Informational Autocrats*

Sergei Guriev† Daniel Treisman‡

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Abstract

In recent decades, dictatorships based on mass repression have largely given way to a new model based on the manipulation of information. Instead of terrorizing citizens into submission, "informational autocrats" artificially boost their popularity by convincing the public they are competent. To do so, they use propaganda and silence informed members of the elite by co-optation or censorship. We develop a formal theory that shows how such regimes work and under what conditions they prevail over democracies or old-style dictatorships. Using several sources—including a newly created dataset of authoritarian control techniques—we document a range of trends in recent autocracies that fit the theory: a decline in violence, efforts to conceal state repression, rejection of official ideologies, imitation of democracy, a perceptions gap between masses and elite, and the adoption by leaders of a rhetoric of performance rather than one aimed at inspiring fear.

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†Professor of Economics, Sciences Po, Paris, and Research Fellow, CEPR. E-mail: sergei.guriev@sciencespo.fr

‡Professor of Political Science, UCLA, and Research Associate, NBER. E-mail: treisman@polisci.ucla.edu

1 Introduction

The model of dictatorship that dominated in the 20th century was based on fear. Many rulers terrorized their citizens, killing or imprisoning thousands, and deliberately publicizing their brutality to deter opposition. Totalitarians such as Hitler, Stalin and Mao combined repression with indoctrination into ideologies that demanded devotion to the state. They often isolated their countries with censorship and travel restrictions.

However, in recent years a less bloody and ideological form of authoritarianism has spread. From Hugo Chávez's Venezuela to Vladimir Putin's Russia, illiberal leaders have managed to concentrate power without cutting their countries off from global markets, imposing exotic social philosophies, or resorting to mass murder. Many have come to office in elections and preserved a democratic facade while covertly subverting political institutions. Rather than jailing thousands, these autocrats harass and humiliate opposition activists, accuse them of fabricated crimes, and encourage them to emigrate. When they do kill, they seek to conceal their responsibility. Their goal, contra Machiavelli, is to be loved rather than feared.

The emergence of such softer, non-ideological autocracies was unexpected and so far lacks a systematic explanation. How do the new dictators survive without using the standard tools of 20th Century authoritarians, and without the traditional legitimacy or religious sanction that supported historical monarchs, or even the revolutionary charisma of anti-colonial leaders?

We suggest an explanation. The key to such regimes, we argue, is the manipulation of information. Rather than terrorizing or indoctrinating the population, rulers survive by leading citizens to believe—rationally but incorrectly—that they are competent and benevolent. Having won popularity, dictators score points both at home and abroad by mimicking democracy. Violent repression, rather than helping, is counterproductive: it punctures the image of able governance the leader seeks to cultivate.

We develop a simple model to show how such informational autocracies work. The game pits a ruler—who may be either competent or incompetent—against an "informed elite," which observes the ruler's type, and the general public, which does not. The public prefers a ruler who is competent and may try to oust the incumbent—in a revolution or election—if it infers that he is not. The elite can send messages to the public via independent media; the ruler transmits his own propaganda and can censor the elite's messages or co-opt it to stay silent. In the absence of any negative signals, the public judges the ruler based on economic performance, which varies stochastically but correlates with the incumbent's ability. The ruler can also deter challenges by spending on repression, but at the cost of revealing irreversibly that he is incompetent.

Within this framework, three types of equilibrium emerge: "overt dictatorship," in which incompetent dictators repress the public; "democracy," in which signals are all accurate and uninformed

citizens vote (or protest) retrospectively on the basis of economic performance; and "informational autocracy," in which incompetent dictators manipulate information to stay in power. These equilibria exist for different ranges of two key parameters—the attentiveness of the public to political information and the size of the informed elite.

Both of these factors relate to modernization. As countries develop economically, the growth in education, media, civil society, and global connections boosts the size and resources of the informed elite. At most levels of public attentiveness, this leads sooner or later to democracy. This is the familiar logic of "modernization theory." But development can also increase political attentiveness. As social mobilization loosens the grip of family, clan, local, and occupational identities, people become available for new messages. If this occurs when the informed elite is not yet very large, the result can be a kind of raucous and manipulative politics that 20th Century critics of "mass society" feared (see, e.g., Kornhauser 1960, Mills 1956). An astute incumbent, unconstrained by a large elite and independent media, can enlist the newly mobilized masses behind him, converting an overt dictatorship or an elite-dominated democracy into an informational autocracy. Later in the modernization process, political attentiveness may fall as citizens revert to "rational ignorance." In fact, low interest acts as a stabilizer in affluent democracies since incumbents recognize that their survival depends more on economic performance than on any propaganda efforts.[1]

After describing the model, we demonstrate its applicability with a range of empirical evidence. As economic development spreads, we should expect the set of authoritarian states to include fewer violent, overt dictatorships and more informational autocracies. Using newly collected data, we document a decrease in the use of violent repression by authoritarian leaders and a decline in the imposition of official ideologies. Less systematically, we illustrate an apparent trend among dictators towards concealing rather than publicizing state brutality. Analyzing texts of leaders' speeches, we show that the rhetoric of those we classify as informational autocrats—focused on economic performance and public service provision—resembles that of democratic leaders far more closely than that of old-style dictators, who employ a rhetoric of threats and fear. We also demonstrate that authoritarian states are—as expected of informational autocracies—increasingly mimicking democracy by holding elections and, where necessary, manipulating the results.

A key element of informational autocracy is the gap in political knowledge between the "informed elite" and the general public. While the elite observes the true character of an incompetent incumbent, the public is susceptible to the ruler's propaganda. Using individual-level data from the Gallup World Poll, we show that exactly such a gap exists in many authoritarian states today. Whereas in democracies the highly educated are more likely to approve of their government, in non-democracies it is the *less* educated that are most supportive. The less educated are also less

[1] Of course, the public's political attentiveness can change in light of events and can, itself, be manipulated by incumbents; treating it as exogenous here is only a useful simplification to establish the first order logic.

likely to recognize restrictions on the media. Finally, we construct proxies for the size of the informed elite and the level of political attentiveness in countries today and show that regime types map onto these two parameters much as the model predicts.

The manipulation of information is not new in itself; some totalitarian leaders were great innovators in the use of propaganda. What is different is how rulers employ such tools. Where Hitler and Stalin sought to reshape citizens' goals and values by imposing comprehensive ideologies, informational autocrats intervene surgically, attempting only to convince citizens of their competence. Of course, democratic politicians would also like citizens to think them competent, and their public relations efforts are sometimes hard to distinguish from propaganda. Although the model sharply apportions the parameter space to different equlibria, in reality the boundary between democracy and informational autocracy is fuzzy, with some regimes and leaders—Silvio Berlusconi, say, or Cristina Kirchner—combining characteristics of both. Where most previous models have assumed it is political institutions that constrain such leaders, we place the emphasis on an educated and informed elite with access to independent media.

At the same time, today's softer dictatorships do not completely foreswear repression. Informational autocrats use considerable violence in fighting ethnic insurgencies and civil wars—as, in fact, do democracies. They may also punish journalists as a mode of censorship (although they seek to camouflage the purpose or conceal the state's role in violent acts). Such states can revert to overt dictatorship, as may have occurred after the 2016 coup attempt in Turkey, where Erdoğan's regime detained tens of thousands, including more than 118 journalists and nine parliamentarians (Amnesty International 2017). Still, as we show, the extent of mass repression in the regimes that we classify as informational autocracies is dwarfed by the bloody exploits of past dictators.

Besides Chávez's Venezuela and Putin's Russia, other informational autocracies include Alberto Fujimori's Peru, Mahathir Mohamad's Malaysia, Viktor Orbán's Hungary, and Rafael Correa's Ecuador. One can see Lee Kuan Yew's Singapore as a pioneer of the model. As we describe later, Lee perfected the inobtrusive management of private media and instructed his Chinese and Malaysian peers on the need to conceal violence. Fujimori's unsavory intelligence chief Vladimiro Montesinos was another early innovator, paying million dollar bribes to television stations to skew their coverage. "We live on information," he told a reporter in one unguarded interview. "The addiction to information is like an addiction to drugs" (McMillan and Zoido 2004, p.74).

The next section briefly discusses related literature. Section 3 develops the model. Section 4 presents evidence of its empirical relevance. Section 5 concludes.

2 Related literature

Previous research on the political economy of dictatorship has developed in a number of directions. One strand examines the role of institutions in authoritarian states, interpreting them as mechanisms for solving time inconsistency problems. By creating institutions that constrain him, a ruler can commit to certain policies—repaying state debts and respecting property rights (North and Weingast 1989, Gehlbach and Keefer 2011), redistributing income to the poor (Boix 2003, Acemoglu and Robinson 2006), or sharing power with colleagues (Myerson 2008, Svolik 2012, Boix and Svolik 2013). A related set of papers considers why autocrats hold elections, with more—or less—genuine competition (Gandhi and Lust-Okar 2009). Such elections might serve to inform the ruler about local attitudes or the effectiveness of his agents (Cox 2009, Blaydes 2010), to project strength to his allies (Simpser 2013, Gehlbach and Simpser 2015), or to convince opponents of his popularity (Rozenas 2015, Egorov and Sonin 2014, Little 2014).

We abstract here almost completely from institutional detail. Indeed, our model does not distinguish between the ouster of leaders by revolution and by election. A more common approach is to classify regimes by their formal institutions—in particular, whether they select leaders through free and fair votes. Yet since almost all dictatorships today hold elections, the question is how free and fair they are. That depends less on the institutions themselves than on the environment in which they operate—most notably, the information environment. In our framework, what distinguishes regimes is whether the public's behavior is determined by state repression, information manipulation, or free information flows. When informational autocrats hold national elections, the goal is not to select leaders but to enhance their reputation at home and abroad.

Another literature models the relationship between dictators and their support group when such interactions are not mediated by institutions. These works examine how the ruler chooses the size and characteristics of his inner circle and how this in turn determines his policy choices and survival odds (Bueno de Mesquita et al. 2003, Egorov and Sonin 2011). Like ours, the "selectorate theory" of Bueno de Mesquita et al. considers the interaction of three actors—a ruling individual or group, an elite, and the public. However, whereas selectorate theory concerns the distribution of material benefits in a world of perfect information, ours focuses on the transmission of information about the dictator's type. And while the selectorate has the power to choose the ruler, our informed elite has no power except to influence and assist the public. Whereas rulers in selectorate theory bribe elites to prevent coups, our rulers bribe—or censor them—to stay silent.

Still another relevant strand of research considers when the public can coordinate on rebellion and how an authoritarian regime might prevent this. Some mechanisms involve information controls. For instance, autocrats may restrict communication among citizens and criminalize protests (Kricheli et al. 2011); censor private messages that encourage anti-regime collective action (King,

Pan, and Roberts 2013); publish misleading propaganda about their repressive capacity (Edmond 2013, Huang 2014); or use both propaganda and censorship to hinder coordination (Chen and Xu 2015). Other papers introduce tradeoffs for the ruler. Egorov, Guriev, and Sonin (2009) and Lorentzen (2014) model the dictator's choice in setting the level of censorship, where a free media, on the one hand, provides him with useful information, but, on the other hand, facilitates the mobilization of opposition.

All these papers consider ways rulers can impede coordination. By contrast, our dictator stays in power not by preventing the masses from rebelling but by removing their desire to do so. He manipulates information not to disrupt coordination but to increase his popularity. The closest paper to ours is Shadmehr and Bernhardt (2015), in which citizens seek to infer whether the absence of "bad news" is due to state censorship or the lack of bad news for journalists to report. Although this paper's model of censorship is similar to ours, it does not consider the interaction with cooptation, propaganda, and economic shocks, which is central to our analysis.

Finally, a number of authors have suggested alternative ways to classify non-democracies. Besides the familiar distinction between authoritarian and totalitarian regimes (Linz 1985), Wintrobe (1990) introduces the "tinpot" dictator, who maximizes consumption subject to a power constraint. More recently, Geddes, Frantz, and Wright (2017) distinguish among monarchies and military, one-party, and personalist dictatorships. Our distinction between "overt dictatorships" and "informational autocrats," which focuses on the method of maintaining power rather than the nature of the dominant group, cuts across these categories. Although informational autocrats are more often personalist dictators, they can also be found in one-party regimes (Singapore, Malaysia) and even monarchies (some of the Gulf states).

3 Theory

3.1 Setting

3.1.1 Players

There is a political leader and a continuum of citizens of unit mass. The leader has a type, denoted θ, which may take two values: competent ($\theta = 1$) or incompetent ($\theta = 0$). The ex ante probability that he is competent is $\bar{\theta}$; naturally, $\bar{\theta}$ is also the expected value of the leader's type.

The citizens are exogenously divided into informed (elite) and uninformed (general public). The main difference is that the elite—like the leader himself—directly observes θ, while the public does not. Much of the action of the game, therefore, concerns whether the elite communicates this information to the public. The public is large and can, if it chooses, remove the leader by revolting or voting against him in an election. By contrast, the informed elite (of mass E) is small, so it

cannot overthrow the leader by itself. Members of the elite are organized into a single group and make decisions together in the group's interest.[2]

3.1.2 Economy

Total output (GDP), Y, may take two values, Y^L and Y^H, where $\Delta Y \equiv Y^H - Y^L > 0$. The probability, q_θ, of the high output, $Y = Y^H$, is higher if the leader is competent:

$$q_1 > q_0. \tag{1}$$

The leader uses Y to fund consumption by the public, C, information manipulation, M, and repression, R. His budget constraint is thus: $Y = C + M + R$. Public consumption may include both private goods and non-excludable, government-provided public goods. For simplicity, we assume it is distributed equally among citizens—so C is also per capita consumption, since the number of citizens is normalized to 1. Manipulation expenditure, $M = P + X + B$, includes spending on (i) propaganda, P, (ii) censorship, X, and (iii) co-optation/bribing of the elite to prevent it revealing the leader's type, B. Spending on the apparatus of repression, R, raises the leader's probability of survival in the event of a revolt. The public observes C and R, but not Y, X, P, or B (we assume that Y may include both official and unofficial revenue sources of the regime).

3.1.3 Payoffs

All agents are risk-neutral but have limited liability (i.e. cannot pay large fines).

3.1.3.1 Leader's payoff

The leader receives an exogenous rent each period he remains in power. He maximizes the net present value of expected future rents—or, in a one-period model, just the probability of his survival. He does not benefit from higher GDP directly, just through increased resources to fund propaganda, co-optation, censorship, and/or repression.

3.1.3.2 Citizens' payoffs

Citizens maximize their current consumption plus the net present value of future consumption. For the public, consumption equals C. For members of the elite who are co-opted, it equals $C + b$, where b is the bribe per member of the elite.

Future payoffs depend on the type of regime in place. We describe the citizens' net present value of having a leader of type θ in the future by a scalar parameter, $\beta > 1$. If the current leader stays, the net present value of future payoffs is $\beta\theta$. If the leader is removed, his replacement is drawn

[2] See Guriev and Treisman (2015) for a version of the model with a heterogeneous elite.

from the same distribution and so is competent with probability $\bar{\theta}$. Therefore the net present value of leader change is $\beta\bar{\theta}$.

3.1.4 Leader's toolkit

3.1.4.1 Repression

To focus on interesting cases, we assume that mass repression is sufficiently costly that competent leaders choose not to use it: in equilibrium, they achieve a higher probability of survival through other means. (If all states were repressive, there would be no variation to explain). Thus, if the public observes non-trivial spending on repression, it understands the leader is incompetent.

We formalize mass repression very simply. If the public revolts, we assume the leader succeeds in suppressing the rebellion with probability $\eta(R, E)$ which increases in the amount of resources devoted to repression, R, and decreases in the size of the elite, E. Higher E renders revolts more effective in several ways. Elite members may help mobilize and coordinate protesters, persuade regime insiders to defect, and organize international pressure on the leader to concede.

We assume there exists an $E^* > 0$ such that for all $E \geq E^*$ the revolt succeeds with certainty: $\eta(R, E^*) = 0$. The revolt also succeeds for sure if there is no spending on the repressive apparatus: $\eta(0, E) = 0$.

Since any spending on repression reveals the leader to be incompetent, there is no point spending anything on M or C. For such leaders, therefore, $R = Y$, and the ex ante probability of survival is:

$$\tau(E) \equiv q_0\eta(Y^H, E) + (1 - q_0)\eta(Y^L, E)$$

Clearly, $\tau(E)$ decreases in E.

3.1.4.2 Manipulation

Co-optation. If the leader chooses to co-opt the elite, he pays b to each elite member, in return for which the elite does not try to inform the public of his type. The total cost of rewarding the elite is $B = bnE$, were $n = \{0, 1\}$ is the elite's choice whether to agree to be coopted ($n = 1$) or reject the offer ($n = 0$). Both n and b are endogenously determined in equilibrium.

Since all members of the elite are identical, they all make the same choice. For the sake of simplicity, we assume that, if indifferent, elite members accept the bribe.

Propaganda. The leader spends P to send the public the message "the leader is competent, $\theta = 1$." The message can be either convincing, $p = 1$, or not, $p = 0$. We assume the competent leader can send the convincing signal, $p = 1$, costlessly. If the leader is incompetent, the probability

of the public getting a convincing message, $p = 1$, is

$$\Lambda(P) = \min\left\{\frac{P}{\widehat{P}}, 1\right\} \tag{2}$$

where $\widehat{P}$ is a parameter representing the cost to an incompetent leader of generating fully convincing propaganda. Thus, we assume that making untrue messages convincing is more costly than doing the same for true messages.

Censorship. By spending X on censorship, the leader blocks a certain share of the elite's messages. The cost of censorship is proportional to the number of messages sent. So if the leader wants to stop x percent of messages from the $(1-n)E$ non-coopted elite members, he has to spend $X = x\widehat{X}(1-n)E$ dollars, i.e.

$$x = \min\left\{\frac{X}{\widehat{X}(1-n)E}; 1\right\}$$

Here $\widehat{X}$ is a parameter that represents the cost of blocking all messages if, in a hypothetical case, all citizens (of unit mass) were informed and sent messages.

3.1.5 Regimes

We will consider three regimes: Democracy, D, Informational Autocracy, IA, and old-style Overt Dictatorship, OD. In Democracy, there is no use of manipulation or repression: $R = P = X = B = 0$. In Informational Autocracy, there is some non-trivial use of manipulation but no mass repression: $R = 0$ and $P + X + B > 0$. In Overt Dictatorship, the leader uses repression against the public, $R > 0$, but cannot manipulate its beliefs since his use of repression reveals his type.

When the leader chooses his strategy, he decides whether to opt for Overt Dictatorship ($R > 0$) or for one of the other two regimes. If he does not use repression, $R = 0$, the public does not observe whether he has chosen Democracy or Informational Autocracy. However, it can make inferences about the leader's equilibrium regime choice.

3.1.6 Information

The model contains six types of signals. All citizens directly observe repression against the public, R, and per capita consumption, C. Each member of the elite learns the type of the leader, θ, and GDP, Y, precisely. All receive the leader's propaganda signal, $p = \{0, 1\}$. Since the competent leader can send $p = 1$ at no cost, he always does so. So if the public observes $p = 0$, it knows for sure the leader is incompetent. Finally, the elite can send the public a signal on the leader's competence, $e = \{0, 1\}$. We assume the elite can conceal evidence of the leader's incompetence (i.e., report $e = 1$ when, in fact, $\theta = 0$) but cannot convincingly claim incompetence, $e = 0$, if the

leader is competent. (This is to abstract from cases in which the elite might blackmail a competent leader.)

The influence of such signals depends crucially on whether citizens process them. Yet public opinion research suggests ordinary people often pay little attention to political news (see, e.g., Zaller 1992). We assume uninformed citizens ignore the elite's and leader's messages with a certain probability. Denoting the level of attentiveness $\sigma = \{0, 1\}$, we assume the public is attentive ($\sigma = 1$) with probability a; in this case, it makes its choices based on the elite's signal, e, the propaganda signal, p, its consumption, C, and the level of repression, R. With probability $1 - a$, the public ignores the signals ($\sigma = 0$). In this case, it bases its decisions on just the observed levels of consumption, C, and repression, R. The realization of σ is independent of other random variables.

The elite's signal, $e = 0$, evades censorship with probability $(1 - x)$, where x is the level of censorship. If the attentive public observes $e = 0$, it knows for sure the leader is incompetent. If, on the other hand, it observes the absence of a negative signal (we denote this as $e = 1$), it must infer whether this is because the ruler is competent ($\theta = 1$), because the signal was censored (probability x), or because the elite was co-opted ($n = 1$). Therefore, if the true state is $\theta = 0$, the probability of observing a positive signal, $e = 1$, is $1 - (1 - x)(1 - n)$. The various elite signals—which include (i) positive signals from the co-opted (their share is n), (ii) positive signals due to censorship (share $x(1-n)$), and (iii) negative signals that get through censorship (share $(1-x)(1-n)$)—mix together; we assume the public picks one of these randomly.[3]

3.1.7 Timing

1. The leader and the elite observe the leader's type, $\theta \in \{0, 1\}$.

2. The leader chooses whether to set $R > 0$ and adopt Overt Dictatorship.

3. The economic shock, Y, is realized ($Y = Y^H$ with probability q_θ and $Y = Y^L$ with probability $1 - q_\theta$). Both the elite and the leader observe Y.

4. If the leader has not chosen Overt Dictatorship at time 2, he decides whether to adopt Democracy ($M = 0$) or Informational Autocracy. If the latter, he sets levels of spending on propaganda, P, censorship, X, and co-optation, B. The elite observes these allocations.

5. The elite decides whether (i) to support the regime, $n = 1$, and receive the payment, or (ii) to join the opposition, $n = 0$, and send a signal to the public revealing the leader's true type.

6. Contracts for the elite are implemented. Censorship blocks share x of the elite's messages, so the signal gets through with probability $(1 - x)(1 - n)$. Payoffs are realized.

[3] Alternatively, one could suppose that all uncensored signals mix together first, and then independent media pick one of them randomly, after which the leader tries to censor if this signal is negative. Since the share of negative signals in the mix is $1 - n$, the public would get the positive signal with the same probability, $1 - (1 - x)(1 - n)$.

7. Citizens observe their consumption, C, and the level of repression, R. With probability a citizens are "attentive" ($\sigma = 1$), in which case they also observe the propaganda signal, $p = \{0, 1\}$, and any elite signals that evade censorship, $e = \{0, 1\}$. Citizens update their beliefs about θ and decide whether to overthrow the leader. If they revolt, they succeed with probability $1 - \tau(E)$.

In the timing above we assume that the leader can commit to the contracts with the elites.[4] We also assume the leader chooses R before learning Y, while spending on propaganda, censorship and cooptation are chosen contingent on Y. This captures the idea that R is more of a long-term commitment than other tools, since setting $R > 0$ irreversibly reveals the leader's low competence.[5]

3.1.8 Assumptions

As mentioned above, we assume that repression is sufficiently inefficient that the competent ruler never uses it, but efficient enough that incompetent rulers do use it when $E = 0$:

Assumption 1.

$$q_0 < \tau(0) < q_1.$$

This assumption implies that

$$q_0(1 - a) < \tau(0) < q_1(1 - a) + a \tag{3}$$

holds for all $a \in [0, 1]$. As we will show later, the left-hand-side inequality guarantees that the ruler will choose OD when the size of the elite is sufficiently small; the right-hand-side one ensures that competent leaders never use repression.

For simplicity, we also assume that $\widehat{P}$ is sufficiently large relative to ΔY that $P/\widehat{P} < 1$ in equilibrium.

Assumption 2.

$$\widehat{P} > \Delta Y/2.$$

3.2 Equilibria

All agents are rational and fully Bayesian. They maximize their expected payoffs given available information. The attentive public observes consumption, C, and the signals p and e. If at least one of the latter two signals is low ($p = 0$ or $e = 0$), it knows for sure that the leader is incompetent

[4] In a repeated game, the contracts between leader and elites could be sustained through grim trigger strategies.

[5] If R, P, X, and B are all chosen at the same time (after learning Y), the results are similar but the structure of equilibria is more complex as there are cases in which the ruler chooses OD if $Y = Y^L$ but IA or D if $Y = Y^H$.

and revolts. If both signals are high ($p = e = 1$), the decision depends on the consumption level, C: the public revolts if consumption is low and supports the regime if it is high.

Since current consumption is already set when the public chooses its action, it decides whether to revolt based on the net present value of expected future payoffs, $\max\left\{\beta E(\theta|C,p,e); \beta\bar{\theta}\right\}$, using all available information. Here $E(\theta|C,p,e)$ is the public's belief about the current leader's type, θ, given the inference of the other players' equilibrium strategies and the observed values of C, p, and e. Recall that $\beta\bar{\theta}$ is the net present value of changing the leader.

The attentive public's strategy is defined by a threshold, C^*: it supports the regime if and only if it observes both $C \geq C^*$ and $p = e = 1$. C^* is the lowest consumption level that satisfies

$$E(\theta|C = C^*, \sigma = 1, p = e = 1) \geq \bar{\theta}.$$

Similarly, the inattentive public has its own threshold, C^{**}: it supports the regime if and only if $C \geq C^{**}$. Here C^{**} is the lowest level of consumption that satisfies

$$E(\theta|C = C^{**}, \sigma = 0) \geq \bar{\theta}.$$

3.2.1 Democracy

Equilibrium under democracy works as follows. The incompetent leader chooses $R = M = 0$ and relies on his luck: indeed, with probability $(1 - a)$ the public is inattentive so his type is not discovered. As he spends nothing on repression and manipulation, $C = Y$. Also, as there is no propaganda, cooptation, and censorship, the state and elite signals announce the leader's incompetence with probability 1.

If the public is attentive, it observes the leader's type and always keeps the competent leader and removes the incompetent one, whatever the realization of Y. If the public is inattentive, it removes the leader if $C = Y^L$ but keeps him if $C = Y^H$. Indeed, condition (**??**) implies:[6]

$$E(\theta|C = Y^L, \sigma = 0) < \bar{\theta} < E(\theta|C = Y^H, \sigma = 0). \tag{4}$$

The probability of survival is $q_1(1-a)+a$ for competent rulers and $q_0(1-a)$ for incompetent ones.

No pooling equilibrium under democracy. There cannot be an equilibrium under democracy in which the attentive public supports the leader whatever the observed C. If the public supports

[6]Using Bayes' equation, we rewrite (**??**) as: $\frac{\bar{\theta}(1-q_1)}{\bar{\theta}(1-q_1)+(1-\bar{\theta})(1-q_0)} < \bar{\theta} < \frac{\bar{\theta}q_1}{\bar{\theta}q_1+(1-\bar{\theta})q_0}$ Both inequalities always hold. Since the competent ruler is more likely to deliver high output ($q_0 < q_1$), the realization of low output signals that the ruler's quality is "below average." Therefore replacing him with an average outsider increases expected future payoffs: the left inequality holds. Similarly, observing high output, the public upgrades its expectation of the ruler's quality to "above average." Hence leader change brings lower expected future payoffs: the right inequality holds.

the ruler when $C = Y^L$, the incompetent leader with $Y = Y^H$ will spend ΔY on manipulation and achieve a non-trivial probability of hiding his type from attentive citizens. Note that inattentive citizens always stick to the same (separating) strategy: remove if $C = Y^L$ and support if $C = Y^H$. This follows from the fact that (**??**) always holds.

3.2.2 Informational Autocracy

In this equilibrium, incompetent leaders manipulate information but do not repress. Five properties characterize the equilibrium. First, competent leaders use the same strategy as above: $C = Y$, $M = R = 0$. Second, lucky incompetent leaders spend exactly $M = \Delta Y$ on manipulation. Indeed, they want to set $Y = Y^H - \Delta Y = Y^L$ in order to pool with unlucky competent leaders.[7] Third, if the public is attentive, it supports leaders with $C = Y^H$ (they are competent with probability one). It also supports those with $C = Y^L$ if it observes positive elite and propaganda signals. Fourth, unlucky incompetent leaders spend nothing on manipulation. Fifth, if the public is inattentive, it also supports leaders with $C = Y^H$, but removes those with $C = Y^L$. Indeed, inattentive citizens understand that among leaders with $C = Y^L$ the share of competent ones, $\frac{\bar{\theta}(1-q_1)}{\bar{\theta}(1-q_1)+\left(1-\bar{\theta}\right)}$, is even smaller than under democracy, $\frac{\bar{\theta}(1-q_1)}{\bar{\theta}(1-q_1)+\left(1-\bar{\theta}\right)(1-q_0)}$, which in turn is below $\bar{\theta}$.

The fourth and fifth points might not seem obvious. Indeed, since unlucky incompetent rulers are removed for sure, they are indifferent about whether to spend anything on manipulation. To see why there cannot be an equilibrium in which some set $M > 0$, suppose this is the case and so for them $C < Y^L$. Inattentive citizens now understand that if $C = Y^L$ the ruler may be either competent and unlucky or incompetent and lucky. Under some parameter values, inattentive citizens may choose to support rulers with $C = Y^L$. But this cannot be an equilibrium as unlucky incompetent rulers would then have a strict incentive to set $C = Y^L$, yielding a non-trivial probability of survival.

In this equilibrium, competent leaders survive with probability $q_1(1-a)+a$, as in Democracy. Incompetent leaders survive with probability $q_0 a\pi$. Here π is the probability that $p = e = 1$ (i.e. that the ruler silences the elite by censorship or cooptation and sends a convincing propaganda signal). This outcome is an equilibrium whenever $E(\theta|C = Y^L, \sigma = 1, p = e = 1) \geq \bar{\theta}$, or

$$\bar{\theta} \leq \frac{\bar{\theta}(1-q_1)}{\bar{\theta}(1-q_1) + \left(1-\bar{\theta}\right) q_0 \pi}$$

which simplifies to

$$\pi \leq \frac{1-q_1}{q_0} \tag{5}$$

In Appendix B, we show how the incompetent ruler allocates his resources between propaganda,

[7] Informational autocrats hide the fact that they use information manipulation. Manipulation expenditure, M, is therefore limited to the amount of resources the leader can divert without the public observing this. While the leader controls the whole output, Y, he can only secretly divert ΔY.

co-optation and censorship. Briefly, if the relative cost of censorship is very low, the leader uses censorship and propaganda; if the relative cost of censorship is very high, the leader uses co-optation and propaganda.[8] If the cost ratio is intermediate, the choice depends on the size of the elite: when it is small, the leader censors; when it is large, he co-opts. We also derive the probability of survival. The probability that lucky incompetent leaders survive when the public is attentive is:

$$\pi = \pi^*(E;a) \equiv \max\left\{\frac{\Delta Y}{a\beta\bar{\theta}E + \widehat{P}}; \widetilde{\pi}(E)\right\} \tag{6}$$

where

$$\widetilde{\pi}(E) = \begin{cases} \frac{\Delta Y - \widehat{X}E}{\widehat{P}} & \text{if } E < \frac{\Delta Y}{2\widehat{X}} \\ \frac{(\Delta Y)^2}{4\widehat{P}\widehat{X}E} & \text{if } E \geq \frac{\Delta Y}{2\widehat{X}} \end{cases} . \tag{7}$$

3.2.3 Overt Dictatorship

By Assumption 1, a competent leader never uses repression. If an incompetent ruler does repress, he sets $R = Y$, and his probability of survival is $\tau(E)$.

3.3 Regime choice

Consider now the choice of the incompetent ruler, who compares OD (probability of survival $\tau(E)$), D (probability of survival $q_0(1-a)$) and IA (probability of survival $q_0 a\pi^*(E;a)$). Recall that both $\tau(E)$ and $\pi^*(E;a)$ are decreasing functions of E. Condition (**??**) implies the IA equilibrium exists and delivers a higher probability of survival than D if and only if

$$\frac{1-a}{a} \leq \pi^*(E;a) \leq \frac{1-q_1}{q_0} \tag{8}$$

Under these conditions, the leader has a good chance of silencing the elite (by co-optation or censorship) and persuading the public with his propaganda. Let us denote as $\widetilde{E}(a)$ the solution to $\pi^*(E;a) = \frac{1-q_1}{q_0}$. Equation (**??**) implies that $\widetilde{E}(a)$ is a weakly decreasing function.

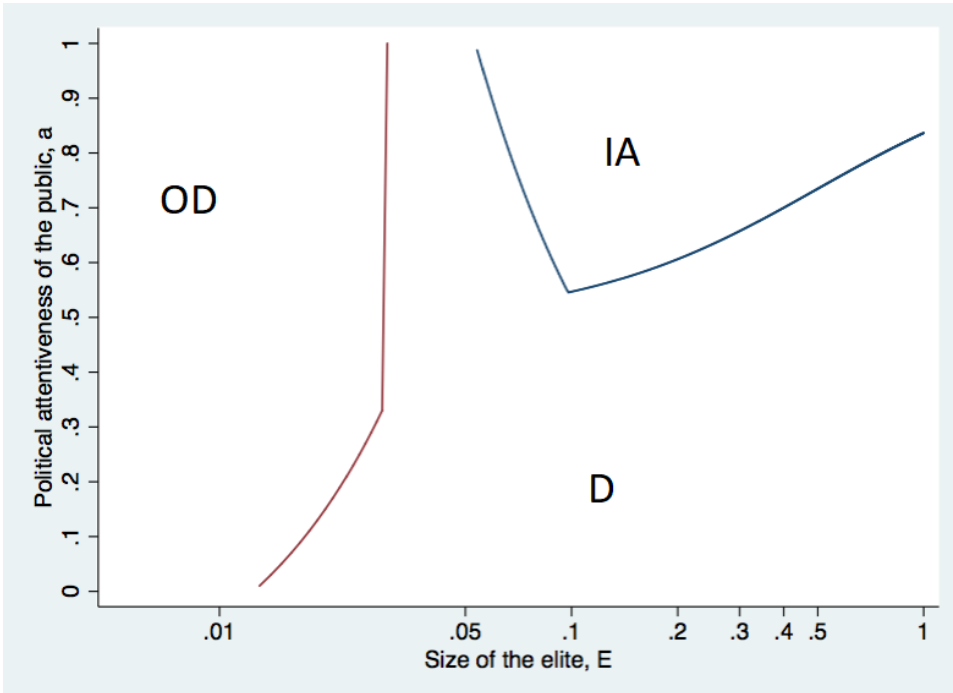
Comparing survival probabilities under different regimes and taking into account the IA equilibrium existence condition (the left-hand-side inequality in (**??**)) we obtain the following.

Proposition 1. *The choice of regime is as follows.*

(i) If the elite is small, $E < \min\left\{E^*, \widetilde{E}(a)\right\}$, then the incompetent ruler chooses OD for higher a and lower E (such that $\tau(E) > q_0(1-a)$) and D for lower a and higher E.

[8] If the ruler co-opts the elite, he does not need to censor it (the elite sends no messages). The assumption of a homogeneous elite rules out equilibria with spending on both cooptation and censorship. However, if the elite contained multiple groups with different preferences, the ruler might in equibrium co-opt some and censor others.

Figure 1: Regime choice as a function of the size of the elite, E, and the attentiveness of the public, a.



Note: Parameter values are: $q_0 = 0.4$, $q_1 = 0.67$, $\bar{\theta} = 0.5$, $\Delta Y = 1.5$, $\widehat{P} = 1.4$, $\widehat{X} = 9$, $\beta = 15$, $\tau(E) = 0.5 - 8E$, $E^* = 0.03$.

(ii) If the elite is above a certain size, $E \geq \max\left\{E^*, \widetilde{E}(a)\right\}$, then the incompetent ruler chooses IA for higher a and lower E (such that $\pi^*(E;a) > \frac{1-a}{a}$) and D for lower a and higher E.

(iii) If $E^* < \widetilde{E}(a)$ then the incompetent ruler chooses D for all $E \in \left[E^*, \widetilde{E}(a)\right]$

Without further assumptions about the form of the repression function, $\tau(\cdot)$, we cannot say for sure which regime will occur at intermediate values of E. However, Proposition **??** implies the comparative statics with regard to elite size will generally resemble those shown in Figure **??**. Assumption 1 implies that at very low E incompetent rulers prefer OD to D; for $E > E^*$, they choose D or IA over OD as mass repression no longer ensures survival. Therefore, given public attentiveness, a, growth in the size of the elite E results in a switch from OD to D or from OD to D to IA to D. At high levels of a, a path from OD directly to IA and then D is also possible for some parameter values (not shown in Figure 1).[9]

The most interesting feature of the incompetent dictator's choice is the domain of informational autocracies, IA. These are chosen at intermediate levels of the elite's size. If the elite is too small ($E < \widetilde{E}(a)$), the dictator's manipulation is—paradoxically—*too* effective. The rational (and

[9]Figure 1 presents the situation where $\widetilde{E}(a) > E^*$ for all a. If for some a $\widetilde{E}(a) \leq E^*$ then an increase in E results in the switch from OD to IA and only then to D.

Bayesian) public understands that the ruler will have silenced almost all potential critics, and so the lack of negative signals signifies little. By contrast, if E is too high then the cost of silencing all the critics becomes prohibitive, unless a is also very high. Instead, the incumbent accepts democracy, taking his chances on good economic performance and public inattention. The shape of the IA domain is as shown in Figure 1. The left-hand side frontier is a declining convex or vertical line while the right-hand side frontier (solution to the left-hand side of (**??**)) is an increasing, concave curve.[10]

4 Informational autocracy: empirical evidence

As more countries develop economically, our theory predicts an associated shift in the balance among non-democracies from overt dictatorship toward informational autocracy. That should produce a decrease in violent repression, growing efforts to conceal rather than publicize such violence, and a decline in official ideologies. We should observe the spread of democratic-seeming institutions such as elections and opposition parties, alongside more vigorous attempts to manipulate these with fraud and media control. Addressing the public, rulers we identify as informational autocrats should resemble democratic leaders rather than old-style dictators, adopting a rhetoric of performance rather than one based on fear. In modern authoritarian states, highly educated citizens should be more aware of media restrictions and less supportive of the government than their less educated peers. Finally, the types of regimes in countries around the world should map onto measures of the size of the informed elite and the level of political attentiveness in a way broadly consistent with Figure 1. In this section, we provide empirical evidence on all these points.

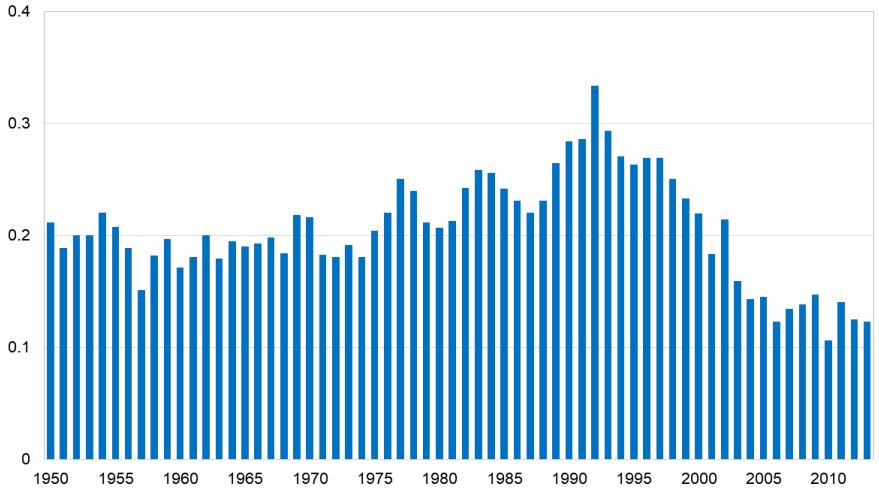
4.1 Less violence

The spread of informational autocracies has, indeed, coincided with a fall in the brutality of authoritarian regimes. Various evidence documents this trend. A first measure is the proportion of non-democracies experiencing state-sponsored mass killings, defined as "any event in which the actions of state agents result in the intentional death of at least 1,000 noncombatants from a discrete group in a period of sustained violence." After rising until the early 1990s, the rate has fallen sharply since then (Figure **??**).

Other evidence comes from a new dataset on Authoritarian Control Techniques (ACT) we created to better understand the dynamics of state violence. We collected information on all leaders who first came to power after 1945 and remained in power for at least five consecutive years in a non-democracy (defined as a country with a Polity2 score of less than six in each year). Using more than 900 sources—reports of human rights organizations, government bodies, and international

[10] As (**??**) provides a closed form solution for $\pi^*(E; a)$, we have analytical solutions for both frontiers.

Figure 2: Proportion of non-democracies with ongoing mass killings.



Sources: Polity IV; Mass Killings Database (see Ulfelder and Valentino 2008, and updated data at https://dartthrowingchimp.wordpress.com/2013/07/25/trends-over-time-in-state-sponsored-mass-killing).
Notes: "Non-democracies" are states with Polity2 scores of less than 6. A "mass killing" is "any event in which the actions of state agents result in the intentional death of at least 1,000 noncombatants from a discrete group in a period of sustained violence."

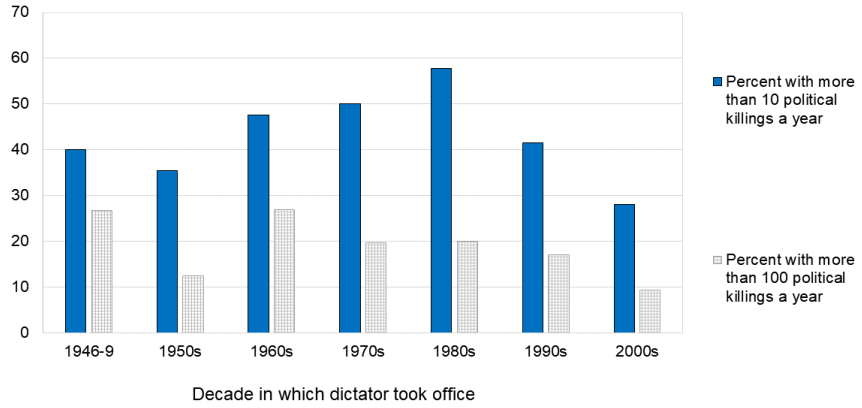
agencies; historical accounts; newspapers; truth commission reports; and other publications—we assembled best estimates of the number of state killings under each leader. By state killings, we mean all killings by agents of the state for political reasons, including assassinations, the killing of unarmed protesters, executions, and all other deaths in custody of political prisoners or detainees, even if the authorities blamed natural causes (since the state is responsible for failing to provide adequate medical care). We also include indiscriminate killings of unarmed civilians by the armed forces or security personnel as these often serve the political goal of spreading terror. Finally, we interpret political reasons broadly and also count protesters killed in demonstrations making economic demands and those killed because of their religion (e.g., persecuted sects). We do not include killings in two-sided violence. While the availability and accuracy of data on state violence are problematic and we do not attempt to make fine-grained comparisons, we believe these data can reliably distinguish countries whose records of political violence differ by orders of magnitude.[11]

Figure **??** plots the trend in political killings. Since the incidence of violence is uneven across years and the tenure of dictators varies, we compare the average number of deaths per year under each leader. If sources gave a range of estimates, we take the midpoint. To show the dynamic, we classify by the decade in which the leader first took power.

As can be seen, the estimated frequency of state political killings has fallen sharply under leaders

[11]The main bias to fear is that the spread of global media and human rights movements in recent decades will have rendered reporting progressively more comprehensive (Ulfelder 2015, Clark and Sikkink 2013). This would work against our main conjecture—that the violence of authoritarian regimes has decreased.

Figure 3: Political killings per year in non-democracies.



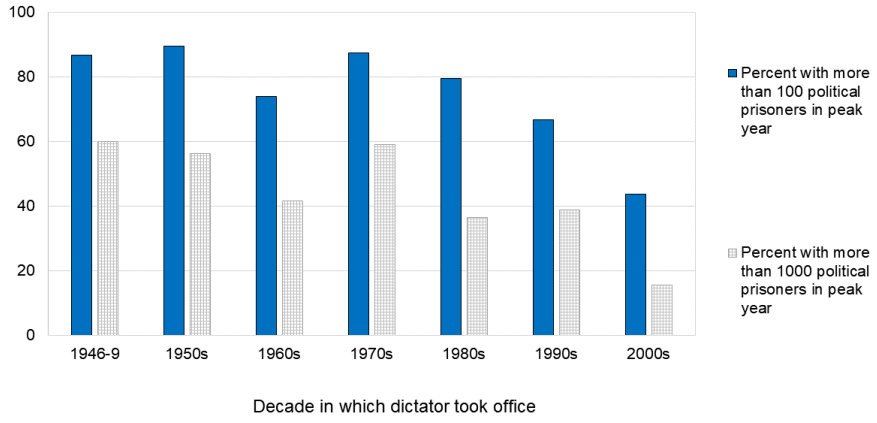
Source: Guriev and Treisman (2017).
Note: Only leaders who served at least five years in a non-democracy (Polity2 score below 6) included.

coming to office since the 1980s. Whereas 58 percent of dictators who took power in the 1980s (and lasted at least five years) had more than 10 political killings per year, that was true of only 28 percent of those starting in the 2000s. Not all early dictators were mass murderers: in each cohort, some were accused of few or no killings. And not all recent autocrats are less violent: Bashar al Assad, for instance, averages nearly 1,500 estimated killings a year. But the balance has shifted.

We can exclude two possible explanations. First, civil wars tend to increase other kinds of violence, and the frequency of civil wars has fallen since the 1990s. Figure **??** in the Appendix shows a similar graph excluding all dictators whose terms overlapped with civil wars or major insurgencies; the recent fall in violence is even more dramatic. Second, dictators who came to power in the 2000s could not have ruled for as long as some of their longest lasting predecessors. We already normalize by the leader's tenure and include only those who survived at least five years. But if very long-lasting leaders tended to commit atrocities late in their tenure, that might distort the pattern. To ensure comparability, Figure **??** includes only those leaders who served no more than 10 years (and who had left office by the end of 2015), again excluding cases of civil war. Once more, the fall in killings is more dramatic than initially: the proportion with more than 10 political killings per year now falls from 58 to 17 percent.

We also collected data on the number of political prisoners and detainees held under each authoritarian leader. We focus on the year in which the reported number in jail for political reasons was highest since complete annual counts were not available. We include detentions of anti-government protesters if they were held for more than a few hours. Again, such data—derived from multiple

Figure 4: Political prisoners and detainees in dictator's peak year.



Source: Guriev and Treisman (2017).
Note: Only leaders who served at least five years in a non-democracy (Polity2 score below 6) included.

sources, including human rights groups, historical accounts, newspapers, truth commissions, and other documents—are highly approximate and we focus only on comparisons in which cases differ by orders of magnitude.

Figure **??** shows that the share of authoritarian leaders who hold large numbers of political prisoners or detainees has fallen markedly since the 1970s. Whereas 58 percent of those who took office in the 1970s (and lasted at least five years) held more than 1,000 political prisoners in their peak year, this was true of only 16 percent of those who came to office in the 2000s.

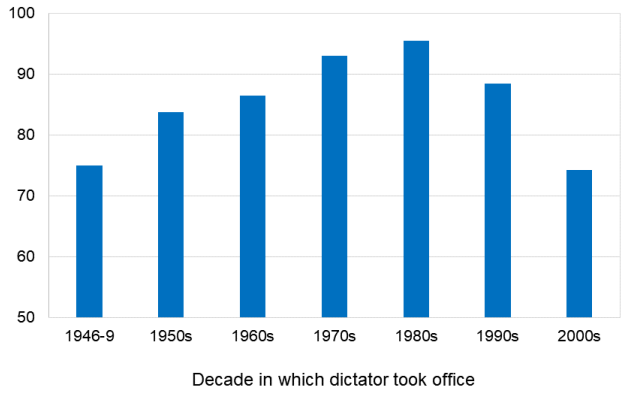
Finally, although allegations of torture of political prisoners or detainees remain extremely common, their frequency has also fallen. Seventy-four percent of dictators taking office in the 2000s (and surviving at least five years) were alleged by human rights groups, historians, or other sources to have tortured political dissidents, compared to 96 percent of those taking office in the 1980s (Figure **??**). This is doubly surprising given the increased scope of human rights monitoring, which should make the data for recent decades more comprehensive.[12]

Anecdotal evidence illustrates how some dictators have substituted less brutal techniques for open repression. Early on, Singapore's dictator Lee Kuan Yew detained more than 100 political prisoners, but later he pioneered low-violence methods. In an interview, he recalled how, after the Tiananmen Square massacre, he had lectured China's leaders:

> I said later to [then Premier] Li Peng, "When I had trouble with my sit-in communist

[12] We do not include torture of ordinary criminal suspects. Nor can we verify whether torture actually took place. However, the decreased frequency of allegations suggests in itself that dictators are increasingly eager to avoid a reputation for abuses.

Figure 5: Percentage of dictators with alleged torture of political prisoners or detainees.



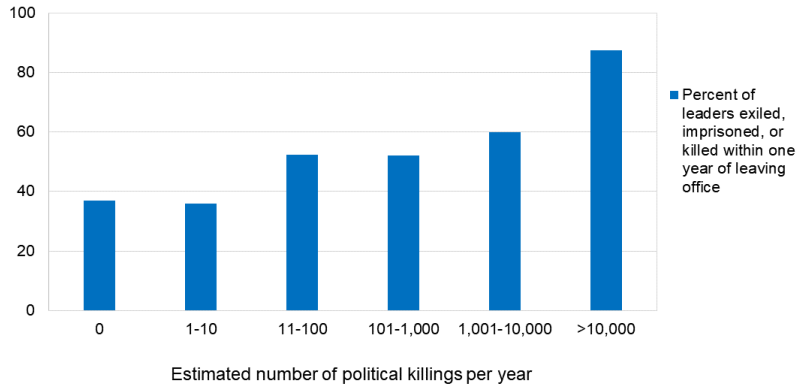
Source: Guriev and Treisman (2017).
Note: Only leaders who served at least five years in a non-democracy (Polity2 score below 6) included.

> students, squatting in school premises and keeping their teachers captive, I cordoned off the whole area around the schools, shut off the water and electricity, and just waited. I told their parents that health conditions were deteriorating, dysentery was going to spread. And they broke it up without any difficulty." I said to Li Peng, you had the world's TV cameras there waiting for the meeting with Gorbachev, and you stage this grand show. His answer was: We are completely inexperienced in these matters (Elegant and Elliott 2005).

Peruvian President Fujimori's intelligence chief, Vladimiro Montesinos, underwent a similar conversion. The regime brutally crushed the Sendero Luminoso insurgency and Montesinos organized death squads. However, he later came to favor indirect methods. When an aide suggested using death threats against a television magnate, he replied: "Remember why Pinochet had his problems. We will not be so clumsy" (McMillan and Zoido 2004, p.74). Instead, he stripped the tycoon of Peruvian citizenship, letting regulations against foreign media ownership do the rest (Ibid., p.85).

Instead of long sentences for dissidents, many rulers now favor short detentions interspersed with amnesties. Unlike his brother Fidel, who jailed some for more than 10 years, Cuba's Raoul Castro holds dissidents for just a few days, enough to intimidate without attracting attention (Amnesty International 2012). Authorities in Russia and Morocco use preventative short-term detentions to disrupt opposition events. Related techniques include house arrest, job loss, and denial of housing, educational opportunities, or travel documents—all of which can be cast as non-political.

Figure 6: Violent repression and post-tenure fate of authoritarian leaders.



Sources: Guriev and Treisman (2017), Goemans et al. (2009).
Note: Only leaders who served at least five years in a non-democracy (i.e. country with Polity2 score below 6), who had left office by the end of 2013, and who did not die a natural death within 6 months of stepping down included. Categories rounded (e.g., "1-10" = 0.51-10.49).

One consequence of decreased violence may be to improve the dictator's odds of retiring safely. We cannot make strong causal claims, but our data are consistent with this. Among leaders of non-democracies who left office between 1946 and 2013 after serving at least five years, the probability of exile, imprisonment, or death within a year of exit correlated positively with the scale of political killing under the leader's rule (Figure **??**). This probability was 46 percent for those who had held political prisoners, but just 14 percent for those who had not, and 48 percent for those accused of torturing political detainees, compared to 26 percent for those not accused of this. (Of course, we cannot exclude the possibility that violence increases both the odds of punishment after stepping down and the odds of surviving indefinitely in office, which would lead to censoring of our data.)

4.2 Violence concealed

In many autocracies, leaders publicize their brutality to deter future opposition or energize supporters. From medieval monarchs to the Afghan Taliban, rulers have staged show trials and bloody public executions of "traitors" and "heretics." Table **??** details a few 20th Century examples.

By contrast, in informational autocracies violence can puncture the dictator's image, prompting a spiral of protest and insider defections. In Ukraine in 2000, the airing of a tape that seemed to implicate President Kuchma in a journalist's killing sparked demonstrations that ultimately led to the country's "Orange Revolution." In 1980s Poland, the murder by the security services of a popular priest, Father Popieluszko, had a similar effect (Bloom 2013, p.354). More generally, among

Table 1: Dictators who publicized their political violence: selected examples

Benito Mussolini (Italy, 1922-43)	Advocated violence to "transform the Italians from a bunch of undisciplined, chattering 'mandolin players' into fearsome, conquering warriors." They needed "bastone, bastone, bastone [the club, the club, the club]" (Ebner 2011, pp.13-14). "By the time of Italy's involvement in the Second World War, there were concentration camps, political prisons, work houses, confinement colonies, and sites of internment scattered throughout the entire Italian peninsula" (Ebner 2011, p.2).
Josef Stalin (USSR, 1924-53)	Show trials used to deter and intimidate in the 1930s. In 1937, Stalin ordered the security service to organize "two to three open show trials in each district" and to publish reports of the executions in the local press (McLoughlin and McDermott 2003, p.42).
Rafael Trujillo (Dominican Republic, 1930-61)	"[A]bductions under Trujillo were typically public affairs, as official spies patrolling the capital in their black Volkswagen beetles created the sensation that Trujillo was always watching." The corpse of one executed rebel "was paraded in a chair throughout the province and his peasant supporters were forced to dance with his remains" (Derby 2009, pp.2-3).
Antonio Salazar (Portugal, 1932-68)	"[P]assersby on the street in front of police headquarters were allowed to hear the screams of detainees subjected to both bluntly crude and exquisitely refined forms of torture" (Birmingham 1993, p.162).
Adolf Hitler (Germany, 1933-45)	Violence deliberately public. On *Kristallnacht* in 1938, 191 synagogues set on fire by Storm Troopers and 91 murdered in the streets (Gilbert 1986).
Francisco Franco (Spain, 1939-75)	Used a special sentence *garotte y prensa* ("strangulation by garotte with press coverage") to punish political enemies, intensify their families' suffering, and deter others (Preston 2003, p.42).
Boleslaw Bierut (Poland, 1944-56)	"The dates of some [political] trials were fixed to coincide with various elections so that the propaganda effect was maximized" (Paczkowski 1999, p.378).
Ahmad bin Yahya (Yemen, 1948-62)	Had 40 rebels "beheaded by swords on the football field in Taiz." Had the heads of executed 'traitors' "hung on the branches of trees as a warning" (Roucek 1962, pp.312-3).
Mao Zedong (China, 1949-76)	During the Cultural Revolution, political victims were humiliated and tortured before crowds. "10,000 are said to have watched as Ba Jin, China's most famous contemporary novelist, was forced to kneel on broken glass. Thousands watched, too, at the execution of 28-year-old Yu Luoke" (Thurston 1990, p.154). As Mao said: "One cannot not kill; one cannot kill too many; kill a few, scare them. Why should we fear a bit of shock? We want to be shocking. Also, if we kill wrongly, the dead cannot come back to life" (Mao 1964).
Francois Duvalier (Haiti, 1957-71)	In August 1964, for three days a headless corpse was propped up in a chair at a busy downtown intersection in Port au Prince, with a sign hung on the mutiliated body identifying it as a "renegade" (Natanson 1966).
Fidel Castro (Cuba, 1959-2008)	Public executions of political opponents by firing squad (Clark 2011).
Modibo Keita (Mali, 1960-68)	Tuareg population forced to attend executions and applaud (Boilley 2012, p.341).
Ferdinand Marcos (Philippines, 1965-86)	"The roughly 2,500 'salvagings' [extrajudicial executions] committed by Marcos's security forces had a purposefully public character: victims' corpses—mutilated from torture—were commonly displayed as an example for others not to follow" (Hutchcroft 2011, p.565).
Mobutu Seso Seke (1965-97)	"Challengers, both imagined and real, often paid with their lives, like the four former Cabinet ministers whom Mr Mobutu had publicly hanged before 50,000 spectators six months after he took office" (French 1997).
Macias Nguema (Equatorial Guinea, 1968-79)	Macias "celebrated Christmas Eve in 1977 by ordering the shooting and hanging of 150 prisoners in the national soccer stadium. During the spectacle, loudspeakers blared a recording of 'Those Were the Days'" (Lamb 1987, p.106).
Siad Barre (Somalia, 1969-91)	Obligatory attendance at public executions (Africa Watch 1990, p.122).
Muammar Gaddafi (Libya, 1969-2011)	Addressing the General People's Congress in Tripoli, Colonel Gaddafi was quoted deriding those who run over their political enemies with cars or poison them. "We do not do that. He whom we have executed we have executed on television" (Amnesty International 1987, pp.247-8).
Idi Amin (Uganda, 1971-79)	Executed a cross-section of the Ugandan elite, from government ministers and judges to diplomats, church leaders, university rectors, and business executives. "Their killings were public affairs carried out in ways that were meant to attract attention, terrorize the living and convey the message that it was Mr. Amin who wanted them killed" (Kaufman 2003)
Juan Bordaberry, Aparicio Mendez, Gregorio Alvarez (Uruguay, 1973-1985)	"In Uruguay, interrogation sessions were devised not only to physically and psychologically degrade each prisoner but to send a chilling signal to all ... political opposition. [Torture victims] were returned to society so they could exhibit to others the horrors of their ordeals" (Pion-Berlin 1995, p.85).
Muhammad Zia-ul-Haq (Pakistan, 1977-88).	Political prisoners were "publicly flogged ... by bare-chested wrestlers" (Talbot 2009, p.250), "with loudspeakers relaying the cry of the person being whipped" (International Commission of Jurists 1987, p.84). President Zia: "Martial Law should be based on fear" (quoted in Noman 1989, p.33).
Saddam Hussein (Iraq, 1979-2003)	"In a 1992 attempt to control market forces, Saddam Husain detained 550 of Baghdad's leading merchants on charges of profiteering; 42 of them were executed, their bodies tied to telephone poles in front of their shops with signs around their necks that read 'Greedy Merchant'" (Makiya 1998, p.xvi). Army deserters were branded on the forehead.
Kim Jong-il (North Korea, 1994-2011)	Public executions. "In October 2007, a factory boss in South Pyongon Province was reportedly executed by firing squad in front of a stadium crowd of 150,000; he was condemned for making international phone calls on 13 phones he had installed in a factory basement" (Johnson and Zimring 2009, p.362).

Table 2: Selected non-political offences with which opposition members have been charged

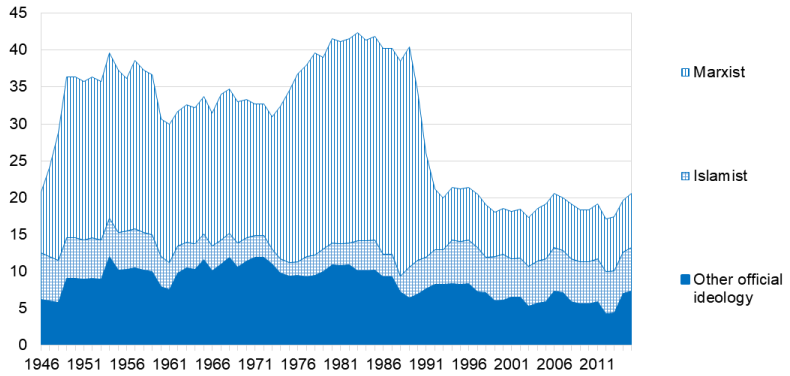
Russia under Vladimir Putin	– defrauding companies (MacFarquhar and Nechepurenko 2017) – stealing street art (MacFarquhar and Nechepurenko 2017) – illegal elk hunting (MacFarquhar and Nechepurenko 2017)
Venezuela under Hugo Chávez	– corruption (Reuters 2008)
Turkey under Recep Tayyip Erdoğan	– using a fake health report to avoid military service (Gokoluk 2007).
Malaysia under Mohathir Mohamad and Najib Razak	– sodomy (Doherty 2015).
South Korea under Chun	– disrupting traffic (Greitens 2015, pp.225-6) – interfering with police investigations (Greitens 2015, pp.225-6)
Morocco under Mohammad VI	– adultery (Amnesty International 2016, p.257-8) – public drunkenness (Amnesty International 2016, p.257-8) – robbery (Amnesty International 2016, p.257-8) – forming a criminal gang (Amnesty International 2016, p.257-8)
China since 1978	– swindling (Woodman and Ping 1999, p.225) – hooliganism (Woodman and Ping 1999, p.225) – soliciting prostitutes (Roberts 2017, p.70)

the 46 cases in 1989-2011 in which a government's violent response to an unarmed protest caused more than 25 deaths, the crackdown catalyzed domestic mobilization in 30 percent and prompted security force defections in 17 percent (Sutton, Butcher, and Svensson 2014). Such repression backfired more often in countries with higher income and where the opposition had its own media.

Those—usually in the security forces—who prefer a regime of raw repression sometimes commit violent acts to compromise their leader, hoping to compel a switch from information manipulation to blatant force. This also shows why an incompetent security apparatus can be dangerous for a dictator. After troops shot dead the Philippine opposition leader Benigno Aquino at Manila Airport, President Marcos could not deny complicity. This murder ignited the "People's Power" movement that eventually split Marcos' military support and triggered his overthrow.

Informational autocrats use various tricks to camouflage those acts of repression they still commit. One is to prosecute dissidents for non-political—preferably embarrassing—crimes. The Romanian defector Ion Pacepa quotes Nicolae Ceausescu instructing his security chief on how to use "inventiveness and creativity" to neutralize dissidents. "We can arrest them as embezzlers or speculators, accuse them of dereliction of their professional duties, or whatever else best fits each case. Once a fellow's in prison, he's yours" (Pacepa 1990, pp.144-5). Lee Kuan Yew berated his Malaysian counterpart Mahathir Mohamad for arresting the opposition leader Anwar Ibrahim in 1998 under the Internal Security Act rather than for some ordinary crime (Pereira 2000). Table 2 lists various non-political offenses that recent dictators have used to charge political opponents.

Figure 7: Percentage of non-democracies with an official ideology.



Source: Guriev and Treisman (2017).

4.3 Ideology

Many past autocrats sought to impose comprehensive ideologies. In totalitarian systems, these were holistic conceptions of man and society that legitimized the dictator's rule and required personal sacrifices (Linz 2000, p.76). They decisively rejected capitalist democracy. Some non-totalitarian autocrats also adopted guiding doctrines. Reactionaries constructed worldviews based on Catholic teachings. Leftists combined Marxism with indigenous elements.

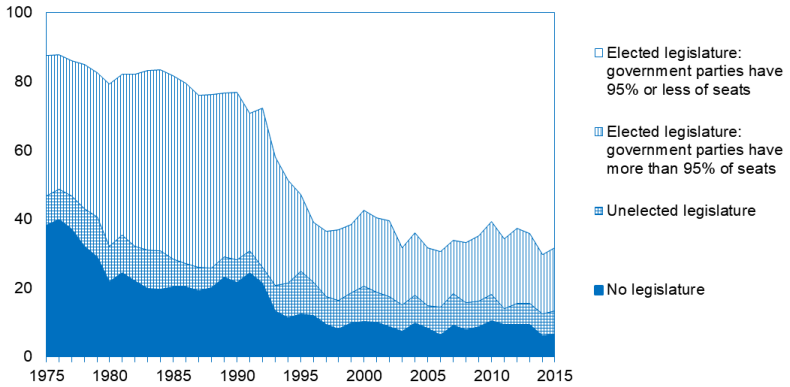
Almost all such ideologies defined opponents of the regime as evil and justified harsh measures against them. We see their use as aimed, at least in part, at motivating state agents to violently punish opposition. Thus, although for simplicity we do not model this explicitly, one can view ideology as a common complement of repression.

Informational autocracts, eschewing mass repression, have less need for ideology. Although often critical of the West, they rarely reject democracy per se, merely insisting that it evolve within their unique conditions. For Orbán that means "illiberal democracy," for Putin "sovereign democracy." Many have no ideology at all. Those that do—for instance, Hugo Chávez, with his populist "Chavismo"—use it to signal commitment to social causes, rather than to control citizens' thought.

We collected data on which non-democratic regimes had an official ideology during the post-war period. By far the most frequent was some form of Marxism.[13] We also counted the number of Islamist non-democracies, understood as regimes that privilege Islamic law over secular law on a

[13]We coded regimes as Marxist if the government was dominated by a communist party or if the leader publicly said he was a Marxist.

Figure 8: Proportion of non-democracies with legislatures of different types, 1975-2015.



Sources: Cruz, Keefer, and Scartascini (2016).
Notes: "Non-democracies" are countries with Polity2 scores of less than 6.

broad range of issues. A residual category, "other ideologies," contains more exotic alternatives such as Ba'athism, Nasserism, Pancasila, and Kemalism.

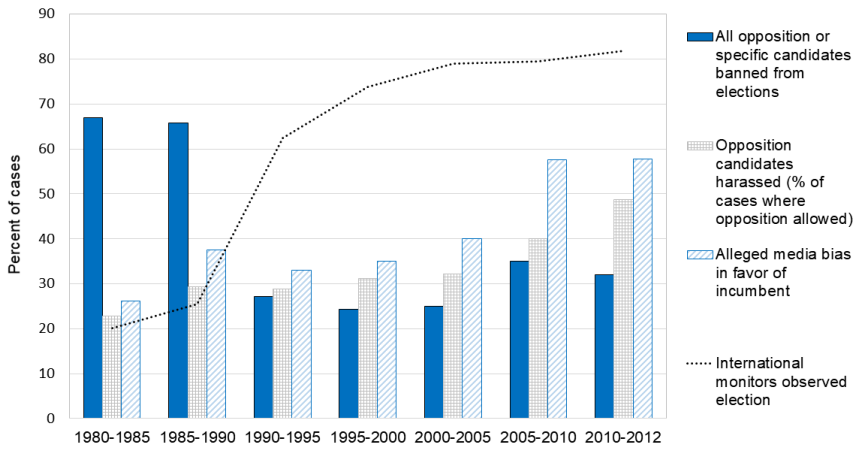
Figure 7 shows the share of non-democracies with an official ideology. From 42 percent in 1983, the frequency dwindles to around 20 percent in the 1990s and 2000s. This reflects a sharp drop in Marxist regimes (from 28 percent to about 7 percent), although "other ideologies" also lost ground. Islamism has increased, but only from around 2 percent in the mid-1970s to 6 percent in 2015.

4.4 Mimicking democracy

Overt dictatorships should have little use for ostensibly democratic institutions such as legal opposition parties, popularly elected parliaments, and partially free presidential elections. Such institutions complicate decision-making and could help opposition actors coordinate. In fact, such institutions have multiplied over the past 30 years. Figure **??** shows the sharp increase in the number of non-democracies that had elected parliaments not completely dominated by pro-government parties. Whereas in 1975 almost half of non-democracies had no elected legislature at all, by 2015 more than two thirds had parliaments in which non-government parties had at least a token presence.

Over time, more and more authoritarian leaders have been taking office by election rather than by military coup or some other irregular path. Between the 1970s cohort and the 2000s cohort of dictators (who remained in office at least five years), the percentage that were originally elected

Figure 9: How authoritarian regimes manipulate elections, 1980-2015.



Sources: Hyde and Marinov (2012).
Note: Based on elections in countries that in previous year had Polity2 score less than 6.

rose from 14 to 56 percent (Guriev and Treisman 2017). This, too, may make for a more peaceful retirement. Again, we cannot make strong causal claims, but the evidence is consistent. Among dictators stepping down between 1946 and 2013 (after at least five years in power), more than half of those who had *not* come to power through election were either exiled, imprisoned or killed within one year. Among those who had been elected, only about one third suffered any of these fates.

While totalitarian states also mobilize citizens to vote in ritual elections, most authoritarian states today seek to render their elections more credible. Rather than banning opposition parties outright—thus revealing a lack of confidence—they permit opposition but then harass candidates and exploit their media control to ensure large victories (Figure **??**). To boost external and internal legitimacy, they invite international monitors, who tend to focus on the immediate pre-election period rather than on longer-term measures that disadvantage challengers.

4.5 Rhetoric of performance rather than violence

4.5.1 Speech data.

Addressing the general public, old-style dictators seek to instill anxiety, prompting citizens to rally behind the nation's protector-in-chief. Informational autocrats aim for something different: a reputation for competence. We sought evidence on this in the speeches of different types of leaders.

Which to take as exemplars of the various categories? Our selection was determined by a mix of theory and data availability. We chose leaders: (a) whom the historical or current literature

considered important, and (b) for whom we could find a sufficient number of appropriate speeches. To identify informational autocrats, we focus on the level of repression: our cases are all leaders of non-democracies under whom there were fewer than five state political killings a year and no more than 100 political prisoners at the peak. These include Vladimir Putin (Russia), Rafael Correa (Ecuador), Hugo Chávez (Venezuela), and Nursultan Nazarbayev (Kazakhstan).[14] We also include Lee Kuan Yew, using only speeches from his later years in office, when the number of political prisoners was well below 100 (although early in his tenure 130 were reported). We see Lee as evolving from a relatively moderate overt dictator to a pioneer of informational autocracy.

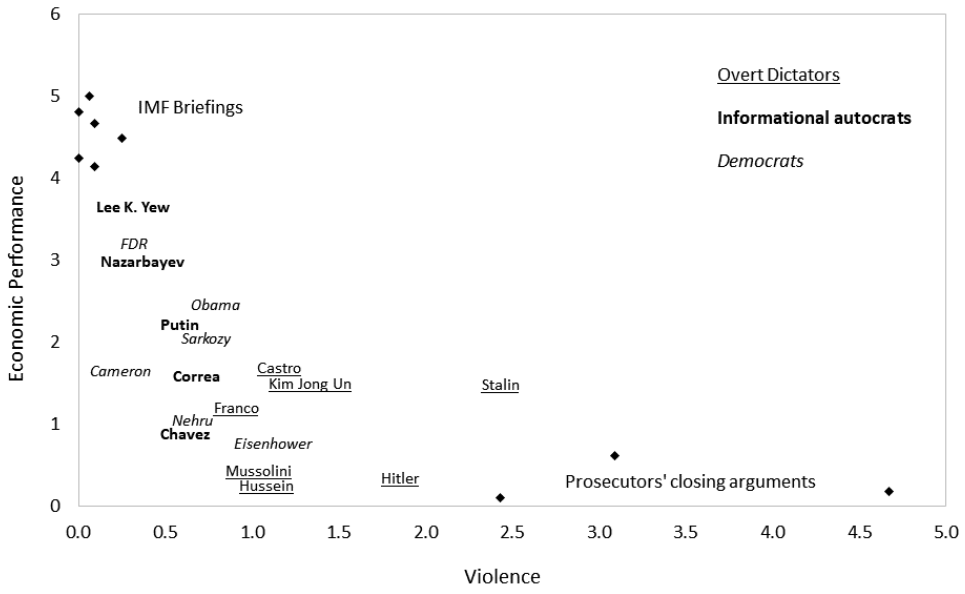
We chose speeches directed at the general public rather than at the elite or specific subgroups of citizens. Thus, we focus on those broadcast nationwide by radio or television. We exclude speeches made during wars, at party meetings, or outside the country, as well as those aimed primarily at an international audience. Similarly, we use addresses to the parliament only when these were broadcast nationally and when better materials were unavailable. Such speeches, although they do communicate to the public, may also incorporate strictly legislative business. We also exclude interviews or press conferences where topics were chosen by the interviewers rather than the leader. However, in several cases (Putin, Eisenhower) we used the leader's answers to questions from citizens in televised call-in or town-hall-meeting events (of course, dropping parts spoken by questioners or hosts). Although the questioners—like interviewers—help to set the agenda in such shows, the range of issues is usually broad and provides the leader considerable freedom to accomplish his rhetorical objectives. (In addition, the leader's team may vet questions.)

One format that targets the general public is the campaign speech; we often included these. Another is the regular radio or TV speech. For President Obama, we used a random sample of 40 (out of his roughly 400) weekly radio addresses. For Roosevelt, we used the 13 "Fireside Chats" before the outbreak of World War II. For Chávez, we randomly selected six of 378 episodes of "Allo Presidente," a rambling, multi-hour TV show, in which he chatted ex tempore with ministers and members of the public, dropping all parts not spoken by Chávez himself. Similarly, we used 12 recent episodes of Ecuadoran President Rafael Correa's public broadcast "Enlace Ciudadano" (Citizens' Link) that were available online, again excluding parts not spoken by him.

It might seem desirable to analyze texts in the speaker's language. However, this complicates comparisons since each analysis employs a dictionary relating words to particular topics, and it is not clear that the different language dictionaries fully correspond. Therefore, we use English translations of each non-English speech (an official one, where available). For most, we could find high quality English versions, but for a few leaders far more numerous appropriate speeches were available in the original language. While the best machine translation programs remain imperfect for most tasks, word count text analysis is arguably an exception. When estimating word frequencies,

[14] Polity IV codes the Putin regime a non-democracy only from 2008, so we used texts only from that year on.

Figure 10: Rhetoric of economic performance and violence.



Source: Authors' calculations; speeches and texts listed in Tables A1 and A2.
Notes: Lee Kuan Yew (1980-90), Putin (2008-).

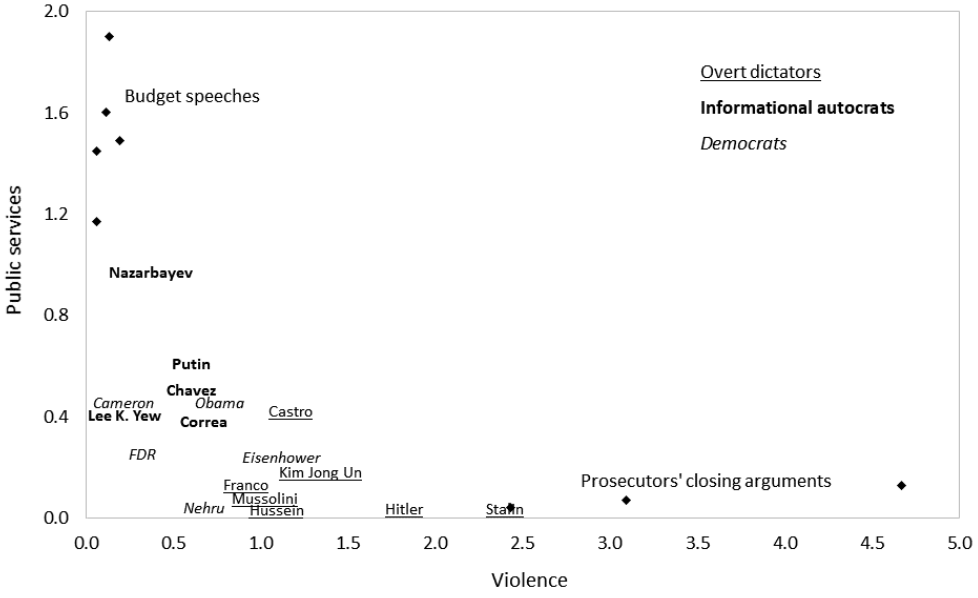
the order of words, punctuation, grammar, and so on do not matter, so the "software needs only to correctly translate the significant terms in the original document" (Lucas et al. 2015, p.7). As recommended by Lucas et al., we use Google Translate to obtain English versions of texts in the few relevant cases (Franco, Chávez, Correa). (Sources of all speeches used are in Table A1.)

4.5.2 Analysis

We use a dictionary method of text analysis to compare the frequency of certain words in the speeches of different leaders (see Grimmer and Stewart 2013). Our hypothesis is that appeals to the general public by informational autocrats will in key respects resemble those of democrats more than those of overt dictators. We focus on three aspects. Overt dictators will use concepts and imagery related to violence (both domestic and external) to create anxiety among listeners. By contrast, informational autocrats—like democrats—will emphasize economic performance and public service provision in the attempt to convince citizens they are competent and benevolent.

Our first task was to construct dictionaries (lists of words) corresponding to these three rhetorical strategies. Since our goal was to compare the approaches of informational autocrats to those of

Figure 11: Rhetoric of public service provision and violence.



Source: Authors calculations; speeches and texts listed in Tables A1 and A2.
Notes: Lee Kuan Yew (1980-90), Putin (2008-).

overt dictators and democrats, we used the speeches of overt dictators and democrats as the sources for our dictionaries. From these speeches, we compiled lists of candidate words and their cognates under each heading. Of course, many words have multiple meanings. We therefore scanned the speeches to check how frequently a given word was used with a meaning other than the one related to the target concept. (For instance, "spending" money is relevant to economic performance and public service provision; "spending" time is not.) When we found more than two non-germane uses, we excluded the word from the list.

This produced three dictionaries (see Appendix Table **??**): violence (143 word stems; examples: death*, massacre*, war, blood, prison); economic performance (113 word stems; examples: sales, wages, wealthy, inflation, prosper*); and public service provision (28 word stems; examples: expenditure, childcare, hospitals, education, funding). We used the text analysis program LIWC2015 (Pennebaker et al. 2015) to count the frequencies of words from the respective dictionaries.

To validate the dictionaries, we used them first to analyze three sets of texts selected to contain discussions of: (a) economic performance (transcripts of six IMF briefings on the *World Economic Outlook*), (b) public service provision (budget speeches by the finance ministers of five democracies),

Table 3: Means, standard errors, and significance levels in two-tailed tests of equivalence of means.

	Violence	Economic performance	Public service provision
Overt dictators	1.33 (0.19)	0.99 (0.23)	0.12 (0.06)
Democrats	0.64 (0.13)	1.87 (0.37)	0.32 (0.07)
Informational autocrats	0.49 (0.08)	2.28 (0.48)	0.58 (0.10)
Informational autocrats vs. overt dictators	p = .005	p = .02	p = .002
Informational autocrats vs. democrats	p = .41	p = .51	p = .07

Source: Authors' calculations.
Notes: Standard errors in parentheses.

and (c) violence (closing arguments of prosecutors at the Nuremberg trial of Nazi leaders, the International Criminal Tribunal trial of former Serb leader Radovan Karadzic, and the trial of terrorist Dzhokhar Tsarnaev; all sources are in Table A2). In each case, the dictionary reliably placed the texts in the appropriate ranges on the three dimensions (see Figures A3 and A4). The only nuance was that budget speeches scored very high for both public services and economic performance, which is not in fact surprising: given the overlap in concepts and terms, they should.

Figures **??** and **??** present the results. As expected, the overt dictatorships cluster in the high violence and low economic performance and service provision parts of the graph. Stalin's public addresses have vocabulary about as violent as the prosecutor's summation in the Karadzic war crimes trial. Also as expected, the democratic leaders cluster in the low violence and high economic performance and service provision sector. Among overt dictators, Fidel Castro's rhetoric is the most oriented towards economic performance and service provision, but he still surpasses all democrats for violent imagery. Among democrats, Eisenhower is slightly unusual, with more violent rhetoric than others—a function of the intense Cold War period in which he governed.[15] Nehru spoke relatively little about service provision. These minor anomalies notwithstanding, the democrats and overt dictators mostly separate out neatly on these dimensions.

What about the informational autocrats? As can be seen, they blend in with the democrats, emphasizing economic performance and service provision rather than violence. Indeed, the leader from this selection with the most insistent discourse of economic performance is Lee Kuan Yew, who talks so much about the economy and so little about violence that he sounds almost like an IMF briefing. The leader in discourse on service provision is Kazakhstan's President Nazarbayev, whose "State of the Nation" addresses resemble democratic leaders' budget speeches.

[15] We exclude all war years, so the speeches analyzed are from after the end of the Korean War.

As Table **??** shows, we can reject at confidence level greater than p = .03 in each case that informational autocrats and overt dictators have the same level of violence, economic performance, and public service vocabulary in their speeches. Informational autocrats are indistinguishable from the democratic leaders on violence and economic performance, and actually use *more* public services vocabulary than the democrats (significant at p = .07).

4.6 Beliefs of elites and masses

A key assumption of our theory is that in informational autocracies the political beliefs of the elite and general public diverge. While the elite observes the ruler's type, incompetent incumbents can—by censoring or co-opting the elite—convince ordinary citizens that they are competent. Of course, such censorship will only work if the public does not detect it. This has two implications. First, informational autocrats should be more popular with the general public than with the elite. Second, the general public should be less aware of any censorship than the elite.

To test these predictions, we use individual level data from the Gallup World Poll (GWP) for 2006-16. This poll surveys around 1,000 respondents from each of more than 120 countries every year with broad coverage of democracies and informational autocracies.[16] As a rough proxy for membership in the informed elite, we use here a dummy for whether the respondent had completed a course of tertiary education.

4.6.1 Support of the regime

For the first prediction, we use a question which asks: "Do you approve or disapprove of the job performance of the leadership of this country?" We created a dummy for positive approval and regressed it, with a linear probability model, on a dummy for elite membership. We ran the same regression on different subsets of countries, divided up according to their regime type, controlling for country-year fixed effects and a number of individual characteristics (age, age squared, gender, and urban status), and clustering standard errors by country-year. The estimated effects of elite membership on approval are shown in Figure **??** (the full regressions are in Table **??**.)

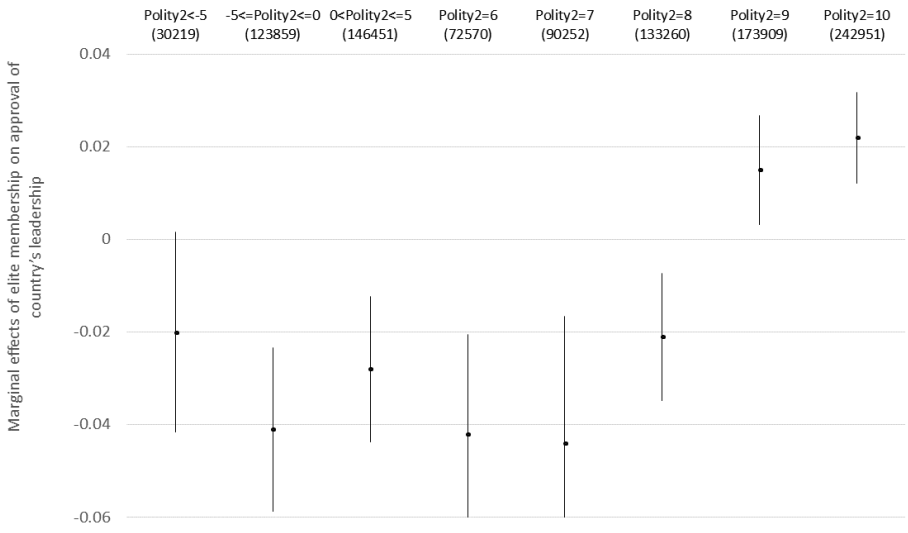
As predicted, in authoritarian states highly educated citizens proved less supportive of the national leadership than their less educated compatriots. This was not true in the consolidated democracies—states with Polity2 scores of 9 or 10—where the highly educated were *more* supportive of government, although it apparently was true in the flawed democracies rated 6 to 8.[17]

Since the highly educated tend to earn higher salaries, their lower support for leaders in au-

[16] As data are for recent years, almost all non-democracies in the GWP are informational autocracies. Coverage of the few remaining overt dictatorships is sparse: for example, there are no polls of North Korea or Syria and only one of Cuba.

[17] We also estimated the relationship for the full sample including both elite membership and its interaction with the level of democracy (see Table **??** in the appendix). The results are very similar.

Figure 12: Approval of country's leadership by informed elite vs. masses



Sources: Gallup World Poll, Polity IV, authors' calculations.
Notes: The chart reports confidence intervals for the effect of elite membership on approval of the country's leadership for subsamples defined by Polity2 score. Numbers in parentheses represent the number of observations in each subsample. The regressions include controls for individual characteristics (age, age squared, gender, urban status) and country-year fixed effects (see Table **??** in the appendix for details). Standard errors are clustered at country-year level.

thoritarian states might seem surprising.[18] But it is consistent with the notion—central to our theory—that the elite more accurately perceives the incompetence of its rulers than does the general public. As a placebo test, we checked whether the highly educated in authoritarian states also had lower life satisfaction than the general public. They did not: in democracies and non-democracies alike, higher education was associated with substantially higher life satisfaction (Table **??**). Finally, we checked whether in non-democracies higher income (or a dummy for income in the top decile of the distribution) also predicted lower approval of the country's leadership. When we included both education and income, education remained significant while income in most cases had no statistically significant effect or even a positive one (Table **??**).[19] Consistent with our argument, it is political knowledge, as proxied by higher education, that predisposes citizens in authoritarian states to opposition. Income, on the other hand, includes co-optation payments, which align certain elite members' interests with those of the informational autocrat.

[18] We estimated a Mincerian equation using GWP data (see Table **??**). Controlling for gender, age, age squared, and urban status, individuals with tertiary education earned salaries 40% higher than those with secondary education (the difference was 30% if we controlled for occupation). As shown in Table **??**, the returns to tertiary education are similar across countries with different levels of democracy (Polity2 score).

[19] By contrast, in *democracies* both education and income—even if included together—were positively related to approval.

4.6.2 Censorship

Many 20th Century dictators used censorship, like public violence, to intimidate possible opponents. The Nazis burned books in public squares and the Soviets demonstratively banned them. Pinochet stationed censors in every newspaper, magazine, radio station, and television channel (Spooner 1999, p. 89). African autocrats shuttered papers and imprisoned, exiled, or murdered their reporters (Lamb 1987, pp.245-6).

For informational autocrats, such measures would be self-defeating, exposing their need to hide the truth. Instead, they adopt less obvious techniques. Lee Kuan Yew emphasized cooptation, cultivating loyal shareholders in key media companies. Newspapers' corporate boards—supposedly independent—then did the censoring for him. When loyalty failed, he punished offending journalists with law suits. In one analyst's words: "forsaken profits and stiff legal penalties have been more effective in fostering self-censorship than earlier methods of intimidation" (Rodan 1998, p.69).

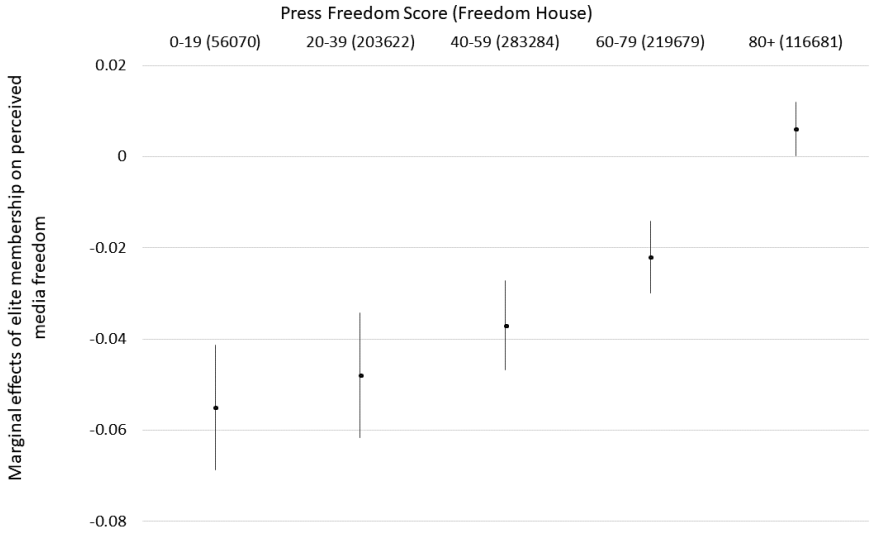
Others have acted similarly. Orbán, in Hungary, starved critical radio stations of state advertising; after their revenue plunged, they could be bought by government allies (Howard 2014). In Russia, Putin has "often relied on surrogates and economic pressure to keep editors and journalists in line" (Gehlbach 2010, p. 78). In Peru, Fujimori bribed most private media (Faiola 1999).

Besides protecting the dictator's image, such indirect methods avoid stimulating search for the censored information. In China, blocking websites outright inspires net users to "jump the great firewall," but introducing technical search friction does not (Roberts 2014). In Russia, the Kremlin enlists supposedly independent hackers and trolls to hinder opposition communication. When they do admit to censorship, informational autocrats often claim—as Russia's government does—to be protecting citizens from "extremism," "vandalism," and child pornography (Kramer 2007).

Such techniques aim to conceal the fact of censorship from the public. If they succeed, ordinary citizens should have greater confidence in media freedom than members of the elite, who experience restrictions first hand. To test this, we used another GWP question: "Do the media in this country have a lot of freedom, or not?" We created a dummy for perceived media freedom taking the value 1 if the respondent answered "yes" and 0 if she answered "no." (Respondents could also say "don't know," or refuse to answer.) Again, we regressed this on elite membership, using a linear probability model, including country-year fixed effects as well as the same individual level controls, and clustering standard errors by country-year. (Note that the country-year fixed effects control for *actual* media freedom, as well as any other country-wide influences.)

Here, we divided countries into subsamples based on actual media freedom, as estimated by Freedom House in its press freedom ratings. Where the media are free, both elite and public should perceive this, and so no perceptions gap should exist. However, as the level of freedom falls, the gap between actual freedom—as perceived by the elite—and the overly positive misperception of the

Figure 13: Perceptions of media freedom by informed elite vs. masses



Sources: Gallup World Poll, Freedom House, authors' calculations.
Notes: The chart reports confidence intervals for the effect of elite membership on perceived media freedom for five subsamples of countries, divided by their Freedom House Press Freedom Scores (0-19, 20-39, 40-59, 60-79, 80-100). We normalize the score so that 0 is perfect censorship and 100 full press freedom. Numbers in parentheses represent the number of observations in each subsample. The regressions include controls for age, age squared, gender, and urban status, as well as country-year fixed effects (see details in Table **??**). Standard errors are clustered by country-year.

manipulated public should grow. As Figure **??** shows, the data strongly confirm this expectation. For countries with high press freedom, the gap between elite and public perceptions is close to zero. However, as actual press freedom falls, the gap widens to a maximum of almost 6 percentage points. Where the press is heavily restricted, the public is—as predicted—considerably less conscious of this than are highly educated citizens.[20] In all specifications, results are in line with those in Figure **??**: the stronger is censorship, the greater is the gap between perceptions of media freedom among the elite and ordinary citizens.

4.7 Regime choice

Our model predicts that different types of regimes will occur under different combinations of E, the size of the "informed elite," and a, the political attentiveness of the general public, in roughly the pattern sketched in Figure **??**. Finding valid proxies for E and a is not straightforward. E represents the proportion of the population that can directly observe the quality of the government and can communicate to the general public through an independent media. The subgroup is defined

[20]Table **??** reports results for additional specifications, including the interaction between tertiary education and actual press freedom, and operationalizing the latter in several ways. In Appendix **??** we consider a simple model microfounding the relationship between the true and perceived media freedom; its predictions are in line with the results in Table **??**.

by a combination of accurate political information and communication skills and resources. To proxy this, we use statistics on education. As a first cut, one might use the share of the adult population with tertiary education (as we did in the previous section). While this may do for comparisons between elite and public within countries, the large differences in quality of education across countries raise problems for cross-national comparisons. For instance, in 2010 the share of the population 15 and older that had completed tertiary education in Cyprus was almost twice that in France, but we do not believe that France's "informed elite" was only half the size of that of Cyprus (Barro and Lee 2013). Moreover, since some authoritarian governments use the education system to disseminate propaganda, the quantitative indicators by themselves could be misleading.

We therefore adjust the tertiary completion data with a measure of schooling quality constructed by Hanushek and Woessmann (2009)—specifically, the share of top performing students in primary and secondary schools based on test scores on math and science. Again, this is not ideal: the quality of primary and secondary schools is less relevant for our purposes than that of higher education, but data on that were not available. At the same time, science and math scores do not capture skills and resources for political analysis and communication. Still, adjusting even imperfectly for quality reduces the risk our measure is picking up pro-regime socialization or even purchased degrees.

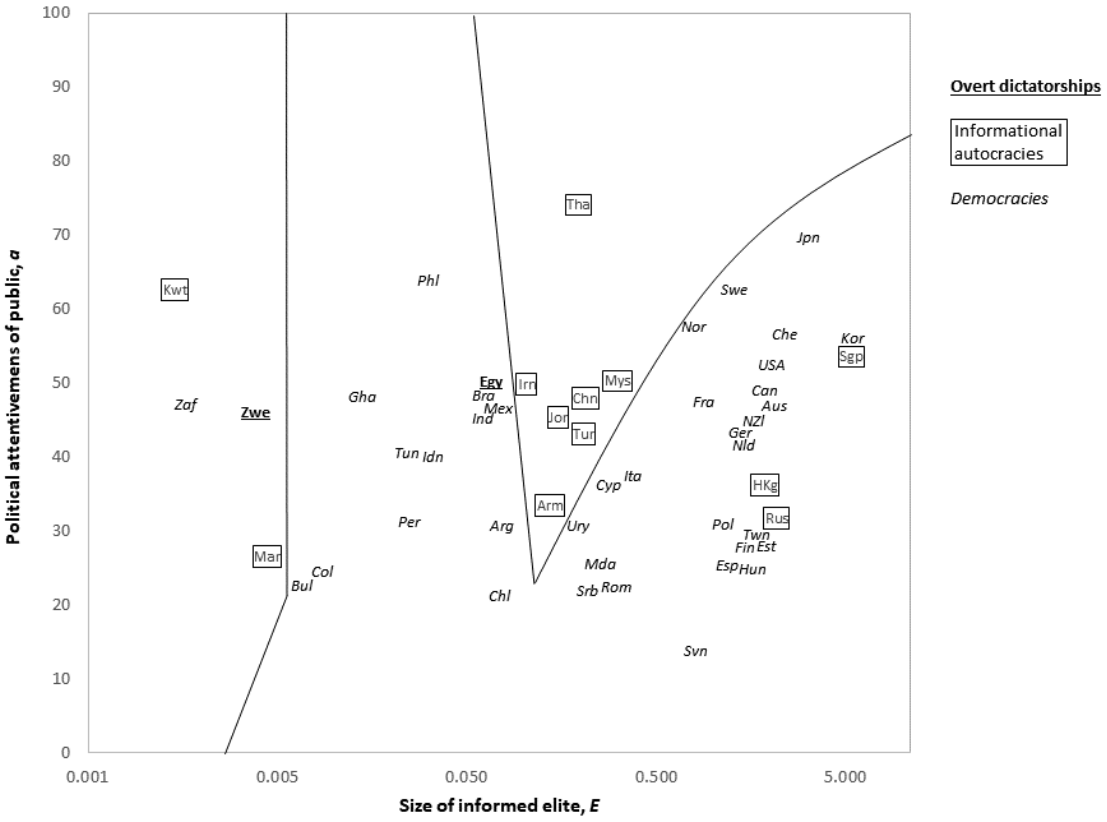
Political attentiveness is also difficult to measure. For this, we used the proportion of respondents who, in answer to a question on the World Values Survey, said that politics was "very" or "rather" important in their lives. To increase the number of available countries, we used responses from either or both of the fifth and sixth wave surveys (conducted in, respectively, 2005-9 and 2010-14), averaged together when both waves were available.[21]

Figure **??** plots our informed elite and political attentiveness proxies for all available countries. Democracies (Polity2 ≥ 6 in 2015) are in italics. Among non-democracies, we distinguish "overt dictatorships" from "informational autocracies" on the basis of state violence. Those with more than five political killings per year under the leader in office in 2015 are coded as overt dictatorships (in bold and underlined); those with fewer political killings are coded as informational autocracies (boxed). The pattern turns out to broadly fit that predicted in Figure **??**. Democracies predominate at high levels of E and low levels of a. Most of the "informational autocracies" are at intermediate levels of E and a. Zimbabwe, one of the two overt dictatorships, is in the predicted low-E zone.

However, several anomalies merit comment. The high levels and quality (in maths and science) of education in Russia, Singapore, and Hong Kong imply that these should be democracies. Two responses are possible. On the one hand, one might attribute this to inexactness of the proxy. While technical studies are, indeed, advanced in each of these places, the kind of education that produces a politically informed and engaged elite is less well developed. On the other hand, it could

[21] Figure **??** proxies for political attentiveness with the percentage of respondents who, in answer to another question, said they were "very" or "somewhat" interested in politics. Results are similar.

Figure 14: Size of the informed elite, political attentiveness of the public, and regime type.



Sources: Barro and Lee (2016), Hanushek and Woessmann (2009), Polity IV, World Values Survey.
Notes: Size of informed elite proxied by the percent of the population over 14 with completed tertiary education in 2010 multiplied by the share of top-performing students (based on average test scores in math and science, primary through end of secondary school, all years). Political attentiveness of the public is the percent of WVS respondents who said politics was "very" or "rather" important in their lives (percentages from Waves 5 (2005-9) and 6 (2010-14) averaged together as available). Democracies: Polity2 ≥ 6; overt dictatorships: Polity2 < 6 and > 5 state political killings a year under leader in power in 2015; informational autocracies: Polity2 < 6 and ≤ 5 state political killings a year under leader in power in 2015.

be not the classifications but the countries themselves that are anomalous. Given their high levels of modernization, Russia, Hong Kong, and Singapore may currently be out of equilibrium. Were Hong Kong not constrained by Beijing, it might indeed be more democratic.

Among dictatorships, Egypt under General al-Sisi has had more political violence than predicted by its moderately high educational attainments and political attentiveness. Kuwait and Morocco had less violence than predicted. In Kuwait's case, it ends up in the "overt dictatorship" range because the quality of its education on the Hanushek and Woessmann indicator is lower than in any of the other countries, including Nigeria and Zimbabwe. This may be a misclassification. Finally, South Africa, although in reality a democracy, is predicted, on the basis of its very low tertiary education level, to be an overt dictatorship.

Of course, the model is a simplification: it assumes, for instance, that the probability of good economic performance under "competent" and "incompetent" leaders is the same for all countries. In fact, this is bound to vary, which would change the location of the dividing lines for different leaders. Given this, as well as the imperfections of the proxies, the fit between predictions and reality in Figure **??** is quite impressive.

5 Conclusion

The totalitarian tyrants of the past employed mass violence, ideological indoctrination, and closed borders to monopolize power. Most authoritarian rulers also used brutal repression to spread fear. However, in recent decades a growing number of undemocratic leaders have chosen a different approach. Their goal—staying in power—remains the same. But their strategy is new. Rather than intimidating the public, they manipulate information—coopting the elite to remain silent, censoring private media, and disseminating propaganda—in order to boost their popularity and eliminate threats to their rule.

We present a theory of how such informational autocracies work and why they have recently become more common. Information manipulation prevails when the public is mobilized into politics at a time when the informed elite is large enough to make violent repression costly but not yet large enough to combat the state's dominance of the information space. Either further growth of the educated elite or a demobilization of the public can lay the ground for democratization. The logic combines the optimism of modernization theory with the pessimism of 20th Century critics of "mass society," who feared that early mobilization of unsophisticated groups into politics would leave them vulnerable to manipulation.

We demonstrate the consistency of this model with empirical evidence on the changing nature of authoritarian regimes, on the content of autocrats' speeches, and on differences between the beliefs and attitudes of members of the elite and general public. We document a decrease in violent

repression, a new determination to conceal such violence, a decline in official ideologies, and a trend toward imitating democracy while covertly manipulating the mechanisms. Moreover, the types of regimes in existence today map onto proxies for the political attentiveness of the public and the size of the informed elite much as the model predicts.

While factors associated with modernization are important drivers of regime change, they are not the only ones. We emphasize domestic factors in this paper. But global influences—the end of the Cold War, the emergence of an international movement for human rights, and advances in information technology—may also have contributed to the growing prevalence of informational autocracy. International organizations and media can, as some dictators fear, help to expand the informed elite in countries that were previously closed off. Yet interventions from outside can also rouse uninformed populations into political consciousness in ways that reinforce the strategies of today's autocrats. Whether external actors and new informational technologies do more to broaden political knowledge or to mobilize the politically unsophisticated, setting them up for manipulation, remains to be seen.

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Online Appendix

A Tables and Figures

Table A1: Speeches analyzed

Leader	Texts	Sources	Words
Adolf Hitler	Speeches broadcast by radio: – Berlin, October 14, 1933. – Hamburg (Blohm and Voss Shipyard), August 17, 1934. – Berchtesgarden Post Office, January 15, 1935. – Berlin, April 19, 1937.	Adolf Hitler: Collection of Speeches, 1922-1945. https://archive.org/details/ Moscow, 1950. Adolf Hitler Collection Of Speeches 1922-45 Domarus, Max. Hitler: Speeches and Proclamations, 1932-1945: The Chronicle Of A Dictatorship. Bolchazy-Carducci Publishers, 1988, P.887. Domarus translation	7,187
Josef Stalin	– Speech Delivered by Comrade J. Stalin at a Meeting of Voters of the Stalin Electoral Area, Moscow, December 11, 1937. – Speech Delivered by J.V. Stalin at a Meeting of the Voters of the Stalin Electoral District, Moscow, February 9, 1946.	Josef Stalin, Works, Vol. 14, Red Star Press Ltd., London, 1978. J. Stalin, Speeches Delivered at Meetings of Voters of the Stalin Electoral District, Moscow, Foreign Languages Publishing House, Moscow, 1950.	6,995
Francisco Franco	New Year's Eve Speeches, broadcast to the nation, each December from 1946-1974, translated from Spanish by Google Translate.	http://www.generalisimofranco.com/ Discursos/mensajes/00000.htm.	100,733
Benito Mussolini	– "Speech to Workers of Milan," October 6, 1934, translation by Italian Consulate in New York, Vital Speeches of the Day, 12/31/34, Vol. 1 Issue 7, pp.208-9. – "The Absurdity of Eternal Peace," before 20,000 soldiers, fascists, and peasants at the Annual War-Games, Avellino, Italy, and by radio to all parts of the nation, August 30, 1936, Vital Speeches of the Day, 10/1/36, Vol. 2 Issue 26, p.824. – "Armed Peace! With Glimpses of Things to Come," November 1, 1936, Vital Speeches of the Day, 11/15/36, Vol. 3 Issue 3, pp.76-7. – "Fascists, Nazis, Bolsheviks," English resume transcribed from the air over NBC, from Rome, August 20, 1937, Vital Speeches of the Day, 9/15/37, Vol. 3 Issue 23, pp.714-15. – "Italy's Position Today" Plebiscites for All is the Answer," Trieste, September 18, 1938 , Vital Speeches of the Day, 10/1/38, Vol. 4 Issue 24, pp.745-6.	Vital Speeches of the Day, various issues.	6,356
Saddam Hussein	Revolution Day Speeches, 1989, 1992, 1993, 1994, 1995, 1996.	Baghdad Iraq Television Network, texts translated in FBIS Daily Report.	35,788
Kim Jong Un	New Year's Addresses, 2013, 2014, 2015, 2016.	http://www.ncnk.org/resources/news-items/.	17,934
Fidel Castro	May Day Speeches, 1966, 1971, 1972, 1973, 1980, 2000, 2001, 2002, 2003, 2004, 2005, 2006 (all available after 1965).	http://lanic.utexas.edu/project/ castro/db/1966/19660502.html; http://www.cuba.cu/ gobierno/discursos.	100,739
Lee Kuan Yew	Prime Minister's National Day Television Addresses, 1980-1990.	http://www.nas.gov.sg/archivesonline /speeches/.	15,236
Vladimir Putin	Direct Line call in shows with President (or PM) Putin, 2008, 2009, 2010, 2011, 2013, 2014, 2015 (only Putin's speech).	http://en.kremlin.ru/events/ president/transcripts; http://archive.premier.gov.ru /eng/events/news/	136,182
Hugo Chávez	Six randomly selected episodes of "Aló Presidente," (out of 378), just Chávez 's parts: 8 (01/08/1999), 44 (24/09/2000), 47 (15/10/2000), 296 (30/09/2007), 307 (16/03/2008), 347 (10/01/2010); Google translated.	TodoChávez .gob.ve	192,503

Leader	Texts	Sources	Words
Rafael Correa	12 recent transcripts (2016-17) of Correa's TV show "Citizen's Link," (Enlace Ciudadano) from among recent episodes for which transcripts are published by El Comercio. Episodes 496, 502, 503, 504, 506, 508, 509, 511, 512, 513, 517, 519. Only Correa's directly quoted parts.	http://www.elcomercio.com	36,431
Nursultan Nazarbayev	State of the Nation Addresses 2000, 2001, 2004, 2005, 2006, 2008, 20011, 2012, 2014, 2015.	http://www.akorda.kz/en/ addresses/addressesofpresident/	57,660
Franklin Roosevelt	First 13 "Fireside Chats," 1933-1938. All that were broadcast before the outbreak of WWII.	http://millercenter.org/president/ speeches	39,461
Dwight D. Eisenhower	– Radio and Television Address to the American People Following Decision on a Second Term, February 29, 1956. – Radio and Television Address Opening the President's Campaign for Re-Election September 19, 1956. –Television Broadcast: "The People Ask the President." October 12, 1956 (only Eisenhower's words). – Radio and Television Report to the American People on the Developments in Eastern Europe and the Middle East October 31, 1956. – Second Inaugural Address, January 1957. – Address on Little Rock, Arkansas, 1957. – Radio and Television Address to the American People on Science in National Security, November 7, 1957. – Radio and Television Report to the American People on the NATO Conference in Paris. December 23, 1957. – Remarks at the National Food Conference, February 24, 1958. – Statement by the President following the Landing of United States Marines at Beirut. July 15, 1958. – Remarks Upon Signing the Proclamation Admitting Alaska to the Union and the Executive Order Changing the Flag of the United States, January 3, 1959. – Radio and Television Report to the American People: Security in the Free World, March 16, 1959. – Remarks Upon Signing the Proclamation Admitting Hawaii to the Union and the Executive Order Changing the Flag of the United States, August 21, 1959. – Remarks Upon Arrival at Andrews Air Force Base, May 20, 1960. – "Farewell Address," January 1961.	http://www.americanrhetoric.com/ speeches/dwightdeisenhowerfarewell.html; http://www.presidency.ucsb.edu; http://historymatters.gmu.edu/d/6335/.	29,155
Jawaharlal Nehru	– "A Historic Day." Message to the Nation, January 26, 1950. – "The General Elections." Speech broaueast from All India Radio, Delhi, November 22,1951. – "Hopeful Prospects." Broadcast from All India Radio, Delhi, June 14, 1952. – "Laying the Foundations." Broadcast from All India Radio, Delhi, December 31, 1952. – "A Great Challenge." Broadcast from All India Radio, Delhi, January 24, 1951. – "To Our Services." Broadcast from All India Radio, Delhi, December 7, 1949. – "A Half-Century Ends." Broadcast from All India Radio, Delhi, December 31, 1950. – "The S.R.C. Report." Broadcast ot the nation, October 9, 1955. – "Appeal for Good Will." Broadcast from New Delhi, January 16, 1956.	Jawaharlal Nehru. Jawaharlal Nehru's Speeches, Vol. 2 (1949-53), and Vol. 3 (March 1953-1957), Delhi: Publications Division, Ministry of Information and Broadcasting, Government of India, 1954 and 1958. All from 1949 to 1957 that were broadcast to the public.	13,531
Barack Obama	Weekly radio addresses (40 randomly selected from out of c.400)	https://www.whitehouse.gov/ briefing-room/weekly-address	24,480

Leader	Texts	Sources	Words
David Cameron	– Scottish Independence Speech in Aberdeen, 15 September 2014. – JCB Staffordshire: Prime Minister's speech, 28 November, 2014. – Campaign Manifesto Speech, April 14, 2015. – "Rebalancing the Economy," 20 April, 2015. – "Making Work Pay," 22 April, 2015. – Chatham House Speech on Europe, 10 November 2015.	http://www.politics.co.uk/comment-analysis/2015/04/14/david-cameron-manifesto-speech-in-full; https://www.politicshome.com/news/uk/economy/news/63341/david-cameron-speech-rebalancing-economy; https://www.politicshome.com/news/uk/economy/news/63265/david-cameron-speech-making-work-pay; https://www.gov.uk/government/ speeches/; http://www.independent.co.uk/ news/uk/scottish-independence/scottish-independence-full-text-of-david-camerons-no-going-back-speech-9735902.html.	22,805
Nicolas Sarkozy	President Sarkozy's New Year's Greetings for 2009 to 2013.	http://www.ambafrance-uk.org; http://franceintheus.org/spip.php?article3103.	4,418

Table A2: Texts used for dictionary validation

Text	Source
Australia 2016-17 Budget Speech	http://budget.gov.au/2016-17/content/speech/html/speech.htm
India 2017-18 Budget Speech	http://indiabudget.nic.in/bspeecha.asp
South Africa 2017 Budget Speech	https://www.oldmutual.co.za/docs/default-source/markets/budget-for-south-africans/budgetspeech2017.pdf?sfvrsn=0
Trinidad and Tobago 2017 Budget Statement	http://www.finance.gov.tt/wp-content/uploads/2016/09/Budget-Statement-2017-for-web-r1.pdf
UK 2017 Budget Speech	https://www.ft.com/content/0b0dfdde-03fb-11e7-aa5b-6bb07f5c8e12
Transcripts of the Press Conferences on the Release of the World Economic Outlook (Oct 2015, Jan 2016, Apr 2016, Oct 2016, Jan 2017, Apr 2017)	www.imf.org/en/news/articles
Prosecution Closing Statement, Trial of Radovan Karadzic	http://www.icty.org/case/karadzic/4#trans
Robert J. Jackson, Closing Arguments for Convictions of Nazi War Criminals (Nuremberg)	https://www.roberthjackson.org/wp-content/uploads/2015/01/Closing_Argument_for_Conviction_of_Nazi_War_Criminals.pdf
Closing Argument, Trial of Dzhokhar Tsarnayev	http://thebostonmarathonbombings.weebly.com/uploads/2/4/2/6/24264849/day_59_trial_day_closing_argument_may_13_2015_unfiled.pdf

Source: Authors.

Table A3: Dictionaries used in speech analysis

Violence
dead, death*, deadly, casualt*, die, died, dies, dying, exterminat*, annihilat*, fatal*, funeral*, holocaust*, kill*, massacre*, mourn*, murder*, slaughter*, war, warfare*, wars, warring, smash*, rout, routed, routs, routing, strike, struck, harass*, conflict*, hostil*, weapon*, gun, guns, gunned, battle, battles, armed, , hurt, hurts, harm, harmed, harms, assault*, fight*, fought, aggress*, attack*, clash*, oppress*, destroy*, destruct*, prison*, jail*, punish*, enslave*, slave*, prey, blood*, bleed*, bled, martyr, martyrs, martyred, armies, army, pain, painful, pains, invade*, invasion, violence, violent, explode*, explos*, bomb*, crush*, wound*, injur*, combat*, persecut*, tyranniz*, eradicat*, skirmish*, soldier*, conquer*, cannon*, terror, terrorism, terrorist*, atrocity, atrocities, brutal*, cruel*, torment*, bayonet*, genocid*, starv*, siege*, surrender*, shatter*, armament*, tanks, artillery, mortar*, armor*, conquest, militar*, crusade*, criminal*, crime*, arrest*, prosecut*, navy, enemy, enemies, enmity, captive, scourge, mutilat*, perish*, ravage*, barbar*, police*, vanquish*, victim*, hostage*, bullet*, weapon*, butcher*, demise, troops, plunder*, hatred*, suffer*, brigade*, detention, liquidation, mistreat*, imprison*, incarcerat*, hostage*
Economic performance
affordable, auditor, auditors, borrow*, bought, budget*, buy*, cheap, cheaper, currenc*, customer*, debt*, deposit*, discount*, dollar, dollars, earnings, econ*, recession*, rent*, retail*, revenue*, richer, riches, richest, salar*, sale, sales, saving*, sell, selling, shop, sold, store, trade*, trading , wage, wages, wealth, wealthier, wealthiest, wealthy, exchang*, expenses, expensive, fees, financ*, fund, income*, insurance, invest, investment*, invested, invests, lease*, lend, lending, loan*, market*, merchant*, money*, monopol*, mortg*, pension*, pesetas, poverty*, price*, prici*, profit*, purchas*, salary, stock, commerc*, growth, job, jobs, product*, industry, industries, industrial, industrializing, industrialization, manufactur*, labour*, labor, labored, laboring, labors, produce*, consum*, factory, factories, remunerat*, goods, employ*, unemploy*, inflation, agricultur*, agrarian, tariff, ration, rationing, export*, import, imports, imported, output, entrepreneur*, efficien*, prosper*, deficit, farming, cultivation
Public service provision
expenditure*, medical, medicine*, education*, housing, school, schools, universities, university, classroom*, childcare, hospital, hospitals, doctor*, maternity, infrastructure, literacy, administration, transportation, retirement, funding, disabled, revenue*, budget*, fees, fund, insurance, pension*

Source: Authors.

Table A4: Approval of country's leadership by subsamples.

	Polity2<-5	-5≤Polity2≤0	0<Polity2≤5	Polity2=6	Polity2=7	Polity2=8	Polity2=9	Polity2=10
Elite	-0.020*	-0.041***	-0.028***	-0.042***	-0.044***	-0.021***	0.015**	0.022***
	(0.011)	(0.009)	(0.008)	(0.011)	(0.014)	(0.007)	(0.006)	(0.005)
Female	0.034***	0.034***	0.023***	0.020***	0.023***	0.010***	0.003	-0.007**
	(0.006)	(0.005)	(0.004)	(0.005)	(0.005)	(0.004)	(0.003)	(0.003)
Age/100	-0.734***	-0.188***	-0.212***	-0.302***	-0.326***	-0.534***	-0.454***	-0.705***
	(0.108)	(0.056)	(0.060)	(0.067)	(0.058)	(0.055)	(0.054)	(0.049)
AgeSq/10^4	0.927***	0.329***	0.303***	0.397***	0.474***	0.714***	0.555***	0.815***
	(0.139)	(0.068)	(0.064)	(0.075)	(0.064)	(0.059)	(0.062)	(0.048)
Small Town	-0.026*	-0.002	-0.023***	-0.026**	-0.007	-0.021***	-0.026**	-0.006
	(0.014)	(0.009)	(0.007)	(0.012)	(0.010)	(0.007)	(0.010)	(0.005)
Suburb of Large City	-0.083**	-0.041**	-0.050***	-0.092***	-0.030**	-0.058***	-0.011	-0.009
	(0.036)	(0.017)	(0.012)	(0.015)	(0.014)	(0.011)	(0.013)	(0.006)
Large City	-0.025*	-0.066***	-0.065***	-0.070***	-0.083***	-0.056***	-0.034***	-0.013**
	(0.014)	(0.011)	(0.009)	(0.014)	(0.010)	(0.008)	(0.010)	(0.006)
Observations	30219	123859	146451	72570	90252	133260	173909	242951

Standard errors in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Source: Gallup World Poll, Polity IV, authors' calculations.

Notes: Standard errors are clustered at the level of country-year. Country-year fixed effects are included but not reported. Elite: dummy for tertiary education.

Table A5: Approval of country's leadership, full sample, interaction terms.

	(1)	(2)	(3)	(4)	(5)	(6)
Elite	-0.034***	-0.019***	-0.032***	-0.024***	-0.043***	-0.073***
	(0.005)	(0.003)	(0.006)	(0.003)	(0.005)	(0.008)
Elite×Polity2	0.004***					
	(0.001)					
Elite×Polity2=10		0.044***				
		(0.006)				
Elite×Polity2>5			0.036***			
			(0.006)			
Elite×PressFreedom				0.052***	0.034***	0.118***
				(0.005)	(0.003)	(0.013)
Observations	1013471	1013471	1013471	1038016	1038016	1038016

* p<0.1, ** p<0.05, *** p<0.01

Source: Gallup World Poll, Polity IV, Freedom House, author's calculations.

Notes: Standard errors are clustered at the level of country-year. Controls for individual characteristics (age, age squared, gender, size of the settlement), country-year fixed effects are included but not reported. Elite: dummy for tertiary education. Measures of press freedom: column (4) – dummy for fully free press, column (5) – dummy for fully or partially free press, column (6) – Freedom House Press Freedom score normalized to 0-1 with 0 corresponding to full censorship and 1 corresponding to full media freedom.

Table A6: Life satisfaction by subsamples.

	(1) Polity2<-5	(2) -5≤Polity2≤0	(3) 0<Polity2≤5	(4) 6≤Polity2≤8	(5) Polity2=9	(6) Polity2=10
Tertiary Education	0.439***	0.618***	0.592***	0.660***	0.758***	0.558***
	(0.024)	(0.032)	(0.028)	(0.021)	(0.022)	(0.019)
Female	0.122***	0.064***	0.023	0.035***	0.015	0.092***
	(0.021)	(0.022)	(0.018)	(0.012)	(0.014)	(0.012)
Age/100	-3.619***	-2.374***	-2.049***	-4.120***	-3.341***	-4.105***
	(0.406)	(0.310)	(0.251)	(0.246)	(0.448)	(0.226)
AgeSq/10^4	3.346***	1.758***	0.688**	2.841***	1.757***	3.269***
	(0.455)	(0.333)	(0.279)	(0.255)	(0.397)	(0.224)
Small Town	0.167***	0.187***	0.174***	0.171***	0.139***	-0.075***
	(0.047)	(0.036)	(0.032)	(0.026)	(0.045)	(0.014)
Suburb of Large City	0.265***	0.342***	0.322***	0.360***	0.481***	-0.080***
	(0.057)	(0.048)	(0.046)	(0.033)	(0.075)	(0.020)
Large City	0.431***	0.390***	0.382***	0.425***	0.430***	-0.038*
	(0.046)	(0.043)	(0.040)	(0.026)	(0.046)	(0.022)
Observations	193284	196774	173215	340778	198632	331881

Standard errors in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Source: Gallup World Poll, Polity IV, authors' calculations.

Notes: Standard errors are clustered at the level of country-year. Country-year fixed effects are included but not reported. The dependent variable is self-reported life satisfaction on a 10-point scale.

Table A7: Mincer equation.

	(1) Log Income	(2) Log Income	(3) Top 10% Income	(4) Top 10% Income
Tertiary Education	0.809***	0.654***	0.227***	0.202***
	(0.012)	(0.014)	(0.005)	(0.007)
Secondary Education	0.419***	0.372***	0.089***	0.084***
	(0.008)	(0.009)	(0.003)	(0.004)
Female	-0.079***	-0.088***	-0.024***	-0.027***
	(0.004)	(0.006)	(0.001)	(0.002)
Age/100	0.104	-0.314***	0.088***	-0.288***
	(0.070)	(0.112)	(0.021)	(0.033)
AgeSq/10^4	0.349***	0.758***	-0.002	0.446***
	(0.073)	(0.144)	(0.024)	(0.037)
Small Town	0.193***	0.133***	0.037***	0.034***
	(0.011)	(0.013)	(0.003)	(0.004)
Suburb of Large City	0.379***	0.284***	0.081***	0.080***
	(0.016)	(0.019)	(0.004)	(0.006)
Large City	0.429***	0.345***	0.107***	0.112***
	(0.016)	(0.018)	(0.005)	(0.006)
Occupational dummies	No	Yes	No	Yes
Observations	1243713	385323	1264008	386115
Adjusted R^2	0.111	0.159	0.060	0.086

Standard errors in parentheses

* p<0.1, ** p<0.05, *** p<0.01

Source: Gallup World Poll, author's calculations.

Notes: Standard errors are clustered at the level of country-year. Country-year fixed effects are included but not reported. In columns (3) and (4) the dependent variable is dummy for belonging to top 10 percent of income distribution within a given country-year. In columns (2) and (4) dummies for 12 occupations are included (but not reported).

Table A8: Mincer Equation by Subsamples.

	Polity2<-5	-5≤Polity2≤0	0<Polity2≤5	6≤Polity2≤8	Polity2=9	Polity2=10
Tertiary Education	0.735***	0.886***	0.743***	0.931***	0.839***	0.679***
	(0.049)	(0.027)	(0.033)	(0.024)	(0.025)	(0.020)
Secondary Education	0.388***	0.457***	0.379***	0.483***	0.396***	0.309***
	(0.037)	(0.020)	(0.018)	(0.013)	(0.015)	(0.014)
Female	-0.027***	-0.064***	-0.062***	-0.110***	-0.080***	-0.117***
	(0.010)	(0.010)	(0.010)	(0.008)	(0.015)	(0.006)
Age/100	-0.770***	0.325*	0.268*	0.324***	0.082	1.222***
	(0.172)	(0.178)	(0.145)	(0.111)	(0.140)	(0.188)
AgeSq/10^4	0.837***	-0.045	-0.096	0.115	0.439***	-0.510***
	(0.207)	(0.243)	(0.165)	(0.141)	(0.159)	(0.195)
Small Town	0.299***	0.176***	0.212***	0.209***	0.176***	0.061***
	(0.042)	(0.021)	(0.027)	(0.014)	(0.023)	(0.009)
Suburb of Large City	0.580***	0.399***	0.452***	0.465***	0.457***	0.134***
	(0.066)	(0.028)	(0.045)	(0.020)	(0.038)	(0.010)
Large City	0.601***	0.484***	0.476***	0.495***	0.427***	0.178***
	(0.069)	(0.025)	(0.030)	(0.017)	(0.024)	(0.012)
Observations	159509	172391	151111	266394	171648	277073

Standard errors in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Source: Gallup World Poll, Polity IV, author's calculations.

Notes: Standard errors are clustered at the level of country-year. Country-year fixed effects are included but not reported. The dependent variable is logarithm of income.

Table A9: Approval of country's leadership by subsamples controlling for education and income.

	(1) Polity2<-5	(2) -5≤Polity2≤0	(3) 0<Polity2≤5	(4) 6≤Polity2≤8	(5) Polity2=9	(6) Polity2=10
Tertiary Education	-0.016	-0.046***	-0.027***	-0.029***	0.003	0.019***
	(0.013)	(0.009)	(0.008)	(0.006)	(0.006)	(0.005)
Log Income	0.012**	0.001	0.003	-0.011***	0.024***	0.016***
	(0.005)	(0.003)	(0.003)	(0.002)	(0.004)	(0.002)
Female	0.034***	0.036***	0.026***	0.017***	0.004	-0.006**
	(0.006)	(0.005)	(0.004)	(0.003)	(0.004)	(0.003)
Age/100	-0.783***	-0.197***	-0.233***	-0.475***	-0.450***	-0.690***
	(0.130)	(0.064)	(0.064)	(0.039)	(0.056)	(0.054)
AgeSq/10^4	0.937***	0.348***	0.329***	0.641***	0.539***	0.798***
	(0.166)	(0.078)	(0.068)	(0.043)	(0.064)	(0.053)
Small Town	-0.022	-0.004	-0.026***	-0.011*	-0.030**	-0.006
	(0.016)	(0.010)	(0.007)	(0.006)	(0.012)	(0.005)
Suburb of Large City	-0.033**	-0.049***	-0.063***	-0.052***	-0.019	-0.011*
	(0.014)	(0.017)	(0.012)	(0.008)	(0.014)	(0.006)
Large City	-0.026**	-0.068***	-0.072***	-0.061***	-0.045***	-0.013*
	(0.012)	(0.012)	(0.009)	(0.006)	(0.012)	(0.007)
Observations	21883	105771	126728	229947	150472	201269

Standard errors in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Source: Gallup World Poll, Polity IV, author's calculations.

Notes: Standard errors are clustered at the level of country-year. Country-year fixed effects are included but not reported.

Table A10: Perceived media freedom by subsamples.

	Media Freedom Score				
	0-19	20-39	40-59	60-79	80-100
Elite	-0.055***	-0.048***	-0.037***	-0.022***	0.006**
	(0.007)	(0.007)	(0.005)	(0.004)	(0.003)
Female	0.050***	0.022***	0.015***	0.002	-0.001
	(0.006)	(0.004)	(0.003)	(0.002)	(0.002)
Age/100	-0.708***	-0.213***	-0.240***	-0.218***	-0.040
	(0.112)	(0.042)	(0.034)	(0.040)	(0.036)
AgeSq/10^4	0.930***	0.317***	0.346***	0.348***	0.118***
	(0.138)	(0.047)	(0.037)	(0.042)	(0.034)
Small Town	-0.026**	-0.010	-0.015***	-0.002	-0.011**
	(0.013)	(0.006)	(0.005)	(0.005)	(0.005)
Suburb of	0.004	-0.045***	-0.041***	-0.008	-0.014***
Large City	(0.031)	(0.009)	(0.007)	(0.007)	(0.005)
Large City	-0.047***	-0.053***	-0.044***	-0.022***	-0.025***
	(0.011)	(0.007)	(0.005)	(0.007)	(0.008)
Observations	56070	203622	283284	219679	116681

Standard errors in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Source: Gallup World Poll, Freedom House, author's calculations.

Notes: Standard errors are clustered at the level of country-year. Country-year fixed effects are included but not reported. Elite: dummy for tertiary education. Freedom House Press Freedom score is normalized to 0-100 with 0 corresponding to perfect censorship and 100 to perfect media freedom.

Table A11: Perceived media freedom, full sample, interaction terms.

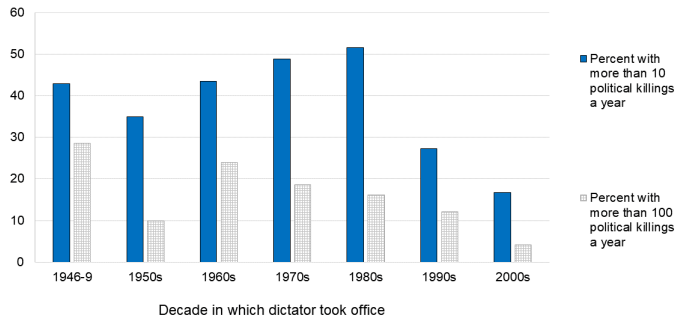
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Elite×Censorship	-0.043***	-0.043***	-0.054***	-0.038***	-0.071***	-0.101***	-0.106***	-0.098***
	(0.004)	(0.005)	(0.005)	(0.006)	(0.005)	(0.010)	(0.008)	(0.011)
Elite		0.000		-0.017***		0.017***		-0.004
		(0.003)		(0.003)		(0.004)		(0.003)
Observations	864330	864330	864330	864330	864330	864330	864330	864330

* p<0.1, ** p<0.05, *** p<0.01

Source: Gallup World Poll, Freedom House, author's calculations.

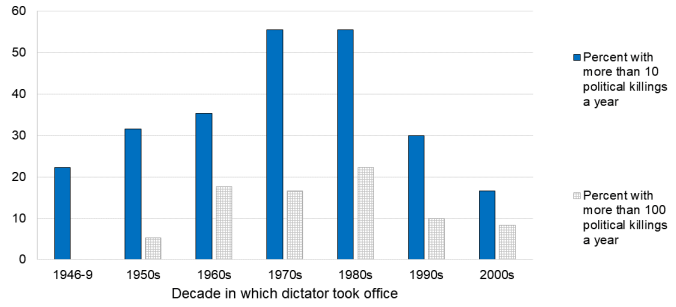
Notes: Standard errors are clustered at the level of country-year. Controls for individual characteristics (age, age squared, gender, size of the settlement), country-year fixed effects are included but not reported. Elite: dummy for tertiary education. Measures of censorship: columns (1)-(2) – dummy for non-free or partially free press, columns (3)-(4) – dummy for non-free press, columns (5)-(6) – Freedom House Press Freedom score normalized to 0-1, columns (7)-(8) – Freedom House Press Freedom score normalized to 0-1 squared. See Appendix **??** for the microfoundations of the relationship between true media freedom and the gap in perceived media freedom between elites and masses.

Figure A1: Political killings per year in non-democracies: cases with no civil war or major insurgency.



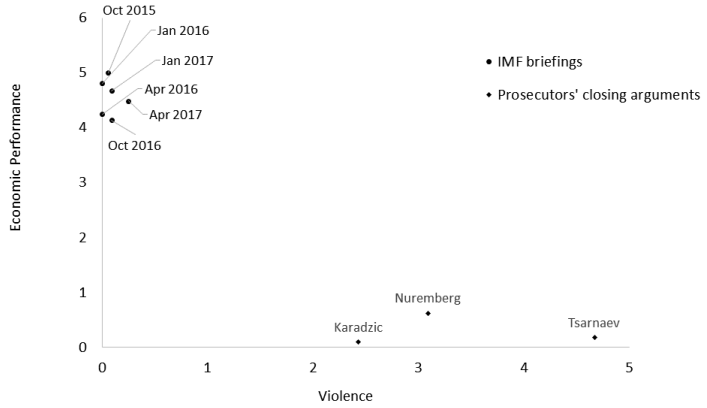
Source: Guriev and Treisman (2017).
Note: Only leaders who served at least five years in a non-democracy (Polity2 score below 6) included.

Figure A2: Political killings per year in non-democracies: cases with no civil war or major insurgency, just leaders in office 5-10 years.



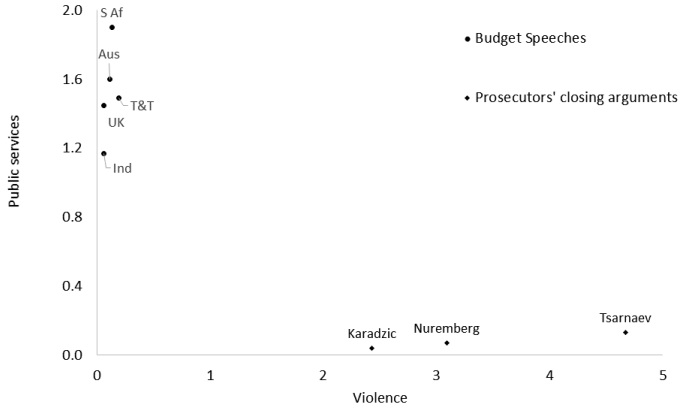
Source: Guriev and Treisman (2017).
Note: Only leaders who served at least five years in a non-democracy (Polity2 score below 6) included.

Figure A3: Validating the dictionaries 1: economic performance and violence.



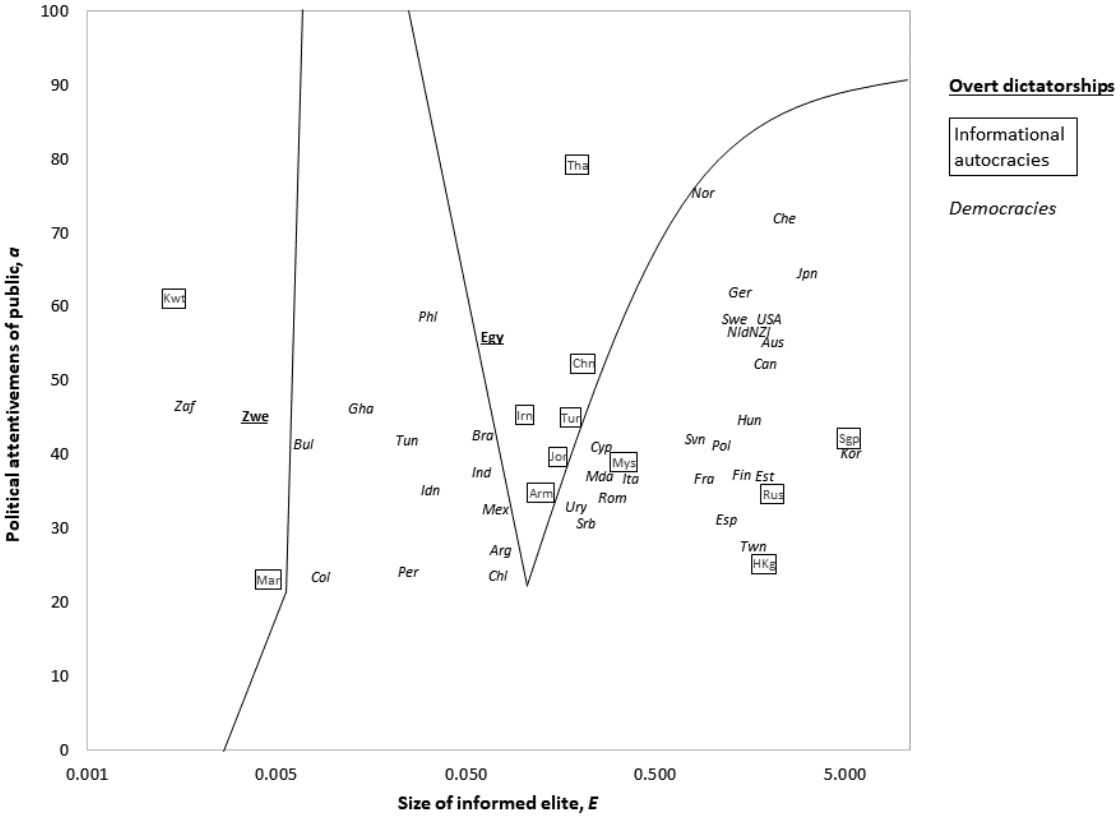
Source: Authors' calculations; texts listed in Table A2.

Figure A4: Validating the dictionaries 2: public service provision and violence.



Source: Authors' calculations; texts listed in Table A2.

Figure A5: Size of the informed elite, alternative measure of political attentiveness of the public, and regime type.



Sources: Barro and Lee (2016), Hanushek and Woessmann (2009), Polity IV, World Values Survey.
Notes: Size of informed elite proxied by the percent of the population over 14 with completed tertiary education in 2010 multiplied by the share of top-performing students (based on average test scores in math and science, primary through end of secondary school, all years). Political attentiveness of the public is the percent of WVS respondents who said they were "very" or "somewhat" interested in politics (percentages from Waves 5 (2005-9) and 6 (2010-14) averaged together as available). Democracies: Polity2 ≥ 6; overt dictatorships: Polity2 < 6 and > 5 state political killings a year under leader in power in 2015; informational autocracies: Polity2 < 6 and ≤ 5 state political killings a year under leader in power in 2015.

B Analysis of IA equilibrium

In this section we solve for the optimal choice of the incompetent ruler with $Y = Y^H$ in the IA equilibrium. This choice depends on the cost of censorship, $\widehat{X}$, relative to the elite's opportunity cost of co-optation, $\beta\bar{\theta}$. We also find the probability of successful silencing of the elites (**??**).

Proposition 2. *In the IA equilibrium, the choice of an incompetent ruler with $Y = Y^H$ is as follows:*

(i) If the cost of censorship is high relative to that of cooptation, $\frac{\widehat{P}\widehat{X}}{a\beta\bar{\theta}\Delta Y} > 1$, the leader uses cooptation and propaganda in equilibrium for all E.

(ii) If the cost of censorship is low relative to that of cooptation, $\frac{\widehat{P}\widehat{X}}{a\beta\bar{\theta}\Delta Y} < \frac{1}{4}$, the leader uses censorship and propaganda in equilibrium for all E.

(iii) For intermediate values of the parameters, $\frac{\widehat{P}\widehat{X}}{a\beta\bar{\theta}\Delta Y} \in [\frac{1}{4}; 1]$, there exists an $\widehat{E}$ such that for $E < \widehat{E}$ the ruler uses censorship and propaganda, and for $E > \widehat{E}$ the ruler uses cooptation and propaganda.

In order to prove the Proposition we proceed with the analysis of the elite's and ruler's choices.

B.1 Elite's choice.

The elite chooses whether to get co-opted ($n = 1$) or not ($n = 0$). It infers the probability, Π_n, of the regime surviving given the leader's strategy P, X, B.

If the elite agrees to be co-opted, each member gets $b + C + \Pi_1\beta\theta + (1 - \Pi_1)\beta\bar{\theta}$. If it decides to reject the cooptation payment and send a true signal, its payoff is $C + \Pi_0\beta\theta + (1 - \Pi_0)\beta\bar{\theta}$. The probabilities Π_1 and Π_0 are to be calculated given the leader's choice of censorship and propaganda spending.

The trade-off is straightforward. By joining the opposition, the elite forgoes the co-optation payment, b, but decreases the odds of the incumbent staying in power by $(1 - \Pi_n)$. The net per capita returns to regime change are $\beta\bar{\theta} - \beta\theta$.

Therefore, the elite joins the opposition if and only if $b < (\Pi_1 - \Pi_0)\left(\beta\bar{\theta} - \beta\theta\right)$. It is immediately clear that if the true type is high, $\theta = 1$, the right-hand side is negative and nobody wants to join the opposition—even if there is no co-optation reward. Hence, a competent leader does not need to offer any reward.

If the leader is incompetent, $\theta = 0$, then the elite prefers to join the opposition if and only if the co-optation rewards are sufficiently low: $b < b^*$. Here

$$b^* \equiv \beta\bar{\theta}\left[\Pi_1 - \Pi_0\right]. \tag{9}$$

Therefore, if the leader is incompetent,

$$n(b) = \mathbf{1}\{b \geq b^*\}. \tag{10}$$

The respective total cooptation payment is $B^* = b^* E$.

B.2 Dictator's choice: censorship, rewards, propaganda

The ruler learns his type, θ, observes Y, and chooses the strategies: censorship (X), rewards (B), and propaganda (P), so as to maximize his probability of staying in power. Given his choice of B, X, and P, the expected probability of staying in power depends on the ruler's type.

If the ruler is incompetent and lucky ($Y = Y^H$), the probability of staying in power is:

$$a\left[1 - (1-x)(1-n)\right]\Lambda(P)\mathbf{1}\{C \geq C^*\} \tag{11}$$

where $n = n(b)$ is a function of b determined by (**??**).

Equation (**??**) implies that returns to censorship increase in propaganda and decrease in co-optation rewards. In other words, censorship and co-optation are substitutes, and propaganda is complementary to both. This simply reflects the fact that co-optation and censorship are alternative methods of preventing the elite from informing the public about the ruler's type (if the elite is co-opted, there is no need for censorship; if the elite is censored, there is no need for co-optation). Propaganda applies to the other signal—the one sent by the ruler himself.

The ruler wants to maximize the probability, π, of getting both a positive propaganda signal and a positive elite signal, $p = e = 1$, subject to the budget constraint $P + X + B = \Delta Y$.

There can be two cases. First, the ruler can choose a reward that is not sufficient for cooptation, $B < B^*$ (so $n = 0$). It is immediately clear that it makes no sense to offer any positive rewards, $B > 0$, hence $B = 0$. In this case, the ruler solves

$$\max_{P+X=\Delta Y} \frac{PX}{\widehat{P}\widehat{X}E}.$$

The optimal choice depends on E. If the size of the elite is sufficiently small, $E < \frac{\Delta Y}{2\widehat{X}}$, then it is optimal to implement perfect censorship, $x = 1$, by setting $X = \widehat{X}E$ and $P = \Delta Y - \widehat{X}E$. If the elite is large, $E \geq \frac{\Delta Y}{2\widehat{X}}$, then $P = X = \frac{1}{2}\Delta Y$ and the probability of survival is $\frac{(\Delta Y)^2}{4\widehat{P}\widehat{X}E}$. Overall, the probability of the ruler's survival in the equilibrium under censorship is

$$a\widetilde{\pi}(E) \tag{12}$$

where $\widetilde{\pi}(E)$ is defined by (**??**).

In the second case, the ruler chooses to offer rewards that are sufficient for cooptation, $B \geq B^*$ (so $n = 1$). In this case, $B = B^*$; offering $B > B^*$ brings no additional increase in survival probability but reduces resources available for propaganda. Also, it is evident that $X = 0$; as the elite is coopted, there is no need for censorship.[22] Hence, propaganda spending is $P = \Delta Y - B^*$. The probability of survival is $\Lambda(\Delta Y - B^*) = \frac{\Delta Y - B^*}{\widehat{P}}$. Given the ruler's strategy $P = \Delta Y - B^*$, $X = 0$, $B = B^*$, we can also calculate $\Pi_1 - \Pi_0 = a\frac{\Delta Y - B^*}{\widehat{P}}$ and therefore $b^* = a\beta\bar{\theta}\frac{\Delta Y - B^*}{\widehat{P}}$. Hence, we can solve for $B^* = b^* E = a\beta\bar{\theta}E\frac{\Delta Y - B^*}{\widehat{P}} = \frac{\beta\bar{\theta}a}{\widehat{P}}E(\Delta Y - B^*)$, obtaining $B^* = \frac{E\Delta Y}{E + \frac{\widehat{P}}{\beta\bar{\theta}a}}$. The probability of survival is

$$a\frac{\Delta Y}{\left(\frac{\beta\bar{\theta}a}{\widehat{P}}E + 1\right)\widehat{P}}. \tag{13}$$

As the ruler moves first, he can choose between censorship-cum-propaganda and cooptation-cum-propaganda ((**??**) vs.(**??**)). The comparison of the survival probabilities immediately implies (**??**) and Proposition **??**.

B.3 Discussion of Proposition ??

The leader prefers co-optation to censorship when the elite is large due to the endogenous choice of co-optation payments. Let us consider the parameter values $\frac{\widehat{P}\widehat{X}}{a\beta\bar{\theta}\Delta Y} \in [\frac{1}{2}; 1]$ for which the censorship equilibrium involves complete censorship, $x = 1$. In this equilibrium, as E increases, the cost of fully effective censorship rises linearly. However, the marginal cost of co-optation *falls* with the size of the elite, E. That is because the per capita bribe required, b, decreases with E. The bribe has to compensate the elite member for the decrease in the probability of replacing the incompetent incumbent that results from his co-optation. But as E rises, the impact of any one elite member's opposition messaging declines. Thus, although the number of bribe recipients in the co-optation equilibrium increases with E, the total cost of bribery rises less than proportionally.[23]

Note that the switch from censorship to co-optation as the elite becomes larger is driven by the strategic interaction between ruler and elite, rather than by functional forms (which are linear in both the case of censorship and that of co-optation). If not for the endogenous relationship between b and E, the total co-optation payment would increase proportionally to the size of the elite.

[22] In principle, the ruler could choose a non-trivial level of censorship, $X > 0$, in order to increase Π_0, the probability of survival in the out-of-equilibrium outcome when the cooptation bribe is rejected, from zero to $\min\left\{1, \frac{X}{\widehat{X}E}\right\}$. In this case, the probability of survival would be $\frac{a(\Delta Y - X)}{1 + \frac{\beta\bar{\theta}a}{\widehat{P}}E\left(1 - \min\left\{1, \frac{X}{\widehat{X}E}\right\}\right)}$. This is a fractional-linear function of X which is strictly monotonic and therefore cannot have an interior maximum. The ruler either chooses $X = 0$ or goes for full censorship, $X = \widehat{X}E$, where the co-optation payment decreases to zero. The latter case is already discussed above.

[23] If $\frac{\widehat{P}\widehat{X}}{a\beta\bar{\theta}\Delta Y} \in [\frac{1}{4}; \frac{1}{2}]$, the censorship equilibrium involves incomplete censorship, $x < 1$; the marginal cost of censorship also falls with E, but not as fast as the marginal cost of co-optation.

C Censorship and perceptions of media freedom

By definition, censorship blocks information about the true state of media freedom as well. Therefore the relationship between observed values of true media freedom (as measured by Freedom House) and the public's perceptions of media freedom is not trivial.

Consider a country, c, at time t, where the true level of media freedom is TMF_{ct}. For simplicity, we will normalize TMF_{ct} to vary between 0 and 1 and to be metrized in terms of the probability that the messages about the true state of nature reach the public. Perceived media freedom, PMF_{ict}, is individual i's perception of the true level of media freedom in country c in year t. Naturally, PMF_{ict} also ranges from 0 to 1. As the government tries to censor information on censorship as well, the probability of true information (on censorship) getting through government filters depends on whether the recipient is in the informed elite and on the level of censorship.

If the individual belongs to the informed elite ($ELITE_{ict} = 1$), she directly observe TMF_{ct} so for her $PMF_{ict} = TMF_{ct}$. The general public ($ELITE_{ict} = 0$) observes the true state, $PMF_{ict} = TMF_{ct}$, with probability TMF_{ct} and observes the government's signal "media is free," $PMF_{ict} = 1$, with probability $1 - TMF_{ct}$. Therefore, for the general public $PMF_{ict} = TMF_{ct} * TMF_{ct} + (1 - TMF_{ct})$. Hence

$$\begin{aligned} PMF_{ict} &= ELITE_{ict}TMF_{ct} + (1 - ELITE_{ict})\left(TMF_{ct}^2 + (1 - TMF_{ct})\right) = \\ &= \left[1 - TMF_{ct} + TMF_{ct}^2\right] - ELITE_{ict}(1 - TMF_{ct})^2 \end{aligned}$$

The first term (in brackets) is absorbed by the country-year dummy but the second term represents within-country-year variation. We therefore should estimate the following regression

$$PMF_{ict} = D_{ct} + \beta ELITE_{ict}(1 - TMF_{ct})^2 + \alpha X_{ict} + \varepsilon_{ict}$$

where D_{ct} is the dummy for country-year, which captures all country-level and country-year-level variation (including the levels of democracy and economic growth), and X_{ict} is the vector of individual controls (age, gender, city size); in some specifications we also include education, which may also have a direct effect on perceptions. The model predicts a negative coefficient at $ELITE_{ict} * (1 - TMF_{ct})^2$, i.e. $\beta < 0$.

This prediction is taken to the data in the Table **??**. In columns (7)-(8) we proxy censorship $(1 - TMF_{ct})$ by the continuous Freedom House Press Freedom score and interact its square with the tertiary education dummy as a proxy for $ELITE_{ict}$. The model rules out the direct impact of $ELITE_{ict}$ on the perceived media freedom. However, as there may be additional channels through $ELITE_{ict}$ affects perceived media freedom—other than those discussed in the simple model above—we run specifications with and without controlling for $ELITE_{ict}$. In columns (1)-(4) we

proxy censorship with a dummy for non-free or partially free press (columns (1)-(2)) and with a dummy for non-free press (columns (3)-(4)). As these are dummies, the linear term is equivalent to the squared term. Finally, as we are agnostic whether Freedom House Press Freedom score is metrized in the same way as the measure of censorship $1 - TMF_{ct}$ in the model (share of blocked messages), in columns (5)-(6) we also present a specification with a linear term $(1 - TMF_{ct})$. In all specifications, the results are consistent with the predictions of the simple model above.