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Collective Memories, Propaganda and Authoritarian Political Support

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Abstract

To what extent does the degree of authoritarian political support depend on collective memories of a past experience with democracy? And how costly is it for a dictator to manipulate such memories with the help of propaganda? In this paper, we develop a political economy model with endogenous reference points, where a dictator strategically recalls traumatic collective memories of past political instability with the help of propaganda, to convince the population that an autocratic status quo is superior to a potential democratic alternative. In our model, both the optimal level of propaganda and collective memories are jointly determined. We show how the marginal benefit of propaganda is positively correlated both with the amount of rent distribution within the elite, and the intensity of a past traumatic experience with democracy. We illustrate our theoretical findings with case-studies of two authoritarian regimes that were preceded by periods of political instability—the Russian Federation under Vladimir Putin, and Chile under Augusto Pinochet. We then also provide cross-country empirical evidence in support of our argument.

JEL Classification: D74, D83, P16, Z13.

Keywords: collective memory, propaganda, political support, rebellion, private investment.

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1 Introduction

After the end of the Soviet Union, Russia experienced a period of economic and political transition that was perceived by many Russians as an economic disaster. In 1998, GDP per capita in Russia was just 61% of GDP per capita in 1991.[1] Apart from a short interlude between February and October 1917, this was also the first time Russians experienced any kind of political pluralism and democratic institutions. However, because of surging crime, rising inequality, economic collapse and political infighting, the democratic experiment ended with a large majority of the population being disillusioned with the way political institutions had developed. According to Colton and McFaul (2002, page 96), while in 1999 still 64% of respondents in a representative survey expressed a general support for the idea of "democracy", 80% were either dissatisfied or completely dissatisfied with "how democracy is developing in Russia."[2]

These beliefs have proven surprisingly stable over time. Although Russians have expressed a persistently high level of support for a democratic political system throughout the last 15 years, a majority of the population remained skeptical with respect to Western-style democratic institutions[3]. Instead, they expressed their preference for a specifically Russian version of democracy that in its form comes close to the electoral authoritarianism that has been the political status quo under Putin. In this paper, we argue that these political preferences are the result of a massive propagandistic campaign conducted by Putin to maintain high levels of support for the regime by keeping the negative association between economic chaos and Western-style democracy alive in the collective memory of the Russian population.

Motivated by this evidence, we build a theoretical model where the autocrat seeks

[1]The real GDP data are from the World Bank global development data (www.data.worldbank.org).

[2]At the time, many people in Russia associated the political and economic chaos they experienced in their country with what they believed was "Western style democracy". This association then directly affected their political preferences. In the 1999 survey cited by Colton and McFaul (2002), only 12% of respondents indicated "the political system that exists today" and 9% "democracy of the Western type" as their preferred political system for Russia. On the other hand, 25% were in favor of "the Soviet system we had in our country before perestroika," and 41% were in favor of "the Soviet system, but in a different, more democratic form".

[3]According to the Levada Barometer Survey, when asked about the specific type of democratic institutions only 13% were expressing their preference for "the kind of democracy existing in developed European countries or the US" in 2014. Instead, 16% were in favor of "the kind of democracy that existed in the Soviet Union," and 55% in favor of a "completely different kind of democracy, in accordance with the national traditions and specific characteristics of Russia." We report these frequences in three tables in Appendix A (Table A.1, A.2, and A.3).

popular support. Citizens have to decide whether to support the autocrat, or to initiate a revolution that will transit the political regime to a democracy, their political reference point. The motivation for initiating a revolution is purely economic, based on the beliefs people form about the economic potential of their political reference point. The autocrat prevents the revolution by convincing the citizenry that the democratic political alternative, their political reference point, is economically inferior to the autocratic status quo.

Specifically, our model features a principal-agent relationship between two players, the autocrat in power and the citizenry. We introduce a two-periods game with three states of the world, autocracy, democracy, and a chaotic regime. Autocracy is the state of the world in period 1 of the game, the status quo. From the point of view of the citizens, it is economically inferior to democracy because of two sources of political cost, within-elite redistribution and propaganda. However, it is economically more efficient than the chaotic regime, which although featuring political competition, is also characterized by the lack of the rule of law.

The key assumption of our model is that people living in autocracies do not have all the necessary information to exactly estimate the economic return under democracy. Their political reference point therefore remains stochastic. We capture this uncertainty by expressing the potential return from the political reference point as a convex combination between the value under democracy and that under the chaotic regime. The attractiveness of the political reference point crucially and negatively depends on the intensity of a negative collective memory experienced in the past.

In our model, this negative collective memory stems from the exposure to a chaotic regime in the past. We assume that by itself, this negative collective memory has no impact on the political equilibrium of the country. This assumption is based on findings by the psychology and cognitive science literature, such as for instance the fading affect bias (Walker et al. 2003), according to which emotions associated with unpleasant memories fade more quickly than the emotions associated with positive events, unless they are recalled.

Our political economy mechanism features an autocrat that invests in propaganda to strategically recall the negative collective memory, in order to convince the citizenry that their political reference point is closer to the chaotic regime than to democracy. However, at the same time propaganda also reduces the attractiveness of the status quo for the citizens, by reducing their productivity. This is the case because investments in propaganda divert public resources from investment in a productive public good, which is complementary to private investment by the citizens. The use of propaganda in our

model is therefore purely unproductive, representing an economic opportunity cost for the people at large, but also for the incumbent himself. The autocrat, in fact, faces an inter-temporal trade-off, as investment in propaganda, while increasing the chances of remaining in power in period 2, also reduces the rents the autocrat expects to obtain in period 2.

Our results feature two possible paths that depend on the extent to which rule of law is absent under the chaotic regime. Specifically, autocracies with a relatively low traumatic experience in the past fail in preventing a rebellion, with the political regime transiting to democracy. Conversely, autocracies with a relatively high traumatic experience in the past succeed in preventing the revolution, by investing substantially into propaganda. The political regime remains the status quo.

The mechanism leading to these two different outcomes is driven by the marginal cost and the marginal benefit of propaganda. Specifically, when the disruptiveness of the chaotic regime is sufficiently high, the marginal benefit of propaganda for the autocrat, associated with a reduction in the expected utility from the political reference point, outweighs its marginal cost, associated with the utility from autocracy. In equilibrium, therefore, investments in propaganda are high, and collective memories are recalled. Conversely, when the disruptiveness is sufficiently low, the marginal cost of an additional unit more of propaganda outweighs its marginal benefit. Because of that, the revolt is not prevented, and the regime transits to democracy. Our mechanism highlights how a more chaotic past experience reduces the cost of doing propaganda.

The strategic manipulation of political beliefs by the selective reinforcement of collective memories offers an explanation why some authoritarian regimes enjoy high popularity and remain in power longer than other comparable regimes, despite having lost the ability to deliver economic benefits to the population. To illustrate our theoretical results, we discuss two case studies of authoritarian regimes that were preceded by periods of political instability—the Russian Federation under Vladimir Putin, and Chile under Augusto Pinochet.

We then provide additional empirical cross-country evidence to further support our argument. Using data on the control of the media around the world, we show that the propaganda effort in autocracies is 25% higher than in democracies. However, those autocracies that have experienced a chaotic experience in the past exert a 15% additional propaganda effort compared to those autocracies that were not exposed to a chaotic regime in the past. We also find that in these autocracies the share of people considering democracy to be of absolute importance is 17.7% lower than in the other group of autocracies.

After a brief review of the literature in section 2, section 3 presents the fundamentals of our model, and section 4 describes its equilibrium. In section 5 we then show the economic and political implications of our mechanism by discussing the cases of Russia and Chile. Finally, in section 6, we present additional empirical cross-country evidence in support of our results. Section 7 concludes.

2 Related literature

Our paper relates to several strands of literature. First of all, it connects with a recent literature stressing the economic implications of optimal collective memory selection.[4] Dessí (2008), for instance, shows how collective memories are optimally transmitted across generations with the final aim of boosting optimism in the economy. Her main finding is that parents optimally suppress negative memories while emphasizing and elaborating positive ones.[5] In this paper, we find that an autocrat in power optimally *recalls* negative memories, associated with a past chaotic pluralistic experience, in order to convince his citizens that democracy is worse than the status quo.

Along similar lines, our work also connects to the political economy of beliefs formation (Lott, 1999; Alesina and Angeletos, 2005; Saint-Paul, 2009; Aghion, Algan and Cahuc, 2011). In these models, governments invest in strategic manipulation of information, in changing the future preferences and beliefs of their citizens. Our work extends this idea by looking at the incentive of an autocrat to manipulate citizens' beliefs about their political reference point—a democratic regime.

More specifically, our paper looks at the optimal strategy an autocrat uses to increase the probability of remaining in power (Wintrobe 1990, 2007). While previous research has focused on economic redistribution (Acemoglu and Robinson 2006), repression (Way and Levitsky 2006; Escriba-Folch 2013), performance (Zhao 2009) or competence of the autocrat (Guriev and Treisman 2015), we focus on the use of propaganda to strategically influence how the population thinks about potential alternatives to the political status quo[6].

[4]Historians, sociologists and psychologists have long studied the ways in which societies remember, represent and interpret the past. See Olick and Robbins (1998) for a complete survey of these studies.

[5]Benabou and Tirole (2002) have studied a more general setting in which time-inconsistent individuals optimally select memory for rising their motivations.

[6]In this respect, our paper also connects with a recent paper by Edmond (2013), where the elite in power uses a signal-jamming technology to shift the mean of the distribution from which individuals sample in order to convince people that the status-quo regime is difficult to overthrow

With respect to the content of propaganda, leaders might sometimes have incentives to misrepresent the true state of the world in order to make coordination among their followers more likely. In a series of experiments, Dickson (2010) shows how followers often appear to not fully account for their leaders' strategic incentives to misrepresent the world in forming their posterior beliefs. A strong propaganda machine can therefore be a powerful tool in the hands of a leader who intends to influence the way the population perceives the world. Conversely, too much transparency, for instance by regularly releasing economic information, can lead to a higher probability of protests in authoritarian regimes (Hollyer, Rosendorff and Vreenland 2015).

The performance of a propaganda machine and in that the ability to influence popular beliefs increases with control over the media. As shown by Gehlbach and Sonin (2014), media bias tends to be greater and state ownership of the media more likely when the government has an interest in mobilizing citizens into a direction that is not necessarily in the citizens' individual best interest. An increasing monopoly over the media and sources of information increases asymmetries of information between the ruler and the population (Gehlbach, Sonin and Svolik 2016), which then can be strategically exploited by the autocrat to influence popular beliefs.

Our study also relates to the literature on loss aversion in politics and reference-dependent preferences. Similar to Kahneman and Tversky (1979) and Alesina and Passarelli (2015), the population in our model prefers a certain but autocratic status quo to a democratic future, if enough people believe that the democratic future will be economically and politically unstable. As in Koszegi and Rabin (2006), the preferences of the population depend on a reference point, which in our case is the true nature of democracy. The way people perceive this reference point can be strategically shaped by the dictator with the help of propaganda.

The dictator's success in convincing a sufficiently large part of the population that the true nature of democracy is unstable depends in our model both on the intensity of propaganda, and on collectively held memories about a pre-authoritarian democratic past. In this, our paper also contributes to the literature on the determinants of how people perceive democratic institutions. A well-established strand of the literature has looked at the effect of economic development on democratization (Lipset 1959, Treisman 2015). More recently, researchers have looked at emancipative mass attitudes (Welzel 2007) or the effect of individualistic vs collectivist culture (Gorodnichenko and Roland 2015) on preferences for democratic institutions. We contribute to this literature by considering the effect of traumatic past experiences with democracy.

3 The baseline model

3.1 Set-up

In this section we describe a political agency relationship between two players, an autocrat in power (the agent) and the citizens (the principals). Citizens have the same preferences and beliefs, and both players live for two periods. However, all their actions are undertaken in period 1, whereas payoffs are obtained in period 2. Players are assumed to be risk-neutral; they discount time at the rate $\beta > 0$. There are three states of the world $\sigma = \{A, D, \tilde{D}\}$. We refer to $\sigma = A$ as autocracy; D as democracy; and $\tilde{D}$ as a chaotic regime.

In period 1, the state of the world is A, the status quo. Autocratic regimes can be of different type, depending on the extent to which the autocrat has to redistribute resources to the elite to maintain political stability. We capture this variation across autocracies, which is similar to the idea of limited access order (North, Wallis, and Weingast, 2009), by introducing the parameter $E > 0$. Low values of E mean autocratic regimes in which few resources are needed to maintain within-elite stability. In autocracies with high values of E, significantly higher amounts of rents have to be redistribute by the autocrat to maintain elite support for the regime.

Along with having to ensure elite consensus, the autocrat has to maintain popular support to stay in power in period 2. Maintaining popular support is crucial as, at the end of period 1, the autocrat potentially faces a revolt by the citizenry who decides to play $\phi = \{0, 1\}$. When he succeeds in both building within-elite consensus and maintain popular support (i.e., $\phi = 0$), he will stay in power in period 2 too, benefiting from taxes collected in period 1. These rents, R, are therefore increasing in taxes and, by implication, in quantity of the output y produced in the country. Private production, in turn, is fostered by the provided quantity of the public good, g. When the regime moves to a democracy (i.e., $\phi = 1$), the autocrat looses a fraction $(1 - \theta)$ of R, with $\theta \in (0, 1)$.

Given E, and given T, the amount of tax revenues collected in the first period, the autocrat has to decide how much disposable resources, $T - E$, to channel for financing the provision of the productive public good. Simultaneously, he has to determine the amount of disposable resources to divert in producing propaganda—with the only aim of manipulating the political beliefs of the citizenry.

In our set-up, propaganda is therefore purely unproductive and intrinsically costly in term of economic resources diverted to productive activities.[7] We define γ as the fraction

[7]The costs for producing the two public goods are set to 1 in order to emphasize the relative

of resources used to manipulate the people, that is $(T-E)\gamma$. Therefore, the problem of the autocrat is to determine the optimal level of γ that maximizes future rents, while at the same time guaranteeing no rebellion.[8] His objective function is therefore given by:

$$\mathcal{V} = \max_{\gamma}\{\beta[1-(1-\theta)\phi]R\}. \tag{1}$$

When the regime remains in the status quo the continuation value of the autocrat is βR. In the case of transition, the autocrat is overthrown and he only retains $\beta\theta R$.

In autocracy, citizens take two decisions. They decide to initiate a revolt and to invest in private activities. The motivations to switch the political regime (i.e., $\phi = 1$) are purely economic in our framework and people decide to fight to establish a democracy D if they expect having higher incomes.[9] We also assume, for simplicity, that rebellion is costless. This setting ensures that the popular threat is highly credible, inducing the autocrat to look for popular support.

People care about the political regime because different political institutions provide them with a different amount of a public good, g, which is complementary to private production. Specifically, at period 1, that is the status quo, each citizen produces y units of income by employing k units of physical (or human) capital that costs $\frac{1}{2}k^2$. Private activity however additionally requires productive public goods, such as roads, infrastructure, and justice (rule of law). We capture this by defining the production function $y = gk$, where $g = (T-E)(1-\gamma)$ directly enters as a complement of private input k.

The utility function of the representative citizen in autocracy is therefore simply the difference between the disposable income y, after having payed taxes at a constant rate τ, and the convex cost of producing k units of capital.

$$\mathcal{U}^A = (1-\tau)(T-E)(1-\gamma)k - \frac{1}{2}k^2. \tag{2}$$

While living in an autocratic regime, citizens form their expectation about a potential political alternative, their political reference point which is a convex combination of D

opportunity cost that the ruler faces when deciding to invest in propaganda rather than in a productive public good. This opportunity cost will endogenously will arise in our model.

[8]We also assume the autocrat cannot issue debt to finance his political activity. The autocrat's budget constraint is then naturally binding and equal to $T-E = (1-\gamma)(T-E) + \gamma(T-E)$. This assumption clearly makes the productive public good and propaganda substitutes.

[9]The inclusion of intrinsic political motivations, such as, for example, democratic values, in addition to extrinsic motivations, which in our model are capture by $E > 0$ and γ, thus further strengthens our mechanism.

and $\tilde{D}$. The two alternatives are characterized by specific features. Democracy (D) features no propaganda so that public money is entirely devoted to productive use, and the absence of within-elite redistribution (normalized to zero for simplicity, i.e. $E = 0$). Therefore, production by citizens is just $y = Tk$ and the associated utility function is

$$\mathcal{U}^D = (1 - \tau)Tk - \frac{1}{2}k^2. \tag{3}$$

The chaotic regime ($\tilde{D}$) features democratic decision-making processes, which cut down E to zero, but also the absence of rule-of-law resulting in substantial economic inefficiency, which we capture by $\xi \in (0, 1)$. Specifically, we assume that ξ is the fraction of private production that is being destroyed. Therefore, under the chaotic regime, people produce $y = Tk$ but get $(1 - \tau)(1 - \xi)y$. Their utility function is equal to

$$\mathcal{U}^{\tilde{D}} = (1 - \tau)(1 - \xi)Tk - \frac{1}{2}k^2. \tag{4}$$

This set-up guarantees a complete ordering of the three states of the world, from the citizens perspective. Specifically, because of the chaos people experienced in the past A is always preferred to $\tilde{D}$, despite within-elite redistribution and propaganda.[10] This yields a complete ordering of the three states of the world as follows:

$$\mathcal{U}^D \geq \mathcal{U}^A \geq \mathcal{U}^{\tilde{D}}. \tag{5}$$

In accordance with this set-up, people fight for their political reference point if and only if they think democracy is D, but not $\tilde{D}$.

3.2 The recalling technology

Several studies have represented the idea of nations transmitting values and beliefs over time that, taken together, compose what is generally called the collective memory of a country.[11] The transmission of the country's collective memory is usually modeled as a process going from generation to generation (e.g. Bisin and Verdier, 2000; Dessí, 2008). However, the state has also been proven to play a crucial role in shaping popular beliefs (e.g. Lott, 1999; Saint-Paul, 2010). This literature, overall, has provided evidence about the fact that the collective memory managed by the state tends to suppress and to recall signals according to the state's needs.

[10] In particular, $\mathcal{U}^A \geq \mathcal{U}^{\tilde{D}}$ if within-elite redistribution is low enough. A sufficient condition for that is guaranteed by Assumption 1, which we will introduce in subsection 3.2.

[11] See for example Olick and Robbins (1998), as well as McBride (2001) and Zerubavel (1995) on the notion of collective memory.

We apply this idea to an authoritarian regime where citizens hold negative collective memories. In our model, these negative collective memories are captured by the regime type $\tilde{D}$. Citizens hold these memories because they have lived under a chaotic regime in the past—such as for instance Russia during the 1990s. Eventually the political regime transits to an autocracy led by a ruler who strategically recalls such negative memories in order to make it more likely that people believe democracy is $\tilde{D}$ and not D.

More precisely, we consider the case in which the autocrat recalls ξ, the substantial economic inefficiency of the chaotic regime, by doing propaganda at the rate γ. We call the mechanism by which investments in propaganda help to recall negative collective memories the *recalling technology*. The recalling technology transforms ξ units of chaos in the people mind into $\xi a\gamma$. a is the marginal return of investing in propaganda and we also assumed that $a > 1/\xi$ to model the idea that less disruptive experiences are more difficult to recall. This also implies that propaganda is always successful.

The recalling technology has been used to exploit a number of memory biases, which have been analyzed more in detail by the psychology and cognitive science literature. For example, as emotions associated with unpleasant memories tend to fade more quickly than emotions associated with positive events (see e.g. Walker et al. 2003), the state might want to periodically recall negative collective memories so that citizens do not forget them too quickly.[12] Similarly, repeating the same statements again and again on state TV over a longer period of time makes it more likely that people remember them as being actually true (*spacing* or *illusion of truth effect*, see e.g. Fazio et al. 2015).

Based on this literature, we assume that negative collective memories have to be *activated* in order to play a relevant political role. Put in another way, unless γ is positive, people do not make a conscious connection between their negative collective memories and the political reference point. The citizens' expected utility from the chaotic regime, after the collective memory has been switched on, is as follows:

$$\mathcal{U}^{\tilde{D}} = (1-\tau)(1-a\gamma\xi)y - \frac{1}{2}k^2. \tag{6}$$

Given $\mathcal{U}^D$ and $\mathcal{U}^{\tilde{D}}$, people form their expectations about the political reference point as a convex combination between the two:

$$\lambda\mathcal{U}^{\tilde{D}} + (1-\lambda)\mathcal{U}^D, \tag{7}$$

[12]This bias is similar to the *positivity effect*, where older adults favor positive over negative information in their memories, or *rosy retrospection*, the remembering of the past as having been better than it really was.

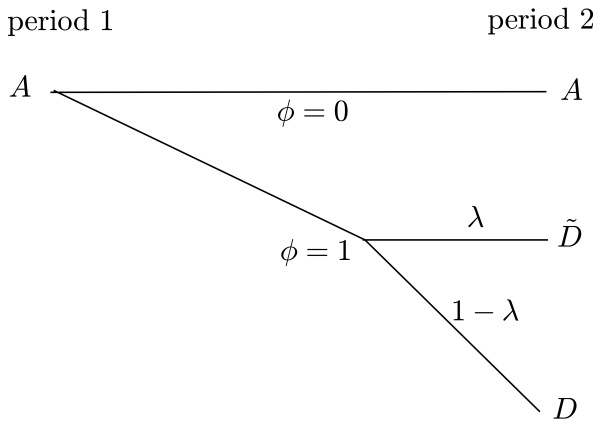

Figure 1: Political regimes transition and the intensity of negative collective memory.

where $\lambda \in (0, 1]$ is the negative collective memory of the citizenry associated with the chaotic regime, $\tilde{D}$. The more intense is the memory of the disruptive experience, the lower is the utility they expect from moving to the political reference point. To put it in another way, Figure 1 shows how the intensity of such collective memory drives the decision to start a popular revolt. When λ is high, people are more likely to think democracy is bad and that, if they start to revolt, they will end up in a political regime with high disruption.

3.3 Assumptions

In order to get analytical results, we assume that the fraction of disposable resources should be high enough relative to the ability and will to recall ξ:

Assumption 1 $\frac{T-E}{T} \geq \frac{\lambda(1-\lambda)a^2\xi^2}{1-\lambda a(2-\xi)\xi}$.

Furthermore, we pose an additional assumption according to which the autocrat will always prefer stay in power, if preventing the rebellion is an admissible strategy. Specifically, we assume that the fraction θ of rents that the autocrat will eventually benefit under a regime transition is low enough.

Assumption 2 $\theta \leq \frac{a\lambda s(1+a\xi)-2s-\sqrt{s-a\lambda\xi[a(1-\lambda)\xi+(2-\xi)s]}}{a^2\lambda\xi^2-s}$.

3.4 Timing

All the actions are undertaken by the ruler and the citizens in the first period according to the following timing:

- Period 1

  S1 The political regime is an autocracy. Disposable resources are given from the previous period and from the type of the autocratic regime, i.e. $T - E$.

  S2 The ruler decides how much to invest in propaganda, γ.

  S3 Citizens invest the optimal level of physical capital k and produce y. Given the production they pay taxes, τ.

  S4 Citizens realize the level of collective memory and decide whether to initiate a revolution, ϕ.

- Period 2

  S5 The ruler obtains his rents βR if the revolution is not initiated. If the regime transits, he only obtains a fraction θ of his rents.

4 Equilibrium

4.1 Collective memory and revolutionary threat

At the end of period 1 citizens decide whether to initiate a revolution or to support the status quo. Taking γ and k as given at this stage, they will support autocracy—playing $\phi = 0$—if they think being richer in autocracy than under their political reference point. In other words, they will support the status quo if the utility they get under an autocratic regime is higher than what they expect to have under their political reference point:

$$\mathcal{U}^A \geq \lambda \mathcal{U}^{\tilde{D}} + (1 - \lambda)\mathcal{U}^D. \tag{8}$$

Accordingly, the way collective memory are activated is key for the political process. In Proposition 1 we state the equilibrium level of negative collective memory and show that when this memory is intense enough people will support the status quo.

Proposition 1 *Citizens support the autocratic regime (i.e. $\phi = 0$) if and only if $\lambda \geq \lambda^\dagger$, where*

$$\lambda^\dagger \equiv \frac{\mathcal{U}^D - \mathcal{U}^A}{\mathcal{U}^D - \mathcal{U}^{\tilde{D}}}. \tag{9}$$

Proof. In the text. ∎

Looking at (9), one can see that $\lambda^\dagger \in [0, 1]$. According to the utility ranking (5), in fact, $\mathcal{U}^D > \mathcal{U}^A$ and $\mathcal{U}^D > \mathcal{U}^{\tilde{D}}$. Clearly, the three terms defining $\lambda^\dagger$ are all endogenous.

In the next subsection, we will find their equilibrium values after computing the optimal level of private investment in each political regime. It is worth to mention at this stage, how the distance in the numerator is driven by the extent to which the autocracy is extractive (E) and by the extent to which the ruler uses propaganda (γ), as propaganda also reduces the utility from autocracy. The distance in the denominator is instead driven by ξ, which gives us a measure of the disruptiveness of the chaotic regime, and by the propaganda itself that is used to strategically recall the former.

4.2 Optimal private investment under different political regimes

At the stage S3, citizens decide how much to invest in capital k, taking, under the autocratic regime, the fraction of disposable resources devoted to indoctrination as given. Each citizen then maximizes his value function (2) by choosing the optimal investment k, as follows:

$$\max_{k} \quad (1-\tau)k(T-E)(1-\gamma) - \frac{1}{2}k^2. \tag{10}$$

Investing is costly and due to convex costs the maximization problem admits a unique solution. We define the optimal capital investment in autocracy as k^A. Similarly, we define k^D and $k^{\tilde{D}}$ as the potential alternative optimal stocks of capital that citizens would have invested being in democracy or in the chaotic regime, respectively.

Solutions are illustrated in Proposition 2. Corollary 1 compares and ranks the three solutions.

Proposition 2 *Citizens invest* $k^A = (1-\tau)(T-E)(1-\gamma)$ *in autocracy; invest* $k^D = (1-\tau)T$ *in democracy;* $k^{\tilde{D}} = (1-\xi a\gamma)(1-\tau)T$ *in the chaotic regime.*

Proof. See Appendix B. ∎

Corollary 1 $k^D \geq k^A \geq k^{\tilde{D}}$.

4.3 How much propaganda is needed?

In period 2 the game ends. If the revolution took place, the autocrat looses power and retains only a fraction θ of his autocratic rents R. If still in power, the autocrat does not make any public investments—appropriating the *entire* tax revenue T_2 that has been collected at the end of period 1 through the citizens contributions. His lifetime flow of rents is therefore composed by $R = T_2$, that can be affected through investment into the productive public good g. On the other hand, the autocrat has to control citizens'

uprisings by spending part of disposable resources in propaganda. Here we formalize this non-linear maximization problem.

The autocrat's decision on how much to invest in propaganda, that is choosing an optimal value of γ, takes place at stage S2. At that time, the autocrat anticipates the credible threat of the citizens as well as their economic production k^A (and k^D and $k^{\tilde{D}}$). He also anticipates that even investing all state resources in the productive public good g would never equalize the value people would get in a democratic regime (D), because $E > 0$. Investment in propaganda is therefore needed. But he has to take into account as well the fact that more propaganda reduces the attractiveness of the status quo itself from the perspective of the people, as productivity declines.

This trade-off is resolved by maximizing (1) with respect to γ. We can now rewrite (1), using Proposition 2, as follows:

$$\max_{\gamma} \quad \begin{cases} \beta R(\gamma) & \text{if} \quad \lambda \geq \lambda^{\dagger}(\gamma), \\ \beta\theta R(\gamma) & \text{elsewhere,} \end{cases} \tag{11}$$

where $R(\gamma) = \tau(1-\tau)(T-E)^2(1-\gamma)^2$. Given that rents are monotonically decreasing in γ in the segment $[0,1]$, with $R(\gamma = 0) > 0 = R(\gamma = 1)$, the autocrat's first best—in the absence of a revolution—would clearly be in principle to set $\gamma = 0$. However, because the autocrat cares of remaining in power (for any value of θ), he has additionally to take into account the revolutionary threat. In other words, he has to satisfy the inequality $\lambda \geq \lambda^{\dagger}$. In equilibrium, therefore, γ and $\lambda^{\dagger}$ are jointly determined, and the optimal γ is the one that will set $\lambda = \lambda^{\dagger}$. In Proposition 3 we gather our results.

Proposition 3 *Let $s = (\frac{T-E}{T})^2$ be the square of the fraction of disposable resources. The following results apply:*

1. *Autocracies with a relatively low traumatic experience in the past (i.e., $\xi < \sqrt{s/a^2\lambda}$) fail in preventing rebellion and $\gamma = 0$. The political regime transits to a democracy.*

2. *Autocracies with a relatively high traumatic experience in the past (i.e., $\xi > \sqrt{s/a^2\lambda}$) use for propaganda purposes the following optimal fraction of disposable resources to prevent the revolution:*

$$\gamma^{\dagger}(\lambda, \xi, E) = \frac{a\lambda\xi - s - \sqrt{s - a\lambda\xi[a(1-\lambda)\xi + (2-\xi)s]}}{a^2\lambda\xi^2 - s}. \tag{12}$$

Citizens remember $\lambda = \lambda^{\dagger}(\gamma^{\dagger})$ units of negative collective memory and the political regime remains in the status quo.

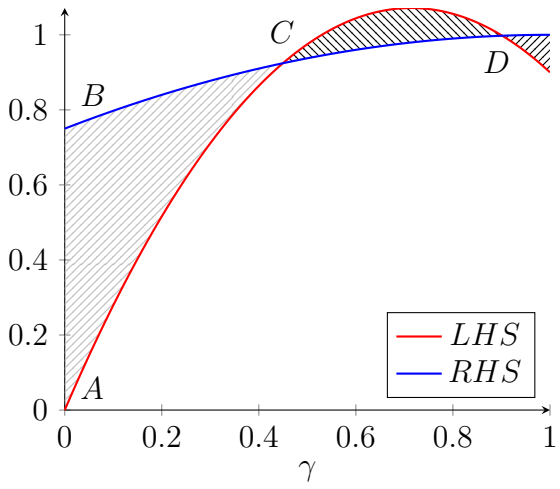

Figure 2: Authoritarian regime consensus ($s < a^2\lambda\xi^2$).

Proof. See Appendix B. ∎

Whether propaganda can be effectively used to successfully prevent a popular uprising is something relying on the magnitude of the two parameters of the model: s, which in turn depends on the extent to which the autocrat needs to redistribute money to the elite to stabilize his holding on power E, and ξ. Specifically, the equilibrium features two different cases: authoritarian regime consensus and popular revolution. The authoritarian regime consensus features an autocracy in which sufficiently high levels of within-elite cohesiveness and popular support are leading to a political stable status quo. Popular revolution is a state in which, despite sufficiently high levels of within-elite cohesiveness, political stability is not achieved and the people initiate a revolution that moves, in the period, the regime to a democracy.

The mechanism leading to these two different outcomes is driven by the marginal cost and benefit of propaganda. In equilibrium, $\gamma^\dagger$ and $\lambda^\dagger$ are jointly determined, and when $\lambda \geq \lambda^\dagger$ people will support autocracy:

$$\lambda(1-(1-a\xi\gamma)^2) \geq 1 - s(1-\gamma)^2. \tag{13}$$

Both sides of the inequality vary with γ in a complex way. The RHS defines the distance between $\mathcal{U}^D$ and $\mathcal{U}^A$. Holding E constant, this distance increases, in a concave way, with the amount of propaganda. Propaganda, in fact, diverts disposable resources, s, from productive uses capable of fueling the economic production in the economy (see the blue line in Figure 2 and 3). The LHS defines the distance between $\mathcal{U}^D$ and $\mathcal{U}^{\tilde{D}}$. It increases, in a concave fashion too, because propaganda, recalling negative collective memories, makes $\tilde{D}$ a worse option (see the red line in Figure 2 and 3).

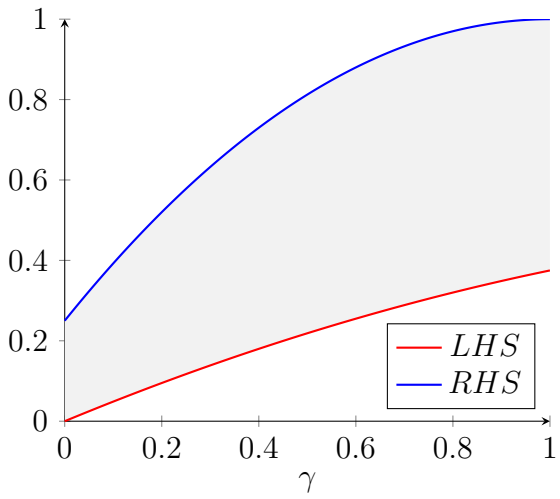

Figure 3: Popular revolution ($s > a^2\lambda\xi^2$).

In the case of authoritarian regime consensus, the effect of an additional unit of propaganda decreases $\mathcal{U}^{\tilde{D}}$ more than $\mathcal{U}^{A}$. In other words, it reduces the attractiveness of the status quo less than that of the political reference point. This case is exemplified in Figure 2. Since the level of within-elite redistribution is substantial, the intercept $(1-s)$ of the blue line (the RHS in equation 13) is really high. But its slope is pretty flat. Since the disposable resources to be employed to fuel the economy are limited, the marginal economic cost of an additional unit of propaganda is low. On the other hand, ξ is high so there is room to easily recall negative collective memories. Intuitively, the increase of propaganda makes the red line (the LHS in equation 13) very steep and, by implication, the marginal benefit of an additional unit of propaganda is high from the perspective of the autocrat.

In the area ABC, however, the level of propaganda is not sufficiently high to convince people about the superiority of the status quo. Conversely, sufficiently high levels of propaganda, that is between the point C and D, lead to $\mathcal{U}^{A} \geq \lambda\mathcal{U}^{\tilde{D}} + (1-\lambda)\mathcal{U}^{D}$. In this interval, propaganda successfully prevents rebellion. However since the autocrat's objective function is decreasing in γ, the optimal level of propaganda is the one depicted by the point C. This level is $\gamma^{\dagger}$ in equation (9). As a result, the autocrat remains in power in period 2 and will benefit from his rents, R.

In the case of popular revolution, an initial increase in γ raises costs more than benefits. In other words, it reduces the attractiveness of the status quo more than that of the political reference point. Figure 3 depicts this situation. The blue line is the utilitarian distance between $\mathcal{U}^{D}$ and $\mathcal{U}^{A}$, the RHS in equation 13. The red line is the

(weighted) utilitarian distance between $\mathcal{U}^D$ and $\mathcal{U}^{\tilde{D}}$, the LHS in equation 13. With no propaganda provided the blue line starts at $1 - s \geq 0$, whereas the red line starts from the origin. An additional unit of γ further increases the gap between the two lines—because $s > a^2\lambda\xi^2$. As a result, the two lines never cross which means that no solution to the problem (8) exists. The autocrat sets $\gamma = 0$ and the rebellion takes place. In period 2 the country will move to a democratic regime.

The concavity of the red line depends on ξ. In particular, when $\xi = 0$ the marginal cost of investing in propaganda is infinite, because an additional unit of γ only leads to a reduction of $\mathcal{U}^A$. More generally, low values of ξ make propaganda particularly costly for the autocrat, so any $\gamma > 0$ could not be an equilibrium. When ξ is sufficiently high, say $\xi > \sqrt{s/a^2\lambda}$, the marginal benefit of doing propaganda is higher than the marginal cost. Therefore, when ξ is high the regime would remain in the status quo. As we show in Appendix B, ξ has a positive impact on $\gamma^\dagger(\xi, E)$.

5 Case Study Evidence: Russia and Chile

One case to illustrate particularly well the key assumptions, features and results of our model is the Russian Federation under Vladimir Putin, a country that features both high levels of within-elite redistribution and high levels of propaganda to foster popular regime support. We then also present a further case study by discussing the end of the Pinochet regime in Chile, before providing additional cross-country empirical evidence in section 6.

5.1 Limited Access and State Propaganda: Putin's Russia

Russia under Vladimir Putin (2000 - today) is a political regime characterized by high levels of within-elite redistribution. The redistribution of the autocratic rent among regime supporters (captured by E in our model) is an important tool for the dictator to maintain elite support for the regime (Bueno de Mesquita et al. 2003) and to limit violence and within-elite conflict (North, Wallis and Weingast 2009). In the selectorate theory of Bueno de Mesquita et al. (2003), an autocratic political system is characterized by the general population, the selectorate of size S, a winning coalition of size W, and the dictator. While the selectorate is the subset of the general population that can become part of the support base of the dictator, the winning coalition is the subset of the selectorate that the dictator needs to stay in power. The dictator then needs to redistribute enough of the autocratic rent to a winning coalition of sufficient size,

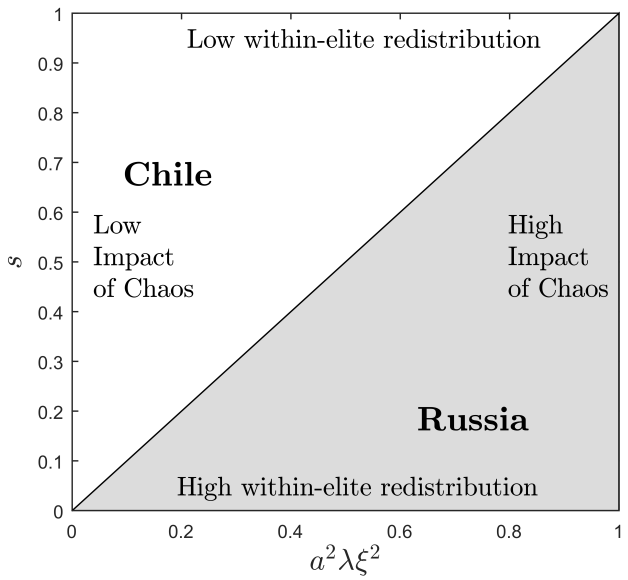

Figure 4: Equilibrium features and country position.

in order to maintain his hold on power. In North, Wallis and Weingast (2009), access to economic rents is limited to a number of ruling elites, who use these resources to maintain the status quo and to limit the kind of violence that occurs if different elite groups openly compete for rents.

Applied to the Russian case, the large fortunes owned by Putin's close associates[13] would be the payments by a patron to his clients in exchange for political support, with the circle of all close associates forming the winning coalition. Russia under Putin clearly is a limited access order in the Northian sense, as access to economic rents is limited to a number of elites close to the regime in power.

In our model, we take the need to redistribute autocratic rents in order to guarantee within-elite stability as given. The primary focus of our model

Once inner-elite stability is guaranteed, the dictator can think about what to do with the remaining taxes. As his income in the next period depends on productive investment today, which in turn depends on the state investing into the productive public good G, in theory it would be in the best interest of the dictator to invest all the remaining taxes into the productive public good.

However, if the general population is aware that they will be better of in democracy

[13]In Russia, various investigations by opposition politicians, journalists and anti-corruption activists have repeatedly uncovered large fortunes owned by Russia's ruling elites that in value far exceed their official incomes and financial possibilities, see e.g. Dawisha (2014).

as compared to autocracy, they will initiate a revolution to overthrow the dictator. In our model, we assume that once initiated, such a revolution always succeeds, leaving the dictator with no autocratic rents in the next period. For the dictator to remain in power, it is therefore crucial that the population believes that they are better off in the status quo - autocracy - than in a possible future democracy.

This is why, in our model, the dictator diverts a fraction γ of the disposable resources $(T-R)$ towards investment into propaganda P, in order to convince the population that the current autocratic regime is superior to potential alternative regimes. The mechanism used by the dictator is to recall collective memories about a democratic experiment or transition period in the past that went wrong. The worse was the political chaos and economic hardship experienced by the population during the democratic experiment - illustrated by the parameter ξ - the less the dictator has to invest in propaganda to convince the population that the autocratic status quo is superior to possible democratic alternatives, everything else remaining equal.

While the 1990s were the first time in Russian history that the country effectively experienced some kind of political pluralism, the time is also remembered by many Russians as a period of political chaos, economic collapse and rapidly falling living standards. When remembering the 1990s, many Russians therefore tend to subconsciously associate political pluralism with economic problems and political instability. In terms of our model, the larger is the share λ of the Russian population that believes that the true state of democracy is the kind of political and economic chaos $\tilde{D}$ they experienced during the 1990s, the less the dictator has to invest in propaganda.

However, the relative frequency of popular uprisings in a number of autocracies in recent years also demonstrates how the revolutionary threat is a reality in most authoritarian regimes. In Russia, the ruling elites have been concerned about the risk of violent regime change since the mid 2000s, when a series of so-called "colour" revolutions toppled authoritarian governments in a number of neighboring post-Soviet states (Bunce and Wolchik 2011, Duncan 2013). Political protests after the Duma elections in late 2011 and early 2012 further increased the concern of Russia's ruling elites about the possibility of violent regime change. In terms of our model, during the colour revolutions and the political protests after the 2011 elections, an increasing percentage of the population became convinced that the true state of democracy is not chaotic, or $\tilde{D}$, but actually superior, D, in political and economic terms to the autocratic status quo, A.

Anticipating the risk of popular uprisings, Vladimir Putin started to invest from the early 2000s onwards into a propaganda machine that would give him the possibility to shape the way Russians perceive their political system. Step by step, TV stations

that offered alternative sources of information were shut down or taken over by the state[14]. Russia is particular in the sense that even in late 2015, 85% of Russians still got their knowledge about Russia and the world mainly from TV[15], with 60% of Russians watching TV news every day[16]. The almost complete control of Russia's TV channels by the government is therefore a powerful propaganda tool. At the same time, efforts to control informational content on the internet have also been scaled up (see e.g. Soldatov and Borogan, 2015). The Russian state has thus been for some time in a position to directly shape and influence much of the information reaching a large part of it's citizens.

A key element of the strategy used by state propaganda on TV, on the internet and during election campaigns is to compare Russia under Putin to the time when Russia was governed by President Boris Yeltsin during the 1990s. Documentaries on state TV often associate symbols of Western political institutions such as the the blue European flag or stories about Western advisors coming to Russia in the 1990s with the poverty and chaos experienced by Russians during the time, while the 2000s under Putin are depicted as a period of stability and economic recovery[17]. Similarly, during election campaigns a possible victory by the democratic opposition is often depicted in terms of a return to the chaotic 1990s[18].

In Russia's pro-government propaganda, the economic and political resurgence under Putin is a direct consequence of the country becoming a "souvereign democracy", i.e. adopting political institutions suited to its specific history, tradition and values. In the same discourse, political and economic chaos during the 1990s were a result of "Western style democracy", i.e. political institutions imposed from abroad that were not adapted to the Russian context. The contrast between "Western style democracy" and Russia's

[14]The process started when the state-owned company Gazprom bought a controlling stake in the TV station NTV in January 2001. In early 2014 one of the last remaining independent TV channels, "Dozhd", was forced to leave cable and satellite TV and was able to continue its activities only on the internet. Afterwards, the only independent source of information remaining available on Russian TV was the business channel RBK, whose editors have however been replaced by editors from the state news agency Ria Novosti in May 2016.

[15]According to a Levada survey from November 2015, http://www.levada.ru/2015/12/16/televidenie-vyhodit-iz-polya-zreniya

[16]http://www.levada.ru/2016/06/06/tv-bez-alternativy/

[17]One example is the documentary *The Dashing 90s*, where poverty and chaos are depicted as a result of Western advice and influence after the collapse of the Soviet Union, while the follow-up documentary *The Cool 2000s* describes a resurgent Russia under Putin. Both documentaries were shown on the state controlled TV channel NTV in 2005.

[18]See for example this pro-government video from the 2011 parliamentary election campaign: https://www.youtube.com/watch?v=-9-5NBaAEsI

own path is further reinforced by a lack of critical debate about Russia's Soviet and Tsarist past, of which a strongly romanticized version is presented on state TV. In the official discourse, the 1990s are thus the only genuinely negative period in Russia's recent history.

When the perceived threat of a popular uprising increased after the controversial Duma elections in 2011, the Arab spring in early 2012, and the return of economic difficulties in 2013, the intensity of TV propaganda also increased. Apart from attributing political and economic chaos during the 1990s to "Western style democracy", a large part of TV news coverage about contemporary Western democracies now tried to depict them as countries in crisis, characterized by dysfunctional political institutions, economic decline and increasing social tensions (Schmid 2015). In terms of our model, Russia's state propaganda describes the 1990s as well as contemporary democracies in Western Europe and the US in terms of "democratic chaos" or $\tilde{D}$, while Russia's political status quo A is depicted as the political system ideally suited to the country, with $\tilde{D} < A$.

In addition to shaping informational content in the media, the Russian state also tries to minimize the possibility that citizens receive outside signals that could make them believe that the true state of a possible alternative political system is not democratic chaos, or $\tilde{D}$, with $\tilde{D} < A$, but genuine democracy, D, with $D > A$. For example, about 4 million government employees working in the military, the police and intelligence agencies are no longer allowed to leave the country[19]. Officially, the travel ban is supposed to prevent state officials from accidentally revealing defense-related secrets abroad. However, it also effectively prevents them from getting an alternative and potentially more positive view of Western countries and democratic institutions than the strongly negative coverage they receive on Russian state TV.

The increase in propaganda that resulted from a perceived increase in the threat of a popular uprising also lead to an increase in the *cost* of propaganda. While the direct costs such as increases in the financing for state TV channels, for the English language channel *Russia Today* or for the establishment of troll-factories to control the internet was notable, the indirect costs such as a deterioration of the business climate (see e.g. Rochlitz 2016) and an increase in international tensions were much more consequential. For example, the increase in tensions with the West (a direct consequence of an increasingly strong anti-Western propaganda) led to a perceived need to increase military and security-related spending. In the face of overall economic recession, this increase in military spending led to decreased spending on health, education and housing, as well as to an increase in public debt (see Figure 5).

[19]https://themoscowtimes.com/articles/controlling-russians-through-travel-bans-35830

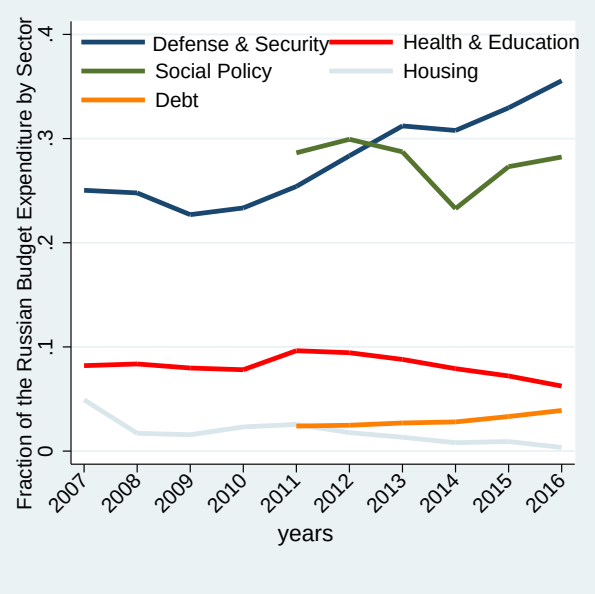

Figure 5: Shares of budget expenditure in the Russian Federation in the last 10 years.

Still, because Russia's ruling elites were able to instrumentalize a collective traumatic experience from the country's recent past, they were able to keep the direct and indirect costs of propaganda low enough to successfully convincing a majority of the population that the current political system is without alternatives, at least for the time being. This can be seen by Putin's consistently high approval ratings (Frye et al. 2016), as well as the overwhelming victory for the ruling party United Russia during the 2016 Duma elections.

5.2 Past Democratic Experience and Current Preferences for Democracy: The 1988 National Plebiscite in Chile

Contemporary Russia is a clear example where a past traumatic experience with democracy has made it easier for the autocrat to convince the population that the current autocratic regime is superior in performance to a possible democratic alternative. However, the mechanism can also work the other way round, with a positive experience with democracy in the past making it more difficult for the autocrat to convince the population about the superiority of the current regime.

One such example is Chile under Augusto Pinochet. After coming to power in a military coup in September 1973 and being in office for 16 years, Pinochet believed in 1988 that his regime was sufficiently consolidated for a plebiscite on an additional 8

years of his presidency to be conducted. However, despite having the organizational and financial resources of the government behind their campaign, the pro-Pinochet camp unexpectedly lost the plebiscite. As a result, Pinochet had to step down, and a new democratic president was elected in 1990.

During the campaign, the pro-Pinochet camp used two main strategies. Not unlike the way the 1990s are depicted in election campaigns in Russia, they tried to create fear among voters by associating the period before 1973 with political and economic chaos. The pro-Pinochet campaign then also tried to capitalize on the relative economic success and stability of the years since 1973. According to Edwards (2001, page 249), Pinochet however underestimated that many Chileans primarily remembered the period before 1973 for the political freedom they had enjoyed, which according to Edwards constituted an "integral part of the Chilean tradition". The campaign against Pinochet, on the other hand, tried to capitalize on and recall the positive collective memories people had preserved from the pre-1973 democratic system. In terms of our model, Pinochet lost because his administration had a wrong perception of the number of people remembering the pre-1973 times as a period of political chaos, or $\tilde{D}$. Instead, it turned out that a majority perceived a democratic alternative as superior to the status quo, in part because Chileans still positively remembered a pre-Pinochet democratic past. For Pinochet to win the referendum and stay in power, his administration would have needed significantly higher investments in propaganda and coercion, at a cost that might have proven prohibitive.

6 Empirical Evidence

6.1 Empirical predictions of the model

In the empirical part we test two comparative statics that come out from our model.

Prediction 1 *The fraction of disposable resources the autocrat invests in propaganda increases with the chaotic rate of the transition regime $\tilde{D}$:*

$$\frac{\partial \gamma}{\partial \xi} > 0.$$

Prediction 2 *The weight people give to political reference point is on average decreasing with respect to the intensity of the past traumatic transition characterized by political instability:*

$$\frac{\partial \mathbb{E}\mathcal{U}^D}{\partial \xi} < 0.$$

In order to capture how the exposure to economic and political chaos in the past is affecting present popular beliefs about democracy (which in line with our model we assume to be their political reference point) and the use of propaganda, we provide two different empirical strategies and sets of variables. In the first strategy, we explore the cross-country variation in the intensity of propaganda from 2000 to 2014 and exposure to a past chaotic regime. In the second strategy, we provide evidence that people in countries that experienced a chaotic political regime in the past now have lower preferences for democracy.

6.2 Investment in propaganda

6.2.1 Data description and empirical strategy

The first prediction of our theory is that the fraction of disposable resources the autocrat invests in propaganda increases with the disruptiveness of the chaotic regime. We test this comparative statics using the Freedom House score on freedom of the press. More precisely, the fraction of resources diverted to propaganda activity is operationalized using country scores collected in the Freedom House press freedom scale—ranging from 0 (no propaganda at all) to 100 (highly propaganda-intensive country)—from 2000 to 2015. We are then able to exploit variation in 2457 data points across 165 countries.

The press freedom score is in turn subdivided into three sub-scores capturing three different dimensions of media control: (*i*) control coming out from laws and regulation that influence media content; (*ii*) political pressure and *direct* control on media content (including censorship); (*iii*) economic influence over media content. Along with the press freedom score, we use the second sub-score that is more closely related to our mechanism based on the use of a cognitive technology. The same country sample of the main press freedom score is provided for this sub-score.

The cross-country average score is 50. However, the cross-country distribution features substantial variation. Specifically, the standard deviation is 23.7, in other words half of the average. The sub-score describing technological control of the media has naturally a lower range, going from 0 to 40. The average sub-score is about 20, and its standard deviation is 9.56. Both cross-country distributions feature three peaks. The first peak gathers political regimes that do not make intensive use of propaganda. The second peak on the center-right side of the distribution are countries that feature a higher level of propaganda. Finally, a third smaller peak collects a handful of countries that intensively use propaganda.

Our main explanatory variables of interest are two: a dummy indicating whether the

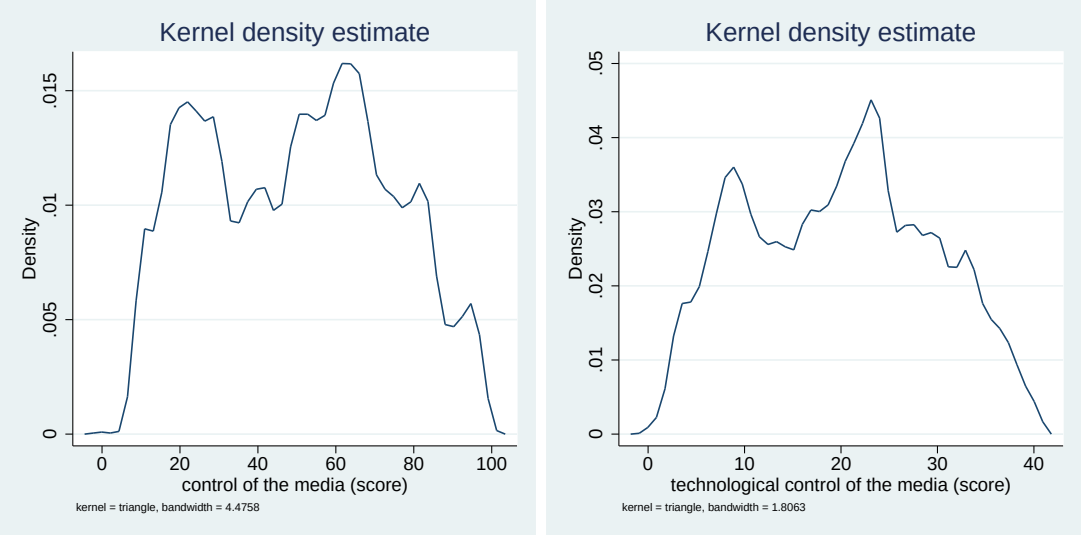

Figure 6: Cross-country distribution of the control of the media score and its sub-score regarding the technological control.

country is an autocratic regime and another one that takes the value of 1 when that autocracy has been preceded by a chaotic regime. The first variable comes from the PolityIV project and it is computed by assigning countries to the autocratic status when the variable $polity2 \leq 4$.[20] The second variable comes from the State Failure Problem Set—a project aimed at studying political instability. We use the dataset about adverse regime changes. Among them we selected only two cases that specifically capture our definition of a chaotic regime: 1) the failure of state authority in a substantial part of the country, or in the capital and its surroundings ($MAGFAIL = 3$); 2) complete collapse or near-total failure of state authority ($MAGFAIL = 4$). Our dummy is then equal to 1 when either of the two cases have been experienced. According to our definition, 39% of the countries in our sample are autocracies, while 4% are autocracies that have been exposed to political and economic chaos in the past.

We also use a set of additional controls that potentially confound the effect of the disruptive experienced in the past on propaganda. First of all, we control for the logarithm of GDP per capita (adjusted for the PPP exchange rate in US dollar in 2011), as the wealth of a country is correlated with the amount of disposable resources the autocrat can use to finance propaganda. We also use the logarithm of the population and the share of military expenditure in the GDP as additional control variables. Military

[20]We also run our analysis considering as autocracies those countries that take negative values of $polity2$. Our results do not change substantially.

Table 1: Summary Statistics. Panel A.

	mean	sd	min	max	count
control of the media (score)	50.08	23.70	0.00	99.00	2457
technological control of the media (score)	19.86	9.56	0.00	40.00	2457
autocracy	0.39	0.49	0.00	1.00	2475
autocracy× chaotic regime	0.04	0.20	0.00	1.00	2475
gdp per capita (log)	9.02	1.25	6.20	11.85	2798
military expenditure/gdp	2.16	1.93	0.04	32.66	2185
foreign direct investment	5.41	14.24	-57.43	466.56	2676
population (log)	15.13	2.36	9.15	21.03	3210
elections	0.20	0.40	0.00	1.00	3418
sanctions	0.06	0.25	0.00	1.00	3473

expenditure substantially varies across countries. Some countries, such as Iceland, spend as low as 0.15% of their GDP on defense. For other countries such as Eritrea, military expenditure is more than 32% of GDP. However, the average is much lower, at about 2%. All these measures are taken from World Development Indicators (WDI), covering the time span from 2000 to 2015. In our dataset, countries also vary substantially with respect to their levels of openness to the world economy. That is why we added net foreign direct investment (FDI) as an additional control. Specifically, the standard deviation of FDI is three times bigger than the cross-country average, which is 5.31. Finally, we control for two different sources of competitive pressure on the regime. To account for international pressure, we an indicator equal to 1 if in a given year the country was subject to international sanctions imposed by the United Nations[21]. To account for domestic pressure on the regime, we construct another indicator which is equal to one when in a given year elections to the national assembly or national parliament were taking place in a given country[22] Table 1 reports summary statistics for this panel data.

Our benchmark regression is then given by:

$$y_{it} = \alpha + \beta_1 autocracy_i + \beta_2(autocracy_i \times chaotic\,regime_i) + X_{it}\gamma + \theta_t + \varepsilon_{it}, \qquad (14)$$

[21]This data is taken from the Targeted Sanctions Consortium Database, http://graduateinstitute.ch/un-sanctions

[22]This novel dataset has been compiled by using data from the Election Guide (http://www.electionguide.org) offered by the International Foundation for Electoral Systems (www.ifes.org).

where i is the index for the countries and t stands for time, that goes from 2000 to 2015. y_{it} is our dependent variable, and stands either for the score of the control of the media or the sub-score of the technological control of the media. Our control variables are gathered by the vector X_{it}. This specification also controls for aggregate shocks that hit the ability of the state to invest in propaganda at a given period t, θ_t. ε_{it} instead captures country/year specific shocks.

6.2.2 Results

In Tables 2, 3 and 4 we present our estimations of regression (14). Specifically, in Table 2 the dependent variable is the total press freedom score; in Table 3 we put in the left hand side the closest measure of propaganda to our theoretical mechanism, the subscore based on technological control of the press. In Table 4, we represent two additional robustness checks, controlling for domestic and international pressure on the government.

Since our interest lies on the effect of a past exposure to a chaotic regime on current autocracies (i.e. in the steady state), we do not estimate within-country effects—even though we collected data for the last fifteen years for each country in the sample. We therefore provide pooled OLS estimations and cluster the standard errors to account for potential redundancy in the within-country pattern.

In column 1 of Table 2 we estimate the unconditional correlation between the autocracy status and the press freedom score. As expected, propaganda is, on average, nearly twice as intense in autocracies than in democracies. Furthermore, since, as predicted by our theory, propaganda is relatively cheaper in those autocracies that have been exposed to a chaotic regime in the past, β_2 is estimated to be significantly positive in column 2. Specifically, the intensity of propaganda in these countries is 5% higher than in other autocracies, and 40% higher than in democracies.

In column 3 we add time trends to control for possible aggregate shocks that hit all economies in the world, and a specific time trend for our autocracies of interest. After controlling for these sources of aggregate shock, our results do not substantially change.

In column 4, we present a more robust comparison between the three groups of political regime that are the focus of our paper, controlling the intensity of propaganda for military expenditure, foreign direct investment, and the logarithm of GDP per capita and of the population.

Based on this conditional distribution, we observe a drop in the magnitude of β_1 by 10% and a rise of β_2 by 9%. Accordingly, the propaganda effort in autocracies is 25% higher than in democracies. The specific group of autocracies that have experienced a

Table 2: Chaotic regime exposure and propaganda effort.

	(1)	(2)	(3)	(4)
autocracy	34.860***	34.231***	34.249***	24.984***
	(2.426)	(2.555)	(2.570)	(3.144)
autocracy ×		5.749*	5.608*	14.375***
chaotic regime		(3.050)	(3.094)	(3.053)
military exp./gdp				2.517***
				(0.667)
gdp per capita (log)				-6.353***
				(0.928)
fdi				-0.029
				(0.031)
population (log)				1.001
				(0.684)
Constant	36.458***	36.458***	33.512***	69.266***
	(1.691)	(1.692)	(1.811)	(14.391)
Year dummies			yes	yes
Year dummies × chaotic regime			yes	yes
N	2457	2457	2457	1828
N_i	165	165	165	147
Adjusted R^2	0.515	0.517	0.515	0.597

Note: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Dependent variable is the control of the media score. Robust standard errors clustered at country level are reported in parentheses.

chaotic regime in the past, however, have a 15% higher propaganda effort than those autocracies that were not exposed to a chaotic regime in the past.

Looking at the effect of military expenditure on our outcome of interest reveals that military expenditure can serve as a complement to propaganda expenditure. Specifically, we find that an additional percent of GDP spent on the military results in 2.5% more propaganda. Conversely, GDP is negatively correlated with propaganda expenditure. This means that poorer countries, on average, spend more on propaganda. Foreign direct investment and population are not significantly related to the level of propaganda.

We replicate this analysis in Table 3 using the sub-score of technological-based control of the media. Although we obtain substantially similar results that corroborate the findings of our model, it is worth to mention that once we use a closer proxy for the mechanism outlined in our model, the link between past exposure to a chaotic regime and propaganda becomes stronger. Specifically, while in Table 2 being exposed to a chaotic regime in the past leads to a 6% increase in levels of propaganda within autocracies, once we use technological-based control of the media we find a difference of 10% between the two groups of autocracies. This difference slightly increases further once we control for aggregate shocks that in a given year hit simultaneously the 165 countries in our sample.

Finally, in column 4 we provide a more robust estimation of β_1 and β_2. To do so, similarly to what we have done in Table 2, we compare countries with the same level of military expenditure, GDP per capita, FDI and population. Adding these additional controls further strengthens our results, with exposure to a chaotic regime in the past now leading to a 17.5% increase in levels of propaganda within autocracies.

A potential concern is presence of additional unobservable factors that also might have an influence on the level of propaganda. Among these, two of the most important factors are related to international and domestic pressure that might induce the government to seek for additional popular support through propaganda. In columns 1 and 3 of Table 4, we therefore additionally control for sanctions imposed by the international community to a country i at time t. In columns 2 and 4, we control for a potential electoral business cycle effect on propaganda, by including two variables measuring if an election takes place in a given year t or in the next year $t+1$, in country i. These additional specification do not substantially change our findings.

Table 3: Chaotic regime exposure and technological propaganda effort.

	(1)	(2)	(3)	(4)
autocracy	12.932***	12.536***	12.546***	8.577***
	(1.021)	(1.062)	(1.068)	(1.230)
autocracy ×		3.622**	4.327***	7.215***
chaotic regime		(1.511)	(1.481)	(1.528)
military exp./gdp				1.031***
				(0.241)
gdp per capita (log)				-2.665***
				(0.381)
fdi				-0.020
				(0.014)
population (log)				0.768***
				(0.280)
Constant	14.804***	14.804***	12.811***	22.321***
	(0.722)	(0.722)	(0.818)	(5.776)
Year dummies			yes	yes
Year dummies × chaotic regime			yes	yes
N	2457	2457	2457	1828
N_i	165	165	165	147
Adjusted R^2	0.435	0.440	0.441	0.546

Note: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Dependent variable is the sub-score on the technological control of the media, that also includes censorship. Robust standard errors clustered at country level are reported in parentheses.

Table 4: Chaotic regime exposure and propaganda effort: international and domestic pressure

	(1)	(2)	(3)	(4)
	control of the media		technological control	
autocracy	24.948***	24.712***	8.562***	8.489***
	(3.061)	(3.113)	(1.192)	(1.222)
autocracy ×	14.691***	14.261***	7.353***	7.191***
chaotic regime	(3.043)	(3.510)	(1.531)	(1.736)
military exp./gdp	2.443***	2.497***	0.998***	1.024***
	(0.664)	(0.659)	(0.238)	(0.239)
gdp per capita (log)	-6.017***	-6.238***	-2.518***	-2.628***
	(0.964)	(0.926)	(0.399)	(0.381)
fdi	-0.035	-0.031	-0.022	-0.020
	(0.031)	(0.031)	(0.014)	(0.014)
population (log)	0.994	1.012	0.765***	0.772***
	(0.682)	(0.674)	(0.280)	(0.277)
sanction	9.737**		4.251**	
	(4.012)		(1.700)	
election		-2.703***		-0.851***
		(0.742)		(0.310)
election (lag)		-2.200***		-0.733**
		(0.717)		(0.304)
Constant	66.125***	69.326***	20.950***	22.342***
	(14.500)	(14.178)	(5.827)	(5.718)
Year dummies	yes	yes	yes	yes
Year dummies × chaotic regime	yes	yes	yes	yes
N	1828	1828	1828	1828
N_i	147	147	147	147
Adjusted R^2	0.606	0.600	0.556	0.548

Note: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors clustered at country level are reported in parentheses.

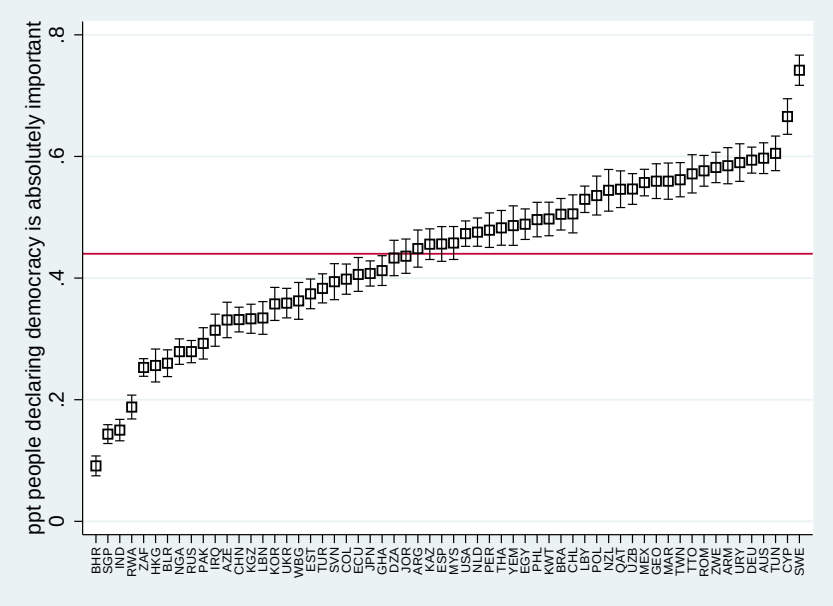

Figure 7: Cross country distribution of the fraction of people declaring democracy is absolutely important (WVS question E235 = 10).

6.3 Beliefs about democracy

The main result of our model is that because of past exposure to a chaotic regime, autocrats invest more in propaganda. We empirically show this in section 6.1. By implication, greater exposure to propaganda reduces, from the point of view of the citizen, the attractiveness of democracy. In this section, we present novel empirical evidence on the link between exposure to a chaotic regime in the past and popular beliefs about democracy. Our proxy for popular beliefs about democracy is obtained from the World Value Survey (WVS) as the (sample) weighted fraction of respondents that in a given country consider democracy absolutely important. Operationally, we compute the weighted mean of individuals responding 10 to the 1-10 WVS scale E235: "*How important is it for you to live in a country that is governed democratically?*" Being asked in two WVS waves (2005 and 2010), this exercise yields 108 data points in 73 countries around the world. The percentage of people in a country declaring that democracy is absolutely important is on average 47—the red line in Figure 7, which depicts the cross-country for 73 countries.

These beliefs do not vary significantly between autocracies and democracies. However, column 2 in Table 5 shows how in autocracies that have been exposed to a chaotic regime in the past, the percentage of people who consider democracy absolutely impor-

Table 5: Chaotic regime exposure and democracy beliefs.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
autocracy	-0.055	-0.029	-0.020	0.009	0.013	0.031	0.038
	(0.034)	(0.037)	(0.040)	(0.042)	(0.044)	(0.045)	(0.046)
autocracy ×		-0.140***	-0.133***	-0.166***	-0.173***	-0.177***	-0.145***
chaotic regime		(0.034)	(0.034)	(0.044)	(0.038)	(0.039)	(0.041)
gdp per capita (log)			0.011	-0.012	-0.016	-0.014	0.048
			(0.015)	(0.023)	(0.022)	(0.022)	(0.049)
population (log)			-0.013	-0.026***	-0.018	-0.015	-0.013
			(0.009)	(0.009)	(0.012)	(0.013)	(0.012)
years of school				0.005	0.007	0.009	-0.004
				(0.008)	(0.008)	(0.008)	(0.010)
year of independence				-0.001**	-0.000	-0.000	0.000
				(0.000)	(0.000)	(0.000)	(0.000)
corruption index					0.079	0.094*	0.104
					(0.052)	(0.054)	(0.075)
government					-0.077	-0.093*	-0.085
effectiveness index					(0.052)	(0.056)	(0.083)
military exp./gdp						-0.020	-0.012
						(0.013)	(0.014)
gini index							0.001
							(0.003)
Constant	0.488***	0.488***	0.600***	1.948***	1.655**	1.510**	0.095
	(0.017)	(0.017)	(0.188)	(0.666)	(0.667)	(0.649)	(1.195)
N	108	108	104	94	94	93	60
N_k	73	73	71	62	62	61	39
Adjusted R^2	0.026	0.067	0.082	0.123	0.126	0.138	0.266

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Dependent variable is fraction of people considering democracy absolutely important. Robust standard errors clustered at country level are reported in parentheses.

tant is 14% lower than in other autocracies. In column 3 we control this relationship for the logarithm of GDP per capita and of the population. In column 4, we also add the average years of schooling (Barro and Lee 2015) and the year of independence as additional controls[23]. In column 5, we then add additional controls for the quality of the status quo, the corruption index and the government effectiveness index taken from the World Government Indicators (WGI). We also look at the coercive side of political belief formation, by controlling for military expenditure in column 6. Sequentially adding these controls to our baseline model strengthens our results, with the difference in the share of people considering democracy to be absolutely important between the two groups of autocracies increasing from -14% to -17.7%.

Finally, we add the gini index in column 7, and see that inequality does not affect neither qualitatively nor quantitatively the effect of chaotic regime exposure on popular beliefs about democracy.

7 Conclusion

This paper provides an explanation why an autocracy can obtain high levels of political support from its citizenry, despite offering potentially lower economic returns than those available in alternative, more democratic political regimes. Our explanation focuses on the impact of authoritarian propaganda on citizens' political beliefs. Propaganda directly affects the decision by the population to revolt, and is therefore a primary determinant of authoritarian regime persistence.

A key feature of our model is that the use of propaganda is economically costly, as disposable resources are diverted from productive public investment, which is complementary to private investment. Lower levels of private accumulation also imply a smaller rent expected by the autocrat in the future. The implication of our mechanism is that only highly extractive autocracies, in which disposable resources are few, can successfully exploit negative collective memories and prevent rebellions through propaganda.

We use two case studies to illustrate our mechanism. In Russia under Putin, the state has used intense propaganda to successfully recall past traumatic memories about

[23]The country's year of independence ranges from 1800—the year when the PolityIV project starts its analysis—to 1991. Those countries that take the minimum value have never been a colony. Those that became independent in 1991 are former Soviet countries. Years of schooling as well as the timespan of independence matters in the way people get use with politics—therefore affecting both their understanding of it and their skills (cognitive ability) in political communication. See for instance Brender and Drazen (2008) who look at the political business cycle in old and new democracies.

democratic politics during the 1990s, to convince the population that a democratic alternative to Russia's current electoral authoritarianism would resemble the political and economic chaos of the country's recent past. Conversely, the Pinochet regime in Chile underestimated the positive memories the population associated with democratic institutions before 1973, and as a result lost the referendum in 1988 that it seemed sure to win.

The implication of our theory is that the degree of public awareness about the true nature of potential political alternatives can be a crucial driver of regime transition. When this information is controlled and the autocrat is able to shape its content, regime transitions from autocracy to democracy become less likely. In our model, the existence of negative collective memories about democratic institutions reduces the costs of shaping information with the help of propaganda, as the population is more receptive to the message of the autocrat.

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Table A1: What do you think, does Russia need democracy? (source: Levada 2015)

	June 2005	Dec. 2006	Dec. 2007	June 2008	June 2009	June 2010	Oct. 2011	Aug. 2013	Sep. 2014	
Yes, Russia needs democracy	66	56	67	62	57	60	55	63	56	62
No, a democratic form of government is not the right thing for Russia	21	27	17	20	26	24	32	24	22	24
Difficult to say	13	18	17	18	17	16	13	13	22	14

Table A2: What kind of democracy does Russia need? (source: Levada 2015)

	June 2005	Dec. 2006	Dec. 2007	June 2008	June 2009	June 2010	Oct. 2011	Aug. 2013	Sep. 2014
The kind of democracy that exists in developed countries in Europe and America	24	18	22	20	20	22	19	26	13
The kind of democracy that existed in the Soviet Union	16	13	10	13	18	17	14	17	16
A completely different kind of democracy, in accordance with the national traditions and specifc characteristics of Russia	45	48	47	45	39	44	49	34	55
Russia does not need democracy	6	10	7	8	10	7	7	8	5
Difficult to say	10	11	14	15	14	10	11	16	11

A Appendix

B Proofs

B.1 Proof of Proposition 2

At the stage T3, each citizen maximizes (10) taking γ as given. The first order condition (FOC) simply gives us the solution $k^A = (1-\tau)(T-E)(1-\gamma)$ as a function of γ and E. Given the convex costs, such solution is also unique. In their political reference point, people would expect either the absence of rents and propaganda or, in its worst version, a loss of the economic output. Specifically, when they believe democracy is D

Table A3: Is contemporary Russia a democracy? (source: Levada 2015)

	Feb. 06	Mar. 10	Feb. 12	Mar. 13	Mar. 14	Nov. 15
Yes, without doubt	4	4	8	6	8	16
Partly, yes	33	32	40	31	38	46
Not yet	33	36	31	32	32	19
Less and less lately	20	20	14	22	13	11
Difficult to say	11	8	8	8	8	9

they would expect $\mathcal{U}^D = (1-\tau)kT - \frac{1}{2}k^2$ and an optimal stock of capital equals to $k^D = (1-\tau)T$. On the contrary, when they believe democracy is $\tilde{D}$ they would expect $\mathcal{U}^{\tilde{D}} = (1-\tau)(1-\xi a\gamma)kT - \frac{1}{2}k^2$ and an optimal stock of $k^{\tilde{D}} = (1-\tau)(1-\xi a\gamma)T$.

It is easy to check that $k^D \geq k^A$:

$$(1-\tau)T \geq (1-\tau)(T-E)(1-\gamma),$$
$$\gamma \geq 1 - \frac{T}{T-E},$$

that is always true. At the same time, one can check that $k^A \geq k^{\tilde{D}}$.

$$(1-\tau)(T-E)(1-\gamma) \geq (1-\tau)(1-\xi\gamma)T,$$
$$\gamma \geq \frac{1-\frac{T-E}{T}}{a\xi - \frac{T-E}{T}},$$

which is always satisfied because $a > \frac{1}{\xi}$. This concludes the proof.

B.2 Proof of Proposition 3

After citizens choose the optimal stock of capital they realize how much utility they get in the period. The indirect utility function in the current political regime can be computed putting the expression of k^A into (10):

$$\mathcal{U}^A = (1-\tau)^2(1-\gamma)^2(T-E)^2.$$

At the same time people can now compare the level of utility obtain in the *status quo* from the one they will have obtained if they have lived in a democracy or in a chaotic regime. The two latter utility levels are obtained from substituting k^D and $k^{\tilde{D}}$ into their respective utilities:

$$\mathcal{U}^D = (1-\tau)^2T^2,$$

$$\mathcal{U}^{\tilde{D}} = (1-\tau)^2(1-a\xi\gamma)^2T^2.$$

The comparison takes place as in (5) and making use of λ—the intensity of the negative collective memory. We can now therefore compute the value of $\lambda^\dagger$:

$$\begin{aligned}\lambda^\dagger &\equiv \frac{\mathcal{U}^D - \mathcal{U}^A}{\mathcal{U}^D - \mathcal{U}^{\tilde{D}}} \\ &= \frac{T^2 - (T-E)^2(1-\gamma)^2}{T^2 - T^2(1-a\xi\gamma)^2} \\ &= \frac{1-s(1-\gamma)^2}{1-(1-a\xi\gamma)^2},\end{aligned}$$

where $s = (\frac{T-E}{T})^2$ is the fraction of disposable resources in the autocracy.

After citizens choose the optimal stock of capital they also pay taxes in the amount of

$$\tau y^A = \tau k(T-E)(1-\gamma) = \tau(1-\tau)(T-E)^2(1-\gamma)^2.$$

This gives us the total tax revenues that represents the expected rents of the autocrat once in power in period 2, R. Substituting R into (3) yields the autocrat's value function (8). The problem of the autocrat is therefore to maximize (8) with respect to γ. However he has to take into account the rebellion threat as well. Given that rents are monotonically decreasing in γ in the segment $[0,1]$, with $R(\gamma=0) > 0 = R(\gamma=1)$, the autocrat's first best, absent revolutions, would clearly be to set $\gamma = 0$.

We proceed by demonstrating that the autocrat will provide the amount of propaganda $\gamma^\dagger$ that makes $\lambda = \lambda^\dagger$. To see that consider again the expression of $\lambda^\dagger$. It clearly varies with γ in a very complex fashion. Its numerator defines the distance between $\mathcal{U}^D$ and $\mathcal{U}^A$. Holding E, such distance increases, in a concave fashion, with the amount of propaganda provided because propaganda diverts disposable resources, s, to productive uses capable of fueling the economic production in the country (see the blue line in Figure 1 and 2). Its denominator defines the distance between $\mathcal{U}^D$ and $\mathcal{U}^{\tilde{D}}$, that increases, in a concave fashion too, because propaganda, recalling negative collective memories, makes $\tilde{D}$ a worst option (see the red line in Figure 1 and 2). In the first case, propaganda makes people more prone to fight to move to democracy because it reduces the value of autocracy. In the second, it reduces the willingness to change political regime because it makes the *political reference point* a bad option on average. Intuitively, if the denominator lies above the numerator the autocrat is able to do a feasible level of propaganda that allows him to remain in power. This clearly depends on the two parameters of the model: s and ξ.

To see that, let us rewrite the inequality $\lambda \geq \lambda^{\dagger}$ as follows:

$$\lambda(1-(1-a\xi\gamma)^2) \geq 1-s(1-\gamma)^2.$$

Solving for γ yields:

$$-(a^2\lambda\xi^2-s)\gamma^2+2(a\lambda\xi-s)\gamma-(1-s)\geq 0.$$

Let us define $H(\gamma)$ the LHS. We can therefore distinguish two cases:

- if $\lambda\xi^2 < s$, the parabola is convex. We will refer to this case as popular revolution;
- if $\lambda\xi^2 > s$, the parabola is concave. We will refer to this case as authoritarian regime consensus.

When $H(\gamma)$ is convex the inequality is never strictly satisfied. To see that, it is sufficient to show that $H(0) = -(1-s) \leq 0$ and that $H(1) = -a^2\lambda\xi^2 + 2a\lambda\xi - 1$ which is always negative. Since $H(\gamma)$ is continuous in the interval $[0,1]$ we conclude that no solutions exist, meaning that when the chaotic experience was relatively low disruptive, autocracies never succeed in preventing rebellions using propaganda. Rebellion indeed takes place and the regime transits to a democracy, where the autocrat benefits the following amount of rents:

$$\beta\theta R(\gamma=0) = \beta\theta\tau(1-\tau)(T-E)^2.$$

When $H(\gamma)$ is concave the inequality is satisfied for the following 2 values:

$$\gamma^{\dagger}_{(-)} = \frac{a\lambda\xi - s - \sqrt{s-a\lambda\xi[a(1-\lambda)\xi+(2-\xi)s]}}{a^2\lambda\xi^2-s}.$$

and

$$\gamma^{\dagger}_{(+)} = \frac{a\lambda\xi - s + \sqrt{s-a\lambda\xi[a(1-\lambda)\xi+(2-\xi)s]}}{a^2\lambda\xi^2-s}.$$

provided that Assumption 1 holds. The two solutions are both positive but $\gamma^{\dagger}_{(-)} \leq \gamma^{\dagger}_{(+)}$. Since the autocrat's value function is decreasing in γ we can conclude that the only plausible solution is $\gamma^{\dagger}_{(-)}$. This solution guarantees stability to the status quo regime and the autocrat benefits from the following amount of rents:

$$\beta R(\gamma^{\dagger}) = \beta\theta\tau(1-\tau)(T-E)^2(1-\gamma^{\dagger})^2.$$

Finally it is easy to show that in equilibrium the autocrat would always prefer to remain in power.

$$\begin{aligned}\beta\theta R(\gamma=0) &< \beta R(\gamma^{\dagger}),\\ \sqrt{\theta} &< 1-\gamma^{\dagger},\end{aligned}$$

given Assumption 2.

Finally, we show that propaganda increases with the chaos featured by the regime $\tilde{D}$. We compute the first derivative of $\gamma^\dagger$ and then show that such derivative is positive.

$$\frac{\partial \gamma^\dagger}{\partial \xi} = \frac{a(1-\lambda-s)\lambda\xi}{2(a^2\lambda\xi^2-s)\sqrt{s-a\lambda\xi(s(2-\xi)+a(1-\lambda)\xi)}},$$

which is positive for small values of s and, in particular, for $s < a^2\lambda\xi^2$. When the autocrat succeeds in preventing the rebellion, propaganda is also relatively less costly.

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