ETHNIC CONFLICT AND THE INFORMATIONAL DIVIDEND OF DEMOCRACY

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Abstract
Prevailing theories of democracy focus on class conflict. In contrast, we study democratic transition when ethnic tensions are more salient than the poor/rich divide, building a model where (i) ethnic groups negotiate about allocating the economic surplus and (ii) military and political mobilizations rest on the unobserved strength of ethnic attachment. Free and fair elections elicit information and restore inter-ethnic bargaining efficiency. Autocrats can rationally choose democratic transition, even if they risk losing power, as elections reduce the opposition's informational rent. The predictions of our framework are consistent with novel country-level and ethnic group-level panel correlational evidence on democratization in the post-decolonization period. (JEL: C72, D02, D72, D74, D82, P16)

1. Introduction

Established explanations of democratization claim that democracy is an institutional arrangement that resolves a social conflict between rich elites and the majority of

Acknowledgments: We thank Brendan Berthold and Pascal Zumbühl for excellent research assistance. There were also helpful comments from Francesco Amodio, Matilde Bombardini, Julien Daubanes, Roland Hodler, Alessandro Riboni, Jean Tirole, Francesco Trebbi, Thierry Verdier, Joachim Voth, and Katia Zhuravskaya. The same applies to participants in seminars and conferences at Berkeley, Frankfurt, the Graduate Institute, NYUAD, Paris-Nanterre, the Paris School of Economics, Stanford, the Toulouse School of Economics, the University of Montreal, UQAM, Yale, the University of Bern, the Barcelona GSE Summer Forum, the CESifo Venice Summer Institute, the Workshop on Democracy and Conflict at UBC, the Workshop on the Political Economy of Conflict and Development in Villars, the Zurich Workshop on Group Identities, and the CEPR RPN Conference on Conflict, Geneva. Jeremy Laurent-Lucchetti acknowledges financial support from the FNS grant 100018-1728141; Dominic Rohner acknowledges financial support from the ERC Starting Grant POLICIES FOR PEACE-677595, and warmly thanks UBC for its hospitality during the work on the first draft; Mathias Thoenig acknowledges financial support from the FNS grant 100018-182242. Rohner is a CEPR fellow and Thoenig is a fellow both at CEPR and IMD Business School.

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the population.[1] Democratic transitions 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 reduced inequality. This paradigm has considerable explanatory power for situations where the main political divide is between rich and poor, such as 19th century Europe. But the post-decolonization period has been mostly marked by ethnic rather than class conflict (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). What is therefore the logic of democratization in societies where ethnicity determines political identity and conflict? Beyond case studies and anecdotes, few studies systematically analyse this issue from a theoretical and empirical perspectives (Beissinger, 2008). This is of importance 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).

Combining applied theory with panel-data evidence, we study the drivers of democratic transition when politics take place along ethnic lines rather than the poor/rich divide. Building on the literature that underscores the various institutional features that enable a credible allocation of *de jure* political power (Acemoglu and Robinson, 2006, Chapter 2), we define democratic transition as the implementation of (i) free and fair elections and (ii) a set of durable institutions that force the political contenders to commit to the election results.[2] Free elections appease tensions and conflicts in the society because they reduce informational asymmetries between the ruling group and the opposition. Additionally, an element of commitment is crucial, otherwise the opposition would not accept the transition. In a nutshell, we provide a simple theoretical model where military as well as electoral mobilization capacities rest on the unobserved strength of ethnic attachment. 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 underestimates the strength of its opponent. By eliciting information on electoral mobilization, free and fair elections restore the efficiency of inter-ethnic bargaining and prevent conflict outbreak. Autocrats may therefore rationally choose democratic transition, even if they risk 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 constitutional regime (i.e. majority rule, proportional representation), government tenure and ethnic favoritism for ethnically divided countries. In particular, our theory explains two new empirical

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

2. We adopt a "minimalist" vision of democracy, e.g. a political regime in which free and fair elections allocate *de jure* power. We abstract purposefully from the many other dimensions of democracy (free media, rule of law, well-functioning checks and balances...) to focus on the crucial information revealing role of elections.

regularities that we document in a large sample of countries over the post-decolonization period at the aggregate (i.e. country) as well as the 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]

An emblematic example of such a democratic transition is the one that took place in 1992 in Ghana. It is one of the first of the democratic wave that swept through Africa in the 1990s. Jerry Rawlings, autocrat in power since 1981 after a military coup, organized the first multi-party elections of the country in a context of frequent inter-ethnic tensions (Kokomba-Bimoba wars and Nawuri-Gonja conflicts). At that time, political parties where organized along two political traditions—the Nkrumah and Danquah-Busia—mostly structured along ethnic lines (Nugent, 1995). Rawlings had a priori good chances of winning (Sandbrook and Oelbaum, 1999), as at the time of the 1992 elections, the government party benefited from being the sole claimant of the Danquah-Busia tradition, while the Nkrumahist tradition was split among various competing political parties and their ability to coalesce was unclear (Nugent 1995). Jerry Rawlings won these first elections with almost 60% of the votes, with outside observers declaring the voting to be "free and fair" (see Carter Center, 1992).[5] Interestingly, inequality (as measured by the GINI Index) has kept rising in the aftermath of the 1992 democratisation. Green (1998) points out that the newly elected Jerry Rawlings distributed patronage to targeted local communities in the form of electricity extensions, water supply, feeder roads and school improvements. These two patterns of (i) an ex-autocrat getting democratically elected in the first elections when facing an opposition of an unknown strength and (ii) stagnant or rising ethnic favoritism and inequality after democratization are salient features of our model.[6,7]

3. In the words of Burgess et al (2015: 1817) "Ethnic favoritism refers to a situation where co-ethnics 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 (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 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. Jerry Rawlings famously stated that "Genuine electoral processes conducted without fear or intimidation, without the harsh use of our armed forces, produces a cleansing effect in society and reassures the people that their will has prevailed. The denial of the will of the people and its attendant corruption is what used to generate the coups of the past."

6. Other prominent examples of democratic transitions that are aligned with our core mechanism include Uruguay in 1984 (Julio Sanguinetti), Niger in 2001 (Hama Amadou), Burundi in 2006 (Pierre Nkurunziza), Sierra Leone in 1999 (Ahmad Tejan Kabbah), and South Korea in 1987 (Roh Tae-woo).

7. It is noteworthy that, by allowing subsequent elections to be monitored by domestic and international election observers, elections in Ghana obtained further legitimacy as fears of electoral manipulation significantly decreased. By peacefully transferring power from one civilian administration to another for the first time ever in 2001, Ghana's democratic status became increasingly recognized. Observers point at

Our theory of democratization features informational issues that we believe are typically inherent in ethnically divided societies. Ethnic politics indeed pertain to non-pecuniary elements that are essential for solving various collective action problems at the group level. Compliance to cultural norms that are deeply rooted in the traditions and history of the groups, the behavioral monitoring and the social control exerted by co-ethnics, as well as the intrinsic motivation attached to pro-ethnic actions explain political mobilization in times of war as well as elections (e.g. Amodio and Chiovelli, 2018). These elements are both elusive and fluctuating, and collecting information on the political mobilization capacities of opposing groups is a first-order concern for ethnic leaders. Such informational problems play a role in class conflict and our theory may also apply to these contexts. However, we believe that these problems are more severe in ethnic conflict because linguistic fractionalization, spatial sorting of ethnic homelands, economic and social segregation limit information collection and blur its precision (Horowitz, 2000, and the literature cited below). It is also likely that economic incentives are much less aligned in ethnic groups than within social classes (rich/poor), such that the role non-pecuniary elements play is more salient in ethnic-based political mobilization.

Our analysis highlights the importance of credible elections to incentivize an opposition group to reveal its mobilization capacity: There must be the possibility, even if uncertain, of a future transfer of power to action its political participation in the elections. This feature of our setting contrasts with part of the literature on nondemocratic politics that stresses the role of "window dressing elections" in revealing information on the autocrat support in the population (Gehlbach at al, 2016). While we agree that such less drastic alternatives to free and fair elections that the autocratic leader could contemplate – window dressing elections, plebiscites, referendums or opinion surveys – may deliver some informational content, we argue that they are typically much less effective in eliciting information *on the opposing group*. One key reason is that the opposition leaders have no incentives to fully engage in costly mobilization without a fair chance of winning the election, as otherwise they would simply be "bought off" by the autocrat at their expected cost of war.[8,9] Thus, the only way to obtain information for the autocrat is to concede something in returns, which in our case is the perspective of potentially gaining power. Put differently, modelling the incentives of the opposition to run in the election is crucial as, without commitment to transmit power, the opposition (correctly) anticipates that once leaders

the contributions from an active civil society, a thriving media, an independent electoral commission and the elite consensus.

8. Even in democratic countries with well-functioning checks and balances and media freedom, anecdotal evidence suggests that crucial information on mobilization capacities is mostly revealed through elections rather than polls (e.g. Donald Trump's surprise victory in the USA's 2016 presidential election).

9. Recent papers (i.e. Martinez-Bravo et al, 2018) highlight that autocrats may use local elections to reveal local information about citizens' preferences. However, while such elections are useful to reveal information about the quality of local rulers, they are typically not reliable for revealing overall support of the opposition.

are endowed with the information, no safeguards would pressure them to make any concession. They would simply behave as autocrats under perfect information and grab an even larger share of the economic surplus.

Another alternative way for an authoritarian regime to collect information may be to allow for limited demonstrations and social unrest, as argued e.g. by Lorentzen (2013). In an extension in the Online Appendix we allow for such limited social unrest to convey informational value, finding that our main qualitative predictions remain unchanged for this extension. Another alternative to elections for collecting information may be to engage in power sharing and offer cabinet positions to the opposition. However, it is first of all not sure how much information could be collected this way, and, more importantly, it is not clear if this is more attractive for the autocrat than running an election. In particular, in such a co-option attempt, the leader needs to abandon part of her power with certainty while, in an election, she abandons full power with uncertainty. Hence, the power sharing scheme can be seen as the "certainty-equivalent" of the election, and it is a priori unclear which option is more drastic than the other.

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 intergroup inequality. Each individual can engage in two pro-ethnic actions: Fighting for their group and (when possible) voting for their ethnic leader. The utility attached to either action depends positively on the strength of ethnic attachment, modeled as an idiosyncratic preference shock with a group-specific shifter that can be large (strong type) or small (weak type). 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 bargaining power – the source of ethnic favoritism in our setup – that we simply model as a take-it-or-leave-it offer.[10] We define as the ruling group rent (RGR) the economic transfer, when agreed, from the opposition to the ruling group.

For the subgame, we first solve equilibrium under autocracy. We show that the ruling group rent decreases with the autocrat believing 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 autocrat's decision to organize free and fair elections and to the issue of whether the opposition agrees to participate in the political competition. Using a standard probabilistic voting model, we analyze the autocrat's political trade-off. On the one hand, elections increase the risk of losing power. On the other hand, the observation of vote shares reduces informational

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

asymmetries because the political mobilization of a group correlates with its military capacity. Post-election inter-ethnic negotiations are therefore less likely to fail, the resulting ruling group rent 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 – for an intermediate range of beliefs. The constitutional regime varies with the strength of the autocrat's group identity: A strong autocrat proposes 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 that comes with large winning chances, while weak autocrats will prefer a proportional regime, allowing them to retain some power even if they are electorally defeated.

Our theory yields a series of empirically testable predictions linking the type of democracy and various politico-economic outcomes. While data limitations prevent us from testing directly how the strength of ethnic attachment and the beliefs of the autocrat impact the likelihood of war and democratization, we are able to study some other important implications of our theoretical framework related to ethnic favoritism and political leadership.

First, in our model, democratic transition toward a majoritarian system increases the ruling group rent and ethnic favoritism. The government's economic resource grabbing is constrained by a lack of information in autocracies or by a proportional electoral system in democracies, while in majoritarian democracies there are only a few ramparts against squeezing the economic share of the opposition. This is because elected leaders of majoritarian democracies can fully exploit the information elections revealed about the ethnic mobilisation of the opposition. They have all the institutional power to limit the amount allocated to the opposition to the strict minimum, making them indifferent to exploitation and costly conflict. The potential of such a "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 opposition's ethnic mobilisation capacity (meaning that 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 conflict in autocracies than in democracies that hold 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 (after 1992). A key focus of our analysis relates to the extent of ethnic favoritism ethnic groups in power exert. Our contribution to the literature here consists of 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; 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 those that are 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 disaggregated 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). It is important to note that our empirical investigation cannot go beyond correlational evidence, as we lack exogenous variation in our key variable, namely democratic transition. Note however that our model does not imply a causal effect of democratization (or election type) on group rents. It merely implies a correlation arising from unobserved relative group strengths and beliefs. We still try to address concerns about confounding factors and endogeneity as far as the data allows – by exploiting alternative sources of identification and including batteries of fixed effects.

In a series of extensions of the model, we relax various assumptions and explore the robustness of our theoretical predictions. We first consider alternative ways of collecting information than through elections. In particular, motivated by a recent study on social unrest as a learning device (Barbera and Jackson, 2016), we allow for an opposition leader to discover the strength of their own group's ethnic identity by observing participation in rioting events. Then we develop a dynamic extension of our setup with the aim of studying post-election conflict and analytically characterizing the conditions for a successful transition path from autocracy toward consolidated democracy. 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 investigate how frequent reshuffling of ethnic identity and/or democratic values can achieve lasting incentives for running democratic elections and avoid democratic backsliding. Finally, we allow for heterogeneous productivities and group sizes and analyze the use of optimal monetary incentives as a substitute to ethnic attachment for military mobilization.

The manuscript is structured as follows: Section 2 provides a survey of the existing literature and presents motivating stylized facts. Section 3 displays the baseline model; the theoretical extensions are relegated to the (online) appendix A. Supportive empirical evidence is reported in section 4 to illustrate the main predictions of our model. Section 5 concludes. The (online) appendix contains supplementary material (theoretical proofs and extensions, data description, robustness tables, and additional empirical results).

2. Literature review and motivating stylized facts

This study builds on the literature on *ethnic politics and ethnic favoritism*. There is substantial evidence that the emergence of ethnic identities and ethnification of party politics is fueled by ethnic inequality (Huber and Suryanarayan, 2016), and that ethnic divisions 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. In the context of road building in Kenya, Burgess et al (2015) conclude 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 et al. (2018) covering 140 multi-ethnic countries, find hardly any differences between ethnic favoritism in democracies and autocracies. Our empirical analysis confirms their finding, but in addition we show that their non-result encompasses substantial heterogeneity across political systems. When one distinguishes between majoritarian versus proportional democracy, our estimations show (in line with our theory) that the former increases favoritism with respect to autocracy, while the latter reduces it.

Our paper is also rooted in the *theoretical literature on democratization*. A large strand of this 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) points to the succession problem as a source of instability in an autocracy. The idea of democracy as a way to avoid costly conflict is also present in more recent literature on franchise extension. In particular, Acemoglu and Robinson (2001, 2006) frame democracy as a commitment device that is allowed to avoid popular revolt by redistributing funds from the elite to the rest of the population. Related to this, Bidner et al (2015) build a model of democracy where competitive elections act as commitment device for power-sharing among 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.[11] Our contribution is complementary to this literature, by introducing asymmetric information on ethnic identity and mobilisation.

In recent contributions, Gehlbach at al (2016) and Egorov and Sonin (2020) review *formal models of nondemocratic politics*. They highlight the informational role of elections in nondemocratic regimes where, for example, the autocrat may use elections to signal her strength to the population (Egorov and Sonin, 2018). Cox

11. 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. This implies that most of our empirically testable predictions (e.g. on redistribution or the economic structure) are not present in Fearon (2011).

(2009) develops a framework where elections can reduce asymmetries of information and hence the risk of bargaining failure. In his model, autocrats may commit to elections that they might lose, when those elections also produce a reduction in their risk of violent removal from office. Our model shows that the benefits for autocrats of running elections may actually be greater than highlighted in this existing literature, as elections increase the rent that can be extracted from the opposition after the election. We thus emphasize a new link between democratization and ethnic favoritism.

Our theory is furthermore part of the *theoretical literature on conflict* (see the recent survey by Rohner, 2022), in particular on the war inefficiency puzzle, asking the question why costly war may not be avoided by bargaining (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.[12] 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 to focus on the role of democracy to address this underlying root cause of conflict[13] Below, we 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 –. In what follows, we discuss the existing empirical literature linked to the key assumptions of our model.

Elections are a means to solve the asymmetric information problems of autocracy: As pointed out by Wintrobe (1990, 1998), Sartori (2005) and Morgenbesser (2015), a foremost dilemma of any dictator is the lack of reliable information about the opposition's war mobilization capacities. 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, a large body of evidence documents information collection as a main purpose of running elections in Mexico (Magaloni, 2006), Egypt (Blaydes, 2011), and Vietnam (Malesky and Schuler, 2010). There is also (cross-country) evidence that autocrats use elections as information gathering tools (Londregan and Vindigni, 2008) and exploit information from elections to calibrate policy responses

12. Commitment problems have for example 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 a 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 spread very slowly.

13. The few studies that link conflict to asymmetric information include Rohner (2011), Martin et al (2008, 2012), Chassang and Padro i Miquel (2009), Rohner et al (2013) and Acemoglu and Wolitzky (2014). These contributions however have a very different focus, and do not link conflict to either democracy or 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 that drive conflict. Their approach is complementary to ours, as it hinges on the availability of a mutually accepted mediator.

(Miller, 2015). Interestingly, opinion polls and surveys are poor substitutes for elections, as the information collected through these means may be severely biased, due to misreporting incentives at various levels (Wallace, 2016).

Mobilisation capacities in war and political competition are positively correlated: Already in antiquity, elections were seen as a 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 the "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 supported by recent empirical evidence by Chacon, Robinson, and Torvik (2011: 392) who built a formal model of the democracy-vs-fighting trade-off and tested 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, in her study of Catalonia and Aragon during the Spanish Civil War Balcells (2011) finds that political loyalties and mobilization of given groups extended to more easily eliminate political enemies trough direct violence.

Relevant empirical stylized facts on predictions of the model –. We briefly review the existing body of evidence that speaks to the implications of our theory.

Impact of democracy on conflict: It has been found in most of the literature 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), Sunde and Cervellati (2014) and Rohner and Saia (2020)).[14]

Impact of democracy on inequality: Although freedom and democracy correlate with desirable outcomes such as development (Acemoglu et al, 2008) and happiness (World Happiness Report, 2018), it has long been known that democracy can also be exploitative or dysfunctional. Particularly illuminating is Alexis de Tocqueville's (1835) famous discussion on the "tyranny of the majority," as well as more recently

14. Note that nascent democratization transitions can be associated with an increase in international or domestic conflicts (see e.g. Mansfield and Snyder, 2005; Esteban et al., 2015). 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.

Besley et al (2010) and Acemoglu et al (2015). 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) conclude that there is no generalized effect of democracy that reduces inequality, and that democracy may actually lower redistribution when groups are unequal enough to start with. 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 the ruling group rent much more directly – the concept studied in our theoretical framework.

In sum, the existing empirical evidence discussed above is reassuringly consistent with the main assumptions of our theoretical setup and supports some of its predictions. However, a series of predictions have not been confronted to empirical data yet – a shortcoming that we address in section 4. In particular, we present novel results on the link between political regimes and ethnic favoritism, highlighting that democratic transition toward a majoritarian system increases ethnic favoritism. We also document that incumbents have a higher probability of victory when an autocracy transitions toward a majoritarian electoral system than 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.[15] Initially, the country is an autocracy with group A in power. The interaction between the two groups is captured through a game in four 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.[16]

15. We purposefully abstracts away from the question of within-ethnic-group dynamics (studied for example in Padró i Miquel, 2007), to focus on the interaction between the ethnic groups and the conflict/democratization decision. Moreover, for the purpose of analytical tractability, the modeling of ethnic composition in our baseline setup is very simple as it focuses on two groups of equal size. We extend the model by allowing for groups of heterogeneous size in online Appendix A.5 and by allowing for more than two groups organized in ruling coalitions in online Appendix A.6.

16. 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 fishers), a system of sector-specific taxes and subsidies is put in place; when the ethnic homelands

Stage 3: If the opponent rejects the tax, war is staged unilaterally with the 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, individuals can vote for their co-ethnic leader or for the other candidate. When war takes place, they can choose to *fight* for their group or *not*. Non-fighters produce 1 unit of good while fighters produce $0 \leq 1-\varphi < 1$ unit, where φ represent the opportunity cost of fighting. 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 individuals either vote for their leader or fight for their 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 $\theta_G \in \{-\mathscr{E}, +\mathscr{E}\}$. We denote by A^+ and B^+ cohesive groups characterized by a strong ethnic identity ($\theta_J = +\mathscr{E}$) and by A^- and B^- divided groups with weak ethnic identity ($\theta_J = -\mathscr{E}$).

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

Finally, each leader is "benevolent" to their group and maximizes the aggregate *materialistic* welfare of their ethnic group $W_G = \max \int_{i \in G} w_i di$. From the perspective of the two leaders, a key aspect is that peace Pareto-dominates war because of the existence of the fighting cost $\varphi > 0$. 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 $W_A + W_B = 2 - \varphi \times (\texttt{army}_A + \texttt{army}_B)$, where $\texttt{army}_A$ and $\texttt{army}_B$ denote the (endogenous) army size of groups A and B, respectively. We are interested, in our theoretical as well as empirical analyses, in 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 the political regime affects this advantage. 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 (setting the take-it-or-leave-it discriminatory tax). Under peace, the extent of RGR is rationally limited

are spatially separated, the tax system may be non-discriminatory but the allocation of public goods (e.g. transport or schools) preferentially targets the ruling group's ethnic homeland.

by the ruling group. Indeed, the opposition would reject tax that is too high, leading to a Pareto-inefficient war. Below, we show how informational asymmetries temper the RGR and how democratic transition exacerbates it.

Discussion. A 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 intragroup 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 in 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 also has an alternative interpretation that comes from psychological payoffs. A broader interpretation of θ_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 participation in collective action, such as an efficient leadership structure closely monitoring co-ethnic action, combined with a system of retaliation of defectors (such as forced enrollment or revolutionary tax). Then $\tilde{e}_i$ in equation (1) can be interpreted as the economic costs/benefits for an individual to participate (or not) in pro-ethnic actions; it can vary between individuals, as detection and monitoring are imperfect. Thus, the group-specific shifter θ_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 θ_G as the capacity of a leader to solve collective action problems within a coalition and federate disparate interests (such as leadership) (section A.6).

Assumption A2 reflects the fact that government features are typically more easily scrutinized than characteristics of opposition groups, especially in autocracies, where 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 repression to stay in power. They impose restrictions on citizens' rights to criticize the government, on press freedom, or on the rights of opposition parties to campaign against the government. Paradoxically, this repression precludes autocrats from knowing their true support among the general population, as well as among opposing groups with the power to depose them: "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 therefore has to form a belief (μ here) about the true strength of the opposition – its ethnic attachment and mobilization capacity – based on noisy

signals of discontent (such as riots, social unrest, hunger strikes, diaspora actions, or international media articles).[17]

Below, we solve 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 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 whether to offer free and fair elections.

3.2. Ethnic identity, war, and political mobilization

The intensity of mobilization impacts the probability of winning war as well as 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 entail a risk of the incumbent losing office.

3.2.1. War mobilization. If groups fight, we assume that the group with the largest operational performance (OP) will win. 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 if $\texttt{OP}_A > \texttt{OP}_B$. Assuming that $\tilde{\kappa}$ is exponentially distributed, the victory 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 endgame tax and fully appropriates the economic surplus. Consequently, the losing group gets nothing. The expected payoff of group G when starting a war is thus

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

When there is forced conscription, a leader will choose the army size, maximizing this expected payoff and taking into account the best response of the other leader. The Nash equilibrium of this subgame is $\texttt{army}^*_G = \texttt{army}^*_{-G} = \min(\frac{1}{2\varphi}, 1)$. 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

17. Our model also accommodates a situation where the type of the autocrat is unknown to all. In this situation, the autocrat and the opposition hold the same belief on the true value of this type and the reasoning that we develop below remains qualitatively similar. However, the post-war or post-election payoffs might be different as the true type of the autocrat is revealed after these events.

incentives to foster voluntary mobilization. In the baseline framework, we model monetary reward as a simple lump sum transfer 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: $w_G \times 1 = 1 - \varphi \times \texttt{army}_{-G}$.[18]

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

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

implying that an agent i in group G fights if $\tilde{e}_i \geq \varphi \mathbb{P}[\text{G wins}]$. This equation shows 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. The uniqueness of the mobilization subgame follows from this strategic substitutability. More precisely, the number of fighters in each group is equal to

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

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

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

implying

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

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

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

18. In appendix section A.7, we consider a richer structure of monetary incentives to fighters as an extension. This extension highlights that when leaders are unable to mobilize sufficiently with only monetary incentives, they optimally use non-pecuniary elements to increase mobilization. The key intuition is that groups, in the case of victory, appropriate a resource of the same size (the total production of 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.

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

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

implying that, given G's type, the leader always prefers to fight a divided ("-") group rather than a cohesive one ("+"). Similarly, given $-G$'s type, the leader always prefers to lead a cohesive group ("+") rather than a divided one ("-").[19] This ordering plays a central role in our analysis. 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 $\mathscr{W}$s do not matter; only ordinality does. We interpret this feature of our modeling setup as a strength and an indication 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 majoritarian rule (as detailed below). Alternative voting rules are considered later in the analysis. Organizing elections entails a (small) implementation cost C_{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 ensure compliance to the election result, for example the independence of the supreme court of justice/army/police force, or monitoring by external observers. We therefore focus on free and fair elections that ensure a credible transition of power if the opposition leader is elected (we discuss the importance of this commitment aspect of free and fair elections in the appendix, section A.1.

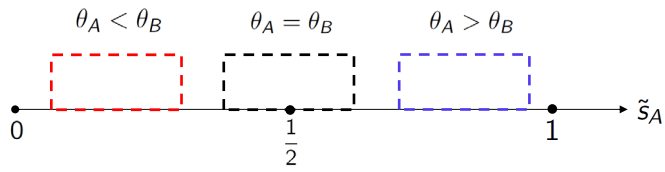
We consider a probabilistic voting model (Lindbeck and Weibull, 1987 and Persson and Tabellini, 2005) where voters' preference for candidates correlates with their ethnicity $\tilde{e}_i$. More specifically, agent $i \in A$ votes for leader A (leader B otherwise) if

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

where v is a scaling parameter and $\tilde{p}$ is leader B's 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-election taxes in case they are elected (denoted by $\mathtt{tax}_G$) to attract voters. The post-election real wages of $i \in A$ depend on the (credible) state-contingent policies candidates announce: $w_A(\text{ruler A}) = 1 + \mathtt{tax}_A - C_{\mathrm{E}}$ and $w_A(\text{ruler B}) = 1 - \mathtt{tax}_B$. A lower promise $\mathtt{tax}_B$ enables candidate B

19. Note that this last argument is not true for high φ (section B.1): with very high opportunity cost of fighting, the winner appropriates very few resources. In this setup, a leader always prefers to fight a "-" to a "+" but, given the other type, the leader prefers to be a "-" rather than a "+". The intuition is that, by mobilizing less, more resources remain after the conflict and this dominates the lower probability of winning.

FIGURE 1. Distribution of vote shares for A



to attract more votes from group A; but the flip side is that they lose votes from the co-ethnics. Aggregating over voters yields the following voting share

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

While the obtained vote share of candidate A depends on 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, meaning that $\tilde{s}_A$ depends on both θ_A and θ_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, candidates maximize their group's post-election welfare. Hence, they announce an accommodating policy (i.e. $1 - \texttt{tax}_G$ strictly larger than $\mathscr{W}^{-G,G}$) only if this strictly increases their odds to be elected. But this is never the case because intergroup transfers cancel out and payoffs are linear: we can see directly in equation (6) that decreasing $\texttt{tax}_A$ has no effect on $\tilde{s}_A$, meaning that the number of voters leaders attract from the other group by promising lower tax is equal to the number of voters they lose in their own group. Consequently, accommodating policies do not increase leaders' vote shares, but directly decrease the welfare of their own group (to the opposition's benefit). At equilibrium, we therefore obtain $1 - \texttt{tax}_G = \mathscr{W}^{-G,G}$. 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 (θ_A, θ_B). Assuming that the asymmetry between types is important enough ($\mathscr{E} > \frac{1}{v2\rho}$) the supports of vote shares do not overlap across states of nature (appendix B.2). This implies that election outcomes fully reveal θ_A and θ_B, and that the result of voting is non-ambiguous (a strong A always wins against a weak B when $\mathscr{E} > \frac{1}{v4\rho}$). We will relax these restrictions in the appendix, section A.3 by allowing overlapping vote share support.

The vote shares are given by

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

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

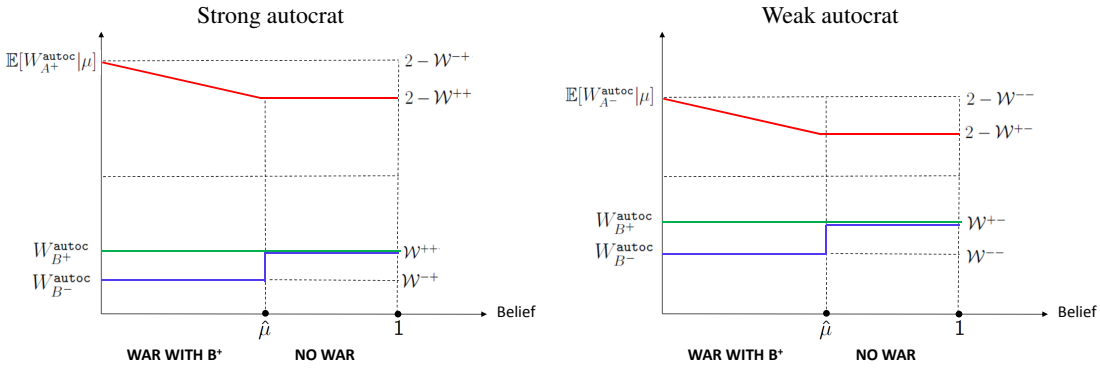
The mobilization models we set out above generate expected payoffs for the autocrat (and the opposition) in a case of war and when there are elections. While there is always a transfer that may prevent war (war is inefficient due to the opportunity cost φ), the autocrat may fail to implement such peace-maintaining transfers due to imperfect information.

The fundamental choice autocrats face is that by organizing free elections they will benefit from more information (and can exert more ethnic favoritism), but they take the risk of losing office. We analyse this choice by trading off the autocrat's expected payoff under autocracy, where the risk of war is looming, and under democracy, where there is a risk of losing office.

3.3.1. Equilibrium transfers in autocracy. The trade-off for autocrat A in power with belief μ about the opponent's type θ_B is on the size of the tax to propose to the opposition: exerting more ethnic favoritism through higher tax increases their gain but also raises the risk of war. When the opposition accepts the discriminatory tax, 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 opposition rejects the tax, war starts and the winner fully appropriates the remaining resources: in this situation the RGR is equal to 1 and the losing group gets nothing.

THEOREM 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 and 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 and peace and* B^- *strictly prefers peace to war (informational rent); (iii) the ruling group rent* RGR *weakly decreases with* μ*.*

FIGURE 2. Autocratic subgame equilibrium



Proof. As mentioned above, we assume the simplest possible bargaining structure – a take-it-or-leave-it offer.[20] Considering the case of a strong autocrat, the opposition will accept the tax peacefully if $\mathscr{W}^{B,+} \leq 1-\texttt{tax}$, that is if the after-tax income is no lower than the expected war payoff. Note first that the high type is more costly to buy off: the tax maintains peace of type B^+ iff $\mathscr{W}^{++} \leq 1-\texttt{tax}$ while it maintains peace of type B^- iff $\mathscr{W}^{-+} \leq 1-\texttt{tax}$. We consider three pacification strategies: $1-\texttt{tax} \in (0; \mathscr{W}^{-+}; \mathscr{W}^{++})$. It is immediately clear that given the Pareto inefficient nature of war, $\varphi > 0$, the government always wants to buy off a B^-. "Never pacify" ($1-\texttt{tax}=0$) is dominated by either "Always pacify" ($1-\texttt{tax}=\mathscr{W}^{++}$) and "Uncertain pacification" ($1-\texttt{tax}=\mathscr{W}^{-+}$). When implementing "Always pacify", B^+ is indifferent between war and 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 $\hat{\mu} \equiv \frac{\mathscr{W}^{++}-\mathscr{W}^{-+}}{(2-\mathscr{W}^{++}-\mathscr{W}^{++})+(\mathscr{W}^{++}-\mathscr{W}^{-+})}$ below which the autocrat is better off risking war, meaning when $2-\mathscr{W}^{++} \leq [\mu \times \mathscr{W}^{++} + (1-\mu)\times(2-\mathscr{W}^{-+})]$. In this case, B^+ prefers to fight, while B^- is indifferent between war or 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 $\frac{2-\mathscr{W}^{-+}}{2}$; while for $\mu > \hat{\mu}$ the RGR decreases to $\frac{2-\mathscr{W}^{++}}{2}$.

In figure 2 the levels of payoffs obtained by A and B for various levels of μ are represented graphically. We can see that $\mathbb{E}[W^{\texttt{autoc}}_{A^+}|\mu]$ is weakly decreasing in μ. □

20. 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. That said, the Myerson-Satterthwaite central result shows that bargaining fails with a non-zero probability as soon as there is informational asymmetry (Martin et al, 2008, for a model of conflict with asymmetric information and endogenous choice of protocol).

To take stock, peace Pareto-dominates war because of the destruction cost $\varphi > 0$, which implies that there is always a tax that prevents war. However, the autocrat may fail to implement such a peace-maintaining tax due to imperfect information. Figure 2 highlights an analogous pattern for A^+ and A^-, with payoffs shifted by $\mathscr{E}$ for a given μ. Note 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 that rejects this discriminatory tax. This zone decreases with the economic war loss and increases with the informational rent. Intuitively $\mathscr{E}$, 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 $\mathscr{W}^{++} - \mathscr{W}^{-+}$ is the informational rent of B^- when $\mu \geq \hat{\mu}$.[21]

3.3.2. Institutional change: Majoritarian democracy. The crucial aspect of elections in our setup is that observing vote shares allows the leader to deduce (θ_A, θ_B). This implies that the ruler can always implement a peace-maintaining tax *after* free and fair elections.

Given the take-it-or-leave-it bargaining structure, the leader can optimally choose the RGR without risking a conflict. In this case, the opponent is indifferent between war and peace, the ruler captures 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 that can avoid war). 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 equals that of the autocrat when there is perfect information: the economic war loss net of the (small) election cost.

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

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 $1 - \texttt{tax} = \mathscr{W}^{-+}$) than in autocracy (where $1 - \texttt{tax} = \mathscr{W}^{++}$ for high μ and $1 - \texttt{tax} = \mathscr{W}^{-+}$ for low μ). Below, we describe the key mechanism that drives the result that democratization may imply more extraction from the group in power.

A note on the enforceability of electoral verdicts: An autocrat who wins an election accepts democratic transition, while an autocrat who loses an election would typically have incentives to refuse to step down. However, we assume that part of the implementation cost $\texttt{C}_{\texttt{E}}$ includes constitutional safeguards that ensure

21. Note 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 itself in order for B to accept a higher tax without starting a war.

compliance to the election result. These could be independence of the supreme court of justice/army/police forces, or 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. $2-\mathscr{W}^{++}-S<\mathscr{W}^{++}$).[22]

We can now study when it is in autocrat A's best interest to propose democracy, and under what conditions opponent B accepts participation. 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

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

and,

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

Only B^- could potentially be better off under autocracy (as for B^- informational rents under autocracy are larger than democratic office rents). Refusing to participate would signal being of a weak type (given that a B^+ will always play their dominant strategy, and this is known to A). B^- will also opt in and participate in elections.[23]

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

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

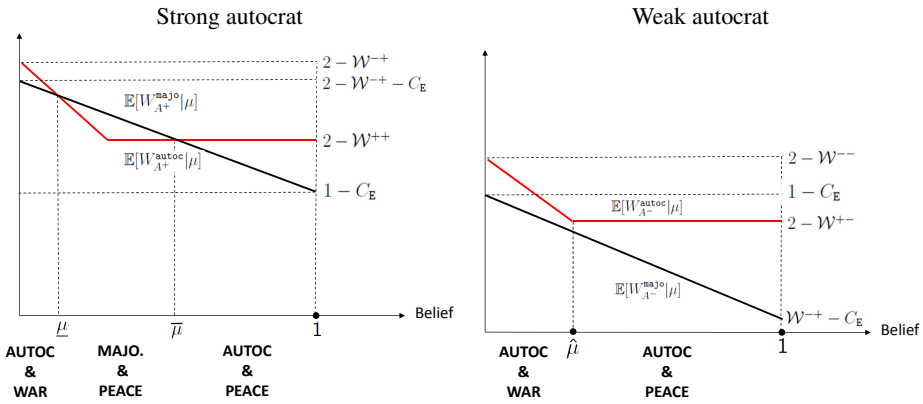
$$\mathbb{E}[W_{A^-}^{\texttt{majo}}|\mu]=\mu\times\mathscr{W}^{-+}+(1-\mu)\times\left[\frac{1}{2}(2-\mathscr{W}^{--})+\frac{1}{2}\mathscr{W}^{--}\right]-C_{\mathrm{E}}$$

The comparison of these payoffs with the payoffs of autocracy listed further above yields the characterization that is displayed in figure 3 .

22. Since 1914, there has been 187 international sanctions episodes, about 66 of which started after the collapse of the Soviet Union (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). In section 3.5, we discuss the recent trend of democratic backsliding where leaders dismantle constitutional safeguards in mature democracies.

23. It is noteworthy that B^- is actually indifferent between accepting elections or not, as with perfect information their payoff in democracy and autocracy is the same. Given this payoff equivalence, we focus, without loss of generality, on the PBE in which B^- accepts the elections.

FIGURE 3. Majoritarian democracy



THEOREM 2. *[Majoritarian democracy] There is an intermediate range of beliefs* $\mu \in [\underline{\mu}, \overline{\mu}]$ *where a strong autocrat proposes majoritarian elections and the opposition accepts participation. Otherwise both types of autocrats never propose majoritarian elections. For* $\mu \in [\underline{\mu}, \overline{\mu}]$*, the* RGR *under majoritarian elections is slightly 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 $\mu \in [\underline{\mu}, \overline{\mu}]$. Intuitively, 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 there is a risk of war and/or a low risk of losing office. The war risk is not fully alleviated for very low μ 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. 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.[24] 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.[25] Finally, this decision to democratize also relies on a moderate destruction cost (proof in the appendix, section B.2). Recall from section 3.2.1 that if

24. 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.

25. 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.

war is highly destructive (e.g. $\varphi \approx 1$ and fighters produce nothing) a leader prefers to be a "-" to 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.

3.4. Institutional change: Proportional democracy

The winner takes all aspect of majoritarian democracy makes it especially attractive for an autocrat who leads 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 autocrats.

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

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

This payoff is always superior to the war payoff for both groups when there is perfect information. Hence, B always accepts this proposal (whether 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 RGR. In contrast with the majoritarian case, a weak autocrat prefers a proportional system. The comparison of the payoffs is displayed in figure 4.

THEOREM 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 μ, the* RGR *under proportional elections can be larger or smaller than under autocracy.*

Proof.

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

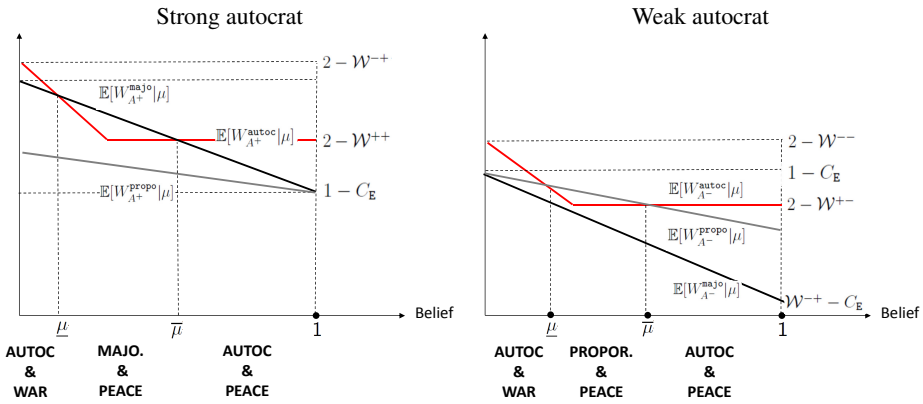
while a strong autocrat clearly prefers majoritarian rule (or even autocracy) to proportional rule:

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

These two inequalities are driven by the fact that in a majoritarian system a strong leader always wins when facing a weak opponent, 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 one. 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 μ is high, the RGR of the (weak) group in power increases

FIGURE 4. Proportional democracy



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 μ is low. If the opposition is strong and μ is high, the 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 $\tilde{s}_B > \frac{1}{2}$.[26]

□

3.5. Extensions and theoretical robustness

In the appendix A, we explore a series of theoretical extensions and show that our main predictions are robust to increasing the complexity and realism of the baseline model. 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 access to information about the opposing group. The reason is that such tools do not ensure a credible transfer of power and are therefore not incentive-compatible. We then allow the opposition leader to rely on social unrest to learn about their own group's ethnic identity strength. This extension generates new predictions about 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 (appendix sections A.3 and A.4), we discuss post-election ethnic conflict and democratic backsliding (dismantling the election process). For this purpose, we allow the possibility of conflict in the transition phase toward mature democracy by introducing imperfectly revealing elections in a dynamic version of the model. Our analysis highlights that while better information reduces the risk

26. When μ is low and the opposition is strong, war starts and the RGR will be equal to 1 because of full expropriation.

of conflict in young democracies, its downside in mature democracies is making it less appealing to organize free and fair elections. In other words, if the dissipation of informational asymmetries helps to scape the potentially conflicted transition period of young democracies, better information in mature democracy gives the elected leader incentives to dismantle the election process. We therefore also discuss this phenomenon of democratic backsliding, that we define as the dismantlement of the constitutional safeguards and executive constraints insuring credible elections (i.e. ex-ante manipulating the elections). In particular, we study how type-reshuffling of the opposition, through active political competition for example, can achieve lasting incentives for running democratic elections. We also discuss how the dynamics of democratic values (Besley and Persson 2019) can discipline the leader and avoid democratic backsliding.

In another set of extensions (online Appendix A.5), we show the implications of heterogeneous productivities and group sizes on ethnic favoritism, inequality, and democratization. We highlight that while considering different productivities does not (qualitatively) affect our main outcomes, considering different group sizes has important implications. In particular, we show that if a small, but strong, opposition wins the elections the RGR might decrease after democratization. This specific case motivates a robustness check in the empirical section, where we focus on democratization events where the same group stays in power after the election.

We conclude with an extension where monetary incentives can be used as a substitute to ethnic attachment for military recruitment (such as 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, therefore the post-conflict stake is the same for both groups. Consequently, both groups' leaders rely on comparable monetary rewards for their fighters and ethnic identity retains its crucial role in mobilization.

4. Empirical facts

This section presents a series of novel empirical regularities motivated by the predictions of our model. After presenting the data sources and variable definitions in subsection 4.1, we first study in subsections 4.2 and 4.3 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 the ethnic group level. Then we document in subsection 4.4 the alternation in *de jure* power and political leadership during transitions. Finally, in subsection 4.5 we investigate the links between political violence (riots and civil conflict) and democratic regimes. At the beginning of each of these subsections we will start with outlining which of the model's theoretical predictions are confronted to the empirical evidence.

While we will aim, as best we can, to address concerns about confounders and endogeneity, drawing e.g. on batteries of fixed effects and subsamples, it is still important to recognize the limits of our empirical investigation. As mentioned in the introduction, our empirical analysis cannot go beyond correlational evidence, given that we lack exogenous variation in key variables.

4.1. Data

The various data sources and measures used in the empirical analysis are briefly discussed below. Most of the discussion is devoted to the measurement of our two main variables, the *ruling group rent* ($\texttt{RGR}_{ct}$) and democratic transition. The appendix C contains more details and summary statistics.

Ruling group rent –. A key focus of our analysis relates to the extent of ethnic favoritism groups in power exert. In line with the theoretical definition (2), we compute the following empirical measure of the ruling group rent (RGR) for a given country c and year t:

$$\texttt{RGR}_{ct} = \frac{\frac{\sum_{e\in \texttt{GOV}_{ct}} Y_{et}}{\sum_{e\in \texttt{GOV}_{ct}} POP_{et}}}{\frac{\sum_{e\in \texttt{GOV}_{ct}} Y_{et}}{\sum_{e\in \texttt{GOV}_{ct}} POP_{et}} + \frac{\sum_{e\in \texttt{OPP}_{ct}} Y_{et}}{\sum_{e\in \texttt{OPP}_{ct}} POP_{et}}} \tag{14}$$

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 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. This functional form implies that a change in the number of groups in power or in their size does not affect $\texttt{RGR}_{ct}$, as long as the average incomes per capita of government and opposition are held constant.[27] 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 ethnic groups' access to power, aiming to measure ethnic favoritism.[28]

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

27. Both the numerator and denominator of (14) correspond to population-weighted averages of per capita income $\sum_e \frac{Y_{et}}{POP_{et}} \times \frac{POP_{et}}{\sum_e POP_{et}}$. Population-weighting allows neutralization of the impact of the number of groups in power.

28. Comparing our variable with respect to, for example, the indicator Alesina et al, (2016) constructed, our measure is time-varying, while they focus on cross-sectional variables. More importantly, they compute a measure of general income dispersion between groups, while we construct a variable that is tailormade to confront our theory with the data, namely the relative income share of the ethnic groups affiliated to the government. Put differently, our approaches are complementary. While their variable is perhaps 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.

in the ethnic homeland of e.[29] 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 covers 113 countries from 1992 to 2008. For this sample, the average RGR amounts to 0.53, implying that the per capita night light is slightly larger in government-affiliated groups with respect to opposition groups. Among the countries with the largest RGR we have Uganda (0.87), Gabon (0.9), and Liberia (0.97). Appendix C contains detailed descriptive summary statistics.

In the context of a democratic transition, our country-level measure $\texttt{RGR}_{ct}$ responds to (i) changes in the average per capita income of groups already in power (i.e. ethnic favoritism at the intensive margin); (ii) groups with different per capita income levels who are accessing or losing power (i.e. composition effects in $\texttt{GOV}_c$ and $\texttt{OPP}_c$). Our theoretical predictions on democratization and ethnic favoritism speak to the first channel. The nature of the second channel is different and relates to a potential reshuffling of the balance of power between groups: Although such a democracy-induced change in power sharing is an interesting phenomenon, it is not the main purpose of our theoretical analysis. We complement our empirical investigation of ethnic favoritism by looking at data disaggregated at the ethnic group level and explain below how this approach mutes composition effects. For this purpose we rely on the rich dataset De Luca et al, (2018) built that collects information on the economic activity for all ethnic homelands and years, proxied by nighttime light intensity, as well as information on which ethnic groups are part of the governing coalition.

We see those two investigations of ethnic favoritism at different levels of aggregation as complementary. It is natural to start our analysis with the aggregate measure $\texttt{RGR}_{ct}$. Indeed, ethnic favoritism is a country-level phenomenon that involves cross-ethnic group externalities, as outlined in our theoretical analysis. Moreover, $\texttt{RGR}_{ct}$ varies at the same level of aggregation than our main explanatory variable, namely the type of political 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 a few groups. By contrast, studying ethnic favoritism at a disaggregated level enables us to control 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 lead to robust, consistent, and significant results, despite substantially different empirical designs, is also reassuring.

Democracy –. We focus on transitions from autocracy to democracy within the last 10 years. Focusing on a quite substantive time window reflects the view that

29. All ethnic groups contained in the GROWUp (Girardin et al, 2015) database are included in our analysis. The ethnic group polygons vary considerably in size, which prompts us to use population-weighted night light measures to compute the RGR in the baseline analysis. In robustness exercises we show that the results are very similar when using absolute levels of night lights for RGR and simultaneously controlling for group population and homeland area. The ethnic-level population information comes from GROWUp (Girardin et al, 2015). Lacking precise annual ethnic-group level data on population, we focus on time-invariant pre-sample information (i.e. the variable "pop90total").

democratization takes time to deploy effects on public policies enacted. In variants, we also investigate robustness to other time windows (i.e. transitions within the last 8 years or 12 years). In all regressions where this variable of democratic transition is included, we also control for mature democracy, namely a variable coding for democratic regimes that have transitioned to democracy more than 10 years ago. The underlying raw data to construct these measures come from Cheibub et al. (2010).[30] Their dichotomous democracy variable covers 199 countries over the 1946 to 2008 period.[31] While this measure is more coarse and conservative than the widely used continuous variable of Polity IV (2022), it has the advantage of rigorously distinguishing free and fair elections from window dressing elections in an autocratic regime. More precisely, Cheibub et al. (2010) code as democratic transitions the first free and fair elections after a period of autocracy. Being coded as a democratic transition is both possible in the case of an incumbent (former autocrat) stepping down peacefully (in the case of defeat) or the incumbent being re-elected, but stepping down peacefully after the end of the electoral mandate. Over the period 1946 to 2008, we observe 107 democratic transitions 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 specific country remains the same as in the previous year, and 0 otherwise. As a secondary variable, we also construct a democracy measure that draws on the democracy measure from Polity IV (2022) that ranges from -10 (full autocracy) to +10 (full democracy). The democracy data of Polity IV in our sample covers 173 countries from 1946 to today.

Finally, we use information on the type of democracy (majoritarian versus proportional), drawing on the Institutions and Elections Project (IAEP) data of Wig et al, (2015) on electoral systems, covering 163 countries over the period 1960 to 2012.[32] For robustness checks we also use an alternative data source on electoral systems, namely the Democratic Electoral Systems (DES) dataset of Bormann and Golder (2013), which is another high quality dataset that yields very similar results.[33] Note that whenever a country is classified as autocracy, both majoritarian democracy measures are coded as zero (to avoid that they pick up "pro forma" / window-dressing institutions), and when the democracy variable has missing information for a given observation, this is also the case for the majoritarian democracy variables.

30. We always list the original data source in what follows. That said, part of the variables were compiled using the GROWUp (Girardin et al, 2015), resp. "Quality of government" (Teorell et al, 2017) systems.

31. A regime is classified as a democracy if it meets the requirements in all of the following four rules: 1) The chief executive must have been chosen by popular election or by a body that was popularly elected; 2) The legislature must have been popularly elected; 3) More than one party must have competed 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.

32. We code as "majoritarian" when their variable "electoral system" corresponds to "plurality" or "majority".

33. Our binary measure is coded as "majoritarian" when their variable "electoral system Type-3 Classes" corresponds to "majoritarian".

Other data –. For conflict measurement, we rely on the widely used conflict dataset of the UCDP Armed Conflict Database, where a given country-year is coded as conflict onset if a conflict with more than 1,000 battle-related deaths breaks out (Gleditsch et al, 2002). We 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 also exploit standard measures of ethnic diversity. We focus on the ethnic polarization measure from Desmet et al, (2012), which accounts for distances between groups (this variable is taken from Alesina et al., 2016).

We also 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).[34] 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 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 mentioned above, the summary statistics of all the aforementioned variables are displayed in the appendix C.

4.2. Democracy and ethnic favoritism – country-level evidence

Our theoretical results 2 and 3 establish conditions under which democratization exacerbates ethnic favoritism. Our model predicts that, everything else being equal, the transition from autocracy to a majoritarian electoral system tends to increase the RGR – our measure of ethnic favoritism that captures the income share accruing to ethnic ruling groups. Transitioning towards a proportional electoral system has a less clearcut effect because the RGR is constrained by the lack of information in autocracy and also by power sharing in a proportional system. To test this prediction, in table 1, we regress the RGR on an indicator variable taking a value of 1 in case of a democratic transition. Hence, the empirical identification rests on time variations in democratization and we expect to find a positive association, especially in a majoritarian system. Our sample is composed of a panel of 116 countries that are tracked from 1992 to 2008. Over this period, we observe 35 democratic transitions taking place in 30 different countries. For all specifications, including country fixed effects, we elicit the within-country across-time impact on RGR of transitioning between autocracy and democracy. Robust standard errors are clustered at the country level. As mentioned above, we control

34. As an example, take country X reaching this score for the first time in 1950, then regardless of what happens to the level of democracy thereafter, the age of democracy variable reaches a level of 50 in the year 2000, and 55 in 2005. If a country has never achieved Polity IV scores above 0, the age of democracy becomes 0.

in all columns for mature democracy (where the transition took place before the 10, respectively 8 or 12 years). Further, in all columns where democratization is interacted with majoritarian democracy, we also control for the interaction of mature democracy with majoritarian democracy.

In column 1, we start with democratization over the last 10 years, finding no statistically significant effect. Next, in column 2 we interact democratization with the main majoritarian democracy measure from IAEP.[35] We find as expected that RGR increase for transitions to majoritarian democracy, but not for transitions to PR. Column 3 replicates column 2, but with the alternative majoritarian democracy variable from DES, yielding similar results, both in terms of significance and coefficient magnitude. Columns 4-6 (resp. 7-9) replicate columns 1-3 but focusing on democratization over the last 8 (resp. 12) years, with again similar findings. Note that the results are robust to controlling for a battery of key covariates. Due to concerns about "bad control" problems, we opt to not include those country-level characteristics in the baseline analysis. Appendix table D.1 reassuringly shows in col. 1-3 that the results hardly change when this battery of controls is included (and several other appendix tables contain specifications controlling for this same battery of controls). In col. 4-6 this appendix table also accounts for global events (such as the beginning of the second Congolese war or the dissolution of the Soviet Union) that may impact both democratization and a rise in ethnic favoritism by including continent $\times$ year fixed effects.

Quantitatively, the results are sizeable: From column 2, we see that transiting towards majoritarian democracy increases RGR by roughly 13.8 percentage points, which corresponds to about a quarter of the sample mean (0.53) and three quarters of a standard deviation (0.16) of this variable.

In table 2, we test additional predictions of our model. The overall approach consists of gradually restricting the sample to a set of countries for which the predictions of our theory should be directly scrutinized. First, we expect a democracy-induced increase in ethnic favoritism to be more pronounced in societies where politics are more likely to be structured along ethnic lines. In columns 1 and 2 we replicate our preferred specification (column 2, table 1) on the subsamples of countries with respectively below-median and above-median ethnic polarization. The results confirm that the impact of majoritarian democracy is larger in ethnically divided countries.

Second, our theoretical 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 re-elected 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

35. Note that we cannot / do not need to control for the uninteracted term of majoritarian democracy, as the sum of democratization interacted with majoritarian democracy plus mature democracy interacted with majoritarian democracy is exactly identical with / multicollinear to the majoritarian democracy measure.

TABLE 1. Democracy and ethnic favoritism: Country-level

Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	ruling group rent (RGR)								
Democratic Transition	0.068	0.031	0.004	0.067	0.029	0.003	0.069	0.032	0.004
	(0.041)	(0.027)	(0.023)	(0.040)	(0.026)	(0.022)	(0.042)	(0.028)	(0.024)
Democratic Transition × Majoritarian		0.107*	0.131**		0.106*	0.132**		0.107*	0.130**
		(0.060)	(0.052)		(0.061)	(0.055)		(0.061)	(0.052)
Trans. demo. last		10 years			8 years			12 years	
Time dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1586	1579	1580	1618	1611	1612	1554	1547	1548
R-squared	0.829	0.835	0.838	0.830	0.835	0.838	0.828	0.834	0.837

Note: Panel with an observation being the country-year, covering 116 countries and the years 1992 to 2009. The democratic transition measure comes from Cheibub et al. (2010) and the electoral system variable (proportional vs majoritarian) comes from IAEP data. All explanatory variables lagged by one year. Country fixed effects and annual time dummies included in all columns. We control for mature democracy in all columns and its interaction with majoritarian democracy in columns 2,3,5,6,8,9. Robust standard errors clustered at the country level (in parenthesis). *=significant at the 10% level, **=significant at the 5% level, ***=significant at the 1% level.

elections is potentially mitigated by the post-election RGR being set by a different group. To test this idea, we keep focusing on the sample of countries with high ethnic polarization in column 2, but estimate our preferred specification in columns 3 and 4 after splitting the sample 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 the absence of alternation of power (with the caveat that the sample size is smaller in column 3 than in column 4), in line with our theoretical view that the informational rent of the opponent is reduced after elections. In column 5, we push the logic one step further by restricting the sample to new democracies only, namely countries that have experienced at least one instance of transition from autocracy to democracy over the period. Given the sample size reduction, this is a demanding specification. However, it is the empirical design that best matches the thought experiment conducted in our theoretical analysis.

Even if the leader stays the same, the ethnic group composition of the government can alter (such as when an additional ethnic group joins the ruling coalition). In column 6, we therefore provide a first attempt at addressing potential composition effects affecting our RGR measure. As discussed above, if under democracy a larger number of ethnic groups are included in government, this compositional change could directly affect the ruling group rent (RGR). To address this concern, we replicate column 4 on the subsample of countries that experience no change in the ethnic group composition of government in the year of transition to democracy (or in the first year after transition).[36] All in all, the estimations of columns 2 to 6 reassuringly suggest that our results are – if anything – stronger when focusing on these restricted

36. We impose this additional restriction on the sample of column 4 instead of column 5, as the move from column 4 to 5 led to a drop in sample size by about half.

subsamples. Note that estimation results are virtually unchanged when we control for the aforementioned country-level variables (appendix table D.2).

TABLE 2. Democracy and ethnic favoritism: Heterogeneous effects

Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)
	ruling group rent (RGR)					
Sample restrictions:	Low EP	High EP	High EP New leader	High EP Same Leader	High EP Same leader New democ.	High EP Same leader Same ethnic composition
Democratic Transition	0.025	0.023	-0.032	0.023	0.021	0.013
	(0.020)	(0.032)	(0.042)	(0.032)	(0.036)	(0.023)
Democratic Transition × Majoritarian	-0.035	0.204**	0.070	0.212**	0.215**	0.233**
	(0.026)	(0.088)	(0.052)	(0.085)	(0.089)	(0.108)
Time dummies	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	751	781	161	573	297	527
R-squared	0.892	0.805	0.878	0.855	0.816	0.865

Note: Panel with an observation being the country-year, covering 116 countries and the years 1992 to 2009. The democratic transition measure comes from Cheibub et al. (2010) and the electoral system variable (proportional vs majoritarian) comes from IAEP data. All explanatory variables lagged by one year. Country fixed effects and annual time dummies included in all columns. We control for mature democracy and its interaction with majoritarian democracy in all columns. In column 1 (resp., 2), the sample is restricted to countries with below-median (resp., above-median) ethnic polarization (EP). In column 3 (resp., 4), the sample is restricted to observations with high EP and with a new leader accessing power (resp., last period's leader remaining in office). In column 5, the sample is restricted to countries that over the sample period had at least one instance of transition to democracy, that have the last period's leader remaining in office and that have above-median ethnic polarization. In column 6, the sample is restricted to countries with above-median ethnic polarization and to observations with the last period's leader remaining in office. It 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 (in parenthesis). *=significant at the 10% level, **=significant at the 5% level, ***=significant at the 1% level.

In the 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 D.3). In the same spirit, we 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) (appendix table D.4). Finally, we investigate cross-continent heterogeneity and find that Africa and Asia drive most of our results (appendix table D.5). This is intuitive, given that these two continents experience the highest historical incidences of ethnic conflict.

4.3. Democracy and ethnic favoritism – ethnic group level

We now investigate the relationship between democracy and ethnic favoritism with data disaggregated at the ethnic group level.[37] This impressive panel dataset from De Luca et al (2018) draws on the well-known *Ethnologue* data and covers 7,653 ethnographic regions located in 140 countries, ranging from 1992 to 2013 (for all

37. 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 the Institutions and Elections Project (IAEP) data of Wig et al (2015), new democratization is from Cheibub et al. (2010), and ethnic fractionalization is from Alesina et al (2003).

references to the raw data used, see De Luca et al., 2018). This level of disaggregation makes it possible to use a richer set of fixed effects, at the ethnic group and country $\times$ year levels especially. We follow the demanding empirical design from De Luca et al (2018): We assess the impact of a leader arriving in power on its 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-$\times$ year fixed effects). Note that the identifying variation is quite different than in the previous tables: Following De Luca et al (2018) we do not exploit here democratization shocks, but focus on changes in leaders, which have heterogeneous effects depending on the regime type. 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 group 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.[38] We start in column 1 by replicating column 5 of table 6 of De Luca et al (2018). The unit of observation is a specific ethnographic region in a certain 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 originates from this region (equal to $1/n$ for multi-ethnic regions composed of n ethnic groups). It captures the extent of ethnic favoritism. This variable is interacted with mutually exclusive measures of political institutions (their linear terms being absorbed by country-$\times$ 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.[39] 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. Consistent with our previous country-level evidence, the point estimates show that only a 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. The results and interpretation are unchanged.

In columns 4 to 7, we replicate the previous specification under sample restrictions that are particularly relevant in our theoretical setting. As in the previous section,

38. 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 appendix table D.6 we cluster the standard errors – due to the number of countries in the sample being too low – 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 D.6 at the country level as well.

39. We focus on the identical specification as De Luca et al (2018), and use like them contemporaneous values of the explanatory variables.

we first restrict our focus to high ethnic polarization countries, then to years without leader change and finally to new democracies (to save space we apply them right away cumulatively, skipping some intermediate steps). In particular, in column 4, we restrict the analysis to countries with above-median ethnic polarization. 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, we maintain the two restrictions of column 5, but in addition restrict the sample to contain only countries that have experienced at least one instance of transition to democracy over the period. 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 D.6 implements even more radical sample restrictions. In particular, we focus on observations that are within short time windows around transition to democracy (seven, five, and three years). We also restrict the analysis further to democratic transitions without leadership change to make it directly comparable to our theoretical prediction (result 2).

In appendix table D.7 we also replicate the main results for an alternative data source on ethnic groups, the "Geo-referencing of Ethnic Groups" (GREG) data (also taken from and described in depth in De Luca et al. (2018)). This secondary dataset suffers from the downside that the resulting sample contains much fewer data points (less than a third of the ones in Ethnologue).[41] Given the very demanding identification strategy, this seriously reduces the statistical power of our estimates. Unsurprisingly, in most columns the estimated coefficients are not statistically significant for GREG, but reassuringly they are always positive for the interaction term of interest, and of a comparable order of magnitude as for the Ethnologue data.

4.4. 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 transitioning 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 allows for large ethnic favoritism in case of re-election).[42] We now confront this specific prediction of our setting to the data.

40. One caveat to bear in mind is that in the last column (6) the sample is so severely restricted to only 23 countries that the statistical variation exploited is drawn from a limited number of observations. These results therefore need to be interpreted with caution.

41. For illustration, only 17 instances of democratization fall in the sample when carrying out the analysis with GREG data.

42. Note that weak and strong autocrats decide to democratize around the same intermediate belief $\hat{\mu}$. Assuming that the belief of the autocrat represents the true strength of the opponent, we should observe on average a similar ratio of strong/weak opposition for proportional and majoritarian elections. Consequently, the election outcome should favor more on average the re-election of strong autocrats than weak autocrats.

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

Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)
	Nighttime light					
Sample restrictions:				High EP	High EP Same lea.	High EP Same lea. New dem.
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	0.043	0.057	0.092
		(0.052)	(0.052)	(0.082)	(0.086)	(0.152)
Leader × demo.majo.		0.071***	0.072***	0.093***	0.052***	0.219*
		(0.022)	(0.022)	(0.015)	(0.014)	(0.105)
Leader × non-demo.			0.073	0.088	0.082	-0.004
			(0.058)	(0.079)	(0.072)	(0.132)
Ethnic group fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Country-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	141164	120581	120581	59683	57127	20614
R-squared	0.947	0.951	0.951	0.952	0.955	0.941

Note: Panel with an observation being the ethnic group-year, covering 140 countries and the years 1992 to 2013. Ethnic group and country-year fixed effects included in all columns. In column 4, we restrict the analysis to countries with above-median ethnic polarization. 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, we maintain the two restrictions of column 5, but in addition restrict the sample to contain only countries that have experienced at least one instance of transition to democracy over the period. Robust standard errors clustered at the country level (in parenthesis). *=significant at the 10% level, **=significant at the 5% level, ***=significant at the 1% level.

We aim to assess 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, amounting to 65 to 79 instances (depending on the specification) over the 1949 to 2008 period. Table 4 displays the estimation results. The dependent variable *same leader* is a dummy equal to 1 if a country's effective head of state is unchanged during the transition (from Cheibub et al. 2010). The main 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 a proportional representation democracy. As above, we draw on the well-established Institutions and Elections Project (IAEP) data of Wig et al (2015) to code this majoritarian representation dummy. As 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. The results show that transition to a majoritarian democracy is associated with a higher re-election likelihood of the former autocrat than transition to a democracy with PR. This finding is confirmed in column 2, when we use the alternative data from the Democratic Electoral Systems (DES) dataset of Bormann and Golder (2013) to code majoritarian representation, and in column 3, with a logit instead of an LPM estimation. One concern may be that a series of confounders could jointly determine the type of democracy adopted and leader tenure (such as a country's political history or its

development level). In column 4, we therefore replicate column 1 with the same set of aggregate controls as in section 4.2 (lagged GDP per capita, lagged population, lagged trade share of GDP, and years since first democratization). Reassuringly, the magnitude of the coefficient of interest is barely impacted. As discussed above, these controls are potentially outcome variables themselves, therefore we decide not to include them in the remainder of the baseline analysis. For the sake of robustness, we replicate all our analyses with these controls in the appendix E.

One further limit to our analysis relates to the small sample size. For this purpose, in table 5 we move to panel data covering all country years associated with democracy (132 countries from 1947 to 2008). An additional advantage is that we can now include country fixed effects and annual time dummies. The dependent variable *same leader* has to be (slightly) adjusted for this panel environment. We code it as a dummy equal to 1 if a country's current head of state has not changed since the last time period (a year or a mandate, depending on the specification). On top of the dummy *majoritarian democracy*, we include a dummy *transition to democracy*, 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 transitioning to majoritarian democracy on an autocrat's re-election odds with respect to transitioning to proportional representation. Column 1 displays the LPM results. It is reassuring to see that the coefficient of the linear term *transition to democracy* is negative: Transitions tend to trigger a leadership change. More importantly, the interaction term is positive and statistically significant, confirming the insights of the previous table. Column 2 replicates the approach of the first column after restricting the sample to election years, aiming to focus only on politically relevant episodes. Despite 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 (0.31) represents over a third of the sample probability of a leader remaining in office (0.82) and is of the same order of magnitude as one standard deviation of this variable (0.38). We replicate the analysis in columns 3 and 4, using the DES dataset for majoritarian representation. The findings are similar.

A series of robustness tests is provided in the appendix. They incorporate country-level control variables (table E.1), using a non-linear logit model instead of the LPM (table E.2). This includes continent-year fixed effects and country-specific time trends, aiming to filter out aspects such as the onset of a new war or long-run trends, for example building a civic culture at the country level (table E.3).

4.5. Further evidence: democracy and ethnic conflict; riots and democratization

Democracy and ethnic conflict. A somewhat less specific implication of our theory is that democracy reduces the risk of conflict. We investigate this relationship in the appendix F, regressing several democratization/democracy variables on conflict measures. While we find no robust effect of democratization in general, we do find a conflict-reducing impact of mature, non-fragile democracy. The effect is detected for both general conflict and a more specific conflict measure closely linked to our

TABLE 4. Type of democracy and tenure of leader in office – sample of democratic transitions

Dependent variable:	(1)	(2)	(3)	(4)
	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 country-year unit of observation. The sample consists of transitions to democracy in 53 countries, from 1949 to 2008. Decade fixed effects and continent fixed effects are 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

Dependent var.:	(1)	(2)	(3)	(4)
	Dummy same leader as last year			
Majoritarian demo.	-0.060	-0.137	0.126**	0.043
	(0.058)	(0.090)	(0.057)	(0.068)
Democratic Transition	-0.559***	-0.160	-0.623***	-0.278***
	(0.060)	(0.098)	(0.044)	(0.080)
Democratic Transition × Majoritarian	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 country-year unit of observation, covering 132 countries and the years 1947 to 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 and 2 use data from the Institutions and Elections Project (IAEP) of Wig et al (2015), while columns 3 and 4 use data from the Democratic Electoral Systems (DES) dataset of Bormann and Golder (2013). Robust standard errors clustered at the country level (in parenthesis). *=significant at the 10% level, **=significant at the 5% level, ***=significant at the 1% level.

theoretical setup, namely ethnic conflict over government. This empirical finding is in line with the predictions of our model – in particular on non-fragile democracy in our dynamic model extension (section A.3).

Riots and democratization. Our theoretical extension on riots predicts that democratization most likely follows after *intermediate* levels of riots (appendix A.2). This non-linear relationship 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 question empirically in appendix G, regressing a dummy variable coding for democratic transition on the country-level number of riots (both linear and squared terms). The estimation results point toward a bell-shaped association between riots and democratic transition.

5. Conclusion

We study the theoretical drivers of democratic transition when ethnic tensions are more salient than the poor/rich divide. By eliciting information on ethnic mobilization, free and fair elections restore the efficiency of inter-ethnic bargaining and prevent civil conflict outbreaks. Autocrats may therefore rationally initiate democratic transition, at the risk of losing power, as elections reduce the opposition's informational rent.

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, democratic transitions to majoritarian systems tend to exacerbate ethnic favoritism. Second, incumbents have a higher probability of victory when an autocracy transitions to a majoritarian electoral system rather than to a proportional representation one.

Our current contribution raises additional questions that we left open for future work. 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. This choice will typically persist for decades and determines a battery of future outcomes. The critical juncture of initial democratization may therefore 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. This could be a fruitful avenue for future research.

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Ethnic Conflict and the Informational Dividend of Democracy

Online appendix

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Appendix A: Theoretical extensions

A.1. Alternatives to elections and boycotts

It is natural to ask whether there are other – simpler or less costly – ways for rulers to learn about the opposition's type than running elections (which could result in the loss of power). If such less risky substitutes were a valid option, the focus of this contribution may be misguided. To address these concerns, we highlight below the importance of credible elections to incentivize the opposition to reveal their type. We specifically consider that the leader can offer alternatives to free and fair elections, including referenda, plebiscites, window dressing elections, or surveys. If the opposition chooses to participate, they reveal their type at a small mobilization cost.

A crucial feature of free and fair elections is that they are designed around a set of commitment devices that ensure a credible transition of power. Alternatives such as window dressing elections or a plebiscite lack the credibility needed to ensure a transition. Once a leader is endowed with the required information, no safeguards will pressure them to make concessions or step down. They will simply behave as an autocrat with perfect information and exert the highest feasible level of ethnic favoritism (setting $1-\texttt{tax}=\mathscr{W}^{-+}$ or $1-\texttt{tax}=\mathscr{W}^{++}$).

In this setup, a strong B will refuse to participate in non-credible alternatives, because revealing themselves will bring no benefits (the leader will tax them at the expected war payoff) and requires paying a mobilization cost. A weak B will mimic a

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strong B and will also refuse to participate. We therefore 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 their 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 (note that non-participation reveals their 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 that refuses to pay a mobilization cost.

A.2. Social unrest as an information device

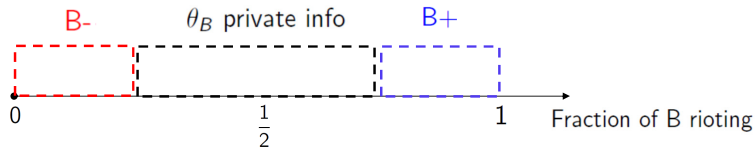
Our baseline model assumes that leaders are perfectly familiar with the ethnic identity strength of their group. However, a recent study (see Barbera and Jackson, 2016, and the literature it references) discusses how people in a group often need to learn this information from each other through costly participation in a collective action. This study, motivated by the Arab Spring events, highlights that despite improved social media and communication, demonstrations and protests remain strong methods of credibly signaling the intensity of preferences and ethnic identity (as participating in rioting and demonstrations entails a costly risk and is not cheap talk).

We introduce this feature in our model by assuming that the leader of the opposing group can learn the type of their own group by observing participation in rioting events. In particular, we consider that neither A nor B know θ_B at the beginning of the game (they both hold the same belief $\mu \equiv \mathbb{P}(\theta_B = +\mathscr{E})$). Leader B – when instigating social unrest – can learn the true intensity of their ethnic identity by observing their group's participation in 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, everyone perfectly observes c_B. However, in times of social or economic turmoil, c_B becomes volatile and is privately observed by B *after* the decision to trigger social unrest (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 the state of the economy with precision. 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 therefore $1 + \mathscr{E} - \frac{c_B}{k}$ for B^+ and $1 - \mathscr{E} - \frac{c_B}{k}$ for B^- . In normal times, when c_B is known to all, A and B will perfectly learn the value of θ_B by observing the mass of protesters. Ex-ante, A^+ can buy off its opponent by transferring their expected war payoff to B and disincentivize riots: $1 - \texttt{tax} = \mathscr{W}^{\mathbb{E}(G),+} = \mu(\mathscr{W}^{++}) + (1-\mu)(\mathscr{W}^{-+})$. For B, this expected payoff is similar to the one in which A and B discover B's type during the mass protest (appendix B.3).

FIGURE A.1. If B triggers a riot, A learns



Consequently, $\mathbb{E}[\mathscr{W}_B^{\texttt{Riot=1}}|A^+] = \mathbb{E}[\mathscr{W}_B^{\texttt{Riot=0}}|A^+] = \mathscr{W}^{\mathbb{E}(G),+}$ and B accepts the `tax` without rioting.

In times of turmoil, for example 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 instigate unrest, creating an informational rent. If the mass of protesters is such that $1+\mathscr{E}-\frac{\bar{c}}{k} < 1+\mathscr{E}-\frac{c_B}{k} < 1-\mathscr{E}+\frac{\bar{c}}{k}$, A won't be able to learn B's type by observing the mass of protesters.[4] 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 A.1.

THEOREM A.1. *[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 B.3).*

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 reveals θ_B to leader A. This ambiguity is created 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 (e.g. 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 B.3). In the appendix G we carry out an empirical investigation of our predictions, finding that democratization is indeed most likely for *intermediate* levels of social unrest, as our theory predicted.

4. When the mass of protesters is between $1+\mathscr{E}-\frac{\bar{c}}{k}$ and $1-\mathscr{E}+\frac{\bar{c}}{k}$, 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. Their belief μ on B's type remains unchanged because of our distributional assumption on c_B.

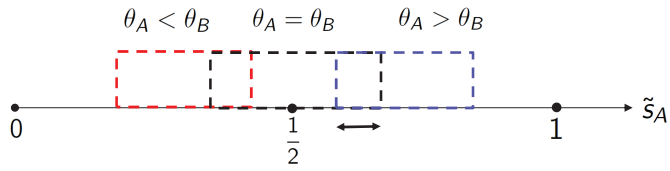
A.3. Path-dependent democratization

Another salient feature of our setting is that democratization yields immediate pacification in the baseline model. 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 (e.g. Snyder, 2000; Mann, 2005; Mansfield and Snyder, 2005). To assess whether this implication of our theory is critical, we develop a dynamic extension of our analysis below, allowing for post-democratization violence. The objective is to model the transition phase of democracy, a period during which young democracies are prone to conflict despite free and fair elections. This is generated in our setup by the presence of imperfectly revealing elections, affecting the leader's ability to discover the type of the opposition and potentially leading to conflict in the short/medium term. We conclude that if the dissipation of informational asymmetries helps to escape the potentially conflicted transition period of young democracies, better information in mature democracy gives the elected leader incentives to dismantle the election process. We therefore discuss this phenomenon of democratic backsliding and highlight two lines to explain why leaders may maintain credible elections: the potential type-switches of the opposition and the development of democratic values.

A.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 imperfectly reveal the opposition type (overlapping vote shares) and (ii) there is 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 charismatic (or uncharismatic) leader, blurring the intensity of the opposition's ethnic mobilization. The second assumption is associated with, for example, the opportunity cost argument, according to which a rebel group can more 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, carrying a risk of war. The second assumption generates a critical period for war to happen, 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. The newly elected leader may therefore impose a discriminatory tax, triggering a war with a strong opposition. Young democracies can escape this transition phase when the information about the opposition type is perfectly revealed. We start by describing the implication of both assumptions on the stage game before moving to the dynamic interpretations.

FIGURE A.2. Distribution of voting shares



Non-revealing elections and post-election conflict. We first relax the assumption that elections perfectly reveal θ_B, which opens the possibility of non-revealing elections and post-election conflict. Remember that the baseline assumption insuring perfectly revealing elections in section 3.2.2 was that $\mathscr{E} > \frac{1}{v2\rho}$, implying that vote shares of A^+ facing a B^- under the most beneficial popularity shock are lower than when facing a B^+ under the most adverse shock (figure 1). 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: $\mathscr{E} < \frac{1}{v2\rho}$.[5] Denote by d the probability that vote shares end up being ambiguous, conditional on type.[6] In figure A.2, the probability d coincides with the overlap of vote shares:

First consider the situation in which a strong autocrat, without information, would set a high tax on the opposition ($\mu < \hat{\mu}$). In this situation, non-revealing elections may lead to post-election conflict if the opposition happens to be strong. Under this possibility of fragile democracy, the expected payoff of A^+ when offering majoritarian elections is

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

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

Then consider 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

5. To keep the analysis simple, we maintain the non-ambiguous voting assumption (a strong A always wins when facing a weak B). This requires $\frac{1}{v4\rho} < \mathscr{E} < \frac{1}{v2\rho}$.

6. 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, μ remains the same after observing vote shares.

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

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

Non-revealing elections may therefore lead to post-election conflict 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: $\mathbb{P}[\text{G wins}] \times (1-\varphi+w_G) + \tilde{e}_i + m$. 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, $1-\texttt{tax}=0$ dominates $1-\texttt{tax}=\mathscr{W}^{-+}$ and $1-\texttt{tax}=\mathscr{W}^{++}$ for low q while $\hat{\mu}$ – the belief threshold at which ensuring pacification becomes worthwhile – decreases with q (details in the appendix, section B.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 clarified 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 B.4).

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

1. The society enters the period either in the state ω_A or ω_D (autocracy and democracy, respectively).
2. The leader updates their belief μ 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.

A.3.2. Analysis.

Conflictual autocracies. When (i) the society enters the period in state ω_A, (ii) μ_0, d, q are such that $\mu_0 \leq \underline{\mu}$ and (iii) q is high, the autocrat optimally sets a high tax

($t = \mathscr{W}^{-+}$). If no conflict occurs, the autocrat updates downward at the beginning of the next period: a B^+ may have missed the window of opportunity.[7] Consequently, they 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 therefore stable (μ will consistently decrease toward 0 over time) and highly extractive. Note that if q is low (the window of opportunity is unlikely), the autocrat sets $t = 0$ and the society will eventually experience conflict, even when the opposition is weak.

Stable autocracies. When (i) the society enters the period in state ω_A, (ii) μ_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 – μ does not change and elections are never offered – and has a low level of extraction (for example Singapore).

Transition and fragile democracies. When (i) the society enters the period in state ω_A, (ii) μ_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 democracy with probability d (non-revealing elections). If $\mu_0 < \hat{\mu}$, the leader sets a high tax in this situation. The fragile democracy regime therefore leads to a risk of war.

If no conflict takes place at the end of the period, the leader updates downward and fixes a high tax in the the subsequent period as well (if re-elected). In this situation, the society faces a risk of conflict when the opposition is strong. This leads to a "race" 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 democratic consolidation in the the same period is equal to that 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

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

7. In this situation, the leader updates their belief about the opposition type as follows: $\mu_t = \frac{\mu_{t-1}q}{\mu_{t-1}q+(1-\mu_{t-1})}$.

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

$$\mathbb{P}(\texttt{consolidation}|\mu) = 1 - \frac{\mu}{1+\frac{1-d}{qd}} \tag{A.2}$$

This probability is decreasing in μ (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.

Young democracies may therefore enter a transitory phase where conflict is likely. They escape this transition phase when elections reveal all the information about the opposition: the "race" between realizing the window of opportunity and the perfect revelation of elections drives the likelihood of peaceful transition.

A.4. Discussion about 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. To relax these implications of the model, in the previous subsection we focused on allowing for conflict along the transition path, while maintaining the assumption that constitutional safeguards (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 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 recent academic literature and popular media alike – sometimes referred to as the backsliding of consolidated democracies (for a recent review, see Waldner and Lust, 2018). According to Freedom House's 2018 annual report, democracy has declined overall for the 12th consecutive year, with 45 percent of countries classified as free, 30 percent as partially free, and the 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. ex-ante manipulating the elections). Recall that in our setup, without constitutional safeguards, the leaders have incentives to stop organizing credible elections if the opposition type is known: the informational 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 opposition type switches, maintaining asymmetric information and (ii) the role of democratic values.

Maintaining asymmetric information through type reshuffling. A key mechanism in our framework that supports 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 learned 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 elected leaders would have incentives to dismantle the election process: they know the opponent's type and do not want to lose the next elections. While better information reduces the risk of conflict in young democracies, in mature democracies it has the downside of making the organization of free and fair elections less appealing.

One way to maintain the electoral incentives is through a sufficiently high probability of opposition type reshuffling in each period, h (privately known to the opposition). We interpret a high probability h as a sign of active political competition (e.g. 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). A low reshuffling probability may be associated with polarized political consistencies, with only a few changes in voting patterns over time. Starting from a period where previous elections revealed the opposition type, 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 its opponent's type (meaning the type has been reshuffled with certainty). It is therefore 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 in each period is worth taking the risk of losing the election.

As h decreases, it becomes increasingly tempting to avoid elections: the informational rent decreases because the revealed opposition type has fewer chances to be reshuffled. There is a critical probability $\hat{h}$ below which the informational 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 opposition type is likely to remain the same. This backsliding in mature democracies corresponds with situations where, for example, the leading group ex-ante manipulates the elections.

Democratic values. In addition to maintaining asymmetric information through type reshuffling, democratic values can also act as a rampart against the backsliding of mature democracies into autocracy. In particular, in mature democracies with regular free and fair elections we often observe 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 governments. As Besley and Persson (2019) argued, citizens experiencing democracy develop democratic values, pushing the population to support

free and fair elections and executive constraints for their own sake.[8] If the group in power dismantles the constitutional safeguards, the citizens may oppose it violently, imposing a high cost on the group in power. Democracy may then be self-enforcing: as citizens experience elections and democracy, it becomes increasingly costly for the leader to dismantle executive constraints, forcing them to abide to election results. The recent 2019 Hong Kong anti-extradition bill protests illustrate that a population that has experienced democratic institutions for some time may oppose democratic backsliding, rendering an autocratic reversal more costly for the leader.

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

A.5. Heterogeneous group sizes/productivity and inequality

Our main theoretical result, stating that democratization is associated with increased ethnic favoritism, has implications for different measures of inequalities, between ethnic groups and for the population as a whole (depending on the relative group sizes). To clarify this link between ethnic favoritism and inequality, we provide some extensions below, emphasising the effect of different group productivity and heterogenous sizes. Surprisingly, we see that introducing heterogenous group productivity has no (qualitative) effect 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 initial productivity. By contrast, accounting for different group sizes will substantially impact our model's outcomes, as population size may affect ethnic mobilization.

Heterogeneous group productivity. Here we 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 because each group's post-tax income 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

8. Also see Moore (1966), Putnam (1993) and Persson and Tabellini (2005).

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 (the same for both groups) and by ethnic identity. Reducing one group's productivity therefore reduces the total size of the spoils (from 2 to $1+\beta$) and scales down all war payoffs. The ex-ante asymmetry in productivity therefore does not translate into differential mobilization. In other words, a strong opposition with high productivity will obtain the same share of the total resource as 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 (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 ethnic identity differentials.

Heterogeneous group sizes. If initial wealth does not impact mobilization in our setup, assuming different group sizes has important implications. This is because group sizes may change 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 therefore determined by the maximum number of fighters that the small group can enroll (its full group) versus the best response to this number 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.[9] Conversely, if a small (strong) opposition wins the election, the RGR decreases from $\frac{2-\mathscr{W}_S^{++}}{2}$ to $\frac{2-\mathscr{W}_L^{++}}{2}$, where $\mathscr{W}_S$ ($\mathscr{W}_L$) 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 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 $\frac{2-\mathscr{W}_L^{++}}{2}$ to $\frac{2-\mathscr{W}_S^{++}}{2}$, with $\mathscr{W}_L^{++} > \mathscr{W}_S^{++}$). In the canonical situation of a small elite losing the election against a large opposition (i.e. citizens), we therefore predict a strong increase in ethnic favoritism (even larger than in our baseline). This effect is

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

likely to decrease inequality measures based on individual income distances (such as the GINI index), because there will be a higher 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 society.

A.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 strong enough to govern the country (or to threaten the group in power). In this environment, one can interpret θ_G as the capacity of a leader to solve collective action problems in their 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 and charisma). In such a context, a group endowed with a high θ is able to federate different interests efficiently and can mobilize efficiently in the case of war (solving the free-riding problem in mobilization).[10]

A.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 the spoils equally among all group members. The leaders are not using monetary incentives fully, which allows clarification of the role of ethnic identity in mobilization. In this extension, we 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 the case of victory, appropriate a resource of the same size (with full expropriation, the spoils are equal to the total production of society, minus the cost of war). The stake is therefore the same for both groups and leaders cannot distinguish themselves by credibly committing to different rewards for their fighters. Consequently, they have incentives to rely on ethnic identity to leverage mobilization and increase their winning chances.

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

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

When deciding whether to fight, agent i still trades off their ethnic identity and the monetary cost of winning with the opportunity cost of fighting,

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

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 $\mathtt{army}_G = 1 + \theta_G - m + \mathbb{P}[\text{G wins}] \times (w_{\mathtt{f}} - w_{\mathtt{nf}} - \varphi)$.

The best response of leader G is therefore

$$(w_{\mathtt{nf}}, w_{\mathtt{f}})_G = \arg\max \mathbb{E}[W_G | \text{war}; (w_{\mathtt{nf}}, w_{\mathtt{f}})_G; (w_{\mathtt{nf}}, w_{\mathtt{f}})_{-G}]$$

Assuming $\varphi \leq \frac{1}{2}$, 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 θ_G. Furthermore, the baseline results hold.

Proof. First, recall that when $\varphi \leq \frac{1}{2}$, the unconstrained Nash equilibrium outcome is to enroll the whole population: $\mathtt{army}^* = 1$. With monetary incentives and no forced conscription, each group leader wishes to allocate all the resources to fighters in order to obtain the largest possible army size: $w_{\mathtt{f}} = \mathscr{S}$ and $w_{\mathtt{nf}} = 0$ (where $\mathscr{S}$ denotes the war spoils in case of winning). Recalling (5), the army size at equilibrium is $\mathtt{army}_G = 1 + \theta_G - m + \mathtt{P}_G(\mathscr{S} - \varphi)$. For high m, meaning when $m > \theta_G + \mathtt{P}_G(\mathscr{S} - \varphi)$, we observe that $\mathtt{army}_G < 1$: mobilization is constrained and army size increases with θ_G. □

This result highlights that when the psychological cost of fighting is high, mobilization is constrained (below the unconstrained Nash equilibrium). Leaders are then unable to mobilize sufficiently, even when committing to allocate all the spoils toward fighters, and they optimally use non-pecuniary elements to increase mobilization. This is a strong theoretical argument that motivates 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 unable to credibly commit to different rewards (the stake is the same for both groups). Ethnic identity is therefore a natural way to mobilize efficiently in the case of war and to create a threat to the other group.

Appendix B: Further theoretical derivations and proofs

B.1. War mobilization

Constrained mobilization. Here we show that $\mathscr{E} < \frac{\varphi}{2}$ leads to an army size lower than the unconstrained army size $\texttt{army}_G^* = \min(\frac{1}{2\varphi}, 1)$. First, note that $\texttt{army}_G^* = 1$ when $\varphi < \frac{1}{2}$ and $\texttt{army}_G^* = \frac{1}{2\varphi}$ otherwise. Furthermore, recall that $\texttt{army}_G = 1 + \theta_G - \varphi \times \left(\frac{1+\theta_G}{2+\theta_G+\theta_{-G}}\right)$. When $\varphi < \frac{1}{2}$, the biggest army size is realized when a "+" fights a "+" and is equal to

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

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

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

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

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

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

and, finally,

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

which also holds as long as $2-\varphi(2-\varphi) > 2\varphi$, therefore $\varphi < 2-\sqrt{2}$.

B.2. Political mobilization

Revealing elections. Here we highlight that $\mathscr{E} > \frac{1}{\nu 2\rho}$ guarantees perfectly revealing elections as well as non-ambiguous electoral outcomes. For A to perfectly learn B's mobilization capacity from vote shares, we need the vote share of A^+ facing B^+ to be 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 requires

$$\frac{1}{2}+\frac{1}{4\rho}<\frac{1}{2}+v\mathscr{E}-\frac{1}{4\rho} \tag{B.1}$$

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. Therefore,

$$\mathscr{E}>\frac{1}{v2\rho} \tag{B.2}$$

which was to be shown.

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

$$\tilde{s}_A=\begin{cases}1-v\mathscr{E}-\tilde{p}<\frac{1}{2}, & \text{if } \theta_A<\theta_B\\ 1/2-\tilde{p}=\frac{1}{2}, & \text{if } \theta_A=\theta_B\\ 1+v\mathscr{E}-\tilde{p}>\frac{1}{2}, & \text{if } \theta_A>\theta_B\end{cases} \tag{B.3}$$

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

Democratic transition with high destructive war. Here we show that highly destructive war destroys all incentives for democratization. We specifically assume that $\varphi\approx 1$: the opportunity cost of war is so high that only a few productive resources are left after the conflict. Recalling that the expected war payoff is

$$\mathscr{W}^{G,-G}\equiv\mathbb{E}[W_G|\text{war},\theta_G,\theta_{-G}]=\frac{1+\theta_G}{2+\theta_G+\theta_{-G}}\times[2-\varphi\times(2+\theta_G+\theta_{-G}-\varphi)] \tag{B.4}$$

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

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

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

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

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

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

and, finally,

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

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

Consequently, to maintain peace, the autocrat A^+ must compensate more a B^- than a B^+: $2-\mathscr{W}^{-+} < 2-\mathscr{W}^{++}$. This change in the ordering of war payoffs reverses autocrats' optimal pacification strategy: they extract a low amount for low belief ($1-\texttt{tax} = \mathscr{W}^{-+}$) and increase their ethnic favoritism for higher belief, risking war against a B^- ($1-\texttt{tax} = \mathscr{W}^{++}$). 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.

B.3. Social unrest

Here we 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 the expected payoff of learning their type would be the same as the one already obtained from A, transferring the expected war payoff $\mathscr{W}^{\mathbb{E}(G),+} = \mu(\mathscr{W}^{++}) + (1-\mu)(\mathscr{W}^{-+})$. If a riot starts, it should therefore 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, meaning a mass of protesters such that A can exactly infer the type of B. Note that, due to the distributional assumption, this probability is the same for B^+ and B^-. With probability z, A discovers B's type after a protest and with a probability $1-z$ only B discovers their 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 they cannot infer the type of B (which happens with probability $(1-z)$), in which case they set the $\texttt{tax}$ to its *highest* value and face a war if B discovers they have a strong ethnic identity, or (ii) either they discover B's type along with B and set the $\texttt{tax}$ just avoiding war (this happens with probability z). It is immediately clear that the expected payoff of group B in case of riot:

$$\mathbb{E}[W_B^{\texttt{Riot}=1}|A^+] = \mu\left[z(\mathscr{W}^{++}) + (1-z)(\mathscr{W}^{++})\right] + (1-\mu)\left[z(\mathscr{W}^{-+}) + (1-z)(\mathscr{W}^{-+})\right] \tag{B.5}$$

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

$$\mathbb{E}[W_B^{\texttt{Riot}=0}|A^+] = \mu\left[\mathscr{W}^{++}\right] + (1-\mu)\left[\mathscr{W}^{-+}\right] \tag{B.6}$$

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 they cannot infer the type of B, in which case they

set the tax to its *lowest* value, or (ii) they discover B's type along with B and set the tax to just avoid war:

$$\mathbb{E}[W_B^{\texttt{Riot}=1}|A^+] = \mu\left[z(\mathscr{W}^{++}) + (1-z)(\mathscr{W}^{++})\right] + (1-\mu)\left[z(\mathscr{W}^{-+}) + (1-z)(\mathscr{W}^{++})\right] \tag{B.7}$$

This is higher than the payoff obtained in uncertainty for B (equation B.6) because A will set a lower tax in case of asymmetric information in order to avoid war, bringing informational rent to a B^-. B therefore has an incentive to instigate 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 they cannot infer the type of B and offer majoritarian elections, or (ii) they discover B's type along with B and set the tax to just avoid war:

$$\mathbb{E}[W_B^{\texttt{R}=1}|A^+] = \mu\left[z(\mathscr{W}^{++}) + (1-z)(1)\right] + (1-\mu)\left[z(\mathscr{W}^{-+}) + (1-z)(\mathscr{W}^{-+})\right] \tag{B.8}$$

This is higher than the payoff obtained in uncertainty for B, because A will offer elections in case of asymmetric information, bringing a higher payoff to a strong B (1 instead of $\mathscr{W}^{++}$) when $(1-z)$ realizes. For this range of belief as well, B has an incentive to instigate 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 their type than in the asymmetric information case. A^+ therefore has incentives to deter social unrest.

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

$$\mathbb{E}[W_{A^+}^{\texttt{Riot}=1}|\mu] = \mu\left[z(2-\mathscr{W}^{++}) + (1-z)(1)\right] + (1-\mu)\left[z(2-\mathscr{W}^{-+}) + (1-z)(2-\mathscr{W}^{-+})\right] \tag{B.9}$$

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

$$\mathbb{E}[W_{A^+}^{\texttt{Riot}=1}|\mu] = \mu\left[z(2-\mathscr{W}^{++}) + (1-z)(2-\mathscr{W}^{++})\right] + (1-\mu)\left[z(2-\mathscr{W}^{-+}) + (1-z)(2-\mathscr{W}^{++})\right] \tag{B.10}$$

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

B.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 $1-\texttt{tax}=\mathscr{W}^{-+}$ when $q<\overline{q}=\frac{\mathscr{W}^{-+}}{2-\mathscr{W}^{+-}-\mu(2-\mathscr{W}^{+-}-\mathscr{W}^{-+})}$ and $\mu<\hat{\mu}$; while $1-\texttt{tax}=0$ dominates $1-\texttt{tax}=\mathscr{W}^{++}$ when $q<\overline{\overline{q}}=\frac{\mathscr{W}^{++}}{2-\mathscr{W}^{+-}-\mu(\mathscr{W}^{++}-\mathscr{W}^{+-})}$ and $\mu>\hat{\mu}$ (where $\hat{\mu}=\frac{\mathscr{W}^{++}-\mathscr{W}^{-+}}{q(2-\mathscr{W}^{++}-\mathscr{W}^{-+})}$).

Window of opportunity and revealing elections. First assuming 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 resources, irrespective of the type of opponent. The autocrat therefore has no incentives to risk losing power through an election because information has no value in this situation. In contrast, democratization is possible when $q>\frac{1-\mathscr{W}^{-+}+\frac{c_E}{\mu}}{2-\mathscr{W}^{++}-\mathscr{W}^{-+}}$, $q>\overline{q}$ for $\mu=1$ and $q>\overline{\overline{q}}$ for $\mu=0$. This ensures that both $1-\texttt{tax}=\mathscr{W}^{++}$ and $1-\texttt{tax}=\mathscr{W}^{-+}$ 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 vote shares) also plays against democratization. In particular, when $d>0$, democratization is only possible when the probability of having a window of opportunity is sufficiently large, for example $q>\frac{1-\mathscr{W}^{-+}+d(1-\mathscr{W}^{-+})+\frac{c_E}{\mu}}{2-\mathscr{W}^{++}-\mathscr{W}^{-+}}$, as well as $q>\overline{q}$ for $\mu=1$ and $q>\overline{\overline{q}}$ for $\mu=0$ (ensuring that $1-\texttt{tax}=\mathscr{W}^{++}$ and $1-\texttt{tax}=\mathscr{W}^{-+}$ dominate $1-\texttt{tax}=0$ after revealing elections).

Appendix C: Descriptive statistics

Table C.1 presents the descriptive summary statistics of the data used in the empirical investigations. Commenting on some of the particularly interesting numbers, we first focus on our novel RGR measure. As expected, the ruling group rent share per capita lies slightly above 0.5, on average consistent with some general ethnic favoritism. As shown in the first row of table C.1 and illustrated in figure C.1, there is a considerable spread in values of our main RGR measure. In the second row of table C.1, we show that the alternative "RGR corr." gives values of a similar order of magnitude (this alternative RGR measure 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 the third row we display the values of a third RGR measure, focusing on the ratio of *total* night light (not per capita) of the government groups over aggregated night light. The fact that this value's mean is substantially larger is consistent with the notion that governing groups may on average be large.

In the second panel, we see, as expected, that government change is actually quite rare. Transitions to democracy are even more rare. Further, elections in democracies occur on average every four years, as expected. The third panel reveals that ethnic conflicts over government take place in 3 percent of country years. Furthermore, on average a country has a riot every second year, but that there is – as expected – huge heterogeneity between countries.

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

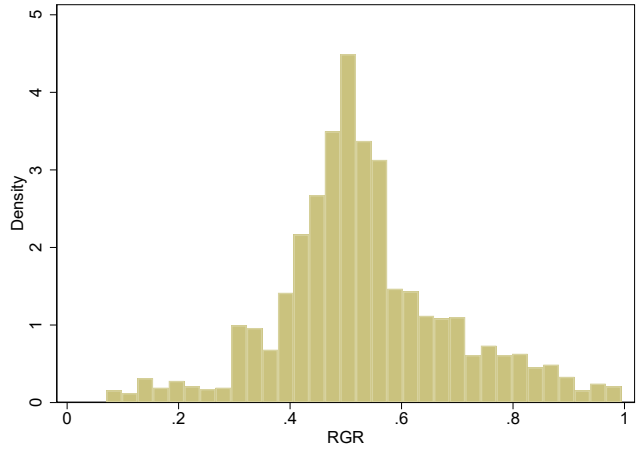
The last panel is devoted to the summary statistics of the ethnic group level data. One striking feature is that the overall likelihood of being co-ethnics of the leader is only slightly above 5 percent (and incidentally, the average change in government access status for an average ethnic group is also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

TABLE C.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 and riots variables					
Incid. ethnic gov. conflict	8752	.032	.18	0	1
Riots	10369	.52	1.9	0	55
Riots (squared)	10369	4	48	0	3025
Democracy variables					
Polity IV dummy (above 8)	9213	.24	.43	0	1
Democracy dummy (Cheibub et al.)	9115	.44	.5	0	1
Majorit. democ (IAEP)	7774	.1	.3	0	1
Majorit. democ (DES)	8786	.16	.36	0	1
Transit. to democ (last 10y)	7,152	.11	.31	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 polarization	12165	.05	.05	0	.21
Ever new democracy	13987	.36	.48	0	1
No change gov. group in transition	14207	.045	.21	0	1
Ethnic group data (Ethnologue)					
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 4.1 of the main text.

FIGURE C.1. Histogram of the distribution of the RGR measure



NOTE – Construction of the RGR measure detailed in main text.

Appendix D: Appendix figures and tables about the impact of democracy on the ruling group rent

Below, we carry out a series of robustness checks with respect to the analysis of subsections 4.2 and 4.3 in the main text. First, appendix table D.1 replicates the main results (col. 1-3) of the baseline table 1, but controlling for our standard battery of country controls, namely GDP per capita, population, trade share of GDP, and age of democracy. In col. 4-6 country-year fixed effects are included. The results are overall close. Similarly, in the following appendix table D.2, we replicate analogously the findings of the second main text table 2, but include the same aforementioned battery of four country controls.

Further, appendix table D.3 performs robustness checks with respect to the construction of the dependent variable. In the first three columns, the ruling group rent is constructed analogously as for our main measure, but uses a corrected variant of the night light measure, accounting for overlapping ethnic group homelands. In contrast, in columns 4 to 6, we again use 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 government groups occupy divided by the country's total area (to account for the possibility that larger groups are more likely to win a majoritarian election and also exert ethnic favoritism). We find that in all columns our baseline results continue to hold.

In appendix table D.4 we replicate the key results of tables 1 and 2, but draw 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

TABLE D.1. Democracy and ethnic favoritism (country-level) with controls and continent-year FE

Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)
	ruling group rent (RGR)					
Democratic Transition	0.074*	0.036	0.006	0.071	0.030	0.005
	(0.043)	(0.030)	(0.028)	(0.046)	(0.029)	(0.023)
Democratic Transition × Majoritarian		0.101*	0.129**		0.109*	0.149**
		(0.059)	(0.051)		(0.065)	(0.063)
Specification		Controls			Continent-year FE	
Time dummies	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1437	1432	1433	1586	1579	1580
R-squared	0.822	0.828	0.832	0.835	0.840	0.845

Note: Panel with an observation being the country-year, covering 116 countries and the years 1992 to 2009. All explanatory variables lagged by one year. Transition to democracy computed over the last 10 years. Country fixed effects and annual time dummies included in all columns. We control for mature democracy in all columns and its interaction with majoritarian democracy in columns 2,3,5,6. The additional controls included in columns 1-3 include GDP per capita, population, trade share of GDP and age of democracy. Robust standard errors clustered at the country level (in parenthesis). *=significant at the 10% level, **=significant at the 5% level, ***=significant at the 1% level.

TABLE D.2. Democracy and ruling group rent (restricted subsamples) with controls

Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)
	ruling group rent (RGR)					
Sample restrictions:	Low EP	High EP	High EP New leader	High EP Same Leader	High EP Same leader New democ.	High EP Same leader Same ethnic composition
Democratic Transition	0.030	0.023	-0.038	0.022	0.018	0.008
	(0.021)	(0.035)	(0.044)	(0.034)	(0.037)	(0.023)
Democratic Transition × Majoritarian	-0.049**	0.189**	0.093*	0.201**	0.204*	0.217**
	(0.024)	(0.094)	(0.055)	(0.090)	(0.104)	(0.105)
Time dummies	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	700	723	154	526	280	480
R-squared	0.895	0.800	0.881	0.854	0.775	0.869

Note: Panel with an observation being the country-year, covering 116 countries and the years 1992 to 2009. The democracy measure comes from Cheibub et al (2010) and the electoral system variable (proportional vs majoritarian) comes from IAEP data. 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. We control for mature democracy and its interaction with majoritarian democracy in all columns. In column 1 (resp., 2), the sample is restricted to countries with below-median (resp., above-median) ethnic polarization (EP). In column 3 (resp., 4), the sample is restricted to observations with high EP and with a new leader accessing power (resp., last period's leader remaining in office). In column 5, the sample is restricted to countries that over the sample period had at least one instance of transition to democracy, that have the last period's leader remaining in office and that have above-median ethnic polarization. In column 6, the sample is restricted to countries with above-median ethnic polarization and to observations with the last period's leader remaining in office. It 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 (in parenthesis). *=significant at the 10% level, **=significant at the 5% level, ***=significant at the 1% level.

(IAEP) data of Wig et al. (2015) to assess sensitivity to particular coding decisions of electoral systems. Our results are robust to this different institutional measure.

In appendix table D.5, we distinguish continents to which our setting is more likely to apply. In particular, we classify continents according to the share of pre-sample years (1946 to 1991) with ethnic civil conflicts (from Gleditsch et al, 2002).[11] Visual inspection suggests that one can classify continents into two baskets: Africa and Asia (with high levels of past ethnic conflict) versus the rest. When splitting the sample in these two categories, we find that – as expected – Africa and Asia drive our results. This is intuitive, given that in these two continents there is the highest historical incidence of ethnic conflict.

Finally, we also present two robustness tables for the analysis at the disaggregate ethnic group level. In particular, appendix table D.6 starts from the specifications of table 3 of the main text, but performs even more radical sample restrictions. In columns 1 to 3, we focus on observations that are within a 7-year window around transition to democracy. Column 2 also requires a group's leadership status 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 seven years. In this specification, we can therefore remove composition effects, and the change in a specific group's economic activity only reflects a change in transfers around democratization when the groups in power are unchanged. Columns 4 to 6 (columns 7 to 9) implement the analogous specification, but restricted to five years (three 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 D.6 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-test p-values in table D.6 for details). As mentioned in the main text, in appendix table D.7 we also replicate the main results for an alternative data source on ethnic groups, the "Geo-referencing of Ethnic Groups" (GREG) data (also taken from and described in depth in De Luca et al. (2018)). The results are qualitatively comparable, but weaker and rarely statistically significant, which is unsurprising given the huge drop in the number of observations.

Appendix E: Appendix tables on the type of democracy and tenure of leader in office

In this appendix section, we provide sensitivity tests corresponding to subsection 4.4 of the main text. We start with replicating the baseline table 5 with the usual battery of country controls. As shown in appendix table E.1, the results are very similar. In appendix tables E.2 and E.3 below, 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.

11. Our data covers Africa (AF), Australia and Oceania (AO), Asia (AS), Europe (EU), North- and Central America (NA), and South America (SA). The average values for the different continents are displayed in appendix figure D.1.

TABLE D.3. Democracy and alternative measures of the ruling group rent (RGR)

Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)
	RGR corrected for overlapping groups			RGR with total night light (not per capita)		
Democratic Transition	0.065	0.027	0.001	0.020	0.000	0.009
	(0.041)	(0.025)	(0.024)	(0.017)	(0.018)	(0.015)
Democratic Transition × Majoritarian		0.108*	0.132**		0.056**	0.022
		(0.061)	(0.052)		(0.024)	(0.021)
Time dummies	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1586	1579	1580	2133	2124	2125
R-squared	0.842	0.847	0.850	0.961	0.962	0.961

Note: Panel with an observation being the country-year, covering 116 countries and the years 1992 to 2009. All explanatory variables lagged by one year. Transition to democracy computed over the last 10 years. Country fixed effects and annual time dummies included in all columns. We control for mature democracy in all columns and its interaction with majoritarian democracy in columns 2,3,5,6. In col. 4-6 we control for the ratio of government population over total population, as well as for area government groups occupy divided by the country's total area. Robust standard errors clustered at the country level (in parenthesis). *=significant at the 10% level, **=significant at the 5% level, ***=significant at the 1% level.

TABLE D.4. Democracy and ruling group rent (RGR): Alternative variable majoritarian democracy

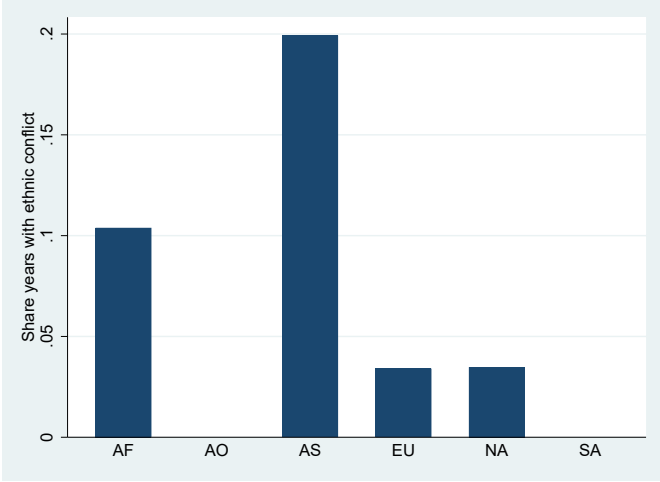
Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)
	ruling group rent (RGR)					
Sample restrictions:	Low EP	High EP	High EP New leader	High EP Same Leader	High EP Same leader New democ.	High EP Same leader Same ethnic composition
Democratic Transition	-0.002	-0.001	-0.067	0.005	-0.009	0.007
	(0.023)	(0.034)	(0.061)	(0.030)	(0.037)	(0.029)
Democratic Transition × Majoritarian	0.021	0.177**	0.115	0.177**	0.194**	0.140
	(0.030)	(0.075)	(0.079)	(0.074)	(0.079)	(0.094)
Time dummies	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	751	782	161	573	297	527
R-squared	0.892	0.801	0.882	0.852	0.815	0.855

Note: Panel with an observation being the country-year, covering 116 countries and the years 1992 to 2009. The democracy measure comes from Cheibub et al (2010) and the electoral system variable (proportional vs majoritarian) comes from IAEP data. All explanatory variables lagged by one year. Country fixed effects and annual time dummies included in all columns. We control for mature democracy and its interaction with majoritarian democracy in all columns. In column 1 (resp., 2), the sample is restricted to countries with below-median (resp., above-median) ethnic polarization (EP). In column 3 (resp., 4), the sample is restricted to observations with high EP and with a new leader accessing power (resp., last period's leader remaining in office). In column 5, the sample is restricted to countries that over the sample period had at least one instance of transition to democracy, that have the last period's leader remaining in office and that have above-median ethnic polarization. In column 6, the sample is restricted to countries with above-median ethnic polarization and to observations with the last period's leader remaining in office. It 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 (in parenthesis). *=significant at the 10% level, **=significant at the 5% level, ***=significant at the 1% level.

Appendix F: Results on democracy and conflict

In the current appendix F, 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. We use as dependent variable a dummy measure taking a value of 1 when there is conflict between ethnic groups on

FIGURE D.1. Ethnic conflict by continent



NOTE – Ethnic conflict data from Gleditsch et al (2002).

TABLE D.5. Democracy and ruling group rent (RGR) – split by geographic region

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:	Ruling group rent (RGR)					
Region:	Africa and Asia			Rest		
Democratic Transition	0.099*	0.026	0.015	-0.007*	-0.009**	-0.008
	(0.054)	(0.040)	(0.038)	(0.004)	(0.004)	(0.006)
Democratic Transition × Majoritarian		0.147*	0.140*		-0.023	0.003
		(0.081)	(0.058)		(0.021)	(0.010)
Time dummies	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	943	939	938	643	640	642
R-squared	0.824	0.831	0.832	0.863	0.865	0.865

Note: Panel with an observation being the country-year, covering 116 countries and the years 1992 to 2009. All explanatory variables lagged by one year. Transition to democracy computed over the last 10 years. Country fixed effects and annual time dummies included in all columns. We control for mature democracy in all columns and its interaction with majoritarian democracy in columns 2,3,5,6. In col. 4-6 we control for the ratio of government population over total population, as well as for area government groups occupy divided by the country's total area. Robust standard errors clustered at the country level (in parenthesis). *=significant at the 10% level, **=significant at the 5% level, ***=significant at the 1% level.

issues related to government (data from Gleditsch et al, 2002).[12] This specific conflict measure closely matches the concept of conflict applied in our model. As far as the

12. Specifically, we focus on conflict incidence, controlling in some specifications for past conflict incidence, in order to control for the fact that conflict often lasts longer than one year. This specification has the advantage of being able to capture the outbreak of conflict, but also the duration. As such, a specification could suffer from Nickell-bias (Nickell, 1981), hence we also display variants where we do not control for past conflict.

TABLE D.6. 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 to 2013. Ethnic group and country year fixed effects included in all columns. Robust standard errors clustered at the ethnic group level (in parenthesis). *=significant at the 10% level, **=significant at the 5% level, ***=significant at the 1% level.

TABLE D.7. Impact (types of) democracy on ruling group rent (RGR): Analysis at ethnic group level (GREG data)

Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)
	Nighttime light					
Sample restrictions:				High EP	High EP Same lea.	High EP Same lea. New dem.
Leader × democracy	0.029					
	(0.034)					
Leader × anocracy	0.127**	0.142**				
	(0.059)	(0.062)				
Leader × dictatorship	0.116	0.103				
	(0.072)	(0.074)				
Leader × demo.PR		0.009	0.008	0.030	0.028	-0.133
		(0.060)	(0.060)	(0.064)	(0.049)	(0.102)
Leader × demo.majo.		0.040	0.040	0.045	0.028	0.156***
		(0.068)	(0.068)	(0.043)	(0.051)	(0.021)
Leader × non-demo.			0.132**	0.172***	0.136***	0.323
			(0.051)	(0.063)	(0.044)	(0.193)
Ethnic group fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Country-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	39546	33669	33669	11289	10933	1430
R-squared	0.968	0.971	0.971	0.966	0.967	0.963

Note: Panel with an observation being the ethnic group-year, covering 140 countries and the years 1992 to 2013. Ethnic group and country-year fixed effects included in all columns. In column 4, we restrict the analysis to countries with above-median ethnic polarization. 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, we maintain the two restrictions of column 5, but in addition restrict the sample to contain only countries that have experienced at least one instance of transition to democracy over the period. Robust standard errors clustered at the country level (in parenthesis). *=significant at the 10% level, **=significant at the 5% level, ***=significant at the 1% level.

democracy measures are concerned, we rely on the same variables as in the main text, before also studying 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 E.1. 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 to 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 and 2 use data from the Institutions and Elections Project (IAEP) of Wig et al. (2015), while columns 3 and 4 use data from the Democratic Electoral Systems (DES) dataset of Bormann and Golder (2013). Robust standard errors clustered at the country level (in parenthesis). *=significant at the 10% level, **=significant at the 5% level, ***=significant at the 1% level.

TABLE E.2. Type of democracy and tenure of leader in office – logit

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent var.:	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 to 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 to 4 use data from the Institutions and Elections Project (IAEP) of Wig et al. (2015), while columns 5 to 8 use data from the Democratic Electoral Systems (DES) dataset of Bormann and Golder (2013). Robust standard errors clustered at the country level (in parenthesis). *=significant at the 10% level, **=significant at the 5% level, ***=significant at the 1% level.

Table F.1 displays the baseline results. In all columns, we display the coefficients for democratization (over the last 10 years), as well as mature democracy (where democratization took place more that ten years ago). Next, we specifically take into account the predictions of our theory's extension on fragile democracies (section A.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 democracies (see also e.g. Esteban et al., 2015). Col. 1 focuses on democratization over the past 10 years, while col. 2 and 3 focus on 8 and 12 years, respectively. Col. 4-6 replicate 1-3 but controlling for past conflict, and col. 7-9 add a measure of full current democracy (i.e. with Polity IV scores above 8 –

TABLE E.3. Type of democracy and tenure of leader in office – with continent year fixed effects

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent var.:	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 to 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 to 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 (in parenthesis). *=significant at the 10% level, **=significant at the 5% level, ***=significant at the 1% level.

which corresponds to democracy scores above the 75th percentile). No significant results are detected for current democratization, while we find weak results on mature democracies fighting less. Finally, current full democracy is associated with lower levels of ethnic conflict over government. Overall all we find that full, non-fragile democracy reduces conflict risk, as our theory predicted.

TABLE F.1. Democracy and conflict: Baseline results

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dependent variable:	Incidence of ethnic conflict over government								
Trans. to democ. (t-1)	0.000	0.002	-0.001	0.003	0.004	0.001	0.003	0.005	0.003
	(0.016)	(0.017)	(0.015)	(0.006)	(0.007)	(0.006)	(0.006)	(0.007)	(0.007)
Mature democ (t-1)	-0.028*	-0.022	-0.034**	-0.006	-0.006	-0.008	-0.005	-0.004	-0.005
	(0.016)	(0.016)	(0.017)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Conflict (t-1)				0.674***	0.680***	0.671***	0.673***	0.678***	0.669***
				(0.042)	(0.043)	(0.043)	(0.045)	(0.045)	(0.045)
Full democ (Polity > 8)							-0.006	-0.008**	-0.008*
							(0.005)	(0.004)	(0.005)
Democratiz. over	10y	8y	12y	10y	8y	12y	10y	8y	12y
Time dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6317	6639	5995	6317	6638	5995	6248	6563	5932
R-squared	0.319	0.306	0.336	0.630	0.626	0.635	0.627	0.623	0.633

Note: Panel with an observation being the country year, covering 165 countries and the years 1947 to 2013. All explanatory variables lagged by one year. Country fixed effects and annual time dummies included in all columns. Robust standard errors clustered at the country level (in parenthesis). *=significant at the 10% level, **=significant at the 5% level, ***=significant at the 1% level.

Appendix G: 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 G.1 presents the results of these investigations.[13]

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 us to study the non-linear relationship our theory predicted. 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 and 6 replicate the baseline columns 3 and 4, but control for continent year fixed effects (which capture continent-level shocks, such as democratization waves in neighboring countries). Columns 7 and 8 again replicate columns 3 and 4, but include a country-specific linear time trend (picking up long-run developments in a given country, such as increasing economic prosperity). Overall, this table's results confirm the finding of intermediate riot levels being associated with the largest likelihood of new democratization.

TABLE G.1. Riots and new democratization

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent var.:	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 to 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 and 6, we include continent year fixed effects instead of annual time dummies, and in columns 7 and 8 we include a country-specific linear time trend. Robust standard errors clustered at the country level (in parenthesis). *=significant at the 10% level, **=significant at the 5% level, ***=significant at the 1% level.

13. 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 that still affects civic culture.