Ethnicity or class?
Identity choice in elections and its implications for redistribution [*]

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Abstract

I examine a model of identity formation in electoral politics. In the model, voters belong to an economic class and to an ethnic group, and parties form endogenously to appeal for votes by making promises either to ethnic groups or to an economic class. Voters respond to these electoral appeals by determining which identity will yield them the largest share of government resources. Under both plurality rule and proportional representation, high inequality and ethnic diversity interact to facilitate ethnic politics, where voters choose parties that appeal to groups rather than class. Since ethnic politics targets some voters who are rich and excludes some who are poor, ethnic politics results in less redistribution than class politics. The model therefore suggests that high inequality and ethnic diversity also interact to diminish the redistributive effects of democracy. Empirical tests provide evidence for the model's intuitions regarding both the mechanism (ethnic-based voting) and the outcome (redistribution).

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1   Introduction.

People typically have multiple identities. In all countries, individuals have an economic "class" identity defined by their level of economic well-being. And in many countries, individuals also have at least one "ethnic identity" – a language, religion, race, ethnicity, tribe, or caste that is typically inherited at birth. Ethnic and class identities are central in studies of democratic politics because they create an obvious and efficient means for politicians and parties to organize their quest for votes and for voters to understand the link between vote choice and access to government resources. If class and ethnic identity are strongly related, the presence of both identities creates little tension because parties can make campaign promises that appeal simultaneously to members of a class and members of an ethnic group, and individuals can vote for their group or class without feeling cross-pressured. But in most situations, the relationship between ethnic group and class is quite weak, with groups containing both rich and poor members.[1]

Since economic diversity within ethnic groups makes it difficult for parties to appeal to groups based on the economic status of their members, such diversity creates a tension regarding "identity choice." A party appeal based on ethnic identity must transcend economic class, and a party appeal based on economic class must transcend ethnic group. Voters are therefore left with a choice between invoking their class and invoking their ethnic identity when deciding how to cast their ballots. Parties, in crafting their appeals for votes, must take this tension into account, which will influence whether class- or ethnic-based appeals will be more successful. The goal of this paper is to develop and test a theory of how this tension gets resolved – to understand when "ethnic" appeals become more prevalent than appeals based on "class" in electoral politics.

Understanding when ethnic identity prevails in electoral politics is intrinsically important, not the least because there is considerable evidence that when ethnic politics are prevalent, so are negative governance outcomes, including lower levels of public goods provisions (e.g., Alesina, Baqir and Easterly 1999, Miguel and Gugerty 2005), lower levels of economic development (e.g., Alesina and Ferrara. 2005) and higher incidence of civil conflict (Esteban, Mayoral and Ray 2012). In addition, the emergence of ethnic as opposed to class politics politics has important implications

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[1]Huber and Mayoral (2013), for example, examine surveys from 88 countries and find that on average, nearly half of all inequality, as measured by the Gini coefficient, is within groups, while less than one-sixth is between groups, with the rest residing in a residual term

for the redistributive consequences of democracy. When class identities are dominant in electoral campaigns – as is assumed in canonical "tax and transfer" models where electoral competition must occur on the class dimension (e.g., Meltzer and Richard 1981, Boix 2003, Acemoglu and Robinson 2005) – all redistribution is from richer individuals to poorer ones, and no poor individuals are excluded from this redistribution. Inequality is therefore central to determining redistributive outcomes, with the winning party commiting to higher levels of redistribution as inequality grows. The redistributive consequences of elections can play out quite differently when ethnic identity is central. If politicians can seek votes and distribute government benefits by appealing to specific ethnic groups, then redistribution is diminished because some rich individuals will be beneficiaries (because they belong to the winning group) and some poor individuals (those in the losing group) will be left out of access to government resources. Thus, when democratic politics centers on ethnic rather than class identity, elections should have smaller redistributive effects.

In the analysis developed here, the redistributive effects of elections are influenced by whether class or ethnic identity emerges as central to electoral competition, but the model does not assume that one form of politics prevails over the other. Instead, identity emerges through electoral competition. Voters in the model belong to one of two ethnic groups – the majority or the minority – and they have one of two incomes, rich or poor. Parties form when a party entrepreneur – who cares both about the rents from winning elections and about the personal benefits from government policy – pays a small cost to form a party that represents her ethnic group or economic class. If a party forms, it appeals for votes by committing to distribute government resources to the ethnic group or class the party represents. Voters are motivated to achieve the highest payoff possible from the government, and they vote strategically to this end, invoking their "ethnic identity" when they support an ethnic party and their "class identity" when they support a class party. Thus, voters have no intrinsic attachment to either their ethnic group or class, and there are no non-economic policies – such as those related to culture, education, or religion – that can be exploited to attract votes. Such attachments can clearly be important, but the goal here is to understand how identity politics might unfold if all agents are motivated exclusively by their economic interests.

A simple argument emerges from the model about how inequality, ethnic diversity, and their interaction influence identity choice, and thus the redistributive consequences of elections. The model is parameterized so that inequality is directly related to the number of poor and so that ethnic

diversity is directly related to the number of individuals in the majority group. When inequality is high – i.e., when there are a large number of poor individuals – a class-based party representing the poor can promise little to each constituent because distributing government resources to the poor spreads these resources very thinly. High inequality therefore opens the door to successful ethnic appeals because ethnicity provides a mechanism for forging smaller electoral coalitions that exclude some segments of the poor from access to government resources. In countries like many in Africa, for example, class politics might be very difficult to sustain given that nearly everyone is poor, and ethnic identity provides a means for creating smaller winning coalitions that exclude some poor from access to government resources. Similarly, in ethnically homogenous societies, ethnic appeals are obviously unappealing to voters because a party representing a large ethnic group will have to spread the spoils of government very thinly. This opens the door to class appeals. Importantly, however, the effect of inequality depends on the level of ethnic diversity, and visa versa. In a very diverse society, ethnic politics will have a strong chance of success independent of the level of inequality. Thus, the effect of inequality on the emergence of class will be strongest in more homogeneous societies. And the effect of ethnic diversity on the emergence of ethnic politics will similarly depend on the level of inequality, and will have the greatest impact on identity choice when inequality is relatively low (because ethnic politics can emerge rather easily when inequality is high). These arguments are robust to variation in the electoral law (plurality vs. proportional representation) and to variation in the source of government revenues (from exogenous windfalls or taxes on the rich).

This logic describing how inequality and ethnic diversity interact to influence identity choice in elections has implications for understanding the redistributive effects of democratic elections. As noted above, from the tax-and-transfer framework (where targeted group politics cannot emerge), one should expect that greater inequality leads to higher levels of redistribution (independently of the level of ethnic diversity). In the model here, the redistributive consequences of democracy are lowest when inequality is highest because such inequality invites less redistributive ethnic politics. The negative effect of inequality on redistribution should only be found, however, in relatively homogenous societies. The expectations from the model about ethnic diversity and redistribution also differ from arguments from previous research. Scholars have recognized that inter-group antipathies prevent voters from supporting general redistributive policies from which they benefit

because such policies also benefit members from other groups (e.g., Gilens 1999, Alesina and Glaser 2003). In these accounts, the level of inequality does not condition the effect of ethnic politics. The model here also suggest that ethnic diversity can result in lower levels of redistribution, but not because of group-based animosities. Instead, ethnic based distribution can make a majority better off than they would be under class politics. Whether this can occur depends on the level of inequality, which determines the value of class politics to the poor.

After developing the theoretical arguments, I estimate empirical models where the dependent variable measures the extent to which parties have a unique ethnic basis of support, and the key independent variables are inequality, ethnic diversity and their interaction. I also estimate models where the dependent variable is the level of redistribution in society and the independent variables are again inequality, ethnic diversity and their interaction. The empirical analysis provides evidence for the model's intuitions regarding both the mechanism (ethnic-based voting) and the outcome (redistribution).

The paper is organized as follows. The next section reviews related literature. I then describe in section 3 the general structure of the model and how its exogenous parameters are linked to the Gini coefficient of inequality and to measures of ethnic diversity. Section 4 examines the baseline model under the assumptions of exogenous revenues and plurality electoral laws, and section 5 examines the model under the assumptions of proportional electoral laws with exogenous revenues. I then consider the role of taxes and transfers in section 6. The empirical analyses follow, with section 7 focusing on the the importance of ethnic identity in elections and section 8 focusing on redistribution in democracies. The final section concludes by describing pathways for future research.

2 Related literature.

It is widely accepted that ethnic identity is not strictly primordial, but rather is "constructed," emerging, often instrumentally, from the social context (e.g., Horowitz 1985, Laitin 1998, Chandra 2004 and Posner 2005). At the same time, ethnic categories are intrinsically important because they provide a menu from which politicians can choose as they target voters for inclusion or exclusion in efforts to build winning electoral coalitions (e.g., Bates 1983, Chandra 2004, Horowitz 1985,

and Posner 2005). Indeed, a central reason that targeting votes based on "ethnicity" – broadly defined to include language, caste, racial, ethnic, tribal or (in some contexts) religious identities with which one is born – is that ethnicity often provides a clear marker that makes it possible to delineate unambiguously who is included and excluded from a governing coalition. This is true because individuals cannot decide that they belong to any ethnic group. They cannot decide, for example, that they are dark skinned if they are light skinned. But individuals are often born with multiple group identities – they may have tribal and language group, for example – and thus it is important to understand when particular identities emerge. Some research therefore focuses on how politicians use ethnicity to target voters. Chandra (2004), for example, focusing on India, emphasizes that ethnic parties are most likely to succeed in patronage-democracies when they have competitive rules for intra-party advancement and when the ethnic group they seek to mobilize is large enough to win. Other research focuses more explicitly on individual level calculations that transcend the electoral context, such as Laitin (1998), who focuses on the size of groups and on the expectations that individuals have about the behavior off others.

Posner (2004, 2005) also focuses on the strategic choice of identity, describing ethnic electoral politics as a sort of "ethnic head count," where the challenge politicians face is to form a minimum winning coalition of ethnic groups. Parties strategically employ appeals to particular group identities, and voters invoke the particular identities that give them access to the highest levels of government resources. The model here builds on Posner's idea that identity choice occurs instrumentally as individuals seek to become part of minimum winning electoral coalitions. But a key difference is the role played by economic class. Like most research in identity politics, Posner focuses on instrumental choices among possible "ethnic" identities, and thus does not consider the possibility that lower income individuals could band together to support parties that represent all the poor rather than parties that represent specific groups. The focus here on the trade-off between ethnic and class politics makes it possible to explore why any ethnic markers become salient in electoral competition in the first place, and to introduce the importance of inequality in shaping the salience of ethnic politics. This makes it possible to develop testable propositions about when ethnic identity will be salient in a political system.

The model here is also related to previous political economy models of elections. A number of recent models bring group politics into the analysis by studying the possibility that parties can

compete for votes on dimensions unrelated to class. Shayo (2009), for example, explicitly models whether individuals identify with their class or their nationality. Thus, like in the model here, individuals have multiple identities that they can tap at election time, one of which is class (they are rich or poor). But for Shayo, the other identity is not an ethnic group on which individuals can differ, but rather is a single national identity to which all individuals can adhere. Thus, "identity politics" in Shayo does not create a basis for exclusion of particular groups (as it does here) and is not driven exclusively by individual interest in material gain (as it is here). Instead, his model focuses on the fact that national identity is something like a second dimension (as in Romer 1998), the importance of which is influenced by exogenous factors. Nationalist identity can distract the poor from their economic self-interest, leading to lower levels of redistribution.

Other models of electoral competition also examine how class coalitions can be disrupted by offering subsets of the poor an opportunity to form coalitions with the rich.[2] Most closely related is Fernàndez and Levy (2008), who model elections under plurality rule where individuals are either rich or poor, and where (only) the poor can have a group identity as well (i.e., the poor can have particular preferences for a group-specific good). Fernàndez and Levy's general focus, however, is on how the diversity of group interests among the poor affects the propensity for class politics to emerge. Their model suggests that ethnic diversity has a non-monotonic effect on the amount of general (rich to poor) redistribution that occurs, with increases in diversity diminishing redistribution at low levels of diversity and increasing redistribution at high levels of diversity. The model here, by allowing rich and poor to have a shared ethnic identity, explicitly focuses on the tension that can exist between group-based and class-based electoral politics. So doing makes it possible to describe how ethnic diversity and economic inequality interact to influence identity choice and redistributive outcomes.

3   The model, inequality and ethnic diversity.

A general sketch of the model is as follows. Voters are either rich or poor, and they belong to one of two (ethnic) groups, the majority group or the minority group. Party entrepreneurs are voters who can pay a cost to form a party representing a class (e.g., a party of the rich or a party of the poor) or

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[2]Examples include Levy 2005, Austen-Smith and Wallerstein 2005, Huber and Stanig 2011, and Huber and Ting 2013.

an ethnic group (e.g., a party of the majority group or a party of the minority group). If they pay this cost, they make credible campaign promises about how government resources will be distributed to the individuals they represent. The entrepreneur for the party of the poor, for example, makes a promise regarding how much each poor person will receive from the government if the poor party wins. The winning party distributes the promised government resources to the members of the group the party represents, and the entrepreneur keeps any residual that is not distributed. "Class politics" prevails – and individuals choose "class identity" – when the winning party makes class-based promises and government resources are distributed based on income. "Ethnic politics" prevails – and individuals choose "ethnic identity" – when the winning party makes ethnic-based promises and government resources are distributed based on ethnic identity.

Formally, consider a population n of measure 1. Let A denote the majority group, which has a size of n_A, and let B denote the minority group, which has a size of n_B, so that $n_A + n_B = n$ and $n_A > n_B$. Individuals are rich (R) or poor (P). Let n_P denote the number of poor individuals in society and n_R denote the number of rich individuals. The poor are a majority, with $n_P > n_R$ and $n_R + n_P = n$. The number of individuals in ethnic group j and class k is denoted by n_{jk} and the set of individuals in ethnic group j and class k is denoted by j_k (so, for example, n_{AR} is the number of individuals in group A who are rich and A_R denotes this set of individuals). Thus, individuals belong to one of four subgroups: A_P, A_R, B_P and B_R. Since $n_{AR} = n_A - n_{AP}$, $n_{BP} = n_P - n_{AP}$ and $n_{BR} = 1 - n_P - (n_A - n_{AP})$, the structure of the population is defined by three parameters: n_A, n_P and n_{AP}. I ignore the substantively uninteresting case where any subgroup has a majority (which means that $n_{AP} < \frac{1}{2}$ because the poor in A are the only subgroup that could be a majority). In large electorates, the probability that the groups or subgroups are identical in size obviously goes to zero. f therefore simplifies the analysis to eliminate substantively uninteresting ties by assuming that no subgroups or groups are exactly the same size: i.e., for any $r, s \in M = \{A, B, P, R\}$, $n_r \neq n_s$, and for any $r, s, w, u \in M$, $n_{rs} \neq n_{wu}$ and $n_{rs} \neq n_u$.

Before transfers or government action occurs, there is a fixed level of income in society, with the rich holding some fraction of income and the poor holding the rest. As a consequence, as the number of poor increases (and thus the number of rich decreases), inequality increases. Indeed, with this assumption that the rich and poor each control a fixed level of income, the Gini coefficient can be written strictly as a function of n_P. As an illustration, consider the case where the

total income in society is $Y = 1$. Assume that the rich have one-half of the total income (so that the rich share is $Y^R = \dfrac{Y}{2}$) and the poor have the other half (so that the poor share is $Y^P = Y^R = \dfrac{Y}{2}$). The poor share Y^P equally and the rich do the same, so there are only two levels of income in society (before government action occurs). Let y^P (alternatively, y^R) be the income of a poor (rich) individual. Then $y^P = \frac{1}{2n_P}$ (and $y^R = \frac{1}{2n_R}$). Given that $n_P > n_R$, $y_P < y_R$. It is straightforward to show that with this assumption about pre-existing income, the Gini coefficient of inequality can be written as

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\begin{aligned}
G &= n_P - Y^P \\
&= n_P - \tfrac{1}{2}.
\end{aligned}
$$

Thus, in the model, G increases as n_P increases.

The parameters also define standard measures of ethnic diversity like ELF, a measure of ethnolinguistic fractionalization, and EP, a measure of ethnic polarization (Reynol Querol 2002). These measures are essentially identical when there are only two groups, and both are increasing as n_A *decreases*.

4   The model with plurality rule and exogenous government revenues.

I begin the analysis by assuming that parties compete for votes by offering platforms that describe how exogenous government revenues, $\pi > 0$, will be distributed to voters. This assumption not only makes the model simple to analyze, it also captures a reality in many democracies in the developing world, where direct taxes on income or wealth represent a small proportion of government revenues. Instead, revenues often come from "exogenous" sources, such as natural resources, foreign aid, sales from state-owned farms or industries, or taxes on imports or exports. Of course, income taxes can also be important sources of revenue, and below I consider an extension of the model where government revenues come from an income tax on the rich.

Since parties can form to represent a class or a group, there are at most four parties that can form: P_P (representing the poor); P_R (representing the rich); P_A (representing the majority group A); and P_B (representing the minority group B). Each party therefore represents two subgroups – P_A, for example, represents subgroups A_P and A_R.

At the beginning of the game, four individuals are designated as party entrepreneurs, one for each possible party. The party entrepreneurs must be from one of the two subgroups that the party represents. The entrepreneur for P_A, for example, must be from A_P or A_R. Since each party could have an entrepreneur from two subgroups, there must be a mechanism for deciding from which subgroup a party entrepreneur is taken. I discuss this issue below. Here, I describe the process of party competition, which occurs in two stages. In the first stage, if the party entrepreneur for $m \in M = \{A, B, P, R\}$ wishes to form a party, she must pay a cost, $\delta > 0$, which can be arbitrarily small. Paying δ allows the party entrepreneur to seek votes by adopting an initial party platform, $p'_m > 0$, which describes the payment that each individual in m will receive if P_m wins. Let $\mathbf{p}'$ be the vector of initial party platforms, so that $\mathbf{p}' = (p'_A, \ p'_B, \ p'_P, \ p'_R)$, and $p'_m = 0$ if P_m does not form.

Campaigns are not static events, and once parties form, they often must react to the proposals of other parties. I therefore assume that once all parties announce their initial platforms, those parties that have formed can pay a cost, $\bar{\delta}$ to adjust their platform in response $\mathbf{p}'$. Let $p_m(\mathbf{p}')$ be the updated platform of P_m. Only parties that pay the initial cost of formation can update their party platforms, so $p_m(\mathbf{p}') = 0$ if $p'_m = 0$. The ultimate set of party platforms from which voters can choose is therefore given by the vector $\mathbf{p}(\mathbf{p}') = (p_A(\mathbf{p}'), \ p_B(\mathbf{p}'), \ p_P(\mathbf{p}'), \ p_R(\mathbf{p}'))$. Where it creates no confusion, I will refer to the set of party platforms from which voters choose simply as $\mathbf{p}$.

Note that if a party representing m ultimately adopts $p_m(\mathbf{p}') = x$ and P_m wins, then each voter in m – no matter how they vote – receive x. Parties therefore cannot discriminate against particular members of the group they represent, but instead must treat all group members the same. This implies that the maximum platform for a party representing group m is $\frac{\pi}{n_m}$, which occurs if the party entrepreneur proposes to distribute the entire π to the group her party represents. The amount that parties can "pay" for votes therefore varies with the size of the group the party represents.

The model, then, assumes that the strategy space available to parties is quite limited. Party entrepreneurs cannot cherry pick individuals within groups, cannot appeal to subsets of the rich or poor (e.g., only those in a particular ethnic group) or to subsets of an ethnic group (e.g., only those that are poor), and cannot appeal at once to a group and class (such as to the rich and the minority group). This assumption is obviously a heuristic used to focus on the identity choice problem that is

central here, and to do so in a way that is consistent with a framework where voters adopt identities in elections instrumentally, thereby inviting identity-based appeals. Of course, parties can and do at times attempt to make commitments that cherry pick individuals or that transcend group or class. But the implicit argument underlying the assumption about the strategy space for parties is that such commitments are less credible to the voters than are commitments to a particular group or class. If a party makes an appeal to specific groups, for example, but then only honors such commitments for a subset of group members, this will make group-based appeals less credible. The same might be true for appeals that transcend group and class. If a party appeals at once to both the rich and the minority group, for example, the poor in the minority group might rightfully worry that the party could be captured by the rich and work against the interests of the poor. Similarly, the members of the rich in the majority group might rightfully worry that the party might be captured by the minority group.[3] The assumption that parties cannot appeal to class-based segments of ethnic groups is also consistent with existing descriptive research on how ethnic parties appeal for votes. This research does not find that such appeals target particular economic segments within subgroups (e.g., Chanda 2009, Gadjnova 2013). Indeed, the purpose of such parties is to avoid such appeals by seeking votes based solely on ethnic identity. Although there are clear exceptions, such as the various language-based parties in Belgium, it is generally the case that ethnic appeals are "class-free," suggesting it may be difficult for a party to credibly commit to an "ethnic strategy" whereby they represent only a subset of an ethnic group.

4.1   Voter utility functions and equilibrium voting behavior.

After a party system forms and voting takes place, a voter receives the amount promised to his or her group in the platform of the winning party. Thus a voter receives the promised amount if the voter belongs to one of the two subgroups that the winning party represents, and receives zero otherwise. Formally, let $p_m^*(\mathbf{p})$ be the platform of the winning party, P_m, which represents individuals from group or class m, and let $u_{jk}[p_m^*]$ be the utility of a voter of ethnic group j and class k given p_m^*. Then

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[3]Below, I argue that the severity of such commitment problems is central to generating differences between the party systems under proportional representation and plurality rule.

$$u_{jk}[p_m^*] = \begin{cases} 0 \text{ if } j \neq m \text{ and } k \neq m \\ \\ p_m^* \text{ if } j = m \text{ or } k = m. \end{cases}$$

Given a party system, $\mathbf{p}$, voters will choose the party that results in the highest payoff. Voters from each subgroup are identical and vote in the same way. Voters in subgroup jk can be represented only by one of two parties, which I denote by P_m and $P_{m'}$. Let $v_{jk} = P_m$ denote that subgroup jk supports P_m. Define $\mathbf{v_{\neg jk}}(\mathbf{p})$ as the vector of voting strategies for the three subgroups other than jk given the party system $\mathbf{p}$. Define $p^*(v_{jk} = P_m | \mathbf{v_{\neg jk}}(\mathbf{p}))$ as the winning platform that results if for party system $\mathbf{p}$, subgroup jk supports P_m and other subgroups have voted as specified in $\mathbf{v_{\neg jk}}(\mathbf{p})$. A Nash equilibrium voting strategy for subgroup jk is given by:

$$v_{jk}^*(\mathbf{p}) = \begin{cases} \emptyset \text{ if } p_m = p_{m'} = 0 \\ P_m \text{ if } p_m > 0 \text{ and } p_{m'} = 0 \\ P_m \text{ if } u_{jk}\left[p^*(v_{jk} = P_m | \mathbf{v_{\neg jk}}(\mathbf{p}))\right] > u_{jk}\left[p^*(v_{jk} = P_{m'} | \mathbf{v_{\neg jk}}(\mathbf{p}))\right] \\ P_m \text{ if } u_{jk}\left[p^*(v_{jk} = P_m | \mathbf{v_{\neg jk}}(\mathbf{p}))\right] = u_{jk}\left[p^*(v_{jk} = P_{m'} | \mathbf{v_{\neg jk}}(\mathbf{p}))\right] \text{ and } e_m > e_{m'}. \end{cases} \tag{1}$$

A Nash equilibrium at the voting stage exists if the vote choice of all subgroups satisfies eq 1.

Equation 1 states that if no party represents a voter, the voter abstains. If there is only one party that represents the voter, the voter plays the weakly dominant strategy, which is to support this party. Finally, there may be both a class and ethnic party that represent a voter. In this case, the voter chooses the party that yields the highest expected utility given the strategies of other voters. If a voter is indifferent between his class- and ethnic-based parties, the voter supports the party whose entrepreneur has the largest surplus (i.e., who has the largest e_m). This tie-breaking rule makes it possible to avoid requiring party entrepreneurs to choose platforms that maximize on an open set. Suppose, for example, that a voter is pivotal in choosing between P_j and P_k and that $p_j = p_k$. By assumption, $n_j \neq n_k$, so assume $n_j < n_k$. This implies that it is always possible for P_j to offer more to its voters. If P_k proposes to distribute all of π to voters, for example, its platform is $\frac{\pi}{n_k}$. But then since $n_j < n_k$, P_j could propose $\frac{\pi + \epsilon}{n_k}$ and win against the larger group. Of course, as $\epsilon \to 0$, $\frac{\pi + \epsilon}{n_k}$ converges to $\frac{\pi}{n_k}$. The tie-breaking assumption rules out the need to make such "ϵ"

proposals.

4.2 Party utility functions and equilibrium party formation.

The utility function of party entrepreneurs has three components. First, as noted above, an entrepreneur pays a cost $\delta > 0$ of offering a platform and $\bar{\delta} > 0$ of updating her platform if she has formed a party. Note that if $p'_m = 0$ (which implies that $p_m = 0$) then P_m does not form and there are no costs of formation. These costs can be arbitrarily small, but their presence ensures that parties will not form unless there is some benefit of doing so.

Second, entrepreneurs can obtain personal rents from forming parties and winning control of the government. Specifically, if the entrepreneur offers the winning platform, she keeps any government resources that are not distributed to voters after honoring the platform. This residual for the entrepreneur of the winning party, P_m, is $e_m = \pi - (p_m * n_m)$, which we can think of as the political rents that accrue to party entrepreneurs. Politicians therefore have an incentive to offer the smallest possible winning platform so as to maximize the rents they receive.

Finally, party entrepreneur may derive policy benefits from forming a party even if the party does not win. This benefit would occur when the party entrepreneur is herself a member of a group and class that is represented by the winning party. The entrepreneur may therefore have an incentive to form a party that loses if by so doing she forces the winning party to offer more to her constituents. Suppose, for example, that P_A is going to win an election. Since P_A represents poor individuals in A, an entrepreneur for a P_P who is from A can have an incentive to form P_P, pledging the largest possible platform, and thereby forcing P_A to offer a larger platform than it would if P_P did not form.

Parties, of course, can have entrepreneurs from one of two subgroups, and one could model the choice of party entrepreneur from these subgroups directly. But so doing adds a layer of notation and complexity without adding any intuitions because only one of these subgroups can receive benefits from the winning party, and only an entrepreneur from this subgroup would therefore pay δ to form a party. When P_A is going to win, for example, an entrepreneur from B_P would never have an incentive to form P_P because individuals in this subgroup receive no benefits if P_A wins. I therefore make the simplifying assumption that an entrepreneur receives the policy payment of-

fered by the winning platform if the entrepreneur represents any voter who is also represented by the winning party. For example, if P_A wins, then an entrepreneur for P_P receives p_A because this entrepreneur represents poor individuals in A who are also represented by P_A. An entrepreneur for P_B, by contrast, would not receive p_A in this case because P_B does not represent any voters who are represented by P_A. This assumption is a notationally simple way of incorporating incentives individuals have to form parties in order to influence the policy of the winning party. This assumption implies (to avoid adding citizens to the population) that if the entrepreneur represents any voters who are also represented by the winning party, the entrepreneur herself is one of the individuals represented by this party.

Let $p^*(\mathbf{p})$ be the winning platform given party system $\mathbf{p}$ and equilibrium voting strategies. The utility for P_m's entrepreneur is therefore given by:

$$u_m(p^*(\mathbf{p})) = \begin{cases} -\delta - \bar{\delta} & \text{if } P_m \text{ loses and represents no voters represented by the winning party} \\ p^*(\mathbf{p}) - \delta - \bar{\delta} & \text{if } P_m \text{ loses but represents some voters represented by the winning party} \\ p^*(\mathbf{p}) + e_m - \delta - \bar{\delta} & \text{if } P_m \text{ wins (i.e., offered } p^*) \end{cases}$$

$$(2)$$

A Nash equilibrium exists in party strategies if (1) each party entrepreneur updates her platform optimally given the initial party platforms and equilibrium voting behavior of voters, and (2) each party entrepreneur chooses an initial platform optimally given that all parties update optimally. Consider the updating stage. For some party, P_m, let $\bar{p}_m(\mathbf{p}')$ be an updated platform given the initial set of party platforms, $\mathbf{p}'$, and let $\bar{\mathbf{p}}_{\neg \mathbf{m}}(\mathbf{p}')$ be the updated platforms of parties other than P_m. Together, $\bar{p}_m(\mathbf{p}')$ and $\bar{\mathbf{p}}_{\neg \mathbf{m}}(\mathbf{p}')$ define a party system, $(\bar{p}_m(\mathbf{p}'), \bar{\mathbf{p}}_{\neg \mathbf{m}}(\mathbf{p}')$. Voters will choose optimally given this party system, producing the outcome $p^*(\bar{p}_m(\mathbf{p}'), \bar{\mathbf{p}}_{\neg \mathbf{m}}(\mathbf{p}')$, and yielding for P_m's entrepreneur the utility defined in equality Eq. 2, which we can label $u_m(p^*(\bar{p}_m(\mathbf{p}'), \bar{\mathbf{p}}_{\neg \mathbf{m}}(\mathbf{p}'))$. For P_m, the updated platform $\bar{p}_m(\mathbf{p}')$ is optimal if:

$$u_m(p^*(\bar{p}_m(\mathbf{p}'), \bar{\mathbf{p}}_{\neg \mathbf{m}}(\mathbf{p}'))) \geq u_m(p^*(\tilde{p}_m(\mathbf{p}'), \bar{\mathbf{p}}_{\neg \mathbf{m}}(\mathbf{p}'))) \text{ for all } \tilde{p}_m \neq \bar{p}_m. \tag{3}$$

A Nash equilibrium exists in the platform updating stage if eq. 3 is satisfied for all parties and define $\mathbf{p}^*(\mathbf{p}')$ as the equilibrium vector of updated party strategies given the initial party system defined by

$\mathbf{p}'$. One problem that could arise for parties who generate expectations about outcomes based on voting equilibria is that there could in principle exist multiple Nash equilibria in the voting stage. One could make further assumptions about equilibrium selection in such cases, but as will become clear below, this is not a problem in practice because the possibility of multiple Nash equilibria in voting never arises.

Next consider initial platforms. Let $\bar{\mathbf{p}}'_{\neg \mathbf{m}}$ define a vector of initial platforms for all parties other than P_m. If P_m adopts $\bar{p}'_m$, then the resulting set of initial platforms will be $(\bar{p}'_m, \bar{\mathbf{p}}'_{\neg \mathbf{m}})$, which will trigger the equilibrium updated platforms defined by $\mathbf{p}^*(\bar{p}'_m, \bar{\mathbf{p}}'_{\neg \mathbf{m}})$, and thus the outcome, $p^*(\mathbf{p}^*(\bar{p}'_m, \bar{\mathbf{p}}'_{\neg \mathbf{m}}))$. For P_m, the initial platform, $\bar{p}'_m$, is optimal if

$$u_m(p^*(\mathbf{p}^*(\bar{p}'_m, \bar{\mathbf{p}}'_{\neg \mathbf{m}}))) \geq u_m(p^*(\mathbf{p}^*(\tilde{p}'_m, \bar{\mathbf{p}}'_{\neg \mathbf{m}}))) \text{ for all } \tilde{p}'_m \neq \bar{p}'_m. \tag{4}$$

A Nash equilibrium exists in the initial platform stage if eq. 4 is satisfied for all parties. That is, each party chooses optimally, understanding that all parties update optimally and voters choose optimally given the resulting party system.

4.3 Analysis of the plurality rule case.

I begin the analysis by describing why there can only be two-party equilibria in the plurality rule case.

Lemma 1 *In any plurality rule equilibrium, there will be two (and only two) parties that form.*

Proof. *There can exist no one-party equilibria.* Suppose $p'_m > 0$ only for one party, P_m. If $p' = 0$ for all other parties, then the only equilibrium adjustment strategy for P_m is to offer the smallest possible platform, say $p_m = \epsilon$. But if p_m approaches zero, it cannot have been an equilibrium for no other party to have entered. In particular, there is at least one potential party that represents a subgroup represented by P_m. Call this party $P_{m'}$ and suppose that this party can never win (because for any $p_{m'}$, P_m can propose something that is preferred by a majority). The payoff to $P_{m'}$'s entrepreneur of not entering is ϵ (because the entrepreneur is represented by P_m). But for any $p'_{m'} > 0$, P_m must adopt $p_m \geq p'_{m'}$, yielding a payoff of $p'_{m'} - \delta$. Given δ is arbitrarily small, the entrepreneur for $P_{m'}$ prefers entering because it increases the policy payoff she receives, Thus,

there can be no one-party equilibrium.

There cannot be more than two parties in any equilibrium. There cannot be an equilibrium where there exists a party that does not represent any voters who are also represented by the winning party. The entrepreneur for such a party has a negative utility if she forms: she receives 0 in policy utility, does not win so reaps no residual from winning, and pays her cost of forming. Thus, she must not form in equilibrium. This implies that there cannot be an equilibrium with four parties because one party would necessarily represent voters who are not represented by the winning party. In addition, a three-party equilibrium could only exist if the winning party represented voters who are also represented by the other two parties.

Suppose there are three parties. P_x represents subgroups 1 and 2, P_y represents subgroups 3 and 4, and P_z represent subgroups 1 and 3. This could not be an equilibrium in party formation if P_x wins (because then P_y would represent no voters who are represented by the winning party) and it could not be an equilibrium in party formation if P_y wins (because then P_x would represent no voters who are also represented by the winning party). Thus, in order for this to be an equilibrium in three parties, it must be the case that P_z wins (since P_z represents voters who are also represented by P_x and P_y).

P_z could emerge the winner in equilibrium in three different ways. One possibility is that $n_1 > n_3 + n_4$ so that group 1 is pivotal. In any voting equilibrium, group 1 will support P_x if it offers a higher expected utility than P_z and will support P_z otherwise. Since the equilibrium outcome is determined by whether p_x is larger than p_z, the expected benefit to the entrepreneur of any $p_y > 0$ is $-\delta$. That is, the policy outcome and the winner will be unaffected by p_y, and thus the entrepreneur will pay a cost of forming without affecting her policy utility or her chance of winning. P_y therefore cannot form in an equilibrium in the case. Similarly, if group 3 is pivotal (e.g., because $n_3 > n_1 + n_2$), it can never be an equilibrium for P_x to form.

Thus, it remains to show that there cannot be an equilibrium with three parties where both group 1 and group 3 support P_z and the votes of both groups are pivotal (so that P_x wins if group 1 supports P_x and P_y wins if group 3 supports P_y). In this case, Since P_z wins, it must be true that $p_z \geq p_x$ and that $p_z \geq p_y$. Note there cannot be an equilibrium where $p_x \neq p_y$: if this were true, the net benefit to the party making the lower offer would be $-\delta - \bar{\delta}$ (because p_z must respond to the higher proposal, making the lower proposal irrelevant to the outcome). Similarly, if $p_x = p_y$, one

of the entrepreneurs could achieve the same outcome by not paying the cost of forming a party. Thus, it cannot be an equilibrium for both P_x and P_y to form in this case, and there can never be a three-party equilibrium. ∎

The logic ensuring that there are two parties in equilibrium is straightforward. There obviously cannot be a one-party equilibrium in pure strategies: if only one party forms, it will win with any platform, and thus the optimal platform must approach 0 (because this maximizes the entrepreneur's utility given she keep the residual, e_m). But of course it cannot be an equilibrium for one party to enter and offer near 0 (because then some other party entrepreneur does better by entering and proposing a platform that wins). There also cannot be a three-party equilibrium. In any equilibrium, an entrepreneur will pay the cost of entering only if she either wins or influences the winning party's platform to her benefit. The winning party must offer a platform at least as large as that of the second largest platform. If there are three parties, then if one offers a smaller platform than the other, she reaps no benefit from forming (because the winning party is not influenced by her platform). Thus, there could only be three parties if the two losing parties offered the same platform. But this could not be an equilibrium because one of these parties would have obtained the same outcome without paying the cost of formation. Thus, if there exists a pure strategy equilibrium, it must have two parties that form.

Since there are only two parties in any equilibrium, there must be one party that has a clear advantage because it represents a smaller majority. This fact makes it possible to clearly define the optimal party platforms in any equilibrium.

Lemma 2 *Consider a two-party system where P_m and $P_{m'}$ both form and $n_m < n_{m'}$. If there exists an equilibrium, then it must be true*

(i) There exists one subgroup that is represented by both parties; and

(ii) $p'_m = p'_{m'} = p_m = p_{m'} = \frac{\pi}{n_{m'}}$ and P_m wins.

Proof.

(i) If this were not true, then there would be one party representing the majority of one identity (either group or class) and another party representing the minority for this same identity. The party representing the majority party would win for any platforms by the two parties, and thus the net

benefit of the entrepreneur for the minority party would be $-\delta - \bar{\delta} < 0$, implying it could not have been an equilibrium for this party to form.

(ii) In any equilibrium, it must be true that $p_m = p_{m'}$. The winning entrepreneur obviously maximizes her utility by offering the smallest winning proposal. Given $n_m < n_{m'}$, for any $p_m \geq p_{m'}$, P_m will win and yield a positive residual for P_m's entrepreneur. Thus there cannot be an equilibrium where $p_m > p_{m'}$ (because the entrepreneur for P_m would do better by adopting $p_{m'}$) and there cannot be an equilibrium where $p_m < p_{m'}$ (because P_m would lose).

In equilibrium, it also must be true that $p_m = \frac{\pi}{n_{m'}}$. Suppose not, so that $p_m < \frac{\pi}{n_{m'}}$. We know that this could only be an equilibrium if $p_m = p_{m'}$ and thus if $P_{m'}$ loses. But it obviously cannot be an equilibrium for $P_{m'}$ to adopt this $p_{m'}$ and lose when it could instead have offered $p_{m'} \in (p_m, \frac{\pi}{n_{m'}})$, won and obtained a positive residual. Thus, in any two-party equilibrium, $p_m = p_{m'} = \frac{\pi}{n_{m'}}$.

Finally, it must be true that in any equilibrium, $p'_m = p'_{m'} = p_m = p_{m'} = \frac{\pi}{n_{m'}}$. Since we know that in any equilibrium, $p_m = p_{m'} = \frac{\pi}{n_{m'}}$, if either party adopts an initial platform lower than $\frac{\pi}{n_{m'}}$, it could only be an equilibrium if they then payed $\bar{\delta}$ to adjust to $p_m = p_{m'} = \frac{\pi}{n_{m'}}$. But both parties do better adopting an initial platform of $\frac{\pi}{n_{m'}}$ than by adopting some other platform, and then paying $\bar{\delta}$ to adjust to $\frac{\pi}{n_{m'}}$. ∎

Although one of the two parties is sure to lose, in any equilibrium, the entrepreneur for the losing party will pay the cost to enter. Two assumptions are central to this logic. First, the losing party's entrepreneur cares directly about the winning party's platform because the entrepreneur always represents individuals represented by the winning party. In fact, the only benefit for the losing party's entrepreneur from entering is that so doing affects the platform of the winner, which is why this party's entrepreneur proposes to distribute the entire platform to voters. If party entrepreneurs cared only about rents from winning, the entrepreneur for the losing party would never have an incentive to form. Second, the possibility of adjustment allows the losing party to form and force as large a possible platform by the winning party. With no stage where platform adjustment occurs, there could be no pure strategy equilibrium in party formation. There obviously can be no pure strategy equilibrium where the winning platform is less than the maximum proposal by the party representing the larger group (because either party could have done better by offering a larger

platform). It also cannot be an equilibrium when there is not adjustment possible for both parties to offer this maximum platform: if the party representing the smaller majority group offers this platform, it will win, and when it offers this platform, the party representing the larger group has no incentive to form (because its formation does not affect the policy but has a cost). But it also cannot be an equilibrium for only the party representing the smaller majority group to form and offer this maximum platform (because if no other party enters, the optimal platform must approach zero in order to maximize the entrepreneur's rents). With the possibility of adjustment, the party representing the smaller group can influence the platform of the winning party in equilibrium. By entering and offering the initial "maximum" platform, it forces the winning party to also propose the maximum platform, providing a policy benefit to the losing party's entrepreneur. And it can do this in the initial stage to avoid any unnecessary adjustment costs. This strategy is optimal for the losing party's entrepreneur because if it does not enter, then for any initial proposal by the winning party, the winning party will adjust its platform to near zero. Thus, in any two party equilibrium, the losing party will represent some members of the winning party's constituency, creating a policy incentive to propose the "maximum" platform, and to do this in the initial round so no adjustment is necessary.

Which two parties can form? Lemma 3 describes why the party of the rich and the party of the minority ethnic group can never form in a two-party equilibrium.

Lemma 3 *In any equilibrium, $p'_R = p'_B = 0$.*

Proof. Consider P_R. There are three possible two-party equilibria to consider.

(1) P_R and P_P. This obviously cannot be an equilibrium because P_P would win with certainty, yielding a negative net benefit from forming P_R.

(2) P_R and P_A: By lemma 2, in any equilibrium the two parties must offer the same platform, which implies that P_R will win (given $n_R < n_A$) and that $n_{AP} < n_R$ (otherwise n_R could never win), which means that the entrepreneur for P_P will receive 0. Consider the payoff to the entrepreneur from forming P_P. In any voting equilibrium, $v_{BR} = P_R$ and $v_{BP} = P_P$. If $v_{AP} = P_A$ then it must be true that $v_{AR} = P_R$, which could not be an equilibrium (because the poor in A would then prefer to support P_P). Thus, if P_P enters, in any equilibrium in voting strategies, $v_{AP} = v_{BP} = P_P$ and P_P wins. Thus, it cannot be an equilibrium for $p_P = 0$ if only P_A and P_R have formed.

(3) P_R and P_B: Consider the case where the equilibrium voting outcome from this party system makes P_R the winner, which implies that the rich in B prefer P_R to P_B and $n_R > n_{BP}$. If P_P forms, then in any voting equilibria, the rich in A support P_R and the poor in A support P_P. If n_{AP} is sufficiently large that the poor in A determine the voting outcome, then P_P obviously has an incentive to form. Consider the case, then, where $n_{AP} < min(n_R, n_B)$. Since it must be true that $v_{AP} = P_P$ and $v_{AR} = P_R$, there are 4 possible voting equilibria to consider:

- $v_{BP} = v_{BR} = P_B$. This is not a NE because the rich in B are prefer P_R given $v_{AP} = P_P$ and $v_{BP} = P_B$.

- $v_{BP} = P_B$ and $v_{BR} = P_R$: This is not a NE because the outcome is P_R, which means the poor in B must prefer $v_{BP} = P_P$.

- $v_{BP} = P_P$ and $v_{BR} = P_B$: This cannot be an equilibrium because the poor in B would prefer voting for P_B given that $v_{BR} = P_B$.

- $v_{BP} = P_P$ and $v_{BR} = P_R$. It is straightforward to verify that this satisfies eq 1 for all subgroups, and thus this would be the unique equilibrium if P_P formed.

Since P_P would always win by entering, it cannot be an equilibrium for $p_p = 0$ when only P_R and P_B have formed and P_R is expected to win. The logic is the same for why P_A must enter when only P_R and P_B have formed and P_B is expected to win.

The proof for why P_B cannot form is analogous and is omitted. ∎

In any equilibrium, then, only the parties representing the majority of their identity can form. It cannot be an equilibrium for the majority and minority party for the same identity to form (because the party representing the minority will always lose and cannot influence the platform of the winning party). It also cannot be an equilibrium for a party representing a minority of one identity to form with the party representing the majority of the other identity (because it could always defeat this party, creating an incentive for the party representing the majority of its identity to form). And it cannot be an equilibrium for the two parties representing the minority of their identity to form (again because there will always be a party representing a majority of one of these identities that could have formed and won, making it non-optimal for it not to have formed).

Thus, the only equilibria that can exist are those where the only two parties that form are those representing the majority of their identities.

Proposition 1 shows that there always exists a unique pure strategy equilibrium where both of these parties form and offer the same platform, with the winning party being the one representing a smaller majority.

Proposition 1 *Under plurality rule with windfall revenues, there is a always a unique Nash equilibrium in pure strategies where*

- $p'_A = p_A = p'_P = p_P = \frac{\pi}{n_P}$ *if* $n_A < n_P$

- $p'_A = p_A = p'_P = p_P = \frac{\pi}{n_A}$ *if* $n_A > n_P$

- $p_R = p_B = 0$

The equilibrium voting strategies given $\mathbf{p}$ *are*

- $v_{AR}(\mathbf{p}) = P_A$

- $v_{BR}(\mathbf{p}) = \emptyset$

- $v_{BP}(\mathbf{p}) = P_P$

- $v_{AP} = P_A$ *if* $n_A < n_P$ *and* P_P *if* $n_A > n_P$

Proof. By lemma 1, in any equilibrium, there must be two parties, and by lemma 3, these parties cannot include P_R or P_B. By lemma 2, if there is an equilibrium with P_P and P_A, then $p'_A = p_A = p'_P = p_P = \frac{\pi}{n_P}$ if $n_A < n_P$, and $p'_A = p_A = p'_P = p_P = \frac{\pi}{n_A}$ if $n_P < n_A$. Thus, if an equilibrium exists it must be unique and be the one described in the statement. It only remains to show that these party formation and voting strategies represent a Nash equilibrium.

It is straightforward to confirm that the voting strategies satisfy eq. 1: the poor in A are the only subgroup represented by more than one party, and they support the party representing the smaller electoral majority (and hence the party that yields the largest residual for the entrepreneur).

Consider the party strategies, beginning with the case where $n_A < n_P$.

(1) $p'_R = 0$ is optimal. Suppose not, so that $\mathbf{p}' = (p'_P = \frac{\pi}{n_P}, p'_A = \frac{\pi}{n_P}, p'_B = 0, p'_R > 0)$. Since P_B has not formed it must be true that $v_{BP}(\mathbf{p}') = P_P$ and $v_{BR}(\mathbf{p}') = P_R$. There are two

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cases to consider. In the first, the rich in A are not pivotal (because $n_{AP} > n_R$). In this case, the outcome will obviously be P_A and the net benefit of forming P_R is $-\delta$, so P_R cannot form. In the second case, the rich in A are pivotal (because $n_{AP} < n_R$) and P_R can only reap a positive benefit of entering if $v_{AR}(\mathbf{p}') = P_R$. But if this were true, then it is not a Nash equilibrium for the poor in A to support P_A: if they support P_A, P_R wins and if they support P_P, it wins. Thus, in this case the outcome will be P_P and the net benefit of forming P_R is again $-\delta$.

(2) $p'_B = 0$ is optimal. Obviously, the entry of P_B cannot affect the voting strategies of voters in A, and thus for any $p'_B > 0$, P_A will win. Thus, the net benefit of forming P_B is negative.

(3) $p'_P = p_P = \frac{\pi}{n_P}$ is optimal. Given the specified voting and proposal strategies, the entrepreneur for P_P receives $\frac{\pi}{n_P} - \delta$. P_P obviously cannot do better by forming a party and adopting a strategy that allows P_A to adopt $p_A < \frac{\pi}{n_P}$. It therefore remains to show that the entrepreneur does not prefer $p'_P = 0$. In this case, for any p'_A, P_A's optimal adjustment strategy is $p_A = \epsilon$, yielding ϵ for the entrepreneur for P_P, a worse outcome than that from the equilibrium strategy given δ is arbitrarily small.

(4) $p'_A = p_A = \frac{\pi}{n_P}$ is optimal. Given $p'_A = \frac{\pi}{n_P}$, the entrepreneur for P_A prefers p'_A to $\bar{p}'_A < p'_A$. Similarly, since any $p'_A \geq p'_P$ will win, the entrepreneur prefers p'_A to anything larger (because this maximizes the residual). For the same reasons, P_A will not adjust if recognized to do so. Thus, $p'_A = p_A = \frac{\pi}{n_P}$ is optimal.

The logic when $n_P > n_A$ is identical and is omitted. ∎

Since P_A and P_P must form in any two-party equilibrium, the poor in A are pivotal. The poor in A will support the party that represents the smallest of the two possible majority groups. This means that the party representing the smaller majority has a clear advantage. The most that the party representing the larger majority can offer is to divide π equally among all members of this group, which would yield no residual for the party entrepreneur. But an entrepreneur for a party representing the smaller majority group can always promise more because the party has fewer constituents who need to be paid if the party wins. Thus, if $n_A < n_P$, an entrepreneur for P_A can offer more than the best platform that the entrepreneur for P_P could offer. By contrast, if $n_P < n_A$, an entrepreneur for P_P can offer more than the best platform that the entrepreneur for

P_A could offer. In either case, the winning party's entrepreneur reaps positive rents that increase as the size of the losing party's group grows larger. The losing party nevertheless has an incentive to form because so doing forces the winning party to offer a larger platform than would be necessary if the losing party did not form.

Equilibrium outcomes are therefore a function of n_P (a measure of inequality) and n_A (a measure of ethnic homogeneity). As inequality becomes large (n_P increases), the value to the poor of class politics decreases because there are so many poor who must share the spoils of government. As a consequence, when there are a lot of poor individuals, party entrepreneurs representing ethnic groups can build successful electoral coalitions that include some poor and exclude others. Similarly, as a society becomes more homogenous, it is very difficult to build an attractive coalition around ethnicity, making class politics more salient. The level of inequality that triggers ethnic politics is not, however, independent of the level of ethnic diversity. In a relatively heterogeneous society where there can be a small ethnic majority, ethnic politics may prevail for almost any level of inequality, making inequality essentially irrelevant. But as the society becomes less diverse, the level of inequality becomes more important, with class politics most likely to be triggered when the number of poor is small, and thus when inequality is relatively low. The model, then, suggests not only an interaction between ethnic diversity and inequality in triggering ethnic politics, it also suggests that given a permissive level of ethnic politics, class politics will be most likely when inequality is *lowest*. Since ethnic groups are economically diverse, when ethnic politics prevails, the voters who support the winning ethnic party and who therefore receive government benefits include rich and poor individuals. In addition, some of the poor – those in the losing ethnic group – are excluded. Thus, the extent tow which democracy reduces inequality should be affected by the same factors that affect the emergence of ethnic vs class identity, and thus by the interaction of inequality and ethnic diversity.

5   Proportional representation with windfall revenues.

Under proportional representation (PR), the number of seats won by a party is proportional to the number of voters who support it. Elections might therefore produce no majority winner, resulting in coalition bargaining. This section explores the implications of PR for the emergence of ethnic-

versus class-based electoral politics.

Interactions begin with party formation following the same structure as under plurality rule. Voters vote strategically so as to achieve the highest possible payoff given the voting strategies of others and the dynamics of coalition formation. As under plurality rule, indifferent voters select the party that produces the largest total residual.

If a party wins a majority, it implements its platform and the party leader keeps the residual. If no party wins a majority, then party platforms during the electoral stage become irrelevant and a coalition bargaining process begins. Each leader of a party that receives votes can make a coalition proposal, $c_{mm'} = x$, which states that P_m and proposes a coalition with $P_{m'}$ to give x to each person represented by P_m and $P_{m'}$. Such proposals can win only if P_m and $P_{m'}$ represent a majority in the legislature, and if $c_{mm'} = c_{m'm}$ (that is, the two parties agree on the proposal). If P_R and P_B receive support from a majority, for example, and $c_{BR} = c_{RB} = x$, then P_B and P_R form a majority coalition and all individuals who are rich or in group B receive x. Under coalitions, party leaders share equally the residual that is not distributed to voters. Thus, leaders from different parties in the same coalition have identical interests – they want to offer the smallest amount possible to their voters so as to maximize their rents.

Without additional constraints, when no majority exists, party leaders in a coalition have opportunities to bargain in bad faith vis-à-vis their constituents. At the extreme, party leaders can keep π entirely for themselves. Such behavior would of course only work in the short-term, as voters would punish party leaders who did not bargain faithfully on behalf of the groups they represent. It is therefore important to impose an additional constraint on party behavior, and I adopt the following "good faith" assumption: a party leader pays a large cost $\phi > 0$ if she accepts a coalition proposal that gives her party's constituents a lower payoff than these constituents would have received had they voted for any other party that has formed. Suppose, for example, that P_A forms and receives the support of the poor in A. If the rich in A support P_R in anticipation of a coalition with P_B, c_{BR} cannot give constituents less than the rich in A would have received from supporting P_A (the payoff of which is conditional on the voting strategies of other subgroups).

In equilibrium, party formation strategies must be optimal at the initial and updated stage, just as in the plurality case. Voters vote optimally given the party platforms and expectations about coalition formation where no party wins a majority. And party entrepreneurs maximize their utility

in the coalition bargaining stage by agreeing to coalition bargains that provide the highest possible utility, subject to the "good faith" constraint. Although there are up to four parties and a wide variety of coalitions, it is straightforward to show that there are only three possible equilibrium governance outcomes.

Lemma 4 *Under proportional representation, there exist only three possible equilibrium outcomes:*

1. *P_A wins a majority; or*

2. *P_P wins a majority; or*

3. *No party wins a majority and P_R and P_B form a majority coalition.*

Proof. By the same logic in the proof of Lemma 3, it can never be an equilibrium for P_R or P_B to win a majority. It therefore remains to show that the only possible equilibrium majority coalition includes only P_R and P_B. Any other coalition must include either P_A or P_P. No equilibrium can result in a coalition of P_A with another party, P_k. Such a coalition could at most provide $\frac{\pi}{n_A + n_k}$ to individuals represented by P_A and P_k, which would yield no residual for the party entrepreneurs. But the entrepreneur for P_A could always offer a platform that all members of A prefer to this best possible outcome under the coalition, and that yields a positive residual for the entrepreneur. Thus it can never be an equilibrium for a party entrepreneur to adopt any p_A that leads the groups in A to split their vote in a way that results in a coalition of P_A with P_k. The logic for why there cannot be an equilibrium between P_P and another party is identical: the entrepreneur for P_P always prefers to offer a platform that wins a majority to offering a platform that results in a coalition. ∎

Lemma 4 makes it relatively straightforward to characterize equilibria under PR. Recall $\mathbf{p}^* = (p_A, \ p_B, \ p_P, p_R)$ is the vector of equilibrium party platforms, and let $\mathbf{v}^*(\mathbf{p}^*) = (v_{AP}, \ v_{AR}, \ v_{BP}, \ v_{BR})$ be the equilibrium vector of voting strategies, and let $c^*_{mm'}$ be the equilibrium coalition agreement when no party wins a majority.

Proposition 2 *Under proportional representation,*

(1) If $n_A < n_P$ and $n_{AP} < n_B$ then P_A wins and

$$\mathbf{p}^* = (\tfrac{\pi}{n_P}, \ \tfrac{\pi}{n_P}, \ 0, \ 0)$$
$$\mathbf{v}^* = (P_A, \ P_A, \ P_P, \emptyset)$$

(2) If $n_A < n_P$ and $n_{AP} > n_B$ then P_B and P_R form a majority coalition and

$$\mathbf{p}^* = (\tfrac{\pi}{n_A}, 0, p_B > 0, p_R > 0)$$

$$\mathbf{v}^* = (P_A,\ P_R,\ P_B, P_R \text{ or } P_B)$$
$$c^*_{BR} = c^*_{RB} = \frac{\pi}{n_A}$$

(3) If $n_A > n_P$ and $n_{AP} < n_R$, then P_P wins and

$$\mathbf{p}^* = (\tfrac{\pi}{n_A},\ \tfrac{\pi}{n_A},\ 0,\ 0)$$
$$\mathbf{v}^* = (P_P,\ P_A,\ P_P, \emptyset)$$

(4) If $n_A > n_P$ and $n_{AP} > n_R$ then P_B and P_R form a majority coalition and

$$\mathbf{p}^* = (0,\ \tfrac{\pi}{n_P}, p_B > 0, p_R > 0)$$
$$\mathbf{v}^* = (P_P,\ P_R,\ P_B, P_R \text{ or } P_B)$$
$$c^*_{BR} = c^*_{RB} = \frac{\pi}{n_P}$$

Proof. As in the plurality case, there can be no equilibrium where a party updates its platform after the initial stage (because then its initial proposal could not have been optimal). The proof will therefore focus only on the final policy platforms and resulting voting and coalition strategies.

(1) $n_A < n_P$ and $n_{AP} < n_B$: Following the same logic found under plurality rule, the specific platforms of P_P and P_A are optimal given that P_B and P_R do not form, and the voting strategies are optimal given the party system. It therefore remains to show that P_B and P_R cannot enter. Since $n_{AP} < n_B$ implies $n_A < n_R + n_{BP}$, there cannot exist an equilibrium where a coalition of P_R and P_B is the winner (because the entrepreneur for P_A can always ensure that the rich in A prefer P_A to this coalition). And since $n_A < n_P$, an entrepreneur for P_A can always ensure that the poor in A prefer P_A to P_P (and the entrepreneur has an incentive to do so in order to obtain the residual). Thus, there cannot exist an equilibrium where any members of B receive a payoff from the winning party, and P_B therefore cannot form (because the expected payoff of doing so is negative). Given P_B will never form, P_R can never be a credible coalition partner (because the rich in A will never prefer a coalition between P_A and P_R to a majority victory by P_A), and thus the optimal platform for P_A is independent of p_R, making the expected payoff of forming P_R negative.

(2) $n_A < n_P$ and $n_{AP} > n_B$: Given the party system, the voting strategies are optimal. Since $p_P = 0$, in any voting equilibrium, $v_{AP} = P_A$ and $v_{BP} = P_B$. Given $p_A = c_{BR}$, the rich in A vote for the party that yields the largest total residual, which is P_R given $n_{AP} > n_B$. The rich in B can support either P_R or P_B with no effect on the outcome. Thus, it remains to show that party formation strategies are optimal.

By lemma 4, there cannot be an equilibrium where only P_R and P_B form (because if this occurred, one of these parties would win a majority). There also cannot be an equilibrium where

P_R and P_B do not form because by forming they win with certainty (because $n_{AP} > n_B$ ensures that no party can offer a platform that defeats the coalition) and reap a positive residual for their entrepreneurs. Thus, in any equilibrium P_R and P_B and at least one other party must form.

For $P_R + P_B$ coalition to prevail and satisfy the "good faith" assumption, it must be true $c_{BR} \geq p_A$ (because given $v_{AP} = P_A$, P_A will win if the rich in A change their vote to support P_A). Thus, the optimal platform for P_A is $\frac{\pi}{n_A}$ (because this maximizes the policy payoff for the rich in A). Since P_A adopts $p_A = \frac{\pi}{n_A}$, the optimal coalition agreement is also $\frac{\pi}{n_A}$ (because this maximizes the rents).

(3) $n_A > n_P$ and $n_{AP} < n_B$: The structure of the proof is identical to that of (1) and is omitted.

(4) $n_A > n_P$ and $n_{AP} > n_B$: The structure of the proof is identical to that of (2) and is omitted. ∎

Proposition 2 suggests that like under plurality rule, inequality and ethnic diversity interact to influence identity choice under PR. Class politics under PR can emerge when inequality is sufficiently low (where "low" is determined by the level of ethnic diversity), and ethnic politics can emerge when ethnic diversity is sufficiently high (where "high" is determined by the level of inequality). But PR also makes it possible for party entrepreneurs to break up both group and class politics by dividing the majority ethnic group or the poor against themselves.

Suppose class politics prevails under plurality rule ($n_A > n_P$). With PR electoral rules, the poor in A are no longer pivotal: since they can only support parties that represent a majority of the population, they can never be represented by a party that is a feasible coalition partner. Instead, the poor in B are pivotal. The poor in group B could be part of a pure class coalition with the poor in A (supporting P_P) or they could support P_B which could form a majority coalition with P^R. When the number of poor in A is greater than the number of rich, the door opens for the coalition. Party entrepreneurs for P_B and P_R can ensure that the poor in B obtain more from a coalition with the rich than from supporting P_P. Proportional representation, then, makes it possible for party leaders to form smaller winning coalitions than would be possible in a class-politics equilibrium under plurality rule, thereby dividing the poor (the poor in A support a different party than the

poor in B) and dividing the majority group (the rich in A support a different party than the poor in A). By the same logic, PR can alter undermine the group politics equilibrium when $n_A < n_P$, with the rich in A preferring the coalition between P_R and P_B to a P_A victory if n_{AP} is sufficiently large.

It is important to recognize that this difference between PR and plurality rule is driven by the assumption in the model that under plurality rule, parties cannot credibly commit to supporting both ethnic and class groups. If hybrid parties – that is, parties that represent both a class and a group – can form under plurality rule, there would be no difference in the model between outcomes under plurality rule and outcomes under PR. In particular, with plurality rule, a hybrid party representing the rich and group B could win under the same conditions that the P_R and P_B coalition wins under PR because this hybrid party would represent the smallest possible majority coalition. It may well be reasonable to assume that it is more difficult for the same party to credibly commit to both an ethnic group and a class than it is for such coalitions to emerge after coalition bargaining. The poor in B, for example, might reasonably worry that if they support a P_{BR} party under plurality rule and it wins, then the rich within this party might adopt policies that are disadvantageous to the poor. Such a poor voter might reasonably expect that if it supports P_B to bargain on its behalf in the coalition politics of PR, there will be less risk. The model obviously cannot resolve this issue, but the results and this discussion emphasize the fact that the effects of electoral laws on identity choice and party systems might be driven principally by the ability of parties to credibly commit to multi-identity governing coalitions before elections (as they must under plurality rule) as opposed to after elections (as they can under PR). The greater the problems of *ex ante* commitment, the greater should be the differences between PR and plurality rule.

6 Government revenues from taxes on the rich.

In some democratic contexts, substantial government revenues come from taxes, and these taxes affect government revenues directly (because they determine the proportion of income that goes to the government) and indirectly (because tax revenues are a function of labor, which responds to tax rates). This section assumes that government revenues do not come from exogenous windfalls, but rather come from taxes on the rich, and that these taxes also affect the incentives of the rich to engage in revenue-generating labor. This makes it possible to explore the impact of taxes on the

incidence of ethinc versus class politics. I focus on the case of plurality rule, where the poor in A are pivotal in determining whether P_A or P_P prevails in equilibrium (although the logic developed here would apply under PR as well).

Assume that only the rich pay taxes, and that the rich receive utility from consumption, C and leisure, $\mathcal{L}$. They can supply labor, L, at a fixed wage, w (which is set equal to 1), and they have a fixed stock of capital, K. There is a proportional tax rate, t, on labor income. If P_P wins, the rich receive nothing from the government; they only pay taxes. I will not make an assumption about how revenues are shared among the rich and poor if P_A wins, but rather assume the (tax free) transfer to the rich in group A will be λ_{AR}. The budget constraint on consumption is $C = (1-t)L + K + \lambda_{AR}$, where $\lambda_{AR} = 0$ if P_P wins. The rich in B always receive 0 under group or class politics, so $\lambda_{AR} = 0$ for the rich in B . The time constraint is $T = \mathcal{L} + L = 1$. Let α be the weight that the rich give to consumption, and for simplicity assume that α is the same for the rich in both groups. Then the preferences over consumption and leisure are given by $U(C, \mathcal{L}) = \alpha \, ln \, C + (1-\alpha) \, ln \, \mathcal{L}$, which (substituting the budget and time constraints) can be written as $U(C, \mathcal{L}) = \alpha \, ln \, ((1-t)L + K + \lambda_{AR}) + (1-\alpha) \, ln \, (1-L)$.

Let $L_C^*(t)$ be the equilibrium labor output as a function of t if class politics prevails because P_P wins, and let $L_G^*(t)$ be the equilibrium labor output if ethnic politics prevails because P_A wins. I focus on parameter values that produce an interior solution. A central implication of having group politics prevail in any equilibrium is that the government transfer to the rich in A reduces the marginal value of labor for this group, and thus results in less labor by the rich when group politics prevails than when class politics prevails.

Lemma 5 $L_C^*(t) > L_G^*(t) \ \forall t.$

Proof. Note that $U(C, \mathcal{L})$ is concave in t for both group and class based politics. Solving the first-order conditions when $\lambda_{AR} = 0$ yields $L_C^*(t) = \frac{K(1-\alpha)+\alpha(t-1)}{t-1}$, which is decreasing in t. And for group politics (when $\lambda_{AR} > 0$), $L_G^*(t) = \frac{(K+\lambda_{AR})(1-\alpha)+\alpha(t-1)}{t-1}$, which is also decreasing in t. $L_C^*(t) > L_G^*(t)$ whenever $\lambda_{AR} > 0$, which is always true by the definition of group politics. ∎

There is an economic cost of ethnic politics. Taxpayers in the model have a diminishing marginal utility of consumption, and thus they will work less if they are given a transfer that re-

quires no work. Under ethnic politics, the rich in A receive transfers, which reduces their incentive to provide revenue-generating labor. Since the rich in A work less when P_A wins than when P_P wins, total economic output from labor will be less when ethnic politics prevails than when class politics prevails. This also means that total government revenues from taxes will be less when P_A wins.

Let t_C^* be the equilibrium tax rate under class politics (i.e., the tax rate set by P_P if it wins) and let $\pi_C^*(t_C^*)$ be total government revenues when the rich are making optimal labor decisions in response to t_C^*. Similarly define t_G^* as the equilibrium tax rate under group politics and $\pi_G^*(t_G^*)$ as the resulting government revenues. Even though the entrepreneurs for P_A and P_P have the same incentives – to set t^* to maximize revenues so as to maximize rents – Lemma 6 shows that total government revenues are always greater in an equilibrium when P_P wins than when P_A wins.

Lemma 6 $\pi_C^*(t_C^*) > \pi_G^*(t_G^*)$.

Proof. If class politics prevails, the rich in both groups respond identically (because no rich receive transfers) and thus total government revenue is given by

$$
\begin{aligned}
\pi_C^*(t_C^*) &= t_C^* * L_C^*(t_C^*) * n_R \\
&= [t_C^* * L_C^*(t_C^*) * n_{AR}] + [t_C^* * L_C^*(t_C^*) * n_{BR}].
\end{aligned}
$$

Under ethnic politics, the rich in A respond differently to t_G^* than do the rich in B. The rich in B receive no transfers, and thus their optimal labor output is given by $L_C^*(t_G^*)$. The rich in A do receive transfers, and thus their optimal labor output is given by $L_G^*(t_G^*)$. Total revenues are therefore

$$
\pi_G^*(t_G^*) = [t_G^* * L_G^*(t_G^*) * n_{AR}] + [t_G^* * L_C^*(t_G^*) * n_{BR}].
$$

There are two cases. In the first, $t_G^* = t_C^*$. This implies that the revenues received from labor output by the rich in B will be the same under ethnic and class politics, and thus $\pi_C^*(t_C^*) > \pi_G^*(t_G^* = t_C^*)$ if the rich in A produce more revenues under class politics than under ethnic politics, which is true if $t_C^* * L_C^*(t_C^*) > t_C^* * L_G^*(t_G^* = t_C^*)*$, or if $L_C^*(t_C^*) > L_G^*(t_C^*)$, which is true by Lemma 5.

In the second case, $t_G^* \neq t_C^*$. Given t_C^* is revenue maximizing when the rich receive no transfers, we know that there are more revenues generated by the rich in B under class politics

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than under ethnic politics (i.e., $t_G^* * L_C^*(t_G^*) < t_C^* * L_C^*(t_C^*)$ for any $t_G^* \neq t_C^*$). In addition, the rich in A produce fewer government revenues under ethnic politics. To see this, note that by Lemma 5, for for any $t_G^* \neq t_C^*$ it must be true that $t_G^* * L_G^*(t_G^*) < t_G^* * L_C^*(t_G^*)$. In addition, given t_C^* is revenue maximizing under class politics, it must also be true that $t_G^* * L_C^*(t_G^*) < t_C^* * L_C^*(t_C^*)$. By transitivity, $t_G^* * L_G^*(t_G^*) < t_C^* * L_C^*(t_C^*)$, ensuring that $\pi_C^*(t_C^*) > \pi_G^*(t_G^*)$. ∎

We can now describe the conditions under which ethnic or class politics prevails in the model where government revenues are endogenously determined by taxes.

Proposition 3 *Under plurality rule, P_A can win only if $n_P > \frac{\pi_C^*(t_C^*)}{\pi_G^*(t_G^*)} n_A$, which implies that the conditions for class politics are easier to satisfy when government revenues are obtained from taxes on the rich than when the are obtained from exogenous windfalls.*

Proof. In Proposition 1, where revenues are from windfalls, the poor in A are pivotal and ethnic politics prevails if $n_P > n_A$. With taxes on the rich, the maximum that an entrepreneur for P_A could offer is $\frac{\pi_G^*(t_G^*)}{n_A}$ and the maximum that an entpreneur for P_P could offer is $\frac{\pi_C^*(t_C^*)}{n_P}$. Thus, an entrepreneur for A could only win if $n_P > \frac{\pi_C^*(t_C^*)}{\pi_G^*(t_G^*)} n_A$. From Lemma 6, $\pi_C^*(t_C^*) > \pi_G^*(t_G^*)$, which implies that it is more difficult for the entrepreneur for P_A to win when revenues derive from taxes on the rich. ∎

Proposition 3 suggest that inequality and ethnic diversity interact in the same way to influence identity choice when revenues are raised through taxes rather than windfalls, with class politics occurring when inequality is sufficiently low relative to diversity. But it is also the case that taxes on the rich makes ethnic-based politics less attractive in general to the poor in A. The reason is related to the differential effect of taxes on revenues under ethnic-based as opposed to class-based politics. The labor model used here makes the standard assumption that there is diminishing marginal utility from money (and thus labor). Consequently, if taxpayers are given transfers, their incentives to work are reduced, which reduces the amount of revenues that the government collects. The pivotal poor in A, then, care not simply about the size of the winning coalition if P_P or P_A wins, they also care about how big the pie will be under the two possible outcomes. It could be that n_A is smaller than n_P (making P_A more attractive), but that the negative effect of a P_A

victory on π is sufficiently large that the poor in A prefer the class-based politics associated with a P_P victory. A similar logic will obviously make it more difficult to satisfy the conditions for pure group politics under PR (case (3) in proposition 2). And since there are more rich who receive transfers under coalition politics than under ethnic politics, it will also undermine the value of the P_R and P_B coalition to the poor in B when PR exists.

7   Inequality, ethnic diversity and the importance of ethnic identity in elections.

I now turn to examining empirical two implications of the model concerning inequality and ethnic diversity. First, inequality and ethnic diversity should interact to influence the importance of ethnic identity in electoral outcomes. Second, these two variables should interact to influence the extent to which electoral competition results in inequality reduction. This section explores empirically the implication regarding voting and the next section focuses on inequality reduction.

The model describes why inequality should play a role in identity choice, underscoring that this role should depend on the degree of ethnic diversity in society. When it is possible to form a small majority based on ethnic groups, inequality should have little effect on voting outcomes because there should be a strong incentive for ethnic politics at almost any level of inequality. As societies become more homogenous, inequality should become more salient, with greater inequality tipping politics in the direction of ethnic rather than class coalitions. Thus, the effect of inequality on ethnic voting should be positive, but it should decline as the ethnic diversity of society increases, disappearing when society is sufficiently diverse that its difficult for class politics to prevail at any level of inequality. Similarly the effect of ethnic diversity on ethnic voting should be positive, but this effect should decrease as inequality increases. This section explores whether there exist evidence of these associations.

The empirical analysis requires system-level measures of ethnic voting, inequality and ethnic diversity. Since the model suggests that ethnic identity in elections is most attractive when the ethnic majority is smallest, I use "ethnic polarization" (EP) as the measure of ethnic diversity (Reynol-Querol 2002). EP is directly linked to the size of the majority: it takes its largest values as a society moves toward two groups of equal size (and thus grows larger as the largest group moves

toward a bare majority). Thus, the importance of ethnicity in elections should be largest when this variable is large.[4] The definition of groups and the measure of ethnic polarization are taken from Fearon (2003). The available measures are constant within countries over time.

The measure of inequality comes from Solt (2009). Solt develops a methodology for creating comparable, time-varying measures of the Gini index across a wide variety of countries, and his data include a measure of the gross Gini (GINI), which is inequality before taxes and transfers occur. This measure, then, taps the distribution of income before taking into account the redistributive seffect of government.[5] To limit the possibility of reverse causation, I lag GINI , as well as all other time varying right-hand side variables.

To measure the extent to which patterns of party support are "ethnified," I use the "Party Voting Polarization" (PVP) measure from Huber (2012). To construct PVP, one first compares the ethnic basis of support for each party with the ethnic basis of support for each other party to measure the extent to which any two parties differ in their ethnic bases of support. This measure of difference takes the value 0 if the ethnic basis of support is identical for the two parties (for example, if both parties get 80 percent of their support from group 1 and 20 percent from group 2), and it takes its maximum value 1 if one party receives all its support from one group and the other party receives all its support from a different group. Formally, $\tilde{r}_{ij}$ is the distance in the electoral bases of support for parties i and j, which is defined as

$$\tilde{r}_{ij} = \sqrt{\frac{1}{2}\sum_{g=1}^{G}(P_g^i - P_g^j)^2},$$ (5)

where P_g^i and P_g^j are the proportion of supporters of parties i and j who come from group g, and there are G groups. To create a measure of how 'ethnified' the party system is, one aggregates the measures of distance, invoking the polarization perspective to weight the party distances by party size, so that

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[4]The formal definition of EP is from Reynol Querol (2002) is $EP = 1 - \sum_{i=1}^{G}\left(\frac{1/2 - s_i}{1/2}\right)^2 s_i$, where s_i is the size of group i and there are G groups. Ethnolinguistic fractionalization (ELF) is not directly tied to the size of the majority and thus maps less clearly to expectations about bargaining under group-based politics.

[5]Qualitatively identical results are obtained when using Solt's measure of the net Gini, which measures inequality after taxes and transfers occur.

$$PVP = 4 \sum_{i=1}^{N} \sum_{j=1}^{N} p_i p_j^2 \tilde{r}_{ij}. \tag{6}$$

PVP, then, is a measure of the role that ethnic identity plays in describing the bases of support for parties. Since it invokes the polarization perspective in aggregating the differences between pairs of parties, it takes its maximum value when there are two parties, each of equal size and each with their own basis of ethnic support.[6] The expectation from the model is that the degree to which voters will sort themselves at election time based on ethnicity will depend on inequality and EP. We should expect to find that PVP increases with GINI and EP, but that there should be an interaction between these two right-hand side variables, with the association between GINI and PVP being largest at low levels of EP, and with this association diminishing as EP grows large. Similarly, the association between EP and PVP should be positive but should diminish as GINI grows large.

There are non-zero measures of PVP from 39 countries in Huber (2012), with at most 4 surveys in one country and with 23 countries having one survey. I regress PVP on lagged GINI and EP , as well as other controls. The controls, some of which are related to those used below in the analysis of redistribution, include:

- PR, an indicator variable that takes the value 1 if the electoral law is proportional representation.

- RESSEG, a measure of how geographically isolated groups are from each other. It is calculated from the surveys, with details in Huber (2012).

- AFRO2, AFRO3, CSES, indicator variables for surveys used, with WVS the omitted category (see Huber 2012).

- GDP , the lagged value (by one year) of the log of real GDP per capita. The source is the Penn World Tables (2011).

- POP, the log of the population in millions, lagged one year, as reported by the Penn World Tables (2011).

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[6]See discussion in Huber (2012).

- OIL/DIAM, an indicator variable that takes the value 1 if the country is 'rich in oil' or produces (any positive quantity of) diamonds. A country is 'rich in oil' if the average value of its oil production in a period is larger than 100 US dollars per person in 2000 constant dollars. The source is Ross (2011).

I estimate OLS models with robust standard errors clustered at the country level. The results are given in Table 1.

Model 1 includes GINI and EP (but not their interaction) and the controls. EP has the expected positive coefficient, but it is not precisely estimated (p=.19). The coefficient for GINI is also positive, but is not at all precisely estimated (p=.64). The only substantive variable that has a reasonable precisely estimated coefficient is the PR indicator variable, which has a negative coefficient (p=.102). Many of the variables in model 1 are measured with substantial error, so model 2 drops the variables from model 1 that have the most imprecisely estimated coefficients. The coefficient for EP and GINI are more precisely estimated than in model 1, and EP is significant at the .10 level (p=.08). The coefficient estimate for PR is now very precisely estimated.

As noted, however, the model suggests an interaction of ethnic diversity and inequality. Model 3 therefore adds the interaction of GINI and EP to model 1. The coefficient for EP is now positive and very precisely estimated (p=.04) and the coefficient for GINI is positive and imprecisely estimated. But the interaction has the expected negative coefficient and is very precisely estimated (p=.02). Thus, the estimated association between inequality and ethnic parties declines as ethnic polarization increases. Model 4 removes the variables from model 3 that are estimated with considerable error, and the coefficients for EP and the interaction of EP and GINI are even more precisely estimated than in model 3.

The magnitude of the coefficient for GINI and its standard error depend on the level of EP. The left panel in Figure 1 plots the marginal effect of the inequality coefficient and its 95-percent confidence interval at different levels of EP. At low levels of EP, the coefficient for GINI is positive – higher levels of inequality are associated with stronger ethnic bases of support for parties. The estimated coefficient is significant at the .05 level when EP is less than one-standard deviation below the mean EP. But consistent with the argument, this coefficient is declining in EP. When EP is above this level, the coefficient for GINI is no longer significant, and the estimated coefficient

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Table 1: Inequality, ethnic diversity and the ethnic bases of parties

	(1)	(2)	(3)	(4)
GINI	0.115	0.160	0.116	0.054
	(0.243)	(0.222)	(0.238)	(0.217)
EP	0.230	0.273*	0.320**	0.348***
	(0.173)	(0.151)	(0.148)	(0.115)
GINI*EP			-0.387**	-0.403***
			(0.165)	(0.105)
PR	-0.744	-0.886**	-1.046**	-1.057***
	(0.444)	(0.364)	(0.422)	(0.361)
OIL/DIAM	-0.457	-0.452	-0.362	-0.320
	(0.395)	(0.374)	(0.368)	(0.342)
RESSEG	0.005		0.079	
	(0.235)		(0.220)	
GDP	0.075		-0.165	-0.118
	(0.206)		(0.217)	(0.162)
POP	0.111		0.056	
	(0.222)		(0.211)	
AFRO2	0.435		-0.258	
	(0.605)		(0.676)	
AFRO3	0.766	0.520	0.090	
	(0.583)	(0.348)	(0.691)	
CSES	-0.437	-0.355	-0.333	-0.238
	(0.282)	(0.260)	(0.239)	(0.224)
CONSTANT	0.766**	0.957***	1.129**	1.102***
	(0.378)	(0.304)	(0.419)	(0.326)
N	63	64	63	64
R-squared	.33	.36	.44	.43

Note: The DV is PVP. Robust standard errors clustered by country in parentheses.   * p<.10, ** p<.05, *** p<.01
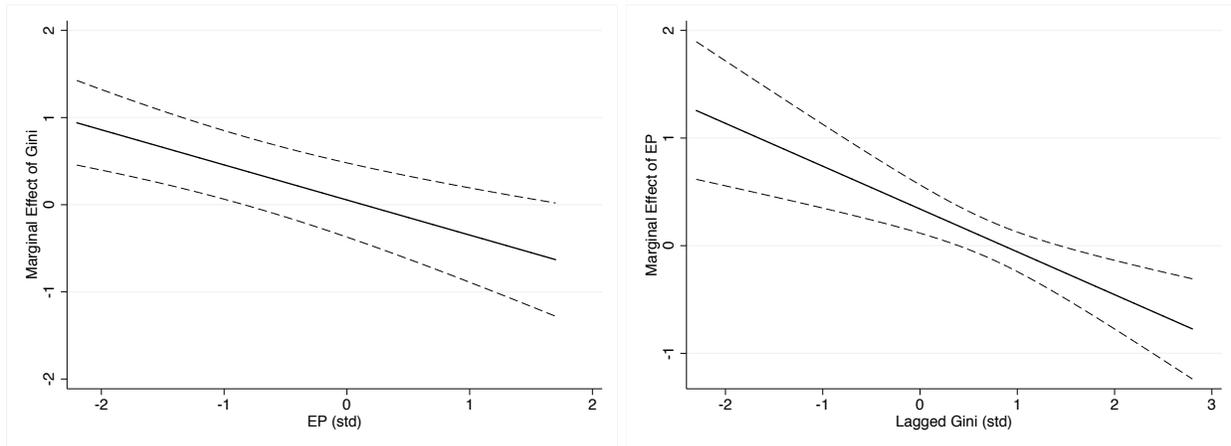
Figure 1: The marginal effect of GINI and EP on PVP

actually becomes negative (but not significant) when EP reaches its mean level. Thus, inequality is associated with a greater importance of ethnic identity in voting, but only when ethnic polarization is sufficiently low.

The right panel in the figure depicts the estimated coefficient for EP at different levels of GINI, along with its 95%-confidence interval. As expected, the estimated coefficient EP is positive but declining as GINI increases. When GINI is sufficiently low, an increase in EP is associated with an increase in PVP. The coefficient is statistically significant at the .05 level if the value of GINI is greater than a point that is slightly above the mean of EP. Thus, for both EP and GINI, the patterns in the data are largely consistent with the expectations from the model.

8   Inequality, ethnic diversity and redistribution.

This section explore the empirical patterns that exist between inequality, ethnic diversity and redistribution. In particular, while we expect that both GINI and EP to be associated with lower levels of redistribution, the negative association between inequality and redistribution should dissipate when ethnic diversity is large (because under large EP, ethnic politics is likely to emerge for a very wide range of Gini). And the negative association between ethnic diversity and redistribution should be similarly conditioned by the level of inequality.

To measure redistribution, I use the inequality data from Solt (2009). As noted, his method-

ology provides time-varying measures of the gross Gini across a wide variety of countries. In addition, he has a measure of net Gini (NET GINI) – inequality after taxes and transfers occur. A standard measure of redistribution, R, uses GINI and NET GINI, to calculate the proportion of inequality that is removed via taxes and transfers. Specifically,

$$\text{R} = \frac{\text{GINI} - \text{NET GINI}}{\text{GINI}}.$$

The Solt data includes inequality measures from 1960 to the present. The panel is unbalanced, with considerable missing data for some countries and nearly the full series for others. I include an observation from Solt's data set when the country has a Polity2 score of 6 or larger in the current and previous year. As a robustness test, I expand the data set to include countries that have a non-negative Polity2 score in the current and previous year.

I estimate random effects models with lagged dependent variables, dummy variables for each year, and robust standard errors clustered by country. It is not possible to test the model using fixed effects because EP is central to the model but is constant within countries (and in any event doubtfully varies meaningfully over time within countries). It is crucial to include the lagged dependent variable because GINI is at once a key right-hand side variable and a component of R, the measure of redistribution. Moreover, there exist macro economic factors in the world economy that are correlated across countries and that have a systematic effect on GINI and thus on R. Given issues that arise with lagged dependent variables in panel data, I estimate the model using a variety of lag structures, reducing concerns about bias and inefficiency. Of course, the lagged dependent variables and the year dummies explain a substantial amount of variation in R, ensuring that the estimated magnitudes of all right-hand side variables w9ll be quite small. To diminish concerns about reverse causality, I use one-year lags of all right-hand side variables, and to facilitate comparisons of the coefficients, all continuous variables are normalized to have a mean of 0 and a standard deviation of 1 (so that the coefficients can be interpreted as how many standard deviations the dependent variable changes with a one-standard deviation in the independent variable).

Table 2 presents the results. Model 1 includes only the direct effects of GINI and EP

Table 2: Random Effects models of redistribution (R)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
GINI	-0.013***	-0.015***	-0.016***	-0.014***	-0.014***	-0.016***	-0.014***	-0.015***	-0.011**
	(0.005)	(0.004)	(0.004)	(0.004)	(0.004)	(0.005)	(0.004)	(0.004)	(0.005)
EP	-0.004	-0.005	-0.007**	-0.005	-0.006*	-0.005	-0.006*	-0.008**	-0.009
	(0.003)	(0.003)	(0.004)	(0.003)	(0.003)	(0.004)	(0.003)	(0.004)	(0.008)
GINI * EP				0.006	0.006	0.002	0.006	0.005	0.004
				(0.005)	(0.005)	(0.006)	(0.005)	(0.005)	(0.006)
OIL/DIAM	-0.009	-0.009	-0.011	-0.009	-0.009	0.003		-0.005	
	(0.010)	(0.009)	(0.009)	(0.009)	(0.008)	(0.009)		(0.009)	
GDP	0.024***	0.023***	0.025***	0.023***	0.025***	0.021***	0.022***	0.023***	0.027***
	(0.007)	(0.006)	(0.006)	(0.006)	(0.006)	(0.007)	(0.006)	(0.006)	(0.008)
POP	-0.005	-0.004	-0.007*	-0.005	-0.005	-0.006	-0.006*	-0.005	-0.013***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.003)	(0.004)	(0.004)
POLITY2					-0.016			0.026*	
					(0.033)			(0.015)	
DM(LOG)						0.007			
						(0.005)			
R_{t-1}	0.971***	1.188***	1.159***	1.187***	1.188***	1.231***	1.186***	1.171***	1.091***
	(0.005)	(0.042)	(0.034)	(0.042)	(0.042)	(0.054)	(0.042)	(0.036)	(0.053)
R_{t-2}		-0.218***	0.005	-0.218***	-0.218***	-0.260***	-0.215***	-0.210***	-0.131**
		(0.043)	(0.060)	(0.043)	(0.043)	(0.054)	(0.043)	(0.038)	(0.056)
R_{t-3}			-0.200***						
			(0.040)						
Year indicators	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-0.004	-0.005	-0.015	-0.004	0.014	-0.008	-0.005	-0.041	-0.025
	(0.025)	(0.032)	(0.027)	(0.031)	(0.056)	(0.036)	(0.032)	(0.030)	(0.016)
Countries	98	95	94	95	93	91	95	104	39
σ_u 0	0	0	0	0	0	0	0	0	0
σ_e	.162	.153	.145	.153	.153	.146	.153	.162	.156
ρ	0	0	0	0	0	0	0	0	0
N	1932	1865	1803	1865	1848	1511	1872	2141	847

Note: Dependent variable is R, the measure of inequality reduction. All continuous variables are standardized to have a mean of 0 and standard deviation of 1 to facilitate comparisons of coefficients. Robust standard errors clustered by country. Models 1-7 include country-year observations where Polity2 and its lag are 6 or larger. Model 8 includes country-year observations where Polity2 and its lag are 0 or larger. Model 9 includes only those countries used in Table 1 and only years where Polity2 and its lag are 0 or larger.   * p<.10, ** p<.05, *** p<.0

(not their interaction) and one lag of the dependent variable.[7] The coefficients for GINI and EP both have the expected positive direction, and the coefficient for GINI is very precisely estimated (p=.004). Model 2 adds a second lag of the dependent variable, and the results are quite stable, with the coefficient for EP estimated a bit more precisely. Model 3 adds a third lag of the dependent variable, and again the results are quite stable. In model 3, the second lag of R is not precisely estimated, and the coefficient for EP is estimated quite precisely. The results, then, are rather stable across specifications that include a different number of lags of the dependent variable, and in what follows I focus on models that include the first and second lag.

Model 4 includes the interaction of GINI and EP. The main effects of these variables continue to be negative and the interaction is positive, as expected, but not measured terribly precisely. It is difficult to interpret the size and significance of these variables from the regression table, and below I present graphs of the marginal effects of these variables and their confidence intervals. Before doing so, however, consider several other model specifications. Although all of the included countries are fairly democratic, there is a difference between countries that have a Polity2 score of 6 and those that have a score of 10. Model 5 therefore adds Polity2 to the model. Although the coefficient for Polity2 is very imprecisely measured and this variable does not seem to belong in the model, the results for the variables of interest are quite similar to those in Model 4. Model 6 adds a measure of the proportionality of the electoral law, the log of the average district magnitude in the lower house (DM(LOG)).[8] Again, the variable does not seem to belong: the coefficient is very imprecisely estimated. Its inclusion does increase the standard error of the interaction, but it is important to note that when one takes into the relevant variances and covariance from the interactions, the coefficient for GINI (alternatively EP) remains statistically significant at the .05 level for a broad range of EP (alternatively GINI)). Model 7 removes OIL/DIAM , which is never remotely significant, and there is little effect on the results for the variables of central interest. Model 8 estimates the model with a larger set of countries by setting the threshold for inclusion at Polity2 (and its lag) at greater than 0. Again, the results are rather stable. Finally, Model 9 considers only those 39 countries used in the voting analysis above. This is obviously a much smaller set of countries, and I use 0 as the cutoff for the Polity2 score. The size of the coefficients are very similar to the

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[7]If one estimates this model with OLS, the coefficients for all the right-hand side variables are *extremely* small – there are typically 15 zeros or more after the decimal point.
[8]Virtually identical results are obtained when one uses a PR indicator variable instead.

results for the larger data set, although they have larger standard errors.

Figure 2 graphs the marginal effects of of the variables of central interest, along with their 95-percent confidence intervals. The top panel is based on model 7, and the top-left panel plots the marginal effect of GINI for the entire range of EP. There is a negative association between GINI and R at all levels of EP. As expected, the estimated association grows smaller as EP increases, but it remains statistically significant at the .05 level for quite a broad range of EP. The top-right panel plots the marginal effect of EP for the entire range of GINI. Again, there is a negative association between EP and R, one that is rather precisely estimated at the lower ranges of GINI but that is not precisely estimated when GINI is larger than the mean GINI in the sample. The two bottom figures present the same graphs but using model 9, where the sample data set includes only those countries available for the study of ethnic voting. Though the standard errors are larger, it is worth noting that the patterns are very similar to those found in the larger data set.

With two lagged dependent variables and year fixed effects in the model, the coefficients of all the right-hand side variables are obviously going to be quite small. The fact that all right-hand side variables are standardized, however, at least allows us to easily discern the relative magnitudes of the different coefficients. Consider the top left panel in Figure 2. If EP is one standard deviation below its mean, a one standard deviation increase in GINI leads to a .02 standard deviation decrease in R. While this absolute magnitude is clearly very small as expected, the relative magnitude is not. The size of this effect is essentially identical to that of GDP, the only other variable with a coefficient that is consistently estimated rather precisely. And it is larger in absolute magnitude than that of any other right-hand side variable that appears in any of the models, including EP for any level of GINI.

9   Conclusion.

The model presented above attempts to improve our understanding of identity choice, electoral politics and redistribution by developing a theoretical framework in which the nature of political parties (whether they base their electoral appeals on class or ethnicity) and the identity choices of voters emerge endogenously. The theoretical model describes how ethnic diversity and inequality
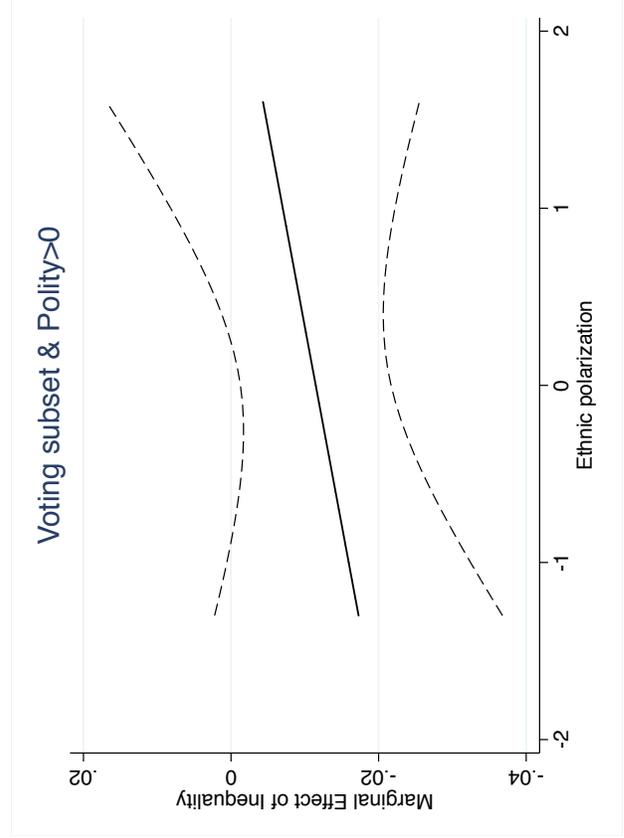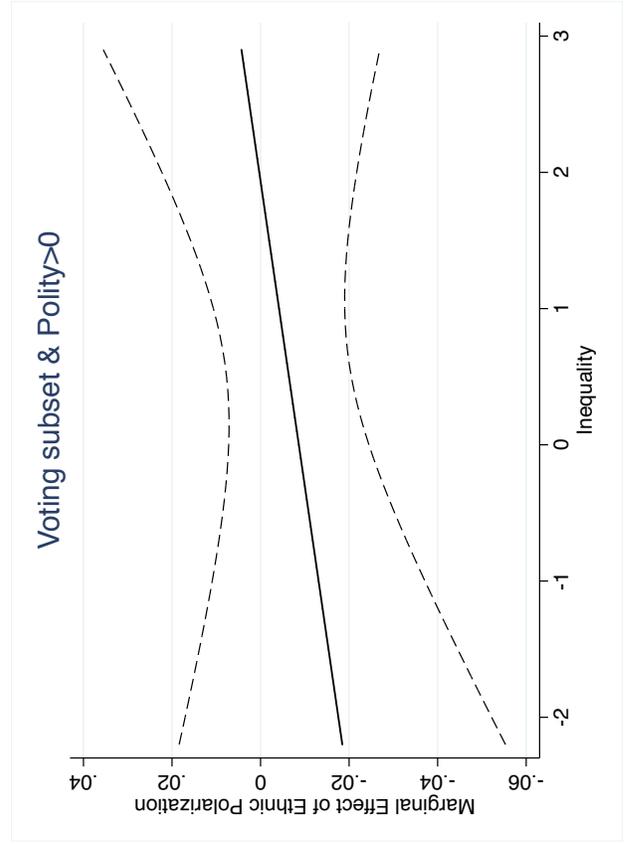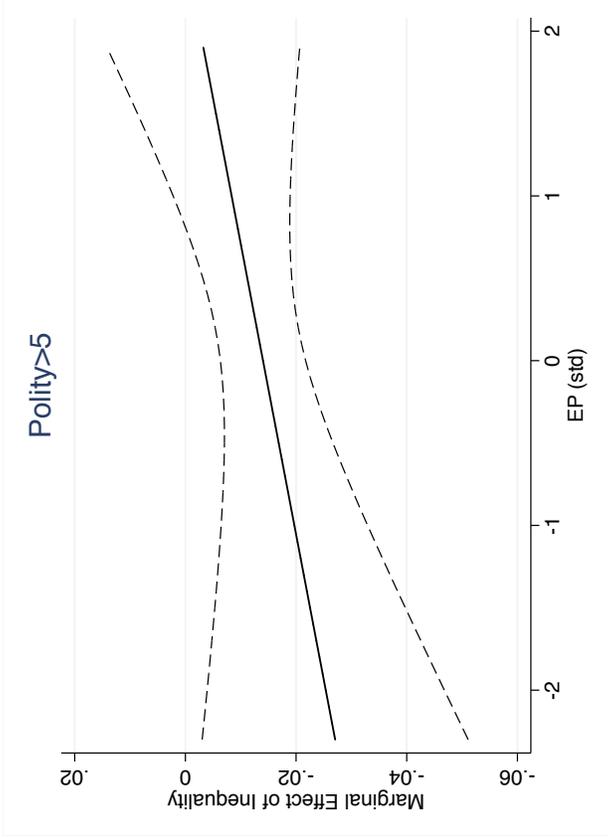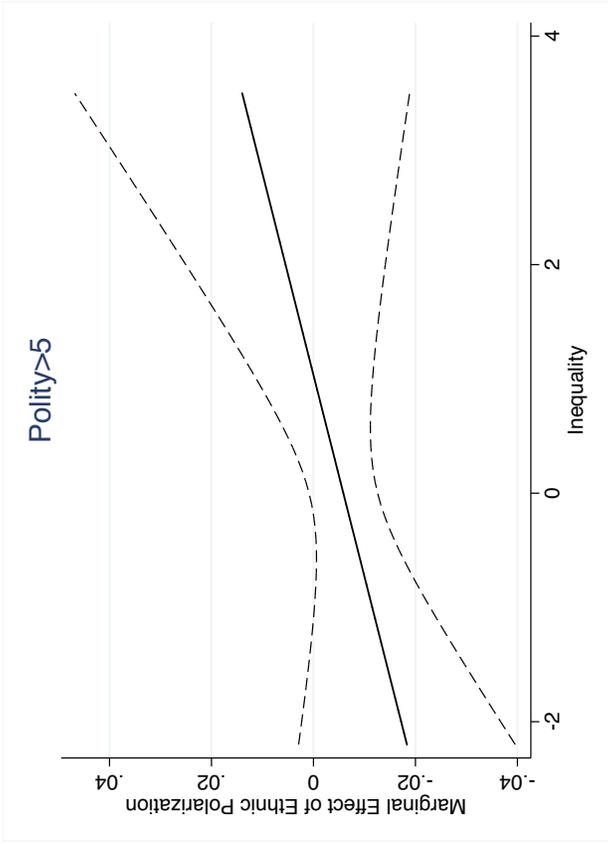
Figure 2: The marginal effects of GINI and EP in the redistribution analysis

interact to influence the importance of ethnicity and levels of redistribution, and the patterns in the data are consistent with expectations from the model. The research therefore underlines the value of treating electoral appeals based on ethnicity or class as endogenous in a framework where both types of appeals are feasible and where individuals are motivated by economic gain.

The model suggests several clear avenues for future research. First, the model's framework could be usefully embedded in the development of explicit models of democratic transitions because it has implications for how autocrats from different ethnic groups view the costs of transition. Second, across contexts, the boundaries between ethnic categories can be more or less porous, with markers like race being more difficult to change than markers like language. One could extend the model to consider the impact of "porous" group identity on the emergence of ethnic politics. Third, the model could relax the assumption that there are only two ethnic groups. While moving in this direction could clearly bring the model in closer alignment with the empirical reality in many countries, it is doubtful that central insights from this paper would change substantially. In particular, for any number of groups, the value of class politics will always be lowest when inequality is highest; PR will always make it possible to develop smaller winning coalitions than plurality rule, and taxes on the rich will always increase the value of class politics to the poor. Fourth, the model assumes that under group based politics, all group members are treated identically. In some cases, rich elites have a strong influence over distribution within groups, making it worthwhile to explore how within-group dynamics influence identity choice. Finally, it would useful to consider a dynamic model of elections. Each time an election occurs, there is redistribution of wealth in society, which in turn will affect the possibilities of subsequent success of ethnic or class parties. A dynamic framework would yield insights into the relative stability of identity choice over time.

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