

# Democracy, targeted redistribution and ethnic inequality\*

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## Abstract

There are two principal ways that redistribution occurs in democracies. One is across income groups – *class-based* politics. The other is *across groups* not defined by class, such as those based on language, race or ethnicity. Using a new data set comprising 81 countries, we calculate measures of class-based inequality (“within-group inequality”) and group-based inequality (“between-group inequality”). We then examine empirically the relationship between democracy and these two forms of inequality. We find a strong and robust relationship between democracy and between-group inequality but no such relationship between democracy and within-group inequality or overall inequality. Two-stage least squares with a new instrument for democracy suggests this relationship between democracy and lower between-group inequality may be causal. The results are consistent with group-based politics in democracies that disproportionately benefit the richest members of the poorest groups. We also find that the negative relationship between democracy and between-group inequality is strongest in the most ethnically diverse societies, and that there is a negative relationship between democracy and class-based inequality in the most ethnically homogeneous countries. Theoretical work on democracy and inequality should therefore focus on the interaction between class and group, with the political incentives to target “class” within groups mediated by the level of ethnic diversity in society.

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# 1 Introduction

By empowering the poor to vote for redistributive policies, democracy should reduce inequality. This simple and powerful intuition, which is made explicit in a wide range of “tax and transfer” models, is among the most influential and widely used in studies of democracy. Empirical research, however, has not provided convincing support for the central claim that democracy leads to lower levels of overall inequality, more redistribution, or higher levels of assistance for the poor.<sup>1</sup> Why could the redistributive logic be so compelling while empirical support for the implied relationship between democracy and inequality be so weak? If there is little or no relationship between democracy and inequality, does this mean that democracy does not encourage redistributive politics?

Redistribution can occur in different ways. One is obviously from rich to poor – classic *class-based politics* that so much research considers. In authoritarian governments, the elites in power can typically repress the poor. Under democracy, this repression is replaced by a struggle for votes, with parties competing against each other to build winning coalitions. Existing research like Acemoglu and Robinson (2006) and Boix (2003) use tax and transfer models to argue that in this struggle for votes, a majority of the poor can form an electoral coalition that demands redistribution from the rich. The transition from dictatorship to democracy will therefore be costly to the rich and beneficial to the poor.

But a second important form of redistribution is group- rather than class-based. Democratic competition often unfolds less as a battle between rich and poor than as a battle between groups, particularly those based on race, ethnicity or religion. If parties have incentives to target ethnic groups, then the logic of the tax and transfer models might be applied differently. We might expect the poorest groups to make demands for redistribution from the richest ones. Democracy’s impact on inequality would therefore work through groups by driving down inequality between them. The central goal of this paper is to explore empirically the relationship between democracy and class-based inequality, on one hand, and between democracy and group-based inequality on the other.

Using a new data set covering 81 countries, we decompose the Gini coefficient of inequal-

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<sup>1</sup>See Houle 2009, Mulligan, Gil and Sala-i-Martin 2004, Ross 2006 and Timmons 2010. Not all research, however, fails to support the democracy-redistribution hypotheses. Tavares and Wacziarg (2001) find democracy is associated with less inequality across countries, and Martínez-Bravo, Padró i Miquel, Qian and Yao (2012) find that the introduction of (quasi) democratic elections leads to lower land inequality in rural China.

ity into its "group-based" (between-group inequality) and "class-based" (within-group inequality) components, as well as its third component, "Overlap," a residual that has been related to income stratification (Yitzhaki and Lerman 1991). We then estimate statistical models of the relationship between democracy and these different components. Using OLS regressions, we show that democracy is not associated with lower levels of general inequality (measured by the Gini), lower levels of within-group inequality (the class-based component), or lower levels of Overlap. But there is a very strong and robust empirical relationship between democracy and group-based inequality: democracy is associated with *lower levels* of between-group economic differences. Using a new instrument for democracy, we provide evidence that this relationship could be causal.

Why might democracy be associated with lower inequality between ethnic groups but not lower general or class-based inequality? Although it is beyond the scope of this paper to provide an explicit theory, in our discussion of the empirical findings, we make a several observations. First, we point out that class politics based on "rich to poor" redistribution is likely an inefficient tool for parties seeking to build support for a majority in a democracy. Targeting groups often allows lower cost strategies for building majorities, and ethnic groups are an obvious basis for such targeting because such groups are often easily identifiable, and because individuals cannot easily select in and out of ethnic groups.

Second, in order for democracy to reduce between-group economic differences without affecting other types of inequality, democracy must (a) boost the well-being of the rich in the poorer groups more than it does the well-being of the poor in poorer groups, (b) decrease the well-being of the poorest in the rich groups more than it decreases the well-being of the rich in the richest groups, or (c) do both. If this were not true, the accounting could not work – that is, it would be impossible for between-group inequality to decrease without also decreasing overall inequality. Yet we believe this "within-group targeting" is consistent with what we often observe, particular with respect to the poorer groups. In countries as diverse as the US, Brazil and India, for example, wide ranging affirmative action and other policies targeting groups typically benefit the most-well off in the poor groups. The empirical analysis therefore suggests that the best pathway forward in theorizing about democracy and inequality should involve neither a focus on strictly class-based politics nor a focus on strictly group-based politics. Instead, there is likely an important interaction between class and group, and incentives by politicians to target "class" within groups. Understanding such targeting

incentives in democratic competition should help paint a more accurate picture of the effect of democracy on inequality.

Third, targeting ethnic groups will obviously not be a viable electoral strategy in highly homogenous societies. Does this imply that we see “class-based politics” in homogenous societies and group-based politics in heterogeneous one? Our evidence suggests the answer is yes. When we examine the interaction of democracy and ethnic diversity, we find that in homogeneous societies, democracy is associated with lower within-group inequality, suggesting that class-based politics are likely the norm in such countries. By contrast, in heterogeneous societies, democracy is associated only with lower group-based inequality, suggesting that targeting ethnic groups is the dominant strategy in such countries.

The paper is organized as follows. The next section describes the decomposition of the familiar Gini coefficient into three components – between-group inequality, within-group inequality and “overlap.” Section 3 presents the data set used to measure these three three components and describes biases associated with some of the 175 surveys used in the analysis, an exercise that informs the types of empirical models we estimate. Section 4 then presents data on the three components, showing that most inequality is within- rather than between groups. Our empirical tests are in sections 5 and 6, followed by our interpretation of the main empirical findings in section 7.

## 2 Decomposing the Gini coefficient

The Gini coefficient, which ranges from 0 (perfect equality) to 1 (maximal inequality, where one person controls all the income), is perhaps the most well-known and widely used measure of overall inequality in society. The Gini coefficient can be decomposed into three components, *Between-group inequality* (BGI), which is a measure of economic differences between groups, *Within-group inequality* (WGI), which is a measure of economic differences within groups, and thus is a measure of class-based differences, and *Overlap* (O), a residual term.

To understand the nature of the three components and their relation to the Gini, it is useful to recall that the Gini is based on the Lorenz curve, which describes the income distribution by ordering individuals on the  $x$  axis from poorest to richest. Let  $p$  be a percentile rank on the  $x$  axis.

Thus, for example, a point  $p = 30$  on the  $x$ -axis signifies the person at the 30<sup>th</sup> percentile in the income distribution: people to the left (just less than 30% of the population) are poorer, while people to the right (70% of the population) are richer. For any  $p$  one can plot on the  $y$  axis the proportion of income held by all individuals who are at least as poor as  $p$ , defined as  $L(p)$ . So if the poorest 30 percent of the population had 15 percent of total income, there would be a point on the Lorenz curve at  $x=30, y=15$ . In a case of perfect equality,  $L(p) = p$  for all  $p$ . So the “poorest” 30 percent of the population earns 30 percent of total income, the “poorest” 50 percent earns 50 percent of income, the “poorest” 90 percent earns 90 percent of the income, and so on for each possible percentile. Of course, implicit in such a perfect-equality case is that any ranking of individuals by income would be arbitrary. In both panels of Figure 1, the cases of perfect equality are represented by the 45-degree lines. If any inequality exists, then at all  $p$ , the income share  $L(p)$ , will fall below the 45-degree line. This curve, denoted by  $L(p)$  in the figure, is the Lorenz curve. The area between the curve and the 45 degree line describes the Gini coefficient, which is the ratio of this area over the total area below the 45-degree line. The Gini is thus written as

$$G = 2 \int_0^1 [p - L(p)] dp. \quad (1)$$

Naturally, larger Gini coefficients mean a greater area between the Lorenz curve and the 45 degree line, and thus greater inequality.

The Gini coefficient is neutral with respect to how inequality is distributed across and within different groups in society, but class- and group-based inequality are often distinct and of central substantive concern. First consider inequality between groups. Lambert and Aronson (1993) provide a graphical interpretation of the Gini decomposition using the Lorenz curve, and the top panel in Figure 1 is adapted from their figure 1. Suppose that society is composed of three groups and that we assign each person in a group the mean income of that group. We can array each person on the  $x$ -axis from poorest to richest and graph the Lorenz curve as before. In the top panel, the poorest group is 40 percent of the population and has 20 percent of total income, so the segment of the group-based Lorenz curve for this group is the straight dashed line connecting the point 0,0 with the point 40,20. The next poorest group is 35 percent of the population and has 30 percent of the income, so its segment of the group-based Lorenz curve is the straight line from the point

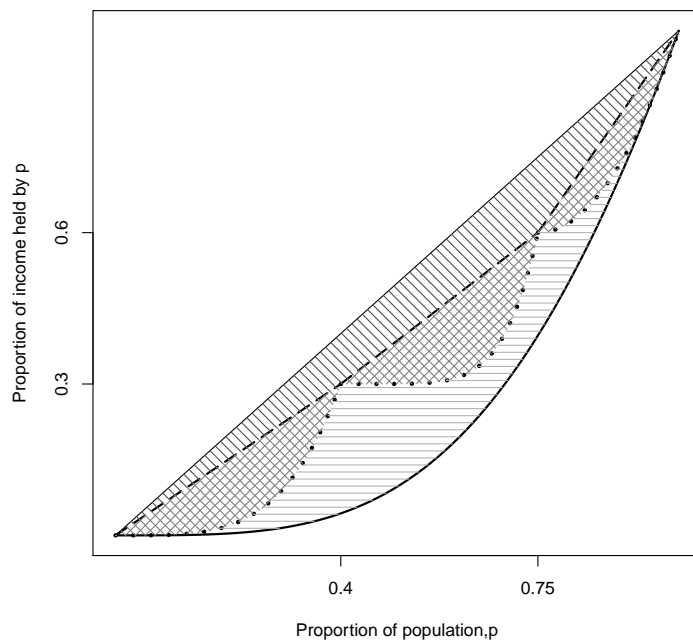
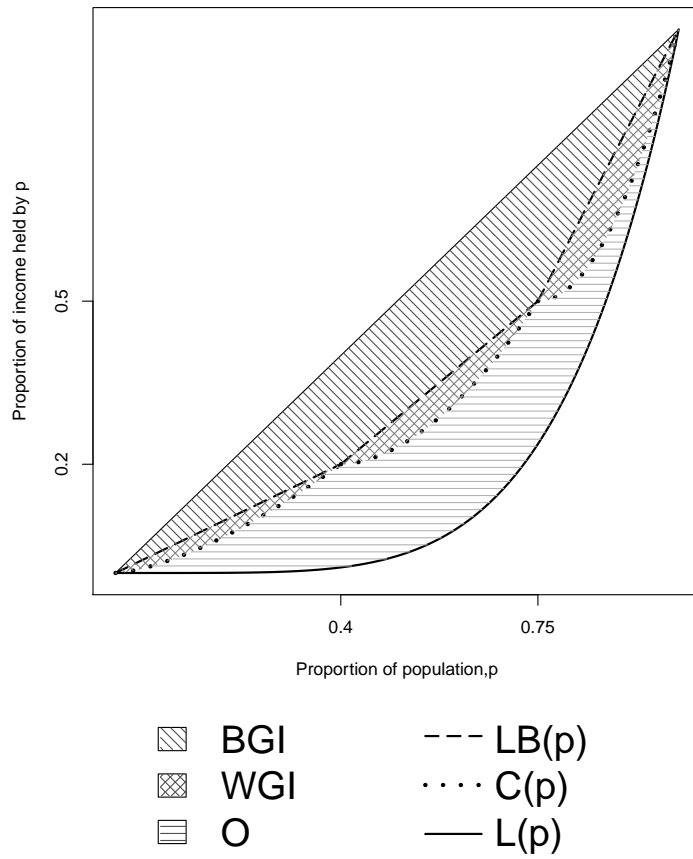


Figure 1: Two examples of the Gini's decomposition

at 40,20 to the point 75, 50. This leaves the third group with 25 percent of the population and 50 percent of the income. This rich group's segment in the group-based Lorenz curve goes from the point 75, 50 to the point 1,1. The group-based Gini, or BGI, is represented by the area between the dashed line  $LB(p)$  and the 45-degree line, depicted by the diagonal shading. The formula for this area is given by

$$BGI = 2 \int_0^1 [p - LB(p)] dp. \quad (2)$$

BGI obviously does not capture all inequality in society, as it ignores income differences *within* groups. Within-group inequality ("WGI") is a second component of the Gini. It considers economic differences within rather than across groups, and is a weighted average of the Gini coefficients for each group. Returning to Figure 1, we can preserve the income rankings defined by group average incomes, so for example every member of group 1 is poorer than every member of group 2, and so on. But within each group, individuals can be ranked on the  $x$  axis from poorest to richest. This within-group ranking, along with information about the proportion of group income held at each percentile rank for each group, provides the information needed to calculate the Lorenz curve for the group. For each group, the dashed line,  $L_B(p)$ , delineates the within-group equivalent of the 45-degree line in the total-population case, and the dotted line delineates the Lorenz curve for each group. Consider group 1. If there was perfect equality within the group, so that the poorest 10 percent of the group had 10 percent of the group's income, the poorest 20 percent had 20 percent of income and so forth, within-group inequality for group 1 would be zero, and its depiction would simply follow the dashed line. But as inequality increases within the group, the Lorenz (or concentration) curve for the group would drop below the group's dashed line segment for the group. The figure delineates the Gini coefficient for each group, denoted by the dotted line marked  $C(p)$ . The cross-hatched areas between  $C(p)$  and  $L_B(p)$  represent the Gini coefficients for each group. Note in the top panel of the figure there is very little inequality within the poor group and considerable inequality within the rich group. WGI is essentially the sum of these areas and is given by

$$WGI = 2 \int_0^1 [L_B(p) - C(p)] dp. \quad (3)$$

Note that within-group inequality is a function not simply of the group-based Ginis but also of

group size (which affect the length of the dashed line segments) and group mean incomes (which affect the slopes of these lines, and thus the total income under the curve at any group-specific  $p$ ).

In arraying individuals on the  $x$  axis to calculate WGI, we implicitly assume that the richest person in each group is poorer than the poorest person in the next richest group (because in calculating WGI, we are preserving the income rankings for the BGI calculation and then ranking individuals by income within groups). Together, BGI and WGI would capture all inequality in a society if there was no overlap in the incomes of group members (so that all group 1 members in the example are poorer than group 2 members, and all group 2 members were poorer than all group 3 members). But this, of course, is unlikely to ever be the case. To capture the true level of inequality, we must order all individuals by their income, ignoring group all together. The amount of income inequality that is not accounted for by BGI and WGI is therefore the area between  $L(p)$  and  $C(p)$ , which is represented by the area shaded using horizontal lines. This residual area is often called Overlap (“O”), and it is given by

$$O = 2 \int_0^1 [C(p) - L(p)] dp. \quad (4)$$

The Gini, then, is decomposable into three components:

$$G = BGI + WGI + O \quad (5)$$

As the proportion of income held by each group becomes more proportional to group size, BGI will obviously decrease. In the bottom panel of Figure 1, for example, the groups are the same size as in the top panel, but group 1 has 30 percent of the income (instead of 20 in the top panel) and group 3 has 40 percent of income (instead of 50 percent). Thus, BGI shrinks. This shrinkage could occur with or without a change in WGI or O. Compared with the top panel, the bottom panel depicts a situation not only where BGI is smaller, but also where WGI is larger (the cross-hatched shaded group Ginis are relatively large) and O is smaller.

Though a number of efforts have been made to interpret the Overlap term as substantively important in its own right (e.g., Yitzhaki and Lerman 1991), this has proven quite difficult because it has not been possible to characterize analytically the Overlap term – which is typically written as a residual – in a substantively meaningful fashion that is tied tightly to the Gini decomposition.



Moreover, while BGI and WGI are conceptually distinct and either can change with no effect on the other, the same is not true for O, which is a function of both BGI and WGI: given any overlap in group income distributions, O will increase as BGI decreases or as WGI increases. Given that the Gini does not decompose neatly into within-group and between-group components, scholars interested in between- and within-group differences have often turned to generally entropy measures (such as the Theil index), which decompose neatly into within- and between-group components. However, the general entropy measures are sensitive to the number of groups and thus are appropriate measures only when the number of groups across comparison units is constant (such as when comparing inequality between urban and rural areas across states).

This problem associated with interpreting the Overlap term need not undermine the utility of BGI and WGI, however, because each of these two components of the Gini has a straightforward substantive interpretation in its own right. BGI is a measure of group-based economic differences, and has been used, for example, in the study of conflict (e.g., Stewart 2008) and public goods provision (e.g, Baldwin and Huber 2010). BGI measures the differences between the average income of groups, and using discrete data, can be written as

$$BGI = \frac{1}{2\bar{y}} \left( \sum_{m=1}^k \sum_{n=1}^k p_m p_n | \bar{y}_m - \bar{y}_n | \right), \quad (6)$$

where  $m$  and  $n$  index groups,  $p_m$  is the proportion of the population in group  $m$ ,  $\bar{y}_m$  is the average income of group  $m$ , and there are  $k$  groups in society.

WGI is a measure of class conflict, as it measures the total inequality that exists solely within groups. This variable has not received much attention in previous studies in political science, though recent theoretical work by Esteban and Ray (2008, 2011) and Houle (2011) argues that civil conflict is affected by WGI. Using discrete data, WGI can be written as

$$WGI = \sum_{i=1}^k G_i p_i \pi_i, \quad (7)$$

where  $G_i$  is the Gini coefficient for group  $i$  and  $\pi_i$  is the proportion of total income going to group  $i$ .

In principle, democracy could be associated with different levels of all three components

of inequality. If democracy is associated with lower BGI, we know that it is associated with lower economic differences between ethnic groups. If democracy is associated with lower WGI, we know that is associated with lower levels of class-based economic differences. In principle, democracy could be associated with higher levels of one component and lower levels of another, providing insight into precisely how democracy affects the politics of redistribution.

### 3 Measuring the three elements of the Gini decomposition

Testing the relationship between democracy and the various components of inequality requires data on the “income” and group identity of individuals. To this end, we use individual-level surveys. A central goal is to create a data set that includes as wide a range of countries as possible, and we often use more than one survey from particular countries. The surveys are from 1992-2008,<sup>2</sup> and there are five different types of surveys that we use:

- The World Values Survey (WVS) (from 1995-2002).
- The Comparative Study of Electoral Systems (CSES) (from 1996-2004).
- The Afrobarometer (2002-2006).
- The Demographic and Health Surveys (DHS) (1992-2008).
- Various fine-grained surveys which we call “Household expenditure surveys” (HES), including the LSMS (Living Standards Monitoring Surveys), miscellaneous country-specific studies, country census files from IPUMS, and the Luxembourg Income Study (LIS) (from 1988-2006).

#### 3.1 What is a “group”?

Since different surveys can use different definitions of groups, it is useful to have a definition of “group” that can be employed consistently across a range of surveys. To this end, we follow the definition of groups found in Fearon (2003), which emphasizes groups be understood as “descent groups” that are locally viewed as socially or politically consequential. Depending on the country, Fearon’s identification of groups may be based on race (e.g., the US), language (e.g., Belgium),

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<sup>2</sup>There is one exception to this time frame – we have only one survey from Cote d’Ivoire, which is from 1988.

religion (e.g. France), tribe (e.g., many African countries), or even some combination of these factors. The strong advantage of this approach is that it attempts to apply a consistent definition of groups across a wide range of countries. While the question of how to define a group is important and contentious, the most important issue for present purposes is that the definition plausibly identifies groups that could be targeted. That is clearly the case with the Fearon definition. Of course, the same issues explored in this study could be explored using alternative definitions of groups.

To determine whether the Fearon groups are sufficiently well-identified by a survey to merit the inclusion of the survey in our data set, we employ a *10 percent rule*, which works as follows. For each survey, we calculate the percentage of the population (per Fearon's data) that we cannot assign to any of Fearon's groups, and we retain the survey if this number is less than 10. For example, if there are three groups in Fearon's data, and group 1 represents 12 percent of the population according to Fearon, then we do not use the survey if it does not include group 1 (because 12 percent violates the 10 percent rule). We sum the percentages of all the Fearon groups that we cannot identify and omit the survey if this sum is greater than 10 percent. This ensures that we are using a consistent definition of groups across the surveys.

### **3.2 Measuring "income"**

The other key variable in constructing our measures is "income," which the surveys measure either directly or indirectly. First consider the direct measures. By far the best measures of "income" that are available in any existing surveys come from those we place in the HES category. The 28 HES surveys cover 23 countries. These include the data taken directly from a national census ("IPUMS"), which have fine-grained income categories and very large representative samples. These also include detailed household income and consumption surveys. Some of the HES surveys included ready-made income and/or consumption variables that follow protocols that have been developed by economists (e.g. Deaton 1980, Deaton and Zaidi 2002). For those that do not, we constructed measures of net income and consumption that follow these same protocols. Measures of net income included wages, net earnings from self-employment, net value of home production; value of government subsidized services, pensions, child assistance, alimony, child support, disability in-

insurance, and social benefits; and value of investment, insurance, and rental income.<sup>3</sup> Measures of consumption/expenditures include the value of all food consumption, educational expenditures, other market consumer purchases, goods produced and consumed in the home, in-kind payments, rental expenditures, and rental-equivalent use value of durable goods and housing if owned. These two measures are expressed in local currency and measured at the monthly household level. Each total figure, for household expenditure/consumption and household income, is then divided by the size of the household to create the household income and consumption figures we use in the creation of the nation-level measures of group-based economic differences.<sup>4</sup> As is standard in the use of these surveys to study inequality, we focus on consumption rather than income when both types of measure are available (although the two are very highly correlated), given that consumption-based measures do a better job of differentiating individuals at the low end of the income scale. Indeed, for many individuals in many countries in this study, cash incomes often are non-existent.

The other direct measures of “income” are found in the CSES and WVS, which each have a single question that asks respondents to state the income category of the respondent’s household income after taxes and transfers. The CSES reports the income as quintiles, whereas the WVS has a different income scale for each country. Since these data are less fined-grained than those in the HES category, they may understate the true levels of group-based inequality (an issue we explore empirically below).

Next consider indirect measures of “income.” In developing parts of the world, cash incomes often do little to distinguish the relative economic well-being of individuals. Consequently, scholars have developed a strategy for assessing economic well-being that involves asking survey respondents about their living conditions and access to material goods. The Demographic Health Surveys (DHS) have been leaders in this regard, and their surveys ask respondents about their possession of assets, services, and amenities that are assumed to be directly related to the economic status of the household. They have a rather large number of questions that include information about the type of flooring, roof, water supply, sanitation facilities, and vehicle; possession of goods such as a refrigerator, radio, television, and telephone; and the number of persons per sleeping room. To

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<sup>3</sup>Taxes paid and business expenses (including expenses for home-based agriculture or production) are subtracted out of this to make the income a valid “net” measure of income.

<sup>4</sup>To account for household size, we divide the total household income and consumption by a measure of adult equivalency whenever possible or when it has not been done already in the survey: 1 unit for household head, .7 for other adults and adolescents, .5 for children under 14 years of age.

construct its wealth index, DHS typically uses all available asset and utility services variables in order to improve the distribution of households across index scores. For categorical variables such as “type of flooring,” DHS first constructs sets of dichotomous variables from the indicator variables. Ordering the categories is at times a subjective exercise affected by the conditions in each country. For example, types of flooring include carpet, ceramic tiling, and parquet; it is not obvious which type of floor wealthier households are more likely to have. Finally, weights are attached to the indicator variables using principal components analysis. The household’s wealth index value, a standardized score with mean zero and standard deviation of one, is calculated by summing the weighted indicator values. Filmer and Pritchett (2001) and McKenzie (2005) discuss the use of asset indicators to create these variables. The variable HV271 in DHS provides the household wealth index. However, this variable is not available for all DHS surveys. Using a procedure similar to that of DHS, we constructed our own household wealth index when the DHS variable does not exist in a given survey.<sup>5</sup>

The Afrobarometer surveys also include no measures of income, but like DHS, include several “well-being” variables. Each survey asks respondents how often they (or family members) have gone without food, water, medical care, cooking fuel, and cash income. Each variable is coded on a five-point scale (from 0 to 4) according to how often the respondent has gone without the item. The third wave also includes questions about whether or not the respondent owns a radio, television, motorbike, or “motor vehicle,” and these are included where available. As with the DHS, we estimate the household affluence by including all of the available asset and needs variables in a principal components factor analysis, and estimate “income” based on the first factor.

These indirect measures of income are attractive in that they allow us to differentiate economic well-being of respondents who often have no cash income. But there is an obvious cost – because it includes no measure of actual cash income, wages, or high-end wealth, this index is most useful in distinguishing differences among the least well-off, masking differences that exist among the more well-to-do. Thus, estimates of various inequality variables risk understating the true level of inequality using the indirect measures. This should be particularly true of the Afrobarometer surveys, which have a more limited range of variables with which to construct the measures of

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<sup>5</sup>Since the principle components analysis returns a variable with mean zero, it cannot be used as an input to derive the Gini decomposition. We therefore convert each DHS income score into a percentile (ranging from 1-100) score.

Table 1: Average democracy and national wealth of different survey types

Survey	Avg. Polity2 score	Avg. GDP/capita	# Surveys	# countries
Afrobarometer	5.13	\$2,311	22	13
CSES	8.3	\$18,751	27	19
DHS	2.1	\$2,223	69	35
WVS	6.0	\$14,607	29	29
HES	6.3	\$15,106	28	23

economic well-being.<sup>6</sup> We analyze this issue below.

### 3.3 Biases in the surveys

We have a total of 175 surveys from 81 countries available for analysis.<sup>7</sup> Before employing the group-based inequality measures for substantive research, it is important to explore biases that may exist in the various surveys. One bias is that the surveys are correlated with region and/or with national wealth or democracy. The Afrobarometer, for instance, exists only in Africa, the DHS contains no advanced industrial countries, and the CSES focuses mostly on rich countries. Table 1, which displays the mean Polity2 democracy score, as well as the mean GDP/capita for each of the five survey types, describes these biases. We can see that the DHS countries are on average the least democratic whereas the CSES countries are the most democratic on average. Similarly, the CSES countries are richer on average than other surveys, whereas the DHS and Afrobarometer surveys are quite poor on average. Thus, it is important to bear in mind that the various individual survey types are not random samples of all countries.

Do the surveys accurately reflect the size of groups? A simple way to address this is to

<sup>6</sup>See Baldwin and Huber 2010 for a discussion of how Afrobarometer surveys lead to underestimates of BGI.

<sup>7</sup>See Table 10 in the appendix for a complete list of countries and surveys. We use a slightly smaller number of surveys in some of the analyses below because for some countries we lack measures of right-hand side variables. We also exclude South Africa, which obviously has a very unique history of group-based economic differences. There is extreme variation in our South African measures. We calculate all components of the Gini using the “ginidesc” command in Stata (Aliaga and Montoya 1999).

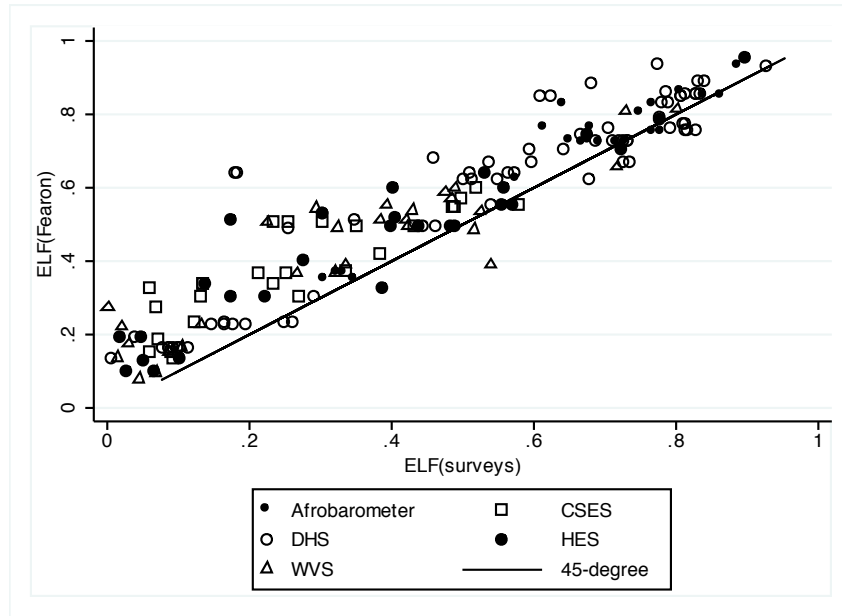


Figure 2: Fearon’s diversity measures vs. the survey-based diversity measures

compare the measures of ELF from each of the surveys with the ELF from Fearon’s data. Figure 2 plots Fearon’s measure of ELF against the ELF measure based on surveys, with different symbols for different survey types. There are three points worth noting. First, the correlation is very strong, with a Pearson’s  $r$  of .94. Second, all of the surveys are systematically underestimating Fearon ELF, particularly in the countries that have low ELF. Third, none of the surveys seem to overestimate or underestimate ELF more than the others.

Next consider the measurement of income in the surveys. Figure 3 plots the Gini coefficient from the World Development Indicators against the Gini calculated from the surveys for each survey type. Not surprisingly, the correlations are quite weak for three survey types: the top three panels show essentially no relationship between the WDI and survey Ginis. For the DHS and Afrobarometer, this lack of correlation is almost certainly due to the fact that the indirect measures of income lump all individuals who are relatively well-to-do into the same “income” category, when in fact there are certainly large income differences across such individuals. The greater the “high income” inequality, the more these surveys will underestimate total inequality. For the CSES, the use of quintiles to measure income essentially ensures no correlation with the WDI Gini. In the bottom panel, the correlations are stronger, particularly for the HES. But even the correlation between the HES Gini and the WDI Gini is quite noisy in countries with a Gini greater than about .30.

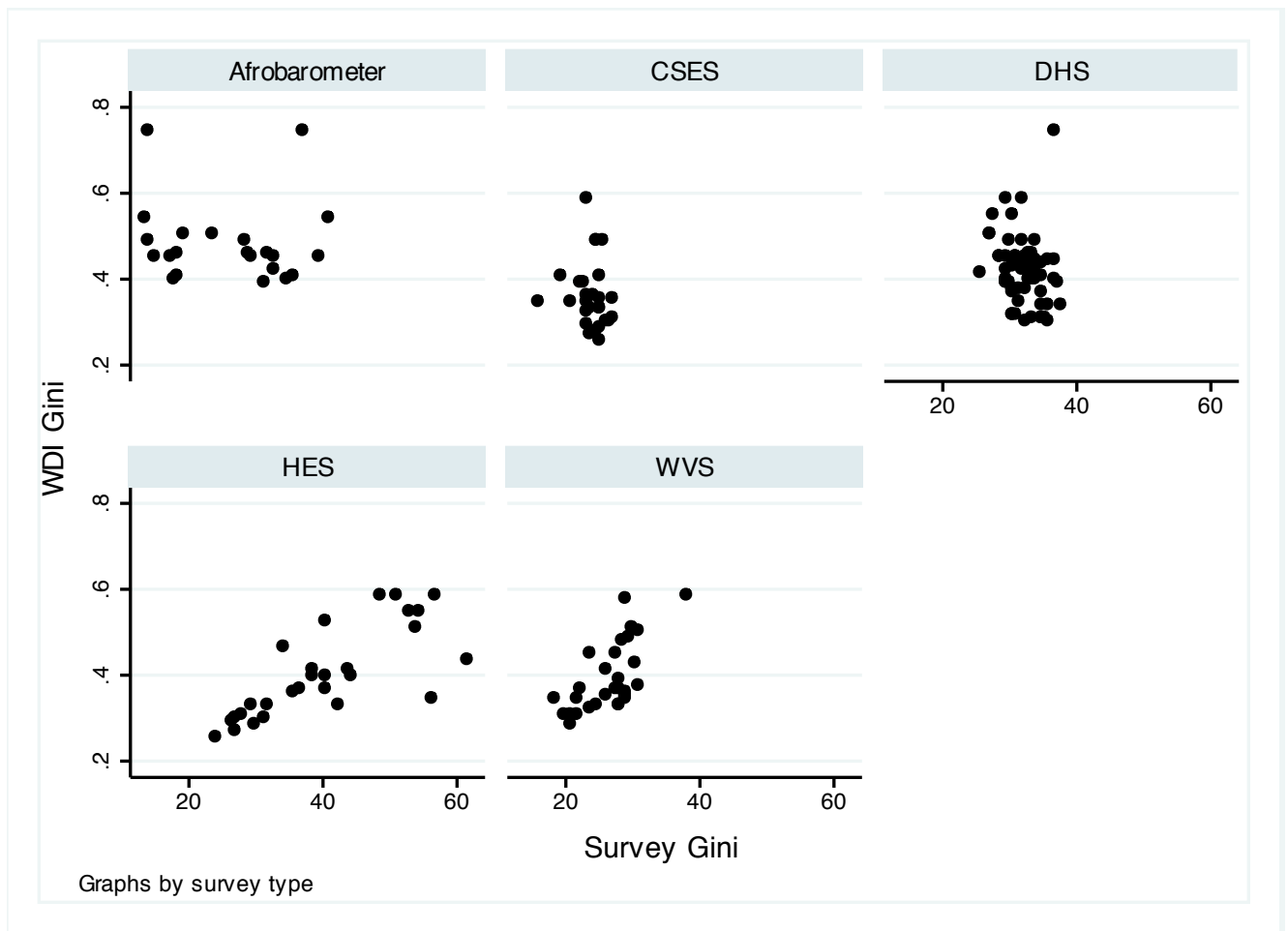


Figure 3: WDI Gini v. Survey-based Gini

Given these HES surveys represent the best data we are able to uncover for household income, it raises the question how well the WDI Gini measures inequality, a question that is beyond the scope of what we can explore here.

Our goal, of course, is to measure the three components of the Gini, not the Gini itself. If the various measures of income are accurately correlated with group identity across the surveys, then even surveys like CSES and DHS will provide useful information about the relative importance of BGI and WGI across countries. But it is important to understand and account for possible biases caused by the way that income is measured in particular surveys. To this end, we can use the HES as a benchmark. The surveys we call HES provide the best possible information available to social scientists about the income distributions in particular societies, given the care that they take in obtaining representative samples, as well as in the measurement of household income or expendi-



ture. They can therefore be used to evaluate biases in measures from the non-HES surveys. First consider biases in the measurement of BGI. Model 1 in Table 2 presents the results from a regression where BGI is the dependent variable. The independent variables include indicator variables for each country, indicator variables for regions (with Africa as the omitted category), and indicator variables for the five types of surveys (with HES as the omitted category). The coefficients on the survey indicators are therefore estimated from within-country variation, controlling for region (given that the survey categories are correlated with region). They measure the average difference between each survey type and the benchmark HES surveys.

All of the non-HES surveys underestimate BGI (relative to the HES estimates), with a particularly large underestimate found in the Afrobarometer surveys. This result for the Afrobarometer is unsurprising given that the indirect measure of “income” is based on a relatively small number of variables in those surveys. Note that the mean and standard deviation of BGI are .051 and .046 respectively, implying that the “underestimate” in the Afrobarometer is non-trivial in size. The other surveys have underestimates that are relatively similar to each other, though it is interesting to note that the CSES produces the estimates closest to those of the HES. Thus, even though CSES income is measured in quintiles (making estimates of Gini meaningless), the between-group incomes differences from these surveys reflect relatively well the between-group differences found in the best surveys available.

Model 2 is the same as Model 1 except that WGI is the dependent variable. Again, each of the surveys underestimates polarization relative to the estimates using the HES surveys. But there is not too much difference across the surveys, each of which have a coefficient between  $-.070$  and  $-.106$ . The mean/SD of WGI is  $.163/.085$ . Finally, model (3) presents the results for Overlap. Again, the non-HES surveys tend to underestimate Overlap, with the greatest underestimates found in the Afrobarometer surveys.

## **4 An empirical description of the three components of the Gini**

We now describe the three components of the Gini. The analysis in Table 2 suggests taking the means of the raw data would give an inaccurate picture because the various surveys underestimate to different degrees the actual components of inequality relative to our most accurate surveys, the

Table 2: Regressing group-based measures of inequality on survey indicator variables

	(1)	(2)	(3)
	DV=BGI	DV=WGI	DV=Overlap
Afrobarom	-0.073*** (0.024)	-0.080*** (0.026)	-0.064* (0.037)
CSES	-0.036** (0.016)	-0.106*** (0.026)	-0.023* (0.014)
DHS	-0.044** (0.019)	-0.070*** (0.025)	-0.043 (0.032)
WVS	-0.043** (0.018)	-0.085*** (0.023)	-0.033 (0.021)
East Europe	-0.050*** (0.016)	0.201*** (0.026)	-0.077*** (0.014)
Latin America	-0.016 (0.018)	0.096*** (0.023)	0.028 (0.021)
Middle East	-0.031 (0.019)	0.228*** (0.025)	-0.078** (0.032)
Neo-Europe	-0.033*** (0.010)	0.179*** (0.014)	-0.083*** (0.009)
East Asia	-0.006 (0.018)	0.225*** (0.023)	-0.094*** (0.021)
South Asia	-0.016 (0.018)	0.061** (0.023)	-0.004 (0.021)
Constant	0.104*** (0.000)	0.070*** (0.000)	0.169*** (0.000)
Country indicator variables	Yes	Yes	Yes
R-squared	0.759	0.861	0.713
N	175	175	175

Note: OLS coefficients with standard errors clustered by country.  
The omitted region is Africa and the omitted survey is HES.  
\* p<.10, \*\* p<.05, \*\*\* p< .01

HES. In the statistical models that we estimate below, where we regress inequality on democracy, we can address this problem by including survey and region indicator variables on the right-hand side. But here, where we wish to examine the means of the variables themselves, we can use the estimates in Table 2 to adjust the scores for the components. Our best estimate of how much the Afrobarometer surveys underestimate BGI, for example, is the Afrobarometer coefficient in Model 1 of table 2, which is  $-.073$  and which represents the mean difference (using within-country variation) between Afrobarometer surveys and the best surveys available, HES. Thus, if we add  $.073$  to each Afrobarometer measure of BGI, we should be closer to the true BGI. For each non-HES survey, we can adjust the measures of BGI, WGI and O in the same fashion, adding the absolute value of the relevant coefficients to the original measures. Table 3 shows for each survey type, the average of each of the three components of the Gini, as well as the average proportion of total inequality for each component, using the adjusted data. Looking at the far right right column, which gives the total for all surveys, the average BGI is  $.090$ , a bit smaller than Overlap's average of  $.123$  and much smaller than the average WGI,  $.232$ . On average across all surveys, 19.3 percent of the Gini is due to between-group economic differences, compared with 27.3 percent for Overlap and 53.4 percent for WGI. The table also shows that these proportions vary somewhat across the different survey types. BGI is highest in the Afrobarometer, which is not surprising as the African countries have tremendous ethnic diversity coupled with high levels of inequality. In the highest-quality surveys, HES, 14.7 percent of inequality is due to between group differences, while 65 percent of inequality due to within-group differences.

Table 4 shows the correlation matrix for the three components, along with Gini and ELF. Several points are worth highlighting:

- ELF is positively correlated with Gini. More ethnically fragmented societies are also more unequal.
- ELF is very strongly correlated with each component of the Gini. This correlation is positive for Overlap and BGI, and is negative for WGI.
- Overlap and BGI are positively correlated with each other and are negatively correlated with WGI.

Table 3: Decomposition of Gini by survey type using adjusted data

	HES	Afrobarometer	DHS	CSES	WVS	All surveys
BGI	.069 (.147)	0.120 (0.253)	0.112 (0.232)	0.054 (0.133)	0.068 (0.157)	0.090 (0.193)
WGI	.245 (.650)	0.167 (0.350)	0.220 (0.460)	0.280 (0.684)	0.257 (0.600)	0.232 (0.534)
Overlap	.090 (.202)	0.193 (0.397)	0.150 (0.310)	0.074 (0.183)	0.104 (0.243)	0.126 (0.272)

Note: Cells show the mean level of each variable and the numbers in parentheses show the average proportions of the total Gini.

- The Gini, whether using the measure from WDI or the adjusted Gini from the surveys, is positively correlated with Overlap and BGI but is negatively correlated with WGI.

Table 4: Cross-correlation table of adjusted components of Gini

Variables	ELF	Gini(WDI)	Gini(survey)	BGI	Within	Overlap
ELF	1.000					
Gini(WDI)	0.405	1.000				
Gini(survey)	0.398	0.373	1.000			
BGI	0.736	0.527	0.652	1.000		
Within	-0.863	-0.311	-0.096	-0.622	1.000	
Overlap	0.826	0.341	0.616	0.627	-0.766	1.000

There is a simple explanation for why WGI is the largest component of the Gini but has no correlation – or even a negative one – with the Gini. Given the extremely strong negative correlation of WGI and ELF and the positive correlation of ELF and Gini, it is difficult to say anything about the relationship between WGI (or any component of the Gini) and Gini itself without controlling for ELF. Consider the simple regressions in Table 5. Model 1 regresses Gini on ELF, indicator variables for each survey, and regional indicator variables. Each of models 2-4 add one of the three Gini decomposition variables. In Model 1, ELF has a positive and precisely estimated coefficient. When BGI is added to the regression (model 2), the overall fit of the model improves considerably, but the coefficient on BGI, though positive, is not measured precisely. The same is true for the coefficient on ELF. By contrast, when WGI (model 3) is added to model 1, WGI has a positive and precisely

estimated coefficient, as does ELF, suggesting the negative bivariate correlation is simply an artifact of not controlling for ELF. When *Overlap* is added to the model, the coefficient has the wrong sign, though it is small and very imprecisely measured – *O* indeed seems like a noisy residual. Thus, *WGI* is the component with the strongest correlation with *Gini*, though we have to control for ELF to see this correlation.

## **5 OLS models regressing group-based inequality measures on democracy.**

We now turn to the principal task of this paper, which is to estimate the empirical relationship between the various components of inequality and democracy. This section presents OLS models, treating each survey as the unit of analysis and estimating the coefficients on democracy when democracy is measured in the same year as the survey. All of the models include two core controls: (1) ELF (measured by Fearon) and (2) the Gini (measured by the World Development Indicators). Given the differences across the surveys demonstrated above, as well as the correlation of the surveys with geography, all models also include regional indicators and survey indicators. In each model, the excluded region is Africa and the excluded survey is HES. To facilitate comparisons of the size of the coefficients, all of the continuous variables are standardized to have a mean of 0 and standard deviation of 1. The models are estimated using OLS with standard errors clustered by country.

Table 6 presents models where *BGI* is the dependent variable and the measure of democracy is *Polity2*. *Polity2* is measured on a 21 point scale, and we might expect that the relationship between democracy and any form of inequality to be non-linear, with diminishing effects of democracy as the scale approaches its highest values, where the most robust democracies are clustered. We therefore consider both linear and logarithmic specifications of *Polity2*. In model 1, all available surveys are used, only the core control variables are included, and the linear specification of *Polity2* is included. *Polity2* has a negative and precisely estimated coefficient, ELF has a positive and precisely estimated coefficient, and *Gini* has a positive coefficient that is not particularly precisely estimated. Model 2 is identical to model 1 except that it uses the natural log of *Polity* as the measure of democracy. The results are virtually identical to those in model 1. In the other models

Table 5: Regressing Gini on ELF and the adjusted measures of BGI, WGI and O

	(1)	(2)	(3)	(4)
ELF	0.152*** (0.034)	0.001 (0.044)	0.082** (0.038)	0.053 (0.041)
BGI		0.255 (0.276)		
WGI			0.219** (0.089)	
Overlap				-0.131 (0.147)
Afrobarom		0.069* (0.039)	0.069** (0.027)	0.048** (0.024)
CSES		-0.002 (0.014)	0.009 (0.014)	-0.014 (0.011)
DHS		0.009 (0.014)	0.013 (0.012)	-0.001 (0.012)
WVS		0.014 (0.015)	0.020 (0.013)	0.001 (0.010)
East Europe		-0.069*** (0.019)	-0.085*** (0.019)	-0.080*** (0.022)
Latin America		0.105*** (0.023)	0.101*** (0.023)	0.104*** (0.025)
Middle East		-0.071** (0.035)	-0.081** (0.036)	-0.077** (0.037)
Neo-Europe		-0.065*** (0.024)	-0.077*** (0.024)	-0.078*** (0.027)
East Asia		0.002 (0.036)	-0.002 (0.033)	0.000 (0.035)
South Asia		-0.096*** (0.021)	-0.110*** (0.022)	-0.105*** (0.022)
Constant	0.330*** (0.019)	0.398*** (0.030)	0.335*** (0.042)	0.412*** (0.032)
Adj. R-squared	0.159	0.594	0.595	0.590
N	175	175	175	175

Note: OLS coefficients with standard errors clustered by country.  
 \* p<.10, \*\* p<.05, \*\*\* p<.01

we estimate, very similar results are obtained using both the linear and logged versions of Polity2. In what follows, we report the results for the linear specifications.

Democracy, of course, is correlated with a wide range of other variables, and it is important to include further controls to improve confidence that the relationships in models 1 and 2 are not spurious. Model 3 therefore includes the following controls:

- *National wealth* (measured as the log of GDP/capita using data from the World Development Indicators). Previous research (e.g., Barro 2000) shows an inverse-U relationship between economic growth and inequality (the Kuznets curve), though for most of the countries in the data here, the relationship is likely in the positive range (see Barro 2008). Barro's results are not about inequality between groups, but to the extent that such inequality is correlated with BGI, it is important to control for national wealth.
- *Cultural Fractionalization* ("CF") (taken from Fearon 2003). This is a measure of the cultural difference between groups based on the degree of linguistic differences between groups.<sup>8</sup> Scholars have argued that group-based discrimination and conflict should be largest when cultural differences between groups are largest (e.g., Fearon 2003 and Desmet et al 2009).
- *Geographic Isolation* (of groups). Since at least the 1930s, sociologists have studied and debated whether inter-group contact increases or decreases prejudice and discrimination.<sup>9</sup> Geographic Isolation is based on the "Isolation" variable used by scholars of residential segregation (see Massey and Denton 1988, 288). The measure uses the region variable available in most surveys to construct this variable, which increases as groups become more isolated in their own region. If intergroup contact decreases discrimination, then the variable should have positive coefficient (i.e., as groups are more regionally isolated from each other, contact declines, and discrimination should increase).<sup>10</sup>
- *Natural resource wealth*. There is considerable evidence of a positive correlation between resource wealth and civil conflict, and one reason for such a relationship is that resource

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<sup>8</sup>Details are in Fearon (2003) and are discussed in Baldwin and Huber (2010).

<sup>9</sup>See Pettigrew and Tropp (2006) for a recent meta-analysis of research on the "contact hypothesis," which maintains that inter-group conflict and discrimination diminishes as individuals interact more with individuals from outside their group. Their study lends support to this view.

<sup>10</sup>Details on variable construction are found in Baldwin and Huber 2010.

Table 6: OLS models regressing BGI on Democracy (Polity2)

	All data	All data	All data	Omit Afrobarometer	DHS & HES only	DHS only
	(1)	(2)	(3)	(4)	(5)	(6)
Polity2	-0.178*** (0.063)		-0.206*** (0.060)	-0.193*** (0.056)	-0.234*** (0.085)	-0.183** (0.071)
Polity2(ln)		-0.157*** (0.056)				
Geo.Isol.			-0.128 (0.087)	-0.099 (0.096)	-0.051 (0.187)	-0.022 (0.180)
(ln)GDP			0.057 (0.058)	0.130 (0.109)	0.203 (0.199)	0.355 (0.248)
Nat. Resources			-0.081* (0.043)	-0.087** (0.042)	-0.172*** (0.055)	-0.168*** (0.061)
ELF	0.588*** (0.079)	0.591*** (0.081)	0.286** (0.137)	0.209 (0.167)	0.466 (0.279)	0.567* (0.323)
Gini	0.140 (0.098)	0.137 (0.098)	0.153** (0.073)	0.296* (0.164)	0.330* (0.193)	0.286 (0.212)
East Europe	-0.179 (0.252)	-0.206 (0.257)	-0.187 (0.266)	-0.230 (0.293)	-0.008 (0.377)	0.340 (0.370)
Latin America	0.481 (0.304)	0.450 (0.301)	0.431 (0.281)	0.140 (0.377)	0.365 (0.444)	-0.246 (0.447)
Middle East	-0.190 (0.209)	-0.184 (0.208)	-0.236 (0.216)	-0.316 (0.244)	0.195 (0.372)	0.346 (0.560)
Neo-Europe	-0.005 (0.259)	-0.072 (0.252)	-0.038 (0.277)	-0.172 (0.310)	-0.126 (0.548)	
East Asia	0.295 (0.216)	0.264 (0.221)	0.106 (0.231)	-0.089 (0.311)	0.463 (0.420)	0.678 (0.517)
South Asia	-0.207 (0.174)	-0.229 (0.178)	-0.184 (0.200)	-0.157 (0.238)	0.346 (0.383)	0.557 (0.491)
Afrobarometer	-1.159*** (0.327)	-1.158*** (0.331)	-1.051*** (0.379)			
CSES	-0.755*** (0.211)	-0.754*** (0.211)	-0.787*** (0.233)	-0.780*** (0.226)		
DHS	-0.511* (0.268)	-0.492* (0.272)	-0.595* (0.319)	-0.544 (0.335)	-0.718 (0.459)	
WVS	-0.864*** (0.217)	-0.850*** (0.217)	-0.905*** (0.234)	-0.869*** (0.238)		
CF			0.230** (0.112)	0.262** (0.127)	0.297* (0.159)	0.368** (0.162)
Constant	0.579** (0.282)	0.593** (0.286)	0.638* (0.324)	0.702** (0.344)	0.649 (0.461)	-0.012 (0.273)
R-squared	0.63	0.62	0.66	0.69	0.66	0.67
N	175	175	163	141	88	69
No. of countries	81	81	75	71	48	35

OLS coefficients with clustered standard errors (by country).

\* $p < .10$ , \*\* $p < .05$ , \*\*\* $p < .01$



wealth leads to inter-group grievances and to conflict to control wealth (see discussion in Ross 2004). We might therefore expect that resource wealth will lead higher inter-group inequality as groups strive to control the resource wealth. Natural resource wealth is total value of coal, oil, natural gas and mineral per capita and is taken from Haber and Menaldo (2011).

Model 3 adds each of these four control variables to Model 1. The coefficient on Polity2 remains negative and precisely estimated, and increases slightly in size relative to model 1. The coefficient for ELF remains positive and precisely estimated, but is much smaller than in model 1. Considering the other controls, we find that larger cultural differences between groups are associated with greater between-group inequality, and that greater geographic isolation of groups is associated with lower BGI. National wealth is associated with more between-group inequality, though this effect is not precisely estimated.<sup>11</sup> And greater natural resources are associated with less between-group inequality, the opposite that one might expect if one believes that such resources spark grievances and stronger efforts by groups to control wealth.

Before discussing these results further, it is important to assess their robustness, which we do here by estimating model 3 using different subsets of the data. In model 4, we remove the Afrobarometer surveys, which have the largest underestimates of BGI. Model 5 removes the three surveys for which the income variables are most coarse – Afrobarometer, CSES and WVS (and thus estimates the model using only DHS and HES). And Model 6 uses only the DHS surveys, which provide the greatest number of surveys using the same “income” metric.

The results show that across all models, Polity2 has a stable, negative and precisely estimated coefficient. The other two control variables (besides ELF), that are consistently estimated with precision are Cultural Fractionalization and natural resource wealth. The Geographic Isolation of groups has a consistently negative sign, but the coefficient is usually estimated with considerable error. And GDP’s coefficient is consistently positive but is also not measured precisely. To further assess the robustness of the results, we re-estimated the models in Table 6, but using two different measures of democracy, Freedom House’s “Political Rights” score and Freedom House’s “Civil Liberties” score. The substantive results for these models are extremely similar to those in Table 6.

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<sup>11</sup>We also estimated the model with a linear and quadratic term for GDP, and the coefficients for both variables were estimated with considerable error while the results for Polity2 were unaffected.

Next consider the association between democracy and the other two elements of the Gini decomposition, WGI and O. Table 7 presents the results from estimating the same models as those in Table 6, but using within-group inequality as the dependent variable. Across all the models, the coefficient is *positive*, suggesting that if anything, democracy is associated with greater within-group inequality. But this effect is measured very imprecisely. Table 8 presents the models when the dependent variable is the overlap component of the Gini. There is a positive coefficient in four of the six models, although all coefficients are very imprecisely measured. We have also regressed the Gini coefficient itself on Polity2 and in these models the coefficient on Polity2 always has a very large standard error and the sign of the coefficient is *positive* in 5 of the 6 models.

## 6 A causal effect of democracy on between-group inequality?

The robust negative association between democracy and BGI, along with the null relationship between democracy and within-group inequality and overlap, suggest that if democracy affects the politics of inequality, it is through the effect of democracy on inequality between groups. But given the possibility of omitted variables that may be correlated with democracy, it is not possible to have confidence that democracy causes a reduction in between-group economic differences. Moreover, there are good reasons to suspect that inequality may in fact affect the level of democracy. Houle (2009), for example, finds that while general inequality does not affect the probability of democratization, it does affect the ability of democracies to consolidate. This section therefore explores whether there could be a causal effect of democracy on between-group inequality using two strategies. First we regress the BGI on lagged democracy scores. Second we estimate models using two-stage least squares with a new instrument for democracy.

Consider the regressions with lagged democracy scores. Since current BGI cannot cause past democracy, if the coefficients on democracy are precisely estimated, we can have greater confidence that the direction of causation works from democracy to between-group inequality. We estimate model 3 from Table 6 using the lagged value of democracy instead of the democracy score in the year of the survey. Since it is not clear what the duration of the lag should be, we estimated 7 different models, each with a different Polity2 lag, with these lags ranging from year  $t - 1$  through year  $t - 7$ . Figure 4 plots the results for the Polity2 coefficients. The graph shows the value of the

Table 7: OLS models regressing Within-group Inequality on Democracy (Polity2)

	All data	All data	All data	Omit Afrobarometer	DHS & HES only	DHS only
	(1)	(2)	(3)	(4)	(5)	(6)
Polity2	0.015 (0.039)		0.037 (0.035)	0.018 (0.036)	0.025 (0.049)	0.035 (0.040)
Polity2(ln)		0.017 (0.039)				
ELF	-0.691*** (0.058)	-0.691*** (0.058)	-0.603*** (0.087)	-0.643*** (0.102)	-0.402** (0.185)	-0.403* (0.211)
Gini	0.096 (0.064)	0.096 (0.064)	0.050 (0.051)	0.116 (0.072)	0.092 (0.093)	-0.075 (0.074)
CF			0.014 (0.048)	0.016 (0.056)	-0.014 (0.089)	-0.081 (0.081)
Geo.Isol.			0.163*** (0.051)	0.175*** (0.054)	0.254*** (0.078)	0.422*** (0.125)
(ln)GDP			-0.001 (0.050)	-0.072 (0.071)	-0.108 (0.150)	0.079 (0.106)
Resources			0.036 (0.032)	0.040 (0.028)	0.058 (0.052)	-0.009 (0.027)
East Europe	0.743*** (0.169)	0.745*** (0.168)	0.735*** (0.165)	0.771*** (0.164)	0.961*** (0.258)	0.734*** (0.227)
Latin America	0.422** (0.192)	0.421** (0.191)	0.520*** (0.179)	0.490** (0.215)	0.520* (0.277)	0.233 (0.207)
Middle East	0.522*** (0.195)	0.525*** (0.196)	0.504*** (0.184)	0.516*** (0.194)	1.012*** (0.328)	0.298 (0.266)
Neo-Europe	0.473** (0.207)	0.474** (0.202)	0.370 (0.223)	0.497** (0.234)	0.225 (0.540)	
East Asia	0.446** (0.170)	0.450** (0.171)	0.410** (0.171)	0.346* (0.192)	0.793** (0.310)	0.297 (0.308)
South Asia	0.595** (0.284)	0.596** (0.282)	0.470 (0.307)	0.470 (0.298)	1.217*** (0.306)	0.558* (0.288)
Afrobarom	-0.770*** (0.200)	-0.773*** (0.199)	-0.619*** (0.234)			
CSES	-1.090*** (0.164)	-1.091*** (0.164)	-1.013*** (0.183)	-0.997*** (0.183)		
DHS	-0.535*** (0.183)	-0.537*** (0.183)	-0.298 (0.225)	-0.326 (0.220)	-0.644** (0.258)	
WVS	-0.915*** (0.167)	-0.916*** (0.168)	-0.796*** (0.199)	-0.808*** (0.198)		
Constant	0.301 (0.191)	0.302 (0.190)	0.146 (0.234)	0.143 (0.232)	0.288 (0.312)	0.055 (0.160)
R-squared	0.809	0.809	0.818	0.817	0.867	0.933
N	175	175	163	141	88	69
No. of countries	81	81	75	72	48	35

OLS coefficients with clustered standard errors (by country).

\* $p < .10$ , \*\*  $p < .05$ , \*\*\*  $p < .01$

Table 8: OLS models regressing Overlap on Democracy (Polity2)

	All data	All data	All data	Omit Afrobarometer	DHS & HES only	DHS only
	(1)	(2)	(3)	(4)	(5)	(6)
Polity2	-0.007 (0.051)		0.070 (0.044)	0.048 (0.046)	0.029 (0.060)	-0.015 (0.068)
Polity2(ln)		0.000 (0.043)				
ELF	0.635*** (0.065)	0.635*** (0.065)	0.481*** (0.109)	0.539*** (0.133)	0.280 (0.216)	0.076 (0.242)
Gini	-0.069 (0.061)	-0.070 (0.061)	-0.042 (0.051)	-0.061 (0.075)	0.002 (0.108)	0.011 (0.134)
CF			-0.017 (0.072)	-0.080 (0.088)	-0.063 (0.131)	-0.009 (0.134)
Geo.Isol.			-0.236** (0.092)	-0.237** (0.093)	-0.417*** (0.135)	-0.574*** (0.159)
(ln)GDP			-0.104 (0.066)	-0.254** (0.107)	-0.389* (0.218)	-0.403** (0.191)
Resources			0.050 (0.051)	0.054 (0.049)	0.079 (0.088)	-0.005 (0.058)
East Europe	-0.899*** (0.223)	-0.901*** (0.224)	-0.612*** (0.170)	-0.482** (0.203)	-0.645** (0.313)	-0.725* (0.359)
Latin America	-0.657** (0.291)	-0.663** (0.291)	-0.553** (0.269)	-0.367 (0.271)	-0.451 (0.312)	-0.541 (0.342)
Middle East	-0.553*** (0.196)	-0.548*** (0.195)	-0.338* (0.187)	-0.224 (0.221)	-0.373 (0.393)	-0.528 (0.531)
Neo-Europe	-1.019*** (0.284)	-1.028*** (0.282)	-0.626** (0.247)	-0.319 (0.294)	-0.050 (0.535)	
East Asia	-0.737*** (0.201)	-0.736*** (0.199)	-0.619*** (0.191)	-0.514** (0.223)	-0.779** (0.347)	-0.976** (0.477)
South Asia	-0.541** (0.241)	-0.542** (0.240)	-0.269* (0.160)	-0.258 (0.184)	-0.301 (0.331)	-0.411 (0.495)
Afrobarom	-0.816*** (0.307)	-0.819*** (0.308)	-0.469* (0.268)			
CSES	-0.352** (0.140)	-0.354** (0.141)	-0.192 (0.127)	-0.186 (0.128)		
DHS	-0.532** (0.258)	-0.532** (0.256)	-0.351 (0.212)	-0.416* (0.211)	-0.506** (0.233)	
WVS	-0.298* (0.174)	-0.299* (0.174)	-0.159 (0.141)	-0.214 (0.143)		
Constant	0.926*** (0.281)	0.929*** (0.283)	0.577*** (0.218)	0.506** (0.216)	0.551** (0.252)	0.013 (0.300)
R-squared	0.705	0.705	0.730	0.790	0.778	0.787
N	175	175	163	141	88	69
No. of countries	81	81	75	72	48	35

OLS coefficients with clustered standard errors (by country).

\* $p < 10$ , \*\*  $p < .05$ , \*\*\*  $p < .01$

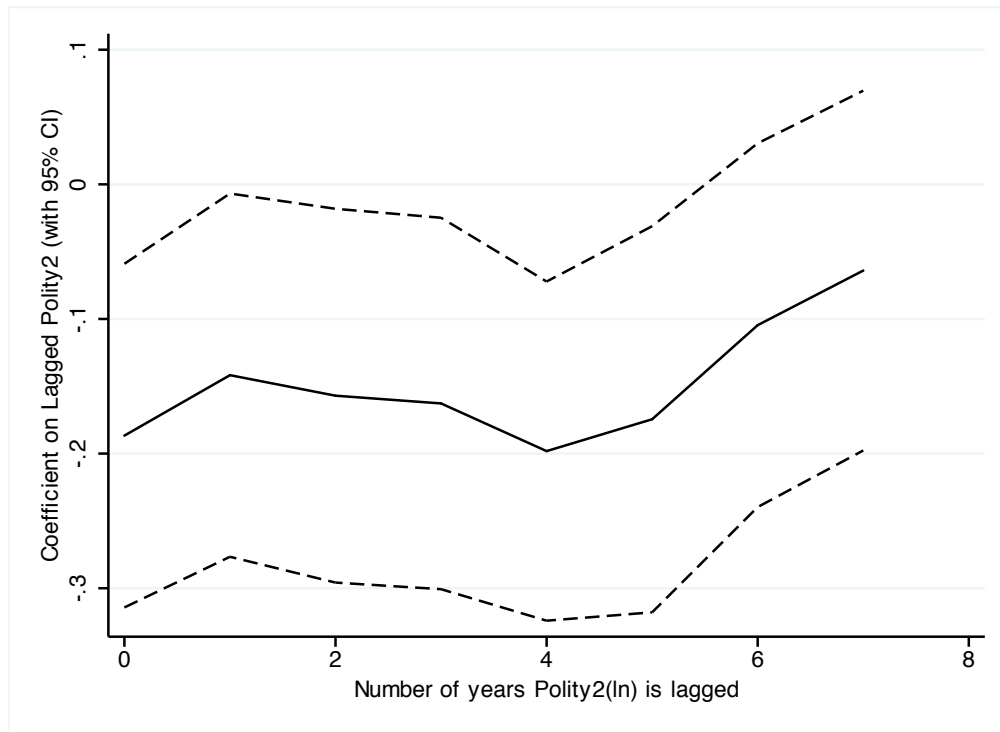


Figure 4: Coefficients for lagged Polity2 using Model 3 in BGI regressions

Polity2 coefficient (with the 95-percent confidence) for the 7 different lags that we examined, as well as for the current year (i.e., model 3 itself). We can see that for each of the lags in the first five years the coefficient remains relatively constant, negative and precisely estimated. This provides support for the possibility of a causal effect of democracy on BGI. By years  $t - 6$  and  $t - 7$  the coefficient is no longer significantly different than zero.

While these regressions with lagged democracy provide some evidence of a causal effect of democracy, it is important to bear in mind their limitation. For many countries the democracy scores during the period of our data do not change – for the lag  $t - 5$ , for example, Polity2 equals the lagged polity score for 43 percent of the surveys. This implies that a non-trivial amount of variation in these tests remains linked to cross-sectional differences. It is therefore important to pursue additional strategies in efforts to pin down a causal effect. To this end, we estimate two-stage least squares models using a new instrument for democracy.

The instrument, “Regional Polity at Regime Inception” (RPRI), measures the average *regional* Polity2 score (using the regions defined in Haber and Menaldo 2011) at the time that the country’s regime began (using Polity2’s date for the beginning of the regime), but excluding the

country for which the measure is being calculated. For example, one of the surveys in the data set is from Finland in 2003. According to Polity2, the regime in place in Finland in 2003 began in 1944. The average Polity2 score for *all* countries (not just those countries in our sample) *except* Finland in Finland's (neo-Europe) region in 1944 is 4.25, which is the score assigned to Finland's 2003 survey for RPRI.<sup>12</sup>

The instrument is inspired by Knusten (2011), who draws on Huntington (1991) to argue that we can exploit the fact that democratization often occurs in waves to develop an instrument for democracy. For each democratization wave, there are geopolitical events that lead to regime change in groups of countries. These events include the revolutions in the US and France (wave 1) and the allied victory in WWII (wave 2). The third wave, Huntington argues, started in the mid-1970s in Spain and Portugal, and continued through the 1990s with the fall of the Soviet Union. Such geopolitical factors can directly lead to democratization, such as in Germany and Japan following the war or in many central European countries following the Soviet Union's demise in 1989. But contagion effects are also very important, and they need not be linked to Huntington's purported waves. At least since Starr's (1991) study, scholars have argued the democratization often works via diffusion in the international system, where regional neighbors copy each other, as may be going on currently in several countries in the Middle East region.<sup>13</sup>

Reverse causation is obviously impossible with this instrument, as a country's democracy score today obviously cannot affect regional democracy scores in the past. The larger concern is that RPRI might be affecting BGI through some channel other than democracy. To the extent that the democracy score for a country at the time that its regime begins is affected by geopolitical factors unrelated to regional concerns about between group inequality – and we have found no arguments about between group inequality in regime choice – it seems highly plausible that an instrument based on regional democracy at the time of regime choice satisfies the exclusion restriction. But even if the geopolitical events and regional contagions were driven by concerns unrelated to between-group inequality, one might still be concerned that the exclusion restriction will be violated if regions share other unmeasured traits that affect their levels of between-group inequality at the time of regime choice. But this should not be particularly worrisome for two reasons. First,

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<sup>12</sup>It is not possible to operationalize this instrument with any of the Freedom House scores because the Freedom House time series is too short.

<sup>13</sup>See, for example, Kopstein and Reilly (2000), Gleditsch, Skrede and Ward (2006), and Leeson and Dean (2009).

we have uncovered no argument or evidence that regional episodes of regime choice are driven by any factors other than democracy that would affect between-group economic inequality. For example, we have yet to identify regional concerns after the war in Europe that simultaneously would affect regime choice and between-group inequality in that region. Of course, as with any instrument, such factors could exist yet remain unidentified. But second, and more importantly, if there exist unmeasured regional traits that affect between-group inequality through channels other than democracy, the effects of such unmeasured traits should be captured by the regional indicator variables, which are included in both stages of the 2SLS estimations. We feel that there is a plausible case to be made, then, that the instrument based on the level of regional democracy at the time of regime inception affects between-group economic differences only through democracy.

Although RPRI is motivated by arguments in Knutsen (2011), his actual instrument is quite different than RPRI. Knutsen uses an indicator variable called "Wave" which is based on whether the country's regime began during one of Huntington's three waves of democratization. Here, since RPRI uses regional Polity2 averages at the time of regime inception, the instrument captures *regional contagion*.<sup>14</sup> And by using the Polity2 regional averages, we not only have a more fine grained measure than a 0-1 indicator variable, we also avoid the need to arbitrarily define the year-based cut-points for the three waves.<sup>15</sup>

The top of Table 9 gives the results for RPRI from the first-stage regression models in the two-stage least-squares models. In these models we obtain stronger instruments when using the logged version of the instrument, and we report the results with this specification, using the standardize value of the log of Polity2 (and the standardize value of the log of RPRI). Although to conserve space the table presents the first-stage results for only RPRI, the first stage regressions of course include all other regressors as well, including the regional indicators. We estimate the 2SLS models using the same specifications as in Table 6 and using standard errors clustered by country. The instrument is weakest in the model with no controls ( $p=.11$ ). In all other models RPRI(ln) is a strong estimate, with positive first-stage coefficients that are quite precisely estimated.

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<sup>14</sup>A variable constructed to take the average value of world polity at the time of regime inception has a very weak correlation with Polity2 in our data.

<sup>15</sup>To measure his "Wave" instrument, Knutsen defines the "inter-wave" periods as 1922-42, 1958-75, or after 1999, with all other years following a wave. When Wave is used as an instrument here, the first stage estimates have large standard errors and have the wrong sign (with regimes beginning between Huntington's three waves having higher estimated Polity2 scores than those of regimes beginning during one of Huntington's waves).

The second stage results indicate a negative effect of democracy on between-group inequality across all five models. The coefficient on the Polity2 instrument is the least precisely estimated in model 1 (where the instrument is weakest). In all models including the extended set of controls, the negative effect is relatively precisely measured, with p-values ranging from .04 to .07. And the coefficients for democracy across the 5 models are all large (in absolute value) – larger by far than in the OLS models. (Recall that all variables are standardized to facilitate comparisons of coefficients.) Using model 2, for example, a one-standard deviation change in  $\ln(\text{RPRI})$  is associated with a roughly one-half standard deviation decrease in BGI. This is far larger than any other control variable.

We also ran each of the five 2SLS regressions in Table 9 using the other measures of inequality – Gini, Within-group inequality, and Overlap – as the dependent variable. As in the OLS models above, in each model, Polity2 is never remotely significant. When WGI is the dependent variable, the coefficient on the Polity2 instrument is always positive, and when O is the dependent variable, it has a positive sign in 2 of the 6 models. Thus, the evidence here strongly suggests that any causal effect of democracy on inequality works through the effect of democracy on between-group inequality.

## 7 Discussion

We find a robust relationship between democracy and between-group inequality. There is not, however, a robust relationship between democracy and within-group inequality or between democracy and overall inequality. How could democracy be associated with lower between-group inequality but not with lower overall inequality?

If democracy created an equal benefit to all members of one or more poorer groups or an equal cost to all members of one or more richer groups, then democracy would be associated with lower BGI, but also with lower overall inequality. Since there seems to be little relationship between democracy and overall inequality, the empirical results in the previous section seem to suggest that any benefits or costs of democracy to particular groups are not born equally by members of these group. Rather, the benefits and costs must operate so as to make specific members of particular groups better or worse off. To be consistent with our findings, this could work in two ways. One



Table 9: 2SLS models regressing BGI on instrument (RPRI) for Democracy (Polity2)

	(1)	(2)	(3)	(4)	(5)
	All data	All data	Omit Afrobarometer	DHS & HES only	DHS only
<i>First stage results for instrument only</i>					
RPRI (ln)	0.305 (0.188)	0.412** (0.181)	0.458** (0.186)	0.630** (0.257)	0.583** (0.270)
<i>Second stage regression results</i>					
Polity2(ln)	-0.770 (0.490)	-0.477* (0.266)	-0.599** (0.287)	-0.488* (0.256)	-0.638* (0.334)
ELF	0.572*** (0.104)	0.321** (0.136)	0.223 (0.171)	0.505** (0.252)	0.451 (0.302)
Gini	0.179 (0.118)	0.166** (0.072)	0.358** (0.175)	0.359* (0.192)	0.405* (0.227)
CF		0.205* (0.105)	0.222* (0.117)	0.238* (0.141)	0.272* (0.161)
Geo.Isol.		-0.098 (0.096)	-0.047 (0.115)	-0.000 (0.194)	-0.148 (0.178)
(ln)GDP		0.122 (0.089)	0.147 (0.126)	0.241 (0.210)	0.322 (0.302)
Resources		-0.118** (0.057)	-0.131** (0.061)	-0.220*** (0.074)	-0.282** (0.114)
East Europe	-0.155 (0.330)	-0.245 (0.279)	-0.285 (0.337)	-0.137 (0.422)	-0.098 (0.547)
Latin America	0.945** (0.479)	0.538* (0.295)	0.293 (0.395)	0.481 (0.433)	-0.085 (0.435)
Middle East	-0.650 (0.556)	-0.539 (0.368)	-0.755* (0.410)	-0.067 (0.418)	-0.111 (0.659)
Neo-Europe	0.602 (0.576)	0.058 (0.332)	0.094 (0.422)	-0.010 (0.568)	
East Asia	0.011 (0.563)	-0.103 (0.368)	-0.426 (0.487)	0.186 (0.491)	0.146 (0.715)
South Asia	-0.146 (0.319)	-0.228 (0.215)	-0.239 (0.277)	0.277 (0.355)	0.461 (0.541)
Afrobarom	-0.758* (0.432)	-0.947** (0.428)			
CSES	-0.520* (0.304)	-0.734*** (0.236)	-0.698*** (0.234)		
DHS	-0.435 (0.335)	-0.587 (0.397)	-0.577 (0.460)	-0.693 (0.546)	
WVS	-0.750*** (0.257)	-0.869*** (0.251)	-0.841*** (0.268)		
Constant	0.275 (0.414)	0.613 (0.394)	0.670 (0.454)	0.633 (0.530)	-0.120 (0.370)
R-squared	0.339	0.581	0.531	0.554	0.421
N	175	163	141	88	69
No. of countries	81	75	72	48	35

2SLS coefficients with clustered standard errors (by country).

\* $p < 10$ , \*\* $p < .05$ , \*\*\* $p < .01$

possibility is that democracy could make the poorest individuals within a rich group worse off. This would lower BGI (by lowering the average income of a rich group) and would raise WGI (by increasing the Gini of the rich group). Alternatively, and in our view much more plausibly, democracy could improve the well-being of the richest members of poorer group. This would create greater inequality within the poor group, but would also raise this group's average income, decreasing between-group inequality.

Studies of group-oriented policies confirm that policies aimed at helping poor minority groups seem to disproportionately benefit the rich within these groups (e.g. Sowell 2004). India, for example, has numerous programs that aim to help the least advantaged groups. Affirmative action in education is one example, and research suggests that the lower-caste individuals who benefit from these programs are richer than the average lower-caste family, so that the policy does not benefit the most disadvantaged in the group (Bertrand, Hanna, and Mullainathan, 2007). In part this reflects the role that household income and family circumstances play in determining whether lower-caste candidates complete schooling and qualify to take college entrance exams (Desai and Kulkarni, 2008). Findings from Brazil's quota-based affirmative action program in universities are similar: places in universities are contingent on students completing high school and taking a common entrance exam, which favors more advantaged blacks and ethnic minorities (Smith, 2010).

The United States also has affirmative action policies that aim to alleviate between-group inequality by ensuring that sectors of society and the economy are open to groups that would be otherwise excluded by discriminatory practices. But as in India, these policies tend to mostly help the most well-off in the disadvantaged groups. Sociologists, for example, have noted a growing gap between middle-class and poorer African Americans, arguing that considering class as a life-defining trait is becoming increasingly important for black Americans as the determinative power of race ebbs for some (Landry and Marsh 2011). Indeed, the Gini coefficient among blacks has increased since the 1960 census (though this is true for all groups in the U.S. and for the country as a whole), even as the ratio to mean white income to mean black income has decreased. More generally, any anti-discriminatory program based on group identity is more likely to disproportionately benefit those above the median income of the targeted group. Most individuals who compete for admissions in education, for government contracts, or for favorable government regulations, trade decisions, or tax benefits are likely to come from the most well-off strata of their

group (whatever that group might be). So to the extent that democracy encourages some form of redistribution across groups, it likely reduces between-group income differences largely by boosting the well-being of the elite within poorer groups.

Should we expect strategic politicians in democracies to compete for votes by advocating group- rather than class-based policies? One problem with class-based strategies might be that general “rich to poor” redistribution is in fact an inefficient tool for parties seeking to build support for a majority in a democracy (Huber and Ting 2011). The benefits to each poor person from any general income-based program will be relatively low if these benefits are spread thinly across all poor people, and redistributive programs with wide eligibility also diminish the ability of politicians to claim credit for assisting their voters. Targeted redistribution programs can therefore be a much more efficient vote-seeking tool for politicians in democratic settings. Models have examined a number of ways that groups can be targeted, including geographic districts (Huber and Ting 2011), race (Austen-Smith and Wallerstein 2006), religion (Huber and Stanig 2010), or policy-specific interests like education (Levy 2005). And the policy tools for such targeting are wide ranging, and need not involve cash transfers. Politicians, for example, can require affirmative action in education and employment practices, can build government offices and industries in particular areas, can adopt agricultural price supports for specific crops, can adopt trade policies for specific goods, and can target groups for public goods through funding for schools, roads, medical care, clean water, public sanitation or other infrastructure needs.

Targeting groups obviously will not work if group members are difficult to identify (making it difficult for politicians to know to whom the benefits should be directed), or if individuals can easily select into groups (making it difficult for politicians to exclude individuals from group-based benefits). These conditions make ethnicity a particularly attractive basis for group based politics. Ethnic groups are typically easy to identify and target – they are often concentrated in particular geographic locations, but even if they are not, they usually have observable traits that are targetable. And it is normally impossible for an individual to “choose” an ethnic group, since group membership is usually based on attributes that one acquires only at birth. Of course, there is ample evidence that politicians often pursue policies that target specific ethnic groups. Ethnicity therefore provides an obvious mechanism for democratic politicians to create majorities using targeted transfers that benefit sub-groups of the poor. Democratic politicians who seek to create low-cost

majorities should therefore be expected to pursue policies that benefit one or more relatively poor ethnic groups, improving the well-being of those groups, and thus diminishing between-group inequality relative to dictatorship. And the empirical results in this paper suggest they should do so by aiding disproportionately the most well-off in the poorest groups.

The possibility of group-based politics obviously depends on the presence of sufficient ethnic heterogeneity to allow groups to be played off against each other. In the absence of such heterogeneity, group politics cannot occur, and we might expect class-based politics to prevail. Since the data used in this analysis contains a wide range of countries vis-à-vis ethnic heterogeneity, we can explore empirically whether the level of ethnic diversity mediates the democracy-inequality relationship in this way. In particular, if democracy leads to group-based politics in heterogeneous societies and class-based politics in homogeneous ones, then in societies above a threshold of ethnic diversity, there should be a negative association between democracy and BGI. And if democracy encourages class-based politics below such a diversity threshold, there should be a negative association between democracy and WGI in such countries

We regressed Gini, BGI, WGI and Overlap on Polity2, ELF and the interaction of Polity2 and ELF (along with the full set of controls used above).<sup>16</sup> Figure 5 presents graphs of the marginal effect of democracy on each of the four types of inequality at different levels of ethnic diversity. When Gini (top left) or Overlap (top right) is the dependent variable, there is no discernible association with the level of democracy at any ELF. When Gini is the dependent variable, at low ELF, the estimated effect of democracy is negative – higher levels of democracy are associated with lower Gini. At high ELF, higher levels of democracy are associated with higher levels of inequality. But across the range of ELF, the marginal effect of democracy is never precisely measured, and is never significantly different than zero. Similarly, when Overlap is the dependent variable we find that the marginal effect of democracy is always measured very imprecisely.

But the results for BGI and WGI are consistent with the idea that democracy encourages group-based politics in diverse societies and class-based politics in homogenous ones. In the graph for BGI (bottom left), we see that at any level of ELF, the estimated marginal effect of democracy is negative. But at low ELF, this effect is very small and is not statistically significant. As ELF increases, the marginal effect becomes larger (in absolute value) and this effect is quite precisely

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<sup>16</sup>We have scaled ELF from 0-100 to make the coefficients easier to read.

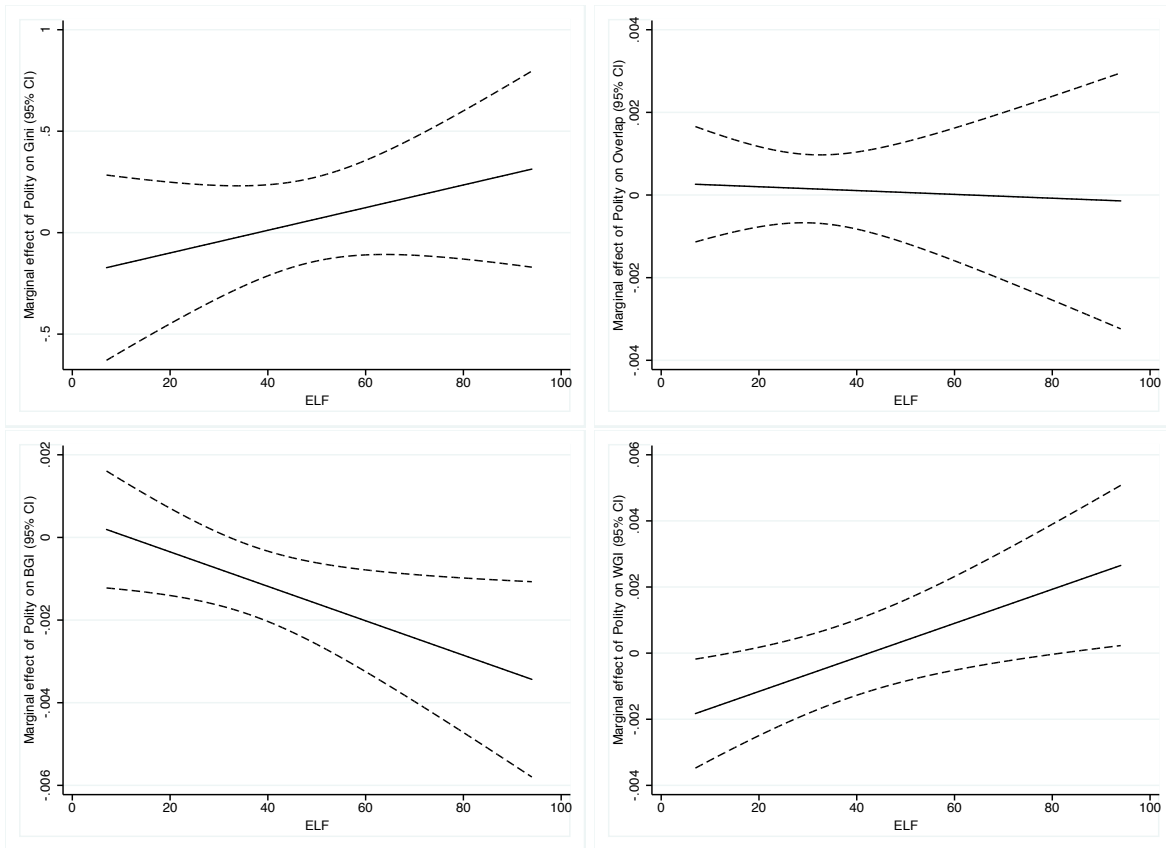


Figure 5: The marginal effect of democracy on different types of inequality at different levels of ELF

estimated when ELF is greater than about 25. In the graph for WGI (bottom right), we find the opposite. When ELF is sufficiently small, an increase in democracy is associated with a decrease in within-group inequality. But when ethnic diversity is sufficiently large – greater than roughly 30 – the estimated coefficient turns positive (albeit with a large standard error). These results are obviously only suggestive, but they are consistent with a dynamic in which electoral politics focuses on class in homogeneous societies and on group in heterogeneous ones.

## 8 Conclusion

Using a new data set, we find a robust relationship between democracy and between-group inequality, but not between democracy and within-group inequality, overlap or the Gini. The findings are consistent with political strategies that target the rich within poor groups, rather than the poor as a whole. The results are also consistent with the argument that in sufficiently heterogeneous so-

cieties, democracy encourages targeted group-based politics, with politicians seeking support from specific low-cost groups in an effort to build majorities that are not overly inclusive, as opposed to engaging in general “rich to poor” redistribution, which dilutes the value of redistribution for its recipients and which makes it more difficult for politicians to claim credit. Consistent with this idea, we find that the relationship between democracy and group-based inequality (measured by BGI) is strong in ethnically heterogeneous societies, but less so in homogeneous ones. By contrast, we find that the relationship between democracy and class-base inequality (measured by WGI) is stronger in homogeneous societies than in heterogeneous ones. That the relationship between democracy and inequality is mediated by ethnic diversity suggests that the strategies of politicians for building majorities will vary with the ethnic diversity of society.

One implication of these findings concerns the possibility of a particular pathway by which democracy may affect public goods provision. Considerable research finds that democracies produce more public goods than non-democracies (e.g., Baum and Lake 2003 and Stasavage 2005) and a recent study finds that high levels of between-group inequality are associated with lower levels of public goods provision (Baldwin and Huber 2010). If democracy leads to lower levels of between-group inequality which in turn leads to higher levels of public goods, then democracy may influence public goods provision in part by encouraging targeted group-based politics. If true, then the benefits of democracy may be distributed quite unevenly among lower income individuals from different groups.

The analysis suggests pathways for further theoretical and empirical research. Theoretical models should be able to provide insights into the circumstances under which group-based as opposed to class-based electoral strategies are optimal. Such models could focus not only on the size and number of groups, but also on the distribution of income within groups themselves. Empirical research should improve our understanding of the mechanisms by which targeting occurs. Politicians, for example, may skew the provision of public schools or roads or health care to particular groups, raising the standards of the poor within these groups while slightly increasing within-group inequality in other groups if middle income and poor voters bear a disproportionate burden in paying for such groups. Or politicians may target some groups with cultural policies while targeting others with economic benefits, with the effect of BGI reductions being offset by increases in general inequality, something that the middle class and poor who receive little economic benefits accept

in return for the cultural policies. There are no doubt other pathways as well, and it is likely that such pathways differ across countries with different institutional arrangements or different number of groups. Thus, our understanding of both democratic politics and ethnic politics will benefit from further study of how group-based targeting operates across authoritarian governments and different forms of democratic ones.

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Table 10: Countries and surveys used in data set

Country	Year	Survey type	Country	Year	Survey type
Albania	HES-LSMS	2005	Kenya	DHS	2008
Armenia	WVS	1996	Kyrgyz Republic	DHS	1997
Armenia	DHS	2000	Latvia	WVS	1999
Australia	CSES	1996	Lithuania	CSES	1997
Australia	WVS	1996	Macedonia	WVS	1999
Australia	CSES	2004	Madagascar	Afrobarometer	2005
Austria	HES-LIS	2000	Malawi	DHS	2000
Azerbaijan	HES-ASLC	1995	Malawi	Afrobarometer	2003
Azerbaijan	DHS	2006	Malawi	DHS	2004
Bangladesh	DHS	1997	Malawi	Afrobarometer	2005
Bangladesh	WVS	1999	Mali	DHS	1995
Bangladesh	DHS	2000	Mali	DHS	2001
Bangladesh	DHS	2004	Mali	Afrobarometer	2002
Bangladesh	DHS	2007	Mali	Afrobarometer	2005
Belarus	CSES	2001	Mali	DHS	2006
Belgium	CSES	1999	Mexico	CSES	1997
Belgium	WVS	1999	Mexico	WVS	1999
Benin	DHS	1996	Mexico	CSES	2000
Benin	DHS	2001	Mexico	CSES	2003
Benin	Afrobarometer	2005	Moldova	WVS	1999
Benin	DHS	2006	Moldova	DHS	2005
Bolivia	HES-MECOVI	2002	Moldova	Afrobarometer	2002
Bolivia	DHS	2003	Mozambique	Afrobarometer	2005
Botswana	Afrobarometer	2003	Namibia	DHS	2000
Botswana	Afrobarometer	2005	Namibia	Afrobarometer	2003
Brazil	DHS	1996	Namibia	Afrobarometer	2006
Brazil	WVS	1996	Netherlands	WVS	1999
Brazil	CSES	2002	New Zealand	CSES	1996
Brazil	HES-PNAD	2002	New Zealand	WVS	1996
Brazil	HES-LIS	2006	New Zealand	CSES	2002
Bulgaria	HES-IHS	1995	Nicaragua	HES-EMNV	2001
Bulgaria	CSES	2001	Niger	DHS	1992
Burkina Faso	DHS	1998	Niger	DHS	1998
Burkina Faso	HES-EP2	1998	Niger	DHS	2006
Burkina Faso	DHS	2003	Nigeria	WVS	1999
Cameroon	DHS	1998	Nigeria	Afrobarometer	2005
Cameroon	DHS	2004	Pakistan	WVS	1999
Canada	CSES	1997	Peru	DHS	2000
Canada	HES-LIS	1997	Peru	DHS	2004
Canada	WVS	1999	Peru	HES-LIS	2004
Canada	HES-IPUMS	2001	Philippines	DHS	1993
Central African Republic	DHS	1994	Philippines	DHS	1998
Chad	DHS	1997	Philippines	DHS	2003
Chad	DHS	2004	Philippines	DHS	2008
Colombia	WVS	1996	Romania	CSES	1996
Cote d'Ivoire	HES-LSMS	1988	Romania	HES-LIS	1997
Czech Republic	CSES	1996	Russia	CSES	1999
DRC	DHS	2007	Russia	CSES	2000
Dominican Republic	WVS	1996	Russia	HES-LIS	2000
Egypt	DHS	1995	Senegal	DHS	1992
Egypt	WVS	1999	Senegal	Afrobarometer	2002
Egypt	DHS	2005	Senegal	Afrobarometer	2005
Egypt	DHS	2008	Senegal	DHS	2005
Estonia	WVS	1999	Singapore	WVS	1999
Estonia	HES-LIS	2000	Slovenia	CSES	1996
Ethiopia	DHS	2000	Spain	CSES	1996
Ethiopia	DHS	2005	Spain	WVS	1999
Finland	CSES	2003	Spain	CSES	2000
Finland	HES-LIS	2004	Spain	CSES	2004
France	WVS	1999	Sweden	HES-LIS	2005
France	CSES	2002	Tajikistan	HES-LSS	1996
Gabon	DHS	2000	Tanzania	HES-HRDS	1993
Georgia	WVS	1996	Togo	DHS	1998
Germany	WVS	1999	Turkey	DHS	1993
Germany	HES-LIS	2004	UK	HES-LIS	2004
Ghana	DHS	1993	Uganda	DHS	1995
Ghana	DHS	1998	Uganda	Afrobarometer	2005
Ghana	DHS	2003	Ukraine	CSES	1998
Ghana	DHS	2008	United States	CSES	1996
Guatemala	DHS	1995	United States	HES-LIS	1997
Guatemala	DHS	1998	United States	WVS	1999
Guatemala	HES-ENCOVI	2000	United States	CSES	2004
Guatemala	HES-LIS	2006	United States	HES-IPUMS	2005
Guinea	DHS	1999	Uruguay	WVS	1996
Guinea	DHS	2005	Uzbekistan	DHS	1996
Guyana	DHS	2005	Venezuela	WVS	1999
Hungary	CSES	2002	Vietnam	DHS	1997
India	WVS	1999	Vietnam	DHS	2002
Ireland	WVS	1999	Vietnam	DHS	2005
Israel	HES-IPUMS	1995	Zambia	DHS	1996
Israel	HES-LIS	2005	Zambia	DHS	2001
Kazakhstan	DHS	1995	Zambia	Afrobarometer	2003
Kazakhstan	DHS	1999	Zambia	Afrobarometer	2005
Kenya	DHS	1993	Zambia	DHS	2007
Kenya	DHS	1998	Zimbabwe	WVS	1999
Kenya	Afrobarometer	2003	Zimbabwe	Afrobarometer	2004
Kenya	DHS	2003	Zimbabwe	Afrobarometer	2005
Kenya	Afrobarometer	2005			