# ETHNIC CONFLICTS

# &

# THE INFORMATIONAL DIVIDEND OF DEMOCRACY[*]

Jeremy Laurent-Lucchetti[†]   Dominic Rohner[‡]   Mathias Thoenig[§]

November 2019

## Abstract

Prevailing explanations view democracy as an institutional arrangement that solves a class conflict between a rich elite and the rest of population. We study the logic of democratic transition when ethnic tensions are more salient than the poor/rich divide. We build a simple theory where (i) ethnic groups negotiate over allocating the economic surplus and (ii) both military and political mobilizations rest on the unobserved strength of ethnic identity. By eliciting information on mobilization, free and fair elections restore inter-ethnic bargaining efficiency and prevent conflict outbreak. We show that democratic transition can be rationally chosen by autocrats, even if it involves a risk of losing power, as elections reduce the informational rent of the opposition, allowing the legitimately elected ruler to grab more economic surplus. Our setup generates new predictions on the nature of political regime, government tenure, ethnic favoritism and social unrest for ethnically divided countries - all consistent with novel country-level and ethnic group-level panel evidence on democratization in the post-decolonization period.

JEL classification: C72, D02, D72, D74, D82, P16.

Keywords: Democracy, Elections, Conflict, Asymmetric Information, Ethnic Identity, Institutions, Government Tenure, Political Regime, Ethnic Favoritism.

---

# 1  Introduction

Prevailing explanations of democratization claim that democracy is an institutional arrangement that solves a social conflict between a rich elite and the majority of the population.[1] Democratic transitions accordingly take place when the ruling elite is about to be overthrown and concedes a partial or total transfer of *de jure* power to the median voter, resulting in more redistribution and a reduction in inequality. This paradigm has considerable explanatory power for situations where the main political cleavage is between the rich and the poor, such as 19th century Europe. But the post-decolonization period has been mostly marked by ethnic rather than class conflicts (Esteban and Ray, 2008) and in the post-1980 wave of democratization "less than a third of all reversions are driven by distributive conflicts between elites and masses" (Haggard and Kaufman, 2012: 495). Figure 1 displays unconditional country-level evidence documenting how ethnic cleavages mute the distributive motive of democratization.[2] Micro-level evidence also suggests that transfers from rich to poor often take place within the boundaries of ethnic groups and are supported by informal (e.g. traditional arrangements, religious charity, extended family) rather than formal institutions (see e.g. Luttmer, 2001; Fong and Luttmer, 2009; and Stichnoth et al., 2013). So, what is the logic of democratization in societies where ethnicity determines political identity and conflict? Beyond case studies and anecdotes, the question remains overlooked from both theoretical and empirical perspectives. This lack of understanding is worrying, as ethnically divided societies are usually associated with weaker institutions, more political instability and recurrent civil wars (Alesina and La Ferrara, 2005; Montalvo and Reynal-Querol, 2005; Esteban, Mayoral and Ray, 2012).

In this paper we study the drivers of democratic transition when politics take place along ethnic lines rather than the poor/rich divide. We explain the choice of an electoral system as a means of conflict resolution by reducing informational asymmetries between the ruling group and the opposition. We provide a simple theoretical model where both military and electoral mobilization capacities rest on the unobserved strengths of ethnic identities. Ethnic groups negotiate over the allocation of the economic surplus (e.g. natural resource management, public policies, taxation) and civil conflict is caused by a bargaining failure when a group under-estimates the strength of its opponent. By eliciting information on electoral mobilization, free and fair elections restore efficiency of inter-ethnic bargaining and prevent conflict outbreak. Thus, democratic transition may be rationally chosen by autocrats, even if it involves a risk of losing power, as elections reduce the informational rent of the opposition, allowing

---

[1]See e.g. Meltzer and Richard (1981), Acemoglu and Robinson (2001, 2006), Fearon (2011) or Bidner et al. (2015).

[2]In Figure 1 a negative correlation between Inequality (as measured by the Gini Index from World Development Indicators (2016)) and Democracy (as measured by the index of Polity IV (2018)) is detected in the cross-sectional dimension for the subsample of ethnically homogeneous countries (left panel) but disappears in the subsample of ethnically heterogeneous countries (right panel). The data used is described in more detail below. Acemoglu et al. (2015) also find that inequality does not fall after democratization, but point out that this stylized fact may be consistent with the aforementioned class conflict models of democracy in the presence of captured democracy, inequality-increasing market opportunities or middle-class bias. Still, given that in these models the purpose of democracy is to provide a credible transfer in the face of looming revolt, what remains unclear is why this low-redistribution democracy is attractive enough to "buy-off" popular discontent.

Figure 1: Link between inequality and democracy depends on ethnic fractionalization
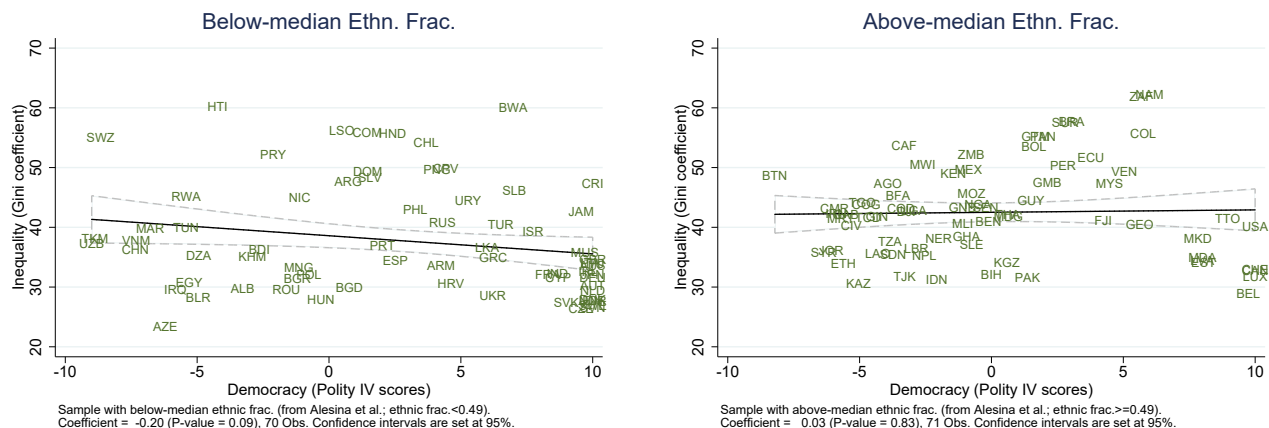
NOTE - Democracy scores from Polity IV (2018) , Gini coefficient from World Development Indicators (2016), ethnic fractionalization from Alesina et al. (2003).

the legitimately elected ruler to grab more economic surplus. Our setup generates new predictions on the nature of constitutional regime (i.e. majority rule, proportional representation (PR)), government tenure and ethnic favoritism for ethnically divided countries. In particular, our theory explains two new empirical regularities that we document in a large sample of countries over the post-decolonization period both at the aggregate (i.e. country) level and ethnic-group level. The first one relates to the puzzling fact that democratic transitions toward majoritarian regime tend to exacerbate ethnic favoritism.[3] The second one relates to the observation that some genuine democratic transitions are not accompanied by an alternation in de jure power and a change in political leadership.[4, 5]

Our theory of democratization features informational issues that, we believe, are typically inherent in ethnically divided societies. Indeed ethnic politics pertain non-pecuniary elements that are essential for solving various collective action problems at the group-level. Compliance to cultural norms deeply rooted in the traditions and history of the groups, the behavioral monitoring and the social control exerted by co-ethnics, as well as intrinsic motivation attached to pro-ethnic actions explain political mobilization, both in time of war and elections (e.g. Amodio and Chiovelli, 2018). These elements are both elusive and transient, and collecting information on the political mobilization capacities of the opposite groups is a first-order concern for ethnic leaders. Such informational problems play also a role in class conflicts and

---

[3]In the words of Burgess et al. (2015: 1817) "Ethnic favoritism refers to a situation where coethnics benefit from patronage and public policy decisions, and thus receive a disproportionate share of public resources, when members of their ethnic group control the government". The empirical debate on the mitigating impact of democratic institutions on ethnic favoritism is rapidly expanding (see Posner, 2005; Franck and Rainer, 2012; Burgess et al., 2015; Kramon and Posner, 2016; De Luca et al. 2018).

[4]When referring to democracy and elections, we focus indeed on political competition that is free and fair and not "window-dressing" elections organized by autocrats in search of legitimacy. Empirically, to distinguish the former from the latter, we draw on rigorous expert coding by, among others, Cheibub et al. (2010), as discussed in more detail below.

[5]Prominent examples of democratic transitions without alternation of power include Ghana in 1992 (Jerry Rawlings), Uruguay in 1984 (Julio Sanguinetti), Niger in 2001 (Hama Amadou), Burundi in 2006 (Pierre Nkurunziza), Sierra Leone in 1999 (Ahmad Tejan Kabbah), South Korea in 1987 (Roh Tae-woo).

our theory may apply to these contexts as well. However, we believe that these problems are more severe in ethnic conflicts because linguistic fractionalization, spatial sorting of the ethnic homelands, economic and social segregation severely limit information collection and blur its precision (Horowitz, 2000, and the literature cited below). It is also likely that monetary incentives for political mobilization are much less aligned within ethnic groups than within social classes (rich/poor) such that the role of non-pecuniary elements is more salient in ethnic politics.

Our analysis highlights the importance of credible elections to incentivize the opposition group to reveal its mobilization capacity: There must be the possibility, even uncertain, of a future transfer of power to induce its political participation to the elections. By contrast, less drastic alternatives that could be contemplated by the autocratic leader –window dressing elections, plebiscite, referendum, opinion survey, or even oppression and torture– are typically ineffective for eliciting information.[6,7] In these cases, the opposition anticipates that once the leader is endowed with the information, no safeguards would pressure her to make any concession or to step down. She would simply behave as an autocrat under perfect information and grasp an even larger share of the economic surplus.

Thus, we define democratic transition as the implementation of (i) free and fair elections; (ii) and a set of durable institutions that force the political contenders to commit to the future election results. This latter element of commitment is crucial, otherwise the transition would not be accepted by the opposition. In this respect, our theory of democratization as a device for solving asymmetric information builds on the literature emphasizing the various institutional features that enable a credible allocation of *de jure* political power (Acemoglu and Robinson, 2006, chapter 2).

We formalize our ideas through a sequential game in which agents belong to two ethnic groups, each led by a benevolent leader, one initially in power (the autocrat) and the other in opposition. Groups have equal size and productivity. Hence polarization is maximal and there is no inter-group inequality. Each individual can engage in two pro-ethnic actions: Fighting for her group and (when possible) voting for her ethnic leader. Utility attached to both actions depends positively on the strength of her ethnic attachment, modeled as an idiosyncratic preference shifter with a group-specific mean that can be strong or weak. The autocrat does not perfectly observe the strength of the opposition group. Groups negotiate over economic transfers and civil conflict arises in case of bargaining failure due to imperfect information (on war payoffs). The ruling group enjoys a bargaining power -the source of ethnic favoritism in our setup- that we simply model as a take-it-or-leave-it offer.[8] We define as the Ruling Group Rent (RGR),

---

[6]Even in democratic countries with well functioning check-and-balances and media freedom, anecdotal evidence suggests that crucial information on mobilization capacities is mostly revealed through elections rather than polls (e.g. surprise victory of Donald Trump in the 2016 US presidential elections).

[7]Some recent papers (i.e. Martinez-Bravo et al., 2018) highlight that local elections may be used by autocrats to reveal local information about preferences of citizens. However, they point out that such elections are useful to reveal information about the quality of local rulers, they are thus not reliable for revealing the overall support for the autocrat.

[8]With one-period protocol, as ours, the informational asymmetry exerts its highest influence on bargaining and more complex protocols are ignored for the sake of simplicity. This said, Myerson-Satterthwaite's central result shows that bargaining fails with a non-zero probability as soon as there is informational asymmetry (see Martin et al, 2008, for a model

the economic transfer, when agreed, from the opposition to the ruling group.

As a first step, we solve for the subgame equilibrium under autocracy. We show that RGR decreases with the autocrat belief that the opposition is strong. However, civil conflict happens at equilibrium when the autocrat wrongly believes that the opposition is weak. Then we turn to the decision by the autocrat to organize free and fair elections and to the issue of whether the opposition accepts to participate to the political competition. Using a standard probabilistic voting model, we analyze the autocrat's political trade-off. On one hand, elections increase the risk of losing power. On the other hand, the observation of vote shares reduces informational asymmetries because political mobilization of a group correlates with its military capacity; thus, post-election inter-ethnic negotiations are less likely to fail, the resulting RGR tends to increase and the conflict risk decreases. We show that the Perfect Bayesian Equilibrium of the game is such that the autocrat chooses to democratize when uncertainty and the threat of conflict are maximal, i.e. for an intermediate range of beliefs. However, the constitutional regime varies with the strength of the autocrat's group identity: A strong autocrat proposes a majority rule, while a weak autocrat opts for a proportional regime. The reason is that the winner-takes-all aspect of a majority system is attractive for leaders benefiting from strong ethnic support and hence large winning chances; while a weak autocrat will prefer PR, allowing her to retain some power even if electorally defeated.

Our theory yields a series of empirically testable predictions linking the type of democracy and various politico-economic outcomes. First, democratic transition toward a majoritarian system increases RGR and ethnic favoritism. The government's grab of economic resources is constrained by either lack of information in autocracies or by a proportional electoral system in democracy, while in majoritarian democracies there are only few ramparts against squeezing the economic share of the opposition. This stems from the fact that the elected leader of a majoritarian democracy can fully exploit the information revealed by the elections on the ethnic mobilisation of the opposition, as she has all the institutional power in hands to limit the amount allocated to the opposition to the strict minimum making them indifferent between exploitation and costly conflict. The potential of such "tyranny of the majority" is typically larger in majoritarian democracies than in most autocracies (where asymmetric information limits rent extraction) and in proportional democracies (in which veto power limits rent extraction). Interestingly, exploitation of the opposition in majoritarian democracies does not threaten political stability and is limited mainly by the ethnic mobilisation capacity of the opposition (i.e. a strong opposition group will be exploited less). The second major prediction of our model is that genuine democratization does not necessarily imply a transition of power, and we expect a higher probability of incumbent victory in majoritarian electoral systems than with proportional representation. Third, we should observe more conflicts in autocracies than in democracies holding regular free and fair elections. We assess the empirical relevance of these theoretical predictions in a large sample of countries (up to 140) over the post-decolonization period (i.e. after 1947). A key focus of our analysis relates to the extent of ethnic

of conflict with asymmetric information and endogenous choice of protocol).

4

favoritism exerted by ethnic groups in power. Our contribution to the literature here consists in building a synthetic measure of ethnic favoritism at the country level. This new measure is used as an empirical counterpart to our concept of Ruling Group Rent (`RGR`); it is computed as the ratio of per capita economic output of the ethnic groups in power over the weighted average of the per capita economic outputs of groups in power and groups not in power, where output is proxied with yearly night light intensity in each ethnic homeland. While most of the analysis is conducted at the country-level, we also investigate the relationship between democracy and ethnic favoritism with data dis-aggregated at the ethnic-group level with the idea of absorbing the (potentially endogenous) country-level drivers of democratization in the fixed-effect structure. All in all, we find robust supporting evidence for our theoretical channels at both levels of aggregation and across alternative options retained for the econometric specifications (e.g. cross-section, panel), the outcome variable measurement (e.g. various informational sources and datasets, coding rules) and the subsamples (e.g. ethnically fractionalized countries only, new democracies only). However, it is important to note that our empirical investigation cannot go beyond correlational evidence, as we lack exogenous variation in key variables such as democratization and conflict. We still try to address concerns about confounding factors and endogeneity as far as the data allow —by exploiting alternative sources of identification and including batteries of fixed effects.

In the rest of the paper, we discuss the most important assumptions of the baseline model and develop extensions to explore the robustness of our predictions. We first focus on informational assumptions and show that alternative ways of collecting information (e.g. plebicites, window dressing elections or surveys) do not generically allow to reveal information on the opposing group. The reason is that such tools do not ensure a credible transfer of power and are thus not incentive compatible. Then, motivated by a recent literature on social unrest as a learning device (Barbera and Jackson, 2016), we allow the opposition leader to discover the strength of ethnic identity of her own group by observing participation in rioting events. This extension generates new predictions on a non-monotonic relationship between the intensity of social unrest and democratization, which we test empirically in the appendix.

In the next series of extensions we discuss post-election ethnic conflicts and democratic backsliding (i.e. dismantling the election process). To this purpose, we allow for the possibility of conflict in the transition phase toward mature democracy by introducing imperfectly revealing elections in a dynamic version of the model. We characterize analytically the conditions for a successful and peaceful democratic transition. An important outcome is that better information revelation reduces the risk of conflict in young democracies but makes the organization of free and fair elections less appealing in mature democracies once the information asymmetry is resolved. We thus study how type-reshuffling of the opposition, through active political competition for example, can achieve lasting incentives for running democratic elections. Alternatively we also show how the dynamics of "democratic values" (Besley and Persson 2019) can discipline the leader and avoid democratic backsliding.

Finally, in the last set of extensions we discuss the implications of heterogeneous productivities and

group sizes on ethnic favoritism, inequality and democratization. We conclude with an extension where monetary incentives can be used as a substitute to ethnic attachment for military recruitment (e.g. mercenaries). We show that even when leaders can use optimal monetary transfers to foster military mobilization, there is no full substitution, ethnic identity stays decisive, informational asymmetry matters and democratization is implemented. This theoretical robustness stems from a salient feature of most civil wars: The winner appropriates a common resource, hence the post-conflict stake is the same for both groups. Consequently, leaders of both groups rely on comparable monetary rewards for their fighters and ethnic identity retains its crucial role in mobilization.

The paper is structured as follows: Section 2 provides a survey of the existing literature and presents motivating stylized facts. Section 3 displays the baseline model; various theoretical extensions are investigated in Section 4. Supportive empirical evidence is reported in Section 5 to illustrate the main predictions of our model. Finally, Section 6 concludes.

## 2 Literature review and motivating stylized facts

The current paper is embedded in the literature on *ethnic politics and ethnic favoritism.* There is substantial evidence that the emergence of ethnic identities and ethnification of party politics is fuelled by ethnic inequality (Huber and Suryanarayan, 2016), and that ethnic cleavages tend to be associated with rent seeking (Easterly and Levine, 1997) and conflict (Montalvo and Reynal-Querol, 2005; Esteban, Mayoral and Ray, 2012). It has also been shown that governments tend to favor their own ethnic groups (see e.g Posner, 2005, on Zambia), whereas an important subject for debate is whether democracy can have a disciplining effect. While Burgess et al. (2015) conclude for road building in Kenya that ethnic favoritism is strongly mitigated by democratic institutions, other studies such as Franck and Rainer, 2012, (covering 18 African countries), Kramon and Posner, 2016, (covering education in Kenya), and De Luca, 2018, (covering 140 multi-ethnic countries) find hardly any differences between ethnic favoritism in democracies and autocracies. Our findings are consistent with theirs, but in addition we show below that this non-result changes when one distinguishes between *majoritarian* versus *proportional* democracy (in line with our theory, the former increases ruling group rents, while the latter reduces them).

Further, our paper is rooted in the *theoretical literature on democratization.* A large strand of the literature relates the rationale for democratization to its peace-promoting virtues. In particular, while Gurr (1971) argues that democratic representation arises as a way to bring peace by reducing "grievances", Olson (1993) also points out as source of instability of autocracies the "succession problem". The idea of democracy as way to avoid costly conflict is also present in the more recent literature on franchise extension. In particular, Acemoglu and Robinson (2001, 2006) frame democracy as a commitment device allowing to avoid popular revolt by redistributing funds from the elite to the population. Related to this, Bidner et al. (2015) build a model of democracy where competitive elections act as commitment device

for power-sharing within the elite, while in Fearon (2011) the electoral system solves the moral hazard problem of a government tempted to shirk by establishing commonly understood electoral rules and procedures enabling the public to credibly threaten mass protest.[9] Our contribution is complementary to this literature, by introducing asymmetric information on ethnic identity and mobilisation.

Our theory is also part of the *theoretical literature on conflict* and in particular on the "war inefficiency puzzle", asking the question of why costly war may not be avoided by bargaining (see Fearon, 1995). While "commitment problems" and "asymmetric information" are typically seen as the major explanations of bargaining failure to prevent conflict, the former has received substantially more attention than the latter.[10] In fact, formal models of informational wars driven by asymmetric information are very scarce, and to the best of our knowledge we are the first one to focus on the role of democracy to address this underlying root cause of conflict[11] Below we shall also briefly discuss existing stylized facts related to the key assumptions and predictions of our model.

**Relevant empirical stylized facts on key assumptions of the model–** We shall survey below the existing empirical literature linked to the key assumptions of our model.

*Elections are a mean to solve asymmetric information problems of autocracy*: As already pointed out by Wintrobe (1990, 1998), Sartori (2005) and Morgenbesser (2015), a foremost dilemma of any dictator is the lack of reliable information over war mobilization capacities of the opposition. Sartori (2005 [1976]: 206) argues that electoral competition is "a means of providing the elite with a flow of information or, at any rate, with more information than the one party is generally able to gather". Consistent with this, there is a large body of evidence documenting information collection as a main purpose of running elections in Mexico (Magaloni, 2006), Egypt (Blaydes, 2011), Vietnam (Malesky and Schuler, 2010). There is also (cross-country) evidence that autocrats use elections as information gathering tool (Londregan and Vindigni, 2008) and exploit information from elections to calibrate policy responses (Miller, 2015). Interestingly, opinion polls and surveys are a poor substitute for running elections, as the information collected through these means may be severely biased, due to misreporting incentives at

---

[9]A major difference with respect to our setting is that in Fearon (2011) there is no imperfect information about the organisational capacity of the opposition and hence democracy does not serve the purpose for the government to extract information – which implies that most of our empirically testable predictions (e.g. on redistribution or the economic structure) are not present in Fearon (2011).

[10]Commitment problems have e.g. been linked to conflict in Fearon (1995), Powell (2006), Jackson and Morelli (2007). One reason for the focus on commitment problems is the argument by Fearon (2004) and Powell (2006) that asymmetric information as root cause of conflict may be hard to reconcile with the long duration of some conflicts (as one would expect information to eventually spread). However, if information has some secrecy value and fighting capacities keep stochastically changing, information may in fact spread only very slowly.

[11]The few papers linking conflict to asymmetric information include Rohner (2011), Martin et al. (2008) and (2012), Chassang and Padro i Miquel (2009), Rohner et al. (2013) and Acemoglu and Wolitzky (2014). These contributions have however a very different focus, and do neither link conflict to democracy nor to riots or redistribution. Further, Barbera and Jackson (2016) study how protests can transmit information on the pool of citizens potentially willing to engage in a revolt, whereas Hoerner et al. (2015) stress mediation as an alternative to democracy for solving asymmetric information problems driving conflict. Their approach is complementary to ours, as it hinges on the availability of a mutually accepted mediator.

various levels (Wallace, 2016).

*Mobilisation capacities in war and political competition are positively correlated*: Already in Antiquity elections have been seen as less costly substitute for war to reveal group strength: "The canonical example of informative elections would be those once held in the city-state of Sparta, in which the supporters of a particular candidate voted by yelling as loudly as they could, while clashing their spears against their shields. The utility of such elections in gauging the fighting spirit and ability of a candidate's supporters was obvious and, with a commonly observed measure of the two sides' strengths, actual recourse to violence should have been less likely." (Staveley, 1972). Similarly, Herodotus (quoted in Bryce 1921: 25-26) made the point that in democracy "physical force of the citizens coincides (broadly speaking) with their voting power". Related points linking physical strength and electoral force have also been made in Simmel (1950), Londregan and Vindigni (2008), Przeworski (2009), and Dunning (2011).

This link between fighting and voting strength is also supported by recent empirical evidence by Chacon, Robinson and Torvik (2011: 392) who build a formal model of the democracy-vs-fighting trade-off and test it using data of the "La Violencia" period in Colombia, concluding that their "result is consistent with a natural model of political competition in which payoffs from participating in democracy and in a violent confrontation are interlinked by popular support". Similarly, Balcells (2011) finds in her study of Catalonia and Aragon during the Spanish civil war that political loyalties and mobilisation of given groups also extended to more easily eliminate political enemies trough direct violence.

**Relevant empirical stylized facts on predictions of the model** – Below we discuss what empirical evidence already exists that speaks to the implications of our theory. Further below we shall extend this existing evidence with our own empirical study of novel stylized facts.

*Impact of democracy on conflict:* It has been found that democracy –at least under some conditions and for some range of values (i.e. high democracy scores throughout all dimensions)– tends to reduce the scope for conflict (Hegre et al. (2001), Fearon and Laitin (2003), Collier and Rohner (2008), Besley et al. (2010, 2011) and Sunde and Cervellati (2014)).[12]

*Impact of democracy on inequality*: Although freedom and democracy correlate with desirable outcomes such as development (see Acemoglu et al., 2008) and happiness (World Happiness Report, 2018), it has been long-known that democracy can also be exploitative or dysfunctional (see Alexis de Tocqueville's (1835) famous discussion on the "tyranny of the majority", as well as more recently Besley et al. (2010), Acemoglu et al. (2015) and the literature therein). As far as the impact of democracy on inequality is concerned, Acemoglu et al. (2015) find that there is no statistically significant effect. Similarly, Ansell and Samuels (2014) also conclude that there is no generalized effect of democracy reducing inequality,

---

[12]In terms of particular aspects of democracy, *Proportional representation* (Reynal-Querol, 2002; Saideman et al., 2002) and *Power-sharing* (Cederman and Girardin, 2007; Francois et al., 2015; Mueller and Rohner, 2018) have been found to decrease the risk of civil conflict. Wright (2008) finds that the initial political competition in a democracy is positively related to its stability and negatively correlated with the risk of conflict.

and that democracy may actually lower redistribution when groups are unequal enough to start with, and Albertus (2015) concludes that "land redistribution - the most consequential form of redistribution in the developing world - occurs more often under dictatorship than democracy". While these results on inequality are consistent with our theory's predictions, we will complement these existing results with an empirical analysis focusing on a set of measures capturing much more directly ruling group rents – the concept studied in our theoretical framework.

In sum, all stylized empirical evidence discussed above is reassuringly consistent with the main assumptions of the model and supports some of the model's implications. However, a series of the model's predictions have not been confronted to empirical data yet – a shortcoming that we shall address below in Section 5. In particular, we will present novel results on the link between political regimes and ethnic favoritism, highlighting that democratic transition toward a majoritarian system increases ethnic favoritism. We will also document that incumbents have a higher probability of victory when an autocracy transits toward a majoritarian electoral system than a proportional representation.

# 3   Theoretical Framework

## 3.1   The Setting: Basic Structure and Timing

We consider a society with a continuum of risk-neutral individuals belonging to two "ethnic" groups $G \in \{A, B\}$, each of unit mass and led by a benevolent leader. Initially the country is an autocracy with group $A$ in power. The interactions between the two groups are described by a game in 4 stages.

Stage 1-  Autocrat $A$ proposes (or not) a majoritarian democracy with free and fair elections. Opponent $B$ can accept or decline to participate. Elections contingently take place.

Stage 2-  The ruler—being either Autocrat A or the Elected Leader (A or B)— sets a take-it-or-leave-it discriminatory tax (denoted `tax`) on the other group.[13]

Stage 3-  If the tax is rejected by the opponent, war is staged unilaterally with endogenous mobilization of troops and the victorious group sets the tax.

Stage 4-  Individuals produce, tax is collected and consumption takes place.

When elections are organized, each individual can vote for her co-ethnic leader or for the other candidate. When war takes place, she can choose to *fight* for her group or *not*. Non-fighters produce 1 unit of good while fighters produce $0 \leq 1 - \phi < 1$ unit, where $\phi$ represent the opportunity cost of fighting.

---

[13]This tax can be more broadly interpreted as a net economic transfer from the opposition to the ruling group. In a context of ethnic fractionalization, such discriminatory transfers can take several forms of "ethnic favoritism": When the two groups are specialized in different economic activities (e.g. farmers vs herders), a system of sector-specific taxes and subsidies is put in place; when the ethnic homelands are spatially separated, the tax system may be non-discriminant but the allocation of public goods (e.g. transports, schools) preferentially targets the ruling group ethnic homeland.

This opportunity cost of war is generated by the fact that fighters have to divert from their productive activity to wage war for their group. We assume that non-economic (psychological) benefits are attached to pro-ethnic actions when an individual either votes for her leader or fights for her group. The payoff of each individual entails real wage and the psychological benefits

$$u_i = w_i + \mathbb{I}_{\texttt{proethnic}} \times \tilde{e}_i \tag{1}$$

We further assume that the psychological benefits are heterogeneous across individuals and not perfectly observable:

**Assumption 1:** Ethnic attachment is heterogeneously distributed across individuals $\tilde{e}_i \sim \texttt{unif}(\theta_G, 1 + \theta_G)$ with a group-specific shifter $\theta_G \in \{-\mathcal{E}, +\mathcal{E}\}$. We denote by $A^+$ and $B^+$ cohesive groups characterized by a strong ethnic identity ($\theta_J = +\mathcal{E}$) and by $A^-$ and $B^-$ divided groups with weak ethnic identity ($\theta_J = -\mathcal{E}$).

**Assumption 2:** $\theta_A$ is publicly observable but $\theta_B$ is privately observed. We denote by $\mu \equiv \mathbb{P}_A(\theta_B = +\mathcal{E})$ the belief that $B$ is $B^+$.

Finally, each leader is "benevolent" to her group and maximizes the aggregate *materialistic* welfare of her ethnic group $W_G = \max \int_{i \in G} w_i di$. Hence, from the perspective of the two leaders, a key aspect is that peace Pareto-dominates war because of the existence of the fighting cost $\phi > 0$. The total economic surplus in Peace is $W_A + W_B = 1 \times 1 + 1 \times 1 = 2$, while in war it is equal to $W_A + W_B = 2 - \phi \times (\texttt{army}_A + \texttt{army}_B)$, where $\texttt{army}_A$ and $\texttt{army}_B$ denote the (endogenous) army size of groups $A$ and $B$, respectively. We are interested, both in our theoretical and empirical analyses, on the (unequal) split of the total economic surplus between the two groups. In particular, we study the advantage conferred by being in power and how this advantage is affected by the political regime. In this respect, the relevant concept is the *Ruling Group Rent* (RGR) that is defined as the share of the total economic surplus extracted by the group in power

$$\texttt{RGR} \equiv \frac{W_{\texttt{ruler}}}{W_A + W_B} \tag{2}$$

where $\texttt{ruler} \in \{A, B\}$. The RGR captures the extent of ethnic favoritism in our setup. Its source stems from the bargaining power of the ruling group (i.e. setting the take-it-or-leave-it discriminatory tax). However, under peace, the extent of RGR is rationally limited by the ruling group. Indeed, a too high tax would be rejected by the opposition and lead to a Pareto inefficient war. We show below how informational asymmetries temper the RGR and how democratic transition exacerbates it.

**Discussion.** One key ingredient of utility 1 is that pro-ethnic Voting and Fighting *both* involve psychological benefits. These benefits encompass identity and compliance to social norms of intra-group cooperation, that are exogenously shaped by medium-run factors (institutions, social structure, spatial heterogeneity). This reflects the widespread view that ethnic identity is a strong way to ensure cohesion and increase the ability to solve collective action problems inside ethnic groups. Recent evidence shows that, in their struggle for power, political parties indeed use ethnic markers as a tool to mobilize individuals for violence (Amodio and Chiovelli, 2018).

We note that the game has also an alternative interpretation that abstracts from psychological payoffs. Indeed, a broader interpretation of $\theta_G$ would encompass all the technological, institutional and social skills for organizing military/political mobilization in groups. For example, suppose that the success of ethnic political mobilization rests on logistical and organizational tools that can incentivize individual-level participation to collective action, such as a close monitoring of co-ethnics action by an efficient leadership structure combined with a system of retaliation of defectors (forced enrollment, revolutionary tax, etc.). Then $\tilde{e}_i$ in equation (1) can be interpreted as the economic costs/benefits for a given individual to participate (or not) to pro-ethnic actions; it can vary across individuals as detection and monitoring are imperfect. Thus, the group-specific shifter $\theta_G$ can be interpreted as the overall mobilization capacity of the group. While in our discussion we emphasize the notion of ethnic identity, which we believe to be especially salient, the gist of our argument extends to a broader set of tools for fostering mobilization at the group level. Finally, with more than two ethnic groups, we can also interpret $\theta_G$ as the capacity of a leader to solve collective action problems within her coalition and federate disparate interests (leadership, etc...) (see section 4.6).

Assumption A2 reflects the fact that government features are typically more easily scrutinized than characteristics of opposition groups, especially in Autocracy were displaying support for the opposition is often severely repressed. This assumption embodies the core argument of the "Dictator Dilemma" (Wintrobe, 1990 and 1998). This argument starts from the observation that autocrats typically use the tool of repression to stay in power. They impose restrictions on the rights of citizens to criticize the government, on the freedom of the press or on the rights of opposition parties to campaign against the government. Paradoxically, this repression precludes the autocrat from knowing the true support he has among the general population, as well as among opposing groups with the power to depose him: "The more his repressive apparatus stifles dissent and criticism, the less he knows how much support he really has among the population" (Wintrobe, 1998). The autocrat thus has to form a belief ($\mu$ here) about the true strength of the opposition—its ethnic attachment and mobilization capacity—based on noisy signals of discontent (i.e. riots and social unrest, hunger strikes, diaspora actions, international media articles...).

Below, we solve for the Perfect Bayesian Equilibrium of this sequential game. Proceeding by backward induction we first study how ethnic identity impacts war and political mobilization –allowing us to

11

establish the payoffs of each group in case of war and elections. We then analyze how the autocrat trades-off the expected payoff in each situation to decide on offering free and fair elections or not.

## 3.2 Ethnic Identity, War and Political Mobilization

Intensity of mobilization impacts the probability of winning both war and elections and, consequently, the expected payoff of each group in these different situations. The particularity of elections with respect to war is that elections will reveal the intensity of ethnic identity of each group at a lower cost than war. However, they will entail a risk of losing office for the incumbent.

### 3.2.1 War Mobilization

If groups fight, we assume that the group with the largest operational performance ($\texttt{OP}$) wins the war. $\texttt{OP}$ depends on the number of fighters in a group $G$, denoted by $\texttt{army}_G$, weighted by an efficiency shock ($\tilde{\kappa}_G$):

$$\texttt{OP}_G \equiv \texttt{army}_G \times \tilde{\kappa}_G.$$

and group A wins the war if $\texttt{OP}_A > \texttt{OP}_B$. Assuming that $\tilde{\kappa}$ is exponentially distributed, the winning probability takes the following "contest success function" form:

$$\mathbb{P}[\text{G wins}] = \mathbb{P}[\texttt{OP}_G \geq \texttt{OP}_{-G}] = \frac{\texttt{army}_G}{\texttt{army}_G + \texttt{army}_{-G}} \tag{3}$$

The victorious leader sets the end-game tax and fully appropriates the economic surplus. Consequently, the losing group obtains zero. The expected payoff of group $G$ when starting a war is thus

$$\mathbb{E}[W_G|\text{war}] = \frac{\texttt{army}_G}{\texttt{army}_G + \texttt{army}_{-G}} \times \left[2 - \phi \times \left(\texttt{army}_G + \texttt{army}_{-G}\right)\right] \tag{4}$$

In presence of forced conscription, a leader will chose the army size maximizing this expected payoff, taking into account the best response of the other leader. The Nash equilibrium of this subgame is $\texttt{army}_G^* = \texttt{army}_{-G}^* = \min(\frac{1}{2\phi}, 1)$. However, it is clear that in the context of a civil war, forced mobilization is hard to enforce. Consequently fighting groups have to rely on ethnic attachment and monetary incentives to foster voluntary mobilization. In the baseline framework, we model monetary reward as a simple lump-sum transfers $w_G$ to *all* group members when $G$ is victorious, where $w_G$ is equal to the individual share of the spoils taken on the losing side: $w_G \times 1 = 1 - \phi \times \texttt{army}_{-G}$.[14]

---

[14]In section 4, we consider a richer structure of monetary incentives to fighters as an extension. This extension highlights that when leaders are unable to mobilize sufficiently only with monetary incentives, they optimally use non-pecuniary elements to increase mobilization. The key intuition is that groups, in case of victory, appropriate a resource of the same

When deciding on whether to fight, agent $i$ hence trades-off her ethnic identity and her monetary cost of winning with her opportunity cost of fighting,

$$u_{i \in G} = \begin{cases} \mathbb{P}[\text{G wins}] \times (1 + w_G) & \text{(non fighter)} \\ \mathbb{P}[\text{G wins}] \times (1 - \phi + w_G) + \tilde{e}_i & \text{(fighter)} \end{cases}$$

implying that an agent $i$ in group $G$ fights if $\tilde{e}_i \geq \phi\mathbb{P}[\text{G wins}]$. This equation makes clear that there is free-riding in fighting decisions: A larger mobilization of co-ethnics (higher $\mathbb{P}[\text{G wins}]$) makes $i$ less likely to fight. Uniqueness of the mobilization subgame follows from this strategic substitutability. More precisely, the number of fighters in each group is equal to

$$\texttt{army}_G = 1 + \theta_G - \phi \times \mathbb{P}[\text{G wins}]$$

Combined with equation (3) this leads to the following characterization of the equilibrium of the mobilization subgame,

$$\frac{\mathbb{P}[\text{G wins}]}{1 - \mathbb{P}[\text{G wins}]} = \frac{1 + \theta_G - \phi\mathbb{P}[\text{G wins}]}{1 - \phi + \theta_{-G} + \phi\mathbb{P}[\text{G wins}]}$$

implying

$$\mathbb{P}[\text{G wins}] = \frac{1 + \theta_G}{2 + \theta_G + \theta_{-G}}$$

Assuming $\mathcal{E} < \frac{\phi}{2}$, $\texttt{army}_G$ is lower than $\texttt{army}_G^*$, the unconstrained equilibrium of forced conscription (proof in the appendix, section A.1). The mobilization games translates into the following expected equilibrium war payoff $\mathcal{W}^{G,-G}$ for group $G$:

$$\mathcal{W}^{G,-G} \equiv \mathbb{E}[W_G | \text{war}, \theta_G, \theta_{-G}] = \frac{1 + \theta_G}{2 + \theta_G + \theta_{-G}} \times [2 - \phi \times (2 + \theta_G + \theta_{-G} - \phi)]$$

Assuming that the opportunity cost of fighting $\phi$ is not too high, we show in the appendix (section A.1) that the following ordering of welfare holds

$$\mathcal{W}^{-+} < \mathcal{W}^{++} < \mathcal{W}^{--} < \mathcal{W}^{+-}$$

size (the total production of the society minus the cost of war). Hence, the stake is the same for both groups and leaders cannot credibly commit to differentially reward their fighters. This is a strong theoretical argument motivating the use of ethnic identity by leaders during civil wars: ethnic identity is a natural way to overcome the limit of monetary incentives and mobilize efficiently.

implying that, given $G$'s type, the leader always prefers to fight a divided ("-") group than a cohesive group ("+"). Similarly, Given $-G$'s type, the leader always prefers to be the leader of a cohesive group ("+") than a divided one ("-").[15] This ordering plays a central role in our analysis. Indeed, our main theoretical predictions can be derived under the assumption that Peace Pareto-dominates war and that this ordering of war payoffs holds: Remarkably no extra parameter restriction is required. In particular, the precise values of the $\mathcal{W}$s do not matter; only ordinality does. We interpret this feature of our modeling setup as a strength and a mark of theoretical robustness.

### 3.2.2 Political Mobilization

We start our analysis by assuming that if groups were to vote, they would elect a leader following a Majoritarian rule (as detailed below). Alternative voting rules are considered later in the analysis. Organizing elections entails a (small) implementation cost $C_{\text{E}}$, ex-post financed by a part of the discriminatory tax. This cost includes (i) a state verification technology that prevents any manipulation of the election and (ii) constitutional safeguards that insure compliance to the election result; e.g. independence of the supreme court of justice/army/police forces or monitoring by external observers. We thus focus on "free and fair" elections insuring a credible transition of power if the opposition leader is elected (we discuss below in section 4.1 the importance of this commitment aspect of free and fair elections).

We consider a Probabilistic Voting Model (see Lindbeck and Weibull, 1987 and Persson and Tabellini, 2005) where voters' preferences over candidates correlate with their ethnic attachment $\tilde{e}_i$. More specifically, agent $i \in A$ votes for leader A (leader B otherwise) iff

$$v \times \tilde{e}_i + w_A(\text{ruler A}) \geq w_A(\text{ruler B}) + \tilde{p} \tag{5}$$

where $v$ is a scaling parameter and $\tilde{p}$ is leader B relative popularity shock, assumed to be uniformly distributed over $[-\frac{1}{4\rho}, \frac{1}{4\rho}]$. We allow each candidate $G \in \{A, B\}$ to make credible promises of post-elections taxes in case she is elected (denoted by $\text{tax}_G$) to attract voters. The post-election real wages of $i \in A$ depend on the (credible) state-contingent policies announced by candidates: $w_A(\text{ruler A}) = 1 + \text{tax}_A - C_{\text{E}}$ and $w_A(\text{ruler B}) = 1 - \text{tax}_B$. A lower promise $\text{tax}_B$ enables candidate $B$ to attract more votes from group A; but the flip side is that she loses votes from her co-ethnics. Aggregating over voters yields the following voting share

$$\tilde{s}_A = \frac{1}{2} - \tilde{p} + v \times \frac{\theta_A - \theta_B}{2} + [(1 + \text{tax}_A - C_{\text{E}}) - (1 - \text{tax}_B)] + [(1 - \text{tax}_A) - (1 + \text{tax}_B - C_{\text{E}})]] \tag{6}$$

---

[15]Note that this last argument is not true for high $\phi$ (see section A.1): with very high opportunity cost of fighting, the winner appropriates very few resources. In this set up, a leader always prefers to fight a "-" than a "+" but, given the other type, the leader prefers to be a "-" than a "+". The intuition is that, by mobilizing less, more resource remains after the conflict and this dominates the lower probability of winning.

Figure 2: Distribution of vote shares for A
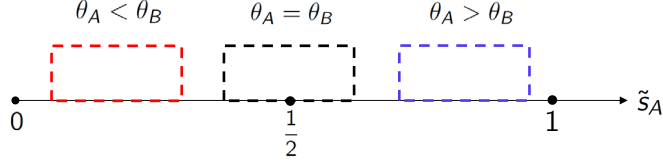


While the obtained vote share of candidate $A$ depends on her popularity $(\frac{1}{2} - \tilde{p})$ and the relative attractiveness of its platform (terms in brackets)—like in standard probabilistic voting frameworks — what is special in our case is that the strength of ethnic identity directly affects electoral success, i.e. $\tilde{s}_A$ depends on both $\theta_A$ and $\theta_B$.

An important observation is that political competition does not lead to more accommodating policies toward the other group and ethnic favoritism is not tempered through this channel. Indeed, each candidate maximizes post-election welfare of her group. Hence, she announces an accommodating policy (i.e. $1 - \texttt{tax}_G$ strictly larger than $\mathcal{W}^{-G,G}$) only if this strictly increases their odds to be elected. But this is never the case because inter-group transfers cancel out and payoffs are linear: we can see directly in equation (6) that decreasing $\texttt{tax}_A$ has no effect on $\tilde{s}_A$, i.e. the number of voters that one leader attracts from the other group by promising a lower tax is equal to the number of voters she loses on her own group. Consequently, accommodating policies do not increase the vote shares of the leader, but decrease directly the welfare of her own group (to the benefit of the opposition). At equilibrium, we thus obtain $1 - \texttt{tax}_G = \mathcal{W}^{-G,G}$. Hence, political competition hinges only on ethnic attachment,

$$\tilde{s}_A = \frac{1}{2} - \tilde{p} + v \times \frac{\theta_A - \theta_B}{2}$$

The figure below displays the distribution of vote shares for various levels of $(\theta_A, \theta_B)$. Assuming that the asymmetry between types is important enough $(\mathcal{E} > \frac{1}{v2\rho})$ the supports of vote shares do not overlap across states of nature (see appendix A.2). This implies that election outcomes fully reveal $\theta_A$ and $\theta_B$, and that the result of voting is non-ambiguous (a strong $A$ always wins against a weak $B$ when $\mathcal{E} > \frac{1}{v4\rho}$). We will relax these restrictions in section 4 by allowing the supports of vote shares to overlap.

The vote shares are given by

$$\tilde{s}_A = \begin{cases} 1 - v\mathcal{E} - \tilde{p} < \frac{1}{2}, & \text{if } \theta_A < \theta_B \\ 1/2 - \tilde{p} = \frac{1}{2}, & \text{if } \theta_A = \theta_B \\ 1 + v\mathcal{E} - \tilde{p} > \frac{1}{2}, & \text{if } \theta_A > \theta_B \end{cases} \qquad (7)$$

and the probability of winning becomes

$$\mathbb{P}[\text{A wins elections}] = \begin{cases} 0, & \text{if } \theta_A < \theta_B \\ 1/2, & \text{if } \theta_A = \theta_B \\ 1, & \text{if } \theta_A > \theta_B \end{cases} \tag{8}$$

## 3.3 The Autocrat Trade-Off: Ballots or Bullets.

The mobilization models we detailed above generate expected payoffs for the Autocrat (and the opposition) in the case of war and in the case of elections. While there always exists a transfer that prevents war to happen (war is inefficient due to the opportunity cost $\phi$), the Autocrat may fail to implement such peace-maintaining transfers due to imperfect information.

The fundamental choice faced by the Autocrat is thus that by organizing free-elections she will benefit from more information (and can exert more ethnic favoritism) but she takes the risk of losing office. We analyse this choice by trading-off the expected payoff of the Autocrat under autocracy, where the risk of war is looming, and under Democracy, where the risk of losing office is present.

### 3.3.1 Equilibrium transfers in Autocracy

The trade-off for Autocrat A in power with belief $\mu$ on her opponent's type $\theta_B$ is on the size of the tax to propose to the opposition: exerting more ethnic favoritism through a higher tax increases his gain but also raises the risk of war. When the discriminatory tax is accepted by the opposition, peace is maintained, and $1-\texttt{tax}$ is the after-tax income of group $B$; while group A gets $1+\texttt{tax}$. As a consequence, the Ruling Group Rent is equal to $\texttt{RGR} \equiv \frac{1+\texttt{tax}}{2}$. If the $\texttt{tax}$ is rejected by the opposition, war starts and the winner fully appropriates the remaining resource: in this situation the $\texttt{RGR}$ is equal to 1 and the losing group obtains zero.

**Result 1** (Autocratic Subgame Equilibrium). *There exists an interior critical belief $0 < \hat{\mu} < 1$ such that (i) for $\mu \leq \hat{\mu}$ the Autocrat sets the highest possible tax where $B^-$ is indifferent between War/Peace and $B^+$ prefers to fight; (ii) for $\mu > \hat{\mu}$, the Autocrat sets the highest possible tax avoiding war with both types; $B^+$ is indifferent between War/Peace and $B^-$ strictly prefers Peace to War (informational rent); (iii) the Ruling Group Rent $\texttt{RGR}$ weakly decreases with $\mu$.*

*Proof.* As mentioned above, we assume the simplest possible bargaining structure, i.e. a take it or leave it offer.[16] Considering the case of a strong autocrat, the opposition will thus accept peacefully the tax if

---

[16]With one-period protocol, as ours, the informational asymmetry exerts its highest influence on bargaining and more complex protocols are ignored for the sake of simplicity. This said, the Myerson-Satterthwaite central result shows that bargaining fails with a non-zero probability as soon as there is informational asymmetry (See Martin et al, 2008, for a model of conflict with asymmetric information and endogenous choice of protocol).

Figure 3: Autocratic Subgame Equilibrium
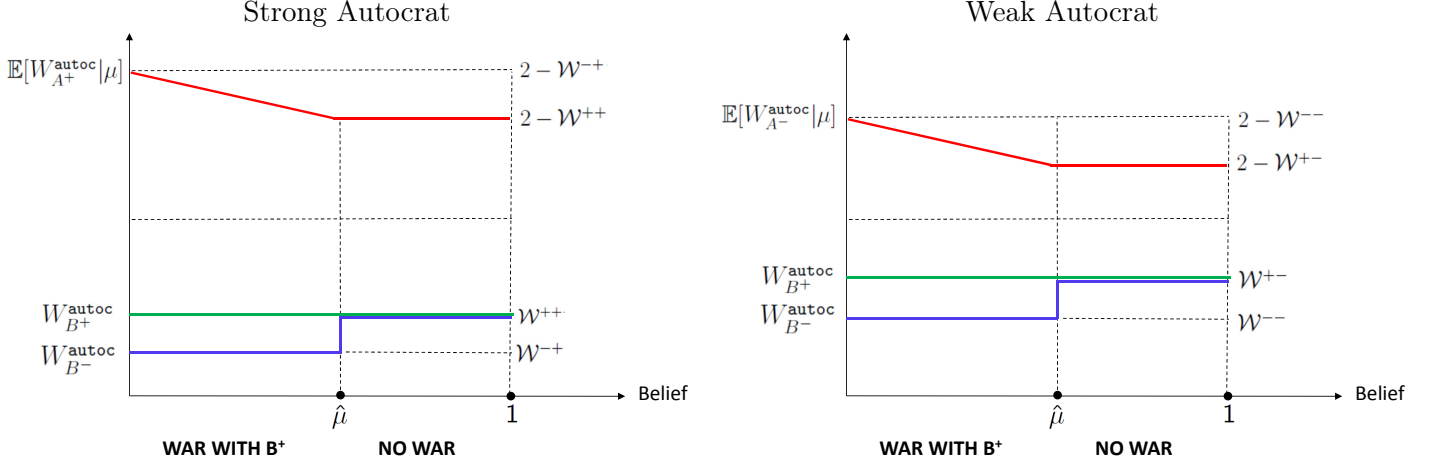
$\mathcal{W}^{B,+} \leq 1 - \texttt{tax}$, i.e. if the after-tax income is no lower than her expected war payoff. Note first that the high type is more costly to buy off: the tax maintains peace of type $B^+$ iff $\mathcal{W}^{++} \leq 1 - \texttt{tax}$ while it maintains peace of type $B^-$ iff $\mathcal{W}^{-+} \leq 1 - \texttt{tax}$. We consider 3 pacification strategies: $1 - \texttt{tax} \in (0; \mathcal{W}^{-+}; \mathcal{W}^{++})$. It is immediate to see that given the Pareto inefficient nature of war, $\phi > 0$, the government always wants to buy off a $B^-$. Hence, "Never pacify" $(1 - \texttt{tax} = 0)$ is dominated by either "Always pacify" $(1 - \texttt{tax} = \mathcal{W}^{++})$ and "Uncertain pacification" $(1 - \texttt{tax} = \mathcal{W}^{-+})$. When implementing "Always pacify", $B^+$ is indifferent between War/Peace, and there is an informational rent for $B^-$, while under "Uncertain pacification" a $B^+$ will wage war while a $B^-$ will peacefully accept the low transfer. There exists a critical belief $\hat{\mu} \equiv \frac{\mathcal{W}^{++} - \mathcal{W}^{-+}}{(2 - \mathcal{W}^{+-} - \mathcal{W}^{++}) + (\mathcal{W}^{++} - \mathcal{W}^{-+})}$ below which the Autocrat is better-off risking war, i.e. when $2 - \mathcal{W}^{++} \leq [\mu \times \mathcal{W}^{++} + (1 - \mu) \times (2 - \mathcal{W}^{-+})]$. In this case, $B^+$ prefers to fight, while $B^-$ is indifferent between War/Peace. Conversely, when $\mu > \hat{\mu}$, the autocrat optimally sets the highest possible tax avoiding war with a $B^+$. Consequently, when $\mu \leq \hat{\mu}$ the RGR is either equal to 1 (in case of war against a $B^+$) or $\frac{2 - \mathcal{W}^{-+}}{2}$; while for $\mu > \hat{\mu}$ the RGR decreases to $\frac{2 - \mathcal{W}^{++}}{2}$.

In Figure 3 are represented graphically the levels of payoffs obtained by $A$ and $B$ for various levels of $\mu$. We can see that $\mathbb{E}[W_{A^+}^{\texttt{autoc}} | \mu]$ is weakly decreasing in $\mu$. $\qquad \square$

To take stock, peace Pareto-dominates war because of the destruction cost $\phi > 0$, which implies that there always exists a tax that prevents war from happening. However, the autocrat may fail to implement such a peace-maintaining tax due to imperfect information. Figure 3 highlights analogous pattern for $A^+$ and $A^-$, with payoffs being shifted by $\mathcal{E}$ for a given $\mu$. Notice that the zone of parameter values where war can occur is given by $\mu \leq \hat{\mu}$: for this range of beliefs the leader exerts substantial ethnic favoritism, which triggers a fight against a strong opposition rejecting this discriminatory tax. This zone decreases

with the economic war loss and increases with the informational rent. Intuitively $\mathcal{E}$, representing the intensity of ethnic identity, generates the informational rent of group $B$. It is noteworthy, that in the case of perfect information ($\mu = 0$ and $\mu = 1$) the ability to make a take it or leave it offer allows $A$ to exert the highest possible ethnic favoritism (highest RGR), while $\mathcal{W}^{++} - \mathcal{W}^{-+}$ is the informational rent of $B^-$ when $\mu \geq \hat{\mu}$.[17]

### 3.3.2 Institutional Change: Majoritarian Democracy

The crucial aspect of elections in our set up is that observing vote shares allows the leader to deduce $(\theta_A, \theta_B)$. This implies that a peace-maintaining tax can always be implemented by the ruler *after* free and fair elections.

Given the "take-it-or-leave-it" bargaining structure, the leader can optimally chose the RGR without risking a conflict. In this case, the opponent is indifferent between war/peace, the ruler captures all the rest of the surplus (minus the small election costs), and the ruler's payoff is higher than in the conflict case (the leader can exert the highest possible level of ethnic favoritism avoiding war). Thus, while the "bright" side of majoritarian democracy is the peace dividend of information, there is a "dark" side too. In De Tocqueville's (1835) words, there is the risk of *Tyranny of majority*, as the democratic ruler's payoff equal the autocrat's payoff under perfect information: the economic war loss net of the (small) election cost.

$$W_A^{\texttt{majo}}(\text{A is ruler}) - W_A^{\texttt{majo}}(\text{B is ruler}) = 2 - C_{\texttt{E}} - \mathcal{W}^{B,A} - \mathcal{W}^{A,B}$$

Hence, by solving asymmetric information problems, a democratic leader manages to extract more from the opponent than an autocrat typically could. A strong leader will on average extract more on a weak opposition in democracy (where $1 - \texttt{tax} = \mathcal{W}^{-+}$) than in autocracy (where $1 - \texttt{tax} = \mathcal{W}^{++}$ for high $\mu$ and $1 - \texttt{tax} = \mathcal{W}^{-+}$ for low $\mu$). We will detail below this key mechanism driving the result that democratization may imply more extraction from the group in power.

A note on the enforceability of electoral verdicts: An autocrat winning the election accepts democratic transition, while an autocrat losing the election would typically have incentives to refuse to step down. However, we assume that part of the implementation cost $C_{\texttt{E}}$ includes constitutional safeguards that ensure compliance to the election result; e.g. independence of the supreme court of justice/army/police forces; monitoring by external observers and the threat of international sanctions in case of non-compliance. In particular, economic sanctions usually combine restrictions on international trade and investment and we assume that they are sufficient to induce compliance to the election results (i.e. sanctions $S$ are s.t. $2 - \mathcal{W}^{++} - S < \mathcal{W}^{++}$).[18]

---

[17]Notice that in the symmetric case where $A$'s type is private information while B's is common knowledge it would be a dominant strategy for a strong A to reveal herself in order for B to accept a higher tax without starting a war.

[18]Since 1914, there has been a total of 187 international sanctions episodes, about 66 of which started after the collapse of

We can now study when it is in the Autocrat $A$'s best interest to propose democracy, and under what conditions the opponent $B$ accepts to participate. Starting with the latter question, we can easily see that it is a dominant strategy for $B^+$ to always accept elections when offered. This follows from the fact that

$$\mathbb{E}[W_{B^+}^{\texttt{majo}}|A^+] = 1 > \mathbb{E}[W_{B^+}^{\texttt{autoc}}|A^+] = \mathcal{W}^{++} \tag{9}$$

and,

$$\mathbb{E}[W_{B^+}^{\texttt{majo}}|A^-] = 2 - \mathcal{W}^{+-} > \mathbb{E}[W_{B^+}^{\texttt{autoc}}|A^-] = \mathcal{W}^{+-}. \tag{10}$$

Hence, only $B^-$ could potentially be better-off under autocracy (as for $B^-$ informational rents under autocracy are larger than democratic office rents). However, refusing to participate would signal being of a weak type (given that a $B^+$ will always play her dominant strategy, and this is known to $A$). Thus, $B^-$ will also opt in and participate to elections.[19]

Knowing that the offer of elections will always be accepted, the autocrat faces the following trade-off: Elections reveal information and avoid Pareto-inefficient war, but they involve a risk of losing power and office rents. Recalling section 3.2.2, the payoffs of $A$ become

$$\mathbb{E}[W_{A^+}^{\texttt{majo}}|\mu] = \mu \times \left[\frac{1}{2}(2 - \mathcal{W}^{++}) + \frac{1}{2}\mathcal{W}^{++}\right] + (1 - \mu) \times \left[2 - \mathcal{W}^{-+}\right] - C_{\texttt{E}}$$

$$\mathbb{E}[W_{A^-}^{\texttt{majo}}|\mu] = \mu \times \mathcal{W}^{-+} + (1 - \mu) \times \left[\frac{1}{2}(2 - \mathcal{W}^{--}) + \frac{1}{2}\mathcal{W}^{--}\right] - C_{\texttt{E}}$$

The comparison of these payoffs with the payoffs of autocracy listed further above yields the characterisation that is graphically displayed in Figure 4 .

**Result 2.** *[Majoritarian Democracy] There exists an intermediate range of beliefs $\mu \in [\underline{\mu}, \overline{\mu}]$ where a strong autocrat proposes majoritarian elections and the opposition accepts to participate. Otherwise both types of autocrats never propose majoritarian elections. For $\mu \in [\underline{\mu}, \overline{\mu}]$, the* RGR *under majoritarian elections is weakly higher than under peaceful autocracy.*

A weak autocrat never proposes majoritarian elections, as the risk (and associated utility cost) of losing office is too high. In contrast, a strong autocrat proposes majoritarian elections when $\mu \in [\underline{\mu}, \overline{\mu}]$.

---

the Soviet empire (Hufbauer et al., 2007). Empirical evidence tends to show that international sanctions against autocrats significantly increase after controversial elections (von Soest and Wahman, 2015) and significantly affect the probability that the autocrat exits power (Folch and Wright, 2010). We discuss in section 4 the recent trend of democratic backsliding where leaders dismantle constitutional safeguards in mature democracies.

[19]It is noteworthy that $B^-$ is actually indifferent between accepting elections or not, her payoff is equivalent in democracy and autocracy with perfect information. Given this payoff-equivalence we focus, without loss of generality, on the PBE in which $B^-$ accepts the elections.

Figure 4: Majoritarian Democracy



Strong Autocrat — Weak Autocrat
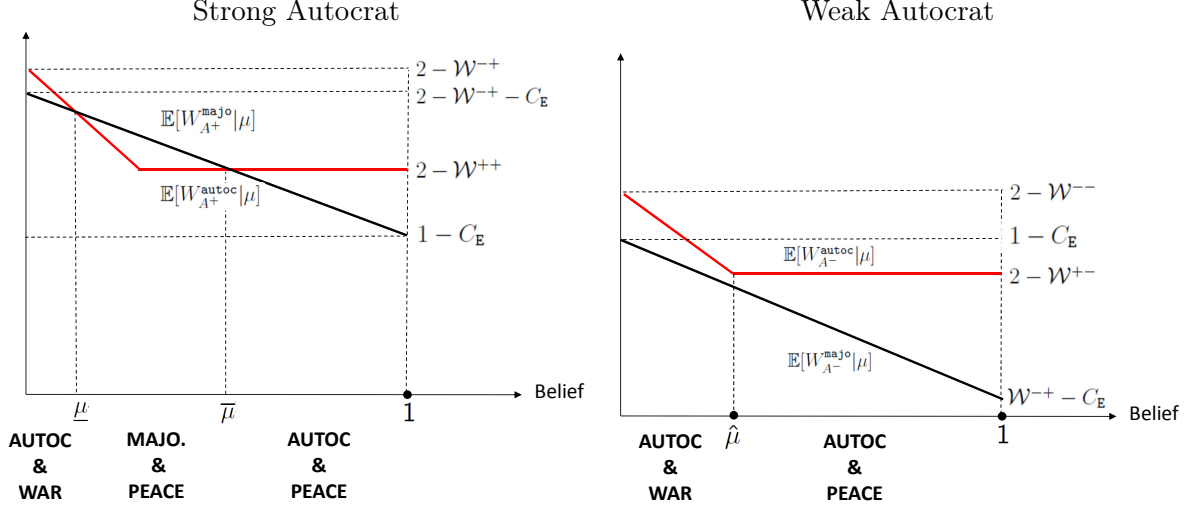
Intuitively notice that around $\hat{\mu}$, $A^+$ always prefers majoritarian elections if facing a $B^+$ (same probability of winning without the cost of war) and is indifferent if facing $B^-$ (wins anyway and just gives the expected war payoff). Consequently, a strong autocrat always proposes majoritarian elections for a non-empty range of beliefs where war risk exists and/or the risk of losing office is low. However the war risk is not fully alleviated for very low $\mu$ because the autocrat's payoff dominates the majoritarian ruler's payoff due to the presence of an election cost: when the ruler is sufficiently convinced that the opposition is weak, there is no gain in organizing (costly) elections to reveal this information. This can lead to war if the opposition is strong. For $\mu < \hat{\mu}$, the RGR is equal to $\frac{2-\mathcal{W}^{-+}}{2}$ both in democracy and peaceful autocracy.[20] When $\hat{\mu} \leq \mu$, the RGR will increase from $\frac{2-\mathcal{W}^{++}}{2}$ in autocracy to $\frac{2-\mathcal{W}^{-+}}{2}$ in democracy when the opposition is weak and will be equal to $\frac{2-\mathcal{W}^{++}}{2}$ under both regimes when the opposition is strong.[21] Finally, notice that this decision to democratize also relies on a moderate destruction cost (proof in the appendix, section A.2). Recall from section 3.2.1 that if war is highly destructive (e.g. $\phi \approx 1$ and fighters produce nothing) a leader prefers to be a "-" than a "+". Consequently, to maintain Peace, the Autocrat $A^+$ must compensate more a $B^-$ than a $B^+$: there is no incentive to democratize because the informational rent has no value.

---

[20] As before, in the case of war the RGR will be equal to 1, because of full expropriation. However, this ratio hides a lower payoff for the ruler than under democracy due to the destruction cost of war.

[21] If the strong opposition wins the elections, the RGR does not change, we just observe a switch in the identity of the group in power.

## 3.4  Institutional Change: Proportional Democracy

The "winner takes all" aspect of majoritarian democracy makes it especially attractive for an autocrat leading a strong and cohesive group. We will now show that alternative (and less stark) democratic systems, such as Proportional Democracy, can be more attractive for weak autocrat.

In particular, we will assume that under proportional democracy, decision power is shared between $A$ & $B$ according to their respective voting shares (due to consensual decision making process or the presence of veto power), i.e.

$$\mathbb{E}[W_A^{\texttt{propo}}|\mu] = \mathbb{E}\left[\tilde{s}_A \times W_A^{\texttt{majo}}(\text{A is ruler}) + \tilde{s}_B \times W_A^{\texttt{majo}}(\text{B is ruler})\right] \tag{11}$$

Notice that this payoff is always superior to the war payoff for both groups in perfect information. Hence, B always accepts this proposal (both if it is strong or weak). Consequently, the autocrat faces, qualitatively, a similar trade-off as for the majoritarian Democracy: Elections reveal information and avoid Pareto-inefficient war, but they may involve lower $\texttt{RGR}$. However, in contrast with the majoritarian case, the Proportional system is preferred by the weak autocrat. The comparison of the payoffs is graphically displayed in Figure 5.

**Result 3.** *[Proportional Democracy] A strong autocrat never proposes proportional elections. A weak autocrat proposes proportional elections for intermediate beliefs $\mu \in [\underline{\mu}, \overline{\mu}]$. For a given belief $\mu$, the $\texttt{RGR}$ under proportional elections can be larger or smaller than under autocracy.*

*Proof.*

$$\mathbb{E}[W_{A-}^{\texttt{propo}}|\mu] \geq \mathbb{E}[W_{A-}^{\texttt{majo}}|\mu] \tag{12}$$

while a Strong Autocrat clearly prefers the majoritarian rule (or even autocracy) to Proportional rule:

$$\mathbb{E}[W_{A+}^{\texttt{propo}}|\mu] \leq \mathbb{E}[W_{A+}^{\texttt{majo}}|\mu] \tag{13}$$

These two inequalities are driven by the fact that a strong leader always wins when facing a weak opponent in a majoritarian system, while in a Proportional system a strong opponent has to concede a positive probability of deciding on transfers to a weak opponent (because $\tilde{s}_B > 0$).

This explains why extraction is overall milder under a proportional system than under a majoritarian system. Interestingly, this generates ambiguous effects on the extraction level of the group in power with respect to autocracy. Specifically, if the opposition is weak and $\mu$ is high, the $\texttt{RGR}$ of the (weak) group in power increases from $\frac{2-\mathcal{W}^{+-}}{2}$ to $\frac{1}{2}$ under proportional democracy and decreases from $\frac{2-\mathcal{W}^{--}}{2}$ to $\frac{1}{2}$ when $\mu$ is low. If the opposition is strong and $\mu$ is high, the $\texttt{RGR}$ will increase from $\frac{2-\mathcal{W}^{+-}}{2}$ to $\frac{\tilde{s}_B(2-\mathcal{W}^{-+})+(1-\tilde{s}_B)(\mathcal{W}^{+-})}{2}$, which is greater than $\frac{1}{2}$ because $\tilde{s}_B > \frac{1}{2}$.[22]

---

[22]When $\mu$ is low and the opposition is strong, war starts and the $\texttt{RGR}$ will be equal to 1 because of full expropriation.

Figure 5: Proportional Democracy

**Strong Autocrat**

$2 - \mathcal{W}^{-+}$

$\mathbb{E}[W_{A+}^{\mathrm{majo}}|\mu]$

$\mathbb{E}[W_{A+}^{\mathrm{autoc}}|\mu]$  $2 - \mathcal{W}^{++}$

$\mathbb{E}[W_{A+}^{\mathrm{propo}}|\mu]$  $1 - C_{\mathrm{E}}$

Belief

$\underline{\mu}$  $\overline{\mu}$  $1$

| AUTOC | MAJO. | AUTOC |
| & | & | & |
| WAR | PEACE | PEACE |

**Weak Autocrat**

$2 - \mathcal{W}^{--}$

$1 - C_{\mathrm{E}}$

$\mathbb{E}[W_{A-}^{\mathrm{autoc}}|\mu]$

$2 - \mathcal{W}^{+-}$

$\mathbb{E}[W_{A-}^{\mathrm{propo}}|\mu]$

$\mathbb{E}[W_{A-}^{\mathrm{majo}}|\mu]$

$\mathcal{W}^{-+} - C_{\mathrm{E}}$  Belief

$\underline{\mu}$  $\overline{\mu}$  $1$

| AUTOC | PROPOR. | AUTOC |
| & | & | & |
| WAR | PEACE | PEACE |

$\square$
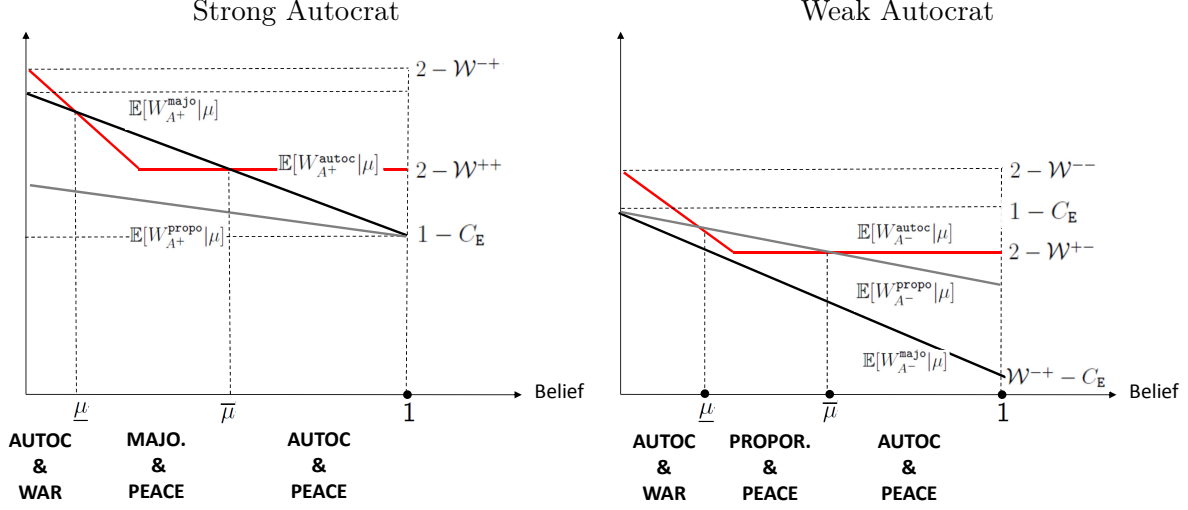
# 4  Theoretical extensions

In the current section, we will discuss the most important assumptions of the baseline model in some details and show under which conditions our results continue to hold when we relax them. In particular, we start by focusing on informational assumptions by discussing of alternative ways of collecting information than through elections, and by allowing for the leader of the opposition to rely on social unrest to discover the ethnic identity of her own group. In the next series of extensions, we discuss post-election conflicts by allowing for conflict on the transition path toward consolidated democracy. An important outcome is that while better information reduces the risk of conflict in young democracies, it has the downside in mature democracies to make the organization of free and fair elections less appealing. We thus study how type-reshuffling and democratic values can achieve lasting incentives for running democratic elections and avoid democratic backsliding. Finally, in the last set of extensions we discuss the implications of heterogeneous productivities and group sizes on ethnic favoritism, inequality and democratization, and conclude with a discussion on the use of optimal monetary incentives for military recruitment. Throughout these extensions we find that the qualitative predictions are remarkably robust to relaxing several key assumptions of the baseline model.

22

## 4.1 Alternatives to elections and boycotts

A natural question to ask is whether there are no other –simpler or less costly– ways for the ruler of learning about the opposition's type than running elections (which could result in the loss of power). If such less risky substitutes for elections were a valid option, the focus of our current contribution may be misguided. To address such concerns, we highlight below the importance of credible elections to incentivize the opposition to reveal her type. Specifically, we shall consider that the leader can offer alternatives to "free and fair elections", including e.g. referenda, plebiscites, window dressing elections, surveys... If the opposition accepts to participate, she reveals her type at a small mobilization cost.

A crucial feature of free and fair elections is that they embed—by design— a set of commitment devices ensuring a credible transition of power. By contrast, the alternatives, such as window dressing elections or a plebiscite, lack the credibility needed to ensure a transition: once the leader is endowed with the needed information, no safeguards will pressure her to make any concession or to step down. She will simply behave as an autocrat in perfect information and exert the highest feasible level of ethnic favoritism (setting $1 - \texttt{tax} = \mathcal{W}^{-+}$ or $1 - \texttt{tax} = \mathcal{W}^{++}$).

In this setup, a strong $B$ will refuse to participate to non-credible alternatives, because revealing herself will bring no benefits (the leader will tax her at her expected war payoff) and requires paying a mobilization cost. A weak $B$ will mimic a strong $B$ and will refuse to participate as well. We hence obtain a "boycott equilibrium" (pooling) in which $A$ is unable to solve the informational problem: the possibility of a credible transfer of power is necessary to obtain mobilization and informational revelation.

With "free and fair" elections, a strong $B$ is willing to mobilize and reveal her type because of the credible possibility to obtain power. In contrast, a weak $B$ does not mobilize for the election to avoid paying the mobilization cost (notice that not participating reveals her type given that a strong $B$ always participates). Consequently, a boycott of the opposition is not necessarily a sign of window dressing elections, but may characterize a weak opposition refusing to pay a mobilization cost.

## 4.2 Social unrest as an information device

Our baseline model assumes that leaders know perfectly the strength of ethnic identity of their group. However, a recent literature (see Barbera and Jackson, 2016, and the literature therein) discusses how people in a group often needs to learn this information from each other through costly participation in a collective action. This literature, motivated by the Arab Spring events, highlights that in spite of the improvements in social media and communication, demonstrations and protests remain strong methods of credibly signalling the intensity of preferences and ethnic identity (as participating to rioting and demonstration entails a costly risk and is consequently not "cheap talk").

We introduce this feature in our model by assuming that the leader of the opposing group can learn the type of her own group by observing participation in rioting events. In particular, we now consider that,

Figure 6: If B triggers a riot, A learns
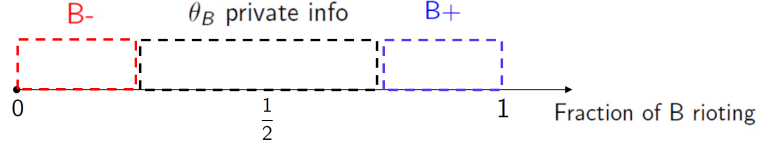


at the beginning of the game, neither A nor B know $\theta_B$ (they both hold the same belief $\mu \equiv \mathbb{P}(\theta_B = +\mathcal{E})$). Leader B—when fomenting social unrest—can learn the true intensity of her ethnic identity by observing the participation of her group to a collective action, at the cost of potentially revealing it to A.

Formally, we posit that if leader B calls for a riot, agent $i \in B$ participates iff $k \times e_i \geq c_B$, where $c_B$ denotes the level of social discontent, specific to group $B$, and $k$ is a scaling parameter translating ethnic attachment $e_i$ into rioting participation. We assume that, in normal times, $c_B$ is perfectly observed by all. However, in times of social or economic turmoils, $c_B$ becomes volatile and is privately observed by B *after* his decision of triggering social unrest (i.e. A and B have the same information set when B decides to trigger the riot). By "times of economic turmoil" we mean periods characterized by important economic shocks and high volatility, making it difficult to observe with precision the state of the economy. For simplicity, we assume that $c_B$ is uniformly distributed over $[-\bar{c}, \bar{c}]$ and that the leader is $A^+$.

If a riot starts, the number of rioters in group B is thus $1 + \mathcal{E} - \frac{c_B}{k}$ for $B^+$ and $1 - \mathcal{E} - \frac{c_B}{k}$ for $B^-$. In normal times, when $c_B$ is known to all, A and B will perfectly learn the value of $\theta_B$ by observing the mass of protesters. Ex-ante, $A^+$ can thus buy off its opponent by transferring exactly her expected war payoff to $B$ and disincentivize riots: $1 - \texttt{tax} = \mathcal{W}^{\mathbb{E}(G),+} = \mu(\mathcal{W}^{++}) + (1 - \mu)(\mathcal{W}^{-+})$. This expected payoff is similar for $B$ to the one in which $A$ and $B$ discover B's type during the mass protest (see appendix A.3). Consequently, $\mathbb{E}[\mathcal{W}_B^{\texttt{Riot}=1}|A^+] = \mathbb{E}[\mathcal{W}_B^{\texttt{Riot}=0}|A^+] = \mathcal{W}^{\mathbb{E}(G),+}$ and $B$ accepts peacefully the $\texttt{tax}$ without rioting.

In times of turmoil—e.g. in the presence of economic or social turbulence—$c_B$ becomes volatile and is privately observed by $B$ after the riot. This creates an incentive for $B$ to foment unrest, creating an informational rent: if the mass of protesters is such that $1 + \mathcal{E} - \frac{\bar{c}}{k} < 1 + \mathcal{E} - \frac{c_B}{k} < 1 - \mathcal{E} + \frac{\bar{c}}{k}$, A won't be able to learn $B$'s type by observing the mass of protesters.[23] However, a strong $B$ facing a highly negative income shock and a weak $B$ facing a strongly positive income shock will reveal their type with certainty, as in Figure 6.

**Result 4.** *[Riots] B starts a riot in times of turmoil if $\mu \geq \underline{\mu}$. B is indifferent between starting a riot or not in normal times or when $\mu < \underline{\mu}$ (proof in the appendix, section A.3).*

---

[23]When the mass of protesters is between $1 + \mathcal{E} - \frac{\bar{c}}{k}$ and $1 - \mathcal{E} + \frac{\bar{c}}{k}$, A is unable to determine if this level corresponds to a strong group facing low social discontent or a weak group facing a high level of social discontent. Her belief $\mu$ on B's type remains unchanged because of our distributional assumption on $c_B$.

An important corollary is that ambiguity over $B$'s strength is necessary for the autocrat to concede elections: "too much" or "too little" unrest perfectly reveal $\theta_B$ to leader $A$. This ambiguity is created here by (i) high social discontent variance and (ii) a moderate intensity of social unrest. This non-linear relation between social unrest and democratization enriches the traditional "window of opportunity" narrative, according to which more intense riots are monotonically associated with a greater chance of democratization in times of economic turmoil (see for example Aidt and Franck, 2015). A second important corollary is that a strong $A$ may have powerful incentives to deter riots in times of economic turmoil to preclude the opposition to (potentially) obtain information (proof in the appendix, section A.3). In the Appendix F we carry out an empirical investigation of our predictions, finding indeed that democratization is most likely for *intermediate* levels of social unrest, as predicted by our theory.

## 4.3   Path-dependent democratization

Another salient feature of our setting is that, in the baseline model, democratization yields immediate pacification. This implication may be too stark, as a strand of the literature has stressed the dangers of inter-ethnic violence in the aftermath of democratization (see, e.g., Snyder 2000, Mann, 2005, Mansfield and Snyder 2005). For the purpose of assessing whether this implication of our theory is critical or not, we below develop a dynamic extension of our analysis, allowing for post-democratization violence. The objective is to model the transition phase of democracy, a period during which young democracies are prone to conflicts despite free and fair elections. This is generated in our setup by the presence of imperfectly revealing elections, affecting the ability of the leader to discover the type of her opposition and potentially leading to conflicts in the short/medium run. We will conclude that if the dissipation of informational asymmetries helps to escape the potentially conflicted transition period of young democracies, in mature democracy better information gives incentives to the elected leader to dismantle the election process. We will thus discuss this phenomenon of democratic backsliding and highlight two lines of explanations explaining why leaders may maintain credible elections: the potential type-switches of the opposition and the development of "democratic values".

### 4.3.1   Setup and informational assumptions

We extend the analysis to a dynamic economy populated by non-altruistic generations of one-period lived agents. Our main purpose here is to understand the "transition" phase of democracies, a period prone to conflict despite the presence of free and fair elections. We relax two assumptions from the baseline model: (i) elections reveal imperfectly the type of the opposition (overlapping vote shares) and (ii) there exists a Markov switching "window of opportunity of war". The first assumption illustrates cases where, for example, election results are driven by the presence of a very charismatic (or un-charismatic) leader which blurs the intensity of the ethnic mobilization of the opposition; whereas the second assumption is associated, for example, to the "opportunity cost" argument according to which a rebel group can more

Figure 7: Distribution of voting shares
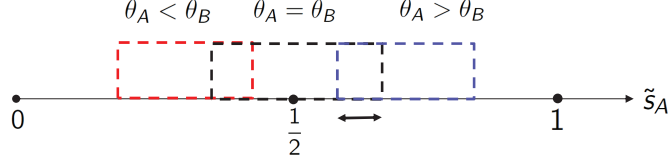


easily start a conflict in difficult economic times (Miguel et al, 2004) or when the international community is not watching (Durante and Zhuravskaya, 2018).

The first assumption implies that young democracies may end up in a situation where elections did not reveal any information (with hence a risk of war) while the second assumption generates a critical period for war to happen, thus rendering the learning meaningful: a high tax which did not trigger a war in the previous period does not necessarily imply that the opposition is weak; a strong opposition may have lacked a window of opportunity. These two assumptions imply that young democracies are in the current extended setting at a risk of war after elections: with some probability elections did not reveal all the information about the opposition. Hence, the newly elected leader may impose a discriminatory tax triggering a war with a strong opposition. Young democracies can escape this transition phase when the information about the type of the opposition is perfectly revealed. We start by describing the implication of both assumptions on the stage game before moving to the dynamic interpretations.

**Non-revealing elections and post-election conflict.** We first relax the assumption that elections perfectly reveal $\theta_B$, which opens the possibility of non-revealing elections and post-election conflicts. Remember that the baseline assumption insuring perfectly revealing elections in section 3.2.2 was that $\mathcal{E} > \frac{1}{v2\rho}$, thus implying that vote shares of $A^+$ facing a $B^-$ under the most beneficial popularity shock is lower than when facing a $B^+$ under the most adverse shock (see figure 2). We relax this assumption by allowing the vote shares of $A^+$ facing a $B^-$ under the most beneficial popularity shock to be higher than when facing a $B^+$ under the most adverse shock: $\mathcal{E} < \frac{1}{v2\rho}$.[24] Denote by $d$ the probability that vote shares end up being ambiguous, conditional on type.[25] On figure 7 below, the probability $d$ coincides with the overlap of vote shares:

Consider first the situation in which a strong autocrat, without information, would set a high tax on

---

[24]In order to keep the analysis simple we maintain the non-ambiguous voting assumption (a strong $A$ always wins when facing a weak $B$). This requires $\frac{1}{v4\rho} < \mathcal{E} < \frac{1}{v2\rho}$.

[25]Note that due to our distributional assumption, the probability of overlap of vote shares $d$ is similar when facing a $B^+$ or a $B^-$. Consequently, $\mu$ remains the same after observing vote shares.

the opposition ($\mu < \hat{\mu}$). In this situation, non-revealing elections may lead to post-election conflicts if the opposition happens to be strong. Under this possibility of "Fragile Democracy", the expected payoff of $A^+$ when offering majoritarian elections is

$$\mathbb{E}[W_{A^+}^{\texttt{majo}}|\mu] = \mu(1 - d(1 - \mathcal{W}^{++})) + (1 - \mu)(2 - \mathcal{W}^{-+}) - \mathtt{c}_E$$

and the autocrat chooses to offer elections if $d < \frac{1 - \mathcal{W}^{++} - \frac{\mathtt{c}_E}{\mu}}{1 - \mathcal{W}^{++}}$.

Consider now that, without information, the autocrat would fix a low tax on the opposition ($\mu > \hat{\mu}$). Here, the expected payoff of $A^+$ when offering majoritarian elections is

$$\mathbb{E}[W_{A^+}^{\texttt{majo}}|\mu] = \mu + (1 - \mu)[d(2 - \mathcal{W}^{++}) + (1 - d)(2 - \mathcal{W}^{-+})] - \mathtt{c}_E$$

and the autocrat chooses to offer elections for this range of beliefs if $d < \frac{(\mathcal{W}^{++} - \mathcal{W}^{-+}) - \mu(1 - \mathcal{W}^{-+}) - \mathtt{c}_E}{(\mathcal{W}^{++} - \mathcal{W}^{-+}) - \mu(\mathcal{W}^{++} - \mathcal{W}^{-+})}$.

Hence, non-revealing elections may lead to post-election conflicts when the incumbent stays in office and, despite this risk, a strong autocrat decides to organize elections if the probability of revelation is high enough.

**Window of opportunity.** We model the (absence of) a "window of opportunity" as a probability $(1 - q)$ to observe a prohibitive cost $m$ in all fighters utility: $\mathbb{P}[\text{G wins}] \times (1 - \phi + w_G) + \tilde{e}_i + m$. We assume that this cost is so high that no agent is better-off fighting when it realizes. Consequently, a leader can only successfully wage war when this cost is equal to 0 (which happens with probability $q$). We further assume that a conflict is the only way for a democracy to revert to autocracy: constitutional safeguards of elections are perennial once instituted.

The presence of this "window of opportunity" impacts the optimal pacification strategy and the belief thresholds at which the autocrat switches decisions. In particular, $1 - \mathtt{tax} = 0$ dominates $1 - \mathtt{tax} = \mathcal{W}^{-+}$ and $1 - \mathtt{tax} = \mathcal{W}^{++}$ for low $q$ while $\hat{\mu}$—the belief threshold at which ensuring pacification becomes worthwhile—decreases with $q$ (details in the appendix, section A.4). Similarly, offering elections is dominated by staying in autocracy and offering $t = 0$ for low $q$. For high $q$, offering elections brings a higher payoff than autocracy around $\hat{\mu}$. However, the probability of ending in non-revealing elections is also playing against democratization (as made clear above). Consequently, both a high $q$ and a low enough $d$ (the probability of obtaining non-revealing elections) are necessary to observe voluntary democratization from the autocrat (details in the appendix, section A.4).

**Timing.** The timing of events within a period can be summarized as follows:

1. The society enters the period either in the state $\omega_A$ or $\omega_D$ (autocracy and democracy, respectively).

2. The leader updates her belief $\mu$ on the opposition.

3. The leader decides to offer elections or not in autocracy. Elections are automatic in democracy (constitutional safeguards are perennial).

4. The leader (elected or not) decides on $t$.

5. The opposition decides to wage war or not. If the opposition decides to fight, the conflict happens with a probability $q$. The type of the loser is reshuffled.

6. Payoffs are realized.

### 4.3.2 Analysis

**Conflictual Autocracies** When (i) the society enters the period in state $\omega_A$, (ii) $\mu_0, d, q$ are such that $\mu_0 \leq \underline{\mu}$ and (iii) $q$ is high, the autocrat optimally sets a high tax ($t = \mathcal{W}^{-+}$). If no conflict occurs, she updates downward at the beginning of the next period: a $B^+$ may have missed her window of opportunity.[26] Consequently, she will set a high tax in this period as well because $\mu_t < \mu_0 \leq \underline{\mu}$ (and all subsequent periods, as long as no conflict occurs).

When the opposition is strong, the opposing leader will try to trigger a conflict at each period. Hence, a conflict will eventually occur when the window of opportunity realizes (the probability of observing at least one conflict over $t$ periods is then $1 - (1-q)^t$).

When facing a weak opposition, the opposing leader will never oppose the high taxation. The autocracy is thus stable ($\mu$ will consistently decrease toward 0 over time) and highly extractive. Notice that if $q$ is low (the window of opportunity is unlikely), the autocrat sets $t = 0$ and the society will eventually end up in a conflict, even when the opposition is weak.

**Stable Autocracies** When (i) the society enters the period in state $\omega_A$, (ii) $\mu_0, d, q$ are such that $\mu_0 \geq \overline{\mu}$ and (iii) $q$ is high, the autocrat sets a low tax and never offers elections (the risk of losing office is too high with respect to the informational gain of elections). The autocracy is stable—$\mu$ does not change and elections are never offered—and has a low level of extraction (i.e. Singapore).

**Transition and fragile democracies.** When (i) the society enters the period in state $\omega_A$, (ii) $\mu_0, d, q$ are such that $\underline{\mu} \leq \mu_0 \leq \overline{\mu}$, and (iii) $q$ is high and $d$ is low, it is in the best interest of the autocrat to offer a democratic transition. After a transition, the society enters into a transitory regime of fragile

---

[26]In this situation, the leader updates her belief on the opposition type as follows: $\mu_t = \frac{\mu_{t-1}q}{\mu_{t-1}q + (1-\mu_{t-1})}$.

democracy with probability $d$ (non-revealing elections). If $\mu_0 < \hat{\mu}$, the leader, in this situation, sets a high tax. Hence, the fragile democracy regime leads to a risk of war.

If no conflict takes place at the end of the period, the leader updates downward and thus fixes a high tax the subsequent period as well (if reelected). In this situation, the society faces a risk of conflict when the opposition is strong. A "race" starts between the realization of the window of opportunity and democratic consolidation (either through revealing elections or because the opposition wins the election).

In particular, when facing a $B^+$, the probability of a democratic consolidation the same period is equal to the probability of obtaining revealing elections $1-d$ plus the probability of the strong opposition missing its window of opportunity when the elections are non-revealing $d(1-q)$. Compounding these probabilities over all subsequent periods leads to the following probability of consolidation: $(1-d) + d(1-q)[(1-d) + d(1-q) + ...]$, hence

$$\mathbb{P}(\texttt{consolidation}|B^+) = \frac{1}{1 + \frac{d}{1-d}q} \tag{14}$$

When facing a $B^-$ this probability is one. From the ruler point of view, when democratizing, the probability of consolidation is thus

$$\mathbb{P}(\texttt{consolidation}|\mu) = 1 - \frac{\mu}{1 + \frac{1-d}{qd}} \tag{15}$$

This probability is decreasing in $\mu$ (the higher the likelihood of facing a strong opposition, the lower the chance of consolidation) and increasing in $d$: the higher the chance of observing informative vote shares, the faster the democracy consolidates. Similarly, if the window of opportunity happens with a low probability (low $q$) we obtain a higher consolidation probability.

Hence, young democracies may enter a transitory phase where conflicts are likely. They escape this transition phase when elections reveal all the information about the opposition: the "race" between the realization of the window of opportunity and the perfect revelation of elections is driving the likelihood of peaceful transition.

## 4.4    Discussion on democratic backsliding

As mentioned above, a stark feature of our baseline model is the permanent shift to peace and credible elections after the first democratization. In order to relax these implications of the model, we have in the previous subsection focused on allowing for conflict along the transition path, while maintaining the assumption that constitutional safeguards (hence credible elections) are perennial once instituted. In contrast, in the current subsection *we relax the perennial nature of credible elections* and allow for the

endogenous adoption of constitutional safeguards. In particular, as will be discussed below, a sufficiently high probability of (privately known) type switches of the opposition may create incentives for endogenously maintaining constitutional safeguards and organizing free and fair elections in each period, as it maintains the informational rent of elections from period to period.

This issue of non-perennial constitutional safeguards has been widely discussed in the recent academic literature and popular media alike; sometimes referred to as the "backsliding" of "consolidated" democracies (see for a recent review Waldner and Lust, 2018). According to the 2018 annual report from Freedom House (2018) democracy has been overall on the decline for the 12th consecutive year, and currently 45 percent of countries are classified as "free", 30 percent as "partially free" and remaining 25 percent as "unfree". In our framework, we interpret democratic backsliding as the dismantlement of the constitutional safeguards and executive constraints insuring credible elections (i.e. manipulating ex-ante the elections). Recall that in our setup, without constitutional safeguards, the leaders have incentives to stop organizing credible elections if the type of the opposition is known: the information rent is nil and the risk of losing power is potentially large. We highlight two lines of explanations to understand why leaders maintain constitutional safeguards and executive constraints: (i) the role of potential type switches of the opposition maintaining asymmetric information and (ii) the role of "democratic values".

**Maintaining asymmetric information through type reshuffling.** A key mechanism in our framework supporting free and fair elections is the existence of an informational rent due to asymmetric information. As long as this asymmetric information remains, the leader has incentives to maintain executive constraints and credible elections. While above we have learnt that the dissipation of informational asymmetries helps to escape the potentially conflicted transition period of young democracies, in mature democracy better information comes with a price tag. If information asymmetries have been eroded in mature democracies, somewhat counter-intuitively the elected leader would have incentives to dismantle the election process: she knows the type of her opponent and does not want to lose the next elections. Hence while better information reduces the risk of conflict in young democracies, it has the downside in mature democracies to make the organization of free and fair elections less appealing.

One way to maintain the electoral incentives is through the existence of a sufficiently high probability of type reshuffling of the opposition in each period, $h$ (privately known to the opposition). We interpret a high probability $h$ as a sign of active political competition (i.e. contested primaries leading to changes of opposition leaders) or a dynamic civil society resulting in a strong shift in voting behavior (e.g. through media revelations), while a low reshuffling probability may be associated with polarized political consistencies with very few changes in voting patterns over time. Starting from a period where previous elections revealed the type of the opposition, fostering constitutional safeguards can be sustained if the probability of type switches is sufficiently high. To see why, consider $h = 1$: the game is then just a repetition of the stage game, with the incumbent having no information on the type of its opponent (i.e.

her type has been reshuffled with certainty). It is thus in the best interest of the elected leader to keep constitutional safeguards and organize credible elections in this period as well: as in our baseline model, the informational rent is in each period worth taking the risk of losing the election.

However, as $h$ decreases, it becomes more and more tempting to avoid elections: the information rent decreases because the revealed type of the opposition has fewer and fewer chances to be reshuffled. There exists a critical probability $\hat{h}$ below which the information rent of elections becomes lower than the cost of potentially losing the election: the leader can dismantle constitutional safeguards and revert to autocracy, facing only a low chance of conflict as the type of the opposition is likely to remain the same. This "backsliding" in mature democracies corresponds to situations where, for example, the leading group manipulates ex-ante the elections.

**Democratic values.** In addition to maintaining asymmetric information through type reshuffling, also "democratic values" can act as rampart against "backsliding" of mature democracies into autocracy. In particular, we often observe in mature democracies, with regular free and fair elections, that a leader dismantling the executive constraints will not do it painlessly: citizens get used to free and fair elections as well as constraints on the governments. As argued by Besley and Persson (2019), citizens experiencing democracy develop "democratic values", pushing the population to support free and fair elections and executive constraints for their own sake.[27] If the group in power dismantles the constitutional safeguards, the citizens may oppose violently, thereby imposing a high cost on the group in power. Hence, democracy may be "self-enforcing": as citizens experience elections and democracy, it becomes more and more costly for the leader to dismantle executive constraints forcing her to abide to elections results. The recent 2019 Hong Kong anti-extradition bill protests illustrate that a population experiencing democratic institutions for some period may oppose democratic backsliding, rendering hence an autocratic reversal more costly for the leader.

In our setup we can think of democratic values as an exogenous "dismantling cost" (triggering a democratic backsliding) for a leader, increasing with each election. After some periods, even if all of the asymmetric information is negated by a strongly polarized political competition, the democratic values of the population may sustain (and coevolve with) free and fair elections in the long run. This corresponds to a lowering of the critical probability $\hat{h}$ below which the leader is better off dismantling constitutional safeguards: high democratic values allow to sustain democracy even in the presence of a very stable political landscape lacking substantial asymmetric information. In a nutshell, autocratic backsliding in mature democracies takes place under two conditions (i) democratic values are eroded; (ii) low reshuffling $h$ of the opposition.

---

[27]See also Moore (1966), Putnam (1993) and Persson and Tabellini (2005).

## 4.5   Heterogeneous group sizes/productivity and inequality

Our main theoretical result stating that democratization is associated with an increase of ethnic favoritism has implications for different measures of inequalities, between ethnic goups and for the population as a whole (depending on the relative group sizes). In order to clarify this link between ethnic favoritism and inequality, we will provide below some extensions emphasising the effect of different group productivity and heterogenous sizes. Surprisingly, we will see that introducing heterogenous group productivity has no (qualitative) effects on the main outcomes of the model. This result is driven by the fact that all decisions are based on the ex-post payoffs where the tax is applied, and these payoffs do not depend on the initial productivity. By contrast, accounting for different group sizes will impact substantially the outcomes of our model, as population size may affect ethnic mobilization.

**Heterogeneous group productivity.**   We here relax the assumption that each group produces the same amount (1 in the baseline) and assume instead that one group, say $B$, produces an amount $\beta < 1$, while the other group keeps producing 1. An interesting implication of our model is that relative productivity does not (qualitatively) impact democratization, the intensity of ethnic favoritism or any other major outcomes of our theory. This is due to the fact that the post-tax income of each group is entirely driven by the "take it or leave it" split of the total resources. Each group obtains a share of the total payoff determined by the threat that it represents in case of war (a strong opposition will obtain a high share of the surplus and a weak group a small share, irrespective of their relative productivity).

   As shown in section 3.2.1, the individual fighting decision is driven by the probability to win and obtain the total resource (same for both groups) and by ethnic identity. Reducing the productivity of one group hence reduces the total size of the spoil (from 2 to $1+\beta$) and scales down all war payoffs. Hence, the ex-ante asymmetry in productivity does not translate into differential mobilization. In other words, a strong opposition with a high productivity will obtain the same share of the total resource than a strong opposition with low productivity, but the overall resource to be shared will be lower in the second case. An important consequence is that differences in initial wealth (existence of ex-ante "rich" and "poor" groups) does not impact the decision to democratize and the ex-post level of ethnic favoritism, which are entirely driven by differentials in ethnic identity. This outcome is in line with our introductory Figure 1 highlighting that ethnically fractionalized countries display no correlation between democratization and GINI measures of income inequality.

**Heterogeneous group sizes.**   If initial wealth does not impact mobilization in our setup, assuming different group sizes has important implications. This is due to the fact that group sizes may change the relative army sizes and the probability of winning differentially (and hence the expected war payoffs and the ex-post income). Looking at section 3.2.1, we can easily see that a smaller group will face a reduced probability of winning if the group size is lower than its "unconstrained" army size. The "constrained"

equilibrium is thus determined by the maximal number of fighters that the small group is able to enroll (its full group) versus the best response to this amount by the other group through the mobilization game. The equilibrium of this game features a greater chance of winning for the large group than for the small (constrained) group because the winning probability corresponds to the ratio of army sizes. This greater chance of winning translates into higher expected war payoffs for the large group and lower war payoffs for the small group with respect to the baseline case with equivalent sizes.

This extension leads to a new set of comparative statics. As in our baseline, if the large group is in power and wins the elections against a small (and weak) opposition, the intensity of ethnic favoritism—measured through the RGR— increases with majoritarian democracy.[28] Conversely, if a small (strong) opposition wins the election, the RGR decreases from $\frac{2-\mathcal{W}_S^{++}}{2}$ to $\frac{2-\mathcal{W}_L^{++}}{2}$, where $\mathcal{W}_S$ ($\mathcal{W}_L$) denotes the expected war payoff of a small (large) group. The fact that the RGR can decrease during democratization for this specific case motivates a robustness check in the empirical section where we will focus on democratization events where the same group stays in power after the election. Interestingly, if the small group initially in power loses the election against a (strong) large opposition, the intensity of ethnic favoritism will increase even more than in our baseline (because the RGR will increase from $\frac{2-\mathcal{W}_L^{++}}{2}$ to $\frac{2-\mathcal{W}_S^{++}}{2}$, with $\mathcal{W}_L^{++} > \mathcal{W}_S^{++}$). Hence, in the canonical situation of a small elite losing the election against a large opposition (i.e. citizens), we predict a very strong increase in ethnic favoritism (even larger than in our baseline). This effect is likely to decrease inequality measures based on individual income distances (such as the GINI index), because we will have an increase in income for a large part of the society. This situation highlights why our measure of ethnic favoritism (the RGR), while close in spirit, is different from usual measures of inequality: we measure difference in extraction between groups when one arrives in power, while usual inequality indicators traditionally measure the distance between individuals within and across groups in the society.

## 4.6 More than two groups organized in ruling coalitions

In this subsection we discuss how our theoretical framework could be interpreted in a context of coalitions of three or more groups in the society. As found in Francois et al. (2015) for African politics, the ruling group in power is often a large coalition of various ethnic groups. Accordingly, one could in our setting interpret A and B as two coalitions consisting of several distinct ethnic groups. The role of the leader of each coalition would then be to hold the different entities together in a single umbrella group that is sufficiently strong for governing the country (or sufficiently strong to threaten the group in power). In this environment, one can interpret $\theta_G$ as the capacity of a leader to solve collective action problems within her coalition and federate disparate interests (which may depend on technological, institutional and social skills for organizing military and political mobilization in large groups, including leadership

---

[28]If the large group in power endowed with a high $\mu$ wins the election against a small weak group, the RGR increases from $\frac{2-\mathcal{W}_L^{++}}{2}$ to $\frac{2-\mathcal{W}_S^{++}}{2}$, where $\mathcal{W}_S$ denotes the expected war payoff of a small group.

skills, charisma, etc...). A group endowed with a high $\theta$ is in such a context able to federate the different interests in an efficient way and can mobilize efficiently in case of war (thus solving the free-riding problem in mobilization).[29]

## 4.7 Monetary incentives

We now study how monetary incentives for fighters/non-fighters play a role in war mobilization. Recall that in the baseline version of the model we assume that the winner of the war splits equally the spoil among all members of the group. Hence, the leaders are not fully using monetary incentives, which allows to clarify the role of ethnic identity in mobilization. In this extension, we will show that, even with optimal monetary incentives, ethnic identity continues to play a major role in mobilization. The key intuition of this result is that groups, in case of victory, appropriate a resource of the same size (with full expropriation, the spoil is equal to the total production of the society minus the cost of war). Hence, the stake is the same for both groups and leaders cannot distinguish themselves by credibly committing to different reward for their fighters. Consequently, they have incentives to rely on ethnic identity to leverage mobilization and increase their winning chances.

In particular, we relax the assumption that monetary rewards are a simple lump-sum transfers to all group members. Each leader can optimally incentivize troop mobilization through intra-group redistribution of the economic surplus between fighters ($w_{\mathtt{f}}$) and non-fighters ($w_{\mathtt{nf}}$). The feasibility constraint requires that the spoil obtained in case of victory (full expropriation of the loser) is equal to the reward given to both fighters and non-fighters: $w_{\mathtt{nf}} \times (1 - \mathtt{army}_G) + w_{\mathtt{f}} \times \mathtt{army}_G = 1 - \phi \times \mathtt{army}_{-G}$ .

When deciding on whether to fight, agent $i$ still trades-off her ethnic identity and her monetary cost of winning with her opportunity cost of fighting,

$$u_{i \in G} = \begin{cases} \mathbb{P}[\text{G wins}] \times (1 + w_{\mathtt{nf}}) & \text{(non fighter)} \\ \mathbb{P}[\text{G wins}] \times (1 - \phi + w_{\mathtt{f}}) + \tilde{e}_i - m & \text{(fighter)} \end{cases}$$

where $m > 0$ is a scaling parameter representing the psychological cost of war (mental stress of fighting/killing...). Summing these decisions across all group members leads to an army size of $\mathtt{army}_G = 1 + \theta_G - m + \mathbb{P}[\text{G wins}] \times (w_{\mathtt{f}} - w_{\mathtt{nf}} - \phi)$.

Thus, the best response of leader $G$ is $(w_{\mathtt{nf}}, w_{\mathtt{f}})_G = \arg\max \mathbb{E}[W_G | \text{war}; (w_{\mathtt{nf}}, w_{\mathtt{f}})_G; (w_{\mathtt{nf}}, w_{\mathtt{f}})_{-G}]$. Assuming $\phi \leq \frac{1}{2}$, a simplifying assumption insuring the baseline ordering of war payoffs, we observe that for $m \geq \bar{m}$, mobilization is constrained, $w_{\mathtt{nf}} = 0$ and $w_{\mathtt{f}} > 0$ and the Nash equilibrium is type-dependent. At equilibrium $\mathtt{army}_G^* < 1$ and is increasing with $\theta_G$. Furthermore, the baseline results hold.

*Proof.* First, recall that when $\phi \leq \frac{1}{2}$, the unconstrained Nash Equilibrium outcome is to enroll the whole population: $\mathtt{army}^* = 1$. Hence, with monetary incentives and no forced conscription, the leader of each

---

[29]An interesting extension here would be to explore the impact of an explicit bargaining game between three or more groups in the coalitions on ethnic favoritism and democratization. We leave these questions to future research.

group wishes to allocate all the resources to fighters in order to obtain the largest possible army size: $w_{\mathtt{f}} = \mathcal{S}$ and $w_{\mathtt{nf}} = 0$ (where $\mathcal{S}$ denotes the war spoil in case of winning). Recalling (5), the army size at equilibrium is $\mathtt{army}_G = 1 + \theta_G - m + \mathtt{P}_G(\mathcal{S} - \phi)$. For high $m$, i.e. when $m > \theta_G + \mathtt{P}_G(\mathcal{S} - \phi)$, we observe that $\mathtt{army}_G < 1$: mobilization is constrained and army size increases with $\theta_G$. $\qquad\square$

This result highlights that when the psychological cost of fighting is high, mobilization is constrained (i.e. is below the unconstrained Nash Equilibrium): hence leaders are unable to mobilize sufficiently even when committing to allocate all the spoil toward fighters, and they optimally use non-pecuniary elements to increase mobilization. This is a strong theoretical argument motivating the use of ethnic identity by leaders during civil wars: the winner of a civil conflict obtains the entirety of a common resource, and groups are thus unable to credibly commit to different rewards (the stake is the same for both groups). Ethnic identity is thus a natural way to mobilize efficiently in the case of war and create a threat to the other group.

# 5 Empirical Facts

This section presents a series of novel empirical regularities motivated by the predictions of our model. We first look at the relationship between democratic transitions and ethnic favoritism in a large sample of countries over the post-decolonization period both at the aggregate (i.e. country) level and ethnic-group level. Then we document alternation in de jure power and political leadership during transitions. Finally, we investigate the links between political violence (riots and civil conflict) and democratic regimes. It is important to notice that, due to the absence of exogenous variations, all our stylized facts are correlations and cannot be interpreted as causal evidence.

## 5.1 Data

Below are briefly discussed the various data sources and measures used in the empirical analysis. Most of the discussion is devoted to the measurement of our two main variables, the *Ruling Group Rent* ($\mathtt{RGR}_{ct}$) and democracy. Appendix B displays more details and summary statistics.

**Ruling Group Rent** –  A key focus of our analysis relates to the extent of ethnic favoritism exerted by ethnic groups in power. In line with the theoretical definition (2), we compute the following empirical measure of the Ruling Group Rent ($\mathtt{RGR}$) for a given country $c$ and year $t$:

$$\mathtt{RGR}_{ct} = \frac{\frac{\sum_{e \in \mathtt{GOV}_{ct}} Y_{et}}{\sum_{e \in \mathtt{GOV}_{ct}} POP_{et}}}{\frac{\sum_{e \in \mathtt{GOV}_{ct}} Y_{et}}{\sum_{e \in \mathtt{GOV}_{ct}} POP_{et}} + \frac{\sum_{e \in \mathtt{OPP}_{ct}} Y_{et}}{\sum_{e \in \mathtt{OPP}_{ct}} POP_{et}}} \tag{16}$$

where $(Y_{et}, POP_{et})$ correspond to the economic income and population size of each ethnic group $e$ and $(\texttt{GOV}_{ct}, \texttt{OPP}_{ct})$ are the subsets of ethnic groups respectively in power and in the opposition. The ratio form of $\texttt{RGR}_{ct}$ represents the average per capita income of groups in power relative to excluded groups, controlling for the number of groups in power and their relative size.[30] For example, an increase in the number of groups in power does not affect $\texttt{RGR}_{ct}$ as long as their average income per capita is hold constant.

Following the empirical literature interested in measuring local economic activity at the subnational level (Henderson et al. 2012, Michalopoulos and Papaioannu 2013, De Luca et al. 2018, etc.) we proxy $Y_{et}$ with the yearly average night light intensity in the ethnic homeland of $e$.[31] Night light data from satellites come from NOAA (2014). Information on power access for computing $(\texttt{GOV}_c, \texttt{OPP}_c)$ and ethnic homeland locations are retrieved fom Vogt et al. (2015). Our data cover 113 countries from 1992 to 2008. In our sample the $\texttt{RGR}$ of government groups amount to on average 0.53, implying that per capita night light is –as expected– slightly larger in government-affiliated groups with respect to opposition groups. Among the countries with the lowest average $\texttt{RGR}$ over the period we find Canada (0.2) and Japan (0.23) and among countries with the highest measured *Ruling Group Rent* we have Uganda (0.87), Gabon (0.9) and Liberia (0.97). Appendix B contains detailed descriptive summary statistics. Our measure $\texttt{RGR}_{ct}$ differs from existing measures of horizontal or ethnic inequality at the country-level (Alesina et al. 2016) because it crucially factors in access to power of ethnic groups with the aim of measuring ethnic favoritism. [32]

By construction, our country-level measure $\texttt{RGR}_{ct}$ reacts to (i) changes in the average income per capita of groups already in power (i.e. ethnic favoritism at the intensive margin); (ii) new groups with different incomes per capita accessing/loosing power (i.e. composition effects in $\texttt{GOV}_c$ and $\texttt{OPP}_c$). The first channel tests for our theoretical predictions on democratization and ethnic favoritism. The second channel pertains to democracy-induced power sharing: Democratic transitions could indeed be associated with extending power sharing to poorer (richer) groups and $\texttt{RGR}_{ct}$ would decrease (increase) during transitions because a larger proportion of poorer (richer) groups are represented in government. Although this composition effect is an interesting phenomenon per se, it is not the main purpose of our theoretical analysis. We thus complement our empirical investigation of ethnic favoritism by looking at data disaggregated at the ethnic-group level and we explain below how this approach mutes composition effects.

---

[30]Each term in ratio-form in (16) is equal to the population-weighted average of per capita income $\sum_e \frac{Y_{et}}{POP_{et}} \times \frac{POP_{et}}{\sum_e POP_{et}}$.

[31]The ethnic group polygons vary considerably in size, which prompts us to use population weighted night light measures in the baseline analysis, but we show in robustness exercises that the results are very similar when using absolute levels of night lights to compute the $\texttt{RGR}$, and controlling for populations and areas of the government and opposition groups.

[32]Comparing our variable with respect e.g. to the indicator constructed by Alesina et al. (2016), first of all, our measure is time-varying, while they focus on cross-sectional variables. Second, and more importantly, they compute a measure of general income dispersion between groups, while we construct a variable that is tailor-made to confront our theory to the data, namely the relative income share of the ethnic groups affiliated to the government. Put differently, our approaches are complementary, as while their variable is maybe of great general applicability, our measure is *more specifically* constructed to capture a particular parameter of our formal model, namely the extent of ethnic favoritism at the country-level.

To this purpose we rely on the very rich dataset built by De Luca et al. (2018) that contains not only information on the economic activity for all ethnic homelands and years, proxied by nighttime light intensity, but also information on which ethnic groups are part of the governing coalition. All details of the data construction and variable definitions are explained in depth in De Luca et al. (2018), and descriptive summary statistics are provided in Appendix B.

Note that we see those two investigations of ethnic favoritism at different levels of aggregation as complementary analyses. It is natural to start our empirical investigation with our aggregate measure $\text{RGR}_{ct}$. Indeed, ethnic favoritism is by nature a country-level phenomenon that involves cross-ethnic group externalities, as outlined in our theoretical analysis. Moreover $\text{RGR}_{ct}$ varies at the same level of aggregation than our main explanatory variable, namely democratic institutions, and it is important to gauge whether the impact of democratic transitions on ethnic favoritism is pervasive at the aggregate-level or whether it affects only few groups. By contrast, studying ethnic favoritism at a disaggregated-level enables us to control not only for the aforementioned composition effect but also for further confounding factors thanks to a rich battery of fixed effects (see below). Finally, the fact that both investigations leads to robust, consistent and significant results, in spite of substantially different empirical designs, is also very reassuring.

**Democracy** – We make use of two main measures of democracy in our analysis. First we exploit the widely used, continuous democracy measure from Polity IV (2018) that ranges from -10 (full autocracy) to +10 (full democracy).[33] We use in some specifications the original continuous measure, while in others we code a binary democracy variable for above median democracy scores, i.e. Polity IV scores above 0. The democracy data of Polity IV in our sample covers 173 countries over the 1946-2015 period. Our second measure of democracy is from Cheibub et al. (2010). This dichotomous democracy variable covers 199 countries over the 1946 to 2008 period. A regime is classified as a democracy if it meets the requirements stipulated in all of the following four rules: 1) The chief executive must be chosen by popular election or by a body that was itself popularly elected; 2) The legislature must be popularly elected; 3) There must be more than one party competing in the elections; 4) An alternation in power under electoral rules identical to the ones that brought the incumbent to office must have taken place. While the binary Cheibub et al. measure is more coarse and conservative than the continuous variable of Polity IV, it has the advantage of rigorously distinguishing "free and fair" elections from "window-dressing" elections. Given that our theory yields predictions on election odds in times of democratic transition, it is particularly crucial in our context to avoid "window-dressing" elections in autocracies being wrongly coded as democratic.

An important purpose of the Cheibub et al. (2010) democracy measure in our context is to code *democratic transitions*, i.e. first free and fair elections after a period of autocracy. Being coded as democratic transition is both possible in the case of an incumbent (former autocrat) stepping down

---

[33]We list in what follows always the original data source. This being said, part of the variables have been compiled using the GROWUp (Girardin et al., 2015), resp. "Quality of Government" (Teorell et al., 2017) systems.

peacefully (in case of defeat) or the incumbent being re-elected, but stepping down peacefully after the end of the electoral mandate. Over the period 1946-2008 we observe 107 democratic transitions (taking place in 71 countries). Of these, 40 are transitions towards proportional democracy. Further, using the same data from Cheibub et al. (2010), we build our *leader stability* measure, taking a value of one when the "effective leader" in a given country remains the same as in the previous year, and 0 otherwise.

Finally, we also make use of data on the type of democracy, drawing in particular on the "Institutions and Elections Project" (IAEP) data of Wig et al. (2015) on the electoral system (majoritarian versus proportional), covering 163 countries over the period 1960 to 2012.[34] This data has the advantage of being recent and basing coding decisions on de jure legal documents (reducing the scope for cognitive bias in hand coding). We also use for robustness checks an alternative data source on electoral system, namely the "Democratic Electoral Systems" (DES) dataset of Bormann and Golder (2013), which is another high quality data set, yielding very similar results.[35]

**Other data** –   As for conflict measurement, we rely on the widely used conflict dataset of UCDP Armed Conflict Database, where a given country year is coded as conflict onset if a conflict with more than 1000 battle-related deaths newly breaks out (Gleditsch et al., 2002). We both use their measure for conflict restricted to fighting between ethnic groups and triggered by issues of government (as opposed to non-ethnic or territorial conflict), as well as a general conflict measure capturing all types of civil wars.

For the study of heterogeneous effects we shall also exploit standard measures of ethnic diversity. In particular, we use as main variable the *ethnic fractionalization* measure from Alesina et al. (2003), which has the widest country coverage, namely is available for 188 countries. As second indicator we rely on the ethnic polarization index from Montalvo and Reynal-Querol (2005), covering 136 countries.

We make use of a set of further control variables, starting with real GDP per capita at constant prices and with population (both from Penn World Tables (Feenstra et al., 2015)). Further, we code a variable of the age of democracy, defined as the number of years since a country first reached Polity IV scores above 0 (Polity IV, 2018).[36] A further control variable is the share of trade / GDP from the World Development Indicators (World Bank, 2018). Finally, based on Vogt et al. (2015) we have also coded the ratio of population of governing groups over the total population, as well as the surface occupied by governing groups over the total surface. As mention above, the summary statistics of all aforementioned variables are displayed in Appendix B.

---

[34]We code as "Majoritarian" when their variable "Electoral System" corresponds to "Plurality" or "Majority".

[35]Our binary measure is coded as "Majoritarian" when their variable "Electoral System Type-3 Classes" corresponds to "Majoritarian".

[36]To give an example, take country X reaching for the first time this score in 1950, then independently of what happens afterwards to the level of democracy, the age of democracy variable reaches in the year 2000 a level of 50, and in 2005 a level of 55. If a country has never achieved Polity IV scores above 0, the age of democracy becomes 0.

## 5.2 Democracy and ethnic favoritism - country level evidence

Our first main theoretical result establishes that democratization exacerbates ethnic favoritism. Our model predicts that the government's grab of economic resources is constrained by either lack of information in autocracies or by a proportional electoral system in democracy, while in majoritarian democracies there are few ramparts against ethnic favoritism. To test this prediction, we regress in Table 1 our proxy of ethnic favoritism —the RGR variable that captures the income share accruing to the ethnic ruling groups— on the overall level of democracy, as well as constitutional types of democracy (proportional or majoritarian). Our sample is composed of a panel of 116 countries over the 1992-2009 period. All specifications crucially including country fixed effects, we thus elicit the within-country across-time impact on RGR of transiting between autocracy and democracy. We expect to find a positive association, especially in majoritarian democracy. Robust standard errors are clustered at the country-level.

We start in column (1) with the standard Polity IV measure of democracy ranging from -10 to +10. The estimation result shows that higher democracy scores are associated with an increase in RGR. Our purpose being to contrast proportional and majoritarian regimes of democracy, we binarize the Polity IV measure in Column (2), coding as democracy all observations with above-median scores (i.e. above 0). Next, in Column (3) we split the binarized democratic indicator into two kinds of regimes, i.e. proportional representation and majoritarian electoral system drawing on IAEP data. Consistent with our theoretical prediction, we observe that only transitions toward majoritarian democracies are associated with higher levels of RGR and ethnic favoritism. Proportional democracy does not have statistically significantly different implications on ethnic favoritism than autocracy (the reference category). A caveat with the Polity IV measure is that some "window-dressing" elections could be wrongly coded as real democratic transitions. In columns 4-5 we consequently replicate col. 2-3 with the binary democracy variable of Cheibub et al. (2010) that is immune to this problem (see section 5.1).[37] Coefficient magnitudes are comparable. Quantitatively, in our preferred specification of column 5, a transition toward majoritarian democracy translates into a 12 percentage point increase of RGR; this represents about one quarter of the sample mean (0.53) and about three quarters of a standard deviation (0.16) of this variable. Finally, in column 6 we repeat the analysis of column 5 after including a battery of time-varying country-level characteristics, namely lagged population, lagged GDP per capita, lagged age of democracy and lagged trade share of GDP. Our goal is to control for the basic socio-economic environment of a country that could co-vary with transitions between autocracy and democracy and also affect ethnic favoritism. We see that the coefficients are barely changed in spite of the sample size reduction. A limitation here relates to the fact that those characteristics are to some extent also an outcome of the transitions (e.g. democratization leading to trade openness). To avoid such concern with bad controls, we opt for not including those country-level characteristics in the rest of the main text analysis of the

---

[37]Further, the transitions captured by Cheibub. et al. (2010) explicitly take place during an election year (as in our model), while increases in Polity IV may potentially happen also outside of elections.

current subsection. Appendix Table A.2 shows that also for the other columns of Table 1 the results are barely changed when this battery of controls is included (and several other appendix tables contain specifications controlling for this same battery of country controls).

Table 1: Democracy and Ethnic Favoritism - Country-level

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| Dependent variable: | | | ruling group rent (RGR) | | | |
| Democracy (t-1) | 0.006* | 0.072** | | 0.063 | | |
| | (0.003) | (0.036) | | (0.040) | | |
| Proport. democ. (t-1) | | | 0.043 | | 0.030 | 0.037 |
| | | | (0.027) | | (0.028) | (0.030) |
| Majorit. democ. (t-1) | | | 0.113** | | 0.122** | 0.121** |
| | | | (0.054) | | (0.060) | (0.060) |
| Democracy measures | Polity IV cont. | Polity IV dummy | | Cheibub et al. | | |
| Time dummies | Yes | Yes | Yes | Yes | Yes | Yes |
| Country fixed effects | Yes | Yes | Yes | Yes | Yes | Yes |
| Additional controls | No | No | No | No | No | Yes |
| Observations | 1993 | 1993 | 1961 | 1755 | 1732 | 1556 |
| R-squared | 0.794 | 0.795 | 0.800 | 0.812 | 0.816 | 0.829 |

Note: Panel with an observation being the country-year, covering 116 countries and the years 1992-2009. All explanatory variables lagged by one year. Country fixed effects and annual time dummies included in all columns. The additional controls included in column 6 include GDP per capita, Population, Trade share of GDP and Age of democracy. Robust standard errors clustered at the country level. t-stat in parenthesis. *=significant at the 10% level, **=significant at the 5% level, ***=significant at the 1% level.

In Table 2, we test additional predictions of our model. First, we expect a democracy-induced increase in ethnic favoritism to be more pronounced in societies where politics are more likely to take place along ethnic lines. In columns 1-2 we replicate our preferred specification (col.5, Table 1) on the subsamples of countries respectively below- and above-median ethnic fractionalization. Results confirm that the impact of majoritarian democracy is larger in ethnically divided countries. Interestingly, we also find that democratic regimes (reference category being autocracy) have a negative impact on RGR in below-median countries. We interpret this evidence in the light of the redistributive theories of democracy: In societies where the rich/poor divide is more salient than ethnic cleavages, democratization is associated with less ethnic favoritism and less inter-group inequality.

Second, our framework suggests that, under majoritarian democracy, ethnic favoritism is more likely to increase after elections when there is no alternation of power (see result 2). Indeed, in this case, the reelected incumbent learns through elections that the opponents' political mobilization capacity tends to be weak. As a consequence, the opponents' informational rent is reduced and the ruler can set a larger RGR without staging a conflict. By contrast, the change in ethnic favoritism is more ambiguous when there is alternation of power as the information-revealing aspect of elections is potentially mitigated by the fact that the post-election RGR is now set by a different group. To test this idea, we keep focusing on the high ethnic fractionalization countries of column 2, but estimate in columns 3-4 our preferred specification after splitting the sample further into countries experiencing an electoral mandate respectively with and

without leadership change. The estimation results show that the democracy-induced increase in ethnic favoritism is larger in absence of alternation of power (with the caveat that the sample size is smaller in col. 3 than 4), in line with our theoretical view that the informational-rent of the opponent is reduced after elections. Finally, in column 5, we replicate the same type of analysis when restricting further to "new democracies", namely countries that have experienced at least one instance of transition from autocracy to democracy over the period. For the sake of space, we report only the estimation results for ethnically divided countries (i.e. above median ethnic fractionalization) with a reelected incumbent. Given the sample size reduction, this is a demanding exercise that serves the purpose of assessing whether results continue to hold in a sample containing only the types of countries for which the predictions of our theory should be directly scrutinized. Lastly, in column 6, we push the logic one step further by –in addition to the focus on above-median ethnic fractionalization and reelected incumbent – restricting the sample to countries that had no change in the ethnic group composition of government in the year of transition to democracy (or in the first year after transition). This pretty drastic specification is a first attempt at addressing potential composition effects affecting our RGR measure. Indeed, if under democracy a larger number of ethnic groups are included in government, then this compositional change could directly affect the ruling group rent (RGR). All in all, it is reassuring that our results are –if anything– stronger when focusing on these restricted subsamples. Note that the results are virtually unchanged if we control for our standard battery of control variables (see Appendix Table A.3)

Table 2: Democracy and Ethnic Favoritism - Heterogeneous Effects

| Dependent variable: | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | | | | ruling group rent (RGR) | | |
| Sample | Low Eth. Frac. (EF) | High EF | High EF & New gov. | High EF & Same gov. last period | Cou. new dem. & same gov. & high EF | Same gr. gov. tra. & same gov. & high EF |
| Proport. democ. (t-1) | -0.039** | 0.006 | -0.048 | 0.011 | 0.016 | 0.003 |
| | (0.016) | (0.031) | (0.040) | (0.029) | (0.031) | (0.021) |
| Majorit. democ. (t-1) | -0.062** | 0.187** | 0.026 | 0.190** | 0.193** | 0.240** |
| | (0.024) | (0.081) | (0.051) | (0.073) | (0.078) | (0.090) |
| Democracy measure | | | | Cheibub et al. | | |
| Time dummies | Yes | Yes | Yes | Yes | Yes | Yes |
| Country fixed effects | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 879 | 847 | 137 | 669 | 298 | 599 |
| R-squared | 0.931 | 0.782 | 0.862 | 0.821 | 0.851 | 0.825 |

Note: Panel with an observation being the country-year, covering 116 countries and the years 1992-2009. All explanatory variables lagged by one year. Country fixed effects and annual time dummies included in all columns. In column 1 (resp., 2) the sample is restricted to countries with below-median (resp., above-median) ethnic fractionalization. In column 3 (resp., 4) the sample is restricted to observations with high EF and with a new leader accessing power (resp., last period's leader remaining in office). In column 5 the sample is restricted to countries which over the sample period had at least one instance of transition to democracy, which have last period's leader remaining in office and which have above-median ethnic fractionalization. In column 6 the sample is restricted to countries with above-median ethnic fractionalization and to observations with last period's leader remaining in office, and also excludes countries that had a change in the ethnic group composition of government in the year of transition to democracy or in the first year after transition. Robust standard errors clustered at the country level. t-stat in parenthesis. *=significant at the 10% level, **=significant at the 5% level, ***=significant at the 1% level.

In the Online Appendix we complement our analysis by performing a battery of sensitivity checks. In particular, we investigate robustness to the construction of the dependent variable (RGR) by considering alternative measures of night lights and/or ethnic group homelands (Appendix Table A.4). In the same spirit, we also assess the sensitivity to coding decisions on electoral systems by replacing our measure of majoritarian representation based on IAEP with the "Democratic Electoral Systems" (DES) dataset of Bormann and Golder (2013) (see Appendix Table A.5). We also account for global events (e.g. beginning of the Second Congo War or dissolution of the Soviet Union) that may impact both democratization and rise in ethnic favoritism by including continent × year fixed effects (Appendix Table A.6). Finally, we investigate cross-continent heterogeneity and find that Africa and Asia drive most of our results (Appendix Table A.7), which is reassuring given that in these two continents there is the highest historical incidence of ethnic conflicts and there are important levels of ethnic fractionalization.

### 5.3 Democracy and ethnic favoritism - ethnic group level

We now investigate the relationship between democracy and ethnic favoritism with data dis-aggregated at the ethnic-group level.[38] This impressive panel dataset from De Luca et al. (2018) covers 7653 ethnographic regions located in 140 countries and ranges from 1992 to 2013. This level of disaggregation makes possible to use a richer set of fixed effects, ethnic group and country × year especially. We follow the demanding empirical design from De Luca et al. (2018): We elicit the effect of having a co-ethnic leader arriving in power on the ethnic-homeland income (measured by night light) relative to the homeland's historical average income (captured by ethnic group fixed effects) and relative to the average income of other ethnic homelands in the same year (captured by country × year fixed effects).[39] As discussed above, this approach complements the one based on the country-level measure of RGR whose main drawback is to react not only to the income of each ruling groups but also to a democracy-induced change in the number of ruling groups. Another key advantage of this approach with respect to the previous one is that the (potentially endogenous) country-level drivers of democratization are now absorbed by the fixed-effect structure.

Table 3 displays the estimation results. We start in column 1 by replicating column 5 of Table 6 of De Luca et al. (2018). The unit of observation is a given ethnographic region in a given year and the dependent variable corresponds to its yearly average nighttime light intensity. The main explanatory variable, *Leader*, is equal to 1 if the current political leader of the country is from the region (equal to $1/n$ for multi-ethnic regions composed of $n$ ethnic groups). It captures the extent of ethnic favoritism.

---

[38]For all other variables we use the same data as in the previous sections. In particular, the information on PR versus majoritarian democracies is, as before, from "Institutions and Elections Project" (IAEP) data of Wig et al. (2015), new democratization is from Cheibub et al. (2010), and ethnic fractionalization from Alesina et al. (2003).

[39]In the specifications of the main text (Table 3) we follow De Luca et al. (2018) in clustering the standard errors at the country level (which is the most conservative option), while in the Appendix Table A.8 we cluster the standard errors –due to a too small number of countries in the sample– at the ethnic group level. Note that the statistical significance would be –if anything– larger if we were to cluster standard errors in Appendix Table A.8 at the country level as well.

This variable is interacted with mutually exclusive measures of political institutions (their linear terms being absorbed by country × year fixed effects). The results show that democracy increases nighttime light intensity when a co-ethnic is in power. The interpretation is that the extent of ethnic favoritism tends to increase in democracy with respect to anocracy and dictatorship. In column 2 we alter the specification of De Luca et al. (2018) to fit our research question. We split their democracy variable into proportional and majoritarian regimes. Consistently with our previous country-level evidence, the point estimates show that only majoritarian system exacerbates ethnic favoritism. In column 3 we run a similar regression but lump together all non-democratic regimes, making this specification closer to the categories featured in our theoretical framework. Results and interpretation are unchanged. In columns 4-7 we replicate the previous specification under sample restrictions particularly relevant for our theoretical setting (see previous section). In column 4, we restrict the analysis to countries with above-median ethnic fractionalization. In column 5 this same restriction is implemented, but on top of it we focus on observations for which ethnic leadership is unchanged with respect to the previous year. In column 6 the sample only contains countries that have experienced at least one instance of transition to democracy over the period and Column 7 adds to this restriction the requirement of no leadership change since the previous year. The quantitatively large and statistically significant effect of majoritarian democracy is found throughout the table, and becomes even more striking for the restricted samples. [40] Appendix Table A.8 performs even more radical sample restrictions. In particular, we focus on observations that are within short time windows around transition to democracy (i.e. 7, 5 and 3 years). And we restrict further to democratic transitions without leadership change to make it directly comparable to our theoretical prediction (see result 2).

## 5.4    Evidence on the type of democracy and tenure of leader in office

The second major prediction of our model is that the re-election odds of an autocrat are larger when transiting to majoritarian democracy than to proportional representation. The theoretical reason stems from the underlying autocrat's political mobilization capacity: A strong autocrat leading a cohesive group is more likely to do well in the first post-transition elections and consequently chooses to adopt a majoritarian representation (that favors ethnic favoritism in case of re-election). We now confront this specific prediction of our setting to the data.

We aim at assessing the likelihood of an autocrat remaining in power after a democratic transition. We start with the (small) sample of countries observed in their first election year after a transition from autocracy to democracy. This corresponds to 65 cases over the 1949 to 2008 period. Table 4 displays the estimation results. The dependent variable *same leader* is a dummy equal to 1 if the effective head of state of a given country is unchanged during the transition (from Cheibub et al., 2010). The main

---

[40]One caveat to bear in mind is that in the last columns 6 and 7 the sample is so severely restricted to only 26 countries that the statistical variation exploited is drawn from a limited number of observations. Hence these results need to be interpreted with caution.

Table 3: Impact (types of) democracy on ruling group rent (RGR) – Analysis at ethnic group level

| Dependent variable: | (1) | (2) | (3) | (4) Nighttime light | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| Leader × Democracy | 0.051** | | | | | | |
| | (0.024) | | | | | | |
| Leader × Anocracy | 0.088 | 0.087 | | | | | |
| | (0.058) | (0.062) | | | | | |
| Leader × Dictatorship | 0.043 | 0.041 | | | | | |
| | (0.079) | (0.085) | | | | | |
| Leader × Demo.PR | | 0.037 | 0.037 | 0.040 | 0.048 | 0.051 | 0.072 |
| | | (0.052) | (0.052) | (0.072) | (0.077) | (0.105) | (0.111) |
| Leader × Demo.Majo. | | 0.071*** | 0.072*** | 0.108*** | 0.083** | 0.115** | 0.102** |
| | | (0.022) | (0.022) | (0.039) | (0.032) | (0.047) | (0.041) |
| Leader × Non Demo. | | | 0.073 | 0.055 | 0.071 | -0.037 | -0.013 |
| | | | (0.058) | (0.077) | (0.070) | (0.095) | (0.093) |
| | | | | | | | |
| Ethnic group fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Country-year fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Restriction sample to high EF | | | | Yes | Yes | | |
| Restr. sample countries with new demo. | | | | | | Yes | Yes |
| Restr. sample same leader since last yr | | | | | Yes | | Yes |
| Observations | 141164 | 120581 | 120581 | 76334 | 73072 | 38876 | 37250 |
| R-squared | 0.947 | 0.951 | 0.951 | 0.937 | 0.941 | 0.928 | 0.932 |

Note: Panel with an observation being the ethnic group-year, covering 140 countries and the years 1992-2013. Ethnic group and country-year fixed effects included in all columns. Robust standard errors clustered at the country level. t-stat in parenthesis. *=significant at the 10% level, **=significant at the 5% level, ***=significant at the 1% level.

explanatory variable of interest is a dummy taking a value of 1 in case of a democratic transition towards *majoritarian democracy*, with the omitted category being a democratic transition towards PR. As before, we draw for the coding of this majoritarian representation dummy on the well-established "Institutions and Elections Project" (IAEP) data of Wig et al. (2015).

Given that most countries only enter once in our sample, we are not able to include country-specific fixed effects and consequently rely on continent fixed effects and decade fixed effects. In Column 1 we estimate a Linear Probability Model by regressing *same leader* on *majoritarian democracy* and the fixed effects. Results show that transition to majoritarian democracy is associated with a higher re-election likelihood of the former autocrat than transition to a democracy with PR. This result is confirmed in column 2 when using for the coding of majoritarian representation the alternative data from the "Democratic Electoral Systems" (DES) dataset of Bormann and Golder (2013), and in column 3 when performing a logit instead of LPM estimation.

One concern may be that a series of confounders could jointly determine the type of democracy adopted and leader tenure (such as e.g. the political history of a country or its level of development) and we hence replicate the baseline specification when including in column 4 the same basic aggregate controls of the last section (i.e. lagged GDP per capita, lagged Population, lagged Trade share of GDP, and years since first democratization). Reassuringly, our baseline result becomes –if anything– stronger.

As discussed in the previous subsection, these controls are themselves outcome variables that may be endogenously determined. Hence, in the remainder of the main text we shall not include these controls, but in the Appendix D we again include robustness checks controlling for this battery of country controls.

One further limit to our analysis is that the small sample size prevents us from including country fixed effects. To this purpose, we move in Table 5 to panel data covering all country-years with democracy, for 132 countries and the years 1947-2008. This allows us to control for country fixed effects and annual time dummies. The dependent variable *same leader* has to be (slightly) adjusted to this panel environment: It is a dummy equal to 1 if the current head of state of a given country is unchanged since last time period (a year or a mandate depending on the specification). On top of the dummy *majoritarian democracy*, we also include a dummy *democratic transitions* coding for the subsample of observations already studied in the previous table. Our interest lies in the interaction term between these two explanatory variables because it captures the impact of transiting to majoritarian democracy on autocrat's re-election odds with respect to transiting toward PR. Column 1 displays the LPM results. We reassuringly see that the coefficient of the linear term *democratic transitions* is negative. Hence, democratic transitions tend to lead to a leadership change. But the interaction term is positive and statistically significant, confirming the insights of the previous table. Columns 2 replicates the approach of the first column after restricting the sample to election years with the aim of focusing on politically relevant episodes only. In spite of the huge drop in the sample size, the interaction term is positive and retains statistical significance. Quantitatively, in our preferred specification of Column 2, the coefficient of the interaction term (0.52) represents more than half of the sample probability of a leader remaining in office (0.82) and is greater than one standard deviation of this variable (0.38). Columns 3-4 replicate the results of columns 1-2, but using the alternative data for majoritarian representation from the "Democratic Electoral Systems" (DES) dataset of Bormann and Golder (2013). These columns confirm the positive effect of the interaction term on the likelihood of re-election. In Appendix Table A.9 we show that our results are –if anything– stronger when controlling for the same battery of country controls as above.

Further, we show in Appendix Table A.10 that the results of Table 5 continue to hold when we implement a logit instead of LPM estimation, while in Appendix Table A.11 we find that our results of Table 5 are robust to the inclusion of continent-year fixed effects (filtering out continent-specific shocks, such as e.g. the onset of a new war) and country-specific time trends (capturing long-run trends such as e.g. the building up of a civic culture at the country level).

## 5.5 Further evidence: ethnic conflicts, riots and democratization

**Democracy and ethnic conflicts.** Another, somewhat less specific implication of our theory is that the risk of conflict is reduced by democracy (and in particular, by "non-fragile" democracy, see Section 4.3 above). We investigate this relationship in Appendix E, regressing several democracy variables on conflict measures. While we find no robust effect of democracy in general, we do find a statistically

Table 4: Type of democracy and tenure of leader in office – sample of democratic transitions

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Dependent variable: | | Dummy same leader as last year | | |
| Majoritarian democracy | 0.210* | 0.143* | 2.248 | 0.254* |
| | (0.111) | (0.076) | (1.445) | (0.127) |
| Data source regime type | IAEP | DES | IAEP | IAEP |
| Estimator | LPM | LPM | Logit | LPM |
| Decade fixed effects | Yes | Yes | Yes | Yes |
| Continent fixed effects | Yes | Yes | Yes | Yes |
| Control variables | No | No | No | Yes |
| Observations | 65 | 79 | 54 | 56 |
| (Pseudo-)R-squared | 0.234 | 0.236 | 0.183 | 0.294 |

Note: Panel with an observation being the country-year. The sample consists of transitions to democracy from 1949 to 2008, containing 53 countries. Decade fixed effects and continent fixed effects included in all columns. The controls in column 4 include lagged GDP per capita, lagged Population, lagged Trade share of GDP, and lagged age of democracy. LPM estimations in columns 1, 2, and 4, and logit in column 3. For coding the variable of majoritarian democracy, columns 1, 3 and 4 use data from the "Institutions and Elections Project" (IAEP) of Wig et al. (2015), while column 2 uses data from the "Democratic Electoral Systems" (DES) dataset of Bormann and Golder (2013). Robust standard errors in parenthesis. *=significant at the 10% level, **=significant at the 5% level, ***=significant at the 1% level.

Table 5: Type of democracy and tenure of leader in office – panel of democracies

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Dependent var.: | | Dummy same leader as last year | | |
| Majorit. demo. | -0.060 | -0.137 | 0.126** | 0.043 |
| | (0.058) | (0.090) | (0.057) | (0.068) |
| Transition to demo. | -0.559*** | -0.160 | -0.623*** | -0.278*** |
| | (0.060) | (0.098) | (0.044) | (0.080) |
| Majorit. * Transit. | 0.230** | 0.305* | 0.132 | 0.357*** |
| | (0.102) | (0.158) | (0.089) | (0.124) |
| Data source Majo. | | IAEP | | DES |
| Sample | All demo. (Cheibub) | All demo. & elec. yrs | All demo. (Cheibub) | All demo. & elec. yrs |
| Time dummies | Yes | Yes | Yes | Yes |
| Country fixed eff. | Yes | Yes | Yes | Yes |
| Observations | 2647 | 661 | 3646 | 748 |
| R-squared | 0.204 | 0.381 | 0.220 | 0.373 |

Note: Panel with an observation being the country-year, covering 132 countries and the years 1947-2008. LPM regressions in all columns. Country fixed effects, annual time dummies as well as lagged years in office of the leader included in all columns. For coding the variable of majoritarian democracy, columns 1-2 use data from the "Institutions and Elections Project" (IAEP) of Wig et al. (2015), while columns 3-4 use data from the "Democratic Electoral Systems" (DES) dataset of Bormann and Golder (2013). Robust standard errors clustered at the country level. t-stat in parenthesis. *=significant at the 10% level, **=significant at the 5% level, ***=significant at the 1% level.

significant conflict-reducing impact of mature, non-fragile democracy in particular. This is in line with the predictions of the model. These results hold for both general conflict, as well as for a more specific conflict measure closely linked to our theoretical setup, namely ethnic conflict over government.

**Riots, protests and democratization.** A prediction of our model extension on riots is that we expect democratization to be most likely following *intermediate* levels of riots, which enriches the traditional "window of opportunity" narrative, according to which more intense riots are monotonically associated

with a greater chance of democratization in times of economic turmoil (Aidt and Franck, 2015). We study this relationship in Appendix F, regressing new democratization on the number of riots (both as linear and squared term). We find indeed find a strong and robust positive association between intermediate levels of riots and new democratization.

# 6 Conclusion

In this paper we study the drivers of democratic transition when ethnic tensions are more salient than the poor/rich divide. We provide a simple model of conflict and democratic transition based on asymmetric information. In our set up, agents belong to one of two groups, each led by benevolent leaders: "the autocrat" in power (deciding on transfers) and the "opposition" (deciding on war). We assume that, for each group, both military and electoral mobilization capacities rest on the unobserved strengths of ethnic identities. Ethnic groups negotiate over the allocation of the economic surplus (e.g. natural resource management, public policies, taxation) and civil conflict is caused by a bargaining failure when the autocrat under-estimates the strength of its opponent. By eliciting information on electoral mobilization, free and fair elections restore efficiency of inter-ethnic bargaining and prevent conflict outbreaks. Democratic elections may thus be rationally chosen by autocrats, as elections reduce the informational rent of the opposition, at the risk of losing the elections.

Our informational theory of democratization generates new predictions on the institutional determinants of ethnic favoritism, as well as on power transition for ethnically divided countries. In particular, our setup explains two new empirical regularities that we document in a large sample of countries over the post-decolonization period. First we show that democratic transition toward a majoritarian system exacerbates ethnic favoritism. Indeed the elected leader of a majoritarian democracy can fully exploit the information revealed by the elections on the ethnic mobilisation of the opposition. Second, we highlight that incumbents have a higher probability of victory when an autocracy transits toward a majoritarian electoral system than a proportional representation. The intuition is that an autocrat proposing democracy will put in place a majoritarian system when she benefits from strong ethnic support and hence large winning chances; while a weak autocrat, under the threat of conflict, will prefer a proportional regime, allowing her to retain some decision power.

Our current contribution raises several additional questions that we left open for future research. One interesting avenue lies in the persistent consequences of initial constitutional choices which one may label the "founding figure" effect. As explained above, the relative balance of ethnic support for the autocrat determines the constitutional regime (proportional versus majoritarian) put in place during the democratic transition and this choice will typically persist for decades to come and determine a battery of future outcomes. Hence, the "critical juncture" of initial democratization may have lasting implications. This feature opens up the related question of ill-adapted institutions. For example, while

the democratizing autocrat may optimally choose a majoritarian system, a future change in the ethnic balance of power may induce later democratic leaders of the same country to be locked into this system while they would be better off under a proportional regime: Such a situation of "constitutional mismatch" may contribute to political deadlock. Again, the study of this could constitute a fruitful avenue for future research.

# References

[1] Acemoglu, Daron, and James Robinson, 2001, "A Theory of Political Transitions", *American Economic Review* 91: 938-963.

[2] Acemoglu, Daron, and James Robinson, 2006, *Economic origins of dictatorship and democracy*, Cambridge: Cambridge University Press.

[3] Acemoglu, Daron, Suresh Naidu, Pascual Restrepo, and James A. Robinson, 2015, "Democracy, Redistribution and Inequality", in Anthony B. Atkinson and Francois Bourguignon (eds.), *Handbook of Income Distribution* (Vol. 2), Amsterdam: Elsevier, Chapter 21.

[4] Acemoglu, Daron, and Alexander Wolitzky, 2014, "Cycles of Conflict: An Economic Model", *American Economic Review* 104: 1350-1367.

[5] Aidt, Toke S., and Raphael Franck, 2015, "Democratization under the Threat of Revolution: Evidence from the Great Reform Act of 1832", *Econometrica* 83: 505-547.

[6] Albertus, Michael, 2015, *Autocracy and Redistribution: The Politics of Land Reform*, Cambridge: Cambridge University Press.

[7] Alesina, Alberto, Arnaud Devleeschauwer, William Easterly, Sergio Kurlat, and Romain Wacziarg, 2003, "Fractionalization." *Journal of Economic Growth* 8: 155-194.

[8] Alesina, Alberto, Stelios Michalopoulos, and Elias Papaioannou, 2016, "Ethnic inequality." *Journal of Political Economy* 124: 428-488.

[9] Amodio, Francesco and Giorgio Chiovelli, 2018, "Ethnicity and Violence During Democratic Transitions: Evidence from South Africa", *Journal of the European Economic Association* 16: 1234-1280.

[10] Ansell, Ben and David Samuels, 2014, *Inequality and Democratization: An Elite-Competition Approach*, Cambridge: Cambridge University Press.

[11] Balcells, Laia, 2011, "Continuation of Politics by Two Means: Direct and Indirect Violence in Civil War", *Journal of Conflict Resolution* 55: 397-422.

[12] Barbera, Salvador, and Matthew O. Jackson, 2016, "A Model of Protests, Revolution, and Information", working paper, Stanford University.

[13] Besley, Timothy, and Torsten Persson, 2019, "Democratic Values and Institutions", *American Economic Review: Insights* 1: 59-76.

[14] Besley, Timothy, and Torsten Persson, 2011, "The logic of political violence", *Quarterly Journal of Economics* 126: 1411-1445.

[15] Besley, Timothy, Torsten Persson and Daniel Sturm, 2010, "Political Competition, Policy and Growth: Theory and Evidence from the United States", *Review of Economic Studies* 77: 1329-1352.

[16] Bidner, Chris, Patrick Francois, and Francesco Trebbi, 2015, "A Theory of Minimalist Democracy", working paper, UBC.

[17] Blaydes, Lisa, 2011, *Elections and Distributive Politics in Mubarak's Egypt*, Cambridge: Cambridge University Press.

[18] Bormann, Nils-Christian, and Matt Golder, 2013, "Democratic electoral systems around the world, 1946-2011" *Electoral Studies* 32: 360-369.

[19] Bryce, James, 1921, *Modern Democracies*, New York: Macmillan

[20] Burgess, Robin, Remi Jedwab, Edward Miguel, Ameet Morjaria, and Gerard Padró i Miquel, 2015, "The value of democracy: evidence from road building in Kenya." *American Economic Review* 105: 1817-51.

[21] Chacón, Mario, James A. Robinson, Ragnar Torvik, "When is Democracy an Equilibrium? Theory and Evidence from Colombia's La Violencia", *Journal of Conflict Resolution* 55: 366-396.

[22] Cederman, Lars Erik and Luc Girardin, 2007, "Beyond Fractionalization: Mapping Ethnicity onto Nationalist Insurgencies", *American Political Science Review* 101: 173-85.

[23] Chassang, Sylvain, and Gerard Padro i Miquel, 2009, "Economic Shocks and Civil War," *Quarterly Journal of Political Science* 4: 211-228.

[24] Cheibub, Jose Antonio, Jennifer Gandhi, and James Raymond Vreeland, 2010, "Democracy and dictatorship revisited", *Public Choice* 143: 67-101.

[25] Collier, Paul and Dominic Rohner, 2008, "Democracy, Development, and Conflict", *Journal of the European Economic Association* 6: 531-40.

[26] De Luca, Giacomo, Roland Hodler, Paul A. Raschky, and Michele Valsecchi, 2018, "Ethnic favoritism: An axiom of politics?", *Journal of Development Economics* 132: 115-129.

[27] De Tocqueville, Alexis, 2000 [1835], *Democracy in America*, Chicago, University of Chicago Press.

[28] Dunning, Thad, 2011, "Fighting and Voting: Violent Conflict and Electoral Politics", *Journal of Conflict Resolution* 55: 327-339.

[29] Durante, Ruben and Ekaterina Zhuravskaya, 2018, "Attack When the World Is Not Watching? US News and the Israeli-Palestinian Conflict", *Journal of Political Economy*, 126: 1085-1133.

[30] Easterly, William, and Ross Levine, 1997, "Africa's growth tragedy: policies and ethnic divisions", *Quarterly Journal of Economics* 112: 1203-1250.

[31] Esteban, Joan, and Debraj Ray, 2008, "On the salience of ethnic conflict", *American Economic Review* 98: 2185-2202.

[32] Esteban, Joan, Laura Mayoral and Debraj Ray, 2012, "Ethnicity and Conflict: An empirical Study", *American Economic Review* 102: 1302-42.

[33] Fearon, James, 1995, "Rationalist Explanations for War", *International Organization* 49: 379-414.

[34] Fearon, James, 2004, "Why Do Some Civil Wars Last So Much Longer than Others? ", *Journal of Peace Research* 41: 275-301.

[35] Fearon, James, 2011, "Self-enforcing Democracy", *Quarterly Journal of Economics* 126: 1661-1708.

[36] Fearon, James, and David Laitin, 2003, "Ethnicity, Insurgeny, and Civil War", *American Political Science Review*, 97: 75:90.

[37] Feenstra, Robert C., Robert Inklaar and Marcel P. Timmer (2015), "The Next Generation of the Penn World Table" *American Economic Review*, 105: 3150-3182, available for download at www.ggdc.net/pwt.

[38] Folch, Abel and Joseph Wright, 2010, "Dealing with tyranny: International sanctions and the survival of authoritarian rulers", *International Studies Quarterly* 54: 335-359.

[39] Fong, Christina M., and Erzo FP Luttmer, 2009. "What determines giving to Hurricane Katrina victims? Experimental evidence on racial group loyalty." *American Economic Journal: Applied Economics* 1: 64-87.

[40] Francois, Patrick, Ilia Rainer, and Francesco Trebbi, 2015, "How is Power Shared in Africa?", *Econometrica* 83: 465-503.

[41] Franck, Raphael, and Ilia Rainer, 2012, "Does the leader's ethnicity matter? Ethnic favoritism, education, and health in sub-Saharan Africa." *American Political Science Review* 106: 294-325.

[42] Girardin, Luc, Philipp Hunziker, Lars-Erik Cederman, Nils-Christian Bormann, and Manuel Vogt,. 2015, "GROWup - Geographical Research On War, Unified Platform", ETH Zurich. http://growup.ethz.ch/

[43] Gleditsch, Nils Petter, Peter Wallensteen, Mikael Eriksson, Margareta Sollenberg, and Håvard Strand, 2002, "Armed conflict 1946-2001: A new dataset", *Journal of Peace Research* 39: 615-637.

[44] Gurr, Ted, 1971, *Why men rebel*, Princeton NJ: Princeton University Press.

[45] Haggard, Stephan, and Robert R. Kaufman, 2012, "Inequality and regime change: Democratic transitions and the stability of democratic rule", *American Political Science Review* 106: 495-516.

[46] Hegre, Havard, Tanja Ellingsen, Scott Gates, and Nils Petter Gleditsch, 2001, "Toward a Democratic Civil Peace? Democracy, Political Change and Civil War 1816-1992", *American Political Science Review* 95: 33-48.

[47] Henderson, J. Vernon, Adam Storeygard, David N. Weil, 2012, "Measuring Economic Growth from Outer Space", *American Economic Review* 102: 994-1028

[48] Hoerner, Johannes, Massimo Morelli, and Francesco Squintani, 2015, "Mediation and Peace", *Review of Economic Studies* 82: 1483-1501.

[49] Horowitz, Donald L., 2000, *Ethnic Groups in Conflict*, (second edition), Berkeley: University of California Press.

[50] Huber, John D., and Pavithra Suryanarayan, 2016, "Ethnic inequality and the ethnification of political parties: Evidence from India." *World Politics* 68 : 149-188.

[51] Jackson, Matthew O. and Massimo Morelli, 2007, "Political Bias and War," *American Economic Review* 97: 1353-73.

[52] Kramon, Eric, and Daniel N. Posner, 2016, "Ethnic Favoritism in Education in Kenya." *Quarterly Journal of Political Science* 11: 1-58.

[53] Lindbeck, Assar, and Jorgen Weibull, 1987, "Balanced-budget redistribution as the outcome of political competition", *Public Choice* 52: 273-297.

[54] Londregan, John, Andrea Vindigni, 2008, "Authoritarian plebiscites." Princeton University. Unpublished manuscript.

[55] Luttmer, Erzo, 2001, "Group loyalty and the taste for redistribution." *Journal of Political Economy* 109: 500-528.

[56] Magaloni, Beatriz, 2006, *Voting for Autocracy: Hegemonic Party Survival and its Demise in Mexico*, Cambridge: Cambridge University Press.

[57] Malesky, Edmund and Paul Schuler, 2010, "Nodding or Needling: Analyzing Delegate Responsiveness in an Authoritarian Parliament", *American Political Science Review*, 104: 482:502

[58] Mann, Michael, 2005, *The Dark Side of Democracy: Explaining Ethnic Cleansing*, Cambridge: Cambridge University Press.

[59] Mansfield, Edward, and Jack Snyder, 2005, *Electing to Fight: Why Emerging Democracies Go to War*, Cambridge MA: MIT Press.

[60] Martin, Philippe, Thierry Mayer, and Mathias Thoenig, 2008, "Make Trade not War?", *Review of Economic Studies* 75: 865-900.

[61] Martin, Philippe, Thierry Mayer, and Mathias Thoenig, 2012, "The Geography of Conflicts and Regional Trade Agreements", *American Economic Journal: Macroeconomics*, 4: 1-35.

[62] Martinez-Bravo, Monica, Gerard Padró i Miquel, Nancy Qian, and Yang Yao, 2018, "The Rise and Fall of Local Elections in China: Theory and Empirical Evidence on the Autocrat's Trade-off", mimeo CEMFI.

[63] Meltzer, Allan H., and Scott F. Richard, 1981, "A rational theory of the size of government", *Journal of Political Economy* 89: 914-927.

[64] Michalopoulos, Stelios and Elias Papaioannou, 2013, "Pre-Colonial Ethnic Institutions and Contemporary African Development", *Econometrica*, 81: 113-152.

[65] Miguel, Edward, Shanker Satyanath and Ernest Sergenti, 2004, "Economic Shocks and Civil Conflict: An Instrumental Variables Approach", *Journal of Political Economy*, 112: 725-753.

[66] Miller, Michael, 2015, "Electoral Authoritarianism and Human Development", *Comparative Political Studies*, 48: 1526-1562.

[67] Montalvo, Jose G., and Marta Reynal-Querol, 2005, "Ethnic polarization, potential conflict, and civil wars." *American Economic Review* 95: 796-816.

[68] Moore, Barrington, 1966, *Social Origins of Dictatorship and Democracy: Lord and Peasant in the Making of the Modern World*, Boston, MA: Beacon Press.

[69] Morgenbesser, Lee, 2015, "In Search of Stability: Electoral Legitimation under Authoritarianism in Myanmar", *European Journal of East Asia Studies*, Vol. 14: 163-188.

[70] Mueller, Hannes and Dominic Rohner, 2018, "Can power-sharing foster peace? Evidence from Northern Ireland", *Economic Policy* 33: 447-484,

[71] NOAA (2014),"Image and data processing by NOAA's National Geophysical Data Center. DMSP data collected by US Air Force Weather Agency.","http://ngdc.noaa.gov/eog/dmsp.html"

[72] Olson, Mancur, 1993, "Dictatorship, Democracy, and Development," *American Political Science Review* 87: 567-576.

[73] Persson, Torsten, and Guido Tabellini, 2005, *The Economic Effects of Constitutions*, Cambridge MA: MIT Press.

[74] Polity IV, 2018, "Polity IV Project", Center for Systemic Peace.

[75] Posner, Daniel N., 2005, *Institutions and ethnic politics in Africa*, Cambridge: Cambridge University Press.

[76] Powell, Robert, 2006, "War as a Commitment Problem", *International Organization* 60: 169-203.

[77] Przeworski, Adam, 2009, "The Mechanics of Regime Instability in Latin America", *Journal of Politics in Latin America*, 1: 5-36.

[78] Putnam, Robert, 1993, *Making Democracy Work: Civic Traditions in Modern Italy*, Princeton NJ: Princeton University Press.

[79] Reynal-Querol, Marta, 2002, "Ethnicity, Political Systems, and Civil War", *Journal of Conflict Resolution* 46: 29-54.

[80] Rohner, Dominic, 2011, "Reputation, Group Structure and Social Tensions", *Journal of Development Economics* 96: 188-199.

[81] Rohner, Dominic, Mathias Thoenig, and Fabrizio Zilibotti, 2013, "War Signals: A Theory of Trade, Trust and Conflict", *Review of Economic Studies* 80: 1114-1147.

[82] Saideman, Stephen, David Lanoue, Michael Campenni and Samuel Stanton, 2002, "Democratization, Political Institutions, and Ethnic Conflict: A Pooled Time-Series Analysis, 1985-1998", *Comparative Political Studies* 35: 103-29.

[83] Sartori, Giovanni, 1976, *Parties and Party Systems*. Cambridge: Cambridge University Press.

[84] Sartori, Giovanni, 2005, *Parties and Party Systems: A Framework for Analysis*, London: ECPR Press.

[85] Simmel, Georg, 1950, *The Sociology of Georg Simmel*, Glencoe, Ill.: Free Press.

[86] Snyder, Jack, 2000, *From Voting to Violence: Democratization and Nationalist Conflict*, New York: Norton.

[87] Staveley, E.S., 1972, *Greek and Roman Voting and Elections*, Ithaca NY: Cornell University Press.

[88] Stichnoth, Holger, and Karine Van der Straeten, 2013. "Ethnic diversity, public spending, and individual support for the welfare state: A review of the empirical literature." *Journal of Economic Surveys* 27: 364-389.

[89] Sunde, Uwe, and Matteo Cervellati, 2014, "Democratizing for peace? The effect of democratization on civil conflicts",*Oxford Economic Papers* 66: 774-797.

[90] Teorell, Jan, Stefan Dahlberg, Soren Holmberg, Bo Rothstein, Anna Khomenko and Richard Svensson, 2017, "The Quality of Government Standard Dataset", version Jan17. University of Gothenburg: The Quality of Government Institute, http://www.qog.pol.gu.se doi:10.18157/QoGStdJan17

[91] Vogt, Manuel, Nils-Christian Bormann, Seraina Rüegger, Lars-Erik Cederman, Philipp Hunziker, and Luc Girardin, 2015, "Integrating data on ethnicity, geography, and conflict: The ethnic power relations data set family", *Journal of Conflict Resolution* 59: 1327-1342.

[92] Waldner, David and Ellen Lust, 2018, "Unwelcome Change: Coming to Terms with Democratic Backsliding", *Annual Review of Political Science*, 21: 93-113.

[93] Wallace, Jeremy, 2016, "Juking the Stats? Authoritarian Information Problems in China", *British Journal of Political Science*, 46: 11-29.

[94] Wig, Tore, Håvard Hegre, and Patrick M. Regan, 2015, "Updated data on institutions and elections 1960–2012: presenting the IAEP dataset version 2.0." *Research and Politics* 2: Published online.

[95] Wintrobe, Ronald, 1990, "The Tinpot and the Totalitarian: An Economic Theory of Dictatorship", *American Political Science Review*, 84: 849-872

[96] Wintrobe, Ronald, 1998, *The Political Economy of Dictatorship*, New York: Cambridge University Press.

[97] World Bank. (2016). "World development indicators", Washington DC: The World Bank.

[98] Wright, Joseph, 2008, "Political Competition and Democratic Stability in New Democracies",*British Journal of Poltical Science* 38: 221-245.

# Ethnic Conflicts and the Informational Dividend of Democracy
## Online Appendix

November 23, 2019

Jeremy LAURENT-LUCCHETTI[1]     Dominic ROHNER[2]     Mathias THOENIG[3]

---

[1]Department of Economics, University of Geneva. E-mail: Jeremy.Lucchetti@unige.ch.
[2]Department of Economics, University of Lausanne and CEPR. E-mail: dominic.rohner@unil.ch.
[3]Department of Economics, University of Lausanne and CEPR. E-mail: mathias.thoenig@unil.ch.

# A  Appendix: Theory

## A.1  War mobilization

**Constrained mobilization.**  We here show that $\mathcal{E} < \frac{\phi}{2}$ leads to an army size lowers than the uncon-strained army size $\texttt{army}^*_G = \min(\frac{1}{2\phi}, 1)$. First, notice that $\texttt{army}^*_G = 1$ when $\phi < \frac{1}{2}$ and $\texttt{army}^*_G = \frac{1}{2\phi}$ otherwise. Furthermore, recall that $\texttt{army}_G = 1 + \theta_G - \phi \times \left(\frac{1+\theta_G}{2+\theta_G+\theta_{-G}}\right)$. Hence, when $\phi < \frac{1}{2}$, the biggest army size is realized when a " $+$ " fights a " $+$ " and is equal to

$$\texttt{army}^{+,+}_G = 1 + \mathcal{E} - \phi\left(\frac{1}{2}\right)$$

which is lower than 1 if $\mathcal{E} < \frac{\phi}{2}$. When $\phi > \frac{1}{2}$, this condition becomes $\mathcal{E} < \frac{1+\phi^2-2\phi}{2\phi}$. As will become clear below, this last condition also relies on $\phi < 2 - \sqrt{2}$ so that the baseline ordering of expected war payoffs holds.

**Ordering of expected war payoffs.**  Assuming that $\phi$ is not too high (i.e. $\phi < 2 - \sqrt{2}$), the following set of inequalities holds:

$$\mathcal{W}^{-+} = \frac{1-\mathcal{E}}{2}\left[2 - \phi\left(2 - \phi\right)\right] < \mathcal{W}^{++} = \frac{1}{2}\left[2 - \phi\left(2(1 + \mathcal{E}) - \phi\right)\right]$$

which is true as long as $2 - \phi(2 - \phi) > 2\phi$, hence if $1 - \phi(1 - \frac{\phi}{2}) - \phi > 0$, implying $\phi < 2 - \sqrt{2}$. Similarly,

$$\mathcal{W}^{++} = \frac{1}{2}\left[2 - \phi\left(2(1 + \mathcal{E}) - \phi\right)\right] < \mathcal{W}^{--} = \frac{1}{2}\left[2 - \phi\left(2(1 - \mathcal{E}) - \phi\right)\right]$$

and, finally,

$$\mathcal{W}^{--} = \frac{1}{2}\left[2 - \phi\left(2(1 - \mathcal{E}) - \phi\right)\right] < \mathcal{W}^{+-} = \frac{1+\mathcal{E}}{2}\left[2 - \phi\left(2 - \phi\right)\right]$$

which also holds as long as $2 - \phi(2 - \phi) > 2\phi$, hence $\phi < 2 - \sqrt{2}$

## A.2  Political Mobilization

**Revealing elections.**  We here highlight that $\mathcal{E} > \frac{1}{v2\rho}$ guarantees both perfectly revealing elections and non-ambiguous electoral outcome. In order for $A$ to perfectly learn $B$'s mobilization capacity from vote shares, we need the vote share of $A^+$ facing $B^+$ to be strictly lower than $A^+$ facing $B^-$ *for all possible (non-observable) preference shock $\tilde{p}$*. Consequently, we want the vote shares of a strong A facing a strong B under the most beneficial preference shock to be lower than the vote share of a strong A facing a weak B under the most adverse shock. Using equation 6 and recalling that $\tilde{p}$ is uniformly distributed over $[-\frac{1}{4\rho}, \frac{1}{4\rho}]$, perfect revelation thus requires

$$\frac{1}{2} + \frac{1}{4\rho} < \frac{1}{2} + v\mathcal{E} - \frac{1}{4\rho} \tag{17}$$

where the left hand side of the inequality denotes the vote shares of $A^+$ facing a $B^-$ under the most beneficial shock possible, and the right hand side corresponds to the vote shares of an $A^+$ facing a $B^+$ under the most adverse shock possible. Hence,

$$\mathcal{E} > \frac{1}{v2\rho} \tag{18}$$

which was to be shown.

**Non-ambiguous electoral outcomes.** Non-ambiguous voting requires that:

$$\tilde{s}_A = \begin{cases} 1 - v\mathcal{E} - \tilde{p} < \frac{1}{2}, & \text{if } \theta_A < \theta_B \\ 1/2 - \tilde{p} = \frac{1}{2}, & \text{if } \theta_A = \theta_B \\ 1 + v\mathcal{E} - \tilde{p} > \frac{1}{2}, & \text{if } \theta_A > \theta_B \end{cases} \tag{19}$$

We thus can easily see that $1 + v\mathcal{E} - \tilde{p} > \frac{1}{2}$ should be true under the most adverse preference shock that can affect $A$, i.e. when $\tilde{p} = \frac{1}{4\rho}$: this implies $\mathcal{E} > \frac{1}{v4\rho}$. Notice that this condition is implied by the previous one on perfect revelation.

**Democratic transition with high destructive war.** We here show that highly destructive war destroys all incentives for democratization. Specifically, we assume here that $\phi \approx 1$: the opportunity cost of war is so high that few productive resources are left after the conflict. Recalling that the expected war payoff is

$$\mathcal{W}^{G,-G} \equiv \mathbb{E}[W_G|\text{war}, \theta_G, \theta_{-G}] = \frac{1 + \theta_G}{2 + \theta_G + \theta_{-G}} \times [2 - \phi \times (2 + \theta_G + \theta_{-G} - \phi)] \tag{20}$$

we first show that the ordering of war payoffs reverts with respect to the baseline set up:

$$\mathcal{W}^{++} < \mathcal{W}^{-+} < \mathcal{W}^{+-} < \mathcal{W}^{--}$$

We can directly infer from section A.1 that if $\phi \approx 1$, the following set of inequalities holds

$$\mathcal{W}^{++} = \frac{1}{2}[2 - \phi(2(1 + \mathcal{E}) - \phi)] < \mathcal{W}^{-+} = \frac{1 - \mathcal{E}}{2}[2 - \phi(2 - \phi)]$$

which is true as long as $2 - \phi(2 - \phi) < \phi$, hence $\phi > 2 - \sqrt{2}$. Similarly,

Figure A.1: Highly destructive war: no incentive to democratize
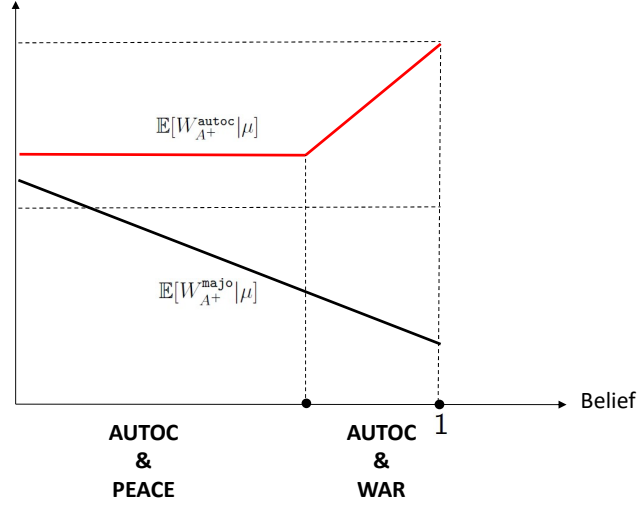


$$\mathcal{W}^{-+} = \frac{1-\mathcal{E}}{2}\left[2 - \phi\left(2 - \phi\right)\right] < \mathcal{W}^{+-} = \frac{1+\mathcal{E}}{2}\left[2 - \phi\left(2 - \phi\right)\right]$$

and, finally,

$$\mathcal{W}^{+-} = \frac{1+\mathcal{E}}{2}\left[2 - \phi\left(2 - \phi\right)\right] < \mathcal{W}^{--} = \frac{1}{2}\left[2 - \phi\left(2(1 - \mathcal{E}) - \phi\right)\right]$$

which is also true as long as $2 - \phi(2 - \phi) < \phi$, hence $\phi > 2 - \sqrt{2}$.

Consequently, to maintain Peace, the Autocrat $A^+$ must compensate more a $B^-$ than a $B^+$: $2 - \mathcal{W}^{-+}$ $< 2 - \mathcal{W}^{++}$. Figure A.1 illustrates that this change in the ordering of war payoffs reverses the optimal pacification strategy of the autocrat: she extracts a low amount for low belief $(1 - \mathtt{tax} = \mathcal{W}^{-+})$ and increases her ethnic favoritism for higher belief, thus risking war against a $B^-$ $(1 - \mathtt{tax} = \mathcal{W}^{++})$. In this situation the majoritarian payoff is dominated by the autocratic payoff for all beliefs and $A$ never proposes elections because the informational rent has no value.

## A.3   Social unrest

We here show that $B$ always starts a riot if $\mu > \underline{\mu}$ in times of turmoil. First, recall that in normal times there are no informational incentives for the leader of group $B$ to start a riot, because her expected payoff of learning her type would be the same as the one already obtained from A transferring exactly her expected war payoff $\mathcal{W}^{\mathbb{E}(G),+} = \mu(\mathcal{W}^{++}) + (1 - \mu)(\mathcal{W}^{-+})$. Hence, if a riot starts, it should be in times of turmoil where $A$ does not observe the group income shock $c_B$.

In times of turmoil, we denote by $z$ the probability (conditional on type) of observing a "non-

ambiguous" number of protesters, i.e. a mass of protesters such that $A$ can exactly infer the type of $B$. Notice that, due to the distributional assumption, this probability is the same for $B^+$ and $B^-$. Hence, with probability $z$, $A$ discovers $B$'s type after a protest and with a probability $1 - z$ only $B$ discovers her type (leading to our baseline framework with asymmetric information).

**Case 1:** $\mu < \underline{\mu}$. In this situation, if a riot takes place, the leader faces two alternatives: (i) either the number of protesters is such that she cannot infer the type of $B$ (which happens with probability $(1-z)$), in which case she sets the `tax` to its *highest* value and faces a war if $B$ discovers she has a strong ethnic identity (ii) either she discovers $B$'s type along with $B$ and sets the `tax` just avoiding war (this happens with probability $z$). It is immediate to see that the expected payoff of group $B$ in case of riot:

$$\mathbb{E}[W_B^{\texttt{Riot=1}}|A^+] = \mu\left[z(\mathcal{W}^{++}) + (1-z)(\mathcal{W}^{++})\right] + (1-\mu)\left[z(\mathcal{W}^{-+}) + (1-z)(\mathcal{W}^{-+})\right] \qquad (21)$$

is equivalent to the payoff in total uncertainty (no riot):

$$\mathbb{E}[W_B^{\texttt{Riot=0}}|A^+] = \mu\left[\mathcal{W}^{++}\right] + (1-\mu)\left[\mathcal{W}^{-+}\right] \qquad (22)$$

implying that $B$ has no incentive to start a protest.

**Case 2:** $\mu > \underline{\mu}$. If a riot takes place, the leader faces two alternatives: (i) either the number of protesters is such that she cannot infer the type of $B$, in which case she sets the `tax` to its *lowest* value (ii) either she discovers $B$'s type along with $B$ and sets the `tax` just avoiding war:

$$\mathbb{E}[W_B^{\texttt{Riot=1}}|A^+] = \mu\left[z(\mathcal{W}^{++}) + (1-z)(\mathcal{W}^{++})\right] + (1-\mu)\left[z(\mathcal{W}^{-+}) + (1-z)(\mathcal{W}^{++})\right] \qquad (23)$$

which is higher than the payoff obtained in uncertainty for $B$ (equation 22) because $A$ will set a lower `tax` in case of asymmetric information in order to avoid war, thus bringing informational rents to a $B^-$. $B$ thus has incentive to foment social unrest and potentially obtains an informational rent.

**Case 3:** $\underline{\mu} < \mu < \overline{\mu}$. Here, if a riot takes place, the leader faces two alternatives: (i) either the number of protesters is such that she cannot infer the type of $B$ and she offers majoritarian elections (ii) either she discovers $B$'s type along with $B$ and sets the `tax` just avoiding war:

$$\mathbb{E}[W_B^{\texttt{R=1}}|A^+] = \mu\left[z(\mathcal{W}^{++}) + (1-z)(1)\right] + (1-\mu)\left[z(\mathcal{W}^{-+}) + (1-z)(\mathcal{W}^{-+})\right] \qquad (24)$$

which is higher than the payoff obtained in uncertainty for $B$, because $A$ will offer elections in case of asymmetric information, thus bringing a higher payoff to a strong B (1 instead of $\mathcal{W}^{++}$) when $(1-z)$ realizes. For this range of belief as well, $B$ has incentive to foment social unrest in order to obtain an informational rent if the election cost is not too high.

We conclude this section by showing that $A^+$ has a higher expected payoff if $B$ does not know her type than in the asymmetric information case. $A^+$ thus has incentives to deter social unrest.

**Case 1: $\underline{\mu} < \mu < \overline{\mu}$.** Here, the expected payoff of $A$ when a riot starts is

$$\mathbb{E}[W_{A^+}^{\texttt{Riot=1}}|\mu] = \mu\left[z(2-\mathcal{W}^{++}) + (1-z)(1)\right] + (1-\mu)\left[z(2-\mathcal{W}^{-+}) + (1-z)(2-\mathcal{W}^{-+})\right] \tag{25}$$

which is lower than the payoff obtained without any protest $(\mathbb{E}[W_{A^+}^{\texttt{Riot=0}}|\mu] = 2 - \mathcal{W}^{\mathbb{E}(G),+})$, because $A$ has to offer elections when asymmetric information realizes. $A$ thus has incentives to deter protests in this range of belief to preclude $B$ obtaining an information rent and, consequently, elections.

**Case 2: $\mu > \overline{\mu}$.** Finally, if a riot takes place in this situation the expected payoff of $A$ when a riot starts is

$$\mathbb{E}[W_{A^+}^{\texttt{Riot=1}}|\mu] = \mu\left[z(2-\mathcal{W}^{++}) + (1-z)(2-\mathcal{W}^{++})\right] + (1-\mu)\left[z(2-\mathcal{W}^{-+}) + (1-z)(2-\mathcal{W}^{++})\right] \tag{26}$$

which is lower than the payoff obtained without any protest because $A$ gives a high transfer to a $B^-$ when $(1-z)$ realizes. Hence, here as well $A$ has incentives to deter protests to preclude $B$ obtaining an information rent.

## A.4   Dynamic model

**Window of opportunity and the autocrat decision.**   The presence of the "window of opportunity" impacts the optimal pacification strategy and the various belief thresholds at which the autocrat switches decisions. In particular, $1 - \texttt{tax} = 0$ dominates $1 - \texttt{tax} = \mathcal{W}^{-+}$ when $q < \overline{q} = \frac{\mathcal{W}^{-+}}{2-\mathcal{W}^{+-}-\mu(2-\mathcal{W}^{+-}-\mathcal{W}^{-+})}$ and $\mu < \hat{\mu}$; while $1 - \texttt{tax} = 0$ dominates $1 - \texttt{tax} = \mathcal{W}^{++}$ when $q < \overline{\overline{q}} = \frac{\mathcal{W}^{++}}{2-\mathcal{W}^{+-}-\mu(\mathcal{W}^{++}-\mathcal{W}^{+-})}$ and $\mu > \hat{\mu}$ (where $\hat{\mu} = \frac{\mathcal{W}^{++}-\mathcal{W}^{-+}}{q(2-\mathcal{W}^{++}-\mathcal{W}^{-+})}$).

**Window of opportunity and revealing elections.**   Assuming first perfectly revealing elections—$d = 0$, no overlap in vote shares—we will observe no democratization when $q < \overline{q}$ for $\mu = 1$ and $q < \overline{\overline{q}}$ for $\mu = 0$. The reason is that $1 - \texttt{tax} = 0$ dominates the other taxation strategies for this constellation of parameters: the autocrat is better off keeping all the resource for herself, irrespective of the type of her opponent. The autocrat has thus no incentives to risk losing power through an election because information has no value in this situation. In contrast, democratization is possible when $q > \frac{1-\mathcal{W}^{-+}+\frac{c_E}{\mu}}{2-\mathcal{W}^{++}-\mathcal{W}^{-+}}$,

$q > \bar{q}$ for $\mu = 1$ and $q > \bar{\bar{q}}$ for $\mu = 0$. This insures that both $1 - \texttt{tax} = \mathcal{W}^{++}$ and $1 - \texttt{tax} = \mathcal{W}^{-+}$ dominate $1 - \texttt{tax} = 0$ after the elections (when information is revealed).

**Window of opportunity and non-revealing elections.** The probability $d$ of ending in non-revealing elections (overlapping of vote shares) is also playing against democratization. In particular, when $d > 0$, democratization is only possible when the probability of having a window of opportunity is sufficiently large, e.g. $q > \frac{1-\mathcal{W}^{-+}+d(1-\mathcal{W}^{-+})+\frac{c_E}{\mu}}{2-\mathcal{W}^{++}-\mathcal{W}^{-+}}$, as well as $q > \bar{q}$ for $\mu = 1$ and $q > \bar{\bar{q}}$ for $\mu = 0$ (ensuring that $1 - \texttt{tax} = \mathcal{W}^{++}$ and $1 - \texttt{tax} = \mathcal{W}^{-+}$ dominates $1 - \texttt{tax} = 0$ after revealing elections).

# B    Descriptive statistics

Below are presented in Table A.1 the descriptive summary statistics for the data used in the empirical investigations. To comment on some of the particularly interesting numbers displayed we can first focus on RGR. As expected, the ruling group rent share per capita lies slightly above 0.5, consistent with on average some general ethnic favoritism. In the second panel we see as expected that government change is actually quite rare and even rarer are transitions to democracy. Further, elections occur in democracies on average every four years, as expected.

The third panel reveals that while general conflicts take place in roughly 16 percent of country years, the specific ethnic conflicts over government are substantially rarer (3 percent of country years). The lower numbers for onsets reflect the fact that most conflicts carry on for several years. Furthermore, the fourth panel shows that on average a country has a riot every second year, but that there is –as expected– a huge heterogeneity between countries.

Moreover, the next panel points out that about every second country can be classified as democracy, and that proportional democracies are roughly twice as common than majoritarian ones. Further, the penultimate panel displays summary statistics for control variables and measures used for sample restriction.

Finally, the last panel is devoted to the summary statistics for the ethnic group level data. One striking feature is that the overall likelihood of being co-ethnics of the leader is only slightly above 5 percent (and incidentally, also the average change in government access status for an average ethnic group is very small, namely 0.5 percent).

# C    Appendix Figures and Tables on the impact of democracy on the ruling group rent

Below we shall carry out a series of robustness checks with respect to the analysis of subsections 5.2 and 5.3 in the main text. First of all, Appendix Table A.2 below replicates the baseline Table 1, following exactly

Table A.1: Descriptive summary statistics

| Variable | N | mean | sd | min | max |
|---|---|---|---|---|---|
| RGR variables | | | | | |
| RGR | 2043 | .53 | .16 | .07 | .99 |
| RGR corr. | 2043 | .58 | .16 | .07 | .99 |
| RGR (with total night light) | 2760 | .84 | .21 | 0 | 1 |
| Government tenure variables | | | | | |
| Same head | 8908 | .82 | .38 | 0 | 1 |
| New democ. | 9115 | .012 | .11 | 0 | 1 |
| Election year | 5759 | .27 | .44 | 0 | 1 |
| Conflict variables | | | | | |
| Incid. ethnic gov. conflict | 8752 | .032 | .18 | 0 | 1 |
| Incid. conflict | 8752 | .16 | .37 | 0 | 1 |
| Onset ethnic gov. conflict | 8421 | .0071 | .084 | 0 | 1 |
| Onset conflict | 7162 | .029 | .17 | 0 | 1 |
| Riot variables | | | | | |
| Riots | 10369 | .52 | 1.9 | 0 | 55 |
| Riots (squared) | 10369 | 4 | 48 | 0 | 3025 |
| Democracy variables | | | | | |
| Polity IV continuous | 9213 | .66 | 7.5 | -10 | 10 |
| Polity IV dummy (above 0) | 9213 | .49 | .5 | 0 | 1 |
| Polity IV dummy (above 8) | 9213 | .24 | .43 | 0 | 1 |
| Democracy dummy (Cheibub et al.) | 9115 | .44 | .5 | 0 | 1 |
| Proport. Democ (IAEP) | 7774 | .24 | .43 | 0 | 1 |
| Majorit. Democ (IAEP) | 7774 | .1 | .3 | 0 | 1 |
| Proport. Democ (DES) | 8786 | .26 | .44 | 0 | 1 |
| Majorit. Democ (DES) | 8786 | .16 | .36 | 0 | 1 |
| Further variables | | | | | |
| Population | 8284 | 33 | 118 | .041 | 1369 |
| GDP per capita | 8284 | 12677 | 19012 | 162 | 227239 |
| Age democ. | 14206 | 28 | 43 | 0 | 216 |
| Trade per GDP | 7965 | 76 | 49 | .021 | 532 |
| Ratio population | 7183 | .79 | .25 | 0 | 1 |
| Ratio area | 7183 | .73 | .29 | 0 | 1 |
| Ethnic fractionaliz. continuous | 10012 | .44 | .26 | 0 | .93 |
| High frac. dummy | 10012 | .44 | .5 | 0 | 1 |
| Ever new democracy | 13987 | .36 | .48 | 0 | 1 |
| No change gov. group in transition | 14207 | .045 | .21 | 0 | 1 |
| Ethnic group data | | | | | |
| Nighttime light | 148079 | -2.5 | 2.5 | -4.6 | 4.1 |
| Leader * Demo. PR | 120753 | .024 | .13 | 0 | 1 |
| Leader * Demo. Majo | 120753 | .015 | .088 | 0 | 1 |
| Leader * Non Demo. | 141196 | .014 | .1 | 0 | 1 |

Note: Data sources described in section 5.1 of the main text.

the same structure as its col. 1-5, but controlling for our standard battery of country controls, namely GDP per capita, Population, Trade share of GDP and Age of democracy. The results are extremely close. Similarly, in the following Appendix Table A.3 we replicate analogously the findings of the second main text table 2, but including the same aforementioned battery of four country controls.

Table A.2: Democracy and Ethnic Favoritism - Country-level - with control variables

| Dependent variable: | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| | | | ruling group rent (RGR) | | |
| Democracy (t-1) | 0.007* | 0.078* | | 0.068 | |
| | (0.004) | (0.042) | | (0.042) | |
| Proport. democ. (t-1) | | | 0.056* | | 0.037 |
| | | | (0.029) | | (0.031) |
| Majorit. democ. (t-1) | | | 0.116* | | 0.121** |
| | | | (0.061) | | (0.060) |
| Democracy measures | Polity IV cont. | Polity IV dummy | | Cheibub et al. | |
| Time dummies | Yes | Yes | Yes | Yes | Yes |
| Country fixed effects | Yes | Yes | Yes | Yes | Yes |
| Additional controls | Yes | Yes | Yes | Yes | Yes |
| Observations | 1809 | 1809 | 1783 | 1568 | 1556 |
| R-squared | 0.804 | 0.805 | 0.810 | 0.825 | 0.829 |

Note: Panel with an observation being the country-year, covering 136 countries and the years 1992-2009. All explanatory variables lagged by one year. Country fixed effects, annual time dummies, GDP per capita, Population, Trade share of GDP and Age of democracy included in all columns. Robust standard errors clustered at the country level. t-stat in parenthesis. *=significant at the 10% level, **=significant at the 5% level, ***=significant at the 1% level.

Table A.3: Democracy and ruling group rent (RGR) - restricted subsamples - with controls

| Dependent variable: | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | | | | ruling group rent (RGR) | | |
| Sample | Low Eth. Frac. (EF) | High EF | High EF & New gov. | High EF & Same gov. last period | Cou. new dem. & same gov. & high EF | Same gr. gov. tra. & same gov. & high EF |
| Proport. democ. (t-1) | -0.040* | 0.003 | -0.060 | 0.008 | 0.010 | 0.015 |
| | (0.021) | (0.033) | (0.048) | (0.031) | (0.033) | (0.025) |
| Majorit. democ. (t-1) | -0.062** | 0.182** | 0.029 | 0.189** | 0.182** | 0.252*** |
| | (0.027) | (0.078) | (0.045) | (0.076) | (0.077) | (0.091) |
| Democracy measures | | | | Cheibub et al. | | |
| Time dummies | Yes | Yes | Yes | Yes | Yes | Yes |
| Country fixed effects | Yes | Yes | Yes | Yes | Yes | Yes |
| Control variables | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 845 | 708 | 122 | 552 | 271 | 483 |
| R-squared | 0.937 | 0.797 | 0.878 | 0.842 | 0.829 | 0.855 |

Note: Panel with an observation being the country-year, covering 136 countries and the years 1992-2009. All explanatory variables lagged by one year. Country fixed effects, annual time dummies and GDP per capita, Population, Trade share of GDP and Age of democracy included in all columns. In column 1 (resp., 2) the sample is restricted to countries with below-median (resp., above-median) ethnic fractionalization. In column 3 (resp., 4) the sample is restricted to observations with high EF and with a new leader accessing power (resp., last period's leader remaining in office). In column 5 the sample is restricted to countries which over the sample period had at least one instance of transition to democracy, which have last period's leader remaining in office and which have above-median ethnic fractionalization. In column 6 the sample is restricted to countries with above-median ethnic fractionalization and to observations with last period's leader remaining in office, and also excludes countries that had a change in the ethnic group composition of government in the year of transition to democracy or in the first year after transition. Robust standard errors clustered at the country level. t-stat in parenthesis. *=significant at the 10% level, **=significant at the 5% level, ***=significant at the 1% level.

Further, Appendix Table A.4 performs robustness checks with respect to the construction of the dependent variable. In the first four columns the ruling group rent is constructed analogously as for our main measure but using a corrected variant of the night light measure accounting for overlapping ethnic

group homelands. In contrast, in columns 5-8 we use again the main night light measure, but focus on the ratio of *total* night light (not per capita) of the government groups over aggregated night light. In this flexible specification we further control for the ratio of government population over total population, as well as for area occupied by government groups divided by total area of the country (in order to account for the possibility that larger groups are both more likely to win a majoritarian election and exerts ethnic favoritism). We find that in all columns our baseline results continue to hold.

Moreover, in Appendix Table A.5 we replicate the key results of Tables 1 and 2 but drawing on the measure of majoritarian representation of the "Democratic Electoral Systems" (DES) dataset of Bormann and Golder (2013) instead of the "Institutions and Elections Project" (IAEP) data of Wig et al. (2015) to assess the sensitivity to particular coding decisions on electoral systems. Our results are robust to this different institutional measure.

A further robustness check is performed in Appendix Table A.6 where we include continent-year fixed effects which allows to filter out continent-wide shocks, such as e.g. the beginning of the Second Congo War or the dissolution of the Soviet Union (events that may impact both democratization and rise in ethnic favoritism). While the statistical significance is somewhat reduced in some specifications, we find that overall the results are qualitatively similar to the ones reported in the baseline Table 1.

In Appendix Table A.7 we distinguish continents for which our setting is more likely to apply. In particular, we classify continents along 2 characteristics: the share of pre-sample years (1946-1991) with ethnic civil conflicts (from Gleditsch et al., 2002), as well as ethnic fractionalization (from Alesina et al., 2003).[4] Visual inspection suggests that one can classify continents into three baskets: Africa and Asia (with high levels of past ethnic conflict and high ethnic fractionalization), Australia/Oceania and Europe (with low levels of past ethnic conflict and low ethnic fractionalization), and North-, Central- and South-America (with low levels of past ethnic conflict but high ethnic fractionalization). When splitting the sample in these three categories, we find that –as expected– Africa and Asia drive our results, which is reassuring given that in these two continents there is the highest historical incidence of ethnic conflict and there are important levels of ethnic heterogeneity.

Finally, we present below also one robustness table for the analysis at the disaggregate ethnic group level. In particular, Appendix Table A.8 starts from the specifications of Table 3 of the main text, but performs even more radical sample restrictions. In columns 1-3 we focus on observations that are within a 7 year window around transition to democracy, with column 2 in addition requiring the leadership status of a group to be unchanged with respect to the previous year, while in column 3 an observation is only included in the sample when the leadership status has been unaltered for 7 years. Hence in this specification we can remove composition effects, and the change in economic activity of a given group only reflects a change in transfers around democratization when the groups in power are unchanged. Columns

---

[4]Our data cover Africa (AF), Australia and Oceania (AO), Asia (AS), Europe (EU), North- and Central America (NA), and South America (SA) and the average values of these two measures for the different continents are displayed in the Appendix Figure A.2.

4-6 (columns 7-9) implement the analogous specification, but restricted to 5 years (3 years) around new democratic elections. In all these specifications we find that only the coefficient of $Leader_{eit} \times Majo.Democracy_{ct}$ is quantitatively large and statistically significant. It turns out that in Appendix Table A.8 the difference between the coefficients of $Leader_{eit} \times Majo.Democracy_{ct}$ and $Leader_{eit} \times Prop.Democracy_{ct}$ is in most columns statistically significant (see t-stat p-values in Table A.8 for details).

Table A.4: Democracy and alternative measures of the ruling group rent (RGR)

| Dependent variable: | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | RGR corrected for overlapping groups | | | | RGR with total night light (not per capita) | | | |
| Democracy (t-1) | 0.006* | 0.007* | | | 0.003* | 0.003** | | |
| | (0.003) | (0.004) | | | (0.001) | (0.002) | | |
| Proport. democ. (t-1) | | | 0.026 | 0.032 | | | 0.001 | 0.010 |
| | | | (0.027) | (0.030) | | | (0.018) | (0.015) |
| Majorit. democ. (t-1) | | | 0.117* | 0.115* | | | 0.050** | 0.050*** |
| | | | (0.062) | (0.062) | | | (0.020) | (0.018) |
| Democracy measures | Polity IV continuous | | Cheibub et al. | | Polity IV continuous | | Cheibub et al. | |
| Time dummies | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Country fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Control variables | No | Yes | No | Yes | No | Yes | No | Yes |
| Control pop & area share | No | No | No | No | Yes | Yes | Yes | Yes |
| Observations | 1993 | 1809 | 1732 | 1556 | 2682 | 2444 | 2328 | 2104 |
| R-squared | 0.808 | 0.820 | 0.832 | 0.846 | 0.957 | 0.960 | 0.962 | 0.965 |

Note: Panel with an observation being the country-year, covering 116 countries and the years 1992-2009. All explanatory variables lagged by one year. Country fixed effects and annual time dummies included in all columns. The controls included in columns 2, 4, 6 and 8 include GDP per capita, Population, Trade share of GDP and Age of democracy. Columns 1-2 and 5-6 of the current table replicate columns 1-2 of Table 1, while columns 3-4 and 7-8 correspond to columns 7-8 of Table 1. Robust standard errors clustered at the country level. t-stat in parenthesis. *=significant at the 10% level, **=significant at the 5% level, ***=significant at the 1% level.

Figure A.2: Ethnic conflict and fractionalization by continent
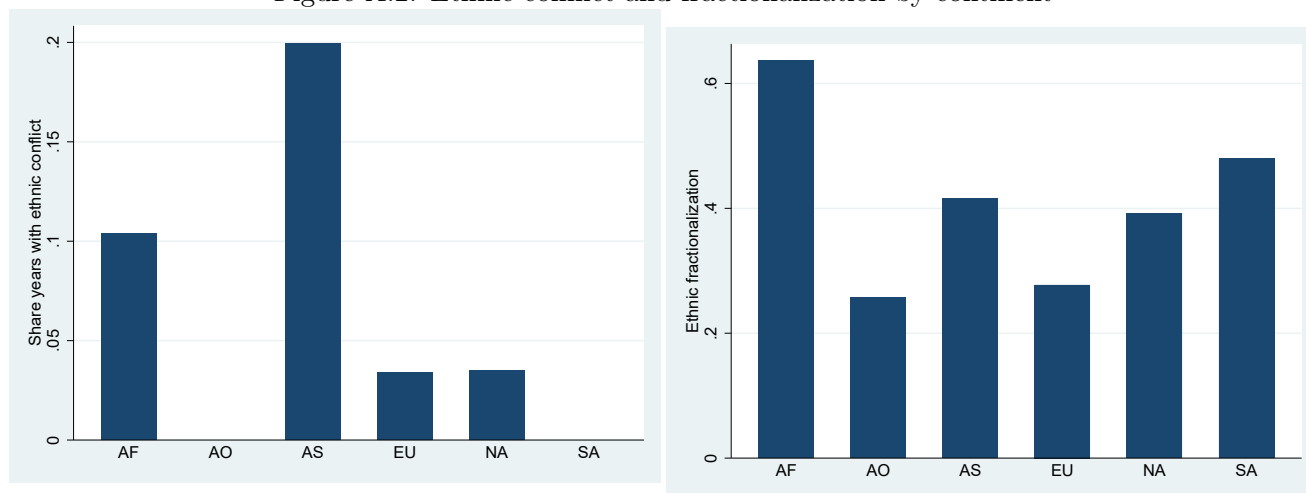


NOTE - Ethnic conflict data from Gleditsch et al. (2002), ethnic fractionalization from Alesina et al. (2003).

Table A.5: Democracy and ruling group rent (RGR) - Alternative variable Majoritarian Democracy

| Dependent variable: | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Ruling group rent (RGR) | | | | | |
| Sample | Full sample | | High ethnic frac. (EF) | | Same gov. last period & high EF | | Countries new dem. & high EF & same gov. | | Same gr. gov. trans. & high EF & same gov. | |
| Proport. democ. (t-1) | 0.007 | 0.012 | -0.016 | -0.019 | -0.012 | -0.013 | -0.014 | -0.018 | -0.010 | 0.005 |
| | (0.025) | (0.029) | (0.030) | (0.034) | (0.026) | (0.029) | (0.033) | (0.031) | (0.024) | (0.030) |
| Majorit. democ. (t-1) | 0.124** | 0.123** | 0.158** | 0.153** | 0.166** | 0.164** | 0.168** | 0.161** | 0.144 | 0.152 |
| | (0.053) | (0.053) | (0.065) | (0.063) | (0.063) | (0.068) | (0.068) | (0.070) | (0.092) | (0.094) |
| Democracy measures | Cheibub | Cheibub | Cheibub | Cheibub | Cheibub | Cheibub | Cheibub | Cheibub | Cheibub | Cheibub |
| Time dummies | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Country fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Controls | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes |
| Observations | 1727 | 1553 | 844 | 706 | 666 | 551 | 299 | 271 | 596 | 482 |
| R-squared | 0.820 | 0.833 | 0.784 | 0.797 | 0.823 | 0.843 | 0.854 | 0.833 | 0.820 | 0.848 |

Note: Panel with an observation being the country-year, covering 116 countries and the years 1992-2009. All explanatory variables lagged by one year. Country fixed effects and annual time dummies included in all columns. The controls included in columns 2, 4, 6, 8 and 10 include GDP per capita, Population, Trade share of GDP and Age of democracy. In columns 1-2 we use the full sample, in columns 3-4 the sample is restricted to countries with above-median ethnic fractionalization, and in columns 5-6 the sample is restricted to observations with last period's leader remaining in office and high ethnic fractionalization. In columns 7-8 the sample is restricted to countries which over the sample period had at least one instance of transition to democracy, which have above-median ethnic fractionalization and with last period's leader remaining in office. In columns 9-10 the sample is restricted to countries with above-median ethnic fractionalization and to observations with last period's leader remaining in office, and also excludes countries that had a change in the ethnic group composition of government in the year of transition to democracy or in the first year after transition. Majoritarian representation coded using "Democratic Electoral Systems" (DES) dataset of Bormann and Golder (2013). Robust standard errors clustered at the country level. t-stat in parenthesis. *=significant at the 10% level, **=significant at the 5% level, ***=significant at the 1% level.

Table A.6: Democracy and ruling group rent (RGR) when including continent-year fixed effects

| Dependent variable: | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | | | ruling group rent (RGR) | | | |
| Democracy (t-1) | 0.006 | 0.069* | | 0.067 | | |
| | (0.004) | (0.038) | | (0.044) | | |
| Proport. democ. (t-1) | | | 0.039 | | 0.033 | 0.038 |
| | | | (0.027) | | (0.030) | (0.033) |
| Majorit. democ. (t-1) | | | 0.113** | | 0.121* | 0.124* |
| | | | (0.057) | | (0.066) | (0.065) |
| Democracy measures | Polity IV cont. | Polity IV dummy | | Cheibub et al. | | |
| Contin.-year fixed eff. | Yes | Yes | Yes | Yes | Yes | Yes |
| Country fixed effects | Yes | Yes | Yes | Yes | Yes | Yes |
| Additional controls | No | No | No | No | No | Yes |
| Observations | 1993 | 1993 | 1961 | 1755 | 1732 | 1556 |
| R-squared | 0.803 | 0.804 | 0.809 | 0.817 | 0.821 | 0.835 |

Note: Panel with an observation being the country-year, covering 136 countries and the years 1992-2009. All explanatory variables lagged by one year. Country fixed effects and continent-year fixed effects included in all columns. The additional controls included in column 6 include GDP per capita, Population, Trade share of GDP and Age of democracy. Robust standard errors clustered at the country level. t-stat in parenthesis. *=significant at the 10% level, **=significant at the 5% level, ***=significant at the 1% level.

## Table A.7: Democracy and ruling group rent (RGR) - split by geographic region

| Dependent variable: | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Ruling group rent (RGR) | | | | | | |
| Sample: | Africa & Asia | | N. & S. America | | Europe & Oceania | | Africa & Asia | | N. & S. America | | Europe & Oceania | |
| Democracy (t-1) | 0.010** | 0.009* | -0.002 | -0.003 | -0.003 | -0.001 | | | | | | |
| | (0.004) | (0.005) | (0.002) | (0.002) | (0.002) | (0.001) | | | | | | |
| Proport. democ. (t-1) | | | | | | | 0.023 | 0.034 | -0.013 | -0.009 | -0.009 | -0.028*** |
| | | | | | | | (0.039) | (0.041) | (0.009) | (0.007) | (0.011) | (0.005) |
| Majorit. democ. (t-1) | | | | | | | 0.158** | 0.154** | -0.010 | -0.001 | -0.016 | -0.043 |
| | | | | | | | (0.073) | (0.073) | (0.008) | (0.008) | (0.033) | (0.027) |
| Democracy measures | Polity IV continuous | | Polity IV continuous | | Polity IV continuous | | Cheibub et al. | | Cheibub et al. | | Cheibub et al. | |
| Time dummies | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Country fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Control variables | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes |
| Observations | 1158 | 1030 | 400 | 375 | 435 | 404 | 1020 | 896 | 346 | 324 | 366 | 336 |
| R-squared | 0.789 | 0.802 | 0.825 | 0.844 | 0.831 | 0.867 | 0.811 | 0.826 | 0.846 | 0.851 | 0.832 | 0.882 |

Note: Panel with an observation being the country-year, covering 136 countries and the years 1992-2009. All explanatory variables lagged by one year. Country fixed effects and annual time dummies included in all columns. The controls included in columns 2, 4, 6, 8, 10 and 12 include GDP per capita, Population, Trade share of GDP and Age of democracy. Robust standard errors clustered at the country level. t-stat in parenthesis. *=significant at the 10% level, **=significant at the 5% level, ***=significant at the 1% level.

## Table A.8: Impact (types of) democracy on ruling group rent (RGR) – Analysis at ethnic group level with sample restrictions

| Dependent variable: | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Nighttime light | | | | |
| Leader × Demo.PR | -0.078 | -0.068 | 0.188 | -0.043 | -0.002 | 0.224 | 0.045 | 0.010 | 0.120 |
| | (0.091) | (0.092) | (0.182) | (0.107) | (0.108) | (0.154) | (0.109) | (0.119) | (0.098) |
| Leader × Demo.Majo. | 0.184* | 0.189 | 0.368* | 0.264** | 0.326** | 0.416** | 0.334** | 0.409** | 0.586** |
| | (0.106) | (0.121) | (0.188) | (0.121) | (0.164) | (0.206) | (0.144) | (0.203) | (0.241) |
| Leader × Non Demo. | -0.125 | -0.096 | 0.077 | -0.126 | -0.075 | 0.057 | -0.087 | -0.095 | -0.024 |
| | (0.100) | (0.094) | (0.181) | (0.117) | (0.096) | (0.152) | (0.123) | (0.094) | (0.107) |
| Ethnic group fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Country-year fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Restriction yrs around new election | 7 | 7 | 7 | 5 | 5 | 5 | 3 | 3 | 3 |
| Same leader since at least how many yrs | | 1 | 7 | | 1 | 5 | | 1 | 3 |
| t-test between PR and Majo. (p-value) | 0.044 | 0.083 | 0.487 | 0.036 | 0.089 | 0.439 | 0.057 | 0.076 | 0.047 |
| Observations | 24537 | 23544 | 14690 | 18020 | 17759 | 12759 | 11180 | 10934 | 9742 |
| R-squared | 0.939 | 0.942 | 0.954 | 0.946 | 0.946 | 0.953 | 0.958 | 0.958 | 0.957 |

Note: Panel with an observation being the ethnic group-year, covering 26 (or fewer) countries and the years 1992-2013. Ethnic group and country-year fixed effects included in all columns. Robust standard errors clustered at the ethnic group level. t-stat in parenthesis. *=significant at the 10% level, **=significant at the 5% level, ***=significant at the 1% level.

# D   Appendix Tables on the type of democracy and tenure of leader in office

In this appendix section we provide sensitivity tests corresponding to subsection 5.4 of the main text. We start with replicating the baseline table 5 with the usual battery of country controls. As shown in Appendix Table A.9, the results are very similar. Below in Appendix Tables A.10 and A.11 it is found that these baseline results are also robust to the use of logit estimations and to the inclusions of continent-year fixed effects, respectively.

Table A.9: Type of democracy and tenure of leader in office – panel of democracies with controls

|  | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Dependent var.: | | Dummy same leader as last year | | |
| Majorit. demo. | -0.077 | -0.190** | 0.122** | 0.081 |
|  | (0.059) | (0.085) | (0.054) | (0.070) |
| Transition to demo. | -0.577*** | -0.180* | -0.623*** | -0.306*** |
|  | (0.062) | (0.109) | (0.050) | (0.089) |
| Majorit. * Transit. | 0.324*** | 0.521*** | 0.232** | 0.458*** |
|  | (0.113) | (0.158) | (0.108) | (0.134) |
| Data source Majo. | | IAEP | | DES |
| Sample | All demo. (Cheibub) | All demo. & elec. yrs | All demo. (Cheibub) | All demo. & elec. yrs |
| Time dummies | Yes | Yes | Yes | Yes |
| Country fixed eff. | Yes | Yes | Yes | Yes |
| Controls | Yes | Yes | Yes | Yes |
| Observations | 2357 | 607 | 2702 | 669 |
| R-squared | 0.198 | 0.405 | 0.209 | 0.389 |

Note: Panel with an observation being the country-year, covering 132 countries and the years 1947-2008. LPM regressions in all columns. Country fixed effects, annual time dummies, lagged years in office of the leader, as well as lagged GDP per capita, lagged Population, lagged Trade share of GDP and lagged Age of democracy included in all columns. For coding the variable of majoritarian democracy, columns 1-2 use data from the "Institutions and Elections Project" (IAEP) of Wig et al. (2015), while columns 3-4use data from the "Democratic Electoral Systems" (DES) dataset of Bormann and Golder (2013). Robust standard errors clustered at the country level. t-stat in parenthesis. *=significant at the 10% level, **=significant at the 5% level, ***=significant at the 1% level.

Table A.10: Type of democracy and tenure of leader in office – logit

| Dependent var.: | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | | | | Dummy same leader as last year | | | | |
| Majoritarian demo. | -0.332 | -0.375 | -1.007 | -1.201 | 0.719** | 0.738** | 0.343 | 0.580 |
| | (0.347) | (0.342) | (0.705) | (0.743) | (0.298) | (0.303) | (0.398) | (0.411) |
| Transition to demo. | -3.721*** | -3.713*** | -2.037* | -2.033* | -4.500*** | -4.250*** | -3.669*** | -3.547*** |
| | (0.695) | (0.714) | (1.043) | (1.082) | (0.753) | (0.767) | (1.197) | (1.249) |
| Majorit. * Transit. | 2.074** | 2.489*** | 2.754* | 4.321*** | 1.756* | 1.985* | 4.537*** | 4.778*** |
| | (0.871) | (0.889) | (1.583) | (1.511) | (0.974) | (1.063) | (1.425) | (1.490) |
| Data source Majo. | | | IAEP | | | | DES | |
| Sample | All demo. | (Cheibub) | All demo. & elec. yrs | | All demo. | (Cheibub) | All demo. & elec. yrs | |
| Time dummies | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Country fixed eff. | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Controls | No | Yes | No | Yes | No | Yes | No | Yes |
| Observations | 2592 | 2315 | 534 | 492 | 3561 | 2662 | 616 | 559 |
| Pseudo R-squared | 0.147 | 0.145 | 0.234 | 0.261 | 0.156 | 0.160 | 0.244 | 0.264 |

Note: Panel with an observation being the country-year, covering 132 countries and the years 1947-2008. Conditional logit estimations in all columns. Country fixed effects, annual time dummies as well as lagged years in office of the leader included in all columns. The additional controls included in columns 2, 4, 6 and 8 include lagged GDP per capita, lagged Population, lagged Trade share of GDP and lagged Age of democracy. For coding the variable of majoritarian democracy, columns 1-4 use data from the "Institutions and Elections Project" (IAEP) of Wig et al. (2015), while columns 5-8 use data from the "Democratic Electoral Systems" (DES) dataset of Bormann and Golder (2013). Robust standard errors clustered at the country level. t-stat in parenthesis. *=significant at the 10% level, **=significant at the 5% level, ***=significant at the 1% level.


Table A.11: Type of democracy and tenure of leader in office – with continent-year fixed effects

| Dependent var.: | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | | | | Dummy same leader as last year | | | | |
| Majorit. demo. | -0.161*** | -0.191*** | -0.325*** | -0.349*** | -0.197** | -0.221*** | -0.523*** | -0.615*** |
| | (0.049) | (0.052) | (0.120) | (0.113) | (0.080) | (0.082) | (0.136) | (0.197) |
| Transit. to demo. | -0.545*** | -0.578*** | -0.240** | -0.262*** | -0.550*** | -0.558*** | -0.440*** | -0.486** |
| | (0.062) | (0.063) | (0.093) | (0.099) | (0.073) | (0.083) | (0.166) | (0.190) |
| Majorit. * Transit. | 0.230** | 0.322*** | 0.398** | 0.534*** | 0.319*** | 0.383*** | 0.583** | 0.573 |
| | (0.099) | (0.112) | (0.177) | (0.178) | (0.116) | (0.138) | (0.247) | (0.369) |
| Sample | All demo. | (Cheibub) | All demo. & elec. yrs | | All demo. | (Cheibub) | All demo. & elec. yrs | |
| Count. lin. trend | No | No | No | No | Yes | Yes | Yes | Yes |
| Contin.-year FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Country fixed eff. | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Controls | No | Yes | No | Yes | No | Yes | No | Yes |
| Observations | 2647 | 2357 | 661 | 607 | 2647 | 2357 | 661 | 607 |
| R-squared | 0.280 | 0.283 | 0.546 | 0.565 | 0.322 | 0.329 | 0.568 | 0.100 |

Note: Panel with an observation being the country-year, covering 132 countries and the years 1947-2008. LPM regressions in all columns. Country fixed effects, continent-year fixed effects, as well as lagged years in office of the leader included in all columns. The additional controls included in columns 2, 4, 6 and 8 include lagged GDP per capita, lagged Population, lagged Trade share of GDP and lagged Age of democracy. In columns 5-8 a country-specific linear time trend is included. For coding the variable of majoritarian democracy, all columns use data from the "Institutions and Elections Project" (IAEP) of Wig et al. (2015). Robust standard errors clustered at the country level. t-stat in parenthesis. *=significant at the 10% level, **=significant at the 5% level, ***=significant at the 1% level.

# E    Results on democracy and conflict

In the current Appendix E we focus on a further implication of our theory (that is less specific to our setup). In particular, we study the link between democracy and conflict, focusing on the notion of ethnic conflict. For most of the analysis we use as dependent variable a dummy measure taking a value of 1 when there is conflict between ethnic groups on issues related to government (data from Gleditsch et al., 2002).[5] This specific conflict measure matches closely the concept of conflict applied in our model. In robustness checks we also draw on the conventional conflict measure from the same source that encompasses all types of civil war. As far as the democracy measures are concerned, we rely on the same variables as in the main text, before studying in addition the impact of coherent, mature democracy (i.e. with Polity IV scores of above the 75th percentile, which means a score of at least 9).

Table A.12 below displays the baseline results.[6] In column 1 we start with regressing ethnic conflict over government on the continuous Polity IV measure of democracy (re-scaled to range from -1 to 1). While the coefficient has the expected negative sign, it is far from statistical significance. This conclusion is unaltered when we further add the aforementioned controls (column 2) or when we dichotomize the Polity IV measure (taking a value of 1 for above-median democracy, i.e. above a score of 0) in columns 3-4. We also do not detect an effect when drawing on the Cheibub et al. (2010) democracy measure (columns 5-6).

Next, we shall more specifically take into account the predictions of our theory's extension on fragile democracy (see section 4.3) stating that we expect a strong conflict-reducing effect of democracy when we deal with a mature, coherent democracy and that we should expect weaker results for consolidating democracy. To capture this, we code a new democracy dummy taking a value of 1 for democracy scores above the 75th percentile, i.e. when Polity IV takes a value of at least 9. When replicating the previous analysis for this variable in columns 7-8 we now find that such "full, non-fragile" democracy indeed is found to reduce the risk of conflict. Finally, columns 9-10 replicate columns 7-8 but having as dependent variable instead of our specific conflict variable a more general conflict measure taking a value of 1 for any conflict incidence. We again find that full, non-fragile democracy reduces the conflict risk, as predicted by our theory.

---

[5]Specifically, we focus on conflict incidence, controlling for past conflict incidence, in order to control for the fact that conflicts often last more than one year. This specification has the advantage of being able to capture not only the breaking out of conflict but also their duration. As such a specification could suffer from Nickell-bias (Nickell, 1981), we have also run a regression corresponding to our preferred specification of column (7), using a conflict onset measure instead. This yields a beta coefficient of -0.0036 (S.E. of 0.0025).

[6]We include country fixed effects and annual time dummies in all columns, and add in all even columns the usual battery of controls, namely, lagged population, lagged GDP per capita, lagged trade share of GDP and years since first democratization.

Table A.12: Democracy and conflict: Baseline results

| Dependent variable: | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Incidence of ethic conflict over government | | | | | Incidence Conflict | |
| Democracy (t-1) | -0.005 | -0.003 | -0.008 | -0.007 | -0.000 | 0.004 | -0.007** | -0.006 | -0.019** | -0.020 |
| | (0.004) | (0.005) | (0.006) | (0.008) | (0.005) | (0.006) | (0.003) | (0.004) | (0.010) | (0.013) |
| Democracy measures | Polity IV con. | | Polity IV (>0) | | Cheibub et al. | | Polity IV (>8) | | Polity IV (>8) | |
| Time dummies | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Country fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Control variables | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes |
| Observations | 8378 | 5799 | 8378 | 5799 | 7903 | 5268 | 8378 | 5799 | 8378 | 5799 |
| R-squared | 0.614 | 0.574 | 0.614 | 0.574 | 0.610 | 0.572 | 0.614 | 0.574 | 0.677 | 0.680 |

Note: Panel with an observation being the country-year, covering 165 countries and the years 1947-2013. All explanatory variables lagged by one year. Country fixed effects and annual time dummies and lagged conflict incidence included in all columns. The controls included in columns 2, 4, 6, 8 and 10 are GDP per capita, Population, Trade share of GDP and years since first democratization. Robust standard errors clustered at the country level. t-stat in parenthesis. *=significant at the 10% level, **=significant at the 5% level, ***=significant at the 1% level.

# F   Results on riots and new democratization

Another prominent prediction of our theory comes from the riots extension where we show that new democratization is most likely for an *intermediate* level of riots. To confront this prediction to the data, we regress –for a sample of initially non-democratic regimes– a dummy taking a value of 1 for new democratization on the number of riots in the previous year. Table A.13 below presents the results of these investigations.[7]

In column 1 we find that riots are associated with a higher likelihood of democratization, which continues to hold in column 2 when the aforementioned controls are included. Then we move to our main specification of interest in column 3, where we also include the squared term of riots, allowing to study the non-linear relationship predicted by our theory. We indeed find that the likelihood of new democratization is largest for intermediate levels of riots, which is confirmed in column 4 when the control variables are added. Columns 5-6 replicate the baseline columns 3-4 but control for continent-year fixed effects (which capture continent-level shocks, such as e.g. democratization waves in neighboring countries), and columns 7-8 again replicate columns 3-4 but include a country-specific linear time trend (picking up long-run developments in a given country such as e.g. increasing economic prosperity). Overall, the results of this table confirm the finding of intermediate riot levels being associated to the largest likelihood of new democratization.

---

[7]In all columns we include country fixed effects and annual time dummies. In all even columns we control for the standard covariates GDP per capita, Population, trade openness and years since first democratization, which could capture the presence of a previous democratic experience affecting civic culture still today.

## Table A.13: Riots and new democratization

| Dependent var.: | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | | | | New democracy | | | | |
| Riots (t-1) | 0.0084** | 0.0080* | 0.0154*** | 0.0144** | 0.0133*** | 0.0123** | 0.0123** | 0.0105* |
| | (0.0034) | (0.0041) | (0.0049) | (0.0058) | (0.0049) | (0.0049) | (0.0049) | (0.0057) |
| Riots (t-1) Square | | | -0.0005** | -0.0004* | -0.0005* | -0.0003 | -0.0004* | -0.0003 |
| | | | (0.0002) | (0.0002) | (0.0003) | (0.0002) | (0.0002) | (0.0002) |
| Time dummies | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Country fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Control variables | No | Yes | No | Yes | No | Yes | No | Yes |
| Additional controls | | | | | Contin. FE | | Country time trend | |
| Observations | 4799 | 2874 | 4799 | 2874 | 4799 | 2874 | 4799 | 2874 |
| R-squared | 0.106 | 0.122 | 0.108 | 0.123 | 0.210 | 0.293 | 0.201 | 0.242 |

Note: Panel with an observation being the country-year, covering 138 countries and the years 1947-2008. All explanatory variables lagged by one year. Country fixed effects and annual time dummies included in all columns. The controls included in columns 2, 4, 6, and 8 are GDP per capita, Population, Trade share of GDP and Years since first democratization. In columns 5-6 we include continent-year fixed effects instead of annual time dummies, and in columns 7-8 we include a country-specific linear time trend. Robust standard errors clustered at the country level. t-stat in parenthesis. *=significant at the 10% level, **=significant at the 5% level, ***=significant at the 1% level.