Media Freedom in the Shadow of a Coup

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Abstract

Popular protests and palace coups are the two domestic threats to dictators. We show that free media, which informs citizens about their rulers, is a double-edged sword that alleviates one threat, but exacerbates the other. Informed citizens may protest against a ruler, but they may also protest to restore her after a palace coup. We develop a model in which citizens engage in a regime-change global game, and media freedom is a ruler's instrument for Bayesian persuasion, used to manage the competing risks of coups and protests. A coup switches the status quo from being in the ruler's favor to being against her. This introduces convexities in the ruler's Bayesian persuasion problem, causing her to benefit from an informed citizenry. Rulers tolerate freer press when citizens are pessimistic about them, or coups signal information about them to citizens.

Keywords: authoritarian politics, media freedom, protest, coup, global games, Bayesian persuasion, signaling

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1 Introduction

Modern autocratic regimes consider free flow of information a major threat to their stability. Numerous studies have analyzed their use of censorship or sophisticated manipulation of the media (King, Pan and Roberts, 2013, 2014; Guriev and Treisman, 2019; Chen and Yang, 2019). For regimes that routinely jail or murder their opponents, would it not be natural to prevent the media from disseminating all negative news about the regime? If not, is it true that media freedom is an anathema to dictators, who tolerate it only because of the efficiency costs of censorship (Egorov, Guriev and Sonin, 2009; Lorentzen, 2013)?

In this paper, we argue that, under certain circumstances, reducing censorship serves an important role for dictators by protecting them against palace coups, even if less censorship increases the risk of a popular revolt. In the past seven decades, elite coups have been the most frequent reason for a non-democratic leader's departure (Svolik, 2009, 2012). Dorsch and Maarek (2018) calculated that 75% of irregular power transitions in autocracies, barring foreign interventions, are results of *coup d'états*. Allowing citizens to get additional, potentially negative information about herself, the dictator risks losing power as a result of protests that are more likely than under total censorship. However, the increased likelihood of counter-protest in favor of the deposed leader offers a layer of protection from a coup by the elite. Thus, the leader faces a trade off with respect to the extent of informational freedom.

In October 1964, Nikita Khrushchev, the powerful leader of the Soviet Union, was displaced in a palace coup led by a group of his lieutenants in the party hierarchy, much less known to the people - not surprisingly in the country with zero media freedom. The Soviet people learned about the coup after the power transition was completed, Khrushchev's allies were sidelined, and the palace guards replaced (Taubman, 2003, p.9–17). In contrast, in August 1991, the anti-reformist military coup that removed Mikhail Gorbachev, the last Soviet leader, failed. The partial media freedom that Gorbachev achieved by gradually dismantling the airtight Soviet censorship over the previous five years allowed citizens to form an opinion about his qualities relative to that of his immediate subordinates (Taubman, 2017, p.246–249).[1] In Section 2 we provide additional details and facts about the protective role of partial media freedom.

[1] "Coup reversals," in which mass protests helped the incumbents to regain full control, is by no means exceptional: post World War II, they happened, e.g., in France in 1961, Spain in 1981, Russia in 1993, Venezuela in 2002, and Turkey in 2016.

Two observations underlie our argument for why media freedom provides a layer of protection for rulers against palace coups. First, the incumbent leader wants a popular protest to follow a coup, but does not want a popular protest if there is no coup. Thus, when choosing how much information to provide, the leader must take account of its effects on the likelihood of both an initial protest against her and a counter-protest in the event of a coup by the elites. Second, citizens' acquiescence has inertia: protesting is costly. Thus, there is an inherent asymmetry between information that favors inaction and information that favors action. Once information favoring inaction is sufficiently strong, strengthening it further has little influence on citizens' behavior. By contrast, a stronger information favoring action always has a substantial effect: it keeps compelling some citizens to act, thereby raising the likelihood of a successful protest. These two countervailing forces generate the contrast in the leader's choice of media freedom in the presence and absence of a coup threat.

If the leader's subordinates do not have any informational advantage over ordinary citizens (i.e., they have the same prior beliefs about the incumbent's type), then the officer's coup attempt has no effect on citizens' beliefs. Thus, citizens' decision to protest depends on their costs and prior beliefs about the ruler. If citizens are pessimistic about the incumbent, then a counter-protest is less likely to materialize and a coup is more likely to succeed. By contrast, if citizens are optimistic about the incumbent, then they are likely to come to her aid if a coup is attempted. Thus, if the initial belief about the ruler is pessimistic and she faces an imminent threat from the officer, then she has stronger incentives to "gamble for resurrection" by allowing a degree of media freedom: positive information has the potential to improve citizens' beliefs about the ruler, quashing the officer's ambitions.

When subordinates have private information about the incumbent's type, citizens make inferences about the quality of the ruler from the very fact that she is dismissed in a coup. In this case, coup attempts occur with a positive probability even when citizens are initially optimistic about the incumbent's type. The difference is a result of the fact that the elites have a stronger incentive to attempt a coup against a bad ruler than a good one. Thus, a coup attempt conveys bad information about the ruler and makes citizens less inclined to counter-protest. As a result, in equilibrium, the informed officer always mounts a coup against a bad ruler, but also "bluffs" by sometimes deposing a good ruler. Again, to mitigate the likelihood of a coup, the ruler must allow a greater degree of media freedom, even when citizens are optimistic about her type. The fact that citizens infer the ruler's

type from her subordinates' actions against her makes the incumbent more vulnerable.

Our paper combines insights from regime change global games (Morris and Shin, 1998, 2001) and Bayesian Persuasion (Kamenica and Gentzkow, 2011). A growing literature takes a global game approach to analyze coordination problems in regime change settings (Angeletos, Hellwig and Pavan, 2007; De Mesquita, 2010; Boix and Svolik, 2013; Edmond, 2013; Casper and Tyson, 2014; Egorov and Sonin, 2018; Chen, Lu and Suen, 2016; Rundlett and Svolik, 2014; Barbera and Jackson, 2020; Tyson and Smith, 2018). Although coordination considerations tend to generate multiple equilibria, the global game approach introduces small correlated asymmetric information that selects the risk-dominant equilibrium of the complete information game (Carlsson and Van Damme, 1993; Morris and Shin, 1998, 2001). Applications in revolution settings often place uncertainty on the regime's strength—the minimum fraction of citizens required to overturn the status quo. We follow Persson and Tabellini (2009) by placing uncertainty on the costs of protest, which allows us to sufficiently disentangle the coordination and information design aspects.

The Bayesian persuasion literature studies the problem of an information designer, who can commit to an information disclosure policy in order to induce a receiver to a desirable action (Kamenica and Gentzkow, 2011). This framework has been applied to study elections and media freedom in autocracies (Gehlbach and Sonin, 2014; Gehlbach and Simpser, 2015; Gentzkow, Shapiro and Stone, 2015; Luo and Rozenas, 2018).[2] Although we restrict our attention to a signal structure in which bad news is censored with some probability, in our model this is without loss of generality (see Section 5). Furthermore, our key insight remains valid for any information design: the threat of a palace coup induces convexities in the leader's expected payoff as a function of citizens' prior beliefs about her type. Thus, increasing the informativeness of the citizens' signal can be beneficial for the ruler.

Recent literature investigates information design in multi-player models under a variety of assumptions (Bergemann and Morris, 2016, 2019). Goldstein and Huang (2016) and Inostroza and Pavan (2018) study information design in regime-change global games. In these papers, the designer chooses information about the state, in which the players receive their private information in the subsequent global game, focusing on the worst equilibrium for the designer (adversarial equilibrium). In contrast, in our paper the information designer

[2]See Besley and Prat (2006) for an early model of censorship and Prat (2015) for a survey of models of the media.

(the ruler) chooses information policy about a state (the ruler's type) that is uncorrelated with the state about which players subsequently receive private information (costs). As a result, the global games approach suffices to select a unique equilibrium in our environment.[3]

Our paper contributes to the formal work on intra-elite power struggles in autocracies (De Mesquita Bruce et al., 2003; Acemoglu and Robinson, 2006; Gandhi and Przeworski, 2006, 2007; Kudamatsu and Besley, 2008). Recent contributions have focused on the civilian control of the military (Svolik, 2008, 2012; Acemoglu, Ticchi and Vindigni, 2010) and information content of protests for conspiring officers (Egorov and Sonin, 2011; Casper and Tyson, 2014).

By adapting Padró i Miquel (2007) "politics of fear" to elite infighting, Hollyer, Rosendorff and Vreeland (2019) Hollyer, Rosendorf, and Vreeland (2018) consider a complete information Stackelberg game played by a ruler and an elite challenger. By assumption, higher "transparency" increases the probability that the regime collapses, but with a larger marginal effect when the challenger overthrows the leader. The ruler allows transparency to destabilize the regime: because a destabilized regime is less likely to survive infighting, transparency may deter an overthrow attempt by the elite challenger. In contrast, we present a Bayesian persuasion model in which the leader's choice of media freedom determines the probability with which citizens will learn her type, ahead of a coordination game in which they must decide whether to overthrow the ruler themselves or restore her to power following a coup. Thus, in our model, an unpopular leader allows media freedom in the hope of improving citizens' beliefs about her type, which can simultaneously improve stability in the absence of a coup and mobilize citizens if a coup occurs.

Finally, there are important reasons why dictators might allow partial media freedom even in the absence of a coup threat. In Egorov, Guriev and Sonin (2009), a resource-poor dictator allows media freedom as he is concerned with providing his bureaucrats with proper incentives. Lorentzen (2013, 2014) considers similar efficiency-protests trade off in models of strategic protest restrictions and censorship. In Shadmehr and Bernhardt (2015), the state does not censor modestly bad news to prevent citizens from making inferences from

[3]That the citizens' game always has an equilibrium in which no one revolts may give the impression that we also have to focus on the adversarial equilibrium. However, this is the result of assuming non-negative costs, which preclude lower dominance region in the global game. If we allow costs to be sufficiently negative, and interpret these negative "costs" as expressive payoffs that citizens get from protesting, this no-revolution equilibrium disappears. Then, we will have a unique equilibrium following any information design of the ruler—see footnote 5.

the absence of news that the news could have been far worse. These models do not allow for a double-edged threat of public protests, both for and against the incumbent.

The rest of the paper is organized as follows. In Section 2 we discuss the stylized facts about the role that media freedom plays as a countercoup measure. Section 3 presents the model, Section 4 establishes the relationship between media freedom and popular protests in the absence of a coup threat, Section 5 introduces the threat of coups, and Section 6 discusses the setting in which citizens infer information from the fact that the leader was overthrown. Section 8 concludes.

2 Media Freedom as a Survival Tool

In this Section, we discuss the stylized facts about media freedom and dictatorships. The main applied insights of our theory work beyond media freedom. In the model, the decision to make media free is akin to any kind of experiment that the dictator sets up to have the population informed about her type. The decision to launch a high-profile infrastructure project, or a prominent foreign policy initiative, or even launching a intrastate war are examples of such experiments.

We start by observing that a higher level of media freedom is a deterrent to successful coups. We use the data about coup attempts collected in Bjørnskov and Rode (2019), building upon an earlier data set in Cheibub, Gandhi and Vreeland (2010); the data range from 1950 to 2018 for 174 countries. The after-coup protests are recorded in Powell and Thyne (2011) data set; media Freedom variables are from the Variety of Democracy (V-dem) dataset and Freedom House.

In Figure 1, Panel (a) depicts the change in the hazard rate for high and low media freedom levels separately. Media freedom variable is aggregated as the median media freedom in the time interval prior to the coup attempt. The media freedom variable is split into three levels: low level of media freedom consists of the 1st decile observations, high of the 10th decile. Panel (b) demonstrates that higher levels of media freedom are associated with lower hazard probabilities of coups.

Among the episodes of leaders strategically using media freedom, *beforehand*, to deter an internal coup, the August 1991 coup in Russia stands out as particularly telling. By 1991, media were not entirely free – it required many steps to remove the censorship

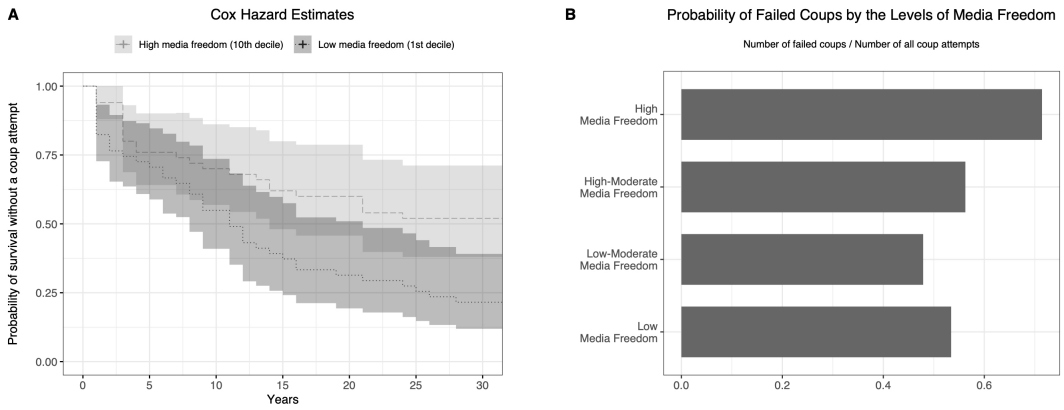

Figure 1: Panel A: Cox hazard estimates of the regime survival with a successful coup for low (red line) and high (blue line) media freedom regimes. Panel B: The probability of a failed coup for different degrees of media freedom.

structure, which in Soviet times included both prepublication approval and a system of *ex post* punishments for editors and journalists. Under the old Soviet system, the one that was firmly in place during the 1964 anti-Khrushchev coup, the citizens have less chances to have an informed opinion about the quality of their leaders and their lieutenants.

In contrast with 1964, the August 1991 military coup led by the country's first vice-president, prime-minister, and the parliament speaker, took place under the new system of relaxed control over media. Although the plotters immediately imposed curfew and media censorship, in the first evening of the plot, August 19, more 100,000 citizens gathered near a government building on the bank of the Moskva-river (Taubman, 2017, p.611). The crowd protected the leaders of the opposition; the arrival of hundreds of thousands more people next day sealed the coup fate. McNair (1994) concludes that "by a combination of administrative incompetence and popular resistance, fueled by the availability of independent sources of information, the coup failed".

Importantly, the Soviet leader Mikhail Gorbachev recognized the role of free media well before the coup attempt against him; in 1985-1990, he was pushing forward greater liberalization of the media (Methvin, 1987). In early December 1990, the Foreign Minister Eduard Shevardnadze, a major ally of Gorbachev, abruptly resigned, citing the emerging threat of an anti-liberal dictatorship. Two weeks later, Gorbachev's aide George Shakhnazarov pronounced that "public debate and *glasnost* [freedom of speech and media freedom] in the USSR would prevent the imposition of a conservative dictatorship on the country" (McNair, 1994).

In 1993, another coup led by the next Russian vice-president and a group of parlia-

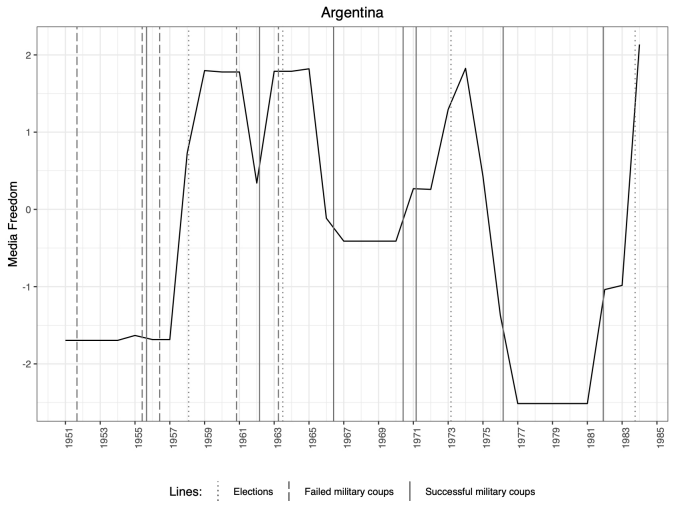

Figure 2: Coups, failed coups, elections, and media freedom in Argentina, 1950-1985.

mentary leaders threatened the rule of reformist President Boris Yeltsin. On October 3, a 10-15,000 person mob disarmed policemen in the center of Moscow, storming government buildings and TV stations (Treisman, 2011, p.53-54). The military vacillated on the use of force, perhaps waiting to see which side was more likely to prevail. Late in the night the liberal vice-prime minister Yegor Gaidar used a TV broadcast to gather thousands of Muscovites to protect government buildings. The demonstration of public support swayed the military leadership and the coup was over, with a loss of more 200 lives, by the end of the next day. Again, importantly for our story, the public has been forming its opinion about President Yeltsin and his opponents under a regime of complete media freedom.

The 20$^{\text{th}}$-century history of Argentina offers a number of episodes that fit well with our theory. Figure 2 demonstrates that in 1950-1985 the coups were a more frequent threat to the incumbents, than regular elections. We plot the level of media freedom against this background to show that there were episodes with an increase in media freedom right before a military coup. Anecdotal evidence confirms that at least some of the motivation behind these episodes was to deter the threat of a military coup.

On June 15, 1955, Juan Peron, Argentina's authoritarian leader since 1946, was speaking before a crowd of tens of thousands supporters. As he spoke, Navy fighter jets dropped bombs into the crowded square, killing more than 300, as part of an anti-Peron military plot. The plot was crushed, yet in less than a month Peron has suddenly loosened his grip over Argentinian media by allowing the opposition to use national radio. Page (1983, p.

313) observes "For the first time since Peron became president, the nation's airwaves carried voices of dissent." Peron would not survive the next military coup, yet his strategy has all the important elements of "gambling for resurrection": facing an increased threat of a coup, he opened the media up, betting that the additional information it provides would allow him to persuade people to support him in the case of a coup. In fact, the Peron's ouster in a couple of months did spark mass protests of his working-class supporters; still, they were insufficient for an immediate restoration.

During the *Revolución Argentina*, the sequence of junta regimes that ruled over the country in 1966-1973, the initial period, when the junta has enjoyed a relatively wide political support, was characterized by tight restrictions the new regime put on media (Lewis, 2001). On June 8, 1971, with economic situation getting worse and the guerilla opposition growing, a military coup overthrew the regime of General Juan Ongania, who was replaced by General Roberto Levingston. On November 29, the *New York Times* reported that "President Levingston promptly lifted the restrictions on magazines and declared that there would be absolute freedom of expression." One reason of such a gamble in a shadow of a next coup was the need of the new incumbent to introduce himself to the public. The strategic move has not saved the Levingston's regime: in March 1971, he was replaced in another internal coup.

The usage of "strategic experimentation" to maintain hold on power was not confined to media freedom. In April 1982, facing the brewing economic crisis and sinking popularity of the military government, the newly installed junta leader, General Leopoldo Galtieri, launched an invasion on Falklands Island, which in turn prompted a war with Great Britain. The immediate effect was a surge of support for the government; yet, it led to the Galtieri fall once the short war was decisively lost (Lewis, 2001). This corresponds to the negative outcome of the experiment a vulnerable dictator launches in our model.

The Falklands war is not a unique Bayesian experiment to boost the autocrat's popularity. There is a significant literature that links critical decisions by authoritarian leaders to launch interstate wars to their desire to prevent a military coup. In Belkin and Schofer (2005), the threat of the coup diminishes as the war can be used to amplify the preexisting military fragmentation. In Goemans (2008), the war allows the leader to repress the would-be plotters. In Levy (1988) and Mansfield and Snyder (1995), the presence of the external enemy bolsters the support for the regime. Our theory provides an alternative, informational foundation for the decision to launch an interstate war when there is a threat

of a coup: launching a war is a Bayesian experiment that, if successful, reduces the threat of the coup by increasing the probability of a counterprotest.

Summing up, the stylized facts about the relationship between the dictator's willingness to experiment, be it lifting censorship or launching an interstate war are as follows. The leader experiments when she is unpopular, essentially gambling on the successful outcome of the experiment. A successful outcome provides a layer of protection as the would-be coup organizers become less certain in their success. An increase of a coup threat would typically be a period of economic difficulties and rising social tensions. A political leader that has military consolidated around him (Hugo Chavez after defeating the 2002 coup) does not need to send an additional signal of his popularity to people, and thus cracks down on media. Nicolas Maduro, Chavez's successor as Venezuelan president, relied almost exclusively on military support: not surprisingly, the subjugation of the press was completed during his first term in office. A political leader who lost military support (Juan Peron in 1952, Gorbachev in 1991) or has not yet consolidated it (Roberto Livingston in 1971), and is thus threatened by a coup, is more likely to choose a certain positive degree of media freedom *ex ante*, have less of these incentives they do not need to experiment with their popularity to stay in power.

3 Model

In this Section, we introduce our model and discuss our technical assumptions.

3.1 Setup

There is a ruler, an officer, and a continuum 1 of citizens. The ruler is one of two possible types, good (g) and bad (b). Under the common prior, the ruler is bad with probability $p \in (0, 1)$. Citizens want a good ruler to stay in power and want a bad ruler to be removed.

The game proceeds as follows. The ruler chooses the level of media freedom $m \in [0, 1]$ before knowing her type. The ruler's type is privately realized, and the (non-strategic) media generates a public report about the ruler's type consistent with the level of media freedom. In particular, if the ruler is the good type, then the media always accurately reports it. However, if the ruler is bad, then the media reports that the ruler is bad with probability m and reports that the ruler is good with probability $1 - m$. Thus, the media reports bad news about the ruler with probability m, and censors it with probability $1-m$. Formally, the media transmits

one of two messages, $M \in \{G, B\}$, with a probability that depends on the ruler's type, $\{g, b\}$:

$$\Pr(G|g) = 1, \quad \Pr(G|b) = m.$$

Next, the officer observes the media's report and decides whether to attempt a coup (C) against the ruler or not (N). If the officer attempts a coup, then the citizens decide whether to protest against the coup. If the protest succeeds, then the ruler is restored; if it fails or there is no protest, then the coup succeeds. If the officer does not attempt a coup, then the citizens decide whether to protest against the regime. If the protest succeeds, then both the ruler and the officer are removed from power and the ruler is replaced by an opponent of the opposite type. We begin by focusing on the case in which the officer has no private information about the ruler's type. We then use the results as an intermediate step in the general case in which the officer has private information about the ruler and his decision to attempt a coup can signal this information to the citizens.

The ruler's payoff is 1 if she retains office and 0 if she is removed. If the officer mounts a successful coup, then his payoff is α. If he does not mount a coup against a ruler of type $i \in \{g, b\}$ and the ruler retains power, then the officer's payoff is β_i. If the officer mounts a failed coup or is removed from power by the citizens' protest against the regime, then his payoff is 0. We focus on the natural case in which $\alpha > \beta_g > \beta_b > 0$. The officer's payoff is highest if he successfully deposes the ruler, but if he decides to remain loyal and the ruler retains power, then his payoff is higher under a good ruler than a bad one.

The essential feature of the strategic interaction that we study is that citizens' incentives to protest depend on their beliefs about the ruler and on the status quo (i.e., whether the power is held by the ruler or the officer). Following a coup, citizens have an incentive to protest if they believe that the original ruler was good, whereas they do not have an incentive to protest if they believe that she was bad. By contrast, if there is no coup, then citizens have an incentive to protest if they believe that the ruler is bad, whereas they do not if they believe that she is good.

We model the strategic interactions between citizens as a coordination game with private costs. Citizens simultaneously decide whether to protest against the *status quo* (either the current ruler or the officer). In both cases, the strength of the *status quo* is reflected in a commonly known parameter $\theta \in (0, 1)$. If the measure of protesters is sufficiently large, $n > \theta$, then the status quo is overturned; otherwise, it is maintained. A coup changes the *status quo*, but does not fundamentally alter the structure of citizens' protest game.

	Outcome	
	$n > \theta$	$n \leq \theta$
Protest	$(1+\delta)\ u_r - c_i$	$u_o - c_i$
No protest	u_r	u_o

	Outcome	
	$n > \theta$	$n \leq \theta$
Protest	$(1+\delta)\ (-u_r) - c_i$	$u_r - c_i$
No protest	$-u_r$	u_r

Figure 3: Left Panel: Citizens' game following the coup. Right Panel: Citizens' game following no coup. Parameters: u_o is the payoff under the officer and u_r, with $r \in \{b, g\}$, is the payoff under the original ruler. $c_i \geq 0$ is citizen i's private costs from protesting against the status quo. $\delta > 0$ captures that a citizen who participates in the protest will receive the payoff from the outcome with a higher intensity.

The left panel of Figure 3 presents citizens' protest game following a coup, while the right panel presents the protest game if no coup occurs. A citizen's payoff depends on the type of the final ruler and on the citizen's protest decision. The payoff of a citizen who chooses not to protest is simply the type of the ultimate ruler. If the officer is left in charge, then a citizen's payoff is u_o. If the original ruler retains power, then such a citizen's payoff is u_r, where $r \in \{g, b\}$ represents the original ruler's type. By contrast, if citizens replace the ruler in the absence of a coup, then the replacement's type is opposite that of the ruler and a non-participating citizen's payoff is $-u_r$. We maintain the simplifying assumptions that $u_g = u > 0$, $u_o = 0$, and $u_b = -u$, although our results go through for any $u_g > u_o > u_b$.

The payoff of a protester is different from that of a non-protester in two ways. First, citizens have correlated private costs of protesting against the *status quo*. Specifically, we assume $c_i = \bar{c} + \rho\nu_i$, with $\bar{c}$ and ν_i's being independent, $\bar{c} \sim G$, and $\nu_i \sim$ i.i.d. F with full support on $\mathbb{R}_+$. Parameter $\bar{c}$ is the common component of the cost, while ρ parameterizes the *noise*. When $\rho = 0$, agent i has no uncertainty about others' costs. To simplify the analysis, we assume that $G = U[0, 1]$. Second, if the protest succeeds, then protesting citizens receive the payoff from the replacement of the *status quo* with a higher intensity. That is, a protest participant's payoff from the final ruler's type is multiplied by $1 + \delta$, where $\delta > 0$. Thus, a citizen who participates in a protest that leaves a good ruler in charge experiences a "warm glow" or "pleasure in agency" (Wood, 2003), whereas the same citizen experiences regret if a bad ruler is left in charge.[4]

[4] Wood (2003), based on a large body of literature and her extensive field work in El Salvador, developed the notion of "pleasure in agency" to capture the selective psychological rewards that a citizen obtains from participating in a movement that succeeds. Similar motives for protest activities have been documented in various places, e.g., in Eastern Europe by Petersen (2001) and in Syria by Pearlman (2018) who calls it "joy

We impose two restrictions on the model parameters to streamline our analysis. Our first assumption requires that the upper bound of the common value component of the protest costs ($\overline{c} \sim U[0,1]$) is sufficiently large relative to the gains of participating in a successful protest.

Assumption 1 *(Upper limit dominance)* $\delta\ u < 1$.

When $\overline{c}$ is at its maximum of 1, the costs of all citizens are above 1 for any positive noise, no matter how small. Thus, Assumption 1 implies that as the noise vanishes ($\rho \to 0$), when $\overline{c} = 1$, citizens have a dominant strategy not to protest. At the same time, Assumption 1 does not imply that citizens have a dominant strategy to protest when $\overline{c} = 0$. For example, even if the protest has no cost, after a coup attempt, citizens do not want to contribute to bringing back a bad ruler and they will choose not to protest if their beliefs about the ruler are sufficiently pessimistic.

Our second assumption requires that the officer's rent, β_g, from being part of the incumbent's inner circle is sufficiently high that he does not attempt a coup against a good ruler. As we see later (inequality (4)), Assumption 2 states this required restriction on the parameter space.

Assumption 2 *The officer does not attempt a coup if the ruler is known to be good:* $\beta_g/\alpha > 1 - G((1-\theta)\delta u)$.

Relaxing these parametric restrictions complicates the analysis without adding substantive insights.

3.2 Discussion

Before moving to the analysis, we discuss some of our modeling choices in more detail.

Information. In our model, the ruler selects the level of media freedom before learning her type. The assumption that the rule does not know her type unless letting media to

of agency." Pleasure in agency motives fit within the dominant sociological theories of social movements spurred by Tilly's influential book, *From Mobilization to Revolution* (Tilly, 1978), in which individuals take into account the costs, benefits, and likelihood of success when deciding whether to protest. They contrast with expressive motives, which fit within Gurrian theories of revolution (Gurr, 1971) that claim citizens use revolution to pursue a cathartic release of their grievances—see Morris and Shadmehr (2018) for a discussion.

report something (even if censored) is justified by the fact that the relevant information is not about the leader *per se*, but rather about the match between the leader and the current circumstances and citizens feelings. So, what the leader does not know is the people's perception of her quality. With this interpretation, the media reports information that helps the public evaluate the *match* between the ruler's preferences and its own.

The second observation is that if the ruler privately knows her type, then there exists a pooling equilibrium with complete media freedom, supported by a standard "belief unraveling" argument. In particular, suppose that citizens believe that if the ruler does not allow complete media freedom, then she must be bad. Obviously, the good type will allow complete media freedom, which will reveal that she is good, ensuring that citizens do not protest against her and support her in the event of a coup. In contrast, we will see that if a ruler is believed to be bad, then she will certainly be removed in a coup supported by the citizens. Thus, if the bad ruler restricts media freedom at all, then citizens will infer that she is a bad type with certainty, and she will be removed from power. But if she *does not* restrict media freedom, then she will be revealed to be bad by the media, and she again will be removed via a palace coup. Thus, the bad type can do no better than allowing complete media freedom, thereby losing power in a coup, and the good ruler can do no better than complete media freedom, which allows her to retain power for certain.

In Section 7 we explore a variant of our model in which the ruler observes a noisy private signal of her type before setting media freedom. Under the conditions we establish, when the ruler's only threat is from popular protest, the ruler allows no media freedom in equilibrium, regardless of her private signal realization. However, when the ruler is also threatened by a palace coup, she allows complete media freedom, regardless of her signal realization.

Coup Timing. In our analysis, the officer decides whether to mount a coup after citizens obtain additional information about the ruler's type. Thus, by allowing a degree of media freedom, a vulnerable leader has an opportunity to improve the public's perception of her type in order to deter a palace coup. Essentially, what the leader chooses is the level of state propaganda: citizens receive a truncated signal about the state of the world. While there is a potential role for media once a coup has occurred, perhaps in facilitating coordination among the deposed ruler's supporters, it is unlikely that information revealed in the media immediately after a coup will have a significant effect on *public opinion* about the ruler.

Since the media cannot affect public opinion after a coup, the mechanism that we propose is most relevant before a coup is attempted.

Opposition Structure and the Status Quo. We make two assumptions about the opposition and the status quo. First, we assume that if no coup occurs, then a sufficiently large protest replaces the ruler with an opponent of the opposite type. If no coup is attempted, citizens must decide whether to support the opposition by protesting against the current ruler; if the protest succeeds, then the ruler is replaced by a member of the opposition. Because the replacement is drawn from the opposition, we posit that his type is negatively correlated with the ruler's. Indeed, it is precisely those who are of the opposite type from the current ruler who have the most to gain from replacing her, and consequently they have the strongest incentive to join the opposition in the first place. We exploit this logic to make the simplifying assumption that the opponent is *always* of the opposite type from the ruler, but our analysis can be extended to allow for imperfect negative correlation.

Second, we assume that if a coup occurs, then a sufficiently large protest restores the original ruler to power. This assumption is a consequence of a fundamental observation about a coup: it profoundly affects both the status quo, and the citizens' "outside options" for leadership. Before the coup, the status quo is the entrenched leader and there may be a significant opposition group contesting her power. After a coup, the only viable alternative to the military is the former leader, who still may have some supporters in key institutions of the state. Protesting in favor of an opposition group after a coup is a futile (if not deadly) effort. The only reason that protesting for the previous ruler may be viable is the very fact that she previously controlled the state and may have some remaining support or control within its apparatus.

4 Media Freedom and Popular Protests

The two coordination games among citizens, presented in Figure 3, can be concisely rewritten as a single game. Because each citizen is infinitesimal, she takes the probability of protest success as exogenous and her strategic decision depends only on the difference in row payoffs. Thus, the second row in Figure 3 can be subtracted from the first. Defining $\hat{u}_r \equiv \delta\ u_r \cdot\ (\mathbf{1}\{\text{Coup}\} - \mathbf{1}\{\text{No Coup}\})$ allows us to represent citizens' coordination game as in Figure 4. Now, "Protest" means "either protest to restore the ruler after a coup or

protest against the ruler": if a citizen protests to restore the ruler after a coup, she would not protest against the ruler if there were no coup.

		outcome	
		$n > \theta$	$n \leq \theta$
Citizen i	Protest	$\hat{u}_r - c_i$	$-c_i$
	No Protest	0	0

Figure 4: Modified Protest Game: $\hat{u}_r = \delta\ u_r \cdot\ (\mathbf{1}\{\text{Coup}\} - \mathbf{1}\{\text{No Coup}\})$.

Consider the case in which a coup attempt has been made, so that $\hat{u}_r = \delta u_r$. If citizen i is certain that the ruler is bad, then she has a dominant strategy not to protest. If citizen i is certain that the ruler is good, then her decision depends on her private cost of protest c_i as well as her belief about the likelihood of success P_i, so that she protests if and only if $P_i\ \delta\ u > c_i$. Of course, citizens may be uncertain about the ruler's type. They use the available information (the prior, the media's report, and the officer's action) to form a posterior about whether the ruler is good or bad. From that posterior, they calculate the expectation of $E[u_r]$:

$$E[u_r] = \Pr(\text{ruler is good})\ u + \Pr(\text{ruler is bad})\ (-u). \tag{1}$$

Thus, citizen i protests if and only if $P_i\ \delta\ E[u_r] > c_i$.

Regardless of $\hat{u}_r$, if a citizen expects that no one else will protest, then she also does not protest. Thus, there is always an equilibrium in which no citizen revolts.[5] As in De Mesquita (2010) and Shadmehr and Bernhardt (2011), we focus on the equilibria in symmetric cutoff strategies in which protests can succeed with a positive probability, namely equilibria in which a citizen protests if and only if her cost is below some threshold $c^* \geq 0$.

Assumption 1 guarantees that following a coup, even if citizens are sure that the previous ruler is good, the realization of the cost fundamental might be sufficiently high so that the coup succeeds. The same condition ensures that if the officer decides not to attempt a coup, then the ruler maintains power with a positive probability, even if citizens are sure that she is bad. Thus, there is no belief that citizens could hold about the ruler's type under which either the officer's coup fails for certain or a protest against the ruler succeeds for certain.

[5]This is because the game has one-sided limit dominance, which can be ruled out if we assume that $\bar{c}$ can be sufficiently negative. Persson and Tabellini (2009) assumed that $\bar{c}$ has full support on $\mathbb{R}$, implying that c_i is sometimes not a cost, but an expressive benefit of protesting that a citizen obtains from protesting independent of the outcome.

In essence, the regime is sufficiently stable that even a ruler who is known to be bad may survive a popular protest; however, it is sufficiently unstable that a ruler who is known to be good may not survive a coup.

Proposition 1 *In the limit when the noise vanishes ($\rho \to 0$), the status quo collapses if and only if*

$$\bar{c} < (1-\theta)\ E[\hat{u}_r],$$

where the expectation is conditioned on all the information available to citizens.

Intuitively, the status quo collapses if citizens' cost fundamental is lower than a threshold value. This threshold decreases in the strength of the status quo, θ, and increases in a citizen's (updated) expectation about the net payoff of overturning the status quo, $E[\hat{u}_r]$. Thus, as citizens become more optimistic about the alternative to the status quo, the status quo is more likely to collapse. For example, if a coup occurred, then as citizens become more optimistic about the previous ruler ($E[u_r]$ increases), the coup is less likely to succeed.

To ease exposition, let $\lambda \equiv (1-\theta)\delta u$. With this notation, if citizens believe that the ruler is bad with probability p' in the protest stage, then the probability that the ruler is restored following an attempted coup is

$$R(p') \equiv G((1-\theta)\delta E[u_r]) = G((1-\theta)\delta(p'(-u) + (1-p')(u))) = G(\lambda(1-2p')), \qquad (2)$$

where we recall that $G(\cdot)$ is the uniform prior of the cost fundamental $\bar{c}$. Now, the probability that the regime survives a popular protest in the absence of a coup is

$$\begin{aligned} S(p') &\equiv 1 - G((1-\theta)\delta E[-u_r]) \\ &= 1 - G(\lambda(2p'-1)) \end{aligned}$$

Before analyzing the full game, we first study the ruler's choice of media freedom assuming that the only threat to the regime comes from a popular protest (i.e., there is no possibility of a coup). This benchmark provides a counterfactual that allows us to isolate how the threat of a coup affects media freedom.

At the beginning of the protest stage, every citizen holds the same belief about the ruler. Because the media always reports good news when the ruler is good, if the citizens observe a bad message from the media, they infer that the ruler is bad, $p_B = 1$, and the regime survives

with probability $S(1)$. Because the good media report is sometimes issued in the bad state, the good report improves citizens' beliefs about the ruler, but it does not convince citizens that the ruler is good for certain. In particular, citizens' beliefs are derived from Bayes' rule,

$$p_G = \frac{p(1-m)}{1-p+p(1-m)} = \frac{p(1-m)}{1-pm}.$$

Following a good report, the regime survives with probability $S(p_G)$. Thus, the ruler chooses m to maximize the probability of regime survival,

$$\max_{m\in[0,1]} pmS(1) + (1-pm)S(p_G). \tag{3}$$

First, consider $p \leq 1/2$. Because $p_G \leq p \leq 1/2$, we have $S(p_G) = 1$. Thus, the ruler's objective function simplifies to $1 - pm\lambda$. Obviously, the ruler strictly prefers to have all bad news censored, $m^* = 0$. Next, consider $p > 1/2$. In this case, small levels of media freedom induce $p_G > 1/2$, while large levels of media freedom induce $p_G < 1/2$; in particular,

$$p_G > \frac{1}{2} \Leftrightarrow m < \frac{2p-1}{p}.$$

Substituting $S(\cdot)$ and $G(\cdot)$, we find the following expression for the ruler's objective function,

$$\begin{aligned} 1 - pm\lambda \quad & \text{if } m > \frac{2p-1}{p} \\ 1 - \lambda(2p-1) \quad & \text{if } m \leq \frac{2p-1}{p}. \end{aligned}$$

Note that the ruler's objective is decreasing in media freedom when m is greater than $(2p-1)/p$ and is constant when m is weakly less than $(2p-1)/p$. Thus, any $m^* \leq (2p-1)/p$, including $m^* = 0$, is optimal. We have the following proposition.

Proposition 2 *In a benchmark model in which there is no threat of a coup, if $p \leq 1/2$, then the dictator allows no media freedom ($m^* = 0$). If $p > 1/2$, then any $m^* \in [0, (2p-1)/p]$ is optimal.*

Proposition 2 has a natural intuition. Observe that the ruler's payoff in the absence of media freedom, given by

$$S(p) = 1 - G(\lambda(2p-1)) = \begin{cases} 1 & \text{if } p \leq \frac{1}{2} \\ 1 - \lambda(2p-1) & \text{if } p \geq \frac{1}{2}, \end{cases}$$

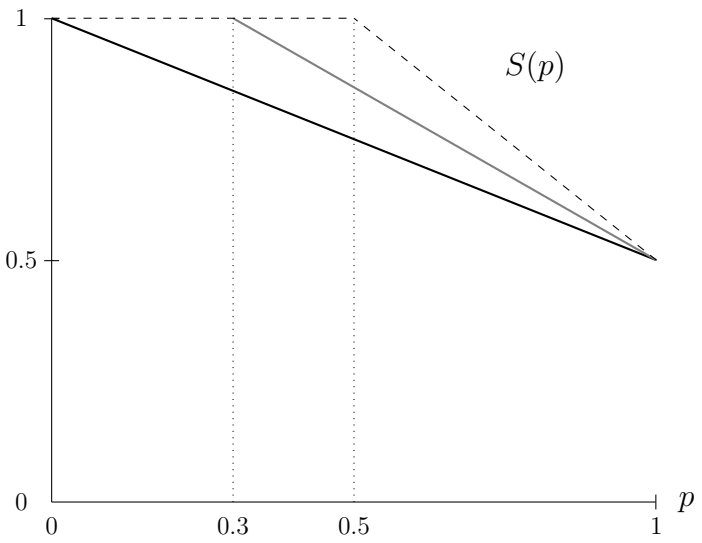

Figure 5: Illustration of Proposition 2. The dashed curve represents $S(p)$, the ruler's payoff with no media freedom. The solid black line represents the ruler's payoff from allowing complete media freedom. The solid gray line represents the ruler's payoff from allowing partial media freedom; specifically, is the ruler's payoff from selecting a level of media freedom that generates $p_G = 0.3$. Note that if $p_G = 0.3$, then $p \geq 0.3$. Parameters: $\lambda = 1/2$.

is weakly concave in p. Thus, the ruler weakly prefers $S(p)$ to the convex combination $pmS(1) + (1 - pm)S(p_G)$ that she obtains with media freedom m, as illustrated in Figure 5.[6]

The concavity of $S(p)$ is linked both to the fundamental strategic forces and to the substantive meaning of Assumption 1. First, if pessimism about the original ruler is low, $p \leq 1/2$, then citizens have no reason to protest and the regime always survives (this holds independently of Assumption 1). In this case, the ruler does not benefit from further reductions in citizens' pessimism. By contrast, if citizens are more pessimistic about the ruler, $p > 1/2$, then the probability of survival is decreasing and linear in citizens' pessimism and Assumption 1 guarantees that the probability of survival does not reach 0, even at the maximum pessimism, $p = 1$. Thus, when pessimism is low, $p \leq 1/2$, further reductions in pessimism are not beneficial; however, when pessimism is high, $p > 1/2$, increases in pessimism are costly, resulting in a concave $S(\cdot)$.

More broadly, the asymmetry between high and low levels of pessimism is connected to the idea that any *status quo* is difficult to overturn in a protest game. If citizens are optimistic about the ruler, then they have no reason to overturn that status quo; however,

[6]The multiplicity of solutions arising for $p > 1/2$ is driven by the linearity of $S(p)$ for $p > 1/2$, which implies that the ruler is indifferent between $S(p)$ and the convex combination $mpS(1) + (1 - mp)S(p_G)$, provided $p_G > 1/2$.

even if citizens are sure that the ruler is bad, there is a chance that she will remain in power (Assumption 1). Thus, the "easy" action for citizens—not protesting—is also the one that the ruler would like them to choose. This situation is reversed following a coup: the ruler wants citizens to overturn the new *status quo* and restore her to power. To that end, the ruler will want to provide information about herself, as we see in the next section.

5 Media Freedom Under the Threat of a Coup

We now consider the ruler's media freedom choice in the full game. To analyze this question, we first derive the officer's optimal strategy.

Officer's Decision. The officer has a direct benefit from carrying out a coup against the ruler, but his decision also depends on the likelihood that his coup attempt will succeed and on the likelihood that he (and the ruler) will be removed from power by the citizens in the absence of a coup. Thus, our model allows for the possibility of a preemptive coup, whose purpose is to reduce the probability of a regime collapse: the officer is interested in getting in power himself, but he might also be launching a coup to avoid losing his privileges once the dictator is removed.

The officer has no private information about the ruler's type and, therefore, his decision to attempt a coup has no effect on citizens' belief about the ruler.[7] Let p' be citizens' posterior belief that the ruler is bad after observing the media report. This belief can take three possible values: $p' = 0$ (media revealed the ruler to be good), $p' = 1$ (media revealed the ruler to be bad), and $p' = p$ (media revealed no new information). From Equations (2) and (3), the officer attempts a coup if and only if $\alpha(1-R(p')) > (p'\beta_b+(1-p')\beta_g)S(p')$, which is equivalent to

$$\frac{1-R(p')}{S(p')} = \frac{1-G(\lambda(1-2p'))}{1-G(\lambda(2p'-1))} > p'\gamma_b + (1-p')\gamma_g, \tag{4}$$

where $\gamma_i \equiv \beta_i/\alpha < 1$ for $i \in \{b, g\}$. Assumption 2 implies (1) if citizens are sure that the ruler is good, $p' = 0$, then the likelihood of a subsequent protest in support of the ruler is sufficient to deter a coup, and (2) if citizens are sure that the ruler is bad, $p' = 1$, then the

[7] We relax this assumption in Section 6.

officer always attempts a coup. In particular,

$$\frac{1-R(0)}{S(0)} = 1 - G(\lambda) < \gamma_g$$
$$\frac{1-R(1)}{S(1)} = \frac{1}{1-G(\lambda)} > \frac{1}{\gamma_g} > 1 > \gamma_b.$$

The ratio on the left hand side of Equation (4) is strictly increasing in p'. When the ruler is more likely to be bad, she is less likely to be restored by the citizens in the event of a coup, which implies that the numerator is increasing in p'. Simultaneously, the regime is less likely to survive a popular protest, and hence, the denominator is decreasing in p'. Meanwhile, the right hand side of (4) is a weakly decreasing linear function. As the officer's belief about the ruler becomes worse, his expected rent from being part of the regime $p'\beta_b+(1-p')\beta_b$ decreases. Together, these observations imply that the officer's incentive to attempt a coup becomes stronger as the belief about the ruler becomes worse. Thus, there exists a unique threshold belief at which the officer's best response switches from no coup to attempting a coup.

Proposition 3 *In equilibrium, the officer attempts a coup if and only if* $p' > P(\lambda, \gamma_g, \gamma_b)$, *where*

$$P(\lambda, \gamma_g, \gamma_b) \equiv \frac{1}{2} - \frac{1 - A(\gamma_g, \gamma_b)}{2\lambda + \gamma_g - \gamma_b} \quad \textit{and} \quad A(\gamma_g, \gamma_b) \equiv \frac{\gamma_g + \gamma_b}{2}.$$

In the absence of a coup attempt, the regime survives when citizens are optimistic about the ruler. In particular, Equation (4) shows that when citizens believe that the ruler is bad with a probability less than or equal to $P(\lambda, \gamma_g, \gamma_b)$, the regime is sure to survive in the absence of a coup. This result together with Proposition 3 allows us to identify the incentives that drive the officer's decision. When $p' \leq P(\lambda, \gamma_g, \gamma_b)$, citizens believe, upon observing the media report, that the incumbent is likely to be good. Consequently, they would not protest against the regime if there is no coup, and they will respond to a coup attempt with a counter-protest, restoring the original ruler. Thus, the officer prefers to collect his payoff of being part of the regime without mounting a coup, which is doomed to fail. In the middle region, $P(\lambda, \gamma_g, \gamma_b) < p' < \frac{1}{2}$, the officer's behavior is a "power grab" against a stable ruler. That is, citizens are sufficiently confident that the incumbent is good that they would never protest against her directly; however, if there is a coup, they are also unlikely to protest against it. Thus, a coup is likely to succeed, and the officer prefers to make an attempt. In the high region, $p' > \frac{1}{2}$, the officer anticipates a low probability of the

current regime's survival and no counter-protest if he mounts a coup. Both of these factors contribute to the officer's decision to take power: if he does not act, he is likely to lose his position with the unpopular leader; if he acts, there will be no counter-protest as people expect an improvement relative to the *status quo*.

The previous observations imply that the ruler's payoff as a function of the citizens' posterior belief has the following form,

$$U(p') = \begin{cases} 1 & \text{if } p' \leq P(\lambda, \gamma_g, \gamma_b) \\ \lambda(1-2p') & \text{if } P(\lambda, \gamma_g, \gamma_b) < p' < \frac{1}{2}. \\ 0 & \text{if } p' \geq \frac{1}{2}. \end{cases}$$

$U(p')$ is equal to 1 below $P(\lambda, \gamma_g, \gamma_b)$, has a downward jump at $P(\lambda, \gamma_g, \gamma_b)$, is decreasing and linear between $P(\lambda, \gamma_g, \gamma_b)$ and $1/2$. Furthermore, $U(\cdot)$ hits 0 at $p' = 1/2$, and remains there as p' increases further (see Figure 6).

Media Freedom. Obviously, if $p \leq P(\lambda, \gamma_g, \gamma_b)$, then the ruler allows no media freedom, $m^* = 0$. In this case, the officer is sufficiently worried about a counter-protest that he does not attempt a coup and the citizens are sufficiently optimistic about the ruler they do not protest against her, delivering the best possible outcome for the ruler. Allowing a positive level of media freedom exposes the ruler to a risk that the media reports a bad message (with probability $mp > 0$), which triggers a successful coup.

To determine the optimal degree of media freedom for $p > P(\lambda, \gamma_g, \gamma_b)$, we apply an argument from Kamenica and Gentzkow (2011). In our model, the ruler selects m, the probability that the media truthfully reveals that the ruler is a bad type. Suppose instead that we allow the ruler to select *any* reporting strategy for the media, without restricting attention to a particular parametric class. In particular, suppose that the ruler can design a set of messages M and a pair of reporting rules $\{\pi(m|g), \pi(m|b)\}$ for $m \in M$, that specify the probability of each possible message conditional on the ruler's underlying type, and, as in our main model, the media's reporting policy is observed by citizens along with the message. Kamenica and Gentzkow (2011) show that the ruler's maximized payoff can be found by forming the concave envelope of her payoff function and evaluating it at the prior belief. Furthermore, an optimal reporting policy induces only posterior beliefs at which the payoff function coincides with its concave envelope. To find the posterior beliefs that are induced by the optimal signal for a specific prior, one confines attention to such posterior

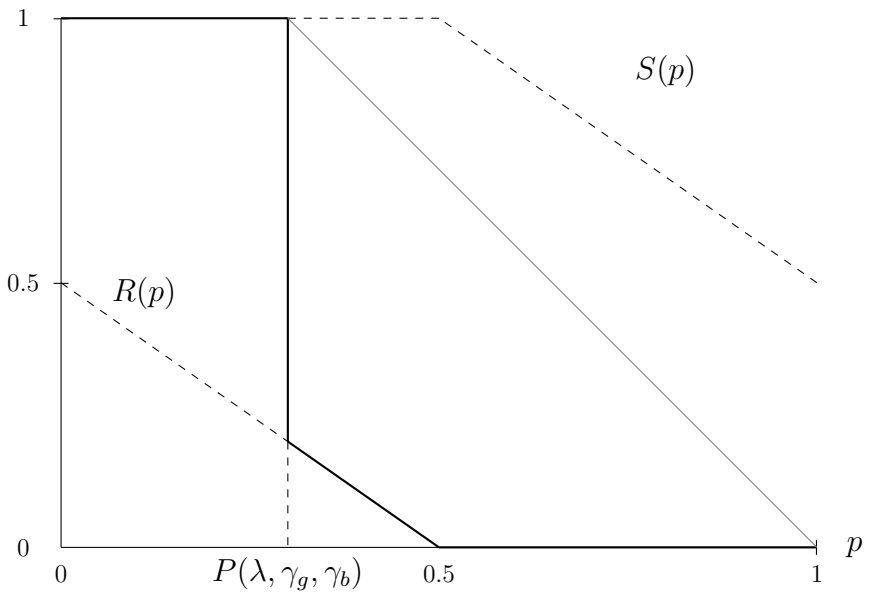

Figure 6: Illustration of Proposition 4. The black curve represents the ruler's payoff with no media freedom. The gray curve represents the concave envelope of the ruler's payoff, over the region $p > P(\lambda, \gamma_g, \gamma_b)$. It also represents the ruler's payoff from choosing the optimal level of media freedom for $p > P(\lambda, \gamma_g, \gamma_b)$. For $p \leq P(\lambda, \gamma_g, \gamma_b)$, the ruler's payoff function and its concave envelope coincide. Parameters: $\lambda = 1/2$, $P(\lambda, \gamma) = 3/10$.

beliefs, and then searches for a set of posterior beliefs with two properties: (1) a particular convex combination of these posterior beliefs is equal to the prior belief, (2) the same convex combination of the ruler's payoffs is equal to the maximized ruler payoff. Any such subset is the support of the distribution of posterior beliefs for an optimal reporting policy.

An elementary argument establishes that the concave envelope of $U(p')$ is given by the following function,

$$\overline{U}(p') = \begin{cases} 1 & \text{if } p' \leq P(\lambda, \gamma_g, \gamma_b) \\ \frac{1-p'}{1-P(\lambda,\gamma_g,\gamma_b)} & \text{if } P(\lambda, \gamma_g, \gamma_b) < p' < 1, \end{cases}$$

as depicted in Figure 6. Thus, for $p' > P(\lambda, \gamma_g, \gamma_b)$, the concave envelope of $U(\cdot)$ lies strictly above $U(\cdot)$, i.e. $U(p') < \overline{U}(p')$.[8] By implication, the ruler strictly prefers to reveal some information about her type, and thus she allows some degree of media freedom. Furthermore, as illustrated in Figure 6, $U(p') = \overline{U}(p')$ for $p' \in \{[0, P(\lambda, \gamma_g, \gamma_b)] \cup 1\}$, and

[8]Note that for $p' < P(\lambda, \gamma_g, \gamma_b)$ we have $U(p') = \overline{U}(p')$; that is, the ruler's payoff function and its concave envelope coincide. By implication, when the ruler can use *any* reporting strategy, reporting no information is weakly optimal. Furthermore, as argued above, when the ruler's choice of reporting policy is confined to censoring bad news with a specified probability, a strategy of reporting no information (always replacing bad news with good news) is *strictly* optimal.

the posterior beliefs induced by the optimal media policy must be in this set. Figure 6 also reveals that, for $p > P(\lambda, \gamma_g, \gamma_b)$ the ruler's maximized payoff can only be achieved as a convex combination of $U(1) = 0$ and $U(P(\lambda, \gamma_g, \gamma_b))$. Thus, for $p > P(\lambda, \gamma_g, \gamma_b)$, the optimal reporting policy induces only posterior beliefs $p' \in \{P(\lambda, \gamma_g, \gamma_b), 1\}$.

It follows that the optimal reporting policy consists of two reports, bad and good. The bad report perfectly reveals that the ruler is bad ($p_B = 1$), whereas a good report improves beliefs just enough that the officer prefers not to attempt a coup ($p_G = P(\lambda, \gamma)$). Thus, the good report is always transmitted if the ruler is good, but both the good and the bad reports are sometimes transmitted if the ruler is bad. In other words, when choosing among *all possible reporting policy*, the ruler prefers a *censorship* policy, which calls for the media to sometimes misreport the bad type of ruler as good. The optimal level of media freedom m^{**} can be calculated directly from Bayes' rule, by solving for m^{**} such that $p_G = P(\lambda, \gamma_g, \gamma_b)$.

Proposition 4 *When there is a threat of a coup and a popular protest, in equilibrium, the ruler allows partial media freedom,*

$$m^{**} = \frac{p - P(\lambda, \gamma_g, \gamma_b)}{p(1 - P(\lambda, \gamma_g, \gamma_b))},$$

if the citizens are sufficiently pessimistic about her, $p > P(\lambda, \gamma_g, \gamma_b)$, whereas she allows no media freedom, $m^{**} = 0$, if the citizens are sufficiently optimistic about her, $p \leq P(\lambda, \gamma_g, \gamma_b)$. Furthermore, the equilibrium level of media freedom under the threat of coup is always weakly larger than the level of media freedom without a threat of coup. For $p \leq P(\lambda, \gamma_g, \gamma_b)$ the regime survives with probability 1, and for $p > P(\lambda, \gamma_g, \gamma_b)$, the regime survives with probability $\frac{1-p}{1-P(\lambda,\gamma_g,\gamma_b)}$; with probability $\frac{p-P(\lambda,\gamma_g,\gamma_b)}{1-P(\lambda,\gamma_g,\gamma_b)}$ the ruler is replaced by the officer.

Together, Figures 5 and 6 illustrate why the potential for a status quo reversal that accompanies a coup affects the ruler's choice of media freedom. If no coup is possible, then the ruler is only worried about surviving a popular protest and her payoff is therefore the concave function $S(p)$. By implication, an uninformative media is always optimal for the ruler. However, when a coup is possible, the officer will attempt it whenever $p > P(\lambda, \gamma_g, \gamma_b)$, generating a reversal of the *status quo*. Thus, for large p, the ruler is worried about being restored following the coup, and her payoff, therefore, is the convex function $R(p)$. Hence, the possibility of a *status quo* reversal generates a payoff function for the ruler that is not concave, opening the possibility that a positive level of media freedom could be beneficial.

Furthermore, given that the officer prefers to mount a coup when the citizens are unlikely to support the ruler, for $p > P(\lambda, \gamma_g, \gamma_b)$, the ruler's payoff $R(p)$ is low (or zero for $p > 1/2$). Thus, there is little to lose from being revealed to be the bad type by the media. At the same time, there is a lot to gain from a report that generates a belief $p' \leq P(\lambda, \gamma_g, \gamma_b)$, since such a belief completely deters the officer's attempted coup. However, if the media is sufficiently free that the good report is *already* sufficiently informative to deter a coup, further increases in media freedom are counter-productive, as they reduce the probability that the good report is generated. When the public is initially pessimistic about the ruler, the media is just "free enough" that good news deters a coup.

Finally, recall that even when a coup threat is absent, the ruler may still reveal some information in equilibrium. In particular, when $p > 1/2$ the ruler is indifferent between all $m^* \in [0, (2p-1)/p]$. Note that when the ruler is under threat of coup, for the same prior belief, the equilibrium level of media freedom m^{**} is strictly larger than all equilibrium levels of media freedom without coup threat, $m^{**} > (2p-1)/p \geq m^*$. Intuitively, in the benchmark model where the only threat to the ruler is popular protest, good news induces a belief that is weakly larger than $1/2$. Because citizens never protest against the ruler when $p \leq 1/2$, leaving them more optimistic delivers no benefit, but reduces the probability that good news is revealed. However, when the ruler also faces a threat of coup, the officer sometimes attempts a "power grab" against an otherwise stable government. In particular, for $p' \in (P(\lambda, \gamma_g, \gamma_b), 1/2)$, citizens would not protest against the ruler (absent coup) but are also unlikely to protest in support of the ruler if the officer attempts a coup. Thus, the officer attempts a coup for such moderate beliefs. To deter a coup, the ruler must reveal more information than is needed to deter a popular protest, resulting in greater media freedom.

6 Signaling and an Informative Coup

In addition to changing the status quo, a coup may convey information to citizens about the ruler's type, a consideration that was absent from our previous analysis. In this section, we allow the officer to have private information about the ruler's type and his coup decision to potentially signal his information to citizens. We show that, in a natural setting, these additional signaling considerations strengthen our main finding that the threat of coups creates incentives for the ruler to allow media freedom.

When the officer decides whether to attempt a coup, suppose he knows the ruler's type. Denote the probability that the officer attempts a coup against a type-i ruler by σ_i, citizens' belief that the ruler is bad before observing the officer's decision by p', and citizens' updated beliefs that the ruler is bad following a coup and no coup by p'_C and p'_{NC}. Unlike in the preceding sections, which assumed $p'_C = p'_{NC}$ (because the officer was uninformed), here these probabilities could be different because the officer's decision may signal his private information to citizens.

The officer's incentives are similar to those described in Section 5. The officer compares the relative payoff of allowing the ruler to remain in power (risking a popular protest) and an attempted coup (risking counter-protest). The difference here is that the officer knows the ruler's type, so the officer knows his payoff of remaining loyal if the regime survives. The officer attempts a coup against the type-i ruler (i.e., $\sigma_i = 1$) if and only if $\alpha(1 - R(p'_C)) > \beta_i S(p'_{NC})$, which is equivalent to

$$\frac{1 - R(p'_C)}{S(p'_{NC})} = \frac{1 - G(\lambda(1 - 2p'_C))}{1 - G(\lambda(2p'_{NC} - 1))} > \gamma_i. \tag{5}$$

Because $\gamma_g > \gamma_b$, the officer has a weaker incentive to mount a coup against a good ruler. This observation is important both for the possible equilibrium configurations and for the refinement of the off-path beliefs in our analysis of possible pooling equilibria.

Citizens' beliefs must be consistent with Bayes' rule applied to the officer's strategy:

$$p'_C = \frac{p'\sigma_b}{p'\sigma_b + (1 - p')\sigma_g} \tag{6}$$

$$p'_{NC} = \frac{p'(1 - \sigma_b)}{p'(1 - \sigma_b) + (1 - p')(1 - \sigma_g)}. \tag{7}$$

Increases in the probability of a coup attempt against a bad ruler (σ_b) make citizens more pessimistic about the ruler and, therefore, they are less inclined to engage in a counter-protest. Conversely, increases in the probability of a coup attempt against a good ruler (σ_g) make citizens more inclined to engage in a counter-protest.

First, consider a separating equilibrium in which the officer's decision to attempt a coup completely reveals the ruler's type. In such an equilibrium, $\sigma_g = 0$ and $\sigma_b = 1$, and hence citizens can infer the ruler's type: $p'_C = 1$ and $p'_{NC} = 0$. In this case, the left-hand side of (5) is 1. Therefore, for such a strategy to be optimal for the officer, the parameter values should satisfy $\gamma_b < 1 < \gamma_g$, which is equivalent to $\beta_b < \alpha < \beta_g$. Thus, an equilibrium in which the officer's decision conveys the ruler's type exists if and only if the officer's

preferences are aligned sufficiently well with those of the citizens. If he is sure that a coup attempt will succeed, then the officer attempts it if and only if the ruler is bad. However, given our assumption that $\alpha > \beta_g$, no such equilibrium exists.

Next, consider the possibility of a pooling equilibrium in which both types of officers play the same pure strategy. In such an equilibrium, the action *not* chosen by any type in equilibrium can, in general, have any beliefs associated with it. We use the *D1* (Fudenberg and Tirole, 1991, p. 452) refinement to pin down the following off-path beliefs.[9]

Remark. *The D1 refinement delivers the following off-path beliefs: (1) If both types of officers do not attempt a coup, $\sigma_g = \sigma_b = 0$, then upon observing an off-path coup, citizens believe that the ruler is bad, $p'_C = 1$; (2) If both types of officers do attempt a coup, $\sigma_g = \sigma_b = 1$, then upon observing no coup off the equilibrium path, citizens believe that the ruler is good, $p'_{NC} = 0$.*

These beliefs immediately rule out the possibility of a pooling equilibrium in which both types do not attempt a coup ($\sigma_g = \sigma_b = 0$). In such an equilibrium, an off-path coup would be interpreted as confirmation that the ruler is bad and no citizen would support her in a counter-protest. Therefore, any coup attempt would succeed for certain and the officer would prefer to deviate by mounting it. An equilibrium in which the officer attempts a coup against both types of rulers ($\sigma_g = \sigma_b = 1$) exists if p is sufficiently large. In such an equilibrium, $p'_C = p'$ because a coup attempt reveals no information and the above remark yields that $p'_{NC} = 0$. For both officers to be willing to attempt a coup, the parameters should satisfy

$$\frac{1 - R(p'_C)}{S(p'_{NC})} \geq \gamma_g,$$

or, equivalently, $p' \geq P_I(\lambda, \gamma_g) \equiv P(\lambda, \gamma_g, \gamma_g)$.

Finally, consider the possibility of a semi-separating equilibrium. Given that the officer has a stronger incentive to mount a coup against a bad ruler, the only possibility is that $\sigma_b = 1$ and $\sigma_g \in (0, 1)$. In such an equilibrium, the officer's decision not to mount a coup reveals that the ruler is good, $p'_{NC} = 0$. For the officer to mix strategies when the ruler is good,

[9]The D1 refinement assigns beliefs to an off-path action by considering the incentives of the underlying types to select the action. In particular, the off-path action is treated as if it was selected only by the player type for whom the action is a best response for a larger set of strategies. In our setting, the officer has a stronger incentive to mount a coup against a bad ruler. In particular, whenever the ruler is good and the officer mounts a coup, he would also mount a coup if the ruler were bad. Therefore, the D1 refinement implies that when the off-path action is a coup, it reveals that the ruler is bad and when the off-path action is no coup, it reveals that the ruler is good.

the following condition should be fulfilled: $1 - R(p'_C) = \gamma_g$. Equivalently, $p'_C = P_I(\lambda, \gamma_g)$.

By substituting the officer's strategy into (6) and solving the equation, we find

$$\sigma_g = \frac{p'}{1-p'} \frac{1 - P_I(\lambda, \gamma_g)}{P_I(\lambda, \gamma_g)}.$$

Therefore, we have the following characterization of the officer's equilibrium strategy and citizens' posterior beliefs following the officer's decision.

Proposition 5 *Suppose that after observing the media's message, citizens believe that the ruler is bad with probability p'. In equilibrium, the officer's strategy and citizens' beliefs are uniquely determined as follows.*

(i) If $p' \geq P_I(\lambda, \gamma_g)$, then the officer attempts a coup against both types of rulers, $\sigma_g = \sigma_b = 1$, a coup attempt conveys no information, $p'_C = p$, and (consistent with the D1 criterion) no coup attempt reveals that the ruler is good, $p'_{NC} = 0$.

(ii) If $p' < P_I(\lambda, \gamma_g)$, then the officer always attempts a coup against the bad ruler, $\sigma_b = 1$, and attempts a coup against a good ruler with probability

$$\sigma_g = \frac{p'}{1-p'} \frac{1 - P_I(\lambda, \gamma_g)}{P_I(\lambda, \gamma_g)}.$$

A coup attempt conveys bad information about the ruler, but does not reveal her type completely, $p'_C = P_I(\lambda, \gamma_g)$, and no coup reveals that the ruler is good, $p'_{NC} = 0$.

To understand the structure of the equilibrium, note first that both the officer and the citizens would like the officer to replace a bad ruler. Thus, an increase in the likelihood of a coup against the bad ruler makes citizens update more negatively about the ruler, reducing their incentives to protest following a coup, which in turn reduces the officer's risk of attempting a coup. As a result, the officer always attempts to overthrow the bad ruler. By contrast, when the ruler is good, the officer still wants to replace her (although less intensely than he wants to replace a bad ruler), whereas the citizens want the good ruler to stay in power. In this case, an increase in the likelihood of a coup against the good ruler makes citizens update less negatively about the ruler, increasing their incentives to protest following a coup, which in turn increases the officer's risk of attempting a coup. When citizens are pessimistic about the ruler, this updating is too weak to cause them to protest following a coup and the officer always stages a coup against the good ruler. When citizens are more optimistic about the ruler, the updating is stronger and they sometimes protest following a coup and succeed in thwarting it. Thus, the officer attempts to overthrow the good ruler less often.

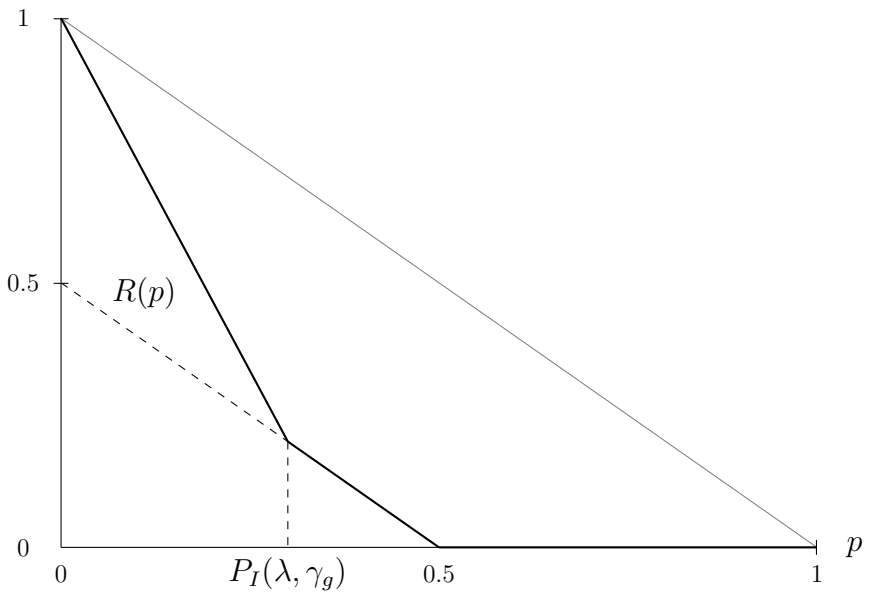

Figure 7: Illustration of Proposition 6. The black curve represents the ruler's payoff as a function of p'. The gray curve represents the concave envelope of the ruler's payoff. Parameters: $\lambda = 1/2$, $P_I(\lambda, \gamma) = 3/10$.

Media Freedom. To analyze media freedom when the coup is informative, we construct the ruler's payoff as a function of p', the citizen's belief following the media's message. For every p', this payoff function can be written as

$$\Pr(\text{coup})R(p'_C) + \Pr(\text{no coup})S(p'_{NC}).$$

From Proposition 5, we know that $p'_{NC} = 0$. That is, in the event of no coup, the ruler is revealed to be good, and hence the regime always survives, $S(p'_{NC}) = 1$. Next, note that for $p' > P_I(\lambda, \gamma_g)$ the probability of a coup is 1, and the probability of regime survival is simply $R(p')$. Finally, for $p' < P_I(\lambda, \gamma_g)$, the probability of a coup is $p' + (1 - p')\sigma_g = p'/P_I(\lambda, \gamma_g)$. Following a coup, the citizens believe that the ruler is bad with probability $p'_C = P_I(\lambda, \gamma_g)$, and he is therefore restored with probability $R(P_I(\lambda, \gamma_g))$. Thus, the ruler's payoff as a function of p' is

$$U(p') = \begin{cases} \frac{p'}{P_I(\lambda,\gamma_g)} R(P_I(\lambda, \gamma_g)) + (1 - \frac{p'}{P_I(\lambda,\gamma_g)}) & \text{if} \quad p' < P_I(\lambda, \gamma_g) \\ R(p') & \text{if} \quad p' \geq P_I(\lambda, \gamma_g). \end{cases}$$

It is straightforward to verify that $U(p')$ is continuous, piece-wise linear and convex, as illustrated in Figure 7. Using Corollary 1 and Proposition 3 in Kamenica and Gentzkow (2011),

we find that the ruler always allows complete media freedom in equilibrium, even if she can design any reporting policy for the media. The next Proposition 6 states this result formally.

Proposition 6 *In the equilibrium of the game with an informed officer, the leader allows complete media freedom, $m^* = 1$ for all prior beliefs.*

Unlike in the case without signaling, where the officer only attempts a coup when beliefs about the ruler are sufficiently bad, in the current environment the probability of a coup attempt is positive for all $p' > 0$. Furthermore, citizens infer bad information about the ruler from the officer's attempted coup, and they are less likely to stage a counter-protest in support of the ruler. In particular, when citizens beliefs about the ruler are initially favorable, citizens are strictly less likely to support the ruler following a coup in the environment with a privately informed officer (and if beliefs are initially unfavorable, then the ruler is restored with the same probability with and without signaling). To mitigate the increased likelihood of a successful coup, the ruler allows a greater degree of media freedom when citizens are optimistic about her type.

7 Signaling Valence via Media Freedom

In an environment where the ruler has no private information about her type, the level of media freedom affects citizens' interpretation of good news: when the media is more free, good news is less likely to be reported, but it has a greater effect on citizens' posterior beliefs. If the ruler also has private information about her type, then the level of media freedom may also affect citizens' *prior* belief. For a given level of media freedom, the ruler's private information about her own type affects the probability that the media delivers a good report. By implication, rulers with different beliefs have different inherent preferences for media freedom. Thus, the ruler's chosen level of freedom may signal her private information to citizens.

In this section, we explore this issue in a simple variant of our baseline model. The ruler observes a private signal of her type, $S \in \{\gamma, \beta\}$, which allows the ruler to privately update beliefs about her type. Realization γ privately reveals good news to the ruler about her type, while β privately reveals bad news. In particular, upon observing realization s, the ruler updates the belief that she is bad to p_s, where $0 < p_\gamma < p < p_\beta < 1$. The Law of Iterated Expectations requires that the expected value of the ruler's posterior belief is equal

to the prior belief. Thus, with prior p and posterior beliefs (p_β, p_γ), we must have

$$\pi \equiv \Pr(S = \beta) = \frac{p - p_\gamma}{p_\beta - p_\gamma}.$$

Note that an increase in signal informativeness (in the Blackwell sense) results in a (weak) increase in p_β and a (weak) decrease in p_γ. In the interest of brevity, we focus on $p_\gamma > 1/2$; that is, even a ruler who privately observes a good signal realization faces a serious threat of coup. To streamline the exposition and enhance tractability, in this section we focus on a binary choice of media freedom: either $m = 0$ (no media freedom) or $m = 1$ (full media freedom). The restriction to the binary choice reduces the impact of off-path beliefs on the equilibrium characterization, which allows us to focus on the underlying strategic incentives.

Because the ruler's private signal is realized before media freedom is chosen, we denote the ruler's choice of media freedom m_i for $i \in \{\gamma, \beta\}$. The ruler's private information can influence her choice of media freedom. Thus, citizens' belief updating takes place in two steps. Upon observing the ruler's choice of media freedom, citizens update beliefs to $p(m)$; they then update to $p'_i(m)$ based on media report $i \in \{G, B\}$ as in the main model.

Our analysis proceeds in two steps. We first analyze the benchmark model without threat of coup, where the ruler's only threat comes from popular protest. Imposing an intuitive restriction on off-path beliefs, we show that when the ruler's private signal is relatively uninformative, the unique equilibrium features pooling on zero media freedom, extending the result of the main model. We then consider the model with a coup threat, showing that the unique equilibrium features pooling on *full media freedom*. Thus, as in the model without private information for the ruler, the convexity in the ruler's payoff generated by the threat of coup induces the ruler to allow greater media freedom.

The notion of weak perfect Bayesian equilibrium places no restrictions on the off-path beliefs. For example, it is possible that an off-path action confirms that the ruler is a good type, $p' = 0$. However, since the ruler, herself, does not know her type exactly, such an off-path belief is counter-intuitive. We therefore impose that the ruler "cannot signal what she doesn't know," which requires that the off-path belief is inside $[p_\gamma, p_\beta]$.

No threat of coup. We first consider the case in which the ruler does not face a threat of coup. Thus, the ruler's payoff given the citizens' belief p' is $S(p')$, where $S(\cdot)$ is concave. We establish the following result.

Proposition 7 *Consider the game with a privately informed ruler and no threat of coup. If the ruler's private signal is not too informative,* $2p_\beta - p_\gamma < 1$ *then an equilibrium with pooling on no media freedom,* $m_\gamma = m_\beta = 0$*, exists. Furthermore, the equilibrium is unique, up to the specification of the off-path belief.*

First, consider the incentives of the pessimistic ruler, who observed realization β. If the ruler allows full media freedom, her payoff is $(1 - p_\beta)S(0) + p_\beta S(1)$.[10] With the restriction on off-path beliefs, the worst belief that citizens could hold about the ruler if no media freedom is permitted is p_β. Thus, the lowest payoff that the pessimistic ruler could achieve by selecting no media freedom is $S(p_\beta)$. Furthermore, because $S(\cdot)$ is concave and $p_\beta > 1/2$, we have $S(p_\beta) > (1-p_\beta)S(0)+p_\beta S(1)$. Thus, the pessimistic ruler allows no media freedom in equilibrium, $m_\beta = 0$.

Next, consider the incentives of the optimistic ruler, who observed realization γ. By allowing full media freedom, an optimistic ruler achieves payoff $p_\gamma S(0)+(1-p_\gamma)S(1)$, regardless of the equilibrium structure. Furthermore, because the pessimistic ruler always selects no media freedom, this choice is always on the equilibrium path. In a separating equilibrium, suppressing media freedom is interpreted by citizens as a signal of the pessimistic type, resulting in payoff $S(p_\beta)$. If no separating equilibrium exists, then the following inequality must hold,

$$S(p_\beta) \geq p_\gamma S(1) + (1 - p_\gamma)S(0). \tag{8}$$

Because $S(\cdot)$ is concave, this inequality always holds for $p_\gamma = p_\beta$, i.e. when the ruler's private signal is uninformative. By implication, it also holds when p_β and p_γ are close together. A simple calculation reveals that (8) is equivalent to $2p_\beta - p_\gamma < 1$, which ensures that no separating equilibrium exists.

It is also straightforward to argue that (8) implies the existence of a pooling equilibrium with no media freedom $m_\gamma = m_\beta = 0$. In this case, if the optimistic ruler selects zero media freedom, then citizens' beliefs remain at the prior, resulting in payoff $S(p)$. Thus, pooling on zero media freedom is an equilibrium if

$$S(p) \geq p_\gamma S(1) + (1 - p_\gamma)S(0) \tag{9}$$

Because $1/2 < p < p_\beta$ and $S(\cdot)$ is strictly decreasing for such p, (9) immediately follows from (8).

[10] If the ruler allows full media freedom, then the media reports her type accurately. In this case, the first stage of the citizens' updating, based solely on the decision to allow media freedom, does not affect the citizens' belief after observing the media's message.

Threat of coup. Now we analyze the case in which the ruler faces a threat of coup. In this case, the ruler's payoff function is given by $U(p')$. Note that for $i \in \{\gamma, \beta\}$, the ruler's expected payoff of allowing full media freedom is

$$p_i U(1) + (1 - p_i)U(0) = 1 - p_i.$$

Note further that, with the restriction on off-path beliefs, the most optimistic beliefs that citizens could hold about the ruler if no media freedom is allowed is p_γ. Thus, at best, allowing no media freedom delivers payoff $U(p_\gamma)$. However, because $p_\gamma > 1/2$, $U(p_\gamma) = 0$. Thus, allowing complete media freedom is strictly better than no media freedom, whether the ruler is optimistic or pessimistic about her type. Therefore, the only possible equilibrium features pooling on complete media freedom.

Proposition 8 *Consider the game with a privately informed ruler and threat of coup. An equilibrium in which the ruler pools on full media freedom exists, and it is unique up to specification of the off-path beliefs.*

8 Conclusion

Although dictators do not like protesters in the streets in normal circumstances, they might want to have them after being deposed in a coup. Even the threat of subsequent protests makes subordinates hesitate before attempting a coup, and after the coup, such protests can help restore deposed rulers. This paper studies the implications of this observation for media freedom in dictatorships in a simple setup that combines the global game technique with Bayesian persuasion. Whether there is a threat of a coup or a threat of a popular protest, should not the leader raise media freedom when she believes that the media will mostly report positive information about her and reduce media freedom when she believes that the media will mostly report negative information about her? We show that the answer is no. When a ruler perceives a high likelihood of a popular protest and no coup, she opts for a less free media, which reveals little information about what kind of ruler she is. In sharp contrast, she sometimes does the opposite when there is a high likelihood of a coup and when citizens infer little about the incumbent's quality from the fact that she was removed in a coup.

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Appendix

Proof of Proposition 1: We look for equilibria in which a citizen with cost c_i protests if and only if $c_i < c^* \in (0,1]$. As discussed in the text, there is always an equilibrium in which citizens never revolt. This equilibrium corresponds to any $c^* \leq 0$. We discuss the case of $c^* > 1$ later. Given the realization of $\bar{c}$ and a cutoff strategy $c^* \in (0,1]$, the measure of protesters is $\Pr(c_i < c^* | \bar{c}) = F\left(\frac{c^* - \bar{c}}{\rho}\right)$. Thus, the protest succeeds if and only if $F\left(\frac{c^* - \bar{c}}{\rho}\right) > \theta$. In the limit when $\rho \to 0$,

$$\lim_{\rho \to 0} \Pr(c_i < c^* | \bar{c} = 0) = \lim_{\rho \to 0} F\left(\frac{c^*}{\rho}\right) = 1 > \theta > 0 = \lim_{\rho \to 0} F\left(\frac{c^* - 1}{\rho}\right) = \lim_{\rho \to 0} \Pr(c_i < c^* | \bar{c} = 1).$$

Moreover, $\Pr(c_i < c^* | \bar{c})$ is decreasing in $\bar{c}$. Thus, given $c^* \in (0,1]$, there exists a threshold $\widetilde{c} \in (0,1)$ such that a protest succeeds if and only if $\bar{c} < \widetilde{c}$, where

$$F\left(\frac{c^* - \widetilde{c}}{\rho}\right) = \theta. \tag{10}$$

This also implies

$$\lim_{\rho \to 0} \widetilde{c} = \lim_{\rho \to 0} [c^* - \rho \; F^{-1}(\theta)] = \lim_{\rho \to 0} c^*. \tag{11}$$

Next, because costs are correlated, a citizen's belief about the likelihood of a protest succeeding depends on her type c_i. Thus, citizen i believes that the protest will succeed with probability $P_i = \Pr(\bar{c} < \widetilde{c} | c_i)$ and she protests if and only if

$$\Pr(\bar{c} < \widetilde{c} | c_i) \; \delta \; E[u_r] > c_i. \tag{12}$$

Because $c_i \geq 0$, no citizen protests and the status quo survives whenever $E[u_r] \leq 0$. Moreover, if $\widetilde{c} = 0$, then the left-hand side is 0 and no citizen protests. Now, consider the case in which both $E[u_r] > 0$ and $\widetilde{c} > 0$. Still, because the left-hand side of (12) is bounded, a citizen with a sufficiently high cost c_i does not revolt. However,

$$\Pr(\bar{c} < \widetilde{c} | c_i = 0) \; \delta \; E[u_r] > c_i = 0.$$

Thus, for any $\widetilde{c} > 0$, there is a unique $c^* > 0$ such that a citizen with cost c_i protests if and only if $c_i < c^*$ and a citizen with cost $c_i = c^*$ is indifferent between protesting and not protesting,

$$\Pr(\bar{c} < \widetilde{c} | c_i = c^*) \; \delta \; E[u_r] = c^*, \quad \text{for} \quad \widetilde{c} > 0. \tag{13}$$

Any pair $(c^*, \widetilde{c})$, with $\widetilde{c} > 0$ and $c^* \in (0, 1]$, that satisfies (10) and (13) is an equilibrium.

Moreover, when $\widetilde{c},\ c^* > 0$, in the limit when the noise in private signals vanishes,

$$\begin{aligned}
\Pr(\bar{c} < \widetilde{c} | c_i = c^*) &= \int_{\bar{c}=0}^{\widetilde{c}} pdf(\bar{c}|c_i = c^*)\ d\bar{c} \\
&= \int_{\bar{c}=0}^{\widetilde{c}} \left[\frac{pdf(c_i = c^*|\bar{c})\ pdf(\bar{c})}{\int_{\bar{c}=0}^{1} pdf(c_i = c^*|\bar{c})\ pdf(\bar{c})\ d\bar{c}} \right] d\bar{c} \quad \text{(the term in brackets is Bayes' rule)} \\
&= \int_{\bar{c}=0}^{\widetilde{c}} \frac{f\left(\frac{c^* - \bar{c}}{\rho}\right)\ g(\bar{c})}{\int_{\bar{c}=0}^{1} f\left(\frac{c^* - \bar{c}}{\rho}\right)\ g(\bar{c})\ d\bar{c}} d\bar{c} \quad \text{(we canceled } 1/\rho\text{, and used } g(\cdot) \text{ as the pdf of } \bar{c}) \\
&= \int_{z=\frac{c^* - \widetilde{c}}{\rho}}^{\frac{c^*}{\rho}} \frac{f(z)\ g(c^* - \rho z)}{\int_{z=\frac{c^*-1}{\rho}}^{\frac{c^*}{\rho}} f(z)\ g(c^* - \rho z)\ dz} dz, \quad \text{(a change of variables to } z = \tfrac{c^* - \bar{c}}{\rho}) \\
&= \int_{z=\frac{c^* - \widetilde{c}}{\rho}}^{\frac{c^*}{\rho}} \frac{f(z)}{\int_{z=\frac{c^*-1}{\rho}}^{\frac{c^*}{\rho}} f(z)\ dz} dz, \quad \text{(because } \bar{c} \sim U[0,1] \text{ implies } g(\cdot) = 1) \\
&= \frac{F\left(\frac{c^*}{\rho}\right) - F\left(\frac{c^* - \widetilde{c}}{\rho}\right)}{F\left(\frac{c^*}{\rho}\right) - F\left(\frac{c^*-1}{\rho}\right)} \\
&= \frac{F\left(\frac{c^*}{\rho}\right) - \theta}{F\left(\frac{c^*}{\rho}\right) - F\left(\frac{c^*-1}{\rho}\right)} \quad \text{(from equation (10))}. \qquad (14)
\end{aligned}$$

Because $c^* \in (0, 1]$, Equation (14) implies that

$$\lim_{\rho \to 0} \Pr(\bar{c} < \widetilde{c} | c_i = c^*) = 1 - \theta. \qquad (15)$$

By combining (11) with Equations (13) and (15),

$$\lim_{\rho \to 0} \widetilde{c} = \lim_{\rho \to 0} c^* = (1 - \theta)\ \delta\ E[u_r] < 1. \qquad (16)$$

It remains to investigate whether there can be an equilibrium with $c^* > 1$. However, Assumption 1 together with (12) rules this out.

Finally, Equation (16) also captures the case of $E[u_r] \leq 0$, in which case $\lim_{\rho \to 0} \widetilde{c} = \lim_{\rho \to 0} c^* \leq 0$, implying that no one protests and the regime survives. □