of material strength: $\frac{dz_v^*}{dm} = -\frac{\alpha+\beta}{\beta}$ and $\frac{d\theta_v^*}{dm} = -1$.

Under these assumptions, visits are associated with regime survival via two mechanisms: a selection effect—the foreign leader visits regimes that the public information indicates are likely to survive—and a strengthening effect. Visits and survival should be empirically correlated. However, given appropriate controls for the size of material support (m) and the *ex ante* likelihood of regime change (Q), the assumptions in Corollary 3 predict that we would find no independent association between visits and leader survival in empirical tests.

5.2. Material support and strategic coordination

We now turn to the deterrent effect of material support when $\rho = 1$ and examine how the strategic coordination of the citizens amplifies the impact of that material support.

Corollary 4. *Suppose $\gamma = 0$ and $\rho = 1$. If $\alpha < \sqrt{2\pi}\sqrt{\beta}$, then, for all Q, there is a unique Perfect Bayesian equilibrium characterized by the tuple $(\theta_0^*, \theta_v^*, z_0^*, z_v^*, Q^*)$ that solves the following Conflict Technology and Citizen Indifference Conditions*

$$\theta_0^* = \rho\Phi(\sqrt{\beta}(z_0^* - \theta_0^*)) \text{ and} \theta_v^* + m = \rho\Phi(\sqrt{\beta}(z_v^* - \theta_v^*))$$

$$Pr(RegimeChange|novisit) = Pr(\theta < \theta_0^*|Z = z_0^*)$$
$$= \Phi(\sqrt{\alpha+\beta}(\theta_0^* - \frac{\alpha Q + \beta z_0^*}{\alpha+\beta})) = \frac{k}{k+\delta}$$

$Pr(Regime\ Change|visit) = Pr(\theta < \theta_v^*|Z_v^*) = \Phi(\sqrt{\alpha+\beta}(\theta_v^* - \frac{\alpha Q + \beta z_v^*}{\alpha+\beta})) = \frac{k}{k+\delta}$ and F visits if and only if

$$\Phi(\sqrt{\alpha}(\theta_v^* - Q^*))(\lambda + \eta + u) - \eta < \Phi(\sqrt{\alpha}(\theta_0^* - Q^*))u$$

A grant of material support m directly strengthens the regime by m and indirectly strengthens the regime by deterring rebellion.

$$\frac{d\theta_v^*}{dm} = \frac{\sqrt{\beta}}{\alpha\phi(\Phi^{-1}(\theta_v^* + m)) - \sqrt{\beta}} < -1$$

The amplification of material assistance in this case follows a similar logic to that of the publicity multiplier described above. Citizen i knows that the material support strengthens the regime, which makes her less likely to rebel. Her fellow citizens know that not only has the regime increased in strength, but also the size of any rebellion has shrunk since i and others are less likely to participate.

If an empirical investigation had usable proxy measures of payoffs, material assistance, and *ex ante* expectations of leader survival, then under the assumptions in Corollary 4, the effect of a diplomatic visit would be fully captured by the effect of the material support. However, compared to the assumptions in Corollary 3, where $\rho = 0$, material support should have a larger impact on enhancing regime survival. That is to say, strategic coordination among a regime's opponents amplifies the effect of visibly delivered material support on the regime's survival.

This finding provides a microfoundational explanation for why material exchanges between heads of state are so often accompanied by summits, signing ceremonies, and other forms of fanfare and pageantry. The overt nature of in-person diplomatic visits creates a deterrent effect as citizens coordinate to abstain from a challenge. Beyond the framework of this model, we can also consider the foreign leader's alternative strategy of providing material support without the pomp and ceremony of a state visit. Doing so may insulate the leader from the reputational costs associated with backing an illegitimate or failed regime—as in the case of US-Nicaraguan relations in the 1970s. However, this strategy involves a tradeoff: such covert material support would increase the regime's underlying durability in the face of a challenge, but would have no deterrent effect on the regime opponents contemplating a challenge. Publicizing the delivery of material assistance magnifies its impact.

6. Informed visits

We start by examining the signaling aspect of a state visit absent strategic coordination.

Corollary 5. *If F is informed ($\gamma > 0$), but weak ($m = 0$), and citizen actions are inconsequential ($\rho = 0$), then Perfect Bayesian Equilibria are characterized by the tuple $(\theta_0^*, \theta_v^*, z_0^*, z_v^*, y^*)$, where the critical states are $\theta_v^* = \theta_0^* = 0$; the critical thresholds, z_v^* and v_0^*, solve $P_0(z_0^*, y^*, 0) = \frac{k}{k+\delta}$ and $P_v(z_v^*, y^*, 0) = \frac{k}{k+\delta}$ (equations $CI_0$and CI_v in Proposition 1); and F visits if and only if $Y > y^*$, where*

$$y^* = -\frac{\sqrt{\alpha+\gamma}}{\gamma}\Phi^{-1}\left(\frac{\eta}{\eta+\lambda}\right) - \frac{\alpha}{\gamma}Q$$

The key difference between this scenario and those examined in the previous corollaries is that F's decision to visit now depends upon his private signal Y. In equilibrium, F's threshold signal y^* is low (meaning he is more likely visit) when the regime is publicly thought to be strong (Q is high), when the conditional benefit η is large, and when the reputational cost λ is small.[7]

F's decision to visit provides the citizens with information about regime strength, and the informativeness of the visit is determined by its *ex ante* likelihood. It follows from Lemma 2 that as a visit becomes increasingly unlikely *ex ante*, the actual occurrence of a visit provides an increasingly informative signal of regime strength: when the threshold y^* is high, the occurrence of a visit indicates that the visitor's private signal of regime strength surpassed that high threshold. In contrast, if a visit is highly anticipated (conditions dictate that y^* is low), then the occurrence of a visit provides the citizens with little additional information. However, under conditions of high *ex ante* visit probability, *F*'s choice not to visit indicates that he privately believes the regime to be much weaker than public information would indicate. As such, the lack of a visit can have a substantial impact in shifting citizens' beliefs and encouraging them to participate in a challenge.

The next corollary shows that strategic coordination among the citizens amplifies the informational impact of diplomatic visits.

Corollary 6. *If F is weak and informed and citizen actions affect regime survival ($\rho = 1$), then the Perfect Bayesian Equilibria are characterized by the tuple $(\theta_0^*, \theta_v^*, z_0^*, z_v^*, y^*)$ which solve equations CT_0, CT_v, CI_0, CI_v, and FI in Proposition 1 with $m = 0$.*

A visit publicly signals regime strength, and strategic coordination by the citizens enhances the impact of this information to create a deterrent effect. A visit reduces the likelihood of regime change by more than a simple shift in beliefs would indicate. Much as we saw in the discussion of the publicity multiplier in Corollary 2, the public nature of a visit both shifts the critical state downward and provides the citizens with information that the state is less likely to be below this critical state. A state visit shifts citizen *i*'s beliefs and discourages her from rebellion. Her reticence to protest means that other citizens realize that a rebellion will be smaller than it would have been absent the signal of the visit, and, as a result, they are further deterred.

6.1. Uniqueness

When the foreign leader is informed, the occurrence or absence of a visit functions as a public signal of regime strength, which all citizens incorporate into their individual beliefs. As per the discussion following Corollary 2 (the generic global game), a typical result in global games is that uniqueness of equilibria breaks down with increased precision in exogenous public information. But in our case, perhaps counterintuitively, when *F*'s private signal is very precise, the *endogenous* public information provided by the foreign power's visit induces a unique equilibrium, regardless of the precision in the exogenous public signal *Q*. In particular:

Proposition 2. *As F becomes perfectly informed, $\gamma \to \infty$, there is a unique equilibrium in which F's signal fully coordinates the citizens: $y^* = -m$; the citizens never rebel following a visit, $\theta_v^* = -m$; and the citizens always rebel after no visit, $\theta_0^* = 1$*

The proof is provided in the appendix.

With respect to the public information provided by a visit, there are two competing factors that affect uniqueness of equilibria. Here we provide a heuristic explanation of these factors, with a full analysis deferred to the appendix. As F's precision increases, the citizens gain more public information from either the occurrence or absence of a visit; and as with the generic global game, more precise public information leads to multiple best responses by the citizens. Running counter to this effect is the fact that F's threshold strategy y^* is not chosen exogenously. In particular,

Corollary 7. *In equilibrium, F's threshold strategy strategy,* y^*, *is such that*

$$\mu_y = \frac{\alpha Q + \gamma y^*}{\alpha + \gamma} \in \left[\theta_v^* - \frac{1}{\sqrt{\alpha + \gamma}}\Phi^{-1}\left(\frac{\eta + u}{\lambda + \eta + u}\right), \theta_v^* - \frac{1}{\sqrt{\alpha + \gamma}}\Phi^{-1}\left(\frac{\eta}{\lambda + \eta}\right)\right] \tag{8}$$

and $\theta_v^* \in [-m, 1 - m]$. *As* $\gamma \to \infty$, $y^* \to \theta_v^* \in [-m, 1 - m]$

Corollary 7 describes how F's threshold strategy, y^*, relates to the critical state following a visit, θ_v^*. F's beliefs about the expected value of θ given the message y^* (i.e. μ_y) is in a window around θ_v^*. First, consider the special case of $\eta = \lambda$ and $u = 0$: in this case μ_y is exactly θ_v^*. In the more general case, F's threshold belief is offset from θ_v^* by some amount between $-\frac{1}{\sqrt{\alpha + \gamma}}\Phi^{-1}\left(\frac{\eta + u}{\lambda + \eta + u}\right)$ and $-\frac{1}{\sqrt{\alpha + \gamma}}\Phi^{-1}\left(\frac{\eta}{\lambda + \eta}\right)$. As F's signal becomes precise, this offset becomes small, y^* converges to the critical state and the occurrence or absence of a visit perfectly coordinates the citizens' decisions.

That F's threshold strategy is focused on the critical state ensures that, as F becomes highly informed, even if the citizens have multiple best responses to the signal of a visit, only one of these responses is part of an equilibrium. We start by examining how signal precision affects the uniqueness of citizen responses and then show that the strategic choice of a threshold by an informed F eliminates all but one of the these responses from being equilibrium behavior. Following an analogous approach to the proof of Corollary 2, we characterize conditions for the uniqueness of citizens' responses to state visits for *any* threshold strategy by F. Given the conflict technology and citizen indifference equations (CT_v and CI_v in Proposition 1), we derive the critical signal as an implicit function of the critical state, $z_v(\theta_v)_{CT_v}$ and $z_v(\theta_v)_{CI_v}$. Uniqueness is assured if these functions cross only once, which is satisfied if the slope of $z_v(\theta_v)_{CT_v}$ is greater than the slope of $z_v(\theta_v)_{CI_v}$:

$$\left.\frac{dz_v}{d\theta_v}\right|_{CI_v} = -\frac{\alpha + \beta}{\beta}\frac{\frac{\partial CI_v}{\partial \theta_v}}{\frac{\partial CI_v}{\partial \mu}} < \frac{\sqrt{2\pi} + \sqrt{\beta}}{\sqrt{\beta}} < \left.\frac{dz_v}{d\theta_v}\right|_{CT_v}$$

where $\mu = \frac{\alpha Q + \beta z}{\alpha + \beta}$. The partial derivatives are

$$\frac{\partial CI_v}{\partial \theta_v} = \sqrt{\alpha + \beta}\phi(\sqrt{\alpha + \beta}(\theta_v - \mu))\Phi(\sqrt{\gamma}(\theta_v - y)) > 0$$

and

$$\frac{\partial CI_v}{\partial \mu} = -\sqrt{\alpha+\beta}\phi(\sqrt{\alpha+\beta}(\theta_v-\mu))\Phi(\sqrt{\gamma}(\theta_v-y))$$

$$+\sqrt{\frac{\gamma(\alpha+\beta)}{\alpha+\beta+\gamma}}\phi\left(\sqrt{\frac{(\alpha+\beta)\gamma}{\alpha+\beta+\gamma}}(y-\mu)\right)$$

$$\left(\Phi\left(\sqrt{\alpha+\beta+\gamma}\left(\theta_v-\frac{\alpha Q+\beta z+\gamma y}{\alpha+\beta+\gamma}\right)\right)-\frac{k}{k+\delta}\right)$$

Note that the first term in $\frac{\partial CI_v}{\partial \mu}$ is $-\frac{\partial CI_v}{\partial \theta_v}$, and, when $\gamma = 0$, the latter term in $\frac{\partial CI_v}{\partial \mu}$ equals zero. Hence when $\gamma = 0$, $\frac{dz_v}{d\theta_v}\Big|_{CI_v} = \frac{\alpha+\beta}{\beta}$, and uniqueness requires the same condition as in Corollary 2. Yet when $\gamma > 0$, the latter term in $\frac{\partial CI_v}{\partial \mu}$ is positive, so $\left|\frac{\frac{\partial CI_v}{\partial \theta_v}}{\frac{\partial CI_v}{\partial \mu}}\right| > 1$; this makes the uniqueness condition more demanding in terms of the precision of α than in the generic global game.

The analysis above suggests uniqueness requires a tighter restriction on the precision of public information as F becomes informed. Yet, Proposition 2 shows that as F becomes highly informed there is a unique equilibrium for any α. These seemingly contradictory results need to be rationalized. The key to the explanation is that unlike a standard public signal of regime strength (Q), Corollary 7 shows that signal of a visit is chosen strategically. If the critical threshold y used by F were exogenous, then multiple equilibria would exist unless β were sufficiently large. However, because F selects the critical threshold strategically, certain best responses by the citizens are ruled out as being part of an equilibrium.

From Corollary 7, as F's precision increases, his threshold strategy converges to the critical state θ_v^*. The citizens' equilibrium response to a visit is to not rebel, so all regimes of strength $\theta > -m$ survive following a visit. From Proposition 2 we know that the unique equilibrium has the critical state $\theta_v^* = -m$. While the equilibrium is unique, the citizens' best response to the signal of a visit need not be. By visiting, F signals that $\theta > -m$, and that the regime that will survive absent any rebellion. However, F's visit does not necessarily signal that the regime will survive if the citizens all rebel (if all citizens rebel the regime survives only if $\theta > 1 - m$). The citizens might succeed if enough of them rebel. Hence when α is large, for some Q there is a best response of the citizens to a visit that results in some fraction of the citizens rebelling. The citizens' best response need not be unique. Yet, a strategy for the citizens that includes some portion of them rebelling following a visit cannot be part of an equilibrium. If the citizens played such a response, then regimes above $-m$ would fail, which would mean that $\theta_v^* > -m$. But this would be a contradiction and F would change his threshold strategy and increase y. As F becomes fully informed, the only equilibrium response to a visit is to abstain from rebelling.

For intermediate values of γ, the limits on uniqueness depend on the relative strength of these competing effects. As the precision of F's information grows, the citizens can have multiple best responses to a visit. Counteracting this effect, F's strategic selection of the threshold y ensures that not all best responses by the citizens can be part of an equilibrium.

6.2. Empirical implications

We can now consider the implications of our theoretical findings for empirical analysis. If F has private information about regime strength, then, even after we control for public information and the size of material support, state visits should have an independent impact on regime survival; this follows from the fact that, after partialling out the publicly observable factors, the remaining variation in visits is driven by F's private knowledge, and the corresponding variation in survival is driven by the citizens' response to the revelation of that private information. Further, we should expect that the observed effect of a state visit (or the absence of a visit) will be moderated by the *ex ante* likelihood of a visit occurring.

The following heuristic illustrates the pattern that we anticipate if F is informed. First, suppose we estimate the likelihood of a state visit based on measures of public information, Q, and of the preferences of F and the citizens (u, η and λ, and δ and k). Let $V \in \{0, 1\}$ represent the actual occurrence of a state visit and let $\hat{v}$ represent the predicted likelihood of a visit based on the first stage analysis. Consider a second stage analysis on the likelihood of regime change, $RC = f(\beta_1 V + \beta_2 \hat{v} + \beta_3 \hat{v} V + ...)$, based on a generalized linear model. Under the assumption that $\gamma > 0$, we anticipate $\beta_1 < 0$, $\beta_3 > 0$ and $\beta_1 + \beta_3 \approx 0$. That is to say, visits reduce the likelihood of regime change and they do so most when the visit is least expected. When a visit is widely anticipated ($\hat{v}$ close to 1), visits have less impact on survival. Predicting the sign of β_2 is more difficult as $\hat{v}$ has competing effects. Estimates of $\hat{v}$ contain public information about the likelihood of regime change and F selects to abstain from visits to regimes thought likely to fail ($\beta_2 < 0$). However, the informational signal of regime weakness provided by a non-visit is greatest when visits are most likely ($\beta_2 > 0$). The latter effect becomes stronger as the precision of F's information increases relative to the precision of public information.

7. Discussion

We conclude with an informal discussion of potential extensions of our model, and applications of our formal results to other substantive contexts.

Some natural extensions of our model could involve endogenizing certain parameters which were assumed here to be exogenous. Future work might consider how the foreign leader would optimally set the level of material assistance m. Previous research has examined formally the role of foreign aid on domestic political survival, and the optimal level of aid in an aid-for-policy exchange (Bueno de Mesquita and Smith, 2007, 2009; Licht, 2010); but these accounts have not considered the complementarities in the regime opponents' strategies, or the importance of the publicity of foreign assistance in deterring coordinated challenges against the regime.

Relatedly, in addition to the level of material support, the foreign power might also exert control over the costs of the visit. One could imagine how the reputational cost of a failed visit would be influenced by, say, the effusiveness of the visitor's praise for the incumbent whom he visits—or alternatively, how the opportunity cost of the visit depends on the amount of time spent attending ceremonies and touring around landmarks and monuments. Such a consideration would lend itself to analysis of the tradeoffs the foreign power faces between the various means of rendering the visit a credible signal; that is, by engaging his reputation, or by committing material resources.

Beyond the analysis of diplomatic exchanges, the formal results provided here can be useful for a range of other substantive applications. Within the context of revolution and regime change, the role of our model's foreign power could certainly be filled by other domestic actors. Consider a top-level military official or close political advisor deciding whether to remain loyal to a dictator or to publicly defect in the face of domestic unrest. Citizens would assume such an actor to have an extremely high degree of private knowledge as to the leader's true strength—the condition needed for our uniqueness result in Proposition 2—so that actor's decision could prove decisive in coordinating the citizens' actions on rebelling or abstaining. Importantly, this result would hold regardless of whether or not that actor was contributing any material strength (m) to the regime; all that matters is that the actor be sufficiently well-informed, and that he have an incentive to align his action with the ultimate outcome. A similar result would apply to contexts that are substantively quite different from that analyzed in the present study; for instance, a party insider making an endorsement in an election primary, or a well-informed venture capitalist deciding to sign on to an investment project. More generally, any global game could conceivably be modified to allow for one agent to move before the rest. If that agent has sufficiently precise private information, and her action is publicly observed by the other agents, a unique equilibrium arises in which the first-mover's decision perfectly coordinates the actions of the remaining agents. This finding adds to our understanding of the endogenous information structures in games of coordination under uncertainty.

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Appendix

Proof of lemma 1. By Bayes rule, $\theta|Z, Q \sim N(\frac{\alpha Q + \beta Z}{\alpha + \beta}, \frac{1}{\alpha + \beta})$. Since F's signal, $Y \sim N(\theta, \frac{1}{\gamma})$, $Pr(Y < y|\theta) = \Phi(\sqrt{\gamma}(y - \theta))$.

By Bayes rule, the probability density

$$f(\theta|Y < y, Z, Q) = \frac{\sqrt{\alpha+\beta}\phi(\sqrt{\alpha+\beta}(\theta - \frac{\alpha Q + \beta Z}{\alpha+\beta}))\Phi(\sqrt{\gamma}(y-\theta))}{Pr(Y < y)}$$

and

$$Pr(\theta \leq \bar{\theta}_0 | Y < y, Z, Q) = \int_{-\infty}^{\bar{\theta}_0} f(\theta|Y < y, Z, Q) d\theta$$

The rest of the proof entails calculating $Pr(Y < y)$. To simplify notation let $\mu = \frac{\alpha Q + \beta Z}{\alpha + \beta}$ and $a = \alpha + \beta$. By Bayes rule:

$$I = Pr(Y < y|Q, Z) = \int_{-\infty}^{\infty} \sqrt{a}\phi(\sqrt{a}(\theta - \mu))\Phi(\sqrt{\gamma}(y-\theta))d\theta$$

Next differentiate I by y:

$$I_y = \int_{-\infty}^{\infty} \sqrt{a}\phi(\sqrt{a}(\theta-\mu))\sqrt{\gamma}\phi(\sqrt{\gamma}(y-\theta))d\theta$$

The integrand equals

$$\frac{1}{\sqrt{2\pi}}\frac{1}{\sqrt{2\pi}}\sqrt{a}\sqrt{\gamma}Exp\left(-\frac{1}{2}(a(\theta-\mu)^2 + \gamma(y-\theta)^2)\right)r$$

By completing the square, this intergrand can be written as

$$\frac{1}{\sqrt{2\pi}}\frac{1}{\sqrt{2\pi}}\sqrt{a}\sqrt{\gamma}Exp\left(-\frac{1}{2}\left((a+\gamma)\left(\theta - \frac{a\mu + \gamma y}{a+\gamma}\right)^2 + \frac{a\gamma}{a+\gamma}(y-\mu)^2\right)\right)$$

Hence we can write I_y as

$$I_y = \frac{\sqrt{a\gamma}}{\sqrt{a+\gamma}}\phi\left(\frac{\sqrt{a\gamma}}{\sqrt{a+\gamma}}(y-\mu)\right)\int_{-\infty}^{\infty}\sqrt{a+\gamma}\phi\left(\sqrt{a+\gamma}\left(\theta - \frac{a\mu+\gamma y}{a+\gamma}\right)\right)d\theta$$

The integral component of which is 1. So

$$I_y = \frac{\sqrt{a\gamma}}{\sqrt{a+\gamma}}\phi\left(\frac{\sqrt{a\gamma}}{\sqrt{a+\gamma}}(y-\mu)\right)$$

We now integrate with respect to y so that

$$I = \Phi\left(\frac{\sqrt{a\gamma}}{\sqrt{a+\gamma}}(y-\mu)\right) + C$$

where C is the integration constant. Examining the original form of the integral and comparing limits: as $y \to = -\infty$, $I \to 0$ and as $y \to = \infty$, $I \to 1$. Hence $C = 0$. The case where F visits follows from $Pr(Y \geqslant y) = 1 - Pr(y < Y)$

Proof of lemma 2. Let $J = \sqrt{\alpha+\beta}\phi(\sqrt{\alpha+\beta}(\theta - \frac{\alpha Q+\beta z}{\alpha+\beta}))\Phi(\sqrt{\gamma}(y-\theta))$

$$P_0(z,y,\bar{\theta}_0) = \frac{\int_{-\infty}^{\bar{\theta}_0} J d\theta}{\int_{-\infty}^{\bar{\theta}_0} J d\theta + \int_{\bar{\theta}_0}^{\infty} J d\theta}$$

As $y \to \infty$, the numerator converges to $\Phi(\sqrt{\alpha+\beta}(\theta - \frac{\alpha Q+\beta z}{\alpha+\beta}))$ and the denominator converges to 1. As $y \to -\infty$, then all the probability mass is in the first integral in the denominator, which is also the numerator. Hence as y decreases, $P_0(z,y,\bar{\theta}_0) \to 1$. The arguments for $P_v(z,y,\bar{\theta}_v)$ are analogous.

Proof of existence for Proposition 1. Consider the Conflict Technology equation (CT_v), and define $z_v(\theta_v)_{CT_v} = \theta_v + \frac{1}{\sqrt{\beta}}\Phi^{-1}(\theta_v + m)$ as the function that solves this equation for any $\theta_v \in (-m, 1-m)$. The limits are as follows: as $\theta_v \to -m$ then $z_v(\theta_v)_{CT_v} \to -\infty$, and as $\theta_v \to 1-m$ then $z_v(\theta_v)_{CT_v} \to \infty$. Further, $z_v(\theta_v)_{CT_v}$ is continuous and

$$\left.\frac{\partial z_v(\theta_v)}{\partial \theta_v}\right|_{CT_v} = 1 + \frac{1}{\sqrt{\beta}\phi(\Phi^{-1}(\theta_v + m))} \geqslant 1 + \frac{\sqrt{2\pi}}{\sqrt{\beta}}$$

It is useful to rewrite the Citizen Indifference equation (CI_v) as

$$CI_v = \int_{-\infty}^{\theta_v} \sqrt{\alpha+\beta}\phi(\sqrt{\alpha+\beta}(\theta-\mu))\Phi(\sqrt{\gamma}(\theta-y))d\theta$$
$$- \frac{k}{k+\delta}\Phi\left(\sqrt{\frac{(\alpha+\beta)\gamma}{\alpha+\beta+\gamma}}(\mu - y)\right) = 0,$$

where $\mu = \frac{\alpha Q+\beta z_v}{\alpha+\beta}$. Define $z_v(\theta_v)_{CI_v}$ as the implicit function that solves $CI_v = 0$. $z_v(\theta_v)_{CI_v}$ is continuous in θ_v and finite for $\theta_v \in (-m, 1-m)$.

Given continuity and the limits, by the intermediate value theorem, $z_v(\theta_v)_{CT_v}$ and $z_v(\theta_v)_{CI_v}$ must intersect. Note that $z_v(\theta_v)_{CT_v}$ is independent of Q and y, but $z_v(\theta_v)_{CI_v}$ in decreasing in both Q and y. Let $\tilde{\theta}_v(y)$ be smallest value of $\theta_v \in (-m, 1-m)$ such that $z_v(\theta_v)_{CT_v} = z_v(\theta_v)_{CI_v}$.

We can repeat the same exercise for Conflict Technology equation and Citizen Indifference equations following no visit by F and define $\tilde{\theta}_0(y)$ as the smallest $\theta_0 \in (0,1)$ that solves $z_0(\theta_0)_{CT_0} = z_0(\theta_0)_{CI_0}$.

These critical states, $\tilde{\theta}_0(y)$ and $\tilde{\theta}_v(y)$, are continuous in y. As a final step we show that there exists some critical signal Y that makes F indifferent between visit and no visit. Given the critical states, $\tilde{\theta}_0(y)$ and $\tilde{\theta}_v(y)$, and the signal Y, the difference between F's expected payoff from visit and no visit is

$$\Delta(Y,y) = U_F(\text{visit}|Q,Y,\tilde{\theta}_v(y)) - U_F(\text{novisit}|Q,Y,\tilde{\theta}_0(y))$$

$$= \eta - Pr(\theta \leq \tilde{\theta}_v(y)|Q,Y)(u+\eta+\lambda) + Pr(\theta \leq \tilde{\theta}_0(y)|Q,Y)u$$

$$= \eta - \Phi\left(\sqrt{\alpha + \gamma}\left(\tilde{\theta}_v(y) - \frac{\gamma Y + \alpha Q}{\gamma + \alpha}\right)\right)(u + \eta + \lambda) + \Phi\left(\sqrt{\alpha + \gamma}\left(\tilde{\theta}_0(y) - \frac{\gamma Y + \alpha Q}{\gamma + \alpha}\right)\right)u.$$

$\Delta(Y, y)$ is continuous in both Y and y; as $Y \to -\infty$ then $\Delta(Y, y) \to -\lambda$ and as $Y \to \infty$ then $\Delta(Y, y) \to \eta$. Hence for every y there is a Y such that $\Delta(Y, y) = 0$. Let $\hat{Y}(y)$ be the implicit function that solves $\Delta(Y, y) = 0$. Since $\tilde{\theta}_0(y) \in (0, 1)$ and $\tilde{\theta}_v(y) \in (-m, 1 - m)$, then $\hat{Y}(y)$ is finite for all $y \in (-\infty, \infty)$. Hence there exist some y^* such that $\hat{Y}(y^*) = y^*$. There is a fixed point and so there exists a tuple $(\theta_0^*, \theta_v^*, z_0^*, z_v^*, y^*)$ that satisfies the condition in Proposition 1

Proof of Corollary 7. From equation FI, $p_v(\lambda + \eta + u) - u - p_0(u) = 0$ where $p_v = \Phi(\sqrt{\alpha + \gamma}(\theta_v^* - \mu_y))$ and p_0 represent the probability of regime collapse following a visit and no visit. Since $0 \leq \theta_v^* \leq \theta_0^* \leq 1$, $p_v \leq p_0 \leq 1$. If $p_0 = p_v$ then $p_v = \frac{\eta}{\lambda + \eta}$. If $p_0 = 1$, then $p_v = \frac{\eta + u}{\lambda + \eta + u}$. Hence $\Phi(\sqrt{\alpha + \gamma}(\theta_v^* - \mu_y)) \in [\frac{\eta}{\lambda + \eta}, \frac{\eta + u}{\lambda + \eta + u}]$. Taking the inverse of the normal CDF generates equation 8 and the limits follow directly from this equation.

Uniqueness Having established existence, we turn now to uniqueness and examine the limits on the precision of the public signal (α) for some fixed y. We use the single crossing property discussed in Corollary 2. Following a visit, uniqueness requires that slope of $z_v(\theta_v)_{CT_v}$ is greater than the slope of $z_v(\theta_v)_{CI_v}$:

$$\left.\frac{dz_v}{d\theta_v}\right|_{CI_v} < \frac{\sqrt{2\pi} + \sqrt{\beta}}{\sqrt{\beta}} < \left.\frac{dz_v}{d\theta_v}\right|_{CT_v}$$

To find the slope of $z_v(\theta_v)_{CT_v}$ we utilize results from Owen (1980) on integrals of Gaussian distributions. The partial derivatives of CI_v with respect to y, z_v and θ_v are:

$$\frac{\partial CI_v}{\partial y} = \sqrt{\frac{(\alpha + \beta)\gamma}{\alpha + \beta + \gamma}}\phi\left(\sqrt{\frac{(\alpha + \beta)\gamma}{\alpha + \beta + \gamma}}(\mu - y)\right)$$
$$\left(\frac{k}{k + \delta} - \Phi\left(\sqrt{\alpha + \beta + \gamma}\left(\theta_v - \frac{\alpha Q + \beta z + \gamma y}{\alpha + \beta + \gamma}\right)\right)\right) < 0$$

We can sign this term. From the citizen's indifference, $\frac{k}{k + \delta}$ equals the probability of regime change given a signal $Y > y$. Note that $\Phi\left(\sqrt{\alpha + \beta + \gamma}\left(\theta_v - \frac{\alpha Q + \beta z + \gamma y}{\alpha + \beta + \gamma}\right)\right)$ would be a citizen's belief about regime change if she knew F saw precisely signal y, and that this term is decreasing in y. Since knowing that F saw $Y > y$, $\frac{k}{k + \delta} < \Phi\left(\sqrt{\alpha + \beta + \gamma}\left(\theta_v - \frac{\alpha Q + \beta z + \gamma y}{\alpha + \beta + \gamma}\right)\right)$. Using a similar argument, we will later exploit that $\frac{k}{k + \delta} > \Phi\left(\sqrt{\alpha + \beta + \gamma}\left(\theta_0 - \frac{\alpha Q + \beta z + \gamma y}{\alpha + \beta + \gamma}\right)\right)$

$\frac{\partial CI_v}{\partial z_v} = \frac{\beta}{\alpha+\beta}\frac{\partial CI_v}{\partial \mu}$ where

$$\frac{\partial CI_v}{\partial \mu} = -\sqrt{\alpha+\beta}\phi(\sqrt{\alpha+\beta}(\theta_v-\mu))\Phi(\sqrt{\gamma}(\theta_v-y))$$

$$+\sqrt{\frac{\gamma(\alpha+\beta)}{\alpha+\beta+\gamma}}\phi\left(\sqrt{\frac{(\alpha+\beta)\gamma}{\alpha+\beta+\gamma}}(y-\mu)\right)$$

$$\left(\Phi\left(\sqrt{\alpha+\beta+\gamma}\left(\theta_v-\frac{\alpha Q+\beta z+\gamma y}{\alpha+\beta+\gamma}\right)\right)-\frac{k}{k+\delta}\right)$$

where the latter term is positive, and

$$\frac{\partial CI_v}{\partial \theta_v} = \sqrt{\alpha+\beta}\phi(\sqrt{\alpha+\beta}(\theta_v-\mu))\Phi(\sqrt{\gamma}(\theta_v-y)) > 0$$

The slope of z_v as a function of θ_v derived from CI_v is

$$\left.\frac{dz_v}{d\theta_v}\right|_{CI_v} = -\frac{\alpha+\beta}{\beta}\frac{\frac{\partial CI_v}{\partial \theta_v}}{\frac{\partial CI_v}{\partial \mu}} = \frac{\alpha+\beta}{\beta}\frac{\frac{\partial CI_v}{\partial \theta_v}}{\frac{\partial CI_v}{\partial \theta_v}-x_v}$$

where $x_v = \sqrt{\frac{\gamma(\alpha+\beta)}{\alpha+\beta+\gamma}}\phi\left(\sqrt{\frac{(\alpha+\beta)\gamma}{\alpha+\beta+\gamma}}(y-\mu)\right)\left(\Phi\left(\sqrt{\alpha+\beta+\gamma}\left(\theta_v-\frac{\alpha Q+\beta z+\gamma y}{\alpha+\beta+\gamma}\right)\right)-\frac{k}{k+\delta}\right) > 0$

Single crossing, and hence uniqueness, is guaranteed if

$$\sqrt{2\pi}\sqrt{\beta} > \alpha\frac{\frac{\partial CI_v}{\partial \theta_v}}{\frac{\partial CI_v}{\partial \theta_v}-x_v} \tag{9}$$

When F's signal is very imprecise, x_v is small and the uniqueness condition converges to $\sqrt{2\pi}\sqrt{\beta} > \alpha$.

Now repeat the same analysis following no visit:

$$CI_0 = \int_{-\infty}^{\theta_0}\sqrt{\alpha+\beta}\phi(\sqrt{\alpha+\beta}(\theta-\mu))\Phi(\sqrt{\gamma}(y-\theta))d\theta$$

$$-\frac{k}{k+\delta}\Phi\left(\sqrt{\frac{(\alpha+\beta)\gamma}{\alpha+\beta+\gamma}}(y-\mu)\right) = 0,$$

$$\frac{\partial CI_0}{\partial y} = \sqrt{\frac{(\alpha+\beta)\gamma}{\alpha+\beta+\gamma}}\phi\left(\sqrt{\frac{(\alpha+\beta)\gamma}{\alpha+\beta+\gamma}}(\mu-y)\right)$$

$$\left(-\frac{k}{k+\delta}+\Phi\left(\sqrt{\alpha+\beta+\gamma}\left(\theta_0-\frac{\alpha Q+\beta z+\gamma y}{\alpha+\beta+\gamma}\right)\right)\right) < 0$$

$$\frac{\partial CI_0}{\partial \mu} = -\sqrt{\alpha+\beta}\phi(\sqrt{\alpha+\beta}(\theta_0-\mu))\Phi(\sqrt{\gamma}(y-\theta_0))$$

$$+\sqrt{\frac{\gamma(\alpha+\beta)}{\alpha+\beta+\gamma}}\phi\left(\sqrt{\frac{(\alpha+\beta)\gamma}{\alpha+\beta+\gamma}}(y-\mu)\right)$$

$$\left(-\Phi\left(\sqrt{\alpha+\beta+\gamma}\left(\theta_0-\frac{\alpha Q+\beta z+\gamma y}{\alpha+\beta+\gamma}\right)\right)+\frac{k}{k+\delta}\right)$$

$$\frac{\partial CI_0}{\partial\theta_0}=\sqrt{\alpha+\beta}\phi(\sqrt{\alpha+\beta}(\theta_0-\mu))\Phi(\sqrt{\gamma}(y-\theta_0))>0$$

$$\left.\frac{dz_0}{d\theta_0}\right|_{CI_0}=-\frac{\alpha+\beta}{\beta}\frac{\frac{\partial CI_0}{\partial\theta_0}}{\frac{\partial CI_0}{\partial\mu}}=\frac{\alpha+\beta}{\beta}\frac{\frac{\partial CI_0}{\partial\theta_0}}{\frac{\partial CI_0}{\partial\theta_0}-x_0}$$

where $x_0=\sqrt{\frac{\gamma(\alpha+\beta)}{\alpha+\beta+\gamma}}\phi\left(\sqrt{\frac{(\alpha+\beta)\gamma}{\alpha+\beta+\gamma}}(y-\mu)\right)\left(-\Phi\left(\sqrt{\alpha+\beta+\gamma}\left(\theta_0-\frac{\alpha Q+\beta z+\gamma y}{\alpha+\beta+\gamma}\right)\right)+\frac{k}{k+\delta}\right)>0$

Single crossing, and hence uniqueness, is guaranteed if

$$\sqrt{2\pi}\sqrt{\beta}>\alpha\frac{\frac{\partial CI_0}{\partial\theta_0}}{\frac{\partial CI_0}{\partial\theta_0}-x_0} \tag{10}$$

Consider a reduced game in which F's threshold strategy is exogenously assigned and examine the citizens' responses to the signal visit ($Y>y$) and no visit ($Y\leq y$). Given the arguments above, we can state the following.

Proposition 3. *If y were exogenously assigned, then the citizens' best response to the absence and presence of a visit induce unique z_0 and z_v if α is sufficiently small that inequalities 10 and 9 hold.*

Proof of Proposition 2. F is fully informed. F visits if $\theta>-m$. Upon seeing the visit signal, all citizens abstain so the regime survives if and only if $\theta>-m$. If F does not visit, then all citizens rebel and the regime fails if $\theta\leq 1$. Clearly this is an equilibrium. Next we show that it is unique.

Suppose there is a pair of critical states, θ_v^* and θ_0^* and suppose that $-m\neq\theta_v^*$. Knowing the value of θ, F visits if and only if $\theta>\theta_v^*$. Upon seeing a visit, the citizens infer that the regime will survive and so abstain. Given that no one protests following a visit, provided that $\theta>-m$, the regime survives if F visits. Hence F visits if $\theta>-m$ and so the regime survives if $\theta>-m$. But this contradicts $-m\neq\theta_v^*$. Hence in equilibrium $\theta_v^*=-m$, which implies that $y^*=-m$ and $\theta_0^*=1$.

Notes

1. This number refers to the total number of days spent visiting foreign leaders abroad, plus total number of days hosting visits from foreign leaders in the USA, divided by total days in office. See Malis and Smith (2019).

2. Since 1875, only 2% (72 out of 3241) of national leaders have been removed by foreign countries or by actors with foreign support (Goemans et al., 2009).
3. More precisely, we can think of η as the difference in the expectation value of the concession that F will receive under the incumbent versus the potential successor regime. This accounts for the possibility that F may be uncertain as to likelihood of obtaining the concession under either the current or future regime, but simply perceives a higher probability of obtaining it under the current regime.
4. See Malis and Smith (2019) for a more thorough discussion of the reputational cost of backing failed regimes.
5. See Bueno de Mesquita (2010) and Morris and Shin (2003) for a discussion.
6. See Camerer (1997) for a discussion of the beauty-contest motivation.
7. Also note the relationship between y^* and signal precision: $\frac{dy^*}{d\gamma} = \frac{\alpha}{\gamma^2} Q + \frac{2\alpha + \gamma}{2\gamma^2 \sqrt{\alpha + \gamma}} \Phi^{-1}\left(\frac{\eta}{\eta + \lambda}\right)$

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