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# Ethnofederalism and Ethnic Voting

## Abstract

We investigate how changes in the administrative-territorial structure affect ethnic voting. We present an event study design that exploits the 2010 constitutional reform in Kenya, which substantially increased the number of primary administrative regions. We find (i) strong evidence for a reduction in ethnic voting when administrative regions become less ethnically diverse and (ii) weak evidence for such a reduction when ethnic groups become less fragmented across regions. These results suggest that ‘ethnofederal’ reforms (leading to administrative borders that more closely follow ethnic boundaries) can mitigate ethnic politics in diverse countries.

JEL-Codes: D020, D720, H770, J150, O550.

Keywords: ethnofederalism, decentralization, territorial structure, ethnic divisions, ethnic voting, ethnic politics, Kenya.

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# 1. Introduction

National politics is ethnic politics in many ethnically diverse developing countries. Ethnic politics manifests itself in ethnic voting (Banerjee and Pande, 2007; Huber, 2012; Ichino and Nathan, 2013), favoritism (Franck and Rainer, 2012; Burgess et al., 2015; Kramon and Posner, 2016; De Luca et al., 2018), and conflict (Montalvo and Reynal-Querol, 2005; Esteban and Ray, 2008; Arbatl et al., 2020; Bazzi and Gudgeon, 2021); and it is a major reason for the poor performance of many diverse countries (Easterly and Levine, 1997). The salience of ethnicity, however, is malleable. It increases around national elections (Eifert et al., 2010) and decreases after victories of the national football team (Depetris-Chauvin et al., 2020). It also responds to propaganda (Blouin and Mukand, 2019), changes in school curricula (Miguel, 2004; Cantoni et al., 2017; Bandiera et al., 2019), and intergroup contact following large resettlement programs (Bazzi et al., 2019). However, it is an open question whether and how political institutions can affect the salience of ethnicity in national politics.

The key aim of this study is to test how changes in the administrative-territorial structure affect ethnic voting in national elections. Proponents of ethnofederal structures see benefits in a design where administrative borders follow ethnic boundaries and power is devolved to subnational units (e.g., Lijphart, 1977; Horowitz, 1985). Such a design which shifts contentious issues, e.g., education, to relatively homogenous regions supposedly reduces ethnic tensions at the national level and activates other, sub-ethnic divisions at the local level. Proponents of cross-cutting structures tend to view ethnofederalism as an institution that reinforces existing ethnic divisions and enables secession (e.g., Roeder, 1991). Instead, they propose administrative-territorial structures in which subnational borders deliberately divide ethnic homelands. Their main argument is that cross-cutting structures reduce the salience of ethnicity by creating alternative potential cleavages—first and foremost regional interests (e.g., Coser, 1956; Dahl, 1956; Lipset, 1960; Rokkan and Lipset, 1967).

We focus on Kenya—one of the most diverse countries in the world with a history of ethnic politics—and exploit the 2010 constitutional reform that replaced the eight provinces by 47 counties as the primary administrative units and devolved power to these counties. To make use of this quasi-experimental setting at the subnational level, we introduce two measures to capture the variation in the degree of ethnofederalism or crosscuttingness experienced by an individual, depending on a person’s place of residence and ethnic identity: An index of regional fractionalization that measures the within-region fractionalization across ethnic groups, and an index of ethnic fragmentation that measures the within-group fractionalization across administrative regions. These indices are both low in case of ethnofederal structures and high in case of crosscutting structures. We use granular census data to compute regional fractionalization for all regions and ethnic

fragmentation for all groups.

We introduce an intuitive measure of ethnic voting, namely, common voting among pairs of coethnic respondents. We construct this measure using micro data from six rounds of geo-coded Afrobarometer surveys, which include information on the ethnic identity of a respondent and on how the respondent would vote if presidential elections took place tomorrow. We estimate bilateral event-study specifications and focus on the heterogeneous treatment effects of reform-induced changes in regional fractionalization and ethnic fragmentation on ethnic voting over time. We support the validity of this design by, among others, providing evidence that ethnic voting before the reform did not respond to subsequent treatment intensity. We find that ethnic voting increases among pairs of coethnics for whom the reform increased regional fractionalization. In contrast, we find only limited evidence that a change in ethnic fragmentation affects ethnic voting.

Our study contributes to the literature on the effects of ethnofederalism and crosscuttingness (e.g., [Lipset, 1960](#); [Lijphart, 1977](#); [Horowitz, 1985](#)) by providing quasi-experimental evidence from a country where ethnicity is politically salient.<sup>1</sup> Testing the effects of cross-cutting cleavages is difficult and previous causal evidence was limited to very specific informal institutions (see [Dunning and Harrison, 2010](#), on cousinage in Mali). Ours is the first study, to our knowledge, that tests the link between ethnofederal institutions and ethnic voting with micro data. Our results are consistent with the view that ethnofederal structures can reduce the salience of ethnicity in national politics. Moreover, they show which component of ethnofederalism is key. If the aim is to reduce ethnic voting and the salience of ethnicity in national politics, territorial reforms should focus on reducing ethnic diversity in administrative units rather than reducing the fragmentation of ethnic groups across multiple units.<sup>2</sup>

By showing that the salience of ethnicity responds to subnational borders and political devolution in the short and medium run, we complement a literature that studies factors influencing the formation of national identities ([Miguel, 2004](#); [Bazzi et al., 2019](#); [Blouin and Mukand, 2019](#); [Depetris-Chauvin et al., 2020](#)), as well as a broad literature that links ethnic diversity to social trust (e.g., [Miguel and Gugerty, 2005](#); [Kasara, 2013](#); [Hodler et al., 2020](#)) and conflict (e.g. [Arbath et al., 2020](#); [Bazzi and Gudgeon, 2021](#)). By focusing on ethnic voting, we also provide evidence for an intermediate step in the link between border changes and conflict at the local level (studied in [Bazzi and Gudgeon, 2021](#)). The redesign of the subnational borders can reduce ethnic grievances at the ballot box and avert outright conflict.

We also make two contributions on the measurement side. First, our indices of

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<sup>1</sup>A related literature in political science considers if the choice of proportional representation versus winner-take-all electoral systems affects the salience of ethnicity in elections, but empirical evidence along these lines is limited to cross-country correlations (e.g., [Huber, 2012](#)).

<sup>2</sup>There are settings where the creation of many small administrative units effectively re-centralizes power (see, e.g., [Grossman and Lewis, 2014](#), on Uganda).

regional fractionalization and ethnic fragmentation are related to aggregate (country-level) indicators of crosscuttingness (Taylor and Rae, 1969; Selway, 2011; Desmet et al., 2017), but take the measurement to the level of administrative regions and ethnic groups, respectively. Second, we contribute to the measurement of ethnic voting (e.g. Banerjee and Pande, 2007; Huber, 2012; Ichino and Nathan, 2013) by taking a discrete version of the voting distance among coethnics as our outcome rather than relying on group or party-based measures of common voting. Together, these two innovations enable us to provide well-identified micro-level evidence on how the alignment of administrative borders with the ethnic geography affects ethnic voting.

Last but not least, our results add an important dimension to what we know about ethnic politics in Kenya (e.g., Burgess et al., 2015; Kramon and Posner, 2016; Kramon et al., 2021). Ethnic voting is extremely common in Kenya and conflict over which groups control the political center brought the country on the verge of civil war in 2007/2008 (e.g., Gibson and Long, 2009; Ferree et al., 2014). Whether devolution to ethnically homogenous units should be preferred over ethnically-mixed and centrally governed regions has been discussed since Kenya’s independence from Britain. This case holds lessons for other countries as well. While the overall level of diversity of many developing countries was determined by colonial politics (e.g., Michalopoulos and Papaioannou, 2016), changing subnational borders and thereby local ethnic diversity may be possible and far less disruptive than other options like large scale resettlement schemes.

The remainder of the paper is structured as follows. Section 2 discusses the institutional background on Kenya. Section 3 presents the data, our measures of ethnofederalism and crosscuttingness, our measure of ethnic voting, and our empirical strategy. Section 4 discusses the results, and Section 5 concludes.

## 2. Institutional background

Ethnic identity is a prominent fault line in Kenyan politics. Kenya is home to many different ethnic groups and tribes. The probability that two randomly drawn individuals from the population identify with different groups is 88% (according to the 1989 census). The five largest groups make up about two-thirds of the population, are spatially segregated (with the exception of Nairobi), and compete over control of the political center.<sup>3</sup> These ethnic divisions are apparent in elections in which members of these large groups typically vote for their ethnic kin (Gibson and Long, 2009; Long and Gibson, 2015) and in which violence among ethnic groups has erupted frequently since the return

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<sup>3</sup>According to the 1989 census, the largest groups are the Kikuyu (20.9% of the population), Luhya (12.4%), Luo (12.4%), Kalenjin (11.5%), and Kamba (9.8%). These groups’ 2019 population shares differ by not more than 2–3 percentage points.

to multi-party politics in 1992.<sup>4</sup> The most prominent outbreak of ethnically motivated violence occurred after the national election in December 2007 and cost the lives of more than 1,000 people, while internally displacing hundreds of thousands. Most violence was concentrated in Rift Valley province, where Kalenjin and Kikuyu groups clashed ([Anderson and Lochery, 2008](#)), but violence also occurred in the ethnically diverse neighborhoods of Nairobi, where ethnic identity was previously considered to be less important ([Kasara, 2013](#)).

As a response to the crisis that pushed Kenya to the brink of civil war in late 2007 and early 2008, Kenya went through an African Union-led conciliation process. The peace commission was headed by former UN secretary general Kofi Annan, who brokered a deal for a unity government among the two main contenders—Mwai Kibaki (a Kikuyu) and Raila Odinga (a Luo)—, and paved the way for an extensive constitutional reform. The reform was approved in a referendum in August 2010 by 68% of voters.

The new constitution constrained the powers of the presidency and radically altered the country's centralized government structure. Two key features of the constitutional reform are political devolution—in the form of more local responsibilities for health care, pre-primary education, and roads—and the splitting of Kenya's eight provinces into 47 counties. Each county has an elected governor and a local assembly, receives a population-based share of 15% of central government revenue, and sends a representative to the new senate, which controls the allocation of resources to county governments ([Kramon and Posner, 2011](#)).<sup>5</sup> The territorial reform and the new devolved government structure were implemented with the 2013 national elections. The counties almost perfectly resemble the colonial districts just before independence (and are congruent to Kenya's pre-1992 districts), as these were the only boundaries that parliament could agree on ([Kramon and Posner, 2011](#)). They are also the last boundaries implemented by the British colonial government. Hence, they are unlikely to be driven by contemporary political motivations, even though they follow historical ethnic divisions.

The timing of the constitutional reform, the division of powers, and the resulting administrative-territorial structure could have hardly been anticipated beforehand. Earlier attempts at reforming the country's constitution failed several times. The reason was that controlling the presidency was an important source of patronage for incumbents, who worked hard to stave off previous attempts at devolution and a weakened presidency ([Kramon and Posner, 2011](#)). Given a large variety of past reform proposals and entrenched factions, most people could not know how many layers of government or

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<sup>4</sup>[Gibson and Long \(2009\)](#) conducted an exit poll during the 2007 election. They document that 94.2% of Kikuyu and 97.8% of Luo voted for their ethnic candidate. These support for ethnic candidates fell substantially across all groups in the subsequent election ([Ferree et al., 2014](#)).

<sup>5</sup>From shortly after independence until 2010, provincial governors and district commissioners were hand-picked representatives of the president ([Oyugi and Ochieng, 2020](#)).

administrative units the 2010 proposal would entail.<sup>6</sup>

Figure I shows the pre-reform provinces in Panel A and the post-reform counties in Panels B. This change in boundaries fundamentally changed how regions aligned with Kenya’s complex ethnic geography. While the average population share of the largest group was 14.4% in the average province, it is 74.7% in the average county.

Political competition at the presidential level has remained relatively stable during the 2007, 2013, and 2017 general elections. In all these elections, former incumbent Mwai Kibaki (PNU) or the current incumbent Uhuru Kenyatta (Jubilee alliance/party) and former prime minister Raila Odinga, who heads the Orange Democratic Movement (ODM), gained over 90% of the popular vote between them. The new constitution explicitly requires that each candidate names a running mate for vice-president and the other half of the ticket has remained constant since 2013 as well. Current vice-president William Ruto, an ethnic Kalenjin, and Kalonzo Musyoka, an ethnic Kamba, were the vice-presidential candidates in both the 2013 and 2017 elections.<sup>7</sup> Panel C of Figure I summarizes the timing of the election years and the constitutional reform.

### 3. Data and empirical strategy

#### 3.1. Data sources

We use data from two sources. The first are micro data for every 20th household from the 1989 Kenya Population and Housing Census made available by the Kenya National Bureau of Statistics. The 1989 census was the last census in Kenya that made ethnic identities available in the micro data (or contained tabulations of ethnic groups at the subnational level). These micro data cover slightly more than a million people and are representative at the level of 3,600 sublocations.<sup>8</sup>

The second data source are geocoded Afrobarometer surveys for Kenya. We use survey rounds 3–8, conducted in 2005, 2008, 2011, 2014, 2016, and 2019.<sup>9</sup> Hence, we have two

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<sup>6</sup>Serious efforts had been made at reforming Kenya’s constitution, starting with the creation of the Constitution of Kenya Review Commission (CKRC) in 2000. The 2002 CKRC draft included a four-tiered structure with regions, districts, locations and villages. The Bomas draft in 2004 included a three-tiered structure of 14 regions with 74 counties. The competing Wako draft envisioned a two-tiered structure with 70 districts but was rejected by referendum in 2005. In 2008, a committee of experts was tasked to harmonize the three drafts and make recommendation to a parliamentary subcommittee (PSC). In 2010, the “PSC simply could not form a consensus [...], with strong disagreements surfacing about the exact number of devolved units and their boundaries [...] the timeline imposed by the power-sharing agreement forced the committee to move forward [...]. The PSC thus agreed to the least controversial position: a two-tier system with 47 county governments” (Kramon and Posner, 2011, p. 94).

<sup>7</sup>Furthermore, a candidate needs to win at least 25% of the vote in at least half of the counties (or provinces). Kenyatta and Odinga have always met this requirement by comfortable margins.

<sup>8</sup>Sublocations are the smallest units above enumeration areas. We use the matching of (unnamed) sublocations in the micro data to official census tabulations created by Asmus et al. (2019).

<sup>9</sup>We do not use rounds 1 and 2 of the Afrobarometer as they do not report the ethnicity of respondents.



survey rounds (2005 and 2008) in the pre-treatment period, one survey round (2011) in the interim period between the referendum and the implementation of the reform, and three survey rounds (2014, 2016, and 2019) in the post-implementation period (see Panel C of [Figure I](#)). We mainly rely on three pieces of information from these surveys. First, the self-declared ethnicity of respondents. Second, the declared voting intention in national elections. The relevant question is phrased consistently throughout the rounds and asks: “If presidential elections were held tomorrow, which party’s candidate would you vote for?” (round 7, question 99). Third, the coordinates of the cluster locations coded by [BenYishay et al. \(2017\)](#) for rounds 3–6 and the GPS coordinates collected in rounds 7 and 8. They allow us to determine in which county the respondents reside even in times in which counties do not officially exist and to calculate the spatial proximity between respondents. In addition, we use information on age, gender, various assets, and urban versus rural location. All this information is available for 7,724 respondents from 933 different clusters and 20 different ethnic groups.<sup>10</sup>

### 3.2. Measuring ethnofederal and crosscutting structures

Federal structures are called ‘ethnofederal’ if subnational administrative borders tend to follow the boundaries of ethnic homelands. The left panel of [Figure II](#) illustrates an extreme case. There, the administrative-territorial structure is maximally ethnofederal as any two individuals live in the same administrative region if and only if they identify with the same ethnic group. In most real-world cases, some locations are ethnically diverse and the members of some groups are dispersed. In these cases, it is impossible to draw subnational administrative borders such that each region is ethnically homogenous and no group is split across multiple administrative regions. However, we can still define an administrative-territorial structure as ethnofederal if—given the spatial distribution of the population—it ensures that most individuals living in the same administrative region identify with the same ethnic group and that most members of the same ethnic group live in the same administrative region. We implement this idea using two subnational fractionalization indices. The first is an index of regional fractionalization that measures the within-region fractionalization across ethnic groups:

$$RF_c = 1 - \sum_{e=1}^n (s_e^c)^2, \quad (1)$$

where  $n$  is the number of ethnic groups and  $s_e^c$  the population share of ethnic group  $e$  in administrative region  $c$ .<sup>11</sup> The second is an index of ethnic fragmentation that captures

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<sup>10</sup>[Figure A.1.1](#) in the Online Appendix illustrates the spatial distribution and size of the Afrobarometer survey clusters in rounds 3–8.

<sup>11</sup>The index is the standard index of ethno-linguistic fractionalization applied at the subnational level.

the within-group fractionalization across regions:

$$EF_e = 1 - \sum_{c=1}^m (s_c^e)^2, \quad (2)$$

where  $m$  is the number of regions and  $s_c^e$  the population share of residents in region  $c$  among members of group  $e$ . An administrative-territorial structure is ethnofederal if regional fractionalization  $RF_c$  is low for most administrative regions  $c$  and ethnic fragmentation  $EF_e$  low for most ethnic groups  $e$ .

In contrast, administrative-territorial structures are ‘crosscutting’ if subnational administrative borders tend to internally divide ethnic homelands. The right graph in [Figure II](#) illustrates a crosscutting structure. There, the subnational administrative border creates ethnically heterogeneous administrative regions (i.e., high  $RF_c$ ) and splits both ethnic groups (i.e., high  $EF_e$ ). Hence, we call an administrative-territorial structure crosscutting if regional fractionalization  $RF_c$  is high for most administrative regions  $c$  and ethnic fragmentation  $EF_e$  high for most ethnic groups  $e$ .<sup>12</sup>

Of course, there exist administrative-territorial structures for which one of these two indices is high and the other is low. For example, (regional) fractionalization  $RF_c$  would be high and ethnic fragmentation  $EF_e$  low in case of a unitarian structure without subnational administrative units. Conversely,  $RF_c$  would be low and  $EF_e$  high in case of very many small administrative regions. More generally, the reliance on these two indices allows for a more complete and nuanced picture of administrative-territorial structures than a single index could ever offer.

We use the micro data from the 1989 census to compute regional fractionalization  $RF_c$  for each region  $c$  and ethnic fragmentation  $EF_e$  for each group  $e$ . We do so twice: once based on the pre-reform province borders and once based on the post-reform county borders. Our treatment variables  $\Delta RF_c$  and  $\Delta EF_e$  measure the reform-induced change in regional fractionalization  $RF_c$  experienced by individuals living in county  $c$  and the reform-induced change in ethnic fragmentation  $EF_e$  experienced by individuals identifying with group  $e$ , respectively. Only relying on pre-reform census data ensures that these changes are exclusively driven by the administrative-territorial reform (as in [Bazzi and Gudgeon, 2021](#)) and not by any potential migratory responses to the reform.

The reform decreased average (population-weighted) regional fractionalization from 0.53 to 0.30, and increased average (population-weighted) ethnic fragmentation from 0.32 to 0.77. These averages conceal considerable variation. In [Figure III](#) we illustrate the

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<sup>12</sup>This notion of crosscuttingness is closely linked to existing measures of crosscuttingness. [Taylor and Rae \(1969\)](#) define crosscuttingness as “the proportion of all the pairs of individuals, whose two members are in the same group of one cleavage [e.g., ethnicity] but in different groups in the other cleavage [e.g., region]” (p. 537). They introduce an aggregate (e.g., country-level) measure of crosscuttingness and show that it is decreasing in aggregate measures of ethnic and regional fractionalization. More recently, [Selway \(2011\)](#) and [Desmet et al. \(2017\)](#) propose aggregate measures of crosscuttingness based on  $\chi^2$ -test statistics. [Selway \(2011\)](#) also discusses how his  $\chi^2$ -based measure relates to the Taylor-Rae measure.

changes  $\Delta RF_c$  and  $\Delta EF_e$  experienced by individuals for all existing county-ethnicity combinations (with the size of the circle being proportional to the population of the corresponding combination). The change  $\Delta RF_c$  is depicted on the horizontal axis. We see that  $\Delta RF_c$  ranges from -0.61 (in Turkana County in the former Rift Valley Province) to 0.28 (in Busia County in the former Western Province). On the vertical axis we see that  $\Delta EF_e$  ranges from 0.04 (for the Kuria) to 0.79 (for the Kalenjin). All ethnic groups became more fragmented because the reform split every province (except Nairobi Province) into multiple counties. Importantly, there is a lot of variation in  $\Delta RF_c$  among members of the same ethnic group. For example, there are some Kalenjin living in counties with  $\Delta RF_c < -0.5$  and others in counties with  $\Delta RF_c > 0$ . Similarly, there is a lot of variation in  $\Delta EF_e$  among residents of the same county. Our empirical strategy exploits this variation within ethnic groups and counties.

### 3.3. Measuring ethnic voting

We propose to measure ethnic voting by the extent to which coethnic respondents would vote for the same party's candidate according to their declared voting intention. We use the Afrobarometer surveys to construct bilateral data and measure ethnic voting at the respondent-pair level. Our unit of observation is a pair of respondents who identify with the same ethnic group  $e$  and were surveyed within the same survey round  $t$ .<sup>13</sup> Hence, our data are repeated cross-sections of coethnic respondent pairs  $(i, j)$ . Our main dependent variable is an indicator for common voting,  $CV_{ijt}$ , which is equal to one for the pair  $(i, j)$  if respondents  $i$  and  $j$  would have voted for the same party's candidate, and equal to zero otherwise. The final sample consists of 407,381 coethnic respondent pairs for which we can compute our dependent and explanatory variables plus the pair-level control variables.

In our final sample, the probability of common voting is 67.9%. In contrast, this probability is only 39.0% percent for pairs of non-coethnic respondents. Hence, pairs of coethnic respondents are 28.9 percentage points more likely to vote for the same party than pairs of non-coethnic respondents. This difference showcases the prevalence of ethnic voting in Kenya.

### 3.4. Empirical strategy

We use the following event study specification:

$$CV_{ijt} = \sum_{t=3}^8 \beta_t (I_t \times \Delta RF_{cd}) + \sum_{t=3}^8 \gamma_t (I_t \times \Delta EF_e) + FE_{cde} + FE_t + \mathbf{Z}'_{ijt} \boldsymbol{\xi} + \epsilon_{ijt}, \quad (3)$$

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<sup>13</sup>The share of all respondent pairs (from the same survey round) who are coethnic is 12.4%.

where  $c$  and  $d$  denote the counties where respondents  $i$  and  $j$  live, and  $e$  the ethnic group with which they both identify.  $I_t$  represents indicator variables for Afrobarometer survey rounds 3–8.  $\Delta RF_{cd} = (\Delta RF_c + \Delta RF_d)/2$  is the pair-averaged change in regional fractionalization, which synthesizes the different experiences of the two respondents if  $c \neq d$ .  $\Delta EF_e$  is the change in ethnic fragmentation, which is the same for both coethnic respondents. The county-pair-by-ethnicity fixed effects  $FE_{cde}$  absorb all purely cross-sectional variation. For example, they absorb the variation specific to the pairing of Kalenjin respondents from Mombasa and Nairobi. The survey round fixed effects  $FE_t$  capture time trends in common voting. The vector of pair-level control variables  $\mathbf{Z}_{ijt}$  proxies for other potential cleavages, such as age, gender, the urban-rural divide, and economic status.<sup>14</sup>

Our coefficients of interest are the  $\beta_t$ 's and the  $\gamma_t$ 's. They capture the time-varying effects of the reform-induced changes in regional fractionalization and ethnic fragmentation on common voting among coethnic pairs of respondents. The identifying variation comes from how the changes in regional fractionalization and ethnic fragmentation that coethnic respondent pairs experience correlate with common voting in different years. Following common practice in event study designs, we set the coefficients for the last pre-treatment period, i.e., round 4 in 2008, to zero. We therefore interpret all effects relative to this baseline.

Our strategy relies on the standard assumptions in event-study or difference-in-differences designs with a few modifications to account for two key features of our setting: simultaneous treatment and heterogenous treatment effects. First, we assume that unobserved time-varying confounds behave similarly in groups or counties that are treated differently by the border reform (in terms of  $\Delta RF_c$  or  $\Delta EF_e$ ). This is the parallel trends assumption in the context of heterogenous treatment effects. This assumption goes beyond the usual notion that voting behaviour of some groups does not change in anticipation of the border reform and adds that it does not vary with respect to treatment intensity. We test this assumption using event-study plots based on [equation 3](#). Second, we require that  $\Delta RF_c$  and  $\Delta EF_e$  are not proxies for some other county/province characteristic that changes in response to the reform and is correlated with either of these two variables and voting patterns. This assumption can only be partially tested through interactions with other changes at the county/province level. In [Online Appendix B](#), we include additional interactions for the change in the size of the administrative unit and the change in the proximity to the unit's capital city to account for other plausible forms

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<sup>14</sup>The pair-level control variables include the age difference between respondents  $i$  and  $j$ , the log distance between their survey clusters (in km plus 0.1), indicator variables indicating whether no/one/both respondent(s) live in an urban cluster, dummy variables indicating whether no/one/both respondent(s) are female, and dummy variables indicating whether no/one/both respondent(s) possess certain assets (radio, TV, motorized vehicle). Summary statistics for all variables are provided in [Table A.3.1](#) in the Online Appendix.

of heterogeneity.<sup>15</sup>

We estimate [equation 3](#) in our full sample, which includes all possible pairs of coethnic respondents from the same survey round, and in a restricted sample that includes only coethnic respondent pairs from the same survey round and county (i.e.,  $c = d$ ). This sample restriction ensures that we focus on changes in regional fractionalization that are actually experienced by the respondents (as  $\Delta RF_{cd} = \Delta RF_c = \Delta RF_d$  if  $c = d$ ). The restriction to same county pairs also makes the comparison more local (e.g., by ensuring that both respondents of a pair face the same local candidates after 2013).

## 4. Results

### 4.1. Main results

[Figure IV](#) presents our estimates of the event study coefficients,  $\beta_t$  and  $\gamma_t$ , and simultaneously demonstrates the validity of the empirical design. We first focus on the estimated effects of reform-induced changes in regional fractionalization ( $\Delta RF_{cd}$ ), shown in the left panel. Circles mark estimates obtained with the full sample, triangles those obtained with the restricted sample. The estimated effect sizes and uncertainties are similar across both samples. Three features stand out. First, the small and statistically insignificant coefficients for the first pre-treatment round (i.e., round 3 in 2005) suggest the absence of pre-trends. Second, the estimates for the interim period (i.e., round 5 in 2011) are relatively small and marginally (in)significant at conventional levels. We take this as evidence of limited anticipation effects before the new boundaries became politically relevant with the 2013 election. Third, the comparatively large, positive and typically statistically significant coefficients for the three post-implementation rounds (i.e., 2014, 2016, and 2019) suggest that higher regional fractionalization raises common voting among pairs of coethnic respondents in the short and medium run. These results show that experienced and, to a lesser degree, expected increases in regional fractionalization raise ethnic voting. However, the reform actually reduced regional fractionalization in the overwhelming majority of counties (see [Figure III](#)). Our results suggest that this reduction in diversity decreased the prevalence of ethnic voting.

These effects are quantitatively important. The coefficient estimates for the post-implementation rounds are in the range from 0.610–0.946. The sample mean of  $\Delta R_{cd}$  is  $-0.164$ . Hence, taking the lower bound of 0.610, our results suggest that the average reform-induced change in  $RF_{cd}$  reduced common voting among coethnics by 10.0 percentage points. This corresponds to around one third of the gap in common voting

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<sup>15</sup>In addition, we also want to be sure that  $\Delta RF_c$  or  $\Delta EF_e$  affect neither the respondents' intention to vote (turnout), nor their willingness to reveal the party's candidate they would vote for. We test and confirm that in an individual-level panel with county-by-ethnicity and year fixed effects (see [Figure B.1.1](#) in the Online Appendix).

between coethnic and non-coethnic respondent pairs. Such reform-induced changes are large enough to impact election outcomes. According to official counts, Kenyatta won the 2013 general election with 50.1% of the votes, while Odinga received 43.3%. There would have been a run-off between these two candidates if Kenyatta had missed an absolute majority. As [Figure IV](#) shows, the decrease in  $RF_c$  tended to be smaller in counties where many Kikuyu live than in most counties dominated by one of the other large ethnic groups. Hence, the differential homogenization across ethnic groups may have contributed to Kenyatta’s (first-round) victory.

We now turn to the effect of changes in ethnic fragmentation ( $\Delta EF_e$ ) on ethnic voting, shown in the right panel of [Figure IV](#). We do not observe any evidence of pre-trends, nor of an effect in the interim period and the first round after the implementation of the administrative-territorial reform. Thereafter, we estimate a slight increase in the effect size over time. The coefficient estimates for the last round (i.e., round 8 in 2019) are in the range from 0.392–0.592 and statistically significant for the restricted sample. We conclude that the effect of ethnic fragmentation on ethnic voting is modest at best. If anything, reform-induced increases in ethnic fragmentation promote more ethnic voting in the medium run.

Taken together, these results suggest that administrative-territorial reforms can reduce ethnic voting in the short and medium run if they lead to more ethnofederal structures, but not if they lead to more cross-cutting structures. They also imply that reducing diversity within administrative units is more important than keeping an ethnic group in as few administrative units as possible.<sup>16</sup>

## 4.2. Mechanism

The mechanism we propose rests on three observations related to ethnic politics in Kenya and other diverse African societies. First, a main motive for ethnic voting is that national leaders often favor coethnics in the allocation of publicly provided goods, such as education, health care, and roads (e.g., [Franck and Rainer, 2012](#); [Burgess et al., 2015](#); [Kramon and Posner, 2016](#)). Second, even when ethnic voting is common, candidate characteristics other than ethnicity (or the supply of information about these characteristics) matter too (e.g., [Banerjee and Pande, 2007](#); [Casey, 2015](#); [Wahman and Boone, 2018](#)).<sup>17</sup> Third, local ethnic diversity impedes the provision of local public goods (e.g., [Miguel and Gugerty, 2005](#)). Based on these observations, we hypothesize that the reform-induced partial political devolution of the provision of public goods to subnational

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<sup>16</sup>[Online Appendix B](#) shows that these results are robust to the use of alternative dependent variables, alternative ways of computing  $RF_c$  and  $EF_e$ , various sample perturbations, the addition of further control variables, and alternative clustering of the standard errors.

<sup>17</sup>This observation is consistent with the fact that the probability of common voting among coethnics is “only” 67.9% in our sample.

administrative regions weakened the clientelistic motive for ethnic voting (vis-à-vis voting based on other candidate characteristics) at the national level. We expect this to hold in particular for voters living in regions where a decrease in ethnic diversity made the local provision of public goods less cumbersome and allows a single group to control these resources.

We provide indirect evidence for this mechanism by testing whether the effect of reform-induced changes in regional fractionalization varies in circumstances where we expect this effect to be different. We offer two related tests. First, we test whether our main effect is driven by pairs of respondents from an ethnic group that is dominant in the new (less diverse) administrative region. Respondents from dominant groups no longer have to rely entirely on the national government to benefit from a clientelistic allocation of public goods. We call a group locally dominant if the candidate from the party it tends to support won the first post-reform gubernatorial election by a margin of at least 20 percentage points.<sup>18</sup> Panel A in Figure V shows that higher  $\Delta RF_c$  is indeed associated with a stronger increase in ethnic voting for dominant groups than non-dominant groups. (Panel B shows that the difference is much smaller for the effect of  $\Delta EF_e$ .)

Second, we expect that the effect of reform-induced changes in regional fractionalization are particularly strong for pairs of respondents who live in administrative regions where the quality of the locally provided goods has been improving. Respondents in such regions are also less dependent on the clientelistic allocation of publicly provided goods by the national government. We proxy the change in the quality of the locally provided goods by whether infant mortality increased or decreased after the reform. Panel C shows that higher  $\Delta RF_c$  is indeed associated with a stronger increase in ethnic voting in regions where the local public goods provision works reasonably well. (Panel D shows that the difference is smaller for the effect of  $\Delta EF_e$ .)

The results of these two tests support our proposed mechanism. They suggest that reducing local diversity within an administrative region (combined with political devolution) decreases the prevalence of ethnic voting in national elections by lowering the stakes, i.e., by making control over the central government in winner-take-all contests less vital to the provision of public goods at the local level.

## 5. Conclusion

Ethnic politics impedes economic and social development in many diverse countries. However, up until now, “the evidence of formal institutional reforms mitigating negative ethnicity [has been] unconvincing” (Mueller, 2020, p. 353). In this paper, we fill this gap.

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<sup>18</sup>Prior to the reform, provincial commissioners were appointed by the central government. The party classification we use is only available for the four main groups.



We provide first evidence on the benefits of ethnofederal reforms on ethnic in a quasi-experimental setting. We use an event study design and micro data on voting intentions to study the effects of the change in subnational administrative borders and political devolution stipulated by the 2010 constitutional reform in Kenya. To enable this design, we introduce novel measures of ethnofederal territorial structures at the regional and ethnic group level as well as ethnic voting at the respondent-pair level. Our study focuses on voting but we believe that using our subnational measures of the alignment of administrative borders with ethnic geography could open up a rich area of research going forward.

Our findings show that ethnofederalism reduces ethnic voting and mitigates the salience of ethnicity in national politics. For ethnofederal reforms to be successful, it is more important to reduce diversity within administrative units than to ensure that most members of the same group live in the same unit. Our analysis of mechanisms suggests that this effect operates through a decrease in the “costs” of voting for a presidential candidate who is not an ethnic kin. These results hold important lessons for policy-makers seeking to lessen the impact of ethnic identity on voting.



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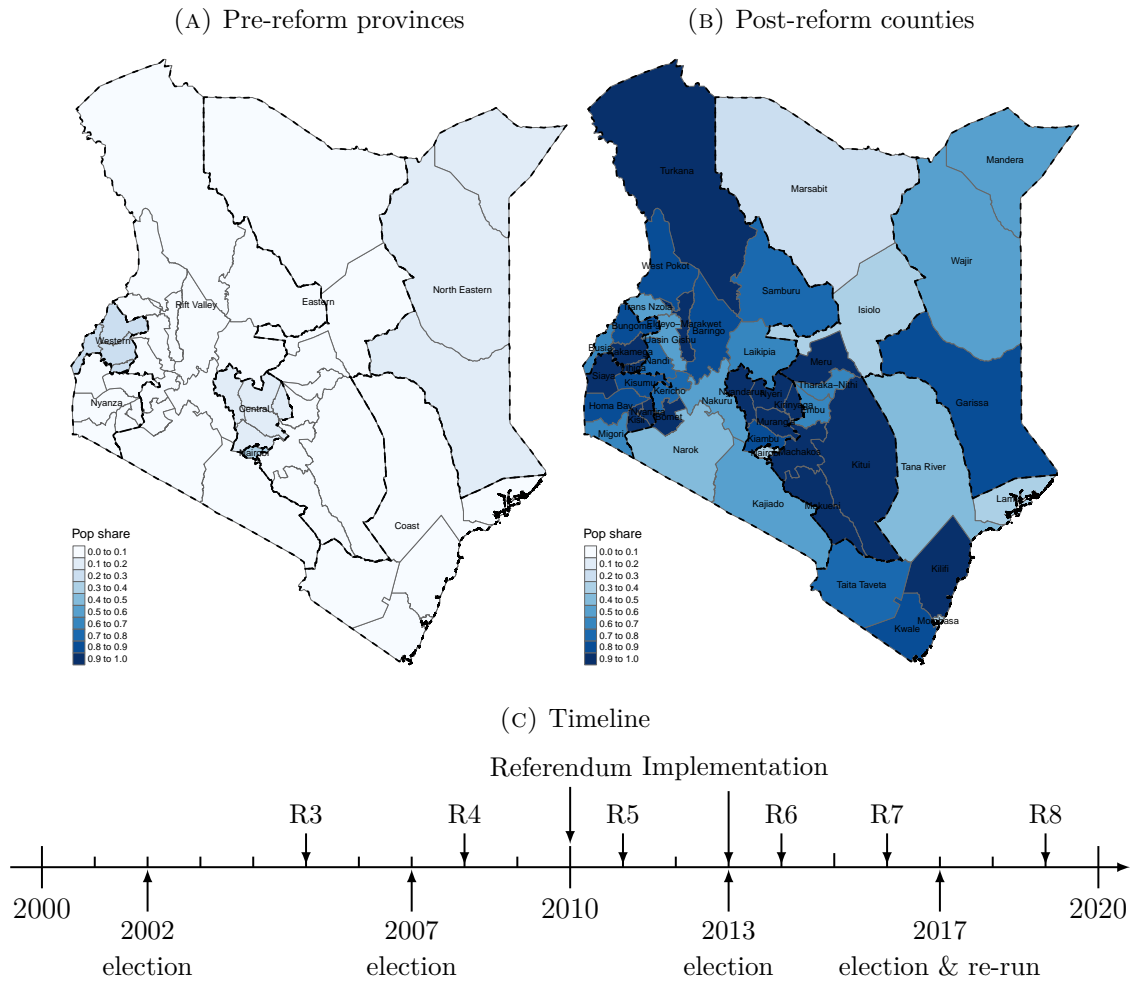
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# Figures and Tables

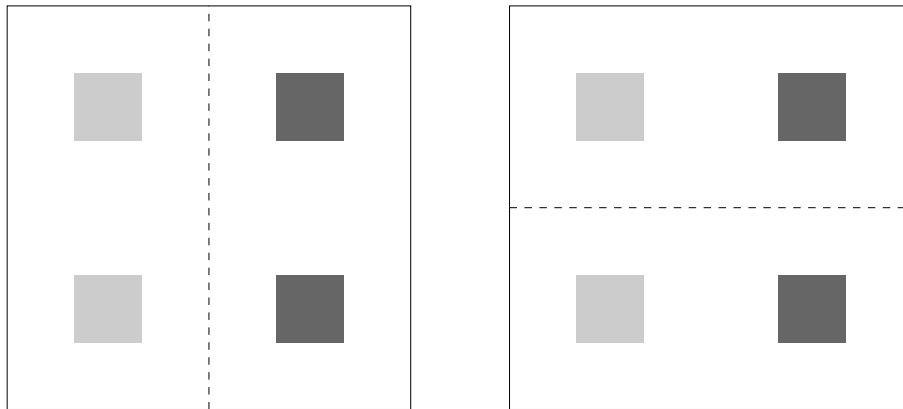
FIGURE I  
Kenya: Border reforms and timeline



*Notes:* Illustration of the boundary reform process in Kenya. Panels A and B show pre-reform province borders using thick dashed lines and post-reform county borders using fine lines. In addition, Panel A shows the population shares of the largest group in the pre-reform provinces, and Panel B the population shares of the largest group in the post-reform counties. Panel C shows a timeline indicating the election years; the years in which the constitutional referendum took place and in which the political devolution and the territorial reform were implemented; and the years in which the Afrobarometer survey rounds 3–8 (denoted R3–R8) were conducted. (The Supreme Court nullified the 2017 presidential election, leading to a re-run, which was boycotted by Odinga and won by Kenyatta with 98.3% of the vote.)

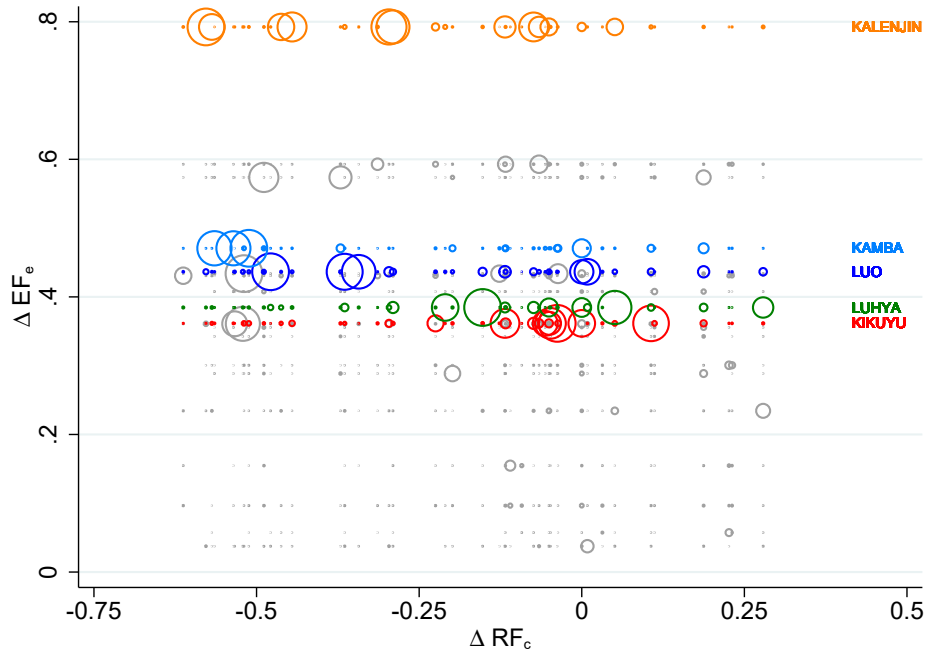
FIGURE II  
Illustration of ethnofederalism and crosscuttingness

(A) Ethnofederalism (low EF, low RF)      (B) Ethnofederalism (low EF, low RF)



*Notes:* Illustration of ethnofederal and crosscutting structures in an example with two spatially segregated ethnic groups and two administrative units. The squares represent ethnically homogenous locations, the different shades of gray different ethnic groups, and the dashed lines subnational administrative borders.

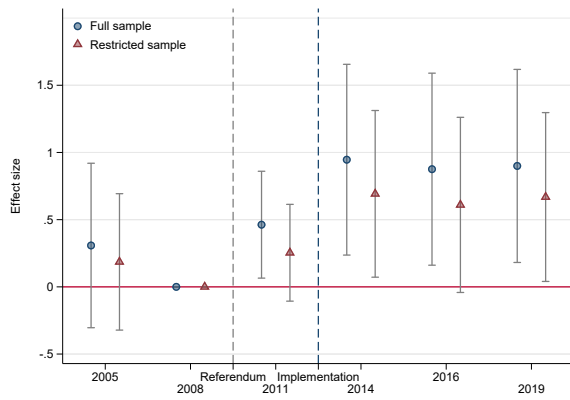
FIGURE III  
 Reform-induced changes in regional fractionalization and ethnic fragmentation



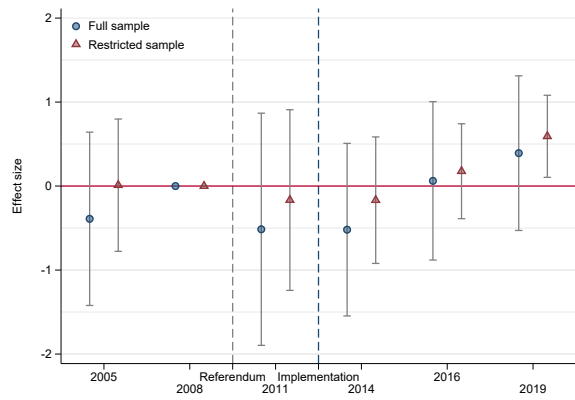
*Notes:* The figure illustrates how the change in subnational boundaries from provinces to counties induces variation in treatment intensity across ethnic groups and administrative units. In particular, it shows the changes in regional fractionalization ( $\Delta RF_c$ ) and the changes in ethnic fragmentation ( $\Delta EF_e$ ) for each county-ethnic group combination (see Section 3.2 for details). The size of the circles are proportional to the population of the corresponding combination. Major ethnic groups are highlighted in different colors.

FIGURE IV  
Main results

(A) Changes in regional fractionalization and ethnic voting

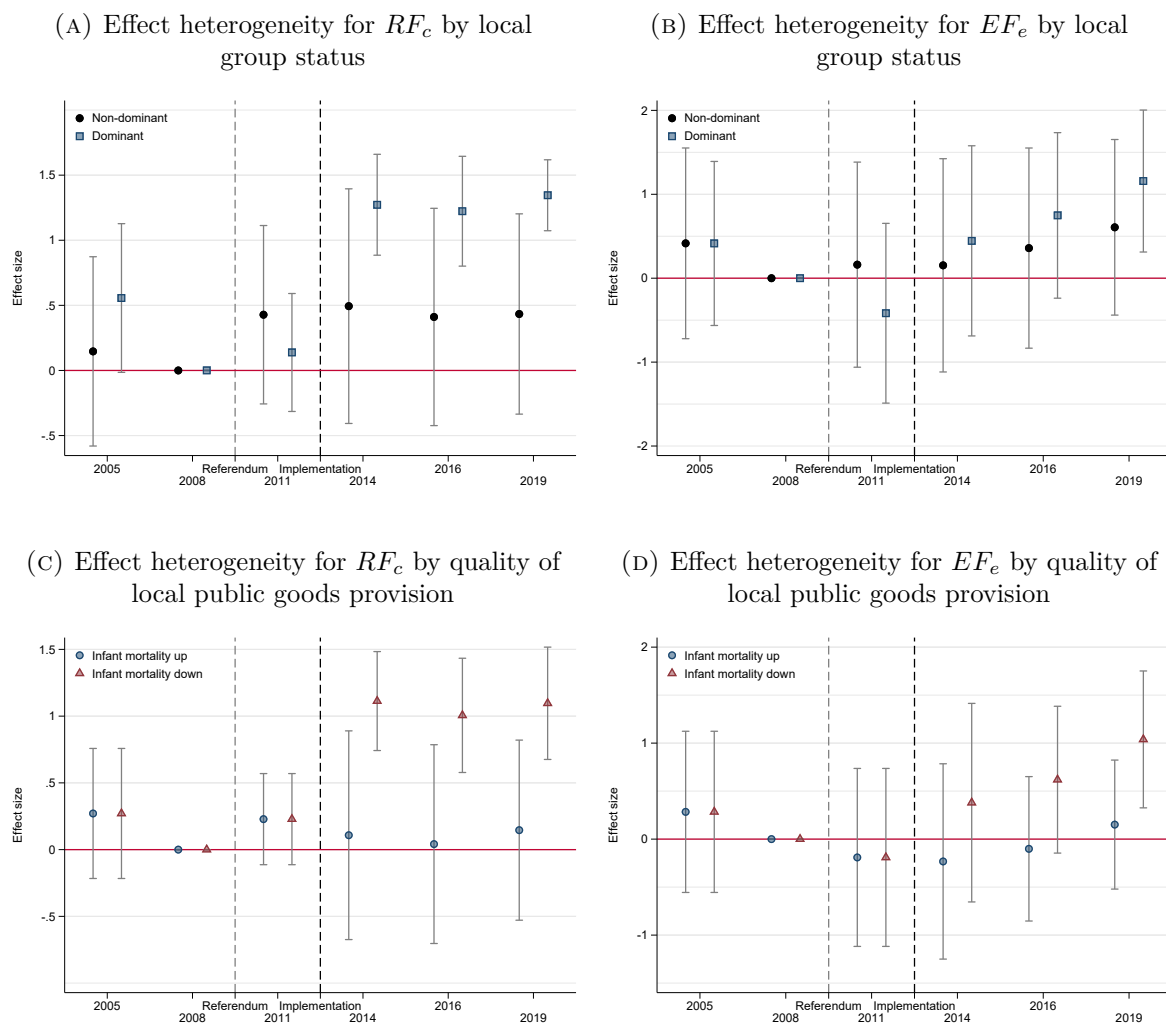


(B) Changes in ethnic fragmentation and ethnic voting



*Notes:* The figure shows event study coefficients of the effect of reform-induced changes in border alignment on ethnic voting for two different samples. Circles represent estimates based on the full sample of coethnic respondents, and triangles on the restricted (within-county) sample. Panel A shows estimates for regional fractionalization ( $\beta_t$ 's), and panel B shows estimates for ethnic fragmentation ( $\gamma_t$ 's). All specifications include county pair-by-ethnicity and survey round fixed effects as well as pair-level controls. 95% confidence intervals based on two-way clustered standard errors at the province-ethnicity level (for each respondent of a given pair) are plotted as gray error bars.

FIGURE V  
Mechanisms: Local public goods



*Notes:* The figure shows event study coefficients from specifications where the two measures of border alignment are interacted with additional binary variables affecting treatment intensity. Panels A and B show the results from interactions with an indicator variable for dominant groups. Panels C and D show results from interactions with an indicator variable for an increase (decrease) in infant mortality. All specifications include county pair-by-ethnicity and survey round fixed effects as well as pair-level controls. 95% confidence intervals based on two-way clustered standard errors at the province-ethnicity level (for each respondent of a given pair) are plotted as gray error bars. Results are based on the restricted (within-county) sample.



# Online appendix

Content:

## A. Additional information on data

A.1. Spatial coverage of Afrobarometer surveys

A.2. Definition of variables

A.3. Summary statistics

## B. Additional results

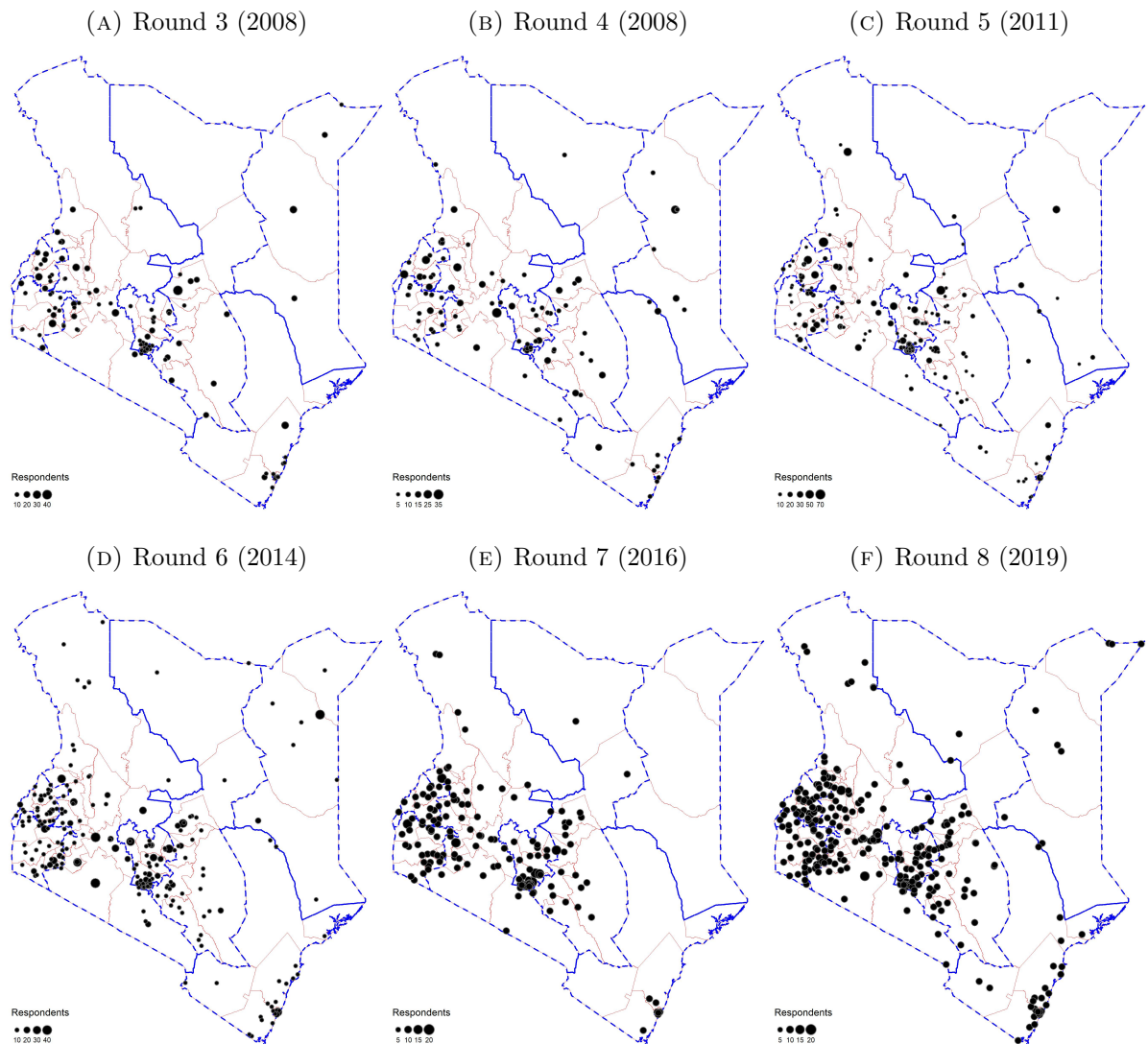
B.1. Auxiliary results supporting identification assumptions

B.2. Robustness tests

# A. Additional information on data

## A.1. Spatial coverage of Afrobarometer surveys

FIGURE A.1.1  
Afrobarometer coverage



*Notes:* Panels A–F show the location of Afrobarometer survey clusters in the different survey rounds. The size of the dots are proportional to the number of respondents in the corresponding cluster. Pre-reform province borders are highlighted in blue, and post-reform county borders in red.

## A.2. Definition of variables

### A.2.1. Variables used in the main text (Figures III and IV)

**Common voting (ij)** is an indicator variable that is equal to one if respondents  $i$  and  $j$  would vote for the same party's candidate if presidential elections were held tomorrow. (Source: Q99 in Afrobarometer rounds 3 and 5–8, and Q97 in round 4).

**Change in regional fractionalization (cd)**, denoted  $\Delta RF_{cd}$ , measures the change in regional fractionalization resulting from the administrative-territorial reform, averaged across counties  $c$  and  $d$  where respondents  $i$  and  $j$  reside; see Section 3.2 for details. (Source: Own computation based on micro data from the 1989 census; Kenya National Bureau of Statistics).

**Change in ethnic fragmentation (e)**, denoted  $\Delta EF_e$ , measures the change in ethnic fragmentation resulting from the administrative-territorial reform for ethnic group  $e$  with which respondents  $i$  and  $j$  identify; see Section 3.2 for details. (Source: Own computation based on micro data from the 1989 census; Kenya National Bureau of Statistics).

**Age gap (ij)** is the age difference between respondents  $i$  and  $j$ . (Source: Q1 in Afrobarometer rounds 3–8).

**Ln distance (ij)** is the log of the geodetic distance between the Afrobarometer survey clusters in which respondents  $i$  and  $j$  reside.

**Urban indicators (ij)** indicate whether none or one or both of respondents  $i$  and  $j$  live in an Afrobarometer cluster designated as urban. (Source: “urbrur” in Afrobarometer rounds 3–8).

**Female indicators (ij)** indicate whether none or one or both of respondents  $i$  and  $j$  are female. (Source: “currint” in Afrobarometer round 3, “thisint” in Afrobarometer rounds 4–8).

**Radio indicators (ij)** indicate whether none or one or both of respondents  $i$  and  $j$  live in a household where somebody owns a radio. (Source: Q93b in Afrobarometer round 3, Q92a in round 4, Q90a in round 5, Q91a in round 6, Q89a in round 7, and Q92a in round 8).

**TV indicators (ij)** indicate whether none or one or both of respondents  $i$  and  $j$  live in a household where somebody owns a TV. (Source: Q93c in Afrobarometer round 3, Q92b in round 4, Q90b in round 5, Q91b in round 6, Q89b in round 7, and Q92b in round 8).

**Motorized vehicle indicators (ij)** indicate whether none or one or both of respondents  $i$  and  $j$  live in a household where somebody owns a motorized vehicle. (Source: Q93f in Afrobarometer round 3, Q92c in round 4, Q90c in round 5, Q91c in round 6, Q89c in round 7, and Q92c in round 8)

**Dominant local group (ce)** is an indicator variable that is equal to one for coethnic respondent pairs from the same county if the gubernatorial candidate representing their ethnic group won the 2013 gubernatorial race in this county with a margin of victory of at least 20 percentage point. This variable is only available for respondent pairs identifying with one of the four main ethnic groups (Kamba, Kikuyu, Kalenjin, Luo); and it is only applicable to the restricted sample based on coethnic respondent pairs residing in the same county. (*Source: Independent Electoral and Boundaries Commission, 2013*).

**Infant mortality up (c)** is an indicator variable that is equal to one if the infant mortality rate is higher in a given county in the years since the implementation of the constitutional reform (2013–2018) than it was in the same area in earlier years (2005–2012). The infant mortality rate is computed based on child death information of live born children. This variable is only used in the restricted sample, which only includes coethnic respondent pairs from the same county. (*Source: Demographic and Health Surveys of rounds 5 and 7*).

#### **A.2.2. Variables used in the auxiliary results (Online Appendix B.1)**

**Intention to vote (i)** is an indicator variable that is equal to one unless the respondent answer “would not vote” in response to the question about which party’s candidate he would vote for if presidential elections were held tomorrow. (*Source: Q99 in Afrobarometer rounds 3 and 5–8, and Q97 in round 4*).

**Willingness to state party preference (i)** is an indicator variable that is equal to one unless the respondent answers “refused to answer” or “don’t know” to the question about which party’s candidate he would vote for if presidential elections were held tomorrow. It is also zero if the respondent is not intending to vote in the next election. (*Source: Q99 in Afrobarometer rounds 3 and 5–8, and Q97 in round 4*).

#### **A.2.3. Variables used in the robustness tests (Online Appendix B.2)**

**Common voting for coalition (ij)** is an indicator variable that is equal to one if respondents  $i$  and  $j$  would vote for a party’s candidate from the same coalition if presidential elections were held tomorrow. Coalitions are defined as parties that support the same presidential ticket in the presidential election (following the electoral commissions in 2013 and 2017). (*Source: Q99 in Afrobarometer rounds 3 and 5–8, and Q97 in round 4*).

**Similar trust president (ij)** is a indicator variable that is equal to one if respondents  $i$  and  $j$  indicate a identical level of trust based on the 5 possible responses to the question: “How much do you trust each of the following, or haven’t you heard enough about them

to say? The President”. (Source: Q55a in Afrobarometer round 3, Q49a in round 4, Q59a in round 5, Q52a in round 6, Q43a in round 7, and Q41 in round 8.)

**Change in regional stratification (cd), denoted  $\Delta RS_{cd}$ ,** measures the reform-induced change in regional stratification resulting from the administrative-territorial reform, averaged across counties  $c$  and  $d$  where respondents  $i$  and  $j$  reside. The stratification measure is calculated following Hodler et al. (2020) using the housing variables from 1989 census. (Source: Own computation based on micro data from the 1989 census; Kenya National Bureau of Statistics).

**Change in ethnic stratification (e), denoted  $\Delta ES_e$ ,** measures the reform-induced change in ethnic stratification across subnational units resulting from the administrative-territorial reform. The stratification measure is calculated following Hodler et al. (2020) using the housing variables from 1989 census. (Source: Own computation based on micro data from the 1989 census; Kenya National Bureau of Statistics).

**Average change in administrative unit size (ij)** is the pair-averaged percentage change in the sizes of the subnational administrative unit where respondent  $i$  and  $j$  reside, resulting from the change from province to county. (Own calculation.)

**Average change in capital proximity (ij)** is the pair-averaged percentage change of distance between the cluster locations of respondents  $i$  and  $j$  and the subnational capital city in the corresponding province/county, resulting from the creation of 39 new subnational capital cities. (Own calculation.)

### A.3. Summary statistics

TABLE A.3.1  
Summary statistics

Variable	Mean	SD	Min	Max	N
<i>Panel A: Full sample</i>					
Common voting (ij)	0.68	0.47	0.00	1.00	407,381
$\Delta RF_{cd}$ - Regional fractionalization (ij)	-0.16	0.19	-0.61	0.28	407,381
$\Delta EF_e$ - Ethnic fragmentation (ij)	0.46	0.15	0.04	0.79	407,381
Age gap (ij)	14.82	12.31	0.00	78.00	407,381
Ln distance (ij)	4.23	1.63	-2.30	6.92	407,381
Indicator: One urban, one rural cluster (ij)	0.45	0.50	0.00	1.00	407,381
Indicator: Both cluster urban (ij)	0.20	0.40	0.00	1.00	407,381
Indicator: One respondent is female, one is male (ij)	0.50	0.50	0.00	1.00	407,381
Indicator: Both respondents are female (ij)	0.23	0.42	0.00	1.00	407,381
Indicator: One respondent owns a radio, other not (ij)	0.21	0.41	0.00	1.00	407,381
Indicator: Both respondents own a radio (ij)	0.77	0.42	0.00	1.00	407,381
Indicator: One respondent owns a TV, other not (ij)	0.45	0.50	0.00	1.00	407,381
Indicator: Both respondents own a TV (ij)	0.31	0.46	0.00	1.00	407,381
Indicator: One respondent owns a vehicle, other not (ij)	0.33	0.47	0.00	1.00	407,381
Indicator: Both respondents own a vehicle (ij)	0.06	0.23	0.00	1.00	407,381
Common voting for coalition (ij)	0.78	0.42	0.00	1.00	407,381
Same trust president (ij)	0.37	0.48	0.00	1.00	407,381
$\Delta RS_{cd}$ (ij)	-0.28	0.48	-1.35	0.88	387,388
$\Delta ES_e$ (ij)	0.69	0.14	0.08	1.29	339,502
Avg. change in admin unit size (ij)	-0.70	0.22	-0.98	0.00	407,381
Avg. change in capital proximity (ij)	-0.44	0.30	-1.00	2.06	407,381
<i>Panel B: Restricted (within county) sample</i>					
Common voting (ij)	0.67	0.47	0.00	1.00	69,084
$\Delta RF_c$ - Regional fractionalization (ij)	-0.21	0.25	-0.61	0.28	69,084
$\Delta EF_e$ - Ethnic fragmentation (ij)	0.43	0.15	0.04	0.79	69,084
Age gap (ij)	14.48	12.06	0.00	77.00	69,084
Ln distance (ij)	1.93	2.38	-2.30	5.50	69,084
Indicator: One urban, one rural cluster (ij)	0.27	0.44	0.00	1.00	69,084
Indicator: Both cluster urban (ij)	0.26	0.44	0.00	1.00	69,084
Indicator: One respondent is female, one is male (ij)	0.51	0.50	0.00	1.00	69,084
Indicator: Both respondents are female (ij)	0.22	0.42	0.00	1.00	69,084
Indicator: One respondent owns a radio, other not (ij)	0.22	0.41	0.00	1.00	69,084
Indicator: Both respondents own a radio (ij)	0.76	0.43	0.00	1.00	69,084
Indicator: One respondent owns a TV, other not (ij)	0.39	0.49	0.00	1.00	69,084
Indicator: Both respondents own a TV (ij)	0.31	0.46	0.00	1.00	69,084
Indicator: One respondent owns a vehicle, other not (ij)	0.31	0.46	0.00	1.00	69,084
Indicator: Both respondents own a vehicle (ij)	0.05	0.22	0.00	1.00	69,084
Common voting for coalition (ij)	0.78	0.42	0.00	1.00	69,084
Same trust president (ij)	0.38	0.49	0.00	1.00	69,084
$\Delta RS_{cd}$ (ij)	-0.33	0.46	-1.35	0.88	65,918
$\Delta ES_e$ (ij)	0.70	0.17	0.08	1.29	59,000

*Continued on next page*

Table A.3.1 – *Continued from previous page*

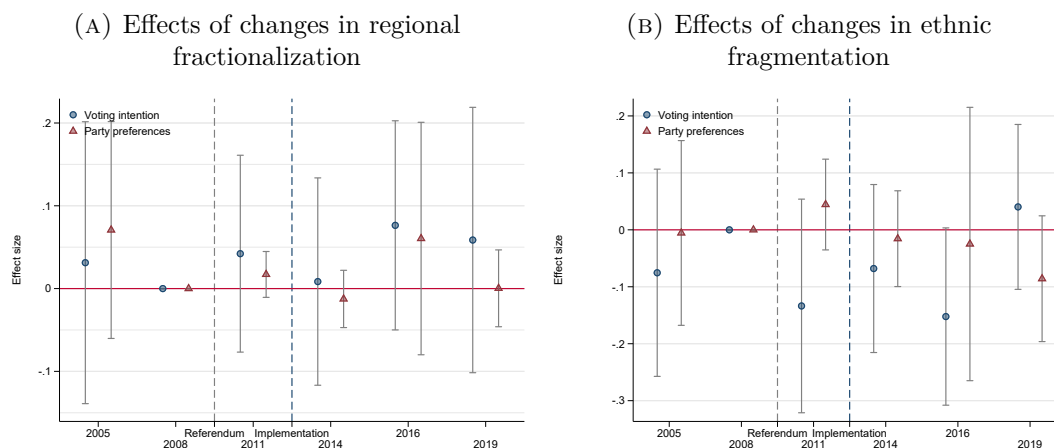
Variable	Mean	SD	Min	Max	N
Avg. change in administrative unit size (ij)	-0.67	0.30	-0.98	0.00	69,084
Avg. change in capital proximity (ij)	-0.46	0.37	-1.00	2.06	69,084
Indicator: Dominant group (ec)	0.89	0.99	0.00	2.00	65,052
Indicator: Infant mortality up (c)	0.42	0.49	0.00	1.00	69,084
<i>Panel C: Respondent level sample</i>					
Indicator: Voting intention (i)	0.93	0.26	0.00	1.00	7,924
Indicator: Party preferences (i)	0.96	0.19	0.00	1.00	7,924
$\Delta RF_c$ - Regional fractionalization (i)	-0.20	0.25	-0.61	0.28	7,924
$\Delta EF_e$ - Ethnic fragmentation (i)	0.45	0.16	0.04	0.79	7,924

*Notes:* The table reports the summary statistics of our variables of interests across samples.

## B. Additional results

### B.1. Auxiliary results supporting identification assumptions

FIGURE B.1.1  
Voting intentions and willingness to reveal party preferences



*Notes:* The figure shows event study coefficients of reform-induced changes in border alignment on turnout. Circles show results for whether an individual respondent indicates an intention to vote, and triangles whether they were willing to reveal the party's candidate they intent to vote for. The event study specifications include county-ethnicity and survey round fixed effects as well as the following individual-level control variables: Age, and indicator variables for residence in a urban cluster, being female, owning a radio, TV, and motorized vehicle. 95% confidence intervals based on standard errors clustered at the ethnic group and county level are plotted as gray error bars.

### B.2. Robustness tests

This section tests the robustness of our main results presented in [Figure IV](#). For brevity, we simplify the event study specification to a generalized difference-in-differences (DiD) specification. This entails three changes: First, we combine the two pre-treatment survey rounds into a single pre-treatment period. Second, we drop the survey round in the interim period (where the treatment status is unclear). Third, we combine the three post-implementation survey rounds into a single post-treatment period.<sup>1</sup> The top row of [Figure B.2.2](#) shows the DiD results analogous to the event study results shown in [Figure IV](#). The results are similar. The main discrepancy is that the positive effect of an increase in ethnic fragmentation on common voting among coethnics becomes statistically significant in the DiD version, whereas it is only marginally significant in the last period of the event study design estimated on the restricted sample. As before, we report results for a sample of coethnic respondents (circles) and a sample of coethnic respondents living in the same county (triangles).

<sup>1</sup>[Figure I](#) summarizes the timing of the Afrobarometer survey rounds and the relevant political events.



The first two robustness tests use alternative dependent variables. In row 2, we use an indicator variable for whether the two respondents vote for the same coalition (rather than the same party) as dependent variable. We do so as parties are often formed in an *ad hoc* manner before elections in Kenya while coalitions or alliances are more stable. In row 3, we use an indicator variable for whether the two respondents give identical answers to the question about trust in the current president.<sup>2</sup>

The next two robustness tests use alternative treatment variables. In row 4, we compute the treatment variables,  $\Delta RF_{cd}$  and  $\Delta EF_e$ , at the level of ethnic families rather than ethnic groups. Specifically, we treat the Kikuyu, Meru and Embu as one group, and combine the Luo and Luhya.<sup>3</sup> In row 5, we base our treatment variables on ethnic and regional stratification instead of regional fractionalization and ethnic fragmentation. We use the measure developed by [Hodler et al. \(2020\)](#), which generalizes the idea of between-group inequality, and compute border-induced changes in inequality within regions and across groups. According to these measures, regional stratification is high if ethnic fractionalization is high in this region and wealth differences between members of different ethnic groups tends to be high too, while ethnic stratification considers inequalities along regional lines within ethnic groups.

The next five robustness tests focus on sample perturbations. In row 6, we add census weights such that each respondent pair in our Afrobarometer sample is weighted for the number of such pairs in the census population that they represent. In row 7, we restricted the sample to respondent pairs from the so-called big 4 ethnic groups who are typically represented by presidential or vice-presidential candidates (i.e., the Kalenjin, the Kamba, the Kikuyu, and the Luo). In row 8, we exclude respondent pairs of which at least one respondent lives in the Rift Valley, which is of special importance given the violence and displacement that followed the 2007 elections. The Rift Valley was also the only province where a majority voted against the new constitution. In row 9, we restricts the sample to pairs of respondents residing in the same Afrobarometer cluster. In row 10, we restrict the sample to pairs of respondents who individually provide the same answer to the question about their ethnicity and the question about their language spoken at home.<sup>4</sup>

The last three robustness tests use different sets of control variables. In row 11, we drop all controls variables (but keep the fixed effects). In row 12, we add the pair-averaged percentage change in the size of the administrative unit as an additional control. Importantly, we also add it interacted with a dummy for the post-treatment periods to allow the treatment effect to differ by the change in size. In row 13, we add the pair-

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<sup>2</sup>We obtain similar results using the performance ranking instead of the trust ranking from the Afrobarometer questionnaire. Results not reported but available upon request.

<sup>3</sup>The Embu and Meru are close cousins of the Kikuyu and have traditionally supported the Kikuyu candidate. Moreover, the Luhya have a history of supporting the Luo candidate Odinga (see [Ferree et al., 2014](#)).

<sup>4</sup>This excludes around 17.0% of the respondents, most of them indicating that they speak Swahili at home.

averaged percentage change in distance from the cluster locations to the administrative capital as an additional control – again also interacted with the post-treatment dummy.

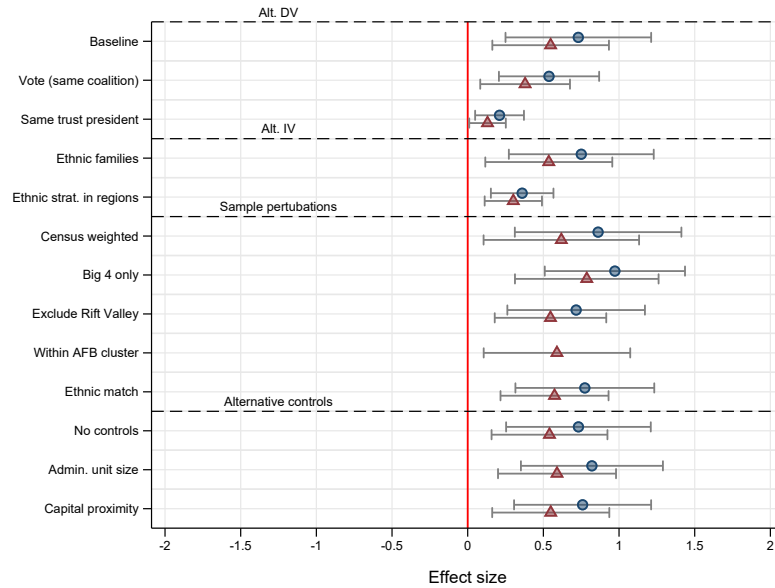
We see that the positive effect of an increase in regional fractionalization on ethnic voting is very robust across these specifications, while the effect of an increase in ethnic fragmentation is particularly vulnerable to sample perturbation.

In addition, [Figure B.2.3](#) shows that our results are not sensitive to different forms of clustering of the standard errors.

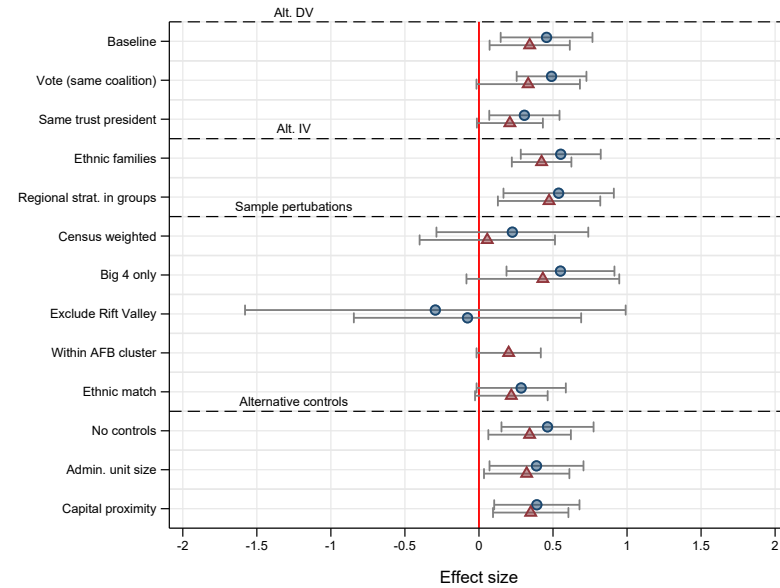
Finally, [Figure B.2.4](#) shows that increases and decrease in regional fractionalization have symmetric effects. (Recall that ethnic fragmentation decreases for all ethnic groups. Hence, we do not show its effects in this figure but included it in the underlying regressions.)

FIGURE B.2.2  
Robustness tests

(A) Effect of changes in regional fractionalization on ethnic voting

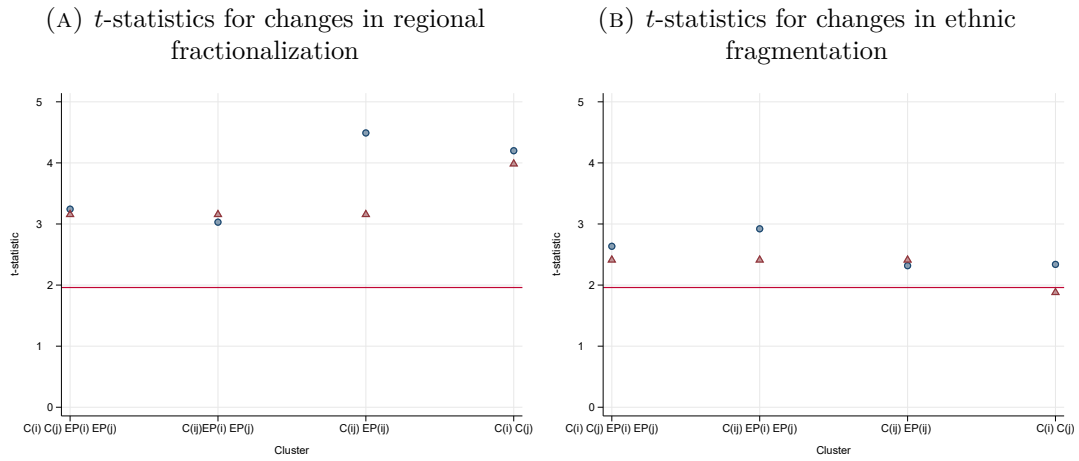


(B) Effect of changes in ethnic fragmentation on ethnic voting



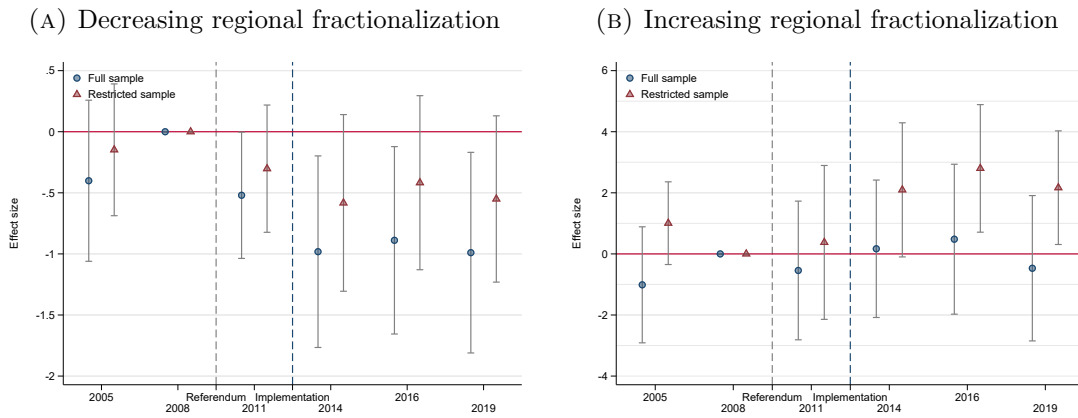
Notes: The figure shows difference-in-differences coefficients of the effect of reform-induced changes in border alignment on ethnic voting for two different samples. Circles represent estimates based on the full sample of coethnic respondents, and triangles on the restricted (within-county) sample. Panel A shows estimates for regional fractionalization, and panel B shows estimates for ethnic fragmentation. 95% confidence intervals based on two-way clustered standard errors at the province-ethnicity level (for each respondent of a given pair) are plotted as gray error bars.

FIGURE B.2.3  
Alternative clustering of the standard errors



*Notes:* The figure reports estimated *t*-statistics testing the null hypotheses that the effects of regional fractionalization ( $\Delta RF_{cd}$ , in panel A) and ethnic fragmentation ( $\Delta EF_e$ , in panel B) are zero using alternative forms of multi-way clustering of the standard errors. The underlying specification is the difference-in-differences version of the main specification (i.e., the top specification in Figure B.2.2). Circles represent estimates based on the full sample of coethnic respondents, and triangles on the restricted (within-county) sample.  $C(i)$  and  $C(j)$  refer to the counties of respondents  $i$  and  $j$ .  $C(ij)$  refers to the county pair where respondents  $i$  and  $j$  live.  $EP(i)$  and  $EP(j)$  refer to the ethnic-province combinations of respondents  $i$  and  $j$ . As an example, standard errors are clustered at the levels of each of the respondents' county and the levels of each of the respondents' ethnic-province combination in the first (left-most) robustness test.

FIGURE B.2.4  
Effect symmetry



*Notes:* The figure shows event study coefficients of the effect of reform-induced changes in border alignment on ethnic voting split by whether regional fractionalization increases or decreases. Circles represent estimates based on the full sample of coethnic respondents, and triangles on the restricted (within-county) sample. Panel A shows estimates for reductions in regional fractionalization, and panel B shows estimates for increases in regional fractionalization. Note that the negative  $\Delta RF_{cd}$  values in panel A are multiplied by -1 to report the effect of reductions in local diversity. All specifications include county pair-by-ethnicity and survey round fixed effects as well as pair-level controls. 95% confidence intervals based on two-way clustered standard errors at the province-ethnicity level (for each respondent of a given pair) are plotted as gray error bars.