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The popularity of authoritarian leaders: A cross-national investigation[1]

Sergei Guriev[2] Daniel Treisman[3]

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Abstract

While some dictators survive through terror, others seem genuinely popular. In what we believe is the first global study of political approval in non-democracies, we use the Gallup World Poll's panel of more than 140 countries in 2006-16 to investigate the drivers of authoritarian leaders' ratings. We argue that these differ across types of regime. As in democracies, economic performance matters in autocracies, and citizens' economic perceptions, while not perfectly accurate, track objective indicators. Dictators also benefit from better perceptions of public safety. Approval is higher in non-democracies when media and Internet are restricted covertly, but ratings fall when citizens observe censorship. Although in brutal dictatorships repression may increase approval and reticence, in more moderate "informational autocracies" it appears to arouse more outrage than fear. In such autocracies, executive elections trigger a ratings surge if the leader changes, but—unlike in democracies—reelected autocrats enjoy at most a limited honeymoon.

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1 Introduction

Why do some leaders of authoritarian states appear genuinely popular while others are detested by their citizens? In Singapore in 2009, 98 percent of respondents told Gallup they thought the government of Prime Minister Lee Hsien Loong was doing a good job. The previous year, only 11 percent of Zimbabweans said the same of Robert Mugabe. Such ratings also vary greatly over time. Between 2006 and 2016, approval of the national leadership rose 21 percentage points in Ecuador but fell 43 points in Venezuela.

A rich literature examines the determinants of government popularity in developed democracies such as the US (Mueller 1973, Brody 1991, Erikson, MacKuen and Stimson 2002, Eichenberg et al. 2006), the UK (Clarke and Stewart 1995, Clarke and Lebo 2003, Sanders 2000) and France (Conley 2006). Studies suggest the importance of economic performance and international conflict, which often prompts a "rally around the flag" (Mueller 1973, Feaver and Gelpi 2004, Voeten and Brewer 2006). Yet, much less is known about the drivers of approval under authoritarian rule. Although some papers have examined particular countries—for instance, Russia (Mishler and Willerton 2003, Treisman 2011), Peru (Stokes 1996, Weyland 2000, Kelly 2003, Arce 2003), Mexico (Buendía 1996, Villareal 1999), and a few other Latin American states (Remmer 2012)—the sparse coverage of non-democracies in cross-national surveys has impeded broader comparisons.

We address this gap, examining data from a panel of 51 non-democracies in 2006-16. Our source, the Gallup World Poll (GWP), uses a standard question to assess government approval. With data for up to 11 years, we can control for unobserved country-specific heterogeneity and explore the dynamics of opinion in a global setting. Although we cannot make

strong causal claims, the broad coverage and panel structure allow for the most comprehensive exploration to date.

Interpreting survey results from non-democracies poses challenges since respondents may not answer frankly. Even in free societies, social desirability bias leads some to express not their opinions but those believed popular (Noelle-Neumann and Peterson 2004). In dictatorships, respondents may fear not just embarrassment but punishment. One response is to posit that the unfree environment precludes any useful analysis of polling data. Another, which we take here, is to incorporate repression into the study, hypothesizing about its impact, and seeking indirect evidence.

We argue that repression has two opposite effects on government ratings. First, state violence, when observed, outrages citizens, alienating them from the incumbents. But second, if severe enough, repression may cause respondents to falsify their preferences, saying they approve when they do not or refusing to answer. The net impact will depend on which effect—outrage or fear—is stronger. If repression is mild and episodic, outrage will dominate, lowering approval; if repression is harsh and pervasive, fear should prevail, boosting—or at least sustaining—ratings.

This will, in turn, relate to the *type* of authoritarian regime. Recent literature has emphasized the heterogeneity of non-democracies, which differ in both the nature of the ruling group and its method of domination (e.g. Diamond 2002). The power-holder may be a party, monarch, military junta, or individual dictator (Geddes, Frantz, and Wright 2017). Authoritarian rulers employ various strategies. Some—e.g., Hitler or Mao—deliberately spread terror, killing millions; others—e.g., Lee Kuan Yew—are largely non-violent. Some impose an official ideology; others claim to respect freedom of thought and expression, while quietly censoring or

co-opting the media. Some deride Western democracy; others imitate it, holding elections, which they manipulate to ensure victory (Levitsky and Way 2010). Some appease citizens with material benefits; others preempt rebellion by disrupting their capacity to communicate and coordinate (De Mesquita and Smith 2010).

Building on a recent paper by Guriev and Treisman (2019a), we distinguish between overt dictatorships and "informational autocracies." Overt dictatorship, the dominant 20th century model, still prevails in, for instance, North Korea, Syria, and Turkmenistan. In such regimes, rulers use well-publicized repression, sometimes combined with indoctrination into an ideology that justifies violence against "traitors." By contrast, informational autocrats seek to manipulate rather than terrorize citizens. They deploy propaganda and co-opt or censor private media, and—when successful—lock in their advantage with democratic-seeming institutions. While visible repression helps overt dictators intimidate opponents, it undercuts informational autocrats by exposing the true nature of their rule.[4]

The distinction has implications for public opinion. We argue that how respondents answer survey questions will differ systematically across these two types of regime. Whereas in overt dictatorships, repression will cause many to insincerely say they support the regime, in informational autocracies outrage may offset or even outweigh fear. In informational autocracies, censorship of media and Internet—if not observed—will boost approval. But censorship that is observed shows the regime has something to hide, weakening support. Bolstered by repression, overt dictators may retain high ratings through short economic downturns and outbreaks of social disorder—indeed, crises may heighten the anxiety that fuels demand for tough leaders (Kakkar

[4] See Guriev and Treisman (2019b) for a formal theory of informational autocracy.

and Sivanathan 2017). By contrast, in informational autocracies as in democracies, support is more tightly linked to good performance, which signals incumbent competence.[5] Informational autocrats manipulate media to persuade citizens that performance is better than it is, but, especially with regard to economics, censorship and propaganda is limited by citizens' direct experience of changing wages, prices, and employment levels. Elections—even though rigged—could temporarily boost approval in both types of regime because of intensified propaganda or clientelistic handouts. In informational autocracies, the election may also confer some legitimacy—especially if it produces a new leader—among those fooled by the incumbents' claim to be democratic.

The 51 authoritarian states with approval data in the Gallup World Poll vary in type.[6] Unfortunately, these do not include the few remaining quasi-totalitarian dictatorships such as North Korea and Syria, so we cannot explore the effect of ideology and systematic terror. Still, Gallup has polled in a number of relatively violent authoritarian regimes. Guriev and Treisman (2019a) collected data on the estimated annual number of state political killings—executions of political prisoners, assassinations by state agents, lethal force against non-violent protesters, and so on—that occurred under all authoritarian leaders since 1945 who survived in office at least five years. As a rule of thumb, they classified as "overt dictatorships" all non-democracies where, under the current leader, state political killings averaged more than 10 per year. In our data, 17 countries—from Zimbabwe and Uganda to Sri Lanka and Cambodia—fit this criterion

[5] We compare non-democracies to a panel of 95 democracies with necessary data in the GWP.

[6] Throughout, we use the Polity IV standard classification, treating countries with Polity2 scores ≥ 6 as "democracies," and those with Polity2 < 6 as "non-democracies" or "authoritarian states" (see Center for Systemic Peace 2016). We classify on the basis of regime type at the start of the year (end of previous year).

for at least part of the period. Another 20 non-democracies with fewer killings—from Ecuador and Russia to Venezuela and Singapore—fit the classification of informational autocracies. The remaining 14 non-democracies were not classified by Guriev and Treisman since the leader did not last in office for five years, rendering unreliable any estimate of the annual body count under his leadership. We pool all 51 non-democracies to test hypotheses that apply to all authoritarian states and then use interaction terms to model differences across the types.

We find that, as hypothesized, repression has a null effect on approval in the overt dictatorships and a negative one in the informational autocracies. Although in North Korea or Syria repression might generate high ratings from terrified respondents, in various less systematic although still violent overt dictatorships fear is apparently offset by indignation at the brutal tactics. In informational autocracies, where leaders pretend to be democratic and benevolent, visible repression even backfires. As expected, approval is higher when citizens perceive strong economic performance and—unlike in democracies—greater public safety. Perceptions are not purely idiosyncratic or distorted: they track objective indicators. Still, information manipulation also matters. Authoritarian regimes that censor media and Internet and that have lower web access are more popular, although—as expected—ratings sink if citizens *realize* the press is censored. In non-democracies, as in democracies, executive election years are distinctive. Perceptions of the economy tend to improve during the campaign, and—in informational autocracies—ratings soar after the vote if the leader is replaced. Such replacements seem to be important to establishing the domestic legitimacy of pseudo-democratic institutions, and may restore some confidence in the independence of the media.

The next section develops our hypotheses. Subsequent sections describe the data, introduce our empirical methodology, report results, presents robustness checks and extensions, and conclude.

2 Government approval in unfree societies

What explains levels of support for authoritarian leaders? We divide possible determinants into four categories: performance, information manipulation, electoral effects, and repression.

2.1 Performance

As in democracies, approval in autocracies should vary with perceived government performance. Governments are generally expected to promote prosperity. Some authoritarian leaders such as the late Lee Kuan Yew vigorously advertise their economic achievements. Indeed, "performance legitimacy" may be even more important when procedural legitimacy is lacking. Prosperity—and the public's perception of it—should boost ratings. Moreover, economic performance should be particularly salient in informational autocracies, whose rulers seek to present themselves as competent leaders, compared to overt dictatorships, where fear and ideology play a greater role.

Besides prosperity, governments also promise to provide "law and order." Many dictators claim to be restoring discipline after periods of crime or corrupt political competition. Russia's President Putin, for instance, portrayed himself as rebuilding the Russian state after the chaotic 1990s. Citizens in all types of dictatorship may, therefore, judge leaders on whether they feel secure. These considerations motivate two related hypotheses.

H1. In all authoritarian regimes:

a) Approval will be higher when citizens judge government performance (on the economy or public safety) to be good.

Among authoritarian regimes:

b) Approval will be more sensitive to economic performance in informational autocracies than in overt dictatorships.

2.2 Information manipulation

All governments use public relations to improve their image. But in democracies opposition politicians and journalists can challenge incumbents' claims and provide alternative interpretive frames. By contrast, autocrats censor criticism and flood state media with pro-regime messages. Such censorship and propaganda aim to inflate assessments of the regime's accomplishments and divert blame for failures (Rozenas and Stukal 2019). In autocracies, we might therefore expect a larger gap than in democracies between objective measures of government performance and the performance citizens perceive.

Among dictatorships, information strategies will vary. Overt dictatorships use censorship and propaganda to indoctrinate or intimidate. Often, the exercise of censorship is quite open, while propaganda can be deliberately crude and extreme. The Nazis staged public book burnings; Chile's General Pinochet stationed censors in newsrooms and television studios (Spooner 1999). In communist states, parties make no secret of their use of propaganda; embracing the official ideology is as much a loyalty ritual as a cognitive process.

By contrast, informational autocrats seek to genuinely persuade. This means they must keep messages more reasonable (Gehlbach and Sonin 2014, Carter and Carter 2018, Rozenas and Stukal 2019). The gap between reality and reported perceptions will be greater than in democracy, but smaller than in overt dictatorship. At the same time, rather than using censorship and propaganda openly, informational autocrats will try to conceal their use. Since they seek an image of competence, open manipulation can backfire, suggesting they have something to hide. Recognition of censorship may also prompt a more active search for concealed material (Roberts 2014).

Several previous papers have tried to measure the impact of information manipulation in non-democracies. Scholars have detected positive effects of censorship and state propaganda on election outcomes in post-communist Russia and Nazi Germany (Enikolopov et al. 2011, Adena et al. 2014). By contrast, in Zimbabwe approval of President Mugabe was *lower* among regular readers of state-controlled newspapers (Bratton et al. 2005, p.102).

The Internet's role in authoritarian states remains controversial. Early "techno-optimists" argued that web communications would circumvent state censorship, provide access to international media, and expose misinformation (e.g., Bellin 2012). Authoritarian incumbents whose support relied on propaganda would see their ratings fall. Consistent with this, growing Internet access significantly depressed the ruling party's vote in Malaysia's 2008 election (Miner 2015). Others raised doubts. What citizens seek on the Internet—as on other free media—may be not investigative reports but entertainment (Kern and Hainmueller 2009). Much web content is repackaged from state broadcasters (Lipman et al. 2017). If citizens do get news online, autocracies can restrict other sources to compensate (Lorentzen 2014). Meanwhile, the difficulties of censoring the web may have been exaggerated. Countries such as China quickly

devised methods (King et al. 2013, 2014). For instance, Beijing blocks online communications about protest and employs internet trolls to interrupt discussions and praise the regime (King et al. 2016). The web also offered new potential indoctrination channels (Gunitsky 2015). Bots could target individuals with tailored messages (Sanovich et al. 2018). Such "horizontal" propaganda, spread by peers, tends to outperform "vertical" centrally broadcast kinds (Ellul 1965). Seeding "fake news" into online discussions, rulers could co-opt society's indigenous networks. If such effects dominate, higher Internet penetration might *increase* ratings.

H2. In all authoritarian regimes:

a) Greater restrictions on media and the Internet will increase approval.

b) Broader Internet access will (i) reduce approval (techno-optimism) or (ii) increase it (techno-skepticism).

c) Perceptions of government performance will be less accurate than in democracies.

d) Misperceptions about government performance will affect approval.

Among authoritarian regimes:

e) Perceptions of government performance will be more accurate in informational autocracies than in overt dictatorships.

f) Approval will be relatively more sensitive to actual performance and less sensitive to misperceptions in informational autocracies than in overt dictatorships.

g) In informational autocracies, approval will be lower if media restrictions are recognized.

2.3 Electoral effects

Almost all modern dictatorships hold elections, although usually with some fraud (Gandhi and Lust-Okar 2009). Elections, parliaments, and other ostensibly democratic institutions might serve

to channel patronage (Blaydes 2010), coopt and divide elites (Geddes 2005), facilitate monitoring of agents (Simpser 2013), project an image of strength (Simpser 2013, Magaloni 2006, Egorov and Sonin 2017), or appease Western donors (Schedler 2006).

Elections in all autocracies may intensify propaganda as well as clientelistic handouts (Gehlbach and Sonin 2014, p.166). Such efforts might seem redundant if results are falsified. Yet, fraud is far from foolproof. Hyde and Marinov (2012) record 51 elections since 1945 in which, despite alleged irregularities, the incumbent party lost. Fraud—if discovered—is also more likely than media distortions to discredit elections. Consequently, one might expect propaganda to surge right before a major vote, boosting ratings. Carter and Carter (2016) found this in African and Asian autocracies. On the other hand, some autocracies loosen constraints on the opposition before elections to make the ballot appear fair. Such liberalization enables challengers to discredit incumbents. If campaign propaganda works, one might also see the gap between objective and subjective measures of government performance widen before elections. Russians' perceptions of economic performance were 4-5 percentage points higher during the 1996 and 2004 presidential campaigns (Treisman 2011).

In overt dictatorships, elections are mostly mobilization efforts, with extreme outcomes that arouse skepticism. In informational autocracies, incumbents seek to manipulate less obviously in the hope of boosting domestic legitimacy. Some citizens may take them seriously, not realizing the scale of covert tampering. Even the cynical may assume less fraud than occurred, upgrade their estimates of leader popularity and feel pressure to conform. If elections have this effect, approval should peak right after the vote, while memory is fresh. Alternatively, it might be not elections per se, but replacement of the top leader that matters. Such turnover—even if from one insider to another, as, for instance, with the replacement of Dmitri Medvedev

by Vladimir Putin in Russia in 2008—may create a sense of genuine competition and potential renewal. If leader turnover is key, ratings should not rise when an incumbent is re-elected but should when a new leader takes power even by some non-electoral path.

H3. In all authoritarian regimes:

a) Approval in months before and during a major election will be (i) higher (because of propaganda, pressure, and handouts) or (ii) lower (because of opposition access to media).

b) Misperceptions of performance will increase before elections (because of intensified propaganda).

Among authoritarian regimes:

c) Approval will be higher in months right after an election in informational autocracies, especially if it results in a change of leader.

2.4 Repression

Many past autocrats deliberately terrorized their citizens. Fear was not the *only* pillar of support even for totalitarians such as Hitler and Stalin (Overy 2004, Arendt 1968). But it was a crucial element (Svolik 2012, p.10). By contrast, many recent authoritarians take pains to appear unthreatening. Even as they rig the system to consolidate power, informational autocrats like Viktor Orbán claim to operate democratically. When they succeed in manipulating information to secure popularity, they do not need violence. Indeed, mass repression—when observed—undermines their reputation for public spirited leadership.

Repression prompts two reactions in citizens—outrage and fear. We hypothesize that in overt dictatorships the second outweighs the first. Where state violence is widespread and open, few will risk speaking out, even in a supposedly anonymous poll. The greater the repression, the higher the ratings. By contrast, in informational autocracies, many citizens genuinely—but wrongly—think the incumbent competent and benevolent.[7] If the regime inadvertently reveals its repressive nature, indignation will offset—and sometimes even outweigh—fear, at least at first. Some may view violent acts as aberrations, reacting angrily without thinking themselves at risk. They may also take seriously the leader's pretense to respect free expression. Thus, we expect the net effect of repression on approval and reticence to be null in such regimes, or even negative if outrage overwhelms fear.[8]

H4. Among authoritarian regimes:

a) Greater repression will lead to higher approval and higher rates of "don't knows" and refusals to answer in overt dictatorships (fear outweighs indignation).

b) Greater repression will lead to unchanged or even lower approval and rates of "don't knows" and refusals to answer in informational autocracies (indignation outweighs fear).

[7] This accords with a 2015 list experiment that estimated the extent of preference falsification in Russia and found a relatively small gap between declared and actual approval of President Putin (6-9 percentage points), which perhaps even overestimates it given artificial deflation (Frye et al. 2017).

[8] Sutton et al. (2014) found that since 1989 autocrats' violence against unarmed protesters has often provoked a backlash. In Zimbabwe in the early 2000s, respondents who said they felt afraid of the regime were "twice as likely to give a *negative* rating to the president" (Bratton et al. 2005, p.99).

3 Data

3.1 Political Approval

Our approval measure is from the Gallup World Poll (GWP), a cross-national survey conducted annually in more than 140 countries. Our dependent variable is the percentage of respondents answering "yes" to: "Do you approve or disapprove of the job performance of the leadership of this country?" Possible answers were "yes," "no," or "don't know." While individuals' responses contain a random element caused by subtle differences of context (Zaller 1992), such noise will mostly disappear when answers are aggregated. We use data as available for 2007-16; since coverage varies by year, this yields 261 observations for which current and lagged approval data were available, spanning 51 non-democracies (see Table A2).[9]

Samples ranged from 504 (Haiti 2012) to 4,000 (Russia 2010), but most were around 1,000 respondents per country. Almost all interviews (in non-democracies with approval data) were conducted face-to-face, but 2 percent used a random-digit-dial telephone method (Tortora et al. 2010, p.536). Some previous studies—most focused on subjective wellbeing (e.g. Deaton 2008), a few on religion—have used the GWP. Stevenson and Wolfers (2011) use it to study trust in public institutions (but not government approval). While no survey is perfect, GWP has withstood considerable scrutiny.

Across all country-years, 54 percent of respondents in non-democracies on average approved of their government (43 percent in democracies). The average ranged from 52 percent in 2016 to 60 percent in 2010. Within countries, approval varied substantially over time. Among

[9] We exclude 2005-6 waves of the GWP, which include very few non-democracies. Results are almost identical using VDEM's democracy classification (see appendix).

countries with data for all ten years between 2007 and 2016, the average gap between highest and lowest ratings was 32 percentage points among both democracies and non-democracies.

3.2 Explanatory variables

3.2.1 Repression and fear

Our main measure of overt repression is the Political Terror Scale (PTS), constructed by a team at UNC (Gibney et al. 2015). A 5-point index, this comes in two versions: one constructed from Amnesty International reports on human rights practices, the other from those of the US State Department. Scores range from 1 ("*Countries under a secure rule of law, people are not imprisoned for their views, and torture is rare or exceptional. Political murders are extremely rare*") to 5 ("*Terror has expanded to the whole population. The leaders of these societies place no limits on the means or thoroughness with which they pursue personal or ideological goals.*"). We also tried using the number killed by the state in one-sided violence against unarmed civilians, from the Uppsala Conflict Data Program. To exploit respondents' own assessments of political repression, we used another GWP question that asked how many people in the country, if any, were "afraid to openly express their political views?" Respondents could answer "most," "many," "some," "no one," or "don't know." The percentage that answered "most" or "many" ranged from 5 percent in Nepal (2008) to 87 percent in Congo Brazzaville (2008). Table A1 contains full details and sources for all variables.

3.2.2 Performance

Our measure of perceived economic performance is the percentage of respondents who considered economic conditions in their country "excellent" or "good." For objective economic

measures, we used the log of GDP per capita at PPP in 2011 dollars (lagged one year), the growth rate of GDP per capita, the log inflation rate, and the unemployment rate. For perceived public safety, we used the percentage who said they felt safe walking alone at night near their homes, and related this to several more objective measures—the rate of intentional homicides and the percentage who said they had been robbed during the previous year. Since the GWP contained no core questions on national defense, we could not study this in detail, but we include interstate and civil war among controls (Table A9). Since only one country-year in a non-democracy with approval data coincided with an interstate war (Russia's 2008 Georgian war), we could not draw reliable conclusions on this.

3.2.3 Information manipulation

For perceived media restrictions, we use the percentage of GWP respondents who said media in their country had "a lot of freedom." To measure actual press restrictions, we use Freedom House's index of media freedom, normalized so higher scores indicate greater freedom. For Internet penetration, we use the proportion of GWP respondents who said their home had Internet access.

Internet censorship is a relatively recent phenomenon, which raises challenges for measurement. Our main proxy is the number of requests the country's authorities made to Google to remove material from its web platforms. These data begin in 2009; we set the count to zero in 2006-8, assuming there were no such requests or almost none. We treat this as a proxy for the intensity of Internet censorship in general, rather than a measure of Google's actions per se. To check robustness, we used the number of requests by the authorities to Twitter to block tweets. These data begin only in 2012—again, we assume no requests or almost none in previous

years. We also tried using Freedom House's "Freedom on the Net" index. This began with a pilot study for 2007-8 and increased its geographical scope over the years. Since country coverage is low, this required imputing a high percentage of the data, which reduced the likelihood of significant findings.

3.2.4 Election effects

We included, first, dummies for whether a national executive or legislative election occurred in the given year. (Of the 261 country-years with approval data in non-democracies, 49 had executive elections and 54 had legislative ones.) We then distinguished when the election occurred relative to the GWP polling. Finally, we explored interactions of elections and leader turnover.

4 Methodology

The nature of the data raises several issues. While the approval question was asked in 324 non-democracy country-years, certain explanatory variables are missing data. Since list-wise deletion may bias estimates and underestimate standard errors, we use multiple imputation for some variables (King et al. 2001). This involves taking random draws from a multivariate normal posterior distribution for the missing variables, conditioned on the observed data. We use the program Amelia II to impute 10 datasets (see Honaker et al. 2011), and run regressions on all 10

datasets, using Rubin's rules to combine results and obtain appropriate standard errors (Rubin 1987).[10]

For various reasons, one might expect approval to be autocorrelated. (For instance, Bayesian updating would lead citizens to adjust evaluations gradually rather than start from scratch whenever new information surfaced.) At the same time, many hard-to-measure country characteristics may influence ratings, potentially biasing estimates of explanatory variables. These considerations suggest the need for a dynamic model that controls for unobserved unit heterogeneity and that is appropriate for "small T, large N" datasets, as there are far more countries than years. We therefore use the Arellano-Bover/Blundell-Bond "system" GMM estimator (Arellano and Bover 1995, Blundell and Bond 1998). This instruments for the lagged dependent variable and other endogenous explanatory variables and transforms the data to expunge country fixed effects. (The system estimator instruments both for levels of the variables with deviations and for deviations with levels; we use the forward orthogonal deviations transformation, rather than differencing.) The system model is preferable to the "difference" GMM estimator here, since it can accommodate slowly changing or constant regressors (Roodman 2009, p.114). Besides the lagged dependent variable, we instrument for other explanatory variables that could be affected by the government's popularity. We therefore estimate the following model:

$$r_{i,t} = \alpha r_{i,t-1} + \boldsymbol{X}'_{i,t}\boldsymbol{\beta} + \gamma_i + \delta_t + \varepsilon_{i,t} \qquad (1)$$

[10] Specifically, we use the "mi estimate" command in STATA, after imputing missing data for: perceived economic conditions, perceived media freedom, unemployment, log inflation, the homicide rate, freedom on the net, perceived fear, and political repression. Proportions of observations imputed are shown in Table A3. We imposed reasonable conditions on the ranges of the imputations, for instance limiting scaled variables to the range of the scale.

where $r_{i,t}$ is the average rating of the government of country *i* in year *t*, $\boldsymbol{X}_{i,t}$ is a vector of explanatory variables, γ_i is the country fixed effect (removed by the transformation), δ_t captures year fixed effects (included in all models), and $\varepsilon_{i,t}$ is an error term with zero mean. Roodman (2009, p.128) strongly recommends including year dummies to guard against cross-country contemporaneous correlation which could otherwise bias estimates of standard errors.[11] We first address each hypothesis separately, and then include all variables in a composite model.

We recognize throughout that causality may run in multiple directions. Where possible, we explore such feedbacks, tracing the hypothesized path from objective indicators to perceptions. Using models that control for unobserved country heterogeneity and a method that instruments for endogenous variables, and also including year effects to account for international shocks, we do our best to improve identification. Still, we make no strong causal claims. Our aim is more modest—to show whether the best available data are consistent with theoretically motivated hypotheses.

5 Results

Table 1 presents results for the full set of non-democracies. Table 2 then models differences between informational autocracies and overt dictatorships using interaction terms.[12] For comparison, Table A4 in the appendix runs the Table 1 regressions on the GWP democracies. As

[11] Non-stationarity does not raise the standard problems for the system GMM estimator, the moment conditions of which remain valid even under I(1) (Bond et al. 2005, p.5). Still, since a unit root complicates identification, we test, using the t-test proposed by Bond et al., which outperformed other available tests in their Monte Carlo study (2005, p.24). We can reject the null of a unit root at $p < .001$. A Phillips-Perron test also rejects non-stationarity at $p < .001$.

[12] In Table 2, we interact each independent variable with dummies for informational autocracy (IA), overt dictatorship, (OD), and unclassified non-democracies (U). We also control for the three dummies themselves.

expected, ratings show considerable continuity: coefficients on lagged approval range from 0.27 to 0.75, but still fall far short of 1, consistent with stationarity.

Perceived performance appears at least as important in authoritarian states as in democracies. In informational autocracies, as in democracies, citizens approve of their government more when they see the economy doing well. Indeed, the estimated effects for all non-democracies (Table 1, column 1), for informational autocracies (Table 2, column 1), and for democracies (Appendix Table A4, column 1) were all around 0.35. In non-democracies, a one standard deviation increase in the proportion of respondents perceiving a booming economy (21 percentage points) predicts approval 7 percentage points higher. As expected (H1b), the influence of economic performance was stronger in informational autocracies than in overt dictatorships (coefficients of .35 vs. .29), although the difference was not statistically significant.

In authoritarian states—but not in democracies—ratings were higher when respondents felt safe in their neighborhoods (Table 1, column 1; Table A4, column 1). This effect was significant in both informational autocracies and overt dictatorships, but almost twice as strong in the latter (Table 2, column 1). Among all non-democracies, a one standard deviation increase in the share that felt safe walking at night (17 percentage points) was associated with a 10-point higher rating. The greater influence of safety perceptions in the authoritarian states does not reflect a greater sense of danger there than in democracies. The proportion saying they felt safe walking at night averaged 59 percent in the democracies and 61 percent in the non-democracies.

Of course, such perceptions may be distorted. We turn now to information manipulation. Our results confirm that media control is both effective and—when recognized—unpopular (H2a, H2g). Lower press freedom, as captured by Freedom House's index, correlates with higher approval in authoritarian states. A one standard deviation decrease in press freedom (-16.0 points

on the 100-point scale) predicts approval 6 points higher (Table 1, model 8). For example, Ecuador's 23-point fall in media freedom in 2007-14 predicts a 9-point rise in government popularity (exactly the actual increase). The effect of media restrictions was only statistically significant in informational autocracies and not overt dictatorships (Table 2, model 3). As hypothesized, ratings were lower in informational autocracies when citizens *perceived* the press to be restricted (Table 2, model 3). In fact, this was also true—with an even stronger effect—in overt dictatorships, and also in democracies (Table A4, model 3). When governments are seen as stifling media freedom, they are less popular everywhere.[13]

Of course, perceptions of media freedom may, themselves, also be distorted by government manipulation. Perceived media freedom correlates much more closely with actual freedom among democracies (r = .65) than among non-democracies (r =.17). On average, citizens in democracies know how extensive censorship is; those in authoritarian states often do not. In 2016, Ukraine came eighth for press freedom among GWP non-democracies, while Rwanda came 43rd. But while 86 percent of Rwandan respondents said they thought their media had a lot of freedom, only 29 percent of Ukrainians did.

[13] Clearly, expressing such opinions in overt dictatorships is conditional on limited fear of reprisals. If, as in Nazi Germany, book burnings succeeded in intimidating regime opponents, the latter would probably not have expressed disapproval to hypothetical pollsters.

Table 1: Determinants of government approval: all non-democracies

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Approval, t-1	0.27**	0.36**	0.38**	0.58**	0.56**	0.57**	0.56**	0.33**
	(0.086)	(0.097)	(0.083)	(0.11)	(0.10)	(0.10)	(0.10)	(0.071)
Perceived performance								
Economic conditions "good" or "excellent", t	0.36**							
	(0.089)							
Percent who felt safe walking alone at night, t	0.57**							
	(0.19)							
Objective economic perceptions, t		0.57**						0.58**
		(0.12)						(0.13)
Economic misperceptions, t		0.32**						0.29**
		(0.083)						(0.075)
Objective safety perceptions, t		0.23*						0.21*
		(0.11)						(0.08)
Safety misperceptions, t		0.53**						0.41**
		(0.13)						(0.11)
Information manipulation								
Press freedom, t			-0.69**					-0.40**
			(0.23)					(0.15)
Percent who think media have a lot of freedom, t			0.55**					0.29**
			(0.11)					(0.09)
Percent with Internet access at home, t			-0.25*					-0.23*
			(0.11)					(0.11)
Total requests to Google to remove content, ths, t			8.9**					1.6**
			(3.4)					(0.45)
Elections								
Executive election year, t				5.85**				
				(1.71)				
Legislative election year, t				-0.01				
				(1.50)				
Polling ended in 6 months before executive election					3.51	3.58		2.58
					(3.17)	(3.03)		(2.29)
Polling overlapped with executive election					0.90	1.53		0.97
					(5.87)	(5.71)		(2.94)
Polling began in 6 months after executive election					6.93**			
					(2.35)			
Polling began in 6 months after election with turnover						17.9**		9.96*
						(4.47)		(4.89)
Polling began in 6 months after election without turnover						4.11		4.45*
						(2.52)		(1.92)
Repression								
Political Terror Score (State Department), t							-2.03	-1.13
							(1.86)	(1.30)
Observations	261	252	258	258	258	258	261	252
Countries	51	50	51	51	51	51	51	50
Arellano-Bond AR(2), p	0.63	0.74	0.13	0.53	0.67	0.34	0.83	0.48
Hansen test, p	0.66	0.79	0.55	0.67	0.51	0.61	0.46	0.82
No. of instruments	22	27	30	19	26	30	18	43

Sources: See Table A1.

Notes: Robust standard errors, clustered by country, in parentheses. * $p < 0.05$, ** $p < 0.01$. Estimated with xtabond2, collapse option to economize on instruments. All models include year dummies. All explanatory variables instrumented with first to third lags except: objective economic and safety perceptions treated as exogenous; (2) lagged approval, economic and safety misperceptions first to fourth lags; (4): all first and second lags; (8): lagged approval and election variables instrumented with first lag, others with first and second lags, to reduce instruments.

Table 2: Determinants of government approval: overt dictatorships and informational autocracies

	(1)	(2)	(3)	(4)	(5)
Approval, t-1	0.34**	0.48**	0.46**	0.77**	0.56**
	(0.10)	(0.12)	(0.09)	(0.08)	(0.10)
Informational autocracy, t	-26.6**	-55.1	-4.08	-7.68	12.1*
	(6.56)	(38.6)	(9.55)	(3.95)	(5.79)
Unclassified authoritarian, t	-25.0**	-41.2*	-27.7*	-7.85*	-0.95
	(8.14)	(19.7)	(11.9)	(3.52)	(7.77)
Overt dictatorship, t	-41.8**	11.5	-30.8**	-6.60	8.83
	(7.06)	(58.2)	(7.85)	(4.07)	(8.66)
Perceived performance					
Economic conditions "good" or "excellent," t, (IA)	0.35**				
	(0.13)				
Economic conditions "good" or "excellent," t, (OD)	0.29**				
	(0.11)				
Felt safe walking alone at night, t (IA)	0.20*				
	(0.11)				
Felt safe walking alone at night, t, (OD)	0.52**				
	(0.10)				
Objective economic perceptions, t, (IA)		0.57**			
		(0.18)			
Objective economic perceptions, t, (OD)		0.087			
		(0.41)			
Economic misperceptions, t, (IA)		0.22			
		(0.17)			
Economic misperceptions, t, (OD)		0.36**			
		(0.17)			
Objective safety perceptions, t, (IA)		0.53			
		(0.53)			
Objective safety perceptions, t, (OD)		-0.23			
		(0.84)			
Safety misperceptions, t, (IA)		0.15			
		(0.18)			
Safety misperceptions, t, (OD)		0.71**			
		(0.17)			
Information manipulation					
Press freedom, t, (IA)			-0.46*		
			(0.19)		
Press freedom, t, (OD)			-0.16		
			(0.21)		
Percent who think media have a lot of freedom, t, (IA)			0.35*		
			(0.14)		
Percent who think media have a lot of freedom, t, (OD)			0.68**		
			(0.10)		
Percent with Internet access at home, t, (IA)			-0.14		
			(0.09)		
Percent with Internet access at home, t, (OD)			-0.14		
			(0.26)		
Total requests to Google to remove content, ths, t, (IA)			5.6*		
			(2.3)		
Total requests to Google to remove content, ths, t, (OD)			1,362.9		
			(2,227.5)		
Elections					
Polling ended in 6 months before executive election (IA)				-2.40	
				(4.20)	
Polling ended in 6 months before executive election (OD)				2.14	
				(4.03)	
Polling overlapped with executive election (IA)				-6.32	
				(6.94)	
Polling overlapped with executive election (OD)				-4.77	
				(8.54)	

Table 2: cont.

Polling began in 6 months after executive election with turnover (IA)				19.7** (3.76)	
Polling began in 6 months after executive election with turnover (OD)				no cases	
Polling began in 6 months after executive election without turnover (IA)				3.78 (3.16)	
Polling began in 6 months after executive election without turnover (OD)				5.47 (5.75)	
Repression					
Political Terror Score (State Department), t, (IA)					-4.71** (1.79)
Political Terror Score (State Department), t, (OD)					-2.67 (2.32)
Coefficients at interaction terms with dummy for unclassified non-democracies (U)					
Economic conditions "good" or "excellent," t, (U)	0.52** (0.12)				
Felt safe walking alone at night, t, (U)	0.20 (0.17)				
Objective economic perceptions, t, (U)		0.49** (0.18)			
Economic misperceptions, t, (U)		0.36* (0.17)			
Objective safety perceptions, t, (U)		0.39 (0.29)			
Safety misperceptions, t, (U)		0.42* (0.21)			
Press freedom, t, (U)			-0.26 (0.19)		
Percent who think media have a lot of freedom, t, (U)			0.65** (0.12)		
Percent with Internet access at home, t, (U)			-0.079 (0.13)		
Total requests to Google to remove content, ths, t, (U)			0.87 (0.51)		
Polling ended in 6 months before executive election (U)				3.92 (7.64)	
Polling overlapped with executive election (U)				14.1 (8.24)	
Polling began in 6 months after executive election with turnover (U)				19.5 (18.6)	
Polling began in 6 months after executive election without turnover (U)				0.64 (4.73)	
Political Terror Score (State Department), t, (U)					-0.30 (1.93)
Observations	261	252	258	258	261
Countries	51	50	51	51	51
Arellano-Bond AR(2), p	0.82	0.79	0.28	0.57	0.65
Hansen test, p	0.58	0.35	0.64	0.44	0.72
No. of instruments	50	42	45	50	38

Sources: See Table A1.

Notes: IA: Informational autocracies; OD: Overt dictatorships; U: Unclassified non-democracies. Subtype classifications as at start of year. Robust standard errors, clustered by country, in parentheses. * $p < 0.05$, ** $p < 0.01$. Estimated with xtabond2, collapse option to economize on instruments. All models include year dummies. Economic conditions, felt safe, Political Terror Score, and lagged approval and type dummies (models 1 and 6) instrumented with first to third lags; economic and safety misperceptions, election variables, and Internet access instrumented with first and second lags; free press, Google requests, perceived media freedom, lagged approval and type dummies (models 2-4) instrumented with first lag; objective economic and safety perceptions treated as exogenous.

What about Internet censorship? Our results on this provide some support for "techno-optimism." In non-democracies, a one standard deviation higher rate of home Internet access (26 percentage points) predicts approval 7 points lower (Table 1, mode 8). Had Thailand had Malaysia's Internet access in 2014, its leaders' predicted rating would have been about 9 points lower. This fits the view that, where media and political opposition are controlled, the web becomes a source of alternative information and critical coverage.[14] However, online censorship may offset this effect. Non-democracies that asked Google to remove more materials had higher ratings. The effect was small but significant: a one standard deviation increase—448 additional requests—was associated with about .7 percentage points higher approval (Table 1, model 8). The effect was statistically significant for the informational autocracies taken separately, but not for the overt dictatorships (Table 2, model 3).

Using requests to Twitter to block tweets, we get a highly significant result of similar size (for one standard deviation; Table A5). Internet censorship is relatively new, and such requests have so far been concentrated in a few countries. The leading web-censoring non-democracies were: Russia (120 requests in 2012 rising to 13,209 in 2016), Turkey (1,781 in 2016), Thailand (168 in 2016), and the United Arab Emirates (41 in 2014). The list for Twitter is similar: Turkey (5,569 requests in 2016) and Russia (2,123 in 2016). Such efforts seem effective only above a certain scale; removing two or three posts is unlikely to matter. With this in mind, we tried several other formulations (Table A5)—the log of the number of requests, a dummy for more than 20 requests a year, and Freedom House's index of "freedom on the net." The results are

[14] Internet access is not just a proxy for economic development. Development—as captured by log GDP per capita—correlates with higher approval; controlling for it in Table 1, model 3, the effect of Internet access is even stronger; log GDP per capita is not at all significant.

consistent, although not always statistically significant. In democracies, there was no robust relationship between Internet access or Internet censorship and approval (Table A4, model 8).

If restrictions on media lead to higher approval, do they achieve this by distorting perceptions of government performance? One can divide respondents' perceptions of government performance into two parts: one based on accurate information, the other on misperceptions, including those deliberately cultivated by government. In Table 3, we isolate the two types of variation. We regress the percentage of respondents who rated the economy "excellent" or "good" on four objective indicators—the growth rate, log previous year GDP per capita, log inflation, and unemployment (model 1). We also regress the percentage of respondents who said they felt safe walking at night on three objective indicators of domestic security—the homicide rate (for the current and previous years) and the percentage of respondents who said they had been robbed during the previous year (model 4).

All variables have the expected signs and their joint contributions are highly significant. Models 2 and 5 add additional controls that might influence perceptions, as well as country and year fixed effects. (We also control here for previous period approval since this might feed back into evaluations of the economy and safety. It is always insignificant.) Joint significance tests for the objective indicators remain significant at $p < .01$. Evidently, average perceptions in non-democracies are not purely idiosyncratic: they track actual economic performance and crime indicators.

Table 3: Correlates of perceptions of economic performance and safety

	DV: Economic performance			*DV: Safe to walk at night*		
	(1)	(2)	(3)	(4)	(5)	(6)
Growth rate of GDP per capita, t	1.30**	0.53**	0.50**			
	(0.34)	(0.17)	(0.18)			
Log GDP per capita, t-1	7.60**	18.6	18.1			
	(1.46)	(9.70)	(9.61)			
Log inflation, t	-4.92*	0.24	0.26			
	(2.26)	(1.28)	(1.30)			
Unemployment rate, t	-1.07**	-1.18	-1.23			
	(0.38)	(0.66)	(0.66)			
Homicide rate, t				-0.49**	-0.08	-0.08
				(0.08)	(0.10)	(0.10)
Homicide rate, t-1				-0.46**	-0.068	-0.06
				(0.073)	(0.062)	(0.06)
Percent robbed last year (GWP), t				-0.54**	-0.24**	-0.24**
				(0.12)	(0.07)	(0.07)
Press freedom (Freedom House), t		-0.18	-0.18		0.01	.01
		(0.19)	(0.19)		(0.15)	(0.15)
Percent with Internet access at home, t		-0.00	-0.010		0.13	0.13
		(0.10)	(0.10)		(0.08)	(0.08)
More than 20 requests to Google, t		4.22	4.17		5.66**	5.64**
		(4.32)	(4.45)		(1.83)	(1.84)
Executive election year, t		1.74*			0.54	
		(0.85)			(0.81)	
Polling before or overlapping with executive election, t			2.41*			.82
			(1.14)			(1.14)
Polling after executive election, t			0.27			.11
			(1.09)			(1.21)
Approval, t-1		0.01	0.01		0.04	0.04
		(0.04)	(0.04)		(0.03)	(0.03)
Political Terror Score (State Department), t		-0.80	-0.85		-1.41**	-1.41**
		(1.08)	(1.06)		(0.54)	(0.55)
N	312	310	309	447	436	435
Country and year dummies	NO	YES	YES	NO	YES	YES
χ^2 for ec. performance vars (p value)	.000	.001	.004			
χ^2 for objective safety vars (p value)				.000	.002	.001
R^2	.359	.873	.873	.385	.869	.869

Sources: See Table A1.

Note: OLS regressions. Robust standard errors, clustered by country and year, in parentheses. * $p < 0.05$, ** $p < 0.01$.

However, other variables may also contribute. Does censorship enhance perceptions of economic performance and public safety? Press freedom is not statistically significant in any regressions, but Internet censorship is associated with greater confidence in law and order (models 5-6). Economic perceptions are 1.7 percentage points higher in executive election years, and this effect is concentrated where polling preceded or overlapped with the vote (model 3), suggesting the impact of pre-election campaigns. Greater state repression, rather than making people feel more secure, was associated with a lower reported perception of safety.

Returning to government approval, we use models 1 and 4 in Table 3 to split the variation in perceptions into (a) "objective perceptions"—i.e., the part related to objective indicators (predicted values), and (b) "misperceptions"—i.e., the part unrelated to our objective indicators (the residuals). We then use these in Table 1 (models 2 and 8). Both "objective perceptions" and "misperceptions" contribute to approval in both cases (H2d). For economic performance, objective perceptions have a stronger impact. For public safety—perhaps because objective measures are more obscure—inaccurate subjective perceptions are more important. As Table 2 shows, on this the types of authoritarian states differ. For informational autocracies, objective perceptions of the economy matter more than misperceptions; for overt dictatorships, it is the reverse (consistent with H2f). Objective perceptions of safety are not significant for either type, and nor are misperceptions for informational autocracies. But misperceptions of safety correlate strongly with higher approval in the overt dictatorships. If leaders can make citizens feel safer than conditions actually merit, this seems to render them more popular. (Of course, causation could be reversed: approving of an authoritarian incumbent might make one feel safer.)

We hypothesized (H2e) that, because of the less extreme censorship, propaganda, and intimidation of respondents in informational autocracies, declared perceptions of government performance there would be more accurate than in overt dictatorships. To test this, we ran models identical to those in Table 3 (models 1 and 4) for each of the types separately. We then compared the amount of variation these objective indicators could explain in the two cases. As expected, the objective indicators explained more of the variation in informational autocracies than in overt dictatorships. For economic perceptions, the adjusted R^2's were 0.46 for informational autocracies and 0.17 for overt dictatorships; for public safety perceptions, they were 0.45 and 0.27.

We expected that, because of freer media and opposition, perceptions would be even more accurate in democracies (H2c). Yet, running the same regressions for just democracies, the adjusted R^2's were 0.20 for economic perceptions and 0.36 for public safety, higher in both cases than for overt dictatorships, but lower than for informational autocracies. This could reflect, in part, extensive manipulation of media in imperfect democracies. Running the same regressions for just consolidated democracies with a Polity2 score of 10, the adjusted R^2 for economic perceptions was .51, higher than for informational autocracies. The adjusted R^2 for public safety remained low—perhaps because all the consolidated democracies were relatively safe and so variation among them was limited (the average intentional homicide rate in the consolidated democracies was 4 per 100,000, compared to 7 per 100,000 in the informational autocracies and 12 per 100,000 in the overt dictatorships). Obviously, these comparisons depend on specific models and imperfect data, so one should interpret cautiously. But the accuracy of perceptions of the economy in informational autocracies appears higher than in overt dictatorships but lower than in at least high quality democracies.

Next, consider election effects. Table 1, model 4, shows approval was almost 6 percentage points higher when GWP polled in the year of a national executive election. (Legislative elections had no effect.) When exactly did this surge occur? We hypothesized that in months leading up to a vote, ratings might rise—because of intensified propaganda or handouts—or fall—because opposition was allowed to campaign (H3a). In fact, there was no significant effect before elections, perhaps because these opposed influences offset each other (Table 1, model 5). Did misperceptions increase during an election campaign, as hypothesized in H3b? As already noted, even controlling for objective economic indicators, about 2.4 percentage points more respondents perceived "good" or "excellent" economic conditions if they were asked shortly before or in the month of an executive election (Table 3, model 3).

The big election-related boost in the ratings came after the vote. When polling began shortly after an executive election, approval was almost 7 points higher (Table 1, model 5). This post-election surge was considerably larger if the vote produced leader change (consistent with H3c). Models 6 and 8 in Table 1 suggest approval jumps 10 to 18 points if this happens, but only 4 to 4.5 points if the incumbent survives. Is it the election per se—and any legitimacy it confers—that explains the result, or just leader turnover? In Table A9, discussed in the next section, we add additional controls in column 2, including one for leader turnover (by election or any other means). Turnover *not* triggered by election turns out to predict a statistically significant 5.7-point *drop* in approval; the effect of election-associated turnover remains around +14 points. In short, changing leaders through election, even if these are manipulated, appears to buy

undemocratic regimes a significant popularity boost. Changing leaders in other ways may burden the new leader with higher *dis*approval.[15]

We hypothesized that any positive effect of elections on approval would be driven by the informational autocracies, where leader turnover lends credibility to the government's simulation of democracy (H3c). Table 2 shows this was in fact the case. The boost to approval if polling occurred right after an election in which the leader changed was almost 20 percentage points in informational autocracies (significant at $p < .01$). In fact, we could not even estimate the corresponding effect in overt dictatorships since in none of the 12 elections held in such regimes in our sample did the leader change.

The effect of elections in democracies contrasts with that in informational autocracies. There, we see a strong boost to approval (about 10-11 points) if polling overlapped with the election month, suggesting the impact of campaigns (Table A4, models 5, 6, 8). We also see a ratings surge after the election. As in the authoritarian states, the rise is greater if a new leader is elected, but the increase is also large (8.5 points compared to 4 - 5 in the non-democracies) and highly significant even if there has been no turnover. Whereas elections without turnover buy relatively little legitimacy in authoritarian states, in democracies they renew the incumbent's appeal.

[15] Dropping variables from Table 1 model 8 suggests that the fall in the post-election-with-turnover effect (from 17.9 in model 6 to 10.0 in model 8) reflects mostly stronger perceived media freedom after a new leader is elected rather than stronger perceived economic performance. (Including perceived media freedom along with actual press freedom in model 6 reduces the post-election-with-turnover effect to 9.1—see Table A6—whereas including economic perceptions lowers the effect only to 14.9.) Elections which dislodge the leader in an authoritarian state may restore faith in freedom of the media, which translates into higher approval.

Consider now repression. Hypothesis H4 posited that greater repression would lead to preference falsification in overt dictatorships—generating higher declared approval, along with higher rates of "don't knows" and refusals to answer. By contrast, in informational autocracies, indignation would offset fear, leading to null results or even a negative effect on approval, "don't knows," and refusals. Table 2 (model 5) shows that in overt dictatorships the effect was actually negative, although statistically insignificant. This may be because GWP is not able to poll in the most repressive dictatorships such as North Korea and Syria, where severe repression has coincided with extremely high rates of declared support for the government in recent elections.[16] In informational autocracies, greater repression was, as hypothesized, associated with *lower* declared approval, consistent with indignation outweighing fear. Pooling the various authoritarian subtypes, repression was not significant (Table 1, models 7-8).

In Tables 1 and 2, we used the US State Department version of the PTS. Tables A7a and A7b substitute: (a) the Amnesty International version of the PTS, (b) the natural log of estimated fatalities in one-sided state violence against unarmed civilians, and (c) the percentage of respondents who said that "most" or "many" people in their country were afraid to discuss their political views. In informational autocracies, the coefficients on indicators of repression were always negative, and approval was significantly lower in countries where state violence caused more fatalities. Against expectations, ratings were also slightly lower and fewer replied "don't know" in overt dictatorships where more respondents thought that others censored themselves

[16] In recent elections, incumbents won 100 percent in North Korea (2014 Supreme People's Assembly) and 88.7 percent in Syria (2014 presidency). We suspect opinion polls on approval would obtain similar results.

(Table A7b, models 4, 8).[17] There was no evidence that repression increased either reported approval or reticence, although again the results might differ in extremely repressive states such as North Korea.[18]

To sum up, although repression may silence critics in the most brutal despotisms, it did not boost ratings in the non-democracies Gallup surveyed. Across all states and years included, there was no correlation between any measure of repression and approval. In informational autocracies greater repression coincided—as hypothesized—with *lower* ratings. We believe that is because repression, while inducing fear, also undercuts the image of competence and benevolence that leaders of such regimes strive to present. Violent governments sometimes claim to use repression to protect the population. However, in countries with more repressive governments, respondents were more—not less—anxious about their personal safety.

Authoritarian countries where people did feel safe walking at night had higher approval. This was true in informational autocracies, but the effect was even stronger in overt dictatorships. What mattered most in the latter was not accurate perceptions rooted in actual crime rates but people's idiosyncratic sense of security, perhaps fueled by the leader's propaganda. It is hard to tell in these cases what causes what: do people approve a strongman if he makes them feel safer than they actually are, do they feel safer than they are if they approve of the incumbent, or do they claim to feel safe and approve of the incumbent because of pressure to

[17] As one would expect, the proportion that believed others censored themselves was highest in the overt dictatorships (62 percent), followed by informational autocracies (54 percent), and democracies (41 percent).

[18] We also looked for non-linear effects (including repression squared) in case very low and very high repression produce higher ratings, sincere in the first case, coerced in the second. We found no significant effects (Table A7c).

conform? In any case, feelings of security and insecurity are bound up with attitudes towards the ruler in such states.

In informational autocracies, political attitudes relate more closely to perceptions of economic performance. And here what matters is less idiosyncratic beliefs—although they also count—but well-founded beliefs that correspond to objective indicators. Moreover, in informational autocracies, respondents turn out on average to have quite accurate impressions of the state of the economy—much more accurate than those in overt dictatorships, and comparable to those in imperfect democracies.

Still, information manipulation does seem to work. In informational autocracies, media and Internet censorship were both associated with higher ratings, and the latter also coincided with greater confidence in public safety. Broader Internet access tended to go along with lower approval. However, since censorship is unpopular everywhere, curbs on press freedom appear most effective when not observed. Approval was significantly lower when respondents realized that the media were unfree.

In executive election years, economic perceptions tend to improve slightly during the campaign, but we found no evidence of a pre-election ratings surge in non-democracies. What drives up approval in informational autocracies—and may also restore belief in the independence of the media—appears to be election-driven turnover of leaders. New elected leaders enjoy a huge surge. In democracies, by contrast, even elections without turnover buy the reelected incumbent a significant new honeymoon, but there is little sign of that after authoritarian elections without turnover.

6 Robustness, extensions, and simulations

The Arellano-Bover, Blundell-Bond "systems" GMM estimator (AB/BB) is our preferred model given the structure of the data. Table A8 shows the same regressions using OLS with country and year fixed effects and standard errors clustered by both country and year. We show versions both with and without the lagged dependent variable (LDV). Both are problematic. Including the LDV risks bias since it is automatically correlated with the errors. However, to exclude the LDV is to assume—implausibly—that all effects of explanatory variables are absorbed in one period. Another advantage of the AB/BB estimator is that one can instrument for endogenous variables with lagged levels and differences, whereas simple fixed effects regressions do not do so. Given these points, one should not expect results to be identical, but in fact, they are very similar.

We also tried alternative specifications of the AB/BB GMM regressions. With this model, there is a tradeoff between instrumenting for explanatory variables that may be endogenous, on the one hand, and over-fitting by including too many instruments, on the other (see Roodman 2009). Although no clear rule defines how many instruments is "too many," one rule of thumb is to include fewer than there are units (countries). This condition is easily met in Table 1, models 1-7, but in model 8 the number of instruments approaches that of countries. Therefore, in Table A9 (column 1), we reduce variables treated as endogenous to economize on instruments. Results are similar.

We also tried adding additional controls that have been linked to approval in democracies—dummies for war, civil war, and leader turnover, and a measure of the leader's

tenure in office (model 2).[19] As noted in the previous section, leader change *without* an election in authoritarian states was associated with a 5.7 point drop in approval. The dummy for international war is significant, suggesting a large war-time surge in approval, but since the only case in our data was Russia's 2008 war in Georgia this should not be considered a robust finding.

If countries were transitioning into or out of democracy on the basis of explanatory variables we study, such selection might obscure the true effects. We therefore tried excluding 17 country-years in which a transition occurred in the current or previous year. The results change little (model 3). We also checked whether findings were sensitive to the scale used to identify "democracies." Instead of Polity2, in model 4 we use the three-way ordinal polyarchy index from the V-Dem dataset (Coppedge et al. 2016), coding the bottom two categories ("autocratic" and "electoral authoritarian") as "non-democracies." Again, results are similar. Model 5 shows the same regression controlling for countries' Polity2 scores to check press freedom is not picking up some broader quality of institutions. The press freedom index remains significant, with a similar coefficient, but Polity2 is not significant at all.

Model 6 shows that results are almost identical dropping the year dummies. Finally, model 7 restricts analysis to years from 2012-16 to ensure the economic perceptions effects are not inflated by the salience of economics during the global recession of 2008-11. In fact, the economic perceptions coefficients are a little higher in the *non*-crisis years; other estimates are similar although slightly less significant since the number of observations falls by nearly 40

[19] Of the 242 country-years in this regression, 30 contained leader turnover.

percent.[20]

When opposition candidates or parties are banned, citizens have no alternative to compare to the incumbent; this might inflate approval. In Table A10, we check whether ratings are higher in non-democracies where: (a) the legislature contains no opposition parties, and (b) no such party has more than 10 percent of seats. Neither coefficient is significant, and other results are little affected. Several papers suggest natural disasters or terrorist attacks can affect incumbents' popularity (e.g. Gasper and Reeves 2011, Ladd 2007). We checked but found no significant relationship. Finally, we tested whether approval varied with the seasons, but found no significant patterns.

To demonstrate the magnitudes of some effects, we produce simulations for several countries (see Online Appendix B for description of the methodology and Figures B1 and B2 for results). These suggest, for instance, that poor economic performance weighed on the ratings of President Putin and Venezuela's Nicolás Maduro in recent years, but that media controls helped shore up their support—and also that of Correa in Ecuador and Nazarbayev in Kazakhstan. The figures also suggest the importance of some individual leaders: approval is higher than the models can explain in Venezuela under Chavez in 2011, but dives after the uncharismatic Maduro takes over in 2013. In all simulations, the effects of changes in media freedom and in economic performance over the decade we study are substantial: the impact of these changes on leaders' popularity is in the range of 10-20 percentage points. Such changes in popularities may significantly affect the probability of survival of these leaders and regimes.

[20] Google requests remain significant, so this result is not driven by setting the variable at zero for early years. Some regressions include variables that are conceptually related.

7 Conclusions

Przeworski (1991, p.58) suggests that authoritarian equilibria rest on "lies, fear, or economic prosperity." We presented comprehensive empirical evidence on how, in recent years, these factors influenced the recorded levels of support for autocratic incumbents. We also documented how two types of authoritarian regime—overt dictatorships and the increasingly prevalent informational autocracies—differ in the basis of their popular support.

In informational autocracies as in democracies, prosperity matters. For every 10 percent of citizens who think economic conditions are good or excellent, the ratings of leaders in informational autocracies are 3-4 percentage points higher. Moreover, economic perceptions, although not perfectly accurate, do track objective indicators. While government propaganda may—especially during election campaigns—accentuate the positive, authoritarian leaders cannot completely escape the consequences of poor performance through misinformation. Similarly, citizens—especially in harsher, overt dictatorships—approve of their governments more when they feel confident in public safety. While such perceptions correlate with actual crime levels, it is respondents' *inaccurate* beliefs about public safety that move approval most in the overt dictatorships.

Although perceptions are not entirely distorted, the "lies" of governments also matter. And the more sophisticated the lies the better—since citizens do not like to be deceived. Authoritarian leaders who restricted the press were more popular than those who permitted greater freedom. Where Internet access was narrower, and where Internet content was censored, support was also higher. Simulations suggest that in countries such as Russia and Ecuador the impact of information manipulation on presidential approval has been significant. However,

when citizens *realized* that their press was censored, they liked their governments less. Today's informational autocrats need to manipulate discreetly.

Modern authoritarian regimes try to blend in with democracies through an extensive use of elections. Our evidence suggests two benefits executive elections may provide incumbents. First, they may coordinate state agents to periodically improve perceptions of the economy. Second, and more important, in informational autocracies they reinvigorate the regime's appeal if the top leader is replaced. Citizens are not naïve about such exercises, taking them less seriously if they do not result in turnover.

Finally, the role of "fear" is no longer as straightforward as it used to be. While repression probably does work in the most brutal dictatorships, it is less effective at boosting approval in less extreme cases. In informational autocracies, where leaders pretend to be democratic, the alienating effects of overt state violence more than offset the loyalty-inducing ones. While "economic prosperity" remains important, and the power of "lies" is amplified by modern technologies and techniques, most autocrats—although far from squeamish—face incentives to use "fear" today less crudely than their predecessors of past decades.

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Online Appendix A: Additional Tables

Table A1. Data sources

Approval	"Do you approve or disapprove of the job performance of the leadership of this country?" Percent of respondents who said yes.	Gallup World Poll
Interstate war	Dummy for state involved in episode of "interstate warfare" or "interstate violence"	Major Episodes of Political Violence and Conflict Regions, 1946-2012 (Monty Marshall, Center for Systemic Peace) www.systemicpeace.org/warlist.htm
Civil war	State involved in episode of "civil war," "ethnic war," "civil violence," or "ethnic violence."	Major Episodes of Political Violence and Conflict Regions, 1946-2012 (Monty Marshall, Center for Systemic Peace) www.systemicpeace.org/warlist.htm.
Homicide rate	Intentional homicides per 100,000 people	United Nations Office on Drugs and Crime
Growth rate of GDP per capita	Growth rate of real GDP per capita	World Bank, World Development Indicators.
Log GDP per capita	Natural log of GDP per capita at PPP in 2011 dollars	World Bank, World Development Indicators.
Log inflation rate	Natural log of (5 + inflation rate). (5 added to prevent exclusion of cases with negative inflation.)	World Bank, World Development Indicators, when available, supplemented by IMF, World Economic Outlook database.
Unemployment	Unemployment rate	World Bank, World Development Indicators, when available, supplemented by IMF, World Economic Outlook database.
Economic conditions good or excellent	"How would you rate economic conditions in this country today—as excellent, good, only fair, or poor?" Percent saying "excellent" or "good."	Gallup World Poll
Percent who felt safe walking alone at night	"Do you feel safe walking alone at night in the city or area where you live?" Percent saying yes.	Gallup World Poll
Percent who thought media had a lot of freedom	"Do the media in this country have a lot of freedom, or not?" Percent saying yes.	Gallup World Poll
Press freedom	Press freedom index; adjusted so 0 = completely unfree, 100 = completely free.	Freedom House
Requests by governments or courts to Twitter to block tweets	Note that data begin in 2012.	Twitter
Requests by governments or courts to Google to "remove information from Google products, such	Note that data begin in 2009	Google Transparency Report

as blog posts or Youtube videos."		
Leader's years in office	Number of years the head of executive had been in office	DPI, see: Cruz, Cesi, Philip Keefer and Carlos Scartascini (2016). "Database of Political Institutions Codebook, 2015 Update (DPI2015)." Inter-American Development Bank. Updated version of Thorsten Beck, George Clarke, Alberto Groff, Philip Keefer, and Patrick Walsh, 2001. "New tools in comparative political economy: The Database of Political Institutions."15:1, 165-176 (September), World Bank Economic Review; our updates.
Legislative or executive election year	Either legislative or execuutive election held this year	DPI, see: Cruz, Cesi, Philip Keefer and Carlos Scartascini (2016). "Database of Political Institutions Codebook, 2015 Update (DPI2015)." Inter-American Development Bank. Updated version of Thorsten Beck, George Clarke, Alberto Groff, Philip Keefer, and Patrick Walsh, 2001. "New tools in comparative political economy: The Database of Political Institutions."15:1, 165-176 (September), World Bank Economic Review; our updates.
Amnesty	Political terror score, based on Amnesty International Reports	Amnesty International, from Political Terror Score database (Gibney, Mark, Linda Cornett, Reed Wood, Peter Haschke, and Daniel Arnon. 2015. The Political Terror Scale 1976-2015. Date Retrieved, from the Political Terror Scale website: http://www.politicalterrorscale.org.)
State Department	Political terror score, based on US State Department Reports	US State Department, from Political Terror Score database (Gibney, Mark, Linda Cornett, Reed Wood, Peter Haschke, and Daniel Arnon. 2015. The Political Terror Scale 1976-2015. Date Retrieved, from the Political Terror Scale website: http://www.politicalterrorscale.org.)
Polity2 score	Score. -10 = "pure autocracy," +10 = "pure democracy"	Polity IV dataset, Monty Marshall, Center for Systemic Peace, http://www.systemicpeace.org/polityproject.html
V-Dem democracy scores	Using e_v2x_api_4C, we code the bottom two categories ("Autocratic" and "Electoral Authoritarian") as non-democracies.	Coppedge, Michael, John Gerring, Staffan I. Lindberg, Svend-Erik Skaaning, Jan Teorell, with David Altman, Michael Bernhard, M. Steven Fish, Adam Glynn, Allen Hicken, Carl Henrik Knutsen, Kelly McMann, Pamela Paxton, Daniel Pemstein, Jeffrey Staton, Brigitte Zimmerman, Rachel Sigman, Frida Andersson, Valeriya Mechkova, and Farhad Miri. 2016. "V-Dem Codebook v6." Varieties of Democracy (VDem) Project.
Deaths from natural disasters		EM-DAT Database, D. Guha-Sapir, R. Below, Ph. Hoyois – "EM-DAT: The CRED/OFDA International Disaster Database" – www.emdat.be – Université Catholique de Louvain – Brussels – Belgium.
Deaths from terrorist attacks		Global Terrorism Database, https://www.start.umd.edu/gtd/.

Share of seats of opposition parties	At least one seat in parliament held by opposition party. More than 10 percent of seats in parliament held by opposition parties.	DPI, see: Cruz, Cesi, Philip Keefer and Carlos Scartascini (2016). "Database of Political Institutions Codebook, 2015 Update (DPI2015)." Inter-American Development Bank. Updated version of Thorsten Beck, George Clarke, Alberto Groff, Philip Keefer, and Patrick Walsh, 2001. "New tools in comparative political economy: The Database of Political Institutions."15:1, 165-176 (September), World Bank Economic Review.
Percent with internet access at home.	Percent of respondents who said their home had acces to Internet. In 2016, since GWP replaced this question, we use predictions from regression of this "home internet access" on lag of "home internet access", percent who said they had access to the Internet in some way, and percent who said they used Internet in previous 7 days (R^2=.98)	Gallup World Poll
Freedom of the Net Index	Index of Internet freedom. We use the 2007-08 pilot study figures for 2007 and 2008.	Freedom House
Perceived fear	Percent saying "most" or "many" afraid to discuss their political views	Gallup World Poll
Number killed in one-sided violence by the state	"Best estimate" of fatalities, one-sided violence, only cases with > 25 fatalities counted.	Uppsala Conflict Data Program Department of Peace and Conflict Research, Uppsala University

Table A2: Non-democracies (Polity2 at start of year < 6) with GWP current and lagged approval data

Country	*Years in data*	*type*	*Country*	*Years in data*	*Type*
Armenia	2008-16	IA	Congo Kinshasa	2012-16	OD
Azerbaijan	2008-9, 2012-16	IA	Ethiopia	2014-16	OD
Djibouti	2009	IA	Sri Lanka	2010-15	OD
Ecuador	2008-16	IA	Togo	2015-16	OD
Gabon	2012-16	IA	Uganda	2008-16	OD
Guinea	2012-16	IA	Zimbabwe	2008-15	OD
Kazakhstan	2008-16	IA	Bangladesh	2008-16	OD (2010-16), U (2008-9)
Belarus	2007-10, 2014-16	IA	Kyrgyzstan	2008-11	OD (2008-10), U (2011)
Mauritania	2009-16	IA	Nigeria	2008-15	OD (2011-15), U (2008-10)
Mozambique	2008	IA	Pakistan	2008-10	OD (2008) U (2009-10)
Russia	2008-16	IA	Tunisia	2011-14	OD (2011) U (2012-14)
Singapore	2008-11, 2014-16	IA	Afghanistan	2015-16	U
Tanzania	2008-16	IA	Bhutan	2014-15	U
Zambia	2008	IA	Egypt	2013-16	U
Burkina Faso	2008, 2011-14	IA (2008-13), U (2014-15)	Haiti	2012-16	U
Malaysia	2008, 2015	IA (2008), U (2015)	Iraq	2011-14	U
Niger	2010-11	IA (2010) U (2011)	Ivory Coast	2014-15	U
Venezuela	2009-16	IA (2009-12), U (2013-16)	Madagascar	2012-14	U
Vietnam	2008-13	IA (2008-11), U (2012-13)	Mali	2014-16	U
Yemen	2010-14	IA (2010-12), U (2013-14)	Myanmar (Burma)	2013-16	U
Angola	2012	OD	Somalia	2015-16	U
Cambodia	2008-16	OD	Sudan-North	2015-16	U
Cameroon	2008-16	OD	Thailand	2008-11, 2015-16	U
CAR	2011	OD	Turkey	2015-16	U
Chad	2008-16	OD	Ukraine	2015-16	U
Congo Brazzaville	2012-16	OD			

Source: Gallup World Poll, Polity IV, Guriev and Treisman (2019a).

Notes: IA: Informational autocracies; OD: Overt dictatorships; U: Unclassified non-democracies**.** Subtype classifications as at start of year.

Table A3: Imputed variables

Variable	Percent of observations used in regressions that are imputed
Percent who thought economic conditions "good" or "excellent" (GWP)	20
Unemployment rate	2
Log inflation rate	8
Percent who believe media have a "lot" of freedom (GWP)	18
Homicide rate	52
Political Terror Score (Amnesty International)	28
Political Terror Score (State Department)	14
Freedom House Freedom on the Net index	65
Percentage who think others afraid to express political opinions (GWP)	25

Source: Authors, Sources in Table A1.

Table A4: Determinants of government approval (same regressions, for democracies)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Approval, t-1	0.41**	0.48**	0.40**	0.59**	0.48**	0.44**	0.42**	0.36**
	(0.09)	(0.05)	(0.065)	(0.067)	(0.070)	(0.073)	(0.067)	(0.068)
Approval, t-2		0.079		0.13**				0.051
		(0.049)		(0.05)				(0.041)
Perceived performance								
Economic conditions "good" or "excellent", t	0.36**							
	(0.066)							
Percent who felt safe walking alone at night, t	-0.20							
	(0.12)							
Objective economic perceptions, t		0.25**						0.44*
		(0.080)						(0.18)
Economic misperceptions, t		0.36**						0.20**
		(0.087)						(0.07)
Objective safety perceptions, t		-0.009						0.29
		(0.058)						(0.15)
Safety misperceptions, t		0.037						0.20
		(0.094)						(0.12)
Information manipulation								
Press freedom, t			-0.15					-0.52**
			(0.15)					(0.16)
Percent who think media have a lot of freedom, t			0.42**					0.43**
			(0.095)					(0.10)
Percent with internet access at home, t			-0.28*					-0.06
			(0.13)					(0.09)
Total requests to Google to remove content, ths, t			6.0					-3.5
			(3.5)					(2.1)
Elections								
Executive election year, t				6.37**				
				(1.67)				
Legislative election year, t				1.83				
				(0.95)				
Polling began in 6 months after executive election					10.4**			
					(1.72)			
Polling overlapped with executive election					11.1**	11.0**		9.59*
					(3.56)	(3.45)		(3.92)
Polling ended in 6 months before executive election					2.51	2.49		3.69
					(1.85)	(1.84)		(2.07)
Polling began in 6 months after election with turnover						14.7**		12.1**
						(2.87)		(2.45)
Polling began in 6 months after election without turnover						5.43**		8.46**
						(1.98)		(2.56)
Repression								
Political Terror Score (State Department), t							-0.40	-0.35
							(1.07)	(1.16)
Observations	665	548	661	545	642	642	665	535
Countries	96	90	95	91	95	95	96	90
Arellano-Bond AR(2), p	0.11	0.35	0.65	0.29	0.18	0.38	0.12	0.17
Hansen test, p	0.11	0.16	0.25	0.14	0.35	0.14	0.13	0.30
No. of instruments	21	23	36	26	23	36	25	37

Sources: See Table A1. **Notes:** Robust standard errors, clustered by country, in parentheses. * $p < 0.05$, ** $p < 0.01$. Estimated with xtabond2, collapse option to economize on instruments. All models include year dummies. All explanatory variables instrumented with 1^{st} -3^{rd} lags except: objective economic and safety perceptions treated as exogenous; (1): approval(t-1) with 3^{rd} lag; (2) approval(t-1) and approval(t-2) with first lag; (3),(4), and (6): 1^{st}-4^{th} lags for all; (4) 1^{st}-2^{nd} lags for all; (7): first to sixth lags for all; (8) 1^{st} lag for all but objective perceptions. Lags chosen on basis of diagnostic tests.

Table A5: Internet and approval

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Approval (t-1)	0.38**	0.40**	0.39**	0.38**	0.39**	0.40**	0.42**
	(0.08)	(0.08)	(0.08)	(0.10)	(0.08)	(0.08)	(0.08)
Approval (t-2)				-0.014			
				(0.059)			
Press freedom	-0.69**	-0.61**	-0.61**	-0.71*	-0.62**	-0.64**	-0.71**
(Freedom House), t	(0.23)	(0.21)	(0.21)	(0.28)	(0.23)	(0.22)	(0.23)
Percent that believe media	0.55**	0.56**	0.56**	0.56**	0.55**	0.55**	0.55**
have "lot" of freedom, t	(0.11)	(0.10)	(0.11)	(0.11)	(0.11)	(0.10)	(0.095)
Internet access at	-0.25*	-0.22*	-0.26**	-0.29**	-0.25**	-0.25*	-0.22*
home, t	(0.11)	(0.095)	(0.093)	(0.11)	(0.095)	(0.10)	(0.11)
Requests to Google,	8.9**						
ths, t	(0.34)						
Requests to Twitter		3.1**					
ths, t		(0.94)					
Ln of requests			1.48				
to Google, t			(1.05)				
More than 20				10.4*			
requests to Google, t				(5.21)			
Ln of requests					1.23		
to Twitter, t					(1.09)		
More than 20						10.3*	
requests to Twitter, t						(4.10)	
Freedom on the net							-0.18
Index (Freedom House), t							(0.15)
Observations	258	258	258	212	258	258	258
Countries	51	51	51	46	51	51	51
Arellano-Bond AR(2), p	0.13	0.15	0.13	0.81	0.17	0.14	0.23
Hansen test, p	0.55	0.51	0.67	0.44	0.46	0.66	0.60
No. of instruments	30	30	30	36	30	30	30

Sources: See Table A1.

Note: Dependent variable is percent approving of the leadership. Robust standard errors, clustered by country, in parentheses. * $p < 0.05$, ** $p < 0.01$. Estimated with xtabond2, collapse option to economize on instruments. All models include year dummies. All explanatory variables instrumented with first to third lags except (4) first to fourth lags.

Table A6: Explaining change in election related coefficients between (Table 1) models 6 and 8

	(1) Model 6 reproduced	(2) Adding just economic variables	(3) Adding just information-related variables
Approval, t-1	0.57** (0.10)	0.46** (0.09)	0.46** (0.09)
Perceived performance			
Objective economic perceptions, t		0.62** (0.10)	
Economic misperceptions, t		0.36** (0.094)	
Information manipulation			
Press freedom, t			-0.52** (0.19)
Percent who think media have a lot of freedom, t			0.49** (0.10)
Elections			
Polling ended in 6 months before executive election	3.58 (3.03)	2.76 (2.56)	2.40 (2.79)
Polling overlapped with executive election	1.53 (5.71)	0.27 (4.12)	0.01 (4.88)
Polling began in 6 months after election with turnover	17.9** (4.47)	14.9* (6.16)	9.06* (4.13)
Polling began in 6 months after election without turnover	4.11 (2.52)	3.90 (2.31)	4.61* (2.26)
Observations	258	252	258
Countries	51	50	51
Arellano-Bond AR(2), p	0.34	0.18	0.11
Hansen test, p	0.61	0.88	0.60
Instruments	30	35	38

Sources: See Table A1.

Notes: Robust standard errors, clustered by country, in parentheses. * $p < 0.05$, ** $p < 0.01$. Estimated with xtabond2, collapse option to economize on instruments. All models include year dummies. (1)-(2): all explanatory variables instrumented with first to third lags except objective economic perceptions treated as exogenous; (3) all instrumented with first to second lags.

Table A7a: Repression: all authoritarian states

	----------DV: Approval----------				*----------DV: Don't know----------*				*---------DV: Refused to answer----------*			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Approval (t-1)	0.56**	0.54**	0.59**	0.56**								
	(0.10)	(0.11)	(0.10)	(0.11)								
Don't know on approval (t-1)					0.46**	0.48**	0.54	0.43**				
					(0.13)	(0.12)	(0.36)	(0.13)				
Refused to answer on Approval (t-1)									0.16	0.15	0.14	0.13
									(0.14)	(0.15)	(0.15)	(0.13)
Approval (t)					-0.11**	-0.11**	-0.09	-0.12**	-0.03	-0.03	-0.03	-0.03
					(0.032)	(0.034)	(0.08)	(0.032)	(0.02)	(0.02)	(0.02)	(0.02)
Political Terror Score (t) (State Department)	-2.03				0.40				0.13			
	(1.86)				(0.52)				(0.18)			
Political Terror Score (t) (Amnesty International)		-1.47				-0.19				-0.05		
		(0.86)				(0.25)				(0.08)		
Ln number killed in one-sided violence by state (UCDP) (t)			-0.61				-0.29				-0.18*	
			(1.51)				(0.56)				(0.07)	
Perceived fear (Percent saying "most" or "many" afraid to discuss their political views) (t)				-0.23				-0.08				-0.017
				(0.12)				(0.04)				(0.014)
Observations	261	261	261	261	261	261	261	261	261	261	261	261
Countries	51	51	51	51	51	51	51	51	51	51	51	51
Arellano-Bond AR(2), p	0.83	0.84	0.65	0.97	0.28	0.27	0.89	0.36	0.55	0.52	0.77	0.53
Hansen test, p	0.46	0.28	0.57	0.49	0.20	0.12	0.12	0.21	0.35	0.26	0.14	0.17
Number of instruments	18	18	18	18	25	22	16	28	22	22	22	22

Sources: See Table A1.

Note: Robust standard errors, clustered by country, in parentheses. * $p < 0.05$, ** $p < 0.01$. Estimated with xtabond2, collapse option to economize on instruments. All models include year dummies. All explanatory variables instrumented with first to third lags except: (5) and (7) first to forth lags, (8) first to fifth lags, based on diagnostic tests.

Table A7b: Repression—informational autocracies and overt dictatorships

	DV: Approval				*DV: Don't know*				*DV: Refused to answer*			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Approval (t-1)	0.57**	0.53**	0.34	0.53**								
	(0.094)	(0.090)	(0.34)	(0.10)								
Approval (t)					-0.17**	-0.15**	-0.16**	-0.079**	-0.030*	-0.029*	-0.032**	-0.031*
					(0.033)	(0.034)	(0.035)	(0.024)	(0.013)	(0.013)	(0.012)	(0.013)
Don't know on approval (t-1)					0.45**	0.47**	0.46**	0.50**				
					(0.14)	(0.13)	(0.14)	(0.14)				
Refused to answer on approval (t-1)									0.39**	0.40**	0.41**	0.40**
									(0.074)	(0.084)	(0.079)	(0.095)
Refused to answer on approval (t-2)									0.090	0.075	0.089	0.077
									(0.083)	(0.085)	(0.092)	(0.091)
Informational autocracy	12.0*	4.58	0.32	10.4	-1.56	0.48	0.69	2.14	-0.38	-0.15	0.23	0.31
	(5.73)	(6.36)	(4.87)	(7.49)	(3.09)	(2.10)	(1.62)	(2.76)	(0.72)	(0.53)	(0.47)	(1.39)
Overt dictatorship	8.63	-1.96	-2.06	15.0*	4.66	-0.88	-1.48	6.07*	-0.024	-0.48	0.12	-1.27
	(8.65)	(6.33)	(4.47)	(7.55)	(3.76)	(1.81)	(1.50)	(2.45)	(1.37)	(0.61)	(0.43)	(2.06)
Political Terror Score (t)	-4.65**				0.67				0.27			
(State Department)*IA	(1.77)				(0.86)				(0.24)			
Political Terror Score (t)	-2.62				-1.65				0.021			
(State Department)*OD	(2.31)				(0.93)				(0.33)			
Political Terror Score (t)		-1.89				0.15				0.17		
(Amnesty International)*IA		(1.57)				(0.42)				(0.17)		
Political Terror Score (t)		0.014				-0.25				0.12		
(Amnesty International)*OD		(1.28)				(0.32)				(0.094)		
Ln number killed in one-sided			-3.15**				-0.40				0.11	
violence by state (UCDP) (t)*IA			(0.98)				(0.34)				(0.13)	
Ln number killed in one-sided			0.11				-0.41				-0.057	
violence by state (UCDP) (t)*OD			(1.09)				(0.48)				(0.092)	
Perceived fear (Percent saying												
"most" or "many" afraid to discuss				-0.18				-0.031				-0.0028
their political views) (t)*IA				(0.13)				(0.050)				(0.016)
Perceived fear (Percent saying				-0.27*				-0.13**				0.015
"most" or "many" afraid to discuss				(0.12)				(0.036)				(0.026)
their political views) (t)*OD												
Memo												
Unclassified	-0.88	2.91	-2.44	8.02	-3.10	1.45	0.32	4.21	-0.55	0.70	0.13	1.08
	(7.79)	(5.68)	(2.97)	(7.59)	(2.82)	(1.76)	(1.07)	(2.70)	(0.88)	(0.68)	(0.41)	(1.90)
Political Terror Score (t)	-0.28				0.79				0.19			

(State Department)*U	(1.94)				(0.66)				(0.23)			
Political Terror Score (t)		-1.46				-0.40				-0.17		
(Amnesty International)*U		(1.30)				(0.43)				(0.17)		
Ln number killed in one-sided			1.09				-0.47				-0.074	
violence by state (UCDP) (t)*U			(2.29)				(0.67)				(0.23)	
Perceived fear (Percent saying				-0.19				-0.074				-0.014
"most" or "many" afraid to discuss				(0.13)				(0.048)				(0.030)
their political views) (t)*U												
Observations	261	261	261	261	261	261	261	261	215	215	215	215
Countries	51	51	51	51	51	51	51	51	46	46	46	46
Arellano-Bond AR(2), p	0.66	0.63	0.63	0.73	0.41	0.35	0.52	0.49	0.34	0.35	0.33	0.33
Hansen test, p	0.54	0.52	0.44	0.73	0.12	0.27	0.25	0.15	0.26	0.36	0.41	0.16
Number of instruments	31	31	27	31	26	26	26	34	35	35	34	29

Sources: See Table A1.

Note: IA: Informational autocracies; OD: Overt dictatorships; U: Unclassified non-democracies. Subtype classifications as at start of year. Robust standard errors, clustered by country, in parentheses. * $p < 0.05$, ** $p < 0.01$. Estimated with xtabond2, collapse option to economize on instruments. All models include year dummies. (1)-(4) and (9)-(12): all explanatory variables instrumented with first and second lags; (5)-(8): all explanatory variables instrumented with first lag.

Table A7c: Repression: non-linear effects

	DV: Percent Approval			
	(1)	(2)	(3)	(4)
Approval (t-1)	0.56**	0.57**	0.61**	0.52**
	(0.10)	(0.09)	(0.09)	(0.10)
Political Terror Score (t) (State Department)	7.53			
	(8.15)			
Political Terror Score squared (t) (SD)	-1.50			
	(1.23)			
Political Terror Score (t) (Amnesty International)		2.67		
		(4.17)		
Political Terror Score squared (t) (AI)		-0.71		
		(0.76)		
Ln number killed in one-sided violence by state (UCDP) (t)			2.90	
			(5.20)	
Ln number killed squared (UCDP) (t)			-0.73	
			(1.09)	
Perceived fear (Percent saying "most" or "many" afraid to discuss their political views) (t)				-0.19
				(0.49)
Perceived fear squared (t)				-0.000
				(0.004)
Observations	261	261	261	261
Countries	51	51	51	51
Arellano-Bond AR(2), p	0.69	0.95	0.70	0.91
Hansen test, p	0.83	0.49	0.43	0.41
Number of instruments	22	22	22	22

Sources: See Table A1.

Note: Robust standard errors, clustered by country, in parentheses. * $p < 0.05$, ** $p < 0.01$. Estimated with xtabond2, collapse option to economize on instruments. All models include year dummies. All explanatory variables instrumented with first to third lags.

Table A8: Determinants of government approval (OLS with country and year fixed effects)

	(1)	(2)
Approval, t-1	0.20**	
	(0.066)	
Repression		
Political Terror Score	-1.30	-1.29
(Amnesty International), t	(0.99)	(0.72)
Perceived performance		
Objective economic	0.46**	0.48**
perceptions, t	(0.14)	(0.12)
Economic	0.20*	0.26**
misperceptions, t	(0.086)	(0.066)
Objective safety	0.52**	0.59**
perceptions, t	(0.13)	(0.12)
Safety misperceptions, t	0.61**	0.62**
	(0.083)	(0.092)
Information manipulation		
Press freedom, t	-0.34*	-0.31**
	(0.14)	(0.072)
Percent who think media	0.26**	0.24**
have a lot of freedom, t	(0.058)	(0.064)
Percent with internet	-0.32**	-0.31*
access at home, t	(0.12)	(0.13)
Total requests to Google	0.85**	1.0**
to remove content, ths, t	(0.30)	(0.31)
Elections		
Polling ended in 6 months	2.07	1.54
before executive election	(1.94)	(1.70)
Polling overlapped with	-2.29	-3.70**
executive election	(1.97)	(1.34)
Polling began in 6 months	8.52*	5.02
after election with turnover	(3.45)	(3.10)
Polling began in 6 months	2.85	3.29
after election without turnover	(1.95)	(1.64)
Observations	252	308
R^2	.884	.873

Sources: See Table A1.
Note: OLS regressions. Robust standard errors, clustered by country and year, in parentheses. * $p < 0.05$, ** $p < 0.01$.

Table A9: Various robustness checks

	(1) Reducing instrum-ents	(2) Addit-ional controls	(3) Exclud-ing regime transi-tions	(4) VDEM non-democra-cies	(5) Controll-ing for Polity2	(6) No year dummies	(7) After 2011
Approval, t-1	0.34**	0.42**	0.33**	0.32**	0.33**	0.33**	0.25*
	(0.07)	(0.07)	(0.08)	(0.07)	(0.07)	(0.07)	(0.10)
Repression							
Political Terror Score	-1.40	-0.94	-1.29	-0.36**	-0.77	-0.61	-0.50
(Amnesty International), t	(1.01)	(1.27)	(1.04)	(1.26)	(1.20)	(1.33)	(1.16)
Perceived performance							
Objective economic	0.56**	0.49**	0.59**	0.55**	0.60**	0.56**	0.63**
perceptions, t	(0.13)	(0.16)	(0.13)	(0.12)	(0.14)	(0.097)	(0.18)
Economic	0.30**	0.29**	0.34**	0.27**	0.27**	0.32**	0.43**
misperceptions, t	(0.08)	(0.10)	(0.08)	(0.07)	(0.07)	(0.08)	(0.10)
Objective safety	0.20*	0.20*	0.21**	0.27**	0.21**	0.21*	0.25*
perceptions, t	(0.08)	(0.10)	(0.07)	(0.08)	(0.08)	(0.01)	(0.11)
Safety misperceptions, t	0.44**	0.55**	0.42**	0.45**	0.40**	0.47**	0.41**
	(0.13)	(0.13)	(0.13)	(0.11)	(0.11)	(0.11)	(0.13)
Information manipulation							
Press freedom, t	-0.39*	-0.40	-0.35	-0.45**	-0.46*	-0.37*	-0.29
	(0.17)	(0.23)	(0.19)	(0.16)	(0.18)	(0.16)	(0.20)
Percent who think media	0.29**	0.27*	0.27*	0.36**	0.30**	0.31**	0.32**
have a lot of freedom, t	(0.09)	(0.11)	(0.10)	(0.09)	(0.08)	(0.09)	(0.12)
Percent with internet	-0.21	-0.22	-0.21	-0.24*	-0.26*	-0.20*	-0.17
access at home, t	(0.11)	(0.13)	(0.12)	(0.11)	(0.11)	(0.09)	(0.17)
Total requests to Google	1.6**	1.7**	1.6**	1.5**	1.4**	1.7**	1.8**
to remove content, ths, t	(0.48)	(0.50)	(0.4.6)	(0.43)	(0.44)	(0.48)	(0.58)
Elections							
Polling began in 6 months	9.96*	20.1**	7.31	9.20	8.87	10.5*	10.9
after election with turnover	(4.96)	(6.21)	(5.82)	(4.88)	(4.85)	(5.03)	(6.60)
Polling began in 6 months	4.37*	4.22*	3.96	3.01	3.97*	3.54	2.12
after election without turnover	(1.97)	(1.97)	(2.09)	(2.12)	(1.87)	(1.87)	(1.93)
Polling overlapped with	1.28	3.17	1.80	0.61	0.49	0.22	4.50
executive election	(2.97)	(3.29)	(2.90)	(3.04)	(2.84)	(2.70)	(2.91)
Polling ended in 6 months	2.91	5.46*	2.69	1.25	2.48	2.59	3.51
before executive election	(2.40)	(2.49)	(2.55)	(2.59)	(2.30)	(2.02)	(2.86)
Leader changed, t		-5.69*					
		(2.85)					
Leader's years in office, t		-0.34					
		(0.31)					
International war, t		11.5*					
		(4.61)					
Civil war, t		-0.73					
		(3.44)					
Democracy (Polity2), t-1					0.25		
					(0.59)		
Observations	252	242	242	228	252	252	156
Countries	50	49	50	47	50	50	43
Arellano-Bond AR(2), p	0.48	0.38	0.54	0.31	0.50	0.30	0.46
Hansen test, p	0.61	0.64	0.58	0.81	0.85	0.95	0.18
Instruments	38	44	38	47	50	38	33

Sources: See Table A1.
Note: Dependent variable is percent approving of the leadership. Robust standard errors, clustered by country, in parentheses. * $p < 0.05$, ** $p < 0.01$. Estimated with xtabond2, collapse option to economize on instruments. All models include year dummies. Instruments: All columns: "Objective" perceptions treated as exogenous. Columns 1, 3, 7: PTS also treated as exogenous; "misperceptions," election variables, lagged approval, Google requests—first lag; press freedom, perceived media freedom, internet access—first and second lags. Column 2: PTS, international and civil war also treated as exogenous; "misperceptions," election variables, lagged approval, Google requests, leader change, leader's years in office—first lag; press freedom, perceived media freedom, internet access—first and second lags. Columns 4-6: Lagged approval—first lag; PTS, "misperceptions," election variables, Google requests, press freedom, perceived media freedom, internet access, Polity2—first and second lags.

Table A10: Determinants of approval (adding controls for opposition parties)

	(1)	(2)
Approval, t-1	0.35**	0.35**
	(0.072)	(0.071)
Repression		
Political Terror Score (State Department), t	-0.83	-0.11
	(1.33)	(1.48)
Perceived performance		
Objective economic perceptions, t	0.55**	0.57**
	(0.15)	(0.16)
Economic misperceptions, t	0.28**	0.26**
	(0.085)	(0.086)
Objective safety perceptions, t	0.21*	0.22*
	(0.099)	(0.098)
Safety misperceptions, t	0.37**	0.38**
	(0.12)	(0.13)
Information manipulation		
Press freedom, t	-0.13	-0.11
	(0.24)	(0.24)
Percent who think media have a lot of freedom, t	0.37**	0.36**
	(0.079)	(0.080)
Percent with internet access at home, t	-0.096	-0.14
	(0.12)	(0.13)
Total requests to Google to remove content, ths, t	1.3*	1.5*
	(0.54)	(0.65)
Election		
Polling overlapped with executive election	1.84	1.98
	(2.90)	(3.12)
Polling ended in 6 months before executive election	3.53	3.41
	(2.37)	(2.38)
Polling began in 6 months after election with turnover	10.4*	11.6*
	(4.76)	(5.43)
Polling began in 6 months after election without turnover	4.03	3.62
	(2.12)	(2.19)
Opposition party in legislature, t-1	2.50	
	(6.19)	
Opposition party has > 10 percent of seats, t-1		-2.25
		(4.33)
Observations	244	244
Countries	50	50
Arellano-Bond AR(2), p	0.62	0.62
Hansen test, p	0.61	0.70
No. of instruments	38	38

Sources: See Table A1. **Note:** Dependent variable is percent approving of the leadership. Robust standard errors, clustered by country, in parentheses. * $p < 0.05$, ** $p < 0.01$. Estimated with xtabond2, collapse option to economize on instruments. All models include year dummies. "Objective" perceptions treated as exogenous, all other variables instrumented with first lag.

Online Appendix B: Simulations

Methodology

To simulate, we use the model in Table 1, column 9. The simplest way to simulate would be to use model predictions. Since the model estimated is:

$$r_{i,t} = \alpha r_{i,t-1} + \boldsymbol{X}'_{i,t}\boldsymbol{\beta} + \gamma_i + \delta_t + \varepsilon_{i,t} \ ,$$

the predictions $\hat{r}_{it}$ can be generated in the standard way:

$$\hat{r}_{i,t} = \hat{\alpha} r_{i,t-1} + \boldsymbol{X}'_{i,t}\widehat{\boldsymbol{\beta}} + \hat{\gamma}_i + \hat{\delta}_t \ .$$

Forecasts thus calculated are shown in Figure A2.

However, predictions calculated in the standard way include in each period the actual value of the lagged dependent variable, $r_{i,t-1}$. They are thus anchored to the actual series. A stronger test is to proceed iteratively, using the prediction as of year *t-1* as the lagged dependent variable when calculating the predicted value for year *t*. That is, we calculate "iterative predictions," $\tilde{r}_{i,t}$, where

$$\tilde{r}_{i,1} = \hat{r}_{i,1} \ ,$$
$$\tilde{r}_{i,2} = \hat{\alpha}\tilde{r}_{i,1} + \boldsymbol{X}'_{i,2}\widehat{\boldsymbol{\beta}} + \hat{\gamma}_i + \hat{\delta}_2 \ ,$$
$$\tilde{r}_{i,3} = \hat{\alpha}\tilde{r}_{i,2} + \boldsymbol{X}'_{i,3}\widehat{\boldsymbol{\beta}} + \hat{\gamma}_i + \hat{\delta}_3 \ ,$$

and so on. In this method, errors cumulate over time, allowing the simulated series to stray far from the correct values. We show predictions calculated in this way in Figure A1.

For convenience, in the calculations we use the fact that for all $t > 2$

$$\tilde{r}_{i,t} = \hat{r}_{i,t} + \hat{\alpha}\left(\tilde{r}_{i,t-1} - r_{i,t-1}\right)$$

Because there are some gaps in the approval series, we interpolate linearly to fill internal gaps before calculating the predictions. (The regressions themselves do not involve any interpolations or imputations in the dependent variable). Since the World Bank data on growth and GDP per capita in Venezuela are missing for 2014-16, we use growth rates from the IMF's World Economic Outlook database to generate these missing observations for the simulations.

Iterative predictions generated in this more demanding way (see blue dashed line in Figure A1) are more accurate for some countries than for others. For Russia, the predictions capture the trend well, although they do not capture the full leap in approval in 2014 that we associate with the Russian annexation of Crimea. Venezuela's forecast is also quite accurate. Note, however, that actual approval is above the prediction during the Chavez presidency, but immediately falls below it once Maduro takes over in 2013, suggesting the importance of individual leaders. Turnover of leaders has been shown to

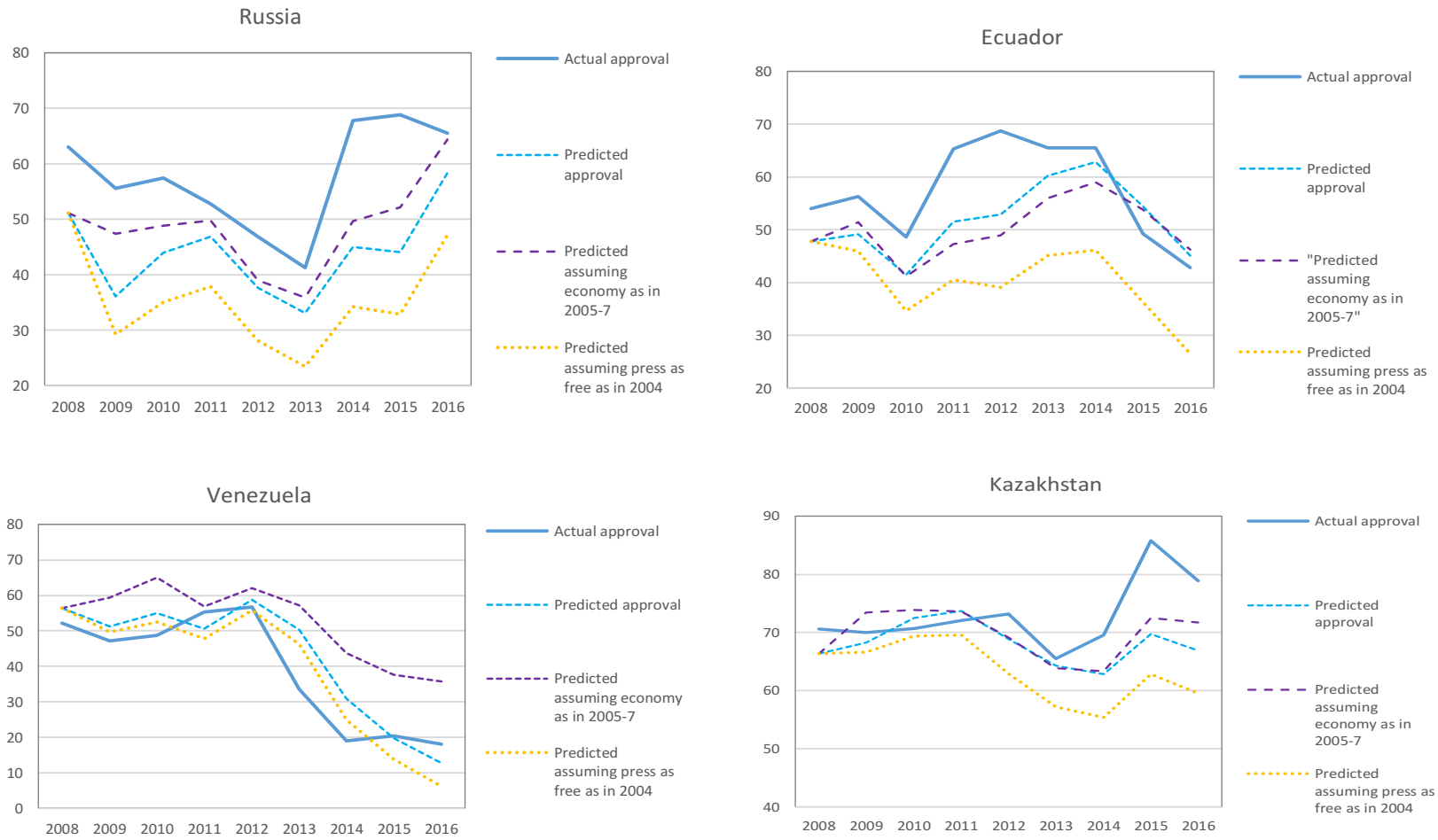
have various other consequences—from institutional change (Jones and Olken 2009) to economic growth (Jones and Olken 2005). For Ecuador, the model gets the trend right, but the rise is more gradual than in reality. The plot for Kazakhstan suggests that we have missed some factor that helps to account for Nazarbaev's surge in 2015; this might be a very large election effect.

The purple dashed lines show simulated values recalculated supposing that economic performance in 2008-14 had remained at the average level for 2005-7. That is, we imagine away the effects of the global economic crisis of 2008-9. Specifically, we calculate the average "objective" economic perception for 2005-7—that is the value for economic perceptions that could be predicted from the country's income level, growth rate, and inflation and unemployment rates. We then fix objective economic perceptions at this level in the following years, and calculate model predictions based on this.

This casts light on the influence of economic factors on government approval. In Russia and Venezuela, the models suggest the government would have been substantially more popular in the post-crisis years had economic growth remained strong (the purple dashed line is above the blue dashed line). For Kazakhstan, economic performance only deteriorated significantly in 2015-16, and in Ecuador, performance was actually better after 2008 than before.

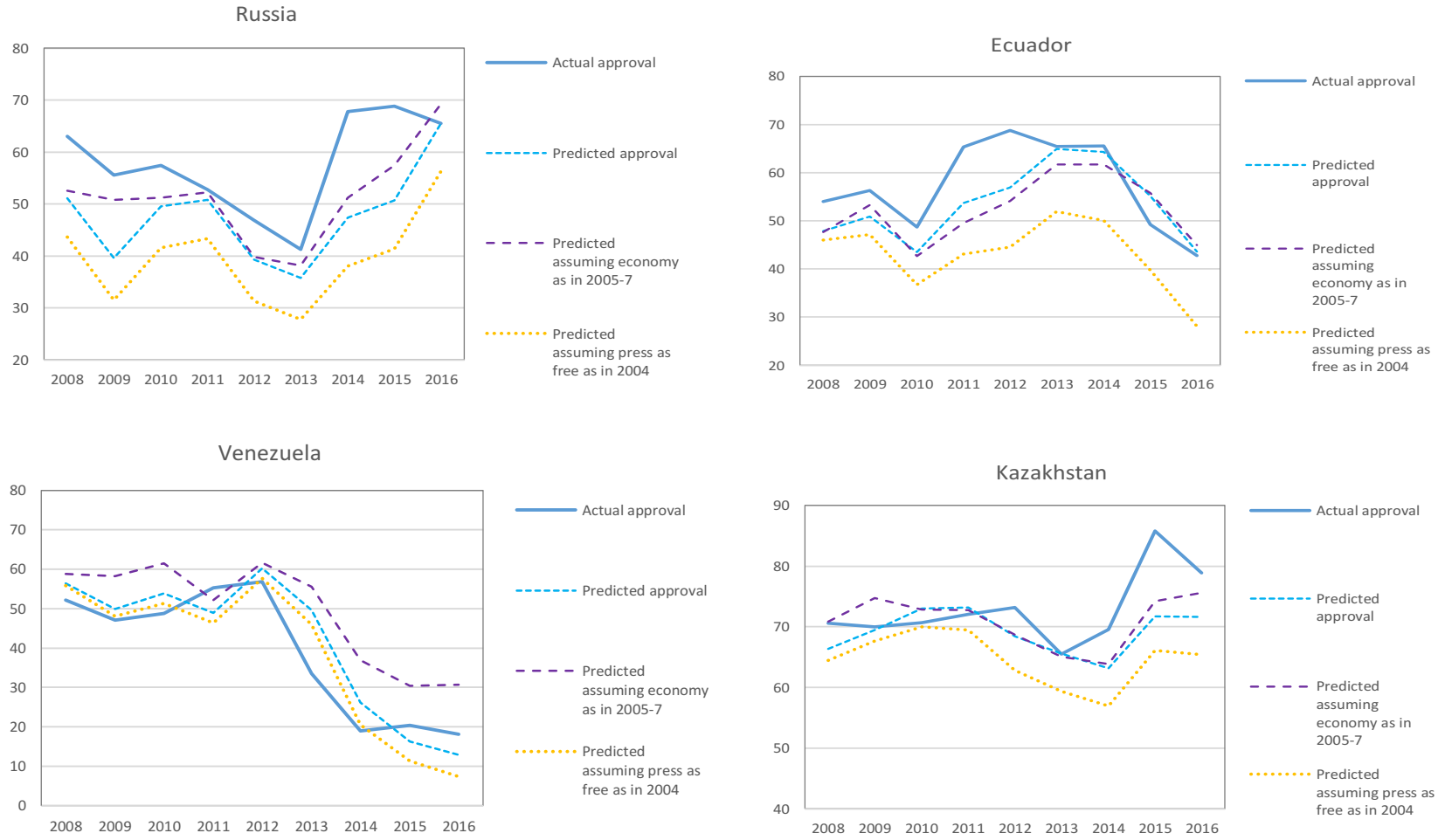
Finally, the yellow dotted line is calculated fixing the level of media freedom at its 2004 value. In other words, it shows predicted approval had there been no subsequent tightening of press restrictions. Both Putin in Russia and Correa in Ecuador appear to have received a significant boost from their manipulation of the media (there is a sizeable gap between the blue dashed line and the yellow dotted one). In Ecuador, the contribution of such manipulation rises from 2011, as President Correa's rating soars alongside tightening press restrictions. The effect is significant and gradually increasing in Kazakhstan as well after 2011. In Venezuela, too, decreasing press freedom made a small but growing contribution to the leader's approval.

Figure B1: Simulating government approval ratings (iterative predictions)



Sources: Gallup World Poll, World Bank, Google, Freedom House, authors' calculations. **Notes**: "Predicted assuming economy as in 2005-07": simulated assuming the objective economic indicators were average for 2005-7 in each subsequent year. "Predicted assuming no internet controls and press as free as in 2004": simulated subtracting out the estimated effect of Google request and fixing press freedom index at 2004 level.

Figure B2: Simulating government approval ratings: predictions using actual lagged dependent variable



Sources: Gallup World Poll, World Bank, Google, Freedom House, authors' calculations. **Notes**: "Predicted assuming economy as in 2005-07": simulated assuming the objective economic indicators were average for 2005-7 in each subsequent year. "Predicted assuming no internet controls and press as free as in 2004": simulated subtracting out the estimated effect of Google request and fixing press freedom index at 2004 level.