# Minorities and Democratization[1]

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# 1 Introduction

Political systems are not composed of majorities and minorities. They comprise groups divided along any number of dimensions: economic, ethnic, regional, sectoral, religious, linguistic, and so on. And it is political institutions that determine who gets to participate in the political process, encourage or discourage certain coalitions from forming, and ultimately allocate power and resources across groups. To say that a society is experiencing ethnic or racial conflict, then, is to say that the institutions within that society have encouraged the different groups in each racial category to put aside their other differences and align along this one dimension. Ethnic conflict is never inevitable, we argue, but it can be an equilibrium outcome given a set of institutional arrangements, or it can be ameliorated by the selection of other institutions.

The relationship between ethnicity and democracy has been discussed thus far mainly through the lens of democratic stability, where the question is not whether, but to what degree ethnic cleavages reduce the long-term viability of democracies.[1] At one end of the spectrum, Rabushka and Shepsle (1972) argue that the two are simply incompatible, and Kaufman (1996) advocates complete separation of ethnic groups following bouts of violence. The participants in the consociationalism debate are more sanguine on the topic, although even Horowitz (1994, p. 37) admits that "things can be done .... but there are good systemic reasons why it is difficult to produce institutions conducive to the emergence of multi-ethnic democracy."

The explanations for ethnic violence in new democracies correspond to different theories of ethnic rivalries. For those who see such rivalries as modern-day expressions of primordial ethnic conflicts, democracy just gives ethnic groups the freedom to attack each other.[2] For those who, like us, see ethnic tensions not as predestined, but as the result of political processes, conflict arises from the new incentives given politicians in emerging democracies.

[1] Classics along these lines include Rustow (1970), Dahl (1971), and Przeworski (1991).

[2] See for instance Geertz (1963). For a critique of this view, see Laitin (1998).

Snyder (2000), for instance, argues that leaders in new democracies can gain followers by advocating nationalistic policy programs that exclude others from power.[3] In the arc of democratization, then, things tend to get worse before they get better, and it is often minorities who suffer the most in the fluid, often chaotic environment that characterizes new democracies.

However, ethnic conflict in new democracies is certainly not a foregone conclusion; some countries with potential ethnic rivalries do avoid outright hostilities, and understanding when and why discrimination does occur is the first step to preventing it in the future.[4] In addition, less work has been done on the related question of the impact of ethnicity on the probability of democratic transitions. It is these topics that we seek to explore in the current paper.

We find that the presence of ethnic minorities, in general, makes peaceful democratic transitions less likely, since the opportunity to exploit minorities under autocracy makes the majority faction less willing to voluntarily cede authority. As for policy, minorities suffer the least discrimination in democracies with intermediate levels of income inequality; here, they are induced to be part of the ruling coalition by lower levels of ethnic discrimination. Finally, regarding participation, minorities can be incorporated into the political process in three ways: being part of a ruling coalition in autocracy, joining majority factions in a revolutionary movement, or being part of a ruling coalition in democracy. Interestingly, minority policy gains and participation do not perfectly overlap: incorporation does not necessarily imply less discrimination, and minorities can gain higher utility even in discriminatory regimes.

The following section presents our model. We then describe and analyze the equilibrium,

[3]Bates (1973) pioneered this "constructivist " approach to ethnicity. See also de Figueiredo and Weingast (1999) for a model of Milosevic's nationalist appeals, and Chandra and Boulet (2003) for a model of the activation of ethnic rivalries amongst many possible dimensions of political conflict.

[4]See Goldstone, et. al. 2000 for a summary of trends in state failure and ethnic rivalries in the postwar era. In particular, X countries experienced democratic transitions between 1955 and 2000. Of these, Y had significant ethnic rivalries, but only Z experienced subsequent ethnic or revolutionary violence.

present comparative statics results, and review some variations on the basic model. A final section concludes, while the appendix provides formal proofs of all propositions.

# 2 Model

We present a variant of the Acemoglu and Robinson (2003) model of democratization, adding the possibility that groups are divided along racial as well as economic lines. The state starts out in autocracy, and can transition to democracy either peacefully or via a revolution. Politics in either autocracy or democracy can revolve around an ethnic or economic axis (or both or neither), depending on the distribution of wealth, violence potential, and the overarching political institutions in place at any given time. Consistent with our approach, then, it is a combination of factors, including political institutions, that activate ethnic rivalries.[5]

## 2.1 Actors and Timing

### 2.1.1 Demographics

There is a continuum of risk neutral agents with measure 1. The society is segregated along two dimensions: income and ethnicity. Each agent belongs to the upper class ($u$) or lower class ($l$); and belongs to ethnic group 1 or 2. Let $t \in \{u, l\}$ denote an agent's income group, $i \in \{1, 2\}$ denote his ethnic group. Then $ti$ denotes the type of an agent. Let $\lambda_{ti} \in [0, 1]$ be the ratio of $ti$ agents; $\sum\limits_{t,i} \lambda_{ti} = 1$; $\lambda_i = \sum\limits_{t} \lambda_{ti}$ be the ratio of group $i$ agents; and $\lambda_t = \sum\limits_{i} \lambda_{ti}$ be the ratio of $t$-class agents. Without loss of generality, we assume that ethnic group 1 is the majority, i.e. $\lambda_1 > \lambda_2$. We also assume that the upper class is a minority, i.e. $\lambda_l > \lambda_u$. For simplicity, we assume that the ratio of the upper class agents within each ethnic group is the same. Then $\lambda_u$ represents that ratio, so $\lambda_{ti} = \lambda_t \lambda_i$ for all $t$ and $i$, and $l1$ is the largest group.

[5] This point is also well made in Chandra (2003).

### 2.1.2 Economy

Let $x$ be the total income. Upper class agents share $x_u = \alpha x$ equally, and lower class agents share $x_l = (1-\alpha)x$ equally, where $\alpha \in (0,1)$. Then an upper class agent's income is $x_{ui} = \frac{\alpha x}{\lambda_u}$, and a lower class agent's income is $x_{li} = \frac{(1-\alpha)x}{\lambda_l}$, $i \in \{1,2\}$. An upper class agent's income is larger than a lower class agent's income, i.e. $x_{ui} > x_{lj}$, which is equivalent to $\alpha > \lambda_u$, so $\alpha$ measures income inequality. [6] The total income of group $i$ agents is $x_i = \lambda_{ui}x_{ui} + \lambda_{li}x_{li} = \lambda_i x$.

We assume that a government can tax group 1, group 2 and upper class agents via proportional income taxes and distribute the tax revenues equally. We will refer to a tax imposed on an ethnic group as an *ethnic tax*, and the tax imposed on the upper class as an *economic tax*.[7] Let $\tau_i$ denote the ethnic tax rate imposed on group $i$, $\tau_e$ the economic tax rate imposed on the upper class, and $T$ the per capita transfers. Then disposable incomes of agents are given as follows:

$$
\begin{aligned}
y_{u1} &= (1-\tau_e)(1-\tau_1)x_{u1} + T, \\
y_{l1} &= (1-\tau_1)x_{l1} + T, \\
y_{u2} &= (1-\tau_e)(1-\tau_2)x_{u2} + T, \\
y_{l2} &= (1-\tau_2)x_{l2} + T.
\end{aligned}
$$

We impose a balanced budget, so total transfers must be equal to total tax revenues:

$$T = [1-(1-\tau_e)(1-\tau_1)]\lambda_{u1}x_{u1} + [1-(1-\tau_e)(1-\tau_2)]\lambda_{u2}x_{u2} + \tau_1\lambda_{l1}x_{l1} + \tau_2\lambda_{l2}x_{l2}.$$

[6] This is proportional to total income inequality, represented by $x_{ui} - x_{li}$.

[7] Adding this feature to our model would not change any of our substantive results. The ethnic tax should be thought of as a set of institutions, both economic and political, that reduce the income of the taxed ethnic group ($i$) and increase that of the other group ($j$). Of course this will create economic inefficiencies (as do all taxes), so that the amount of income gained by $j$ will be less than that lost by $i$. We abstract from such considerations here, but they could be incorporated into model extensions.

### 2.1.3 Politics

Tax rates are set by the political process, which is either democratic or autocratic, each with its own basis for allocating resources. Initially, the political regime is authoritarian and $u1$ is in power, allowing this group to set policy unilaterally. If power is not ceded voluntarily, then it can only be seized by force. Under democracy, policy must be ratified by a majority. This already gives us some indication of how ethnic minorities will be rewarded in either system: in autocracy, they will succeed in proportion to their violence potential, while in democracy it is their numbers that are important.

Democratization can occur through two routes: peacefully, or via a lower class revolution. As illustrated in Figure 1, the timing of the moves is as follows:

1. $u1$ decides whether to democratize or not.
2. If $u1$ democratizes, the regime switches to democracy.
3. If $u1$ decides not to democratize, lower class agents $l1$ and $l2$ independently decide whether to revolt. If the uprising is successful, the regime switches to democracy. Otherwise, the regime remains autocratic.
4. Under autocracy, $u1$ sets $(\tau_e, \tau_1, \tau_2)$. Note that once tax rates are set, the corresponding transfer is determined by the balanced budget condition.
5. Under democracy, the largest group ($l1$) makes a proposal for $(\tau_e, \tau_1, \tau_2)$. If the proposal is accepted by a majority, then it is implemented. If it is rejected, then a no-tax reversion point $\tau_e = \tau_1 = \tau_2 = T = 0$ is implemented.

The probability of a successful revolution is proportional to the size of the uprising mass. The per capita cost of uprising (to all members of society) is also proportional to the size of the uprising mass and the size of the economy, capturing the notion that a more widespread rebellion is likely to do more damage to the productive resources of the economy. If only

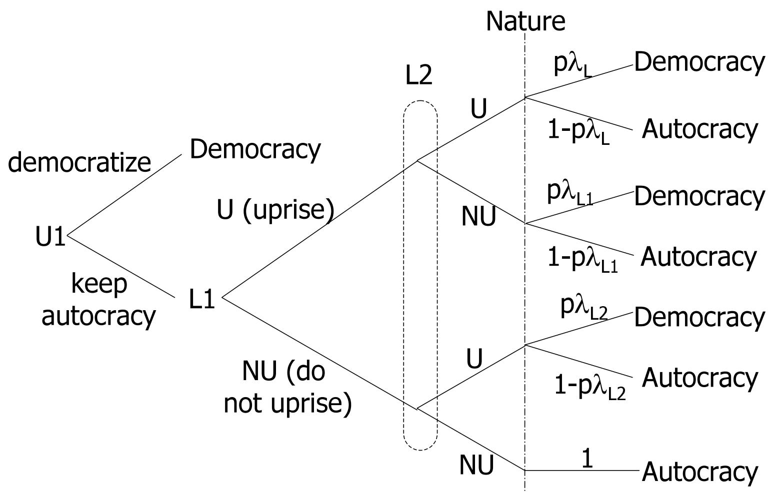


Figure 1: Game Tree

the lower class agents of type $li$ uprise, then the cost is $\lambda_{li}\psi x$; if both groups uprise then the cost is given by $(\lambda_{l1} + \lambda_{l2})\psi x$.

## 2.2 Equilibrium

We predict the outcome of this game by its symmetric subgame perfect equilibrium, where agents of the same type adopt the same strategy. We discuss the political equilibrium in this section and then examine the impact of a number of model variations.

Let us define the following critical values of income inequality:

$$\alpha^* = \frac{\lambda_2(1-\lambda_{l2})}{1-\lambda_{u1}} < 1, \text{ and } \hat{\alpha} = \frac{1-\lambda_{l2}}{1+\lambda_{l1}} \in (\alpha^*, 1).$$

Then define Region 1 (Low Inequality) as $\alpha \leq \alpha^*$; Region 2 (Intermediate Inequality) as $\alpha^* \leq \alpha \leq \hat{\alpha}$; and Region 3 (High Inequality) as $\alpha \geq \hat{\alpha}$.

**Upper Class Actions**

Under autocracy, $u1$ always implements $(\tau_e = \tau_1 = 0, \tau_2 = 1)$.[8] The following conditions summarize $u1$'s equilibrium democratization decision:

[8] In fact, $\tau_1 = 0$ in all equilibria of the game, so from here on we will omit it from the summary analysis.

- **Region 1:** When $\lambda_{l1} < \frac{1}{2}$ and $\lambda_u \leq \alpha < \alpha^*$, $u1$ democratizes if and only if $(\frac{1}{\lambda_l} - p)\lambda_2 \leq \psi \leq p\frac{\lambda_{u1}}{1-\lambda_{u1}}\lambda_2$.

- **Region 2:** When $\lambda_{l1} < \frac{1}{2}$ and $\alpha^* \leq \alpha < \hat{\alpha}$, $u1$ democratizes if and only if $(\frac{1}{\lambda_l} - p)(\lambda_2 + \frac{\lambda_{l1}\alpha}{\lambda_u(1-\lambda_{l2})}) \leq \psi \leq p(\frac{\alpha}{1-\lambda_{l2}} - \lambda_2)$.

- **Region 3:** When $\lambda_{l1} \geq \frac{1}{2}$ or $\alpha \geq \hat{\alpha}$, $u1$ democratizes if and only if $(\frac{1}{\lambda_l} - p)(\frac{1}{\lambda_u} - \lambda_1)\alpha \leq \psi \leq p\alpha\lambda_1$.

**Lower Class Actions**

The equilibrium behavior of lower class agents, including the decision to uprise or not, and which coalitions to form in democracy, are given as follows:

- **Region 1:** When $\lambda_{l1} < \frac{1}{2}$ and $\lambda_u \leq \alpha < \alpha^*$, $l1$ proposes $(\tau_e = \frac{x_2}{(1-\lambda_{u1})x_{u1}}, \tau_2 = 1)$, and the majority ($l1$ and $u1$) votes for this tax scheme in democracy. When $\psi < (\frac{1}{\lambda_l} - p)\lambda_2$, $u1$ does not democratize, both lower class groups uprise, and the regime switches to democracy with probability $p\lambda_l$. When $\psi > p\frac{\lambda_{u1}}{1-\lambda_{u1}}\lambda_2$ neither group uprises and the regime remains autocratic.

- **Region 2:** When $\lambda_{l1} < \frac{1}{2}$ and $\alpha^* \leq \alpha < \hat{\alpha}$, $l1$ proposes $(\tau_e = 1, \tau_2 = \frac{x_u}{(1-\lambda_{l2})x_{l2}})$, and the lower class majority ($l1$ and $l2$) votes for this tax scheme in democracy. When $\psi < (\frac{1}{\lambda_l} - p)(\lambda_2 + \frac{\lambda_{l1}\alpha}{\lambda_u(1-\lambda_{l2})})x$, $u1$ does not democratize, both lower class groups uprise, and the regime switches to democracy with probability $p\lambda_l$. When $p(\frac{\alpha}{1-\lambda_{l2}} - \lambda_2)x < \psi \leq p(x_{l2} - x_2)$, $u1$ does not democratize, only $l2$ uprises, and the regime switches to democracy with probability $p\lambda_{l2}$. When $\psi > p(x_{l2} - x_2)$, neither group uprises and the regime remains autocratic.

- **Region 3:** When $\lambda_{l1} \geq \frac{1}{2}$ or $\alpha \geq \hat{\alpha}$, $l1$ proposes $(\tau_e = 1, \tau_2 = 1)$, and the majority ($l1$ if $\lambda_{l1} > \frac{1}{2}$; $l1$ and $l2$ otherwise) votes for this tax scheme in democracy. When

$\psi < (\frac{1}{\lambda_l} - p)(\frac{1}{\lambda_u} - \lambda_1)\alpha$, $u1$ does not democratize, both lower class groups uprise, and the regime switches to democracy with probability $p\lambda_l$. When $\psi > p\alpha\lambda_1$, neither group uprises and the regime remains autocratic. ■

### 2.3 Discussion

To understand the actors' equilibrium behavior, working from the end of the game forward, let us begin with the fact that in autocracy, the group in power, $u1$, maximizes its revenue by taxing ethnic group 2 ($\tau_2 = 1$), but levying no economic tax ($\tau_e = 0$). Since the tax rates for a given period are set only after the democratization and revolution decisions, $u1$ has no incentives to do anything other than get the highest transfer possible. In particular, $u1$ cannot commit to future redistribution under autocracy; democratization provides the only source of credible commitment. To find out whether $u1$ in fact democratizes, we must look ahead to see what the equilibrium would look like under democracy. The full equilibrium is illustrated in Figure 2, drawn for $\lambda_{l1} < \frac{1}{2}$.

If group $l1$ has over half the population, then democratic politics is essentially a dictatorship by $l1$. This group will set maximal ethnic and economic taxes to get the highest transfer possible. If it has under half the population, though, it must find a coalition partner, and its natural allies are $l2$ for a lower class coalition, or $u1$ for an ethnic coalition.

When economic inequality (measured by $\alpha$) is high, the gains to taxing the rich are high as well. This gives $l1$ incentives to attract the support of $l2$ in a democracy. In fact, if inequality is high enough (Region 3), $l1$ can propose a high ethnic tax as well ($\tau_2 = 1$), and $l2$ will agree since the gains from the economic tax are so large. As inequality begins to fall (to Region 2), $l1$ keeps $l2$ as a partner but lowers the ethnic tax to make $l2$ just indifferent. But if inequality is low enough (Region 1), the returns from the economic tax are too small to offset the concessions made to group 2. In this case, $l1$ prefers to team with $u1$, lowers $\tau_e$ to less than 1, and returns the ethnic tax to 1. Thus discrimination against minorities in democracies is lowest at *intermediate* levels of income inequality. Table 1 summarizes tax

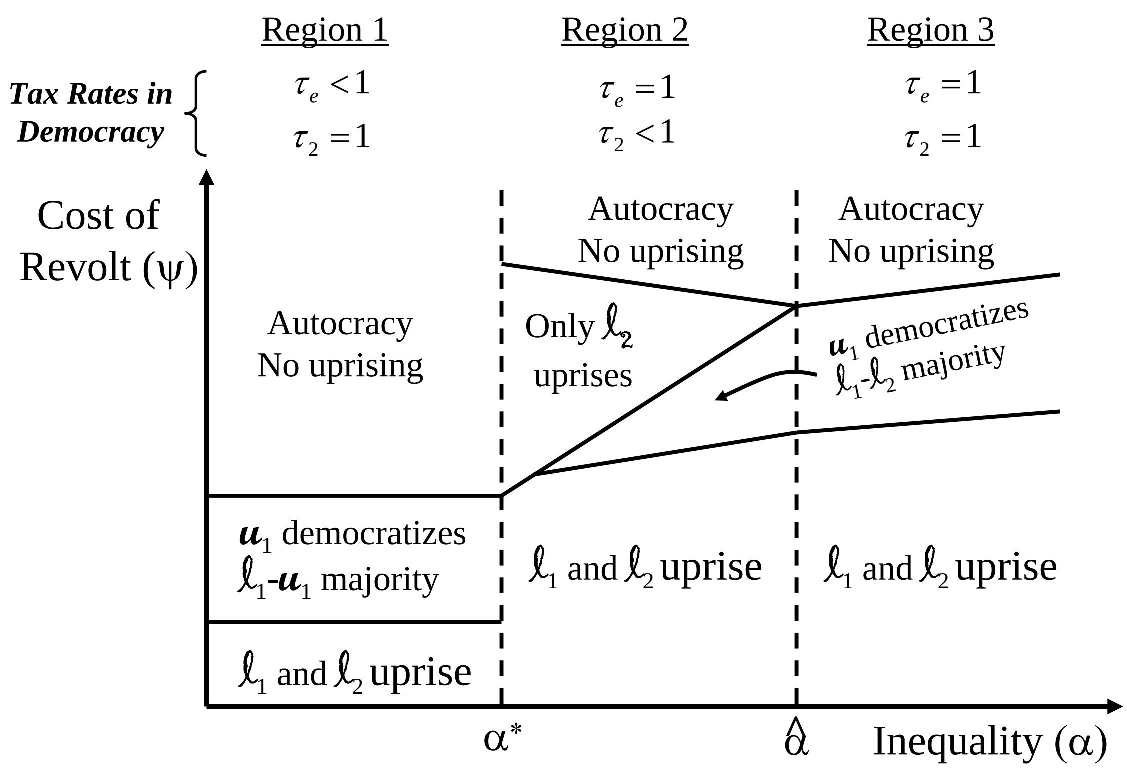


Figure 2: Equilibrium Outcomes

rates, transfers and the disposable income levels in a democracy.

Backing up to the revolution stage, we find that a revolt is most attractive when the probability of success ($p$) is high and the damage done to the economy ($\psi$) is low.[9] Beyond that, groups will rebel when their payoffs in democracy most greatly exceed their payoffs under autocracy. Each of $l1$ and $l2$ benefit equally from an increase in the economic tax, but $l2$ specifically gains from the reduction in the ethnic tax in the intermediate-inequality range discussed above. Thus we have the interesting result that for intermediate values of $\alpha$, there are conditions under which only the ethnic *minority* revolts.[10]

Finally, $u1$ has no incentives to democratize if neither $l1$ nor $l2$ would revolt, so the question is whether $u1$ will democratize peacefully when credibly threatened with an upris-

[9] We interpret this latter finding to indicate that economies built on the export of easily extractable natural resources (oil, diamonds, ores, etc.) are most likely to be unstable, a condition known as the "resource curse."

[10] Notice that this holds even though $l2$ knows that $l1$ will make the first offer in democracy and thus obtain all the surplus value in the coalition. The incentives for $l2$ alone to revolt would thus only increase if, upon successfully overthrowing the autocracy, it got to make the first offer instead of $l1$.

| | $\lambda_{l1} < \frac{1}{2}$ and Region 1 | $\lambda_{l1} < \frac{1}{2}$ and Region 2 | $\lambda_{l1} \geq \frac{1}{2}$ or Region 3 |
|---|---|---|---|
| majority | $l1$ and $u1$ | $l1$ and $l2$ | $l1$ and $l2$ |
| $\tau_e$ | $\frac{x_2}{(1-\lambda_{u1})x_{u1}}$ | 1 | 1 |
| $\tau_2$ | 1 | $\frac{x_u}{(1-\lambda_{l2})x_{l2}}$ | 1 |
| Transfer, $T_d$ | $\frac{x_2}{1-\lambda_{u1}}$ | $\frac{x_u}{1-\lambda_{l2}}$ | $x_2 + \alpha x_1$ |
| $y^d_{u1}$ | $x_{u1}$ | $T_d$ | $T_d$ |
| $y^d_{l1}$ | $x_{l1} + T_d$ | $x_{l1} + T_d$ | $x_{l1} + T_d$ |
| $y^d_{u2}$ | $T_d$ | $T_d$ | $T_d$ |
| $y^d_{l2}$ | $T_d$ | $x_{l2}$ | $T_d$ |

Table 1: Equilibrium Outcomes in Democracy

ing. Ceding power would avoid a potentially costly revolt, but it makes certain a transition that is only probabilistic otherwise. Group $u1$ has more incentives to go the peaceful route as $p$ rises and as $\psi$ rises, since they will suffer more under the revolution. Combining this with the result in the previous paragraph (that incentives to revolt rise when $\psi$ is low), we conclude that peaceful transitions occur for intermediate values of $\psi$. Above this range, no transition occurs, and below it transition comes only through revolution. Group $u1$ is also more willing to transition when inequality is low, so that it will be part of the winning coalition in democracy, and less willing when $l1$ is over half the population, in which case $l1$'s strength works against it.

Summing up, in the base model both ethnic *and* class divisions appear in autocracy, since the autocrat cannot gain anything by setting $\tau_e$ greater than zero or $\tau_2$ less than one.[11] Similar results obtain in democracy when inequality is high ($\alpha > \hat{\alpha}$) or when group $l1$ comprises over half the population. Otherwise, it is economic factors that determine the axis around which politics is organized. When inequality is low ($\alpha < \alpha^*$), ethnic coalitions form with the majority oppressing the minority. When inequality is intermediate ($\alpha^* < \alpha < \hat{\alpha}$), class-consciousness develops, and lower class voters of all races expropriate the wealth of the rich.

[11]But see the extensions in Section 4 below.

## 3 Ethnic Divisions & Democratization

Analyzing the effect of income inequality for different sizes of ethnic minorities reveals the role ethnicity plays in democratization. When $\lambda_{l1} \geq \frac{1}{2}$, the length of the democratization region is

$$D = \left(p - \frac{1-\lambda_{u1}}{\lambda_l}\right)\frac{\alpha}{\lambda_u}.$$

An increase in income inequality increases the size of the democratization region. Also $l1$ makes the political decisions alone in democracy.

However, when $\lambda_{l1} < \frac{1}{2}$, that is, when the ethnic minority group is significantly large, then both the nature of democracy and the effect of income inequality on democratization change dramatically. In particular, when income inequality takes lower values, $\lambda_u \leq \alpha < \alpha^*$, for all levels of income inequality, the length of that region is

$$D = \left(p - \frac{1-\lambda_{u1}}{\lambda_l}\right)\frac{\lambda_2}{1-\lambda_{u1}}.$$

In this case, $l1$ and $u1$ form the majority in democracy, and a change in income inequality does not affect the size of democratization region.

When income inequality takes intermediate values, $\alpha^* \leq \alpha < \hat{\alpha}$, a democratization region may not exist for values of $\alpha$ close to $\alpha^*$. The length of the democratization region is

$$D = \left(p - \frac{\lambda_1}{1-\lambda_{l2}}\right)\frac{\alpha}{\lambda_u} - \frac{\lambda_2}{\lambda_l}.$$

When $D > 0$, $l1$ and $l2$ form the majority in democracy, and an increase in income inequality increases the size of the democratization region.

Finally, when income inequality is high, $\alpha \geq \hat{\alpha}$, for all levels of income inequality, the length of that region is

$$D = \left(p - \frac{1-\lambda_{u1}}{\lambda_l}\right)\frac{\alpha}{\lambda_u}.$$

In this case $l1$ and $l2$ form the majority in democracy, and an increase in income inequality increases the size of the democratization region.

Note that when $\lambda_{l1} \geq 1/2$, a democratization region exists as long as $p \geq \frac{1-\lambda_{u1}}{\lambda_l}$. However, this result does not hold any more when $\lambda_{l1} < 1/2$. In particular, $u1$ may not democratize when income inequality takes intermediate values, i.e. $\alpha^* \leq \alpha < \hat{\alpha}$, and $\alpha$ is close to $\alpha^*$, whereas a democratization region exists for other values of income inequality.

For the comparative statics analysis, let $\psi_h$ and $\psi_l$ be the upper bound and lower bound of the democratization region, respectively, and let $D$ be the length of democratization region.

*Comparative Statics with respect to* $\lambda_l$ :

First, $\frac{\partial \alpha^*}{\partial \lambda_l} < 0$ and $\frac{\partial \hat{\alpha}}{\partial \lambda_l} < 0$. The following table summarizes the comparative statics with respect to $\lambda_l$. For example, a plus sign means that the variable increases as $\lambda_l$ increases.

| | Region 1 | Region 2 | Region 3 |
|---|---|---|---|
| $\psi_h$ | $-$ | $+$ | 0 |
| $\psi_l$ | $-$ | $-$ | $-$ |
| $D$ | $\mp$ | $+$ when $D > 0$ | $+$ |

In region 1, $D$ increases as $\lambda_l$ increases when $p$ is small. In particular, when $\lambda_2$ is large or $\lambda_{u1}$ is small, $\frac{\partial D}{\partial \lambda_l} > 0$ for all $p \leq \frac{1}{\lambda_l}$. If $\lambda_{u1} > \lambda_2$, it is possible that $\frac{\partial D}{\partial \lambda_l} < 0$ for $p$ close to $\frac{1}{\lambda_l}$. So the larger the working class, relative to the upper class, the more likely are peaceful democratic transitions, as they pose more of a credible threat to revolt.

*Comparative Statics with respect to* $\lambda_1$ :

We have $\frac{\partial \alpha^*}{\partial \lambda_1} < 0$ and $\frac{\partial \hat{\alpha}}{\partial \lambda_1} < 0$. The following table summarizes the comparative statics with respect to $\lambda_1$.

| | Region 1 | Region 2 | Region 3 |
|---|---|---|---|
| $\psi_h$ | $\mp$ | $+$ | $+$ |
| $\psi_l$ | $-$ | $-$ | $-$ |
| $D$ | $\mp$ | $+$ when $D > 0$ | $+$ |

In region 1, $D$ increases as $\lambda_1$ increases when $p$ is small. In particular, when $\lambda_l > (1-\lambda_{u1})^2$, $\frac{\partial D}{\partial \lambda_l} > 0$ for all $p \leq \frac{1}{\lambda_l}$. If $\lambda_l < (1-\lambda_{u1})^2$, then $\frac{\partial D}{\partial \lambda_l} > 0$ for $p \leq (\frac{1-\lambda_{u1}}{\lambda_l})^2$, and $\frac{\partial D}{\partial \lambda_l} < 0$ for $(\frac{1-\lambda_{u1}}{\lambda_l})^2 < p \leq \frac{1}{\lambda_l}$.

The larger the majority group, or the smaller the minority, the more likely are peaceful transitions. In the limit, as $\lambda_2$ goes to 0, transitions are more likely than for any positive value of $\lambda_2$. This answers one of our basic questions: as long as the equilibrium coalition in democracy is $l1$ and $l2$, ethnic divisions make transitions less likely, as the upper class would lose its discrimination rents after the transition. The only time that this relation fails to hold is when the equilibrium democratic coalition is $l1 - u1$, which is based on exploiting minorities to the maximum extent possible.

*Comparative Statics with respect to* $\alpha$ :

Finally, the following table summarizes the results of the comparative statics on democratization and transfers (i.e. redistribution) with respect to the level of income inequality.

| | Region 1 | Region 2 | Region 3 |
|---|---|---|---|
| $D$ | 0 | $+$ when $D > 0$ | $+$ |
| $T_d$ | 0 | $+$ when $D > 0$ | $+$ |

If inequality has any impact on transitions, it will make them more likely. The class-based coalition $l1 - l2$ gains more in democracy the greater the degree of inequality. Thus their threat to revolt is more credible, inducing the upper class to voluntarily democratize in some regions.

# 4 Extensions

In the base model presented above, the ethnic minority receives its lowest possible payoff in autocracy, where $u1$ institutes an ethnic tax but no economic tax. Consequently, the minority group can only gain from democratization. Often, though, minorities do relatively well in autocracies, since leaders in these countries see ethnic tensions as potential threats to regime stability. In the language of our model, $u1$ may have incentives to form an upper class coalition with $u2$ in autocracy, thus decreasing its revenues but also making a successful revolution less likely. Or, $u1$ may ally itself with $l1$ to preempt a revolution.

In this section, then, we consider three variants on our base model: 1) the aforementioned possibility that $u1$ can attract the support of $u2$ or $l1$ to stay in power; 2) having $u2$ start off in power under autocracy rather than $u1$; and 3) a multi-period game in which individuals (or their offspring) can change social class from one period to the next, but not their ethnic group. The former two are discussed in detail here, while the latter is reviewed briefly, with a full model left for future work.

## 4.1 Coalition Formation with Power Sharing

We can reinterpret the equilibrium of the base model as follows: In democracy, $l1$ forms a coalition with $u1$ in region 1, and it forms a coalition with $l2$ in regions 2 and 3. When $u1$ decides not to democratize, $l1$ may "support" the autocratic regime by not uprising for certain values of $\psi$ in region 2. One can interpret this as $u1$ and $l1$ forming a coalition under autocracy. In this section, we formally introduce the option of power sharing and analyze coalition formation in autocracy more explicitly.

Before proceeding formally, let us summarize the predictions of this section: $u1$ and $l1$ may share power if cost of uprising is large (e.g. one interpretation is that the economy relies mostly on human capital). $u1$ and $u2$ may share power in equilibrium if inequality is high and cost of uprising is low (i.e. the economy relies mostly on natural resources). The

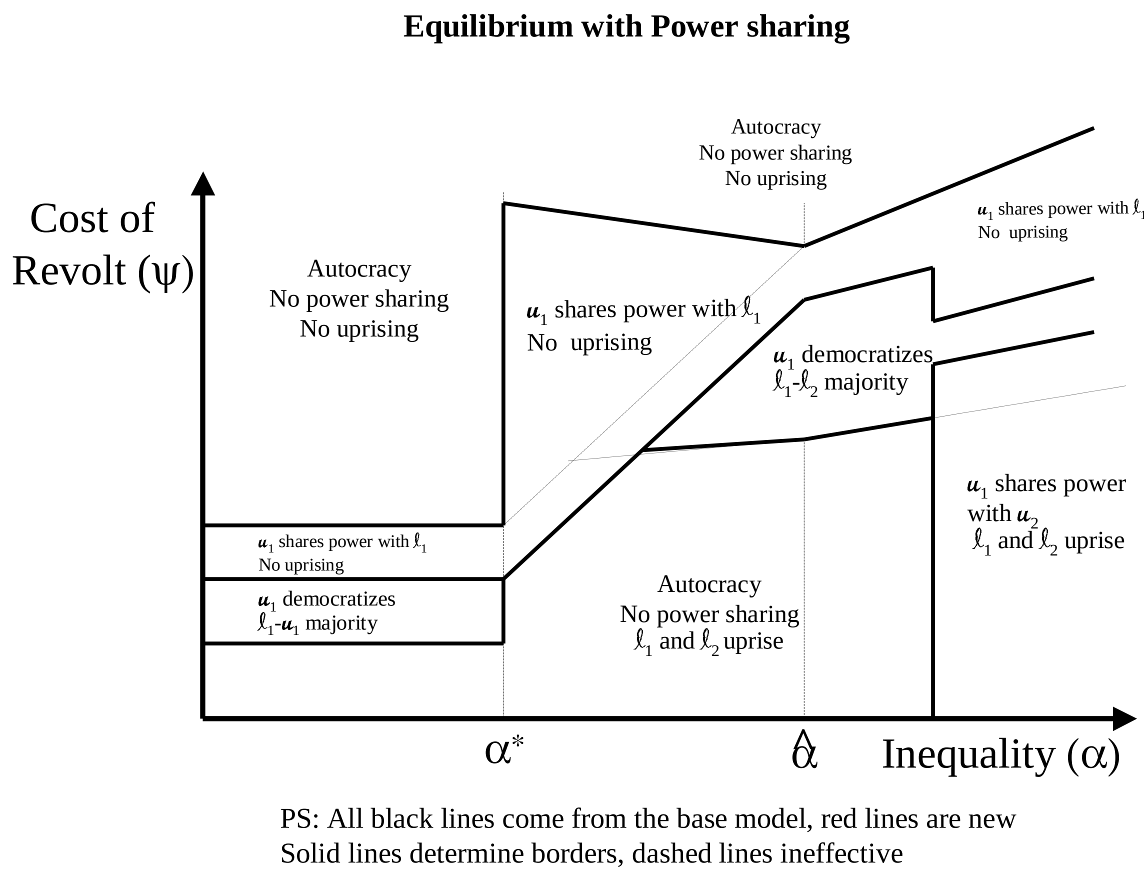


Figure 3: Equilibrium with Power Sharing

changes to the equilibrium, relative to the base model, are illustrated in Figure 3.

We consider the following variation in the base model: At the very beginning of the game, $u1$ decides to democratize or keep the autocracy. If $u1$ decides to keep the autocracy, then it can offer to share its political power with either $l1$ or $u2$. If a group accepts $u1$'s offer of power sharing, then $u1$ has to get that group's consent in order to implement a tax scheme. That is, $u1$ offers a tax scheme, and these tax rates can be implemented only if the other group does not veto; otherwise, $\tau_e = \tau_1 = \tau_2 = 0$ is implemented. Power sharing changes the odds of a successful uprising as well: If $u1$ gains $l1$'s support, then group 1, a majority, holds the power so that uprising by $l2$ is never successful. If $u1$ gains $u2$'s support, then the upper class, a minority, holds the power, and the marginal probability of a successful uprising, $p$, falls to $q < p$. If $u1$ decides not to share power with any group, or if no group accepts power sharing with $u1$, then the remainder of the game proceeds as before.

Introduction of power sharing will obviously shrink the democratization region of the base model because, in this region, $u1$ may find it optimal to share power and not democratize. However, it is not obvious which coalition $u1$ forms by power sharing. In this section, we will characterize the regions where $u1$ forms a coalition with $l1$ or $u2$.

When $\psi$ is high, there is no uprising, so there is no need to share power. Therefore, we will consider the parameter regions that lead to democratization or uprising in the base model.

If $u1$ power shares with $l1$, then $u1$ can implement his most preferred tax scheme $\tau_e = \tau_1 = 0$, and $\tau_2 = 1$ because $l1$ prefers this tax scheme to the alternative $\tau_e = \tau_1 = \tau_2 = 0$. Therefore, $u1$ prefers to power share with $l1$ as long as $l1$ would accept this arrangement. However, $l1$'s optimal decision depends on the subgame when $l1$ rejects power sharing with $u1$. In this case, $u1$ can either go alone or offer $u2$ power sharing. In the latter case,

**Proposition 1:** If $u1$ offers $u2$ to power share, $u2$ always accepts power sharing with $u1$ and $\tau_e = \tau_1 = \tau_2 = 0$ is implemented in autocracy.

Note that $u1$'s disposable income in democracy, $y^d_{u1}$, is equal to $x_{u1}$ in Region 1, and less than $x_{u1}$ in Regions 2 and 3. Therefore, if power-sharing with $u2$ avoids uprising, then $u1$ prefers to share power with $u2$ within the democratization region of the base model, when $l1$ rejects power sharing. Given the equilibrium of this subgame, $l1$ would not reject power sharing with $u1$ at the first place, because, by sharing power with $u1$, $l1$ guarantees $x_{l1} + x_2$, which is greater than $x_{l1}$, which is $l1$'s disposable income when $u1$ power shares with $u2$. So, we have the following:

**Proposition 2:** When power sharing with $u2$ avoids uprising within the democratization region of the base model, $u1$ and $l1$ power share in equilibrium, and ($\tau_e = \tau_1 = 0$, $\tau_2 = 1$) is implemented. $u1$ and $l1$ may also share power in equilibrium when $\psi$ is smaller than but close to $\psi_h$.[12]

In the base model, lower class $li$ uprises when $\psi x < p(y^d_{li} - y^a_{li})$. If $u1$ power shares with $u2$, then $li$ uprises when $\psi x < q(y^d_{li} - x_{li})$. Note that $x_{li}$ is $li$'s disposable income in an autocracy in which $u1$ and $u2$ share power. Noting that $q(y^d_{li} - x_{li}) = q(y^d_{li} - y^a_{li}) + q(y^a_{li} - x_{li})$, $q < p$, $y^a_{l1} - x_{l1} = x_2$ and $y^a_{l2} - x_{l2} = x_2 - x_{l2}$, for higher values of $\psi$ within the democratization region of the base model, for example when $q(y^d_{l1} - x_{l1}) < \psi x < p(y^d_{l1} - y^a_{l1})$, if $l1$ rejects power sharing, then $u1$ will share power with $u2$, since doing so prevents uprising. In this case, $l1$ would not reject power sharing in the first place, and $u1$ and $l1$ will power share in equilibrium.

For lower values of $\psi$, power sharing with $u2$ does not avoid uprising. In this case, $l1$ may prefer not to share power and uprise, even if $u1$ then power shares with $u2$. In equilibrium, $u1$ may share power with $u2$ and both $l1$ and $l2$ uprise if inequality ($\alpha$) is large enough and $\psi$ is low. We write this result as a proposition and give the detailed proof in the appendix.

**Proposition 3:** For large $\alpha$ and low $\psi$, $u1$ may share power with $u2$ and both $l1$ and $l2$ uprise in equilibrium.

In summary, $u1$ may form a coalition either with $l1$ or with $u2$ in autocracy in equilibrium, depending on the values of the underlying parameters. $u1$ would always prefer to power share with $l1$, since in this case, $u1$ can prevent uprising and implement its most preferred tax rate. For large values of $\psi$, power sharing with $u2$ may prevent uprising. In this case, if $l1$ rejects power sharing, $u1$ will find it optimal to share power with $u2$. Therefore, $l1$ would prefer to power share with $u1$ in the first place. On the other hand, if $\psi$ is low, then power sharing with $u2$ does not prevent an uprising. In turn, if income inequality is high, $l1$ rejects power sharing with $u1$, and $u1$ shares power with $u2$.

The possibility of power sharing shrinks the regions of democratization and revolution, since $u1$ can at times keep power in autocracy by strategic power sharing. In equilibrium,

[12] We give a detailed analysis of power sharing among $u1$ and $l1$ in the proof of Proposition 3 in the Appendix.

minorities can move from a relatively protected autocracy to an oppressive democracy, so democratization can increase anti-minority discrimination. Interestingly, there are instances in which the minority willingly joins in a revolution to democratize, even though they know that they will be more oppressed as a result, because of the ensuing increase in the economic taxes and therefore available transfers.

## 4.2 Minority Holds Power in Autocracy

We next consider the variation of the model in which $u2$ starts out in power. So $u2$ decides whether or not to democratize. If the regime remains autocratic, then $u2$ sets the tax rates. Everything else is the same.

In contrast to the base model, $l2$ uprises in autocracy only if inequality is very high. In particular, if $u2$ does not democratize, $l2$ does not uprise in regions 1 and 2. Also, again in contrast to the base model, the democratization region shrinks as income inequality increases, except for a small interval of high income inequality that induces $l2$'s uprising.

The following summarizes the equilibrium outcome.

**Upper Class Actions**

Under autocracy, $u2$ always implements $(\tau_e = \tau_2 = 0, \tau_1 = 1)$. The following conditions summarize $u2$'s equilibrium democratization decision:

- **Region 1:** When $\lambda_{l1} < \frac{1}{2}$ and $\lambda_u \leq \alpha < \alpha^*$, $u2$ democratizes if and only if $(\frac{1}{\lambda_{l1}} - p)(\frac{\alpha}{\lambda_u} + \lambda_1 - \frac{\lambda_2}{1-\lambda_{u1}}) \leq \psi \leq p(\frac{1-\alpha}{\lambda_l} + \frac{\lambda_2}{1-\lambda_{u1}} - \lambda_1)$.

- **Region 2:** When $\lambda_{l1} < \frac{1}{2}$ and $\alpha^* \leq \alpha < \hat{\alpha}$, $u2$ democratizes if and only if $(\frac{1}{\lambda_{l1}} - p)(\frac{\alpha}{\lambda_u} + \lambda_1 - \frac{\alpha}{1-\lambda_{l2}}) \leq \psi \leq p(\frac{1-\alpha}{\lambda_l} + \frac{\alpha}{1-\lambda_{l2}} - \lambda_1)$.

- **Region 3:** When $\lambda_{l1} \geq \frac{1}{2}$ or $\alpha \geq \hat{\alpha}$, (i) in region $p(\lambda_2 - \frac{1-\alpha}{\lambda_l} - (1-\alpha)\lambda_1) < \psi \leq p(\frac{1-\alpha}{\lambda_l} + \frac{\lambda_2}{1-\lambda_{u1}} - \lambda_1)$, $u2$ democratizes if and only if $\psi \geq (\frac{1}{\lambda_{l1}} - p)(\frac{\alpha}{\lambda_u} - \lambda_2 - (1-\alpha)\lambda_1)$;

(ii) in region $\psi < p(\lambda_2 - \frac{1-\alpha}{\lambda_l} - (1-\alpha)\lambda_1)$, $u2$ democratizes if and only if $\psi \geq (\frac{1}{\lambda_l} - p)(\frac{\alpha}{\lambda_u} - \lambda_2 - (1-\alpha)\lambda_1)$.

**Lower Class Actions**

First let us note the following: If $u2$ does not democratize, $l2$ does not uprise in regions 1 and 2. $l2$ uprises in region 3 only for high levels of inequality.

The equilibrium behavior of lower class agents, including the decision to uprise or not, and which coalitions to form in democracy, are given as follows:

- **Region 1:** When $\lambda_{l1} < \frac{1}{2}$ and $\lambda_u \leq \alpha < \alpha^*$, $l1$ proposes $(\tau_e = \frac{x_2}{(1-\lambda_{u1})x_{u1}}, \tau_2 = 1)$, and the ethnic majority ($l1$ and $u1$) votes for this tax scheme in democracy. When $\psi < (\frac{1}{\lambda_{l1}} - p)(\frac{\alpha}{\lambda_u} + \lambda_1 - \frac{\lambda_2}{1-\lambda_{u1}})$, $u2$ does not democratize, only $l1$ uprises, and the regime switches to democracy with probability $p\lambda_{l1}$. When $\psi > p(\frac{1-\alpha}{\lambda_l} + \frac{\lambda_2}{1-\lambda_{u1}} - \lambda_1)$ neither group uprises, and the regime remains autocratic.

- **Region 2:** When $\lambda_{l1} < \frac{1}{2}$ and $\alpha^* \leq \alpha < \hat{\alpha}$, $l1$ proposes $(\tau_e = 1, \tau_2 = \frac{x_u}{(1-\lambda_{l2})x_{l2}})$, and the lower class majority ($l1$ and $l2$) votes for this tax scheme in democracy. When $\psi < (\frac{1}{\lambda_{l1}} - p)(\frac{\alpha}{\lambda_u} + \lambda_1 - \frac{\alpha}{1-\lambda_{l2}})$, $u2$ does not democratize, only $l1$ uprises, and the regime switches to democracy with probability $p\lambda_{l1}$. When $\psi > p(\frac{1-\alpha}{\lambda_l} + \frac{\alpha}{1-\lambda_{l2}} - \lambda_1)$, neither group uprises, and the regime remains autocratic.

- **Region 3:** When $\lambda_{l1} \geq \frac{1}{2}$ or $\alpha \geq \hat{\alpha}$, $l1$ proposes $(\tau_e = 1, \tau_2 = 1)$, and the majority ($l1$ if $\lambda_{l1} > \frac{1}{2}$; $l1$ and $l2$ otherwise) votes for this tax scheme in democracy. (i) When $p(\lambda_2 - \frac{1-\alpha}{\lambda_l} - (1-\alpha)\lambda_1) < \psi \leq p(\frac{1-\alpha}{\lambda_l} + \frac{\lambda_2}{1-\lambda_{u1}} - \lambda_1)$, $u2$ does not democratize if $\psi \geq (\frac{1}{\lambda_{l1}} - p)(\frac{\alpha}{\lambda_u} - \lambda_2 - (1-\alpha)\lambda_1)$. In this case, only $l1$ uprises, and the regime switches to democracy with probability $p\lambda_{l1}$. When $\psi > p(\frac{1-\alpha}{\lambda_l} + \frac{\lambda_2}{1-\lambda_{u1}} - \lambda_1)$, neither group uprises, and the regime remains autocratic. (ii) When $\psi < p(\lambda_2 - \frac{1-\alpha}{\lambda_l} - (1-\alpha)\lambda_1)$, $u2$ does not democratize if $\psi < (\frac{1}{\lambda_l} - p)(\frac{\alpha}{\lambda_u} - \lambda_2 - (1-\alpha)\lambda_1)$. In this case, both groups uprise, and the regime switches to democracy with probability $p\lambda_l$. When

$\psi > p(\lambda_2 - \frac{1-\alpha}{\lambda_l} - (1-\alpha)\lambda_1)$, neither group uprises, and the regime remains autocratic.

To summarize, $u2$ as the autocratic group will be more reluctant than $u1$ to democratize, since $l1$ never allies with $u2$ in democracy and the ethnic tax $\tau_2$ is always positive. In terms of the equilibrium diagram, both the democratization and the peaceful democratization regions shrink, the latter possibly to zero, indicating that dictatorships by ethnic minorities are usually ended only by violent revolutions. On the other hand, the incentives for power sharing (with $u1$ this time) increase, leading to less ethnic tension under autocracy.

### 4.3 A Multi-Period Model

Finally, the one defining characteristic of ethnic minorities in the model is that they exist on a non-economic dimension. What distinguishes ethnicity from other non-economic variables such as religion, language, or region is the low rate of mobility across groups over time.[13] We could modify our model to accommodate this possibility by adding a second period to the game, identical to the first, except that with some probability each lower class individual has transitioned to the upper class, and vice-versa, but with no movement between the ethnic groups.

Such multi-period models with inter-generational mobility are examined in Leventoğlu (2003), and have the property of making the classes more sympathetic to each other. In other words, it is as if the utility functions of the upper classes included some positive weight on the utility of the lower classes, and vice-versa. Relative to the base model, this should increase the likelihood of peaceful transitions and reduce economic taxes in equilibrium. But relative to a model with no ethnic divisions at all, the equilibrium could well exhibit fewer peaceful transitions to democracy and more violent revolutions. Thus ethnic conflict could work against the possibility of non-violent transitions.

[13] Indeed, this is the basis for treating race as a suspect category in U.S. law under the $14^{th}$ Amendment's equal protection clause, requiring strict scrutiny. Thus any legal classification based on race must be narrowly tailored to achieve a compelling state interest. But see Laitin (1988) for an argument that racial boundaries are at least partially permeable.

## 5 Conclusion

There is a growing recognition among scholars that free and fair elections alone are not enough to ensure domestic tranquility: without such ancillary institutions as a party system, rule of law, property rights enforced by a neutral judiciary, social institutions promoting tolerance and compromise, and a competent, non-corrupt bureaucracy, democracies can be just as internally unstable, dangerous to their neighbors, and oppressive of minorities as can autocracies.

This essay investigated the questions of when the presence of an ethnic minority impacts the likelihood of a democratic transition, and when politics revolves around minority issues. Our model allows for either class-based or ethnically-based coalitions, the former bent on taxing the rich's wealth, the latter based on extracting discrimination rents from the smaller ethnic group. We find that class-based coalitions are more likely the higher is economic inequality, while more equal wealth distributions give rise to ethnically-based discrimination. These themes are important in the comparative analysis of institutional arrangements, and they bear more systematic theoretical and empirical investigation, which we leave to future work.

# A Equilibrium Analysis: Base Model

## A.1 Democracy

The regime may switch to democracy either if $u1$ decides to democratize, or if an uprising occurs. Let $y^d_{ti}$ denote the disposable income of $ti$ agents, $T_d$ denote the transfers in equilibrium under democracy.

**Case 1:** $\lambda_{l1} \geq \frac{1}{2}$.

$l1$ can implement any tax-transfer scheme, since $l1$ alone constitutes the majority. Then $l1$ optimally sets $\tau_1 = 0$, that is it does not tax its ethnic group; $\tau_e = \tau_2 = 1$, it taxes the upper class and ethnic minority group (group 2). Then $T_d = x_u + \lambda_{l2} x_{l2} = x_2 + \lambda_{u1} x_{u1} = x_2 + \alpha x_1$. The disposable incomes under democracy are given as follows:

$$y^d_{u1} = y^d_{u2} = y^d_{l2} = T_d,$$
$$y^d_{l1} = x_{l1} + T_d.$$

**Case 2:** $\frac{1}{2} > \lambda_{l1} \geq \lambda_{l2}$.

$l1$ is the largest group, however, it needs a coalition partner to form a majority. $l1$ can form a majority with any other group of same type of agents.

**Lemma 1:** $l1$ forms a majority with either $u1$ or $l2$. $l1$ does not include $u2$ in any majority.

**Proof:** Note that $l1$ prefers to keep $u2$ out of the majority it will form. This is because of the following observations: First, even if $l1$ can form a majority with $u2$ only, it will not prefer to do this, because (i) if $l1$ sets $\tau_u > 0$ then it has to set $\tau_1 > 0$ in order to gain $u2$'s support. In this case, $l1$ would do better by forming a majority with $l2$, since then $l2$ would vote for $\tau_u > 0$ and $\tau_1 = 0$. (ii) If $l1$ sets $\tau_2 > 0$ then it has to set $\tau_1 > 0$ in order to gain $u2$'s support. In this case, $l1$ would do better by forming a majority with $u1$, since then $u1$ would vote for $\tau_2 > 0$ and $\tau_1 = 0$. Second, if $l1$ cannot form a majority with $u2$, then it will prefer to keep $u2$ out of the majority, since adding a new group to a majority constrains $l1$ further. ■

$l1$ will choose its majority coalition partner in order to maximize its disposable income. In order to summarize the equilibrium outcome and payoffs under democracy, first let us define the following critical levels of income inequality: $\breve{\alpha} = \frac{\lambda_{u2}}{1-\lambda_{u1}}$, $\alpha^* = \frac{\lambda_2(1-\lambda_{l2})}{1-\lambda_{u1}}$, and $\hat{\alpha} = \frac{1-\lambda_{l2}}{1+\lambda_{l1}}$. Then

**Lemma 2:** (i) $\breve{\alpha} < \lambda_u$; (ii) $\lambda_u \leq \alpha^*$ if and only if $\lambda_2 \geq \lambda_u$; (iii) $\alpha^* < \hat{\alpha} < 1$.

The proof follows easily. Then the following proposition summarizes $l1$'s optimal decision in democracy.

**Proposition 1:** Under democracy:

1. If $\lambda_u \leq \alpha < \alpha^*$ (Region 1), $l1$ forms a majority with $u1$. The optimal tax rates and the corresponding disposable incomes are given as follows: $\tau_2 = 1$, $\tau_e = \frac{x_2}{(1-\lambda_{u1})x_{u1}}$, $T_d = \frac{x_2}{1-\lambda_{u1}}$, and

$$y^d_{u1} = x_{u1},$$
$$y^d_{l1} = x_{l1} + T_d,$$
$$y^d_{l2} = y^d_{u2} = T_d.$$

2. If $\alpha \geq \alpha^*$, $l1$ forms a majority with $l2$. The optimal tax rates and the corresponding disposable incomes are given as follows:

   (a) if $\alpha^* \leq \alpha < \hat{\alpha}$ (Region 2), then $\tau_e = 1$, $\tau_2 = \frac{x_u}{(1-\lambda_{l2})x_{l2}}$, $T_d = \frac{x_u}{1-\lambda_{l2}}$, and

   $$y^d_{u1} = y^d_{u2} = T_d,$$
   $$y^d_{l1} = x_{l1} + T_d,$$
   $$y^d_{l2} = x_{l2}.$$

   (b) if $\alpha \geq \hat{\alpha}$ (Region 3), then $\tau_2 = \tau_e = 1$, $T_d = x_2 + \alpha x_1$, and

   $$y^d_{u1} = y^d_{u2} = y^d_{l2} = T_d,$$
   $$y^d_{l1} = x_{l1} + T_d.$$

**Proof of Proposition 1:** We will prove the claims of this proposition in the reverse order. If $l1$ forms a majority with $l2$, then $l1$'s optimal tax proposal will be, $\tau_e = 1$ and $\tau_2 = \max \tau$ subject to $T_d(\tau) \geq \tau x_{l2}$, where $T_d(\tau) = x_u + \lambda_{l2}\tau x_{l2}$. That is, $l1$ fully taxes the upper class, and proposes the maximum tax rate $\tau_2$ that $l2$ would accept. Note that $T_d(\tau)$ is the transfer generated by the tax scheme ( $\tau_e = 1, \tau_2 = \tau$). $l2$ votes for ( $\tau_e = 1, \tau_2 = \tau$) only if the transfer it will receive, $T_d(\tau)$, is greater than or equal to the tax it will pay, $\tau x_{l2}$. Otherwise, $l2$ does not vote for the proposal, the status quo tax rates $\tau_e = \tau_2 = 0$ are implemented, and $l2$ avoids paying tax.

So, if $l1$ forms a majority with $l2$, $l1$'s optimal proposal is $\tau_e = 1$ and $\tau_2 = \min\{1, \frac{x_u}{(1-\lambda_{l2})x_{l2}}\}$. Note that $\tau_2 = 1$ if $\alpha \geq \hat{\alpha}$, and $\tau_2 = \frac{x_u}{(1-\lambda_{l2})x_{l2}}$ otherwise. When $\alpha \geq \hat{\alpha}$, $l2$ votes for $\tau_e = \tau_2 = 1$, which is $l1$'s unconstrained optimal. So, $l1$ forms a majority with $l2$ when $\alpha \geq \hat{\alpha}$. This proves part a.

If $\alpha < \hat{\alpha}$ and $l1$ forms a majority with $l2$, then it proposes ($\tau_e = 1, \tau_2 = \frac{x_u}{(1-\lambda_{l2})x_{l2}}$) and $l2$ accepts the proposal. Then the transfer is given by $T_d = \frac{x_u}{1-\lambda_{l2}}$.

If $\alpha < \hat{\alpha}$ and $l1$ forms a majority with $u1$, then $l1$'s optimal tax proposal will be, $\tau_2 = 1$ and $\tau_e = \max \tau$ subject to $T_d(\tau) \geq \tau x_{u1}$, where $T_d(\tau) = x_2 + \lambda_{u1}\tau x_{u1}$. That is, $l1$fully taxes group 2 agents, and proposes the maximum tax rate $\tau_e$ that $u1$ would accept. Note that $T_d(\tau)$ is the transfer generated by the tax scheme ( $\tau_e = \tau, \tau_2 = 1$). $u1$ votes for ( $\tau_e = \tau, \tau_2 = 1$) only if the transfer it will receive, $T_d(\tau)$, is greater than or equal to the tax it will pay, $\tau x_{u1}$. Otherwise, $u1$ does not vote for the proposal, the status quo tax rates $\tau_e = \tau_2 = 0$ are implemented, and $u1$ avoids paying tax. So, $l1$ proposes ($\tau_e = \frac{x_2}{(1-\lambda_{u1})x_{u1}}, \tau_2 = 1$) and $u1$ accepts the proposal. Note that $\tau_e < 1$ if and only if $\alpha > \check{\alpha}$. Since $\alpha > \lambda_u > \check{\alpha}$ by Lemma 2, $\tau_e < 1$ and the transfer is $T_d = \frac{x_2}{1-\lambda_{u1}}$.

A comparison of these alternative transfers gives $l1$'s optimal decision when $\alpha < \hat{\alpha}$ : $l1$ forms a majority with $l2$ if and only if $\frac{x_u}{1-\lambda_{l2}} \geq \frac{x_2}{1-\lambda_{u1}}$, or equivalently $\alpha \geq \alpha^*$. So, parts b and c follow immediately.■

The following summarizes the tax rates in equilibrium under democracy:

[**Figure 5, Tax rates, *I will add this***]

## A.2 Autocracy

If the regime remains autocratic, $u1$ optimally sets the tax rates as follows: $\tau_2 = 1$, $\tau_1 = \tau_e = 0$. Then, the transfer is given by $T_a = x_2$, and the disposable incomes are given as follows:

$$\begin{aligned} y^a_{u1} &= x_{u1} + T_a, \\ y^a_{l1} &= x_{l1} + T_a, \\ y^a_{u2} &= T_a, \\ y^a_{l2} &= T_a. \end{aligned}$$

## A.3 Equilibrium

Given the equilibrium tax rates under democracy and autocracy:

**Lower Class Actions**

If $u1$ decides not to democratize, then each lower class group decides whether to uprise or not in the following subgame. Consider group $li$ and $lj$, $i \neq j$. Let $\gamma_j = 0$ if $lj$ does not uprise, $\gamma_j = 1$ if $lj$ uprises. Given $lj$'s decision, agent $li$ uprises if and only if

$$(1-(\gamma_j\lambda_{lj}+\lambda_{li})p)y^a_{li}+(\gamma_j\lambda_{lj}+\lambda_{li})py^d_{li}-(\gamma_j\lambda_{lj}+\lambda_{li})\psi x > (1-\gamma_j\lambda_{lj}p)y^a_{li}+\gamma_j\lambda_{lj}py^d_{li}-\gamma_j\lambda_{lj}\psi x$$

If $li$ uprises, the size of uprising mass becomes $\gamma_j\lambda_{lj} + \lambda_{li}$. Then the uprising fails with probability $1-(\gamma_j\lambda_{lj}+\lambda_{li})p$, in this case $li$'s disposable income is given by $y^a_{li}$. The uprising is successful with probability $(\gamma_j\lambda_{lj}+\lambda_{li})p$, in this case $li$'s disposable income is $y^d_{li}$. The per capita cost of uprising is $(\gamma_j\lambda_{lj} + \lambda_{li})p\psi x$. Thus, the left hand side of the above inequality is $li$'s expected payoff from uprising. If $li$ does not uprise, then the size of uprising mass is given by $\gamma_j\lambda_{lj}$, and $li$'s expected payoff can be calculated accordingly as in the right hand side of the above inequality. Equivalently, $li$ uprises if and only if

$$p(y^d_{li} - y^a_{li}) > \psi x.$$

So, $li$'s decision is independent of $lj$'s decision and vice versa.

**Upper Class Actions**

Let $\gamma_i$ denote $li$'s equilibrium uprising decision in the subgame when $u1$ does not democratize. Then $u1$ democratizes if and only if

$$y^d_{u1} \geq (1 - (\sum_i \gamma_i\lambda_{li})p)y^a_{u1} + (\sum_i \gamma_i\lambda_{li})py^d_{u1} - (\sum_i \gamma_i\lambda_{li})\psi x$$

If $u1$ democratizes, $u1$'s payoff is given by $y^d_{u1}$. If $u1$ decides not to democratize, lower class groups decide whether to uprise. The uprising fails with probability $1 - (\sum_i \gamma_i\lambda_{li})p$, in this case $u1$'s disposable income is given by $y^a_{u1}$. The uprising is successful with probability $(\sum_i \gamma_i\lambda_{li})p$, in this case $u1$'s disposable income is $y^d_{u1}$. The per capita cost of uprising is $(\sum_i \gamma_i\lambda_{li})\psi x$. Thus, the right hand side of the above inequality is $u1$'s expected payoff from not democratizing. Let $\delta = 1$ if $u1$ democratizes, and $\delta = 0$ otherwise.

$$\delta = 1 \text{ if and only if } (\sum_i \gamma_i \lambda_{li})\psi x \geq (1 - (\sum_i \gamma_i \lambda_{li})p)(y^a_{u1} - y^d_{u1}).$$

Now, we can work out the equilibrium in every case. Suppose that $\lambda_{l1} < 1/2$. The analysis of Region 3 applies for the case $\lambda_{l1} \geq 1/2$ directly.

- **Region 1:** $\lambda_u \leq \alpha < \alpha^*$.

Note that $\tau_2 = 1$, $\tau_e = \frac{x_2}{(1-\lambda_{u1})x_{u1}}$, $T_d = \frac{x_2}{1-\lambda_{u1}}$ in this region. Then $y^d_{li} - y^a_{li} = T_d - T_a = \frac{\lambda_{u1}}{1-\lambda_{u1}}x_2$. Then both $l1$ and $l2$ uprise if and only if $p\frac{\lambda_{u1}}{1-\lambda_{u1}}x_2 < \psi x$. When $p\frac{\lambda_{u1}}{1-\lambda_{u1}}x_2 < \psi x$, $u1$ democratizes if and only if $\lambda_l \psi x \geq (1 - \lambda_l p)(y^a_{u1} - y^d_{u1}) = (1 - \lambda_l p)x_2$, that is

$$\delta = 1 \text{ if and only if } (\frac{1}{\lambda_l} - p)\lambda_2 \leq \psi \leq p\frac{\lambda_{u1}}{1 - \lambda_{u1}}\lambda_2.$$

- **Region 2:** $\alpha^* \leq \alpha < \hat{\alpha}$.

Note that $\tau_e = 1$, $\tau_2 = \frac{x_u}{(1-\lambda_{l2})x_{l2}}$, $T_d = \frac{x_u}{1-\lambda_{l2}}$ in this region. Then $y^d_{l1} - y^a_{l1} = T_d - T_a$ so that $l1$'s uprising decision is given as

$$\gamma_1 = 1 \text{ if and only if } p(T_d - T_a) > \psi x.$$

Similarly, $y^d_{l2} - y^a_{l2} = x_{l2} - T_a > T_d - T_a$. The last inequality follows from $T_d = \tau_2 x_{l2}$ and $\tau_2 < 1$. $l2$'s uprising decision is given as

$$\gamma_2 = 1 \text{ if and only if } p(x_{l2} - T_a) > \psi x.$$

When $\psi x > p(x_{l2} - T_a)$, neither group uprises, so democratization does not occur in this region. When $\psi x \leq p(T_d - T_a) = p(\frac{x_u}{1-\lambda_{l2}} - x_2)$, both $l1$ and $l2$ uprise if $u1$ does not democratize. Then $u1$ democratizes if and only if

$$\lambda_l \psi x \geq (1 - \lambda_l p)(y^a_{u1} - y^d_{u1}) = (1 - \lambda_l p)(x_{u1} + T_a - T_d).$$

When $p(T_d - T_a) < \psi x \leq p(x_{l2} - T_a)$, only $l2$ uprises. Then $u1$ democratizes if and only if

$$\lambda_{l2}\psi x \geq (1 - \lambda_{l2}p)(y^a_{u1} - y^d_{u1}) = (1 - \lambda_{l2}p)(x_{u1} + T_a - T_d).$$

We claim that $(\frac{1}{\lambda_{l2}} - p)(x_{u1} + T_a - T_d) > p(x_{l2} - T_a)$ so that $u1$ does not democratize when $p(T_d - T_a) < \psi x \leq p(x_{l2} - T_a)$. To prove this claim, check that (i) $(\frac{1}{\lambda_{l2}} - p)(x_{u1} + T_a - T_d)$ is increasing in $\alpha$; (ii) $p(x_{l2} - T_a)$ is decreasing in $\alpha$; and (iii) $(\frac{1}{\lambda_{l2}} - p)(x_{u1} + T_a - T_d) > p(x_{l2} - T_a)$ holds when $\alpha = \alpha^*$ and $p = \frac{1}{\lambda_l}$, the largest possible value for $p$.

In summary, when $\alpha^* \leq \alpha < \hat{\alpha}$, $u1$'s democratization decision is given as follows:$\delta = 1$ if and only if

$$(\frac{1}{\lambda_l} - p)(\lambda_2 + \frac{\lambda_{l1}\alpha}{\lambda_u(1 - \lambda_{l2})}) \leq \psi \leq p(\frac{\alpha}{1 - \lambda_{l2}} - \lambda_2).$$

- **Region 3:** $\alpha \geq \hat{\alpha}$

Note that $\tau_e = 1$, $\tau_2 = 1$, $T_d = x_2 + \alpha x_1$. Then $y^d_{li} - y^a_{li} = T_d - T_a = \alpha x_1$, so each lower class uprises if and only if $\psi \leq p\alpha\lambda_1$. If $\psi > p\alpha\lambda_1$, there will be no uprising, so $u1$ will not democratize, i.e. $\delta = 0$. If $\psi \leq p\alpha\lambda_1$ and $u1$ does not democratize, then both lower classes will uprise. Then, $u1$ democratizes if and only if

$$\lambda_l \psi x \geq (1 - \lambda_l p)(y^a_{u1} - y^d_{u1}) = (1 - \lambda_l p)(\frac{1}{\lambda_u} - \lambda_1)\alpha x.$$

That is

$$\delta = 1 \text{ if and only if } (\frac{1}{\lambda_l} - p)(\frac{1}{\lambda_u} - \lambda_1)\alpha \leq \psi \leq p\alpha\lambda_1.$$

This same analysis applies to $\lambda_{l1} \geq \frac{1}{2}$.

# B Comparative Statics Analysis

For notational convenience in computations, let us rename the lines that determine the democratization region as follows: Let $\psi^i_h$ and $\psi^i_l$ be the upper bound and lower bound of the democratization region, respectively, in region $i \in \{1, 2, 3\}$. Similarly, $D^i$ be the length of democratization region in region $i \in \{1, 2, 3\}$.

We will use the following observation to derive some of our results: $\psi^1_h = \psi^2_h$ at $\alpha = \alpha^*$, $\psi^2_h = \psi^3_h$ and $\psi^2_l = \psi^3_l$ at $\alpha = \hat{\alpha}$.

**Comparative Statics with respect to** $\lambda_l$:

It is obvious that $\frac{\partial \psi^1_h}{\partial \lambda_l} < 0$, $\frac{\partial \psi^1_l}{\partial \lambda_l} < 0$, $\frac{\partial \psi^2_h}{\partial \lambda_l} > 0$, and $\frac{\partial \psi^3_h}{\partial \lambda_l} = 0$.

Now, we will show that $\frac{\partial \psi^2_l}{\partial \lambda_l} < 0$. First note that $D^2$ may not be positive for all $\alpha$ in region 2. We will calculate $\frac{\partial \psi^2_l}{\partial \lambda_l}$ when $D^2 > 0$. In particular,

$$\begin{aligned} D^2 &= \psi^2_h - \psi^2_l \\ &= p\frac{\alpha}{\lambda_u} - \frac{1}{\lambda_l}\left(\lambda_2 + \frac{\lambda_{l1}\alpha}{\lambda_u(1 - \lambda_{l2})}\right) \end{aligned}$$

So, $D^2 > 0$ is equivalent to

$$p > \frac{\lambda_u}{\lambda_l \alpha}\left(\lambda_2 + \frac{\lambda_{l1}\alpha}{\lambda_u(1 - \lambda_{l2})}\right)$$

Compute $\frac{\partial \psi^2_l}{\partial \lambda_l}$ :

$$\frac{\partial \psi^2_l}{\partial \lambda_l} = (\frac{1}{\lambda_l} - p)\lambda_1\alpha\frac{1 - \lambda_l\lambda_{l2}}{\lambda^2_u(1 - \lambda_{l2})^2} - \frac{1}{\lambda^2_l}\left(\lambda_2 + \frac{\lambda_{l1}\alpha}{\lambda_u(1 - \lambda_{l2})}\right)$$

Now $p > \frac{\lambda_u}{\lambda_l \alpha}\left(\lambda_2 + \frac{\lambda_{l1}\alpha}{\lambda_u(1-\lambda_{l2})}\right)$ implies that

$$\frac{1}{\lambda_l} - p < \frac{1}{\lambda_l}\left[1 - \frac{\lambda_u}{\alpha}\left(\lambda_2 + \frac{\lambda_{l1}\alpha}{\lambda_u(1-\lambda_{l2})}\right)\right]$$

so that

$$(\frac{1}{\lambda_l} - p)\lambda_1\alpha < \frac{\lambda_{u1}}{\lambda_l}\left[\frac{\alpha}{1-\lambda_{l2}} - \lambda_2\right]$$

Then

$$\begin{aligned}
\frac{\partial \psi_l^2}{\partial \lambda_l} &< \frac{\lambda_{u1}}{\lambda_l}\left[\frac{\alpha}{1-\lambda_{l2}} - \lambda_2\right]\frac{1-\lambda_l\lambda_{l2}}{\lambda_u^2(1-\lambda_{l2})^2} - \frac{1}{\lambda_l^2}\left(\lambda_2 + \frac{\lambda_{l1}\alpha}{\lambda_u(1-\lambda_{l2})}\right) \\
&= \frac{\alpha\lambda_1}{\lambda_l\lambda_u(1-\lambda_{l2})}\frac{\lambda_{l2}(1-\lambda_{l2}+\lambda_u)}{(1-\lambda_{l2})^2} - \frac{\lambda_2\left[\lambda_{l1}(1-\lambda_l\lambda_{l2}) + \lambda_u(1-\lambda_{l2})^2\right]}{\lambda_l^2\lambda_u(1-\lambda_{l2})^2} \\
&\equiv RHS(\alpha)
\end{aligned}$$

$RHS$ is an increasing function of $\alpha$. Now check that $RHS(\hat{\alpha}) < 0$ is equivalent to

$$\frac{\lambda_{l1}}{1+\lambda_{l1}}\lambda_l(1-\lambda_{l2}+\lambda_u) < \lambda_{l1}(1-\lambda_l\lambda_{l2}) + \lambda_u(1-\lambda_{l2})^2.$$

In order to show that this inequality holds, it suffices to show that $\lambda_l(1-\lambda_{l2}+\lambda_u) < (1-\lambda_l\lambda_{l2})$, which is equivalent to $\lambda_l(1+\lambda_u) = \lambda_l(2-\lambda_l) < 1$. Check that $\lambda_l(2-\lambda_l)$ attains its maximum at $\lambda_l = 1$ and its maximum is 1 at $\lambda_l = 1$. Since $\lambda_l < 1$, we have $\lambda_l(2-\lambda_l) < 1$. So, $RHS(\hat{\alpha}) < 0$. This implies that $\frac{\partial \psi_l^2}{\partial \lambda_l} < 0$.

Now consider $\frac{\partial \psi_l^3}{\partial \lambda_l}$ :

$$\begin{aligned}
\frac{\partial \psi_l^3}{\partial \lambda_l} &= \frac{\partial}{\partial \lambda_l}\left[(\frac{1}{\lambda_l} - p)(\frac{1}{\lambda_u} - \lambda_1)\alpha\right] \\
&= \alpha\left[\frac{1}{\lambda_u^2}(\frac{1}{\lambda_l} - p) - \frac{1}{\lambda_l^2}(\frac{1}{\lambda_u} - \lambda_1)\right]
\end{aligned}$$

$D^3 > 0$ implies that $p > \frac{1-\lambda_{u1}}{\lambda_l}$, which in turn implies that $\frac{1}{\lambda_l} - p < \frac{\lambda_{u1}}{\lambda_l}$. Then, $\frac{\partial \psi_l^3}{\partial \lambda_l} < \alpha[\frac{1}{\lambda_u^2}\frac{\lambda_{u1}}{\lambda_l} - \frac{1}{\lambda_l^2}(\frac{1}{\lambda_u} - \lambda_1)] = -\frac{1-\lambda_1}{\lambda_l^2\lambda_u} < 0$.

These results imply that $\frac{\partial D^2}{\partial \lambda_l} > 0$ and $\frac{\partial D^3}{\partial \lambda_l} > 0$. Check that

$$\frac{\partial D^1}{\partial \lambda_l} = \lambda_2\left[\frac{1}{\lambda_l^2} - \frac{p\lambda_1}{(1-\lambda_{u1})^2}\right]$$

Then $\frac{\partial D^1}{\partial \lambda_l} > 0$ if and only if $p < \frac{1}{\lambda_1}(\frac{1-\lambda_{u1}}{\lambda_l})^2$. The last inequality holds for all $p < \frac{1}{\lambda_l}$ if $\lambda_{u1} < \frac{\sqrt{2}-1}{\sqrt{2}}$. Also, $p < \frac{1}{\lambda_l}$ implies that $\frac{\partial D^1}{\partial \lambda_l} > \lambda_2\left[\frac{1}{\lambda_l^2} - \frac{\lambda_1}{\lambda_l(1-\lambda_{u1})^2}\right]$. Now $\lambda_2\left[\frac{1}{\lambda_l^2} - \frac{\lambda_1}{\lambda_l(1-\lambda_{u1})^2}\right] > 0$ is equivalent to $\lambda_2 > \lambda_{u1}$. So, if $\lambda_2 > \lambda_{u1}$, then $\frac{\partial D^1}{\partial \lambda_l} > 0$ for all $p < \frac{1}{\lambda_1}$.

**Comparative Statics with respect to $\lambda_1$:**

It is obvious that $\frac{\partial \psi_l^1}{\partial \lambda_1} < 0$, $\frac{\partial \psi_l^3}{\partial \lambda_1} < 0$, and $\frac{\partial \psi_h^3}{\partial \lambda_1} > 0$.

Now consider $\frac{\partial \psi_h^1}{\partial \lambda_1}$ :

$$\frac{\partial \psi_h^1}{\partial \lambda_1} = p\frac{\lambda_u}{1-\lambda_{u1}}\left(\frac{\lambda_2}{1-\lambda_{u1}} - \lambda_1\right)$$

So $\frac{\partial \psi_h^1}{\partial \lambda_1} > 0$ if and only if $\lambda_2 > \lambda_1(1-\lambda_{u1})$ or equivalently $\lambda_l < (\frac{\lambda_2}{\lambda_1})^2$. That is, the sign of $\frac{\partial \psi_h^1}{\partial \lambda_1}$ is indeterminate.

Now consider $\frac{\partial \psi_h^2}{\partial \lambda_1}$ :

$$\frac{\partial \psi_h^2}{\partial \lambda_1} = p\left(1 - \frac{\alpha\lambda_l}{(1-\lambda_{l2})^2}\right).$$

Then $\frac{\partial \psi_h^2}{\partial \lambda_1} > 0$ if and only if $\alpha < \frac{(1-\lambda_{l2})^2}{\lambda_l}$. Note that $\hat{\alpha} = \frac{1-\lambda_{l2}}{1+\lambda_{l1}} < \frac{(1-\lambda_{l2})^2}{\lambda_l}$, because the last inequality is equivalent to $\lambda_l = \lambda_{l1} + \lambda_{l2} < (1+\lambda_{l1})(1-\lambda_{l2}) = 1 + \lambda_{l1} - \lambda_{l2} - \lambda_{l1}\lambda_{l2}$. By cancelling out $\lambda_{l1}$ and rearranging the terms, we obtain $\lambda_l(2+\lambda_{l1}) < \frac{1}{\lambda_2}$, and (i) $\lambda_l < 1$ and $\lambda_{l1} < \frac{1}{2}$ imply $\lambda_l(2+\lambda_{l1}) < \frac{5}{4} < 2$; (ii) $\lambda_2 < \frac{1}{2}$ implies $2 < \frac{1}{\lambda_2}$. So, $\frac{\partial \psi_h^2}{\partial \lambda_1} > 0$ since $\alpha \leq \hat{\alpha} < \frac{(1-\lambda_{l2})^2}{\lambda_l}$.

Now consider $\frac{\partial \psi_l^2}{\partial \lambda_1}$ :

$$\frac{\partial \psi_l^2}{\partial \lambda_1} = (\frac{1}{\lambda_l} - p)(-1 + \frac{\alpha\lambda_l}{(1-\lambda_{l2})^2})$$

so that $\frac{\partial \psi_l^2}{\partial \lambda_1} < 0$ because of the same reasoning above.

These results immediately imply that $\frac{\partial D^2}{\partial \lambda_l} > 0$ and $\frac{\partial D^3}{\partial \lambda_l} > 0$. Check that $D^1 = \lambda_2(\frac{p}{1-\lambda_{u1}} - \frac{1}{\lambda_l})$ so that

$$\frac{\partial D^1}{\partial \lambda_1} = \frac{1}{\lambda_l} - \frac{p\lambda_l}{(1-\lambda_{u1})^2}.$$

Then $\frac{\partial D^1}{\partial \lambda_1} > 0$ is equivalent to $p < (\frac{1-\lambda_{u1}}{\lambda_l})^2$. The last inequality holds for all $p < \frac{1}{\lambda_l}$ if and only if $\lambda_l < (1-\lambda_{u1})^2$. For example check that this inequality holds when $\lambda_l = \lambda_1 = 0.51$ and it is violated when $\lambda_l = 0.8$, $\lambda_1 = 0.51$. Check that $\lambda_{l1} < 0.5$ in both cases. So, the sign of $\frac{\partial D^1}{\partial \lambda_1}$ is indeterminate.

# C $u2$ starts out in power

In this section, we study the possibility that the upper class ethnic minority, $u2$, starts in power rather than $u1$. We consider the following variant on our base model: If the regime remains autocratic, $u2$ optimally sets the tax rates as follows: $\tau_1 = 1$, $\tau_2 = \tau_e = 0$. Then, the transfer is given by $T_a = x_1$, and the disposable income of each type of agent is given by

$$y^a_{u2} = x_{u2} + T_a,$$
$$y^a_{l2} = x_{l2} + T_a,$$
$$y^a_{u1} = T_a,$$
$$y^a_{l1} = T_a.$$

If the regime transitions to democracy, the same analysis in Section 6.1 applies.

As before, each lower class uprises if and only if

$$p(y^d_{li} - y^a_{li}) > \psi x.$$

Given lower classes' decisions, $u2$ democratizes if and only if

$$y^d_{u2} \geq (1 - (\sum_i \gamma_i \lambda_{li})p)y^a_{u2} + (\sum_i \gamma_i \lambda_{li})py^d_{u2} - (\sum_i \gamma_i \lambda_{li})\psi x$$

that is

$$(\sum_i \gamma_i \lambda_{li})\psi x \geq (1 - (\sum_i \gamma_i \lambda_{li})p)(y^a_{u2} - y^d_{u2}).$$

Now we can work out the equilibrium in every case.

**Region 1:**

Consider $\lambda_{l1} < 1/2$ and $\lambda_u \leq \alpha < \alpha^*$.

First note that $\tau_e = \frac{x_2}{(1-\lambda_{u1})x_{u1}}$, $\tau_2 = 1$, $T_d = \frac{x_2}{1-\lambda_{u1}}$ in this region. Then $y^d_{l1} - y^a_{l1} = x_{l1} + \frac{x_2}{1-\lambda_{u1}} - x_1$ so that $l1$ uprises if

$$\psi x < p(x_{l1} + \frac{x_2}{1 - \lambda_{u1}} - x_1)$$

Equivalently,

$$\gamma_1 = 1 \text{ if and only if } \psi < p(\frac{1-\alpha}{\lambda_l} + \frac{\lambda_2}{1-\lambda_{u1}} - \lambda_1)$$

Similarly, $y^d_{l2} - y^a_{l2} = \frac{x_2}{1-\lambda_{u1}} - (x_{l2} + x_1)$, so that $l2$ uprises if

$$\psi x < p(\frac{x_2}{1 - \lambda_{u1}} - x_{l2} - x_1) < 0$$

Thus, $l2$ never uprises.

When $\psi > p(\frac{1-\alpha}{\lambda_l} + \frac{\lambda_2}{1-\lambda_{u1}} - \lambda_1)$, neither group uprises, so democratization does not occur in this region.

When $\psi \leq p(\frac{1-\alpha}{\lambda_l} + \frac{\lambda_2}{1-\lambda_{u1}} - \lambda_1)$, only $l1$ uprises. Then $u2$ democratizes if

$$\lambda_{l1}\psi x \geq (1 - \lambda_{l1}p)(y^a_{u2} - y^d_{u2}) = (1 - \lambda_{l1}p)(x_{u2} + x_1 - \frac{x_2}{1 - \lambda_{u1}}).$$

Equivalently,

$$\psi \geq (\frac{1}{\lambda_{l1}} - p)(\frac{\alpha}{\lambda_u} + \lambda_1 - \frac{\lambda_2}{1-\lambda_{u1}}).$$

In summary, when $\lambda_u \leq \alpha < \alpha^*$, $u2$'s democratization decision is given as follows:

$$\delta = 1 \text{ if and only if } (\frac{1}{\lambda_{l1}} - p)(\frac{\alpha}{\lambda_u} + \lambda_1 - \frac{\lambda_2}{1-\lambda_{u1}}) \leq \psi \leq p(\frac{1-\alpha}{\lambda_l} + \frac{\lambda_2}{1-\lambda_{u1}} - \lambda_1)$$

**Region 2:**

Consider $\lambda_{l1} < 1/2$ and $\alpha^* \leq \alpha < \hat{\alpha}$.

First note that $\tau_e = 1$, $\tau_2 = \frac{x_u}{(1-\lambda_{l2})x_{l2}}$, $T_d = \frac{x_u}{1-\lambda_{l2}}$ in this region. Then $y^d_{l1} - y^a_{l1} = x_{l1} + \frac{x_u}{1-\lambda_{l2}} - x_1$ so that $l1$ uprises if

$$\psi x < p(x_{l1} + \frac{x_u}{1-\lambda_{l2}} - x_1)$$

Equivalently,

$$\gamma_1 = 1 \text{ if and only if } \psi < p(\frac{1-\alpha}{\lambda_l} + \frac{\alpha}{1-\lambda_{l2}} - \lambda_1)$$

Similarly, $y^d_{l2} - y^a_{l2} = x_{l2} - (x_{l2} + x_1) = -x_1$, so that $l2$ uprises if $\psi < -p\lambda_1 < 0$. Thus, $l2$ never uprises.

When $\psi > p(\frac{1-\alpha}{\lambda_l} + \frac{\alpha}{1-\lambda_{l2}} - \lambda_1)$, neither group uprises, so democratization does not occur in this region.

When $\psi \leq p(\frac{1-\alpha}{\lambda_l} + \frac{\alpha}{1-\lambda_{l2}} - \lambda_1)$, only $l1$ uprises. Then $u2$ democratizes if

$$\lambda_{l1}\psi x \geq (1-\lambda_{l1}p)(y^a_{u2} - y^d_{u2}) = (1-\lambda_{l1}p)(x_{u2} + x_1 - \frac{x_u}{1-\lambda_{l2}}).$$

Equivalently,

$$\psi \geq (\frac{1}{\lambda_{l1}} - p)(\frac{\alpha}{\lambda_u} + \lambda_1 - \frac{\alpha}{1-\lambda_{l2}}).$$

In summary, when $\alpha^* \leq \alpha < \hat{\alpha}$, $u2$'s democratization decision is given as follows:

$$\delta = 1 \text{ if and only if } (\frac{1}{\lambda_{l1}} - p)(\frac{\alpha}{\lambda_u} + \lambda_1 - \frac{\alpha}{1-\lambda_{l2}}) \leq \psi \leq p(\frac{1-\alpha}{\lambda_l} + \frac{\alpha}{1-\lambda_{l2}} - \lambda_1)$$

**Region 3:**

Consider $\hat{\alpha} \leq \alpha$.

First note that $\tau_e = 1$, $\tau_2 = 1$, $T_d = x_2 + \alpha x_1$ in this region. Then $y^d_{l1} - y^a_{l1} = x_{l1} + x_2 + \alpha x_1 - x_1$ so that $l1$ uprises if

$$\psi x < p(x_{l1} + x_2 - (1-\alpha)x_1)$$

Equivalently,

$$\gamma_1 = 1 \text{ if and only if } \psi < p(\frac{1-\alpha}{\lambda_l} + \lambda_2 - (1-\alpha)\lambda_1)$$

Similarly, $y^d_{l2} - y^a_{l2} = x_2 + \alpha x_1 - (x_{l2} + x_1)$, so that $l2$ uprises if

$$\psi x < p(x_2 - x_{l2} - (1-\alpha)x_1)$$

Equivalently,

$$\gamma_2 = 1 \text{ if and only if } \psi < p(\lambda_2 - \frac{1-\alpha}{\lambda_l} - (1-\alpha)\lambda_1)$$

To see if $l_2$ uprises, we have to check if $\lambda_2 - \frac{1-\alpha}{\lambda_l} - (1-\alpha)\lambda_1 > 0$ holds. This holds for large $\alpha$. Since

$$p(\frac{1-\alpha}{\lambda_l} + \lambda_2 - (1-\alpha)\lambda_1) > p(\lambda_2 - \frac{1-\alpha}{\lambda_l} - (1-\alpha)\lambda_1),$$

for larger values of $\alpha$, there exists a region $\psi < p(\lambda_2 - \frac{1-\alpha}{\lambda_l} - (1-\alpha)\lambda_1)$ where both $l1$ and $l2$ uprise, and there exists a region $p(\lambda_2 - \frac{1-\alpha}{\lambda_l} - (1-\alpha)\lambda_1) < \psi \leq p(\frac{1-\alpha}{\lambda_l} + \frac{\lambda_2}{1-\lambda_{u1}} - \lambda_1)$ where only $l1$ uprises.

When $\psi > p(\frac{1-\alpha}{\lambda_l} + \lambda_2 - (1-\alpha)\lambda_1)$, neither group uprises, so democratization does not occur in this region.

When $p(\lambda_2 - \frac{1-\alpha}{\lambda_l} - (1-\alpha)\lambda_1) < \psi \leq p(\frac{1-\alpha}{\lambda_l} + \lambda_2 - (1-\alpha)\lambda_1)$, only $l1$ uprises. Then $u2$ democratizes if

$$\lambda_{l1}\psi x \geq (1-\lambda_{l1}p)(y^a_{u2} - y^d_{u2}) = (1-\lambda_{l1}p)(x_{u2} - x_2 + (1-\alpha)x_1).$$

Equivalently,

$$\psi \geq (\frac{1}{\lambda_{l1}} - p)(\frac{\alpha}{\lambda_u} - \lambda_2 + (1-\alpha)\lambda_1)$$

When $\psi < p(\lambda_2 - \frac{1-\alpha}{\lambda_l} - (1-\alpha)\lambda_1)$, both $l1$ and $l2$ uprise. Then $u2$ democratizes if

$$\lambda_l\psi x \geq (1-\lambda_l p)(y^a_{u2} - y^d_{u2}) = (1-\lambda_l p)(x_{u2} - x_2 + (1-\alpha)x_1)$$

Equivalently,

$$\psi \geq (\frac{1}{\lambda_l} - p)(\frac{\alpha}{\lambda_u} - \lambda_2 + (1-\alpha)\lambda_1)$$

The same analysis applies to $\lambda_{l1} \geq \frac{1}{2}$.

# D Coalition Formation with Power Sharing

**Proposition 1:** $u2$ always accepts power sharing with $u1$.
**Proof:** If $u1$ offers to share power with $u2$, then by accepting $u1$'s offer, $u2$ can guarantee zero tax rates in autocracy. In order $u1$ to get $u2$'s consent for any tax scheme with $\tau_2 > 0$, $u1$ has to tax set either $\tau_1 > 0$ or $\tau_e > 0$. In both cases, $u2$ would be better off by simply setting all the tax rates to zero. Because any other tax scheme with $\tau_e > 0$ would be transfer from the upper class to the lower class. So, $u1$ prefers $\tau_e = 0$. Now consider a tax scheme such that $\tau_e = 0$ and $\tau_1 x_1 + \tau_2 x_2 = \tau_2 x_{u2}$.The last equality is required for $u2$ not to veto the tax scheme. Such a tax scheme generates a net transfer of $T_1 = \tau_1 x_1 + \tau_2 x_2 - \tau_1 x_{u1}$ to $u1$. by substituting for $\tau_1 x_1 = -\tau_2 x_2 + \tau_2 x_{u2}$, $\tau_2 = \frac{x_1}{x_{u2}-x_2}\tau_1$ and $x_{u1} = x_{u2}$, we obtain

$T_1 = \frac{x - x_{u2}}{x_{u2} - x_2}\tau_1$. Then it follows from $x_{u2} > x$ and $x_{u2} > x_2$ that $T_1 < 0$ for any $\tau_1$, so that $u1$ would offer $\tau_e = \tau_1 = \tau_2 = 0$ if $u1$ power shares with $u2$.

So, if autocracy prevails, $u2$'s disposable income is given by $x_{u2}$. On the other hand, if $u2$ rejects power sharing and autocracy prevails, $u2$'s disposable income is given by $x_2$. Since $\alpha > \lambda_u$ implies $x_{u2} > x_2$, $u2$ would be better off by power sharing.

It is possible that the regime may switch to democracy as a result of a successful uprising, even if $u2$ power shares with $u1$. We will show that $x_{u2}$ is larger than $u2$'s disposable income under democracy, so that $u2$ prefers to power share with $u1$. In region 1, $y^d_{u2} = \frac{x_2}{1-\lambda_{u1}}$, and $x_{u2} > \frac{x_2}{1-\lambda_{u1}}$ is equivalent to $\alpha > \lambda_u \frac{\lambda_2}{1-\lambda_{u1}}$. Since $\alpha > \lambda_u > \lambda_u \frac{\lambda_2}{1-\lambda_{u1}}$, we have $x_{u2} > y^d_{u2}$ in region 1. In Region 2, $y^d_{u2} = \frac{x_u}{1-\lambda_{l2}}$. Then, $x_{u2} > y^d_{u2}$ is equivalent to $\frac{1}{\lambda_u} > \frac{1}{1-\lambda_{l2}} = \frac{1}{\lambda_u + \lambda_{l1}}$, which holds trivially. In region 3, $y^d_{u2} = x_2 + \alpha x_1$. Then, $x_{u2} > y^d_{u2}$ is equivalent to $\alpha > \lambda_u \frac{\lambda_2}{1-\lambda_{u1}}$, which holds. So, $u2$ has a higher disposable income under autocracy with power sharing. Moreover, power sharing decreases the likelihood of a successful uprising, and it may even avoid uprising. Therefore, $u2$'s optimal decision is to accept power sharing whenever $u1$ offers to power share. This completes the proof.

**Proposition 3:** For large $\alpha$ and low $\psi$, $u1$ may share power with $u2$ and both $l1$ and $l2$ uprise in equilibrium.

**Proof:** Since the proposition requires high values of $\alpha$, we will restrict our analysis to region 3. However, the same type of equilibrium may exist in region 2, depending on the parameters, as well.

If $u1$ shares power with $u2$ and autocracy prevails, then the disposable incomes of the lower groups are $y^{a(u1-u2)}_{l1} = x_{l1} = y^a_{l1} - x_2$ and $y^{a(u1-u2)}_{l2} = x_{l1} = y^a_{l2} - (x_2 - x_{l2})$.

In this case, $l1$ uprises when $\psi x < q(y^d_{l1} - y^{a(u1-u2)}_{l1}) = q(y^d_{l1} - y^a_{l1}) + qx_2$ and $l2$ uprises when $\psi x < q(y^d_{l2} - y^{a(u1-u2)}_{l2}) = q(y^d_{l2} - y^{a(u1-u2)}_{l2}) = q(y^d_{l2} - y^a_{l2}) + q(x_2 - x_{l2})$.

So, we will consider the following sub-regions of region 3 ($\lambda_{l1} \geq \frac{1}{2}$ or $\alpha \geq \hat{\alpha}$):

3a. $q(y^d_{l1} - y^a_{l1}) + qx_2 < \psi x \leq p(y^d_{l1} - y^a_{l1})$

3b. $q(y^d_{l1} - y^a_{l1}) + q(x_2 - x_{l2}) < \psi x < q(y^d_{l1} - y^a_{l1}) + qx_2$

3c. $(\frac{1}{\lambda_l} - p)(y^a_{u1} - y^d_{u1}) < \psi x < q(y^d_{l1} - y^a_{l1}) + q(x_2 - x_{l2})$

3d. $\psi x < (\frac{1}{\lambda_l} - p)(y^a_{u1} - y^d_{u1})$

Note that these regions exist for certain parameter values. Since our propositions 2 and 3 state existence results, it is sufficient to assume the existence of these regions in the rest of the proof.

When $\psi x > p(y^d_{l1} - y^a_{l1}) = p(y^d_{l2} - y^a_{l2})$, there is no uprising under autocracy, so there is no power-sharing and autocracy prevails.

Consider $(\frac{1}{\lambda_l} - p)(y^a_{u1} - y^d_{u1}) \leq \psi x < p(y^d_{l1} - y^a_{l1})$. In this region, in the base model, $u1$ democratizes since

$$y^d_{u1} > Ey^a_{u1} = \lambda_l p y^d_{u1} + (1 - \lambda_l p) y^a_{u1} - \lambda_l \psi x$$

Consider Region 3a. Suppose that $l1$ does not share power with $u1$. If $u1$ shares power with $u2$, then there is no uprising so that $Ey_{u1}^{a(u1-u2)} = x_{u1}$. If $u1$ does not share power with $u2$, then both groups uprise so that $u1$'s payoff is $Ey_{u1}^{a} = \lambda_l p y_{u1}^{d} + (1-\lambda_l p) y_{u1}^{a} - \lambda_l \psi x$.

Since $Ey_{u1}^{a(u1-u2)} = x_{u1} > y_{u1}^{d} > Ey_{u1}^{a}$, $u1$ shares power with $u2$ when $l1$ rejects power sharing with $u1$. Then, $l1$ would prefer to share power with $u1$ since

$$Ey_{l1}^{a(u1-l1)} = x_{l1} + x_2 > Ey_{l1}^{a(u1-u2)} = x_{l1}$$

Then, $u1$ does not democratize when $\psi x > p(y_{l1}^{d} - y_{l1}^{a}) + q x_2$, shares power with $l1$ and there is no uprising.

Now consider *regions 3b, 3c, 3d*. Suppose $l1$ rejects power sharing with $u1$. If $u1$ shares power with $u2$, $l1$ uprises in *region 3b*, and both lower groups uprise in *regions 3c* and *3d.* If $u1$ does not share power with $u2$, then both lower groups uprise in *regions 3b, 3c, 3d.*

Now consider Regions 3c and 3d. Note that $y_{u1}^{a(u1-u2)} = y_{u1}^{a} - x_2$. If $l1$ rejects power sharing, then $u1$ shares power with $u2$ when

$$\begin{aligned}
Ey_{u1}^{a(u1-u2)} = \lambda_l q y_{u1}^{d} + (1-\lambda_l q) y_{u1}^{a(u1-u2)} - \lambda_l \psi x > Ey_{u1}^{a} = \lambda_l p y_{u1}^{d} + (1-\lambda_l p) y_{u1}^{a} - \lambda_l \psi x \\
\iff (p-q)(y_{u1}^{a} - y_{u1}^{d}) > (\frac{1}{\lambda_l} - q) x_2 \\
\iff \alpha > \tilde{\alpha}^3 = \frac{(\frac{1}{\lambda_l} - q)\lambda_{u2}}{(p-q)(1-\lambda_{u1})}
\end{aligned}$$

Note that $\tilde{\alpha}^3 < 1$ if, for example, the size of the upper class, $\lambda_u$, is small enough. Consider $\alpha > \tilde{\alpha}^3$ : If $l1$ shares power with $u1$, then $Ey_{l1}^{a(u1-l1)} = y_{l1}^{a}$. If $l1$ does not share power with $u1$, then $u1$ shares power with $u2$, and $Ey_{l1}^{a(u1-u2)} = \lambda_l q y_{l1}^{d} + (1-\lambda_l q)(y_{l1}^{a} - x_2) - \lambda_l \psi x$. In this case, $l1$ does not power share with $u1$ if

$$\begin{aligned}
Ey_{l1}^{a(u1-l1)} = y_{l1}^{a} < Ey_{l1}^{a(u1-u2)} = \lambda_l q y_{l1}^{d} + (1-\lambda_l q)(y_{l1}^{a} - x_2) - \lambda_l \psi x \\
\iff \psi x < q(y_{l1}^{d} - y_{l1}^{a}) - (\frac{1}{\lambda_l} - q) x_2 = q\alpha x_1 - (\frac{1}{\lambda_l} - q) x_2.
\end{aligned}$$

To complete the proof of the proposition, check that $\tilde{\alpha}^3 < 1$, and $q\alpha x_1 - (\frac{1}{\lambda_l} - q) x_2 > 0$ if $q > \frac{\lambda_2}{\lambda_l}$, $\alpha$ is close to 1, and $\lambda_u$ is small.

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