Ethnofederalism: Subnational borders and the salience of ethnicity in politics*

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Abstract

We study how the design of subnational political borders shapes the salience of ethnicity in politics. We introduce a framework for measuring how political borders align with a country's ethnic geography at the micro level. We then leverage quasi-experimental variation in the alignment introduced by Kenya's 2010 constitutional reform, which divided the country's eight provinces into 47 counties. Our results suggest that ethnofederal reforms, i.e., reforms that increase the alignment between political borders and ethnic geography, would reduce ethnic voting in national elections. Finally, we evaluate alternative border designs and derive the design that would minimize ethnic voting.

Keywords: Ethnofederalism, decentralization, political borders, ethnic divisions, ethnic voting, ethnic politics, Kenya.

JEL classification: D02, D72, H77, J15, O55.

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1. Introduction

Ethnic identity is a powerful organizing principle in the politics of many countries. However, identity politics often fosters an "us versus them" logic that impedes the formation of broad-based political coalitions, reinforces clientelism, and encourages voting along ethnic lines, all of which undermine nation-building efforts. As a result, ethnic competition for state resources is frequently associated with poor governance and political instability. The costs of such divisions can be severe, as seen when ethnic tensions pushed Kenya to the brink of civil war after the 2007 election. While ethnic identities are somewhat malleable, it is not clear how policymakers can leverage this fact to mitigate ethnic divisions. A central question is, thus, whether formal political institutions can alter the influence of ethnicity in politics.[1]

This paper focuses on a specific political institution: the design of political regions. We ask whether ethnofederal border designs—i.e., designs that align subnational political borders more closely with a country's ethnic geography—can reduce the salience of ethnicity in national politics. To answer this question, we proceed in three steps. First, we propose a new framework for measuring and classifying subnational border designs and reforms at the micro level, which relies on two indicators of fractionalization based on residency and ethnic identity. Second, we leverage the quasi-experimental setting created by Kenya's 2010 constitutional reform to estimate the impact of border changes on ethnic voting in presidential elections. Third, we simulate the effects of a reform designed to minimize ethnic voting and compare it to other proposals championed before 2010. Our results suggest that individuals exposed to more ethnofederal borders are less likely to vote along ethnic lines. These findings highlight the potential of institutional design to mitigate ethnic cleavages in politics.

All subnational border designs differ in the extent to which they unite or divide those with a common ethnic (or other) identity. The importance of a country's political regions, in turn, depends on the power and resources devolved to them. Ethnofederal designs combine relatively homogeneous political regions with powerful regional governments to tie the hands of the central government (Lijphart, 1977; Horowitz, 1985; Weingast, 1995; Rohner and Zhuravskaya, 2023). Horowitz (1985), for example, argues that ethnofederal designs can have a "tranquilizing effect" on ethnic divisions in that they reduce the salience of ethnicity in national politics by shifting contentious issues, such as education or language policy, to homogeneous regions. Economic theory supports such designs, suggesting that federations may be larger, more stable, and more accountable when

[1]See, e.g., Posner (2005), Padró i Miquel (2007), Esteban and Ray (2008), Francois et al. (2015), and Laurent-Lucchetti et al. (2024) on ethnic politics; Franck and Rainer (2012), Huber (2012), Burgess et al. (2015), De Luca et al. (2018), Marx et al. (2019), and Amodio et al. (2024) on ethnic clientelism/favoritism and ethnic voting; and Eifert et al. (2010), Depetris-Chauvin et al. (2020), Carlitz et al. (2022), and Berman et al. (2023) on the malleability of ethnic identities.

political borders are drawn to minimize preference heterogeneity within regions (e.g., Alesina and Spolaore, 1997, 2005; Spolaore, 2010). Additionally, economies of scale and information externalities imply that there should be a relatively small number of homogeneous regions, rather than many (e.g., Tiebout, 1956; Oates, 1972; Boffa et al., 2016). Alternative designs include crosscutting designs, which deliberately mix ethnic groups within political regions in the hope of creating alternative potential cleavages and avoiding regions dominated by a single group that may strengthen their ethnic identity (Dahl, 1956; Lipset, 1960; Rokkan and Lipset, 1967; Spolaore, 2010); unitary designs with few or no political regions; and what we call "provincialist designs," which feature many small regions, typically even multiple regions with a similar ethnic composition. Despite its theoretical appeal, we lack quasi-experimental evidence on the effects of ethnofederalism, as measures of border alignment are typically thought of as country-level aggregates (e.g., Taylor and Rae, 1969; Anderson and Lochery, 2008; Rohner and Zhuravskaya, 2023).

We introduce two measures to approximate how subnational borders align with the settlement patterns of different ethnic groups. The first is the well-established fractionalization index, which we apply to the subnational level to measure ethnic heterogeneity within political regions.[2] The index corresponds to the probability that two randomly selected individuals from a given region identify with different ethnic groups. The second is an index of ethnic fragmentation measuring the within-group fractionalization across political regions. It corresponds to the probability that two randomly selected individuals from the same ethnic group live in different political regions. This index takes the concept of divided ethnic groups (as in Michalopoulos and Papaioannou, 2016) to the sub-national level, where groups may be divided across many regions.

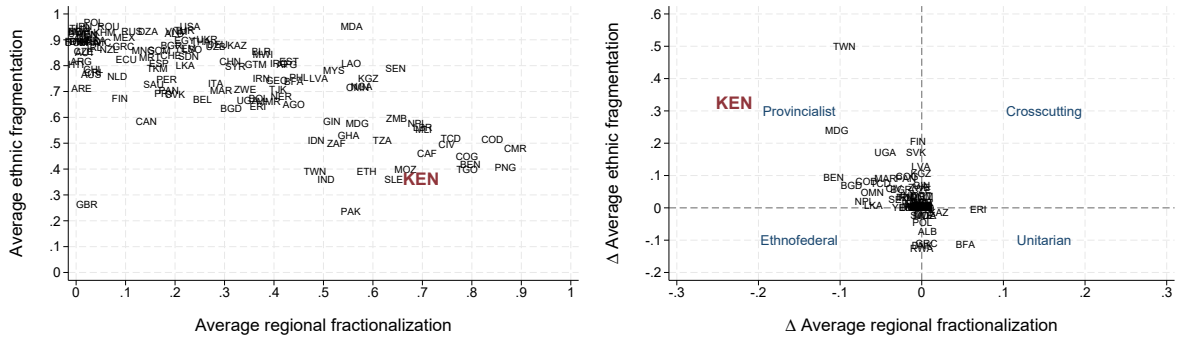
We begin with a global overview of border designs by averaging these two measures at the country level before applying them at the micro level. Panel A of Figure I shows that many countries feature low average regional fractionalization and high average ethnic fragmentation, reflecting the (many) ethnically homogeneous regions typical of provincialist designs. By contrast, countries like pre-reform Kenya feature diverse political regions that unite many groups within their borders. However, comparing these averages is challenging because countries differ in both their border design and their underlying ethnic geography. In contrast, it is straightforward to interpret the reform-induced changes in these averages for a given ethnic geography. Panel B suggests that the border designs of many countries, including Kenya, have shifted towards more provincialist designs over time. This shift reflects a global trend of splitting larger regions into smaller, more homogeneous ones, which often divides ethnic groups across more units (Grossman

[2]Versions of this measure have been used to study how ethnic diversity affects various outcomes, e.g., economic performance, public goods provision, and trust (Alesina and La Ferrara, 2005).

et al., 2017; Bazzi and Gudgeon, 2021; Bluhm et al., 2024).

FIGURE I
Cross-country comparisons of border designs and border reforms

(A) Border designs (1995) (B) Border reforms (1995–2015)



Notes: Panel A plots the population-weighted average regional fractionalization and the population-weighted average ethnic fragmentation across countries. Panel B plots the changes in those averages from 1995 to 2015. The quadrants in panel B allow the classification of the changes and the underlying border reforms as provincialist, crosscutting, ethnofederal, or unitarian. The population data is from the Global Human Settlement Layer or GHSL (Schiavina et al., 2019), political borders in 1995 and 2015 are from Bluhm et al. (2024), and the distribution of ethnic (language) groups is from Ethnologue (Lewis, 2009). The population distribution of ethnic groups is estimated using the algorithm outlined in Desmet et al. (2020) that aligns 1990 population data from GHSL with Ethnologue maps. Further details are provided in Online Appendix A.1.

Our empirical analysis focuses on Kenya's 2010 constitutional reform, which provides an ideal context for examining the effects of an ethnofederal border reform at the local level. First, Kenya is a diverse country with a prominent history of ethnic politics. Second, by replacing eight provinces with 47 counties as primary political regions, the 2010 constitutional reform substantially changed Kenya's border design. Panel B of Figure I shows that no other country underwent a larger decrease in average regional fractionalization, and only one country recorded a greater increase in average ethnic fragmentation between 1995 and 2015. Importantly, the country-wide averages hide substantial heterogeneity in the changes in regional fractionalization across Kenya's political regions and ethnic fragmentation across its ethnic groups. We exploit this variation in our analysis. Third, the constitutional reform not only changed the border design but also introduced administrative and fiscal decentralization as well as county-level elections, as suggested by proponents of ethnofederalism. As a result, it transformed the pre-reform winner-take-all system into one with explicit revenue and power sharing between the federal government and the counties, providing alternative avenues for groups to obtain desired public goods. More broadly, Kenya's reform offers insights into how other countries facing similar ethnic or identity-based divisions could ease ethnic tensions.

We use multiple rounds of Afrobarometer survey data to measure ethnic voting over

time.[3] Our primary outcome is an indicator of ethnic voting equal to one if a respondent would have voted for the same party (or coalition) as most co-ethnic respondents in the same survey round. An important advantage of this measure is that it does not require an ad hoc definition of ethnic parties (or coalitions) but rather defines them from the data. This is important in the Kenyan context, in which parties (and coalitions) are fluid, and there are many more ethnic groups than parties or presidential candidates. While this group-based perspective has benefits, our results do not hinge on the precise definition of ethnic voting.

Our identification strategy exploits the quasi-experimental variation in how different individuals are exposed to the border reform, depending on their ethnic identity and their place of residence, to estimate the effect of different border designs on ethnic voting. We use a generalized difference-in-differences strategy that relies on two sources of variation: reform-induced changes in regional fractionalization at each location and reform-induced changes in ethnic fragmentation for each group. These changes are computed using population data from the 1989 census to hold the population distribution constant and isolate the effects of changing borders. Our specification relates the voting intentions of the Afrobarometer survey respondents to these two sources of regional and group-level variation. We always include county-by-ethnicity and time (survey round) fixed effects to account for important aspects of the underlying ethnic geography and the reform itself, such as the general impact of devolution or differences in the provision of public goods and services.

An important concern is that Kenyan voters could have anticipated how the border reform would be implemented and adjusted their voting behavior accordingly. However, the exact changes in political borders implemented by the 2010 constitutional reform were hard to foresee. Kenya has a history of constitutional proposals aimed at redesigning and strengthening (ethnic) regions. Previous proposals include the so-called Bomas and Wako draft constitutions proposed in 2005. Yet, all previous attempts to change the design were blocked by incumbent presidents or rejected at the ballot box. It was only after the 2007/2008 election violence that a window for reform opened, aided by significant pressure from external actors. Even then, there was widespread disagreement about all aspects of the reform, including the administrative tiers and the number of political regions in each tier. This disagreement makes it unlikely that voters could anticipate the final border design long before it was published and successfully passed in a national referendum in 2010. We provide event-study evidence that ethnic voting before the reform did not respond to subsequent treatment intensity. Moreover, we document that our treatments do not affect the respondents' intention to vote or willingness to reveal party preferences.

[3] Afrobarometer surveys ask about voting intentions and are conducted in off-election years. We use a representative exit poll from Ferree et al. (2014) to illustrate that voting intentions reflect actual voting behavior.

Our main results show that ethnic voting increases in regional fractionalization and ethnic fragmentation. They strongly suggest that ethnofederal reforms, which reduce regional heterogeneity *and* unite members of the same group (to the extent possible), are effective in reducing ethnic voting. However, this is not what happened in Kenya, where all individuals were exposed to either a provincialist or a cross-cutting reform. The beneficial reduction in regional fractionalization was more than offset by the increase in ethnic fragmentation for most groups. Our evaluation of the 2010 constitutional reform suggests that the partial effect of the border reform—net of overall trends in ethnic voting—was an increase in ethnic voting of about 6.5 percentage points.

Our findings remain robust even when accounting for other political changes occurring at the same time. Like most constitutional reforms, the 2010 reform involved a bundle of treatments. We interpret our estimates as the differential effect of changing the border design while holding the extent of devolution constant. This interpretation assumes that any other heterogeneous impacts of devolution or regional elections are not correlated with our two treatment variables. To address potential confounders, we show that controlling for differences in the size of political regions, the proximity to regional capitals, or the vote share in favor of constitutional reform in the national referendum has little impact on our results. We also rule out that other concurrent border changes, such as the redrawing of parliamentary constituencies, drive our estimates. Additional tests show that our results remain qualitatively, and often quantitatively, similar when using nonlinear estimation methods, stringent fixed effects that account for group-time or region-time variation, alternative definitions of ethnic voting, or sample perturbations to address concerns such as interviewer bias, selective migration, and the political alignment of counties with the president.

To better understand why ethnofederalism may "tranquilize" ethnic division and lower incentives to vote along ethnic lines in national elections, we present a simple model of ethnic voting. The model's setup mirrors key features of the Kenyan setting in which the central government generates all revenues and distributes a share to regional governments, while both the central and regional governments may have a co-ethnic bias in providing public goods. Voters may face a trade-off between selecting a high-quality presidential candidate whose ability (or honesty) indirectly increases regional transfers and choosing a co-ethnic candidate who ensures a greater share of centrally provided public goods. Devolution shifts the balance toward the former for ethnic groups living in a county with a regional government controlled by co-ethnics. Moreover, the model suggests that this effect is stronger when co-ethnics are united in a single county, e.g., due to economies of scale or improved accountability (as in Boffa et al., 2016).

To study this mechanism empirically, we first document that the largest group in a county is 84 percentage points more likely than others to control the governorship after the 2013 election. Moreover, large groups with a co-ethnic governor dominate the county

executive. In support of our theoretical argument, we show that the effects of regional fractionalization and ethnic fragmentation tend to be amplified for members of the ethnic group that controls the county government. However, regional control can be a double-edged sword. A prominent counterargument to ethnofederalism is that creating ethnic regions dominated by a single group may also deepen ethnic identities and fuel separatist tendencies (e.g., Spolaore, 2010; Desmet et al., 2022). We find no evidence suggesting that the identification of respondents with their ethnic group changed in response to the change in regional fractionalization and ethnic fragmentation in the first decade after the reform. Taken together, these findings show that ethnofederal reforms modify the incentives to vote along ethnic lines but may not affect ethnic identities more broadly.

Finally, we consider alternatives to Kenya's 2010 border reform. We use our estimates to simulate the counterfactual effects of the maps proposed in earlier draft constitutions—the Bomas and Wako drafts—and to compute the optimal political map, i.e., the map that would minimize ethnic voting, subject to realistic constraints met by the actual reform. The optimal map has 17 instead of 47 subnational units. Many of these units are similar to the 14 regions proposed in the Bomas draft, which resulted from a long and inclusive constitutional review process but was never put to a referendum. Ethnic voting implied by the optimal map would be 5.6 percentage points lower than in the pre-reform provinces (and 12.1 percentage points lower than in the post-reform counties). The Bomas draft would have reduced ethnic voting by about 1.3 percentage points, and the Wako draft would have increased ethnic voting by 7.7 percentage points (relative to the pre-reform provinces). These results show that a genuinely ethnofederal border reform could have reduced the salience of ethnicity in national politics.

Our findings contribute to several strands of the literature. First and foremost, we show that the design of political institutions matters for nation-building and can immediately mitigate the importance of ethnicity in national elections. This distinguishes ethnofederal reforms from large-scale resettlement programs (Bazzi et al., 2019), education programs (Miguel, 2004; Clots-Figueras and Masella, 2013; Cantoni et al., 2017; Bandiera et al., 2019), or a mix of the two (Carlitz et al., 2022), which typically take a long time to affect the salience of ethnicity more generally. Shared experiences (Depetris-Chauvin et al., 2020; Cáceres-Delpiano et al., 2021) and a common narrative (Esposito et al., 2023) can also contribute to nation-building in the short run but are only partially in the control of policymakers.[4]

Second, we relate to the literature on political borders and their effects in several ways. We directly contribute to the long-standing debate on the benefits of ethnofederal and crosscutting designs (e.g., Lipset, 1960; Lijphart, 1977; Horowitz, 1985; Roeder, 1991) by providing new measures that characterize these designs at the subnational level

[4]See Rohner and Zhuravskaya (2023) for an overview of the recent literature on nation-building.

as well as quasi-experimental evidence on the benefits of ethnofederal designs.[5] Our framework for analyzing border designs and focus on ethnic voting complements research on how subnational borders affect conflict in diverse societies (Bazzi and Gudgeon, 2021). Moreover, we indirectly contribute to the literature on artificial national borders (Alesina et al., 2011; Michalopoulos and Papaioannou, 2016) by showing that the design of subnational borders plays an important role in managing ethnic diversity within nations.

Third, we provide evidence that fiscal decentralization and political devolution could reduce the salience of ethnicity in politics in countries with ethnofederal border designs. This insight contributes to the large literature on decentralization, federalism, and political accountability (e.g., Tiebout, 1956; Bardhan and Mookherjee, 2000; Boffa et al., 2016), in particular to contributions focusing on the size of political regions and ethnic diversity (e.g., Alesina and Spolaore, 1997, 2005; Narasimhan and Weaver, 2024; Dahis and Szerman, 2023).

Fourth, we contribute to research on ethnic politics. We build on a sizable body of work documenting ethnic power-sharing (e.g., Padró i Miquel, 2007; Francois et al., 2015) and the existence of ethnic favoritism in the distribution of public goods or job opportunities (e.g., Franck and Rainer, 2012; Burgess et al., 2015; Kramon and Posner, 2016; De Luca et al., 2018; Amodio et al., 2024). By showing that changes in political institutions and political borders can lower the incentive to vote along ethnic lines in national elections, we provide evidence in favor of a practical policy tool that could increase regional performance and accountability. In this manner, we also contribute to the literature on the role of ethnicity in Kenyan politics and society (e.g., Gibson and Long, 2009; Ferree et al., 2014; Burgess et al., 2015; Kramon and Posner, 2016; Kramon et al., 2022; Marx et al., 2021).

The remainder is structured as follows. Section 2 discusses our conceptual framework for measuring and classifying border designs and reforms. Section 3 summarizes Kenya's institutional background and the important aspects of the 2010 constitutional reform. Section 4 presents the data, describes our empirical strategy, and discusses identification issues. Section 5 presents evidence in support of our identifying assumptions, the main results, alternative explanations, and sensitivity analysis. Section 6 discusses regional control as the main mechanism. Section 7 presents counterfactual border designs that minimize ethnic voting. Section 8 concludes.

2. Measuring border designs and reforms

In this section, we first discuss different prototypical border designs, including ethnofederal designs, and introduce two indices describing key characteristics of these

[5] See Dunning and Harrison (2010) for causal estimates on the effects of another type of crosscutting cleavages, namely cleavages between ethnicity and cousinage in Mali.

border designs. We then show that these indices can capture differences in how different individuals are exposed to the same border design or reform, depending on their place of residence and their ethnic identity.

2.1. Prototypical border designs and their properties

Panels A–D of Figure II present four different prototypical border designs, each illustrating different ways political borders can align with ethnic geography in a stylized country with four locations and two spatially segregated ethnic groups. Ethnofederal border designs align political borders with ethnic homelands, ensuring that most individuals in a region share the same ethnic identity and that most members of an ethnic group live in the same province. In the extreme case shown in Panel A, political regions perfectly coincide with ethnic groups due to the homogeneity of each location. In contrast, Panel B illustrates a crosscutting border design, where political borders cut through ethnic homelands, dividing co-ethnics across ethnically heterogeneous regions.[6] Panels C and D shift the focus to the number of political regions: Panel C depicts a provincialist design with many small regions, while Panel D presents a unitarist design with no meaningful political regions below the national level.

These four prototypical border configurations differ along two dimensions. The first is the level of ethnic diversity within political regions. We measure this diversity using a regional fractionalization index, which quantifies the degree of ethnic diversity within each political region:

$$RF_r = 1 - \sum_{e=1}^{n} (s_e^r)^2, \tag{1}$$

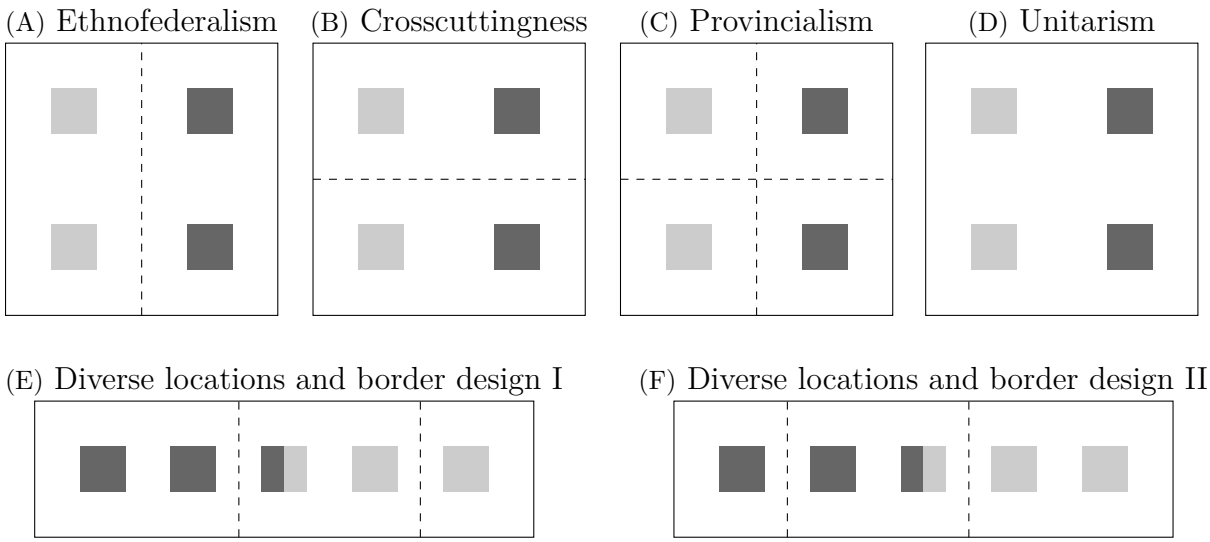
where r is a political region, e an ethnic group, n the number of ethnic groups, and s_e^r the population share of group e in region r.[7] Regional fractionalization RF_r is low in all political regions r in the ethnofederal and provincialist border designs of panels A and C, but high in the crosscutting and unitarian border designs of panels B and D, which assign locations with very different ethnic compositions to the same political region(s).

The second dimension is the extent to which members of the same ethnic group are dispersed across different political regions. We propose to capture this margin by a novel index of ethnic fragmentation that measures the within-group fractionalization across

[6] Panels A and B of Figure II illustrate the role of political borders for different measures of ethnic segregation. Measures of *spatial* segregation, e.g., the index introduced by Hodler et al. (2021), are computed based on spatial distances between individuals. Hence, they are independent of political borders. In contrast, measures of *a-spatial* or political segregation, e.g., those used by Alesina and Zhuravskaya (2011), are computed based on population shares in different political regions. Therefore, political segregation is high when ethnofederal borders ensure different distributions of ethnic groups across political regions but low (zero) when crosscutting borders ensure similar (identical) distributions of ethnic groups across political regions.

[7] RF_r is the standard index of ethnolinguistic fractionalization computed at the regional level.

FIGURE II
Illustration of various border designs



Notes: The squares represent equally sized locations, and the different shades of gray represent different ethnic groups. Hence, all locations are ethnically homogenous except the central location in panels E and F, which are ethnically diverse. The dashed lines represent political borders.

political regions:

$$EF_e = 1 - \sum_{r=1}^{m} (s_r^e)^2, \tag{2}$$

where m is the number of political regions and s_r^e the population share of residents in political region r among all members of ethnic group e. Ethnic fragmentation EF_e must be zero for all ethnic groups e in case of unitarism. Moreover, it is low in ethnofederal border designs. In contrast, it is high in crosscutting and provincialist border designs, which assign locations with similar ethnic compositions to different political regions.

2.2. Individual exposure to border designs and reforms thereof

Unlike the stylized country shown in panels A–D, most real-world countries feature ethnically diverse locations. As a result, it is typically impossible to design borders that ensure zero regional fractionalization (RF_r) in all political regions or zero ethnic fragmentation (EF_e) for all ethnic groups (such as the ethnofederal border design in panel A). More generally, these measures will typically vary across regions and groups. Panels E and F of Figure II present another stylized country—one with an ethnically diverse location in the center—to illustrate this variation. Border design I in panel E implies $RF_r = 0$ in the Western and the Eastern regions but $RF_r = 0.375$ in the central region (which contains the ethnically diverse location). Ethnic fragmentation is $EF_e = 0.32$ for the dark gray group and $EF_e = 0.48$ for the light gray group.

Allowing for diverse locations implies that individuals are exposed to the same border design in different ways depending on their place of residence and ethnic identity. The

same holds true for border reforms. For example, suppose a reform shifts the political borders in the country depicted in Panel E westward, resulting in border design II shown in Panel F. Individuals in the central-western location (the second from the left) are exposed to increasing regional fractionalization as their location transitions from an ethnically homogeneous region to a more diverse one. In contrast, individuals in the central-eastern location (the second from the right) are exposed to a reduction in regional fractionalization. Additionally, the dark gray group sees an increase in ethnic fragmentation, while the light gray group experiences a decrease. As a result, individuals in the central-western location who identify with the dark gray group are exposed to a crosscutting reform (increasing EF_e and RF_r). In contrast, those in the central-eastern location who identify with the light gray group are exposed to an ethnofederal reform (decreasing EF_e and RF_r).

There are many ways in which these two measures of border designs—regional fractionalization and ethnic fragmentation—can be used in applied research. First, they can be used in micro-level analyses to study the effects of border designs and reforms by leveraging differential exposure of different regions and groups. This is the approach we take in this paper, exploiting the fact that changes in regional fractionalization and ethnic fragmentation vary across individuals based on their place of residence and ethnic identity. In Section 4, we explain how we calculate these changes and use them in our empirical analysis. Alternatively, these measures can be averaged across all individuals in a country.[8] These country-level averages, or their changes over time, allow for cross-country comparisons like those in Figure I. Additionally, changes in these averages allow to determine whether border reforms are ethnofederal, crosscutting, provincialist, or unitarian in their overall nature.

3. Institutional background

Ethnic politics in pre-reform Kenya: Kenya is exceptionally diverse. The probability that two randomly drawn individuals from the country's population identify with different groups is about 88%. The five largest groups make up about two-thirds of the population and are spatially segregated (outside of Nairobi).[9] Four of these groups—the Kikuyu, Luo, Kalenjin, and Kamba—explicitly compete for power at the national

[8]These country-level averages of our measures are related to existing measures of crosscuttingness. Taylor and Rae (1969, p. 537) 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]." They introduce a country-level measure of crosscuttingness and show that it decreases in aggregate measures of ethnic and regional fractionalization. See Selway (2011) and Desmet et al. (2017) for alternative aggregate measures of crosscuttingness.

[9]In 1989, the largest groups were the Kikuyu (20.9%), Luhya (12.4%), Luo (12.4%), Kalenjin (11.5%), and Kamba (9.8%). The 2019 population shares of these groups differ by less than three percentage points.

level by fielding presidential (or later vice-presidential) candidates in most elections.

Kenya's ethnic divisions influence electoral politics in several ways. First, parties are fluid, institutionally weak, and often exclusively designed to bring specific politicians to power (Mueller, 2020). These parties often lack physical offices or official programs and are usually dormant between elections (Oloo, 2020). Members of the larger groups typically vote for their ethnic kin (Gibson and Long, 2009; Long and Gibson, 2015).[10] However, no ethnic group is large enough to secure victory alone. Therefore, parties must form multi-ethnic coalitions to win presidential elections, with one or two larger groups typically allying with smaller groups lacking co-ethnic candidates (at the presidential or vice-presidential level). Second, at nearly all levels of government, resources are frequently distributed along ethnic lines. This culture of ethnic competition has become encapsulated in the phrase "it's our turn to eat," reflecting the expectations of supporters when their co-ethnic candidates assume power (Wrong, 2009). The central government and local politicians allocate public goods to and provide patronage in areas where specific ethnic groups reside, aiming to increase voter turnout among their ethnic kin while co-opting other groups (Burgess et al., 2015; Horowitz, 2019; Hassan, 2020). Third, in pre-reform Kenya, power was heavily concentrated in the presidency, and the administrative structure was highly centralized, giving elections a "winner-take-all" character (Mueller, 2020). Until 2010, Kenya had a centralized administrative system, where the first two layers—provinces and districts—were politically relevant. Commissioners at both levels were handpicked by the president, with provincial commissioners overseeing and directing the activities of the district-level administration (Oyugi and Ochieng, 2020).[11] A World Bank (2008, p. 8) report summarized the situation as follows: "power rests with the executive branch and the most powerful force in local government is the provincial administration."

A window of opportunity for decentralization: Over-centralization and an uneven distribution of public resources frequently led to violence around elections after the transition to multi-party democracy in 1992.[12] The most significant recent outbreak of ethnically motivated violence occurred after the 2007 presidential election. It cost the lives of more than 1,000 people while internally displacing hundreds of thousands. Most violence was concentrated in the Rift Valley province, where Kalenjins and Luos clashed with Kikuyus, and in ethnically mixed Nairobi (Anderson and Lochery, 2008). As the crisis pushed Kenya to the brink of civil war, several external actors exerted significant

[10]For instance, exit polls conducted during the 2007 elections show that 94.2% of Kikuyu and 97.8% of Luo voted for their co-ethnic candidate (Gibson and Long, 2009).

[11]In addition, there existed a separate system of local authorities with elected assemblies (see Section 5.3).

[12]This shift to violent elections was near immediate. Already in the two elections in the 1990s, more than 2,000 people were killed, about 500,000 were displaced, and many others were intimidated into not voting (Mueller, 2008).

pressure for constitutional change to prevent further violence. The African Union brokered a power-sharing deal among the two main contenders of the 2007 election—Mwai Kibaki (a Kikuyu) and Raila Odinga (a Luo)—and committed Kenya's elites to start a constitutional reform process.

The 2007–2008 crisis reignited a longstanding debate on devolution. Kenya originally became independent in 1962 with a federal constitution—known as *majimbo*—in which substantial resources were to be distributed by the provinces through elected regional assemblies (Maxon, 2016; Hassan, 2020). *Majimbo* means regions in Swahili but has become more generally associated with federalism and the protection of smaller communities. The *majimbo* state never became operational. The country's first president, Jomo Kenyatta (a Kikuyu), immediately dismantled it (Maxon, 2016).

Serious efforts at reforming Kenya's constitution started as a reaction to protests in the late 1990s. *Majimboism* resurfaced as a rallying cry for the opposition, who sought to limit executive power, and for the center, who labeled it as a divisive ideology (Maxon, 2016). In 1997, a constitutional review commission was formally established and tasked to lead an inclusive reform process. Even so, then-president Daniel Arap Moi (a Kalejin) dissolved parliament in 2002 before the proposed changes could be considered. The process restarted with a new draft constitution in 2005, which resulted from a national constitutional conference held at Bomas. The final *Bomas draft* included 14 regions with 70 districts (where one district includes the four boroughs of Nairobi). The key provisions were strong devolution, a bicameral legislature with a senate, and a substantially weakened presidency.

The Kibaki government opposed the constraints to executive power envisioned by Bomas draft and pushed for a legislative process to alter the document (Posner, 2005). The *Wako draft* constitution (named after the Attorney General at the time) instead proposed a single layer of government with 70 districts, limited devolution, a unicameral system, and a strong presidency. The Wako draft was adopted by parliament and put to a referendum in 2005. The referendum pitted Odinga, who opposed it and founded the Orange Democratic Movement (ODM) to challenge it, against Kibaki, who favored it. It was ultimately rejected by 58% of the vote. The Bomas draft was never voted on, although it remained part of the political discourse well after 2010.[13] Later, in Section 7 we present counterfactual predictions for these competing proposals.

The 2010 constitution: An important part of the 2008 power-sharing agreement was the creation of a committee of experts to draft a new "harmonized" constitution, with the explicit goal of developing a compromise between a strong presidency and *majimboism*. The final draft proposed to create 47 counties and a bicameral legislature, with a senate

[13]Odinga still called for the Bomas draft in 2020 (see https://nation.africa/kenya/news/politics/raila-steps-up-call-for-14-regional-governments-1927152).

that controls the allocation of resources to county governments (Kramon and Posner, 2011; D'Arcy, 2020). Each county was to have an elected governor, with their own cabinet, and an elected county assembly with some legislative and oversight powers (D'Arcy, 2020). Counties would receive a formula-based share of at least 15% of central government revenues to fund a wide range of public goods and services, such as agriculture, health care, pre-primary education, water and sanitation, and county roads.

In 2010, parliament approved the draft, and the new constitution was adopted by 68% of voters in a national referendum. The territorial reform and the new devolved government structure were implemented with the March 2013 national elections. While devolution was planned over a three-year transition period, the new county governors successfully lobbied for a near-immediate transfer of power (D'Arcy, 2020). In fact, the allocation of central government funds has often exceeded the minimum threshold, with counties receiving around 20-30% of the national budget in recent years. These so-called equitable share transfers average about 70-80% of county funds.[14]

The county borders were based on Kenya's pre-1992 districts and represented a compromise between size, homogeneity, and legal convenience (D'Arcy, 2020).[15] They closely resemble the last borders implemented by the British colonial government. Hence, while they follow historical ethnic divisions, these borders were not gerrymandered based on contemporary political motivations. Moreover, given the large variety of reform proposals and efforts to block reform, voters could neither anticipate how many layers nor how many administrative units the final 2010 proposal would entail.[16] Of course, wholesale constitutional change implies that the reform coincided with other changes to the existing governance structure. We study those changes in Section 5.3.

The new borders fundamentally changed how regions aligned with Kenya's ethnic geography. Figure III shows the pre-reform provinces in panel A and the post-reform counties in Panel B. While the population share of the largest group was 9.9% in the average province, it is 74.7% in the average county, significantly reducing regional fractionalization. 40 counties contain a group that is the majority of the population, with a single group representing more than 90% of the population in 17 of these counties. Qualitative evidence suggests that this reform empowered ethnic groups previously locked

[14]Local revenue is typically less than 10%. Only Nairobi and Mombasa have local revenues that comprise a large share of their budgets. The remainder is conditional grants from the government or loans from development partners and cash balances (see the consolidated budgets for 2017/18 available at https://cob.go.ke/reports/consolidated-county-budget-implementation-review-reports/).

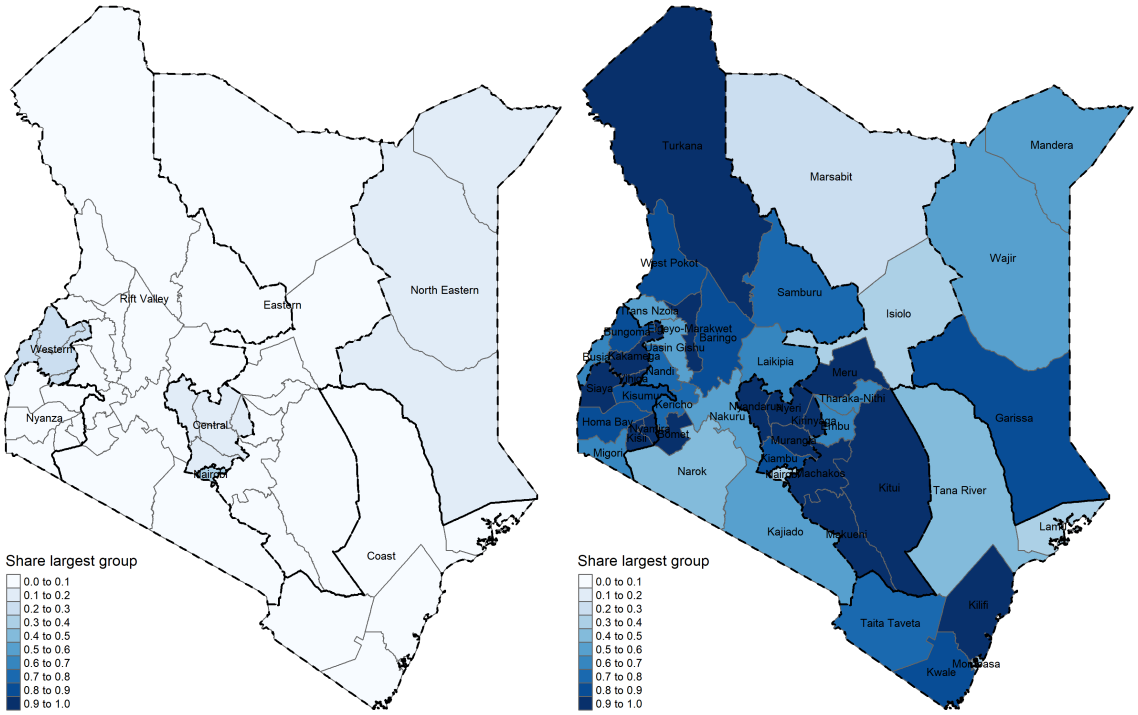
[15]In late 2009, the High Court of Kenya declared all districts created after 1992 illegal, leaving only 47 with some legal basis.

[16]The expert committee developing the draft had initially proposed a two-tier system retaining the original eight provinces and adding 74 counties but changed this to a single layer with 47 counties after the public review process. The revised harmonized draft was forwarded to a parliamentary subcommittee (PSC), but 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: [...] 47 county governments" (Kramon and Posner, 2011, p. 94).

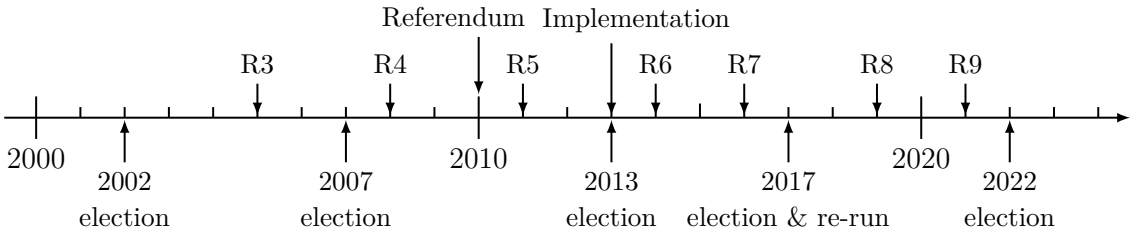
out of the national government and expanded patronage politics to gubernatorial elections (D'Arcy and Cornell, 2016). We return to this consequence when discussing mechanisms in Section 6.

FIGURE III
Kenya: Border reforms and timeline

(A) Pre-reform provinces (B) Post-reform counties



(C) Timeline



Notes: The figure illustrates the 2010 constitutional reform 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 share of the largest group in each pre-reform province, and Panel B the population share of the largest group in each post-reform county. Panel C shows a timeline indicating i) the election years, ii) the years in which the constitutional referendum took place and in which the political devolution and the territorial reform were implemented, and iii) 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.)

General elections for the presidency, national assembly, and (now) county governments and senators regularly occur every five years.[17] Three presidential elections occurred

[17]Before 2010, Kenya had a first-past-the-post system where a plurality of the popular vote was

during the post-reform period: the 2013, 2017, and 2022 general elections. Panel C of Figure III illustrates the timing of the election years and the constitutional reform. In many aspects, political competition has been stable. In all elections from 2002 until 2017, the former incumbent, Kibaki, or his successor, Kenyatta, competed against Odinga and together received well over 90% of the vote.[18] The new constitution also requires that each candidate name a running mate for vice president. William Ruto (a Kalenjin) and Kalonzo Musyoka (a Kamba) were the vice-presidential candidates in the 2013 and 2017 elections. In 2022, when Kenyatta was term-limited, Ruto narrowly won against Odinga.

4. Data and empirical strategy

In this section, we first describe how we use micro-level data from the 1989 Kenya Population and Housing Census to compute the reform-induced changes in regional fractionalization and ethnic fragmentation for all locations and ethnic groups, respectively. We then discuss how we use multiple Afrobarometer survey rounds to measure ethnic voting at the level of individual respondents. Finally, we present our empirical strategy.

4.1. Computing changes in regional fractionalization and ethnic fragmentation

Our main source of population data is micro data for every 20th household from the 1989 Kenya Population and Housing Census (Kenya National Bureau of Statistics, 1989). Although later censuses are available, the 1989 census is the last census in Kenya that disclosed ethnic identities in the micro data. These data cover slightly more than a million people in 3,600 sublocations, which we assign to pre-reform provinces and post-reform counties.[19]

We use these data to compute regional fractionalization for each region and ethnic fragmentation for each group twice: once based on the pre-reform province borders and once based on the post-reform county borders. We denote by ΔRF_c the reform-induced change in regional fractionalization that individuals living in county c are exposed to.

sufficient to win the presidential election. After 2010, the majority (rather than the plurality) of the popular vote is needed to win. The winning candidates in two pre-2010 elections in our sample won with a majority (62.2%) or close to a majority (46.4%). There was also a requirement to win at least 25% of the votes in at least five of the eight provinces, mirrored in the 2010 constitution by a requirement that 25% of votes be won in half of all counties. The two leading candidates always easily satisfied this requirement.

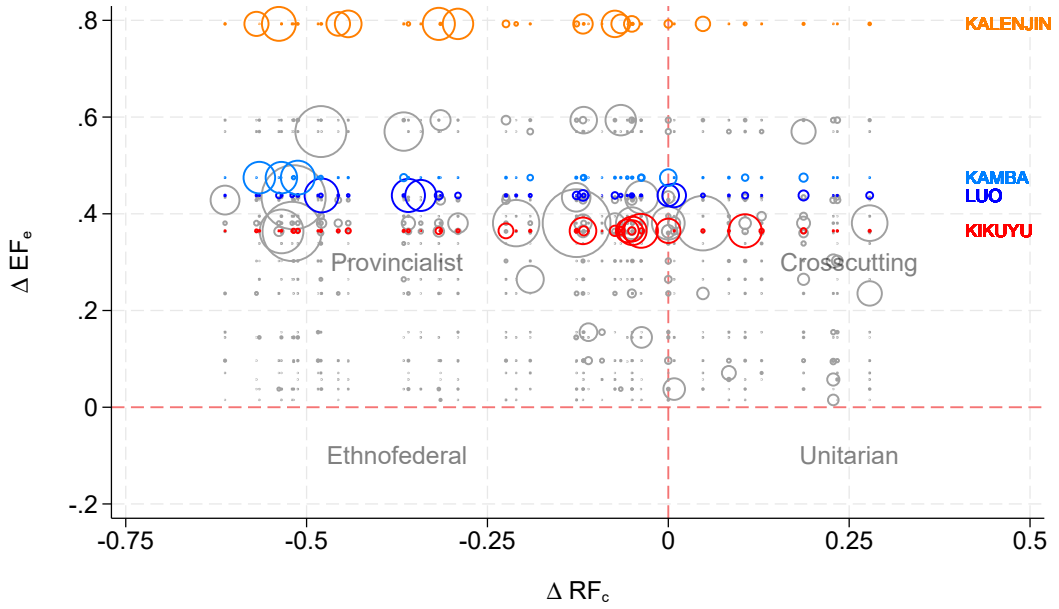
[18]The first run of the 2017 vote was annulled over discrepancies in reported vote totals (see, e.g., https://www.nytimes.com/2017/09/01/world/africa/kenya-election-kenyatta-odinga.html). Odinga boycotted the re-run.

[19]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).

This change equals the difference between the post-reform county-level RF_c and the pre-reform province-level $RF_{p(c)}$ of the province p enclosing future county c. We denote by ΔEF_e the reform-induced change in ethnic fragmentation that individuals of ethnic group e are exposed to. This change equals the difference between EF_e computed for the post-reform county borders and EF_e computed for the pre-reform province borders. Using pre-reform population data ensures that RF_c and EF_e change only because of the border reform.

The border reform decreased average (population-weighted) regional fractionalization from 0.53 to 0.32 and increased average (population-weighted) ethnic fragmentation from 0.32 to 0.76. Hence, our classification suggests that the overall reform was of a provincialist nature. However, these averages mask considerable variation across individuals residing in different places and identifying with different ethnicities.

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



Notes: The figure illustrates how the change from pre-reform province borders to post-reform county borders induces variation in treatment intensity across locations and ethnic groups. In particular, it shows the changes in regional fractionalization (ΔRF_c) and the changes in ethnic fragmentation (ΔEF_e) for each county-ethnicity combination (see main text 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 illustrates the changes in regional fractionalization and ethnic fragmentation across county-ethnicity combinations that individuals are exposed to (with the size of the circle being proportional to the population of the corresponding combination). ΔRF_c, shown on the horizontal axis, ranges from -0.61 (in Turkana County in the former Rift Valley Province) to 0.28 (in Busia County in the former Western Province). ΔEF_e, shown

on the vertical axis, ranges from 0.02 (for the Rendille) to 0.79 (for the Kalenjin). All ethnic groups became more fragmented because the reform split every province (except Nairobi Province) into multiple counties. Hence, there are two types of border reforms people are exposed to. A reform towards provincialism for all circles (i.e., county-ethnicity combinations) to the left of the red vertical line, and a reform towards crosscuttingness for all the circles to the right of the red vertical line. Importantly, there is substantial variation in the direction and degree of ΔRF_c among members of the same ethnic group. For example, some Kalenjin live in counties with $\Delta RF_c < -0.5$ and others in counties with $\Delta RF_c > 0$. Similarly, there is substantial variation in ΔEF_e among residents of the same county. Our empirical strategy exploits this variation within ethnic groups and counties.

4.2. Measuring ethnic voting

We use Afrobarometer survey rounds 3–9 to construct our measures of ethnic voting. These surveys provide information about the location where respondents reside and the ethnic group with which they identify.[20] Importantly, these surveys also contain a question about voting intentions, phrased consistently across these survey rounds: "If presidential elections were held tomorrow, which party's candidate would you vote for?" The suitability of relying on this question depends on how well voting intentions in off-election years can proxy for voting behavior in elections. We thus compare voting intentions from Afrobarometer survey round 6, conducted in 2014, with the exit poll data from the 2013 election by Ferree et al. (2014). Figure A.4 shows that group-level voting patterns are similar across these two data sources, particularly when focusing on coalitions. This similarity lends credibility to the Afrobarometer survey data on voting intentions, at least in our setting.

Our main dependent variable is a plurality indicator for ethnic voting, EV_{iet}, which equals one if respondent i would vote for the party (or coalition) for which the highest number of other respondents of the same ethnic group e would vote in the same survey round t, and zero otherwise. Panel A of Figure V shows the vote shares of the first and second most popular parties for each of the ten largest groups, averaged across survey rounds.[21] The differences between the vote shares of a group's first and second most popular parties are substantial, ranging from 22.7 percentage points for the Kamba to 84.5 percentage points for the Luo. Panel B shows even larger differences when

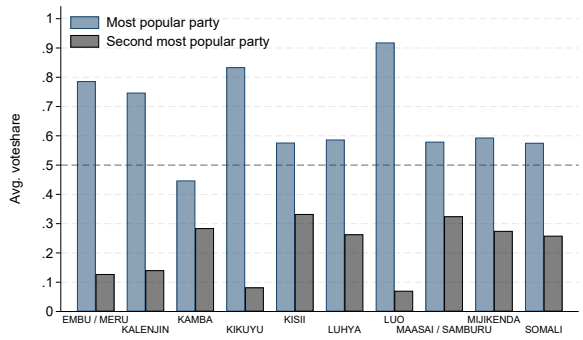
[20] For survey rounds 3–6, we use the coordinates of the cluster locations provided by BenYishay et al. (2017), and for rounds 7–9, we rely on the GPS coordinates collected by Afrobarometer. Online Appendix A.2 shows the spatial distribution and size of the Afrobarometer survey clusters for rounds 3–9. We exclude survey rounds 1 and 2, as they do not report respondents' ethnicity. Survey rounds 3 and 4 were conducted before the reform, round 5 between the referendum and implementation, and rounds 6–9 after implementation (see panel C of Figure III).

[21] Table A.2 lists the most popular parties for all ethnic groups and Afrobarometer survey rounds.

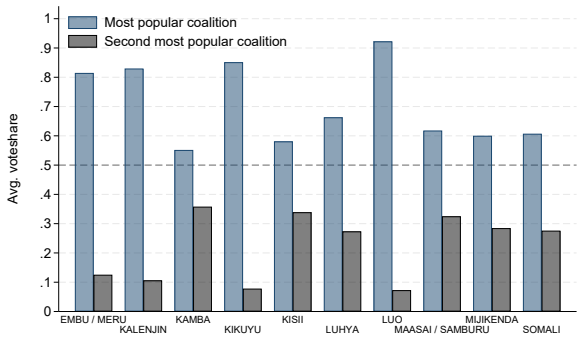
considering coalitions rather than parties. These large differences suggest that there is indeed considerable voting cohesion in most ethnic groups, making the plurality indicator a meaningful measure of ethnic voting.

FIGURE V
Ethnic voting across all survey rounds

(A) Parties, biggest 10 groups



(B) Coalitions, biggest 10 groups



Notes: Panel A plots the vote shares of the two most popular parties for or each of the largest 10 ethnic groups in Kenya, averaged across Afrobarometer survey rounds. Panel B replicates panel A but aggregates the political parties at the level of coalitions.

Measures of ethnic voting have to be tailored to the political context, and the plurality indicator is well-suited to Kenyan politics. Kenya's political landscape is characterized by fluid, personalized parties, with leaders frequently switching affiliations. For instance, President William Ruto (a Kalenjin) has been a member of five different parties over the past two decades. Given this volatility, we adopt a "group-based perspective" focusing on voting cohesion among co-ethnics in the data rather than relying on parties or their platforms.[22] A straightforward alternative would be to define ethnic voting based on the ethnicity of a party's leader. We present robustness tests in which we define ethnic voting as voting for a party with a co-ethnic presidential or vice-presidential candidate. The disadvantage is that (vice-)presidential candidates typically belong to the big four ethnic groups, such that we cannot identify ethnic voting for respondents belonging to other ethnic groups, i.e., for around half the population.

Another feature of Kenyan politics is that parties form ad hoc coalitions to win elections. These coalitions typically include two parties with (vice-)presidential candidates from different ethnic groups. Thus, we also compute the plurality indicator (and all other measures for ethnic voting) at the level of coalitions supporting the same presidential ticket. The coalitions are assigned to parties based on information from the last election unless the party has already publicly declared to switch camps in the next election at the time of the Afrobarometer survey (see Table A.3 for details).

In further robustness tests, we use two additional measures of ethnic voting based on

[22] See Huber (2012) for a discussion of group- and party-based perspectives on ethnic voting.

the vote shares of the different ethnic groups (as is the plurality indicator). First, we use the share of a respondent's co-ethnics who would vote for the same party (or coalition). This measure can account for the fact that the second most popular party might still be somewhat of an "ethnic vote choice" for, say, a Kamba. Second, we use a majority (as opposed to a plurality) indicator, which equals one if respondent i would vote for the party (or coalition) for which at least 50 percent of co-ethnic respondents would vote in the same survey round, and zero otherwise. This measure implies that there is no "ethnic vote choice" for some groups in some survey rounds, e.g., the Kalenjin in round 5 or the Kamba in rounds 6–9.

4.3. Empirical strategy

Our units of observation are repeated cross-sections of respondents i who identify with an ethnic group e, reside in a (post-reform) county c, and are surveyed in a survey round t.[23] We use the Afrobarometer surveys for information on voting intentions as well as information on age, gender, various assets, and urban versus rural locations, which we use to proxy for other common characteristics that may predict voting behavior.[24] The complete information is available for 7,262 respondents from 1,207 different clusters and 19 different ethnic groups.

Our identification strategy relies on the following flexible generalized difference-in-differences specification:

$$EV_{it} = \beta\left(\Delta RF_c \times D_t\right) + \gamma\left(\Delta EF_e \times D_t\right) + \mathbf{Z}'_{it}\boldsymbol{\xi} + \mu_{ce} + \lambda_t + \epsilon_{it}, \tag{3}$$

where ΔRF_c is the change in regional fractionalization, ΔEF_e the change in ethnic fragmentation, D_t indicates the post-reform period (Afrobarometer rounds 6 to 9), the vector $\mathbf{Z}_{it}$ includes the control variables (i.e., age, gender, various assets, and urban/rural location), μ_{ce} are county-by-ethnicity fixed effects, and λ_t are time (survey-round) fixed effects. To account for the clustered nature of the treatment, we use two-way clustered standard errors at the province-by-ethnicity and county levels.

Our coefficients of interest are β and γ. They capture the effects of the reform-induced changes in regional fractionalization and ethnic fragmentation on ethnic voting. The identifying variation comes from how the changes in regional fractionalization and ethnic fragmentation, to which the respondents were exposed, correlate with ethnic voting in different years. We interpret these coefficients as average causal responses. The fixed effects play an important role in this interpretation. The county-by-ethnicity fixed effects

[23] We drop observations from respondents identifying with ethnic groups with fewer than ten respondents in a given survey round to reduce noise in all measures.

[24] See Online Appendix A.3.1 for details on these control variables and Online Appendix A.4 for summary statistics for all variables.

net out potential time-invariant differences between members of the same group residing in different locations or differences between groups residing in the same county. For example, Luo in Mombasa could vote differently than Luo residing in their ancestral homeland. The time-fixed effects absorb the overall non-linear trend in ethnic voting patterns across elections (including any level effect captured by D_t).

The key identification assumption is that changes in ethnic voting for respondents living in counties (or identifying with groups) that are exposed to small changes in regional fractionalization (or ethnic fragmentation) provide a good counterfactual for respondents living in counties (or identifying with groups) that are exposed to larger changes if their border-induced changes in regional fractionalization (or ethnic fragmentation) would have been similar. In other words, we need more than standard parallel trends, which require that unobserved time-varying confounds behave similarly in counties or groups that are treated differently by the border reform (i.e., in terms of ΔRF_c or ΔEF_e). As Callaway et al. (2021) show, we also need to assume a particular form of treatment homogeneity that rules out that respondents select into higher intensities of ΔRF_c or ΔEF_e.[25] If such a "strong parallel trends" assumption is satisfied, then two-way fixed-effects estimation of these two coefficients identifies weighted averages of the average causal responses at different treatment intensities of ΔRF_c or ΔEF_e.[26]

5. Results

In this section, we probe the validity of our empirical strategy and present our main results based on our preferred difference-in-differences specification. We use the point estimates to evaluate how the border reform changed ethnic voting in Kenya. We then provide evidence showing that the estimated effects are indeed driven by the border changes from provinces to counties rather than other parts of the constitutional reform, such as border changes of lower-tier administrative units or features of the devolution process. Finally, we present a battery of robustness tests.

5.1. Design validity and treatment dynamics

We start by studying the effects of changes in regional fractionalization and ethnic fragmentation on ethnic voting in an event study. Panel A of Figure VI presents the β_t's

[25] This treatment homogeneity assumption is stronger than assuming unconfoundedness of the treatment, which only requires that ΔRF_c and ΔEF_e are not proxying for some other county or group characteristic that changes as a result of the reform and is also correlated with voting patterns.

[26] Two-way fixed effects estimation does not always recover treatment effects in staggered difference-in-differences and event study designs with treatment heterogeneity over treated cohorts and/or dynamic treatment effects (e.g., Borusyak et al., 2024; Callaway and Sant'Anna, 2021; Sun and Abraham, 2021). This differs from our setting, where treatment occurs simultaneously, but its intensity varies across units. Callaway et al. (2021) show that the weights on the underlying causal responses are always positive if the data are a proper panel. We interpret our repeated cross-section estimates along these lines.

capturing the (potentially time-varying) effects of a change in regional fractionalization on ethnic voting, and panel B the γ_t's capturing the effects of a change in ethnic fragmentation. Blue circles represent results when using the party-based plurality indicator of ethnic voting as the outcome, and red triangles when using the coalition-based plurality indicator. For both indicators and both coefficients of interest, we cannot reject the null hypothesis of no pretends.

The pattern for the interim period (round 5 in 2011) and the post-treatment period differs across the two panels. The effect of changes in regional fractionalization (shown in panel A) begins already in the interim period and remains fairly stable over time. We interpret this finding as evidence that the ethnic composition of the new counties is highly salient, probably because of the upcoming gubernatorial and assembly elections. In contrast, the effect of changes in ethnic fragmentation (shown in panel B) is insignificant in the interim period. Then, it builds up over time in the post-treatment period, suggesting that the more subtle political implications of fragmented groups take time to materialize.

The assumption of no selection on gains implies that respondents should not move to districts with a larger ΔRF_c as the reform takes effect (or change their self-described ethnic identity in case of ΔEF_e). While such a migration response is possible, it would take some time and, therefore, affect the medium-term estimates more than the immediate response. The event study results thus indirectly suggest that it plays little role for ΔRF_c. Reassuringly, we find no evidence against the assumption of symmetric treatment effects for changes in regional fractionalization (see Figure B-1), which would suggest selection on gains plays a role. We also find no indication that voters change their turnout intention or their willingness to reveal party preferences in anticipation of the treatments (see Figure B-2). Even though static selection is differenced out in event studies, we also document that the sample composition is not correlated with our treatments. Most respondent characteristics, such as their age, gender, various assets, or urban/rural location, show no systematic correlation with ΔRF_c and ΔEF_e (see Figure B-3).

Taken together, these tests support the validity of our design. For the remainder, we collapse the event study to our preferred difference-in-differences design (see equation 3). We also drop survey round 5 (in 2011), which is neither clearly in the pre-treatment nor the post-treatment period (resulting in 897 fewer observations).[27]

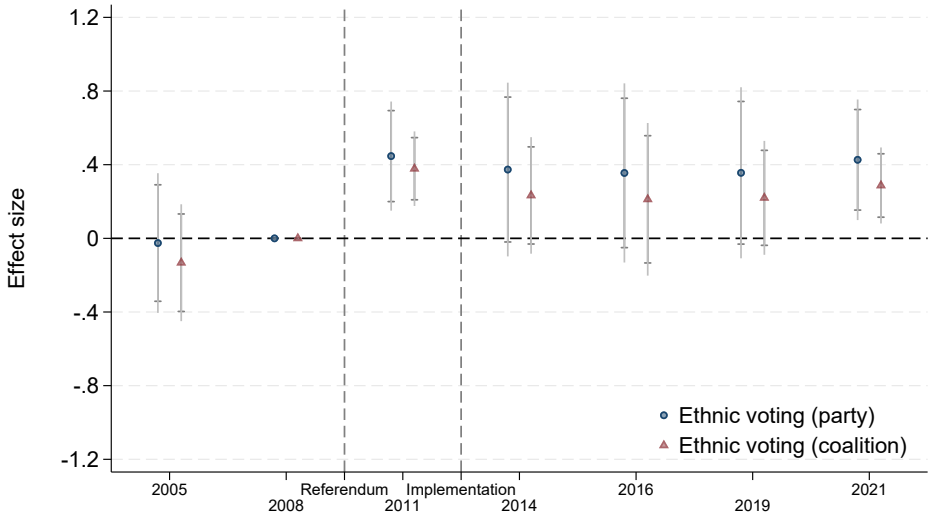
5.2. Main results and evaluation of the reform

Table I presents our main results. Column 1 shows that increases in regional fractionalization and ethnic fragmentation are associated with a higher incidence of ethnic voting, as measured by our party-based plurality indicator. Our findings are similar when using the coalition-based plurality indicator of ethnic voting (in column 4), adding

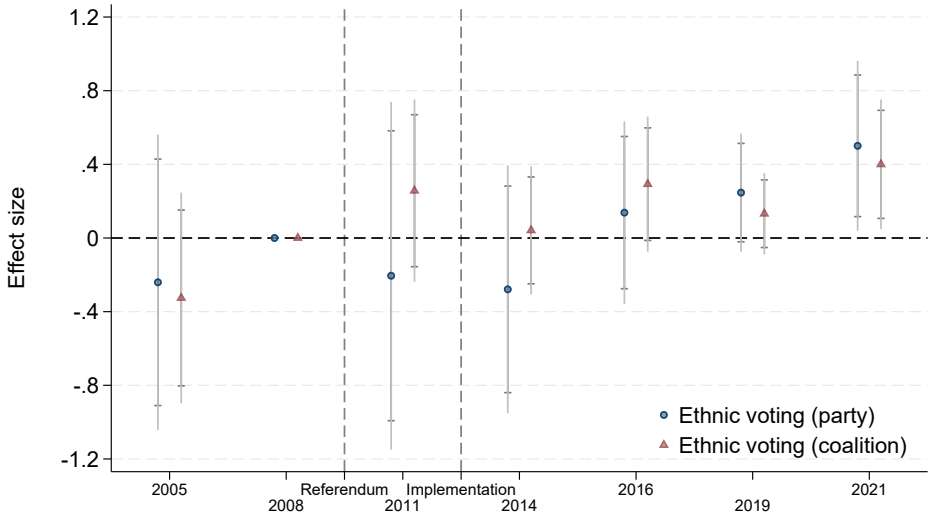
[27]Results do not depend on this choice, as we document in robustness tests (see Figure B-6).

FIGURE VI
Event study estimates

(A) Time-varying effects of ΔRF_c



(B) Time-varying effects of ΔEF_e



Notes: The figure shows event study coefficients for the effect of reform-induced changes in regional fractionalization (ΔRF_c) and ethnic fragmentation (ΔEF_e) on our plurality indicators for ethnic voting, with blue circles (red triangles) representing the effects on the party-based (coalition-based) plurality indicator. Specifically, we estimate $EV_{it} = \sum_t \beta_t \Delta RF_c + \sum_t \gamma_t \Delta EF_e + \mathbf{Z}'_{it}\boldsymbol{\xi}_t + \mu_{ce} + \lambda_t + \epsilon_{it}$, where t are survey years and $t = 2008$ the omitted reference category. Panel A focuses on ΔRF_c and reports the β_t's, and panel B on ΔEF_e and reports the γ_t's. All specifications include county-by-ethnicity fixed effects, time-fixed effects, and the control variables. Standard errors are two-way clustered at the province-by-ethnicity and the county level. 95% and 90% confidence intervals are plotted as gray bars.

respondent-level controls (in columns 2 and 5) or interacting these controls with the post-treatment indicator (in columns 3 and 6). These findings are consistent with the idea

that ethnofederal designs, characterized by low RF_c and low EF_e, reduce the salience of ethnicity in national politics.

TABLE I
Main results: Difference-in-differences

	Dependent variables: Ethnic voting					
	Party-based plurality			*Coalition-based plurality*		
	(1)	(2)	(3)	(4)	(5)	(6)
$\Delta RF_c \times D_t$	0.377**	0.379**	0.357*	0.308***	0.309***	0.282***
	(0.172)	(0.174)	(0.197)	(0.087)	(0.089)	(0.101)
$\Delta EF_e \times D_t$	0.341**	0.334*	0.315*	0.433***	0.428***	0.411***
	(0.168)	(0.168)	(0.167)	(0.099)	(0.098)	(0.099)
County-by-ethnicity FE	✓	✓	✓	✓	✓	✓
Time FE	✓	✓	✓	✓	✓	✓
Controls	–	✓	✓	–	✓	✓
Controls $\times$ D_t	–	–	✓	–	–	✓
Observations	6370	6370	6370	6370	6370	6370

Notes: The table reports the results of regressing our plurality indicators of ethnic voting (party-based plurality in columns 1–3 and coalition-based plurality in columns 4–6) on interaction terms between the post-treatment indicator D_t and the changes in regional fractionalization (ΔRF_c) and ethnic fragmentation (ΔEF_e). All specifications include county-by-ethnicity and time-fixed effects and control for the age of a respondent, indicators if the respondent lives in an urban survey cluster, is female, owns a TV, radio, or motorized vehicle. Standard errors are two-way clustered at the province-by-ethnicity and county levels. $p < 0.1$, $p < 0.05$, $p < 0.01$.

The estimated effects are quantitatively important. The sample mean of ΔRF_c is -0.201, and the estimated β is 0.379 (column 2, our preferred specification). Hence, we predict that the average reform-induced change in regional fractionalization *reduced* ethnic voting by 7.4 percentage points. Similarly, the sample mean of ΔEF_e is 0.456, and the estimated γ is 0.334 (column 2), predicting that the average reform-induced change in ethnic fragmentation *increased* ethnic voting by 15.2 percentage points. These predictions have two implications. First, they suggest that the 2010 border reform led to a net increase in ethnic voting of 7.6 percentage points. Second, they highlight an important trade-off. Reforms that (more or less) mechanically increase the number of political regions tend to reduce regional fractionalization while increasing ethnic fragmentation. Hence, unless political borders can be redrawn in a way that reduces both regional fractionalization and ethnic fragmentation, the challenge becomes to reduce regional fractionalization along with limited increases in ethnic fragmentation or vice versa.

The average change in ethnic voting masks substantial differences across ethnic groups. Table II shows the predicted changes in ethnic voting for each of the largest ten ethnic groups separately by using population-weighted averages of the changes in regional fractionalization and ethnic fragmentation. The reform substantially increased ethnic voting among the Kalenjin and the Kikuyu but had only modest effects on the Luo

and the Kamba (based on our predictions). These differences are likely to have been electorally significant. According to official counts, Kenyatta (a Kikuyu) won the 2013 general election with 50.1% of the votes, while Odinga (a Luo) received 43.3%. There would have been a run-off election if Kenyatta had missed an absolute majority. Hence, the reform's differential effect on ethnic voting among the Kikuyu and the Luo likely contributed to Kenyatta's (first-round) victory.

TABLE II
Aggregate effects of reform on ethnic voting

Ethnic group	Predicted change in ethnic voting due to			Population share
	ΔEF	ΔRF	both	
Kikuyu	0.122	-0.015	0.107	0.208
Luhya	0.127	-0.024	0.103	0.148
Luo	0.146	-0.103	0.043	0.124
Kamba	0.159	-0.171	-0.012	0.114
Kalenjin	0.265	-0.121	0.143	0.113
Embu / Meru	0.145	-0.135	0.010	0.062
Kisii	0.121	-0.178	-0.057	0.062
Mijikenda	0.190	-0.134	0.057	0.046
Maasai / Samburu	0.198	-0.048	0.151	0.023
Turkana	0.143	-0.164	-0.021	0.013
Change in ethnic voting for big 4: 0.076				
Change in ethnic voting for Kenya: 0.065				

Notes: The table reports the predicted aggregate changes in party-based ethnic voting for the ten largest groups. These changes are computed by multiplying the difference-in-differences coefficients estimated in column (2) of Table I with the group-county-specific populations. The table also reports the change in the population-weighted predicted ethnic voting change for the big four ethnic groups and the country as a whole.

Our results so far suggest that political border reforms can reduce ethnic voting in the short and medium run if they lead to more ethnofederal designs (characterized by lower RF_c and EF_e). Given that Kenya's 2010 reform is predicted to have increased ethnic voting on average, it clearly did not strike an optimal balance. An open question is whether alternatives such as the Boma and Wako proposals or simply less "provincialist" border reforms could have achieved reductions in ethnic voting. We evaluate such alternatives in Section 7.

5.3. Sensitivity

Additional administrative-territorial changes: The constitutional reform did not only replace the eight provinces with 47 counties as the primary subnational units but also included two other administrative-territorial changes. First, the number of

electoral constituencies was increased from 210 to 290 (and MPs can use development funds for projects in their constituencies). Second, 175 local authorities (comparable to municipalities in other countries) were abolished, while their basic functions were subsumed into elected county governments. In addition, another administrative territorial change occurred around the same time: 210 districts created by Daniel Arap Moi and Mwai Kibaki were declared illegal by the High Court in September 2009 (BBC Monitoring Africa, 2009).

A priori, these three changes are unlikely to affect ethnic voting in presidential elections. First, the constituency change should only be relevant for parliamentary (rather than presidential) elections. Second, the abolition of local authorities should, at most, affect local (but not presidential) elections.[28] Third, the newly created and short-lived districts were used by the central government for distributing patronage but were not controlled by the local population. Moreover, the intensity of district proliferation in the early 2000s weakened the importance of any one district.

We proceed in three steps to rule out that these other administrative-territorial changes drive our main results. First, we collect data on the borders changed by the reform and identify the appropriate counterfactual. Specifically, we look at changes across electoral constituencies, changes from local authorities to counties, and changes from districts to counties (see Online Appendix A.5 for details). Second, we use the pre- and post-reform borders for these three border changes to compute the corresponding changes in regional fractionalization and ethnic fragmentation.[29] We then rerun our main specification while controlling for the impact of the changes in regional fractionalization and ethnic fragmentation resulting from these other border changes. Columns 1–3 of Table III show that the coefficient estimates for our main treatments remain similar in size and statistical significance. Moreover, the alternative treatments are typically not statistically significantly different from zero.

Devolution and reform support: The time-fixed effects absorb any effect of devolution that applies to all locations and groups equally in a given year. However, devolution or the support of the reform might still heterogeneously impact voting behavior in a way that correlates with our treatments. We control for three ways by which devolution might influence our main effects. First, voters in (now) smaller political regions may need to rely less on ethnicized national politics because discrimination between groups is more difficult in smaller regions. Hence, the reform could have a smaller effect on ethnic voting for respondent experiencing a larger decrease in their political region's population size (i.e., the difference between the county- and the province-level population size). Second, voters close to regional power centers may need to rely less on

[28] Local authorities were weak, lacked sufficient funds, and had very limited responsibilities.
[29] There is no clear pattern in how the different measures are correlated (Table A.4).

TABLE III
Controlling for other constitutional changes

	Dependent variable: Ethnic voting (party-based plurality)					
	(1)	(2)	(3)	(4)	(5)	(6)
$\Delta RF_c \times D_t$	0.369*	0.363*	0.360*	0.385*	0.362*	0.408***
	(0.184)	(0.191)	(0.186)	(0.199)	(0.187)	(0.141)
$\Delta EF_e \times D_t$	0.369**	0.331*	0.326*	0.331*	0.344**	0.334***
	(0.179)	(0.173)	(0.179)	(0.165)	(0.171)	(0.122)
$\Delta RF_c(Constituencies) \times D_t$	0.024					
	(0.092)					
$\Delta EF_e(Constituencies) \times D_t$	0.576*					
	(0.296)					
$\Delta RF_c(Local\ authority) \times D_t$		-0.009				
		(0.038)				
$\Delta EF_e(Local\ authority) \times D_t$		0.058				
		(0.416)				
$\Delta RF_c(District) \times D_t$			-0.004			
			(0.050)			
$\Delta EF_e(District) \times D_t$			0.085			
			(0.380)			
Δ *Adm. unitsize(pop)* $\times D_t$				-0.012		
				(0.079)		
Δ *Capital proximity* $\times D_t$					0.039	
					(0.069)	
Support referendum $\times D_t$						0.129*
						(0.065)
County-by-ethnicity FE	✓	✓	✓	✓	✓	✓
Time FE	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓
Observations	5938	6042	6043	6370	6370	6370

Notes: The table reports the results of regressing our party-based plurality indicator of ethnic voting on interaction terms between the post-treatment indicator D_t and the changes in regional fractionalization (ΔRF_c) and ethnic fragmentation (ΔEF_e). Columns 1–3 control for interaction terms between D_t and changes in subnational fractionalization and ethnic fragmentation resulting from other border changes: changes between electoral constituencies, changes from local authorities to counties, and changes from districts to counties. Columns 4 and 5 control for interaction terms between D_t and proxies of the degree of decentralization: change in the population size of the relevant political region and the average distance of respondents to the county capital compared to the province capital. Column 6 controls for interaction terms between D_t and the province-level support of the constitutional referendum. All specifications include county-by-ethnicity and time-fixed effects and control for the age of a respondent, indicators if the respondent lives in an urban survey cluster, is female, owns a TV, radio, or motorized vehicle. Using the coalition-based plurality indicator of ethnic voting does not change the results (see Table B-3). Standard errors are two-way clustered at the province-ethnicity and county levels. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

ethnicized national politics because they have better access to local public goods. Hence, the reform could have a smaller effect on respondents residing closer to the regional capital after the reform than before it. Third, the constitutional reform could have had a differential impact on ethnic voting depending on its popularity in the different provinces

(measured by the province-level share of voters voting in favor of the constitutional referendum). Columns 4 to 6 of Table III show that the coefficient estimates on our main treatments remain similar in size and statistical significance when controlling for these three additional factors.

Further robustness checks: We conduct the following robustness tests: First, we employ logistic regressions and estimate marginal effects. As Table B-1 and Figure B-4 show, the results remain qualitatively similar, and the marginal effects of ΔRF_c do not depend on ΔEF_e, or vice versa, which is crucial for the extrapolations in Section 7. Second, we use either county-by-time or ethnicity-by-time fixed effects to partial out all unobserved heterogeneity affecting either one of the measures. Table B-2 shows that the point estimates decrease but remain quantitatively meaningful. This shows that even if we eliminate all potential unobserved variation on the location or group level (including variation in one of the treatments), the effect of the other treatment survives, although statistical significance varies. Third, we test alternative ethnic voting measures (e.g., majority vote, continuous vote share, and alternative coalition codings; see Figure B-5). We find similar results, including when we only use co-ethnic presidential/vice-presidential candidates for the big four ethnic groups, though precision is occasionally an issue. Fourth, results for regional fractionalization remain stable across sample perturbations, including using Afrobarometer survey weights, excluding the Rift Valley (to account for the violence and out-migration), including survey round 5 in the post-treatment period, and controlling for factors like language matches between interviewers and respondents or the party alignment of county governors with presidents (see Figure B-6). The results for ethnic fragmentation are mostly similar too, though excluding the Rift Valley reduces effect size and precision (as we lose most variation from the Kalenjin, see Figure IV). Lastly, the statistical significance of our main results holds across various ways of clustering the standard errors, including wild bootstrapped standard errors clustered on the 19 ethnic groups available in the Afrobarometer data (see Figure B-7).

6. Mechanism: Regional control

A key motive for ethnic voting in national elections is that presidents often favor their co-ethnics in the distribution of public goods such as education, healthcare, infrastructure, and job opportunities (e.g., Franck and Rainer, 2012; Burgess et al., 2015; Kramon and Posner, 2016; De Luca et al., 2018; Amodio et al., 2024). Horowitz (1985) argues that ethnofederal reforms have a tranquilizing effect and can reduce ethnic voting by empowering ethnic groups who control regional governments and regional public goods provision.

In Online Appendix C, we outline a simple theoretical framework that captures

features of the Kenyan setting and helps explain why ethnofederal reforms reduce ethnic voting at the national level. We assume that the central government raises most revenue and allocates some share to regional governments. Crucially, the president's ability (or honesty) matters in that it affects how much revenues are collected. Voters choose the presidential candidate who they expect to maximize their national and regional public goods, which may be biased towards specific groups and locations. The framework yields three key results: (1) devolution shifts votes toward more able and honest, but not necessarily co-ethnic, presidential candidates, as regionally provided public goods become more important relative to nationally provided public goods; (2) members of the regional majority group benefit more from regional public goods, further shifting their preferences toward able and honest candidates; and (3) larger regions benefit from economies of scale, making voters in these regions favor an able and honest president, regardless of ethnicity.[30] These results suggest that ethnofederal reforms—reforms that decrease RF_c and EF_e simultaneously—are most effective in reducing ethnic voting for large groups that control regional governments. Government control, in turn, is easiest for the largest group in relatively homogeneous counties (low RF_c). Moreover, their counties tend to be larger when the group is less fragmented across counties (low EF_e). Hence, the effects of changes in RF_c and EF_e are stronger for groups that control county governments.

We provide two pieces of evidence in support of this mechanism. We first show that the largest group in a county is most likely to control the county executive. This test requires additional data: We use data from D'Arcy (2020) on the ethnicity of governors that came into power with the 2013 election and data from the 2016 diversity audit of the county administration on the ethnic composition of the governor's cabinet (National Cohesion and Integration Commission, 2016). This cabinet consists of the County Executive Committee (CEC), which implements development projects, supervises service delivery, and determines the organization of the county's departments, and the Country Public Service Board (CPSB), which establishes public service jobs and appoints people to these jobs. We combine these new data with the 1989 census to create a dataset at the county-by-group level. Panel A of Table IV shows that the largest group in a county is 84 percentage points more likely to have a co-ethnic governor compared to other groups when accounting for county and ethnicity fixed effects. Moreover, large groups controlling the governorship also hold a 75–76 percentage point higher share in the two executive boards, regardless of whether we look at the CEC and the CPSB separately or together. This has interesting implications for ethnic politics at the regional level. Counties have become a significant source of patronage for groups that did not share in executive power in pre-reform Kenya, introducing a new logic of "everyone's turn to eat" (D'Arcy and Cornell, 2016).

[30] Boffa et al. (2016) shows that larger political regions increase accountability and reduce rent extraction.

TABLE IV
Mechanism: Regional political control

Panel A: Determinants of regional control

	Dependent variables: Regional control			
	Coethnic governor	*CEC share*	*CPSB share*	*CEC & CPSB share*
	(1)	(2)	(3)	(4)
$Largest\ group_{ce}$	0.844***	0.333***	0.352***	0.341***
	(0.054)	(0.082)	(0.093)	(0.086)
$Coethnic\ governor_{ce}$		0.417***	0.410***	0.414***
		(0.086)	(0.096)	(0.090)
County FE	✓	✓	✓	✓
Ethnicity FE	✓	✓	✓	✓
Observations	1637	1637	1637	1637

Panel B: Regional control and ethnic voting

	Dependent variables: Ethnic voting			
	Party-based	*Coalition-based*	*Party-based*	*Coalition-based*
	Regional control proxied by:			
	Largest group		*Unitary government*	
	(1)	(2)	(3)	(4)
$\Delta RF_c \times D_t$	0.270*	0.091	0.419**	0.302***
	(0.156)	(0.172)	(0.169)	(0.087)
$\Delta EF_e \times D_t$	0.012	0.324**	0.130	0.271***
	(0.212)	(0.134)	(0.176)	(0.093)
$\Delta RF_c \times D_t \times Regional\ control_{ce}$	0.273	0.319	0.178	0.221**
	(0.243)	(0.204)	(0.168)	(0.083)
$\Delta EF_c \times D_t \times Regional\ control_{ce}$	0.549**	0.238	0.525**	0.409***
	(0.254)	(0.143)	(0.196)	(0.127)
$D_t \times Regional\ control_{ce}$	-0.093	-0.031	-0.092	-0.058
	(0.145)	(0.088)	(0.118)	(0.056)
County-by-ethnicity FE	✓	✓	✓	✓
Time FE	✓	✓	✓	✓
Controls	✓	✓	✓	✓
Observations	6370	6370	6370	6370

Notes: Panel A reports the results from regressing four different proxies for political control at the county level on an indicator for the largest ethnic group in the county (all columns) and an indicator for having a coethnic governor (columns 2–4). The proxies for regional control are an indicator for having a coethnic governor (column 1), the share of coethnics in the county executive committee (CEC; column 2), the share of coethnics in the county public service board (CPSB; column 3), and the share across both the CEC and the CPSB (column 4). These regressions include county and ethnicity-fixed effects, and standard errors are clustered at the county level. The dataset for these regressions are a county-by-ethnicity cross-section based on the census data and data from the 2016 diversity audit of the county administration. Panel B reports the results from regressing the plurality indicator of ethnic voting (based on parties and coalitions) on the same explanatory variables as in Table I plus interactions with measures of regional government control. These measures are an indicator for the largest group in the county (columns 1–2) and an indicator for unitary regional government control, which is equal to one if an ethnic group is the largest group in the county, has a coethnic governor, and has a share across the CEC and the CPSB of at least 94 percent (which is the median share for groups with a coethnic governor). All specifications in panel B include county-by-ethnicity and time-fixed effects and the same controls as in Table I. Standard errors are two-way clustered at the province-ethnicity and county levels. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

For our second piece of evidence, we go back to our main specification but interact both treatments—$\Delta RF_c \times D_t$ and $\Delta EF_e \times D_t$—with the degree of regional control exercised by a group. We use two proxies for regional control. First, an indicator for whether an ethnic group is the largest group in the county (based on the 1989 census). Second, an indicator variable for whether an ethnic group controls a *de facto* unitary regional government. This indicator variable equals one if an ethnic group is the largest group in the county, has a co-ethnic governor, and has a share of co-ethnic members in the executive boards of at least 94 percent (the median share for groups with a co-ethnic governor). Panel B of Table IV shows that the effects of changes in regional fractionalization and ethnic fragmentation are larger for respondents belonging to ethnic groups with regional control. The results are strongest in column (4), which focuses on unitary regional governments and coalition-based ethnic voting. There, the effect of ΔRF_c is considerably larger for groups with a unitary regional government, in line with the notion that control of the provision of regional public goods makes it easier for them to cross the ethnic line in national elections. Similarly, the effect of ΔEF_e is larger for those groups, suggesting that economies of scale matter in that having more of a group's members in the same region reduces ethnic voting even more.

Ethnofederal reforms could backfire if regional autonomy strengthens ethnic identities and fosters secessionist tendencies (e.g., Horowitz, 1985; Spolaore, 2010; Desmet et al., 2022), or if groups without regional control feel excluded in counties dominated by others. While these effects may only emerge over the long run, we provide two tests showing little evidence of such negative effects in the first decade after the reform. First, we rely on an Afrobarometer survey question asking about the respondents' national versus ethnic identification. Table B-4 shows that our treatments are not correlated with changes in national identification.[31] Second, we rely on an Afrobarometer survey question asking whether respondents feel discriminated by the government based on their ethnicity (without specifying a particular layer of government). Table B-5 shows that members of the same ethnic group do not feel more or less ethnically discriminated, depending on whether or not they reside in a county in which their group has regional control.

7. Counterfactual border designs

Our results suggest that Kenya's border reform increased ethnic voting and the salience of ethnicity in national elections. As we outlined in Section 3, Kenya has a history of different constitutional proposals that would likely have had very different electoral implications. In this section, we explore these proposals, along with a benchmark border

[31] The survey question's phrasing does not allow us to rule out simultaneous increases (or decreases) in both group and national identification, as documented for the Nigerian youth service program by Okunogbe (2024).

design aimed at minimizing ethnic voting.

The Bomas and Wako draft constitutions: Recall that the key provision of the Bomas draft constitution was strong devolution to a two-tiered system of 14 regions and 70 districts. Both tiers were supposed to have local assemblies, but the draft gave regions extensive powers, which is why we focus on the 14 regions as the primary layer in the Bomas draft. Panel A of Figure VII illustrates the regions that the Bomas draft envisioned. We superimpose them on the 70 districts (without separating out the four boroughs of Nairobi) that existed at the time. Aggregating the 1989 census data at the district level, we find that the Bomas draft would have decreased average (population-weighted) regional fractionalization by -0.14 and increased average (population-weighted) ethnic fragmentation by 0.12.

The Wako counterproposal put forth by the Kibaki government included a single layer of devolved government with 70 districts. Panel B of Figure VII shows the Wako-draft districts, which also correspond to the lower layer in the Bomas draft.[32] The Wako draft would have decreased average (population-weighted) regional fractionalization by -0.25 and increased average (population-weighted) ethnic fragmentation by as much as 0.51. For comparison, panel D of Figure VII illustrates the ethnic geography of Kenya at this level of aggregation (based on the 1989 census).

The optimal partition: Understanding the implications of different constitutional proposals is difficult without some benchmark of how much ethnofederalism would be possible in Kenya given its ethnic geography. To this end, let us consider a policymaker aiming to minimize ethnic voting in national elections. This policymaker focuses solely on various border designs for a single devolved layer rather than other elements of constitutional reform. They evaluate these designs at the same time as the Bomas and Wako drafts, using the 70 districts existing at the time as a reference point. The policymaker has access to data on the treatment effects estimated earlier and the distribution of the population across districts, including their ethnic affiliation. However, they face two realistic constraints, met by the 2010 constitutional reform and (mostly) adhered to by the draft constitutions. First, the new political regions must be nested within the former provinces.[33] Second, these political regions have to be contiguous. Given these constraints, the policymaker needs to consider "only" approximately 30.38 million contiguous divisions of 70 districts into $K \in \{8, 9, 10, \ldots, 70\}$ alternative political regions.[34]

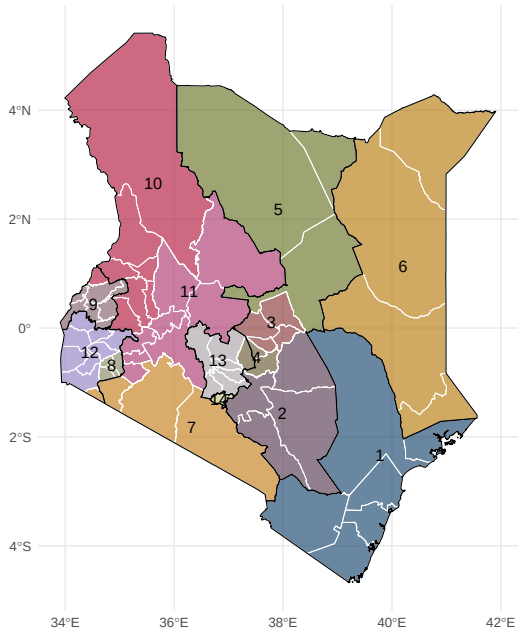
[32]The number of districts was not explicitly mentioned in the Wako draft, leaving the option for parliament to create more districts later on.

[33]The Bomas draft violates this in three instances (see regions 4, 7 and 11 in Panel A of Figure VII, which all cross into Central Province.

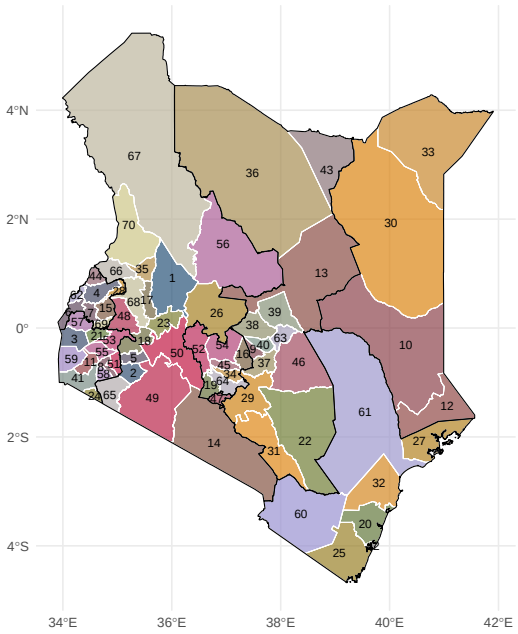
[34]Without these constraints, the number of possible mappings of sub-provincial units into different political regions is extremely large, and optimizing over potentially unbounded sample spaces is

FIGURE VII
Counterfactual divisions

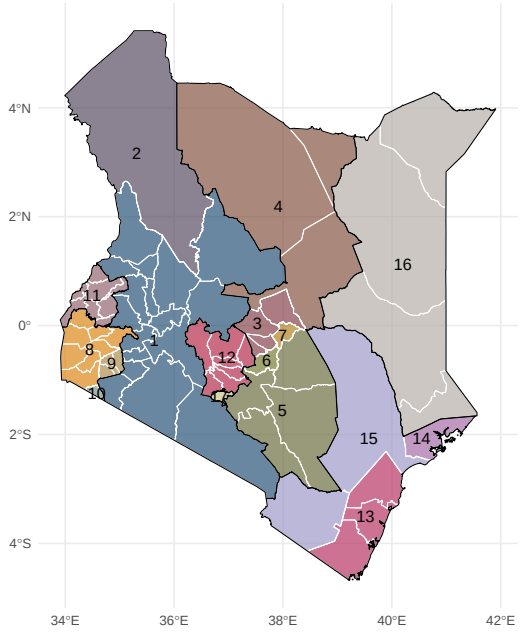
(A) Bomas draft (14 regions)



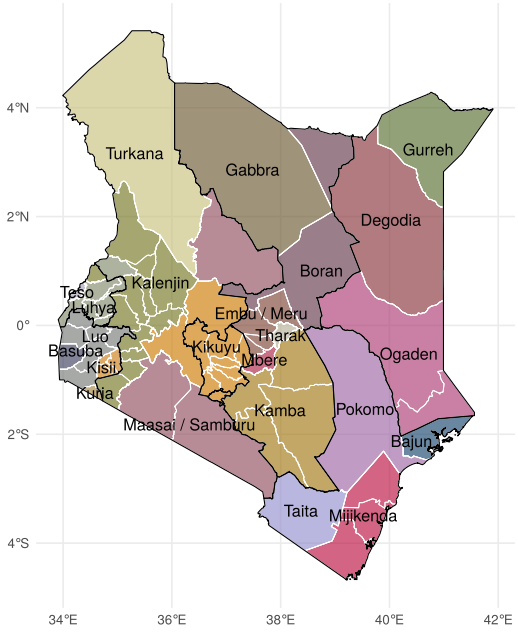
(B) Wako draft (70 districts)



(C) Optimal design (17 regions)



(D) Largest group in districts



Notes: The figure illustrates the counterfactual map divisions. Panel A depicts the divisions as suggested by the Bomas draft, panel B by the Wako draft. Panel C shows the optimal map derived under the assumptions described in the main text. Numbers and colors correspond to the units drawn by the algorithm. White lines mark the 70 districts existing in 2004/2005. Black outlines mark the pre-reform provinces. Panel D depicts the largest ethnic group for each county implied by the 2010 reform.

challenging (Fifield et al., 2020). For instance, there are already approximately 2.69×10^{72} ways of partitioning 70 sub-provincial units into exactly 20 political regions. The constraint that new political

To find the optimum among these candidate maps, the policymaker must determine the design that balances regional fractionalization RF_c and ethnic fragmentation EF_e. Ideally, the two indices would both be low, but an increase in the number of political regions tends to pull them in opposite directions (by decreasing average RF_c but increasing average EF_e). Hence, the objective is to find the border design, $\mathcal{D}^*$, that balances these two effects with some weights—say, $\omega \in [0, 1]$ for RF_c and $(1 - \omega)$ for EF_e. The policymaker uses this weight to determine the design that minimizes the ω-weighted average of the population-weighted average of regional fractionalization and the population-weighted average of ethnic fragmentation. Our estimates in column (2) of Table I suggest $\omega = 0.532$.

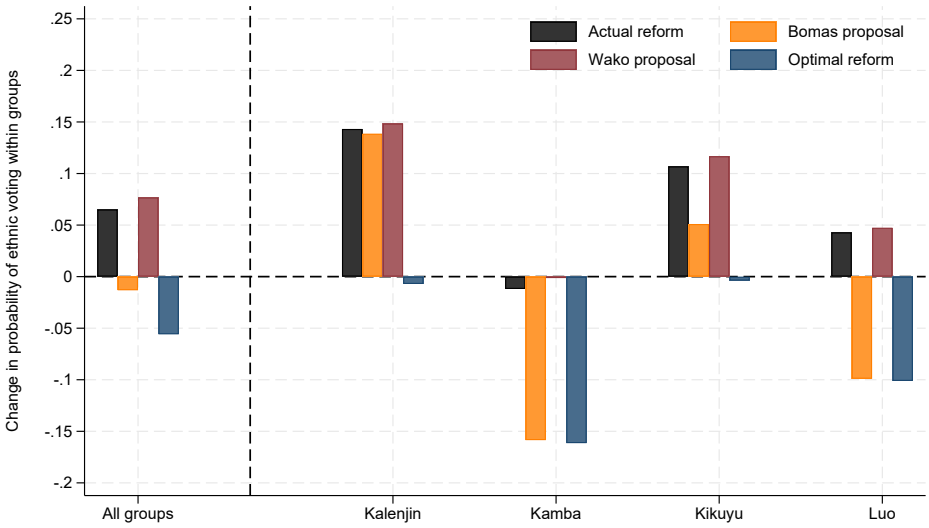
Panel C of Figure VII shows the 17 regions implied by the optimal map. This map would have decreased average (population-weighted) regional fractionalization by -0.17 and increased average (population-weighted) ethnic fragmentation by as little as 0.02. Moreover, using a grid search, we find that the optimal map is stable for $\omega \in [0.457, 0.539]$, which is almost centered on an equal weight on both components and shows that the optimal border design is robust to some uncertainty in the estimated treatment effects.

Electoral implications of counterfactual maps: After computing regional fractionalization and ethnic fragmentation for each proposed map, we use the difference of these measures to the pre-reform situation and the coefficient estimates from column (2) of Table I to compute the counterfactual effects of the constitutional proposals and optimal map. Despite relying on strong ceteris paribus assumptions, such as constant political competition and voting incentives varying solely along previously estimated treatment effects, this evaluation shows that these proposals likely had very different implications for ethnic politics.

Figure VIII compares the counterfactual prediction for the two draft proposals and the optimal map to the effects of the 2010 constitutional reform. The Bomas draft would have reduced ethnic voting by 1.3 percentage points relative to the pre-reform provinces (and 7.8 percentage points relative to the counties introduced by the 2010 constitutional reform). The predicted electoral effects of the Wako draft point in the opposite direction. Based on our predictions, the Wako draft would have increased ethnic voting by 7.7 percentage points on average, i.e., by slightly more than the 2010 constitutional reform. The optimal reform, in turn, is predicted to decrease average ethnic voting by 5.6 percentage points relative to the pre-reform provinces (and 12.1 percentage point relative to the counties introduced by the 2010 constitutional reform).

borders must be nested within the former provinces allows us to determine optimal partitions within each province separately, from which we can later construct the complete map of optimal borders. It also imposes a minimum $K = 8$. Our local homogeneity and group compactness measures are additively separable and do not depend on changes in other provinces. This is easy to see for county-level ΔRF_c but also applies to the group-level ΔEF_e, where changes in the other (unreformed) provinces cancel out.

FIGURE VIII
Predicted effects of counterfactual reforms on ethnic voting



Notes: The figure reports the net (population-weighted) effect of each map on ethnic voting in Kenya. Bars show results for the actual reform, the Bomas draft, the Wako draft, and the optimal reform, both for the total population (all groups) and the big four groups separately.

The optimal map resembles the Bomas draft in some parts but differs in both the number of regions and their exact design. For example, both maps divide the former Nyanza province in the West, where the Luo and the Kisii reside, similarly.[35] Moreover, both maps create a Kamba-dominated region in the South of the former Eastern province and a Kikuyu region identical to the former Central province. However, the optimal map creates fewer regions in the former Rift Valley province, where the Bomas draft puts the Kalejin, Maasai/Samburu, and the Kikuyu in three ethnically mixed regions, but our algorithm groups them but creates a separate Turkana-dominated region (optimal map, region 2). The two maps also differ in the former Coast and Eastern provinces. The Wako draft, on the other hand, is an extreme version of provincialism. It trades large reductions in regional fractionalization RF_c for large increases in ethnic fragmentation EF_e. Taken together, these deviations explain the differences in our evaluations of how these different maps would affect ethnic voting in national elections.

Each map has different electoral implications for Kenya's ethnic groups. The group-level reductions in ethnic voting depend on the design of the new map, but they are constrained by both the pre-reform situation and Kenya's ethnic geography. Figure VIII shows that only the optimal map predicts reductions in ethnic voting for all four major groups but that the predicted impact is very heterogeneous. The reductions are very small for the Kikuyu, who were already concentrated in the former Central province,

[35]The exception is the southern-most district of the former Nyanza province, which becomes the separate region 10 in the optimal map, but is added to the Kalenjin-dominated region 7 from the former Rift Valley province by the Bomas draft.

and the Kalenjin, who formed a large share of the population in the former Rift Valley province. By contrast, the optimal map would lead to larger reductions in ethnic voting for the Kamba and Luo, as both groups would gain their own regions. The Bomas draft has similar implications for some groups but is predicted to increase ethnic voting considerably for the Kalenjin, who are split across more regions in the Bomas draft than in the optimal map.[36] The Wako draft, in contrast, would have increased ethnic voting for all of the big four groups. While these predictions superficially match the patterns of support for the two draft constitutions, they also illustrate how difficult it is to predict changes in voting incentives for all groups. One clear prediction is that the Wako draft would have introduced weaker regions and reinforced ethnic voting in Kenya—a system that benefited the Kikuyu-led coalition government. Meanwhile, the Luo-led multi-ethnic ODM coalition supported the Bomas draft, which we predict would have reduced ethnic voting for many groups, though unevenly and possibly in ways its backers may not have anticipated or, possibly, considered desirable.

8. Conclusion

In this paper, we have shown that reforms to political institutions can reduce the salience of ethnicity in national politics in the short and medium run. We introduced two indices—regional fractionalization and ethnic fragmentation—that measure and classify border designs and their changes at the subnational level. Using Kenya's 2010 constitutional reform as a quasi-experiment and applying generalized difference-in-differences and event study designs with micro-level voting data, we provided evidence that ethnofederal reforms aimed at reducing both regional fractionalization and ethnic fragmentation can lower ethnic voting in national elections. However, the 2010 constitutional reform reduced regional fractionalization but increased ethnic fragmentation, resulting in a net rise in ethnic voting. This highlights a key challenge: changes in border designs should aim for low regional fractionalization and low ethnic fragmentation. In terms of mechanisms, we provided additional theory and evidence that ethnofederal reforms mainly reduce ethnic voting by tranquilizing ethnic groups that control regional governments in relatively homogeneous regions. Our counterfactual analysis suggested that political borders could have been drawn to significantly reduce ethnic voting.

Our findings have important implications for countries dealing with ethnic politics. First, the fact that the optimal map resembles the map proposed in the Bomas draft constitution highlights the importance of deliberation when designing political borders. It also raises questions about which border designs are politically feasible and how reform

[36]The fragmentation of the Kalenjin in the Bomas draft is subtle but substantial. Region 7 mixes Kalenjin with Maasai/Samburu, region 10 mixes Kalenjin with Turkana, and region 11 mixes Kalenjin with Maasai/Samburu and Kikuyu.

processes should be structured to achieve more desirable outcomes. Second, the design of political borders should be part of the policy toolkit aimed at reducing the salience of ethnicity in national politics. However, the recent proliferation of political regions in many developing countries suggests that policymakers may have been too focused on creating homogeneous regions and have thus inadvertently fragmented ethnic groups in the process.

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Online Appendix

Content:

A. Additional information on data

A.1. Data and computation for Figure I

Figure I requires global data on the spatial distribution of ethnic or linguistic groups, global data on subnational boundaries, and aggregate versions of the two border alignment measures used throughout the paper. We describe each component below.

Global data on linguistic diversity: We follow Desmet et al. (2020) in creating a global 5 km by 5 km grid of the population belonging to a particular language group. We use two data sources for this purpose: *i)* the World Language Mapping System (WLMS), the digitized version of the Ethnologue project (17th edition), and *ii)* a global population raster for the year 1990 from the Global Human Settlement Layer (Florczyk et al., 2019).

In preparing the data, we turn the WLMS polygons into a multi-layer raster, including the following adjustments. For widespread languages, we create a polygon for the entire country. For point languages that have no polygon representation of their geographic spread, we create a polygon via a buffer that is proportional to the number of people speaking the point language.[1]

We then use Iterative Proportional Fitting (IPF)—a statistical method for adjusting the counts in a contingency table so that the row and column sums match known marginal totals—to estimate the distribution of linguistic populations over geographic cells, given known language totals for each country and population counts for each grid cell. Like Desmet et al. (2020), we start with three primary data matrices: $\mathcal{P}$: a $K \times 1$ matrix representing the population in each grid cell ℓ; $\mathcal{S}$: a $1 \times M$ matrix giving the total number of speakers of each language i across the country; and $\mathcal{X}$: a $K \times M$ matrix indicating whether language i is spoken in grid cell ℓ.[2]

The goal is to adjust the matrix $\mathcal{X}$ such that the total population in each grid cell and the total number of speakers for each language are preserved. IPF achieves this through the following iterative steps:

1. Set the initial matrix $\mathcal{V}^{(0)} = \mathcal{X}$.

2. Adjust the row sums so that the total population in each grid cell matches the actual population:

$$\mathcal{V}^{(2n-1)}(\ell, i) = \frac{\mathcal{V}^{(2n-2)}(\ell, i)}{\sum_j \mathcal{V}^{(2n-2)}(\ell, j)} \cdot \mathcal{P}(\ell, 1)$$

[1] We first define the equivalent radius of a country assuming its area is a circle and then multiply this radius by the population share represented by the point language. We omit languages accounting for a population share of less than 0.5% of the country's population. Estimates of the population shares of each language are from WLMS.

[2] We assign a value of 0.00000004 to each language cell that is not unity to account for migration not picked up in the WLMS data.

This ensures that the sum of populations across languages in each grid cell equals the total population in that cell.

3. Adjust the column sums so that the total number of speakers of each language matches the known totals:

$$\mathcal{V}^{(2n)}(\ell, i) = \frac{\mathcal{V}^{(2n-1)}(\ell, i)}{\sum_k \mathcal{V}^{(2n-1)}(k, i)} \cdot \mathcal{S}(1, i)$$

This ensures that the total number of speakers of each language across all grid cells equals the actual number of speakers.

4. Repeat steps 1 and 2 until the matrix $\mathcal{V}$ converges, i.e., when $\mathcal{V}^{(2n-1)} \approx \mathcal{V}^{(2n)}$ for all ℓ and i.

Once the algorithm converges, the resulting matrix $\mathcal{V}$ estimates the number of speakers of each language in every grid cell, satisfying both the population and language constraints. This method is flexible and estimates the spatial distribution of language populations even in the absence of census or survey data (see Desmet et al., 2020, for cross-validation of this approach).

Global data on subnational borders: The political boundaries in 1995 and 2015 are the first-order administrative units documented by Bluhm et al. (2024). The boundaries are constructed by first identifying suitable vector data for each country and then creating a cohesive panel of boundaries and capital city locations from 1987 to 2018. Bluhm et al. (2024) use various sources such as GAUL, GADM, and AidData's GeoBoundaries project. Gaps in these sources are filled with georeferenced maps and atlases.

Cross-country averages of RF and EF: Using the language population grid and vector data for subnational boundaries over time, we then compute the following two indices (or differences in these indices) for each country in 1995 and 2015:

$$\overline{RF} = \sum_{r=1}^{m} s^r \left(1 - \sum_{e=1}^{n} (s_e^r)^2\right) = 1 - \sum_{r=1}^{m} s^r \sum_{e=1}^{n} (s_e^r)^2 \tag{A.1}$$

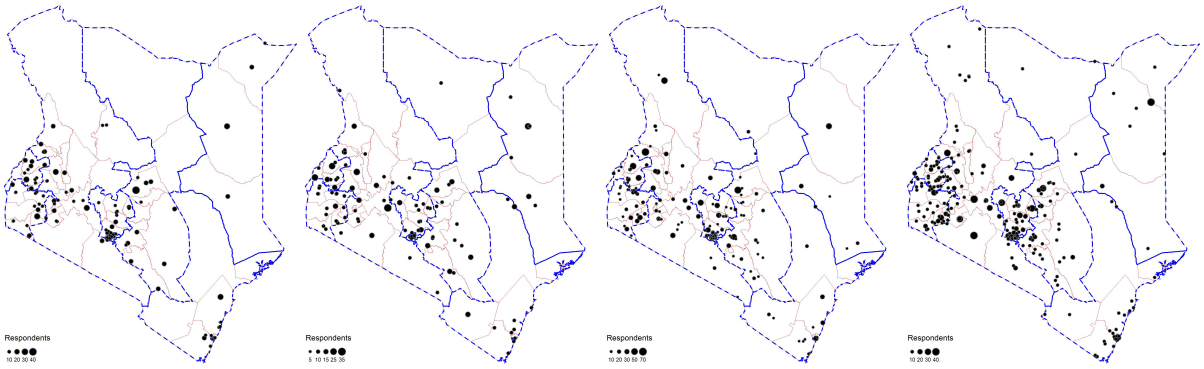
$$\overline{EF} = \sum_{e=1}^{n} s^e \left(1 - \sum_{r=1}^{m} (s_r^e)^2\right) = 1 - \sum_{e=1}^{n} s^e \sum_{r=1}^{m} (s_r^e)^2 \tag{A.2}$$

where r is a political region, e an ethnic group, m is the number of political regions, n the number of ethnic groups, s^r is the population share of region r, s^e is the population share of group e, s_e^r the population share of group e in region r, and s_r^e the population share of residents in political region r among members of ethnic group e.

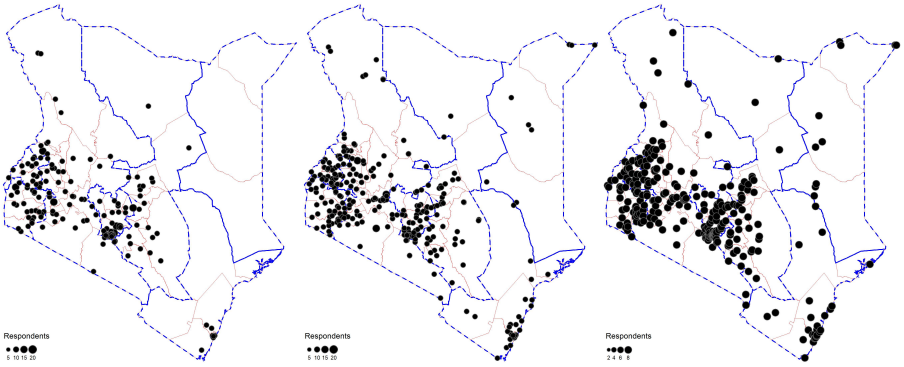
A.2. Spatial coverage of Afrobarometer surveys

FIGURE A.1
Afrobarometer coverage

(A) Round 3 (2005) (B) Round 4 (2008) (C) Round 5 (2011) (D) Round 6 (2014)



(E) Round 7 (2016) (F) Round 8 (2019) (G) Round 9 (2021)



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

A.3. Definition of variables

A.3.1. Variables used in the main paper (Tables I, III, and IV)

Ethnic voting (party-based plurality) is an indicator variable equal to one if respondents i from group e would vote for the party that receives the most votes of other members of groups e during survey round t. The vote shares are constructed from the voting intention question in the Afrobarometer. *(Source: Q99 in Afrobarometer rounds 3 and 5–8, Q97 in round 4, and Q96 in round 9).*

Ethnic voting (coalition-based plurality) is an indicator variable equal to one if respondents i from group e would vote for the coalition that receives the most votes of other members of groups e during survey round t. The vote shares are constructed from the voting intention question in the Afrobarometer matched to the known coalitions at the time of the survey (see Table A.3). *(Source: Q99 in Afrobarometer rounds 3 and 5–8, Q97 in round 4, and Q96 in round 9).*

Change in regional fractionalization ΔRF_c measures the change in regional fractionalization resulting from the administrative-territorial reform where respondent i resides. *(Source: Own computation based on micro data from the 1989 census; Kenya National Bureau of Statistics).*

Change in ethnic fragmentation ΔEF_e measures the change in ethnic fragmentation resulting from the administrative-territorial reform for ethnic group e with which respondent i identifies. *(Source: Own computation based on micro data from the 1989 census; Kenya National Bureau of Statistics).*

Age is the age in years of respondent i. *(Source: Q1 in Afrobarometer rounds 3–9).*

Urban is an indicator variable equal to one if respondent i resides in an Afrobarometer survey cluster designated as urban. *(Source: "urbrur" in Afrobarometer rounds 3–9).*

Female is an indicator variable equal to one if respondent i identifies as female. *(Source: "currint" in Afrobarometer round 3, "thisint" in Afrobarometer rounds 4–9).*

Radio is an indicator variable equal to one if respondent i lives 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, Q92a in round 8, and Q90a in round 9).*

TV is an indicator variable equal to one if respondent i lives 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, Q92b in round 8, and Q90b round in round 9).*

Motorized vehicle is an indicator variable equal to one if respondent i lives 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, Q92c in round 8, and Q90c in round 9).

ΔRF_c **(Constituencies)** measures the change in regional fractionalization resulting from the reform-induced changes (splits) in the electoral constituencies experienced at the location where respondent i resides. *(Source: Own computation based on micro data from the 1989 census; Kenya National Bureau of Statistics).*

ΔEF_e **(Constituencies)** measures the change in ethnic fragmentation resulting from the reform-induced changes (splits) in the electoral constituencies experienced at the location where respondent i resides. *(Source: Own computation based on micro data from the 1989 census; Kenya National Bureau of Statistics).*

ΔRF_c **(Local authorities)** measures the change in regional fractionalization resulting from the change from pre-reform local authorities, which were abolished, to post-reform counties experienced at the location where respondent i resides. *(Source: Own computation based on microdata from the 1989 census; Kenya National Bureau of Statistics).*

ΔEF_e **(Local authorities)** measures the change in ethnic fragmentation resulting from the change from pre-reform local authorities, which were abolished, to post-reform counties experienced at the location where respondent i resides. *(Source: Own computation based on micro data from the 1989 census; Kenya National Bureau of Statistics).*

ΔRF_c **(Districts)** measures the change in regional fractionalization resulting from the change from pre-reform districts to post-reform counties experienced at the location where respondent i resides. *(Source: Own computation based on micro data from the 1989 census; Kenya National Bureau of Statistics).*

ΔEF_e **(Districts)** measures the change in ethnic fragmentation resulting from the change from pre-reform districts to post-reform counties experienced at the location where respondent i resides. *(Source: Own computation based on micro data from the 1989 census; Kenya National Bureau of Statistics).*

Δ **Regional population** is the percentage change in the population size of the political region where respondent i resides, resulting from the change from pre-reform provinces to post-reform counties. *(Source: Own computation based on microdata from the 1989 census; Kenya National Bureau of Statistics).*

Δ **Capital proximity** is the county-averaged percentage change in the distance between the cluster locations of respondents residing in county c and the subnational capital city in the corresponding province/county, resulting from the creation of 39 new subnational capital cities. *(Own calculation.)*

Support referendum is the vote share in favor of the new constitution in the pre-reform province in which respondent i resides. *(Source: African election database).*

Largest group is an indicator variable equal to one if respondent i identifies with the largest ethnic group in the county in which they reside. *(Source: Own computation based on micro data from the 1989 census; Kenya National Bureau of Statistics).*

co-ethnic governor is an indicator variable equal to one if respondent i identifies with the same ethnic group as the governor of the county where they reside. *(Source: D'Arcy (2020).)*

County executive committee (CEC) share is the share of CEC members in county c who identify with the same ethnic group as respondent i residing in count c. *(Source: Ethnic and Diversity Audit of the County Public Service (National Cohesion and Integration Commission, 2016)).*

County public sector board (CPSB) share is the share of CPSB members in county c who identify with the same ethnic group as respondent i residing in count c. *(Source: Ethnic and Diversity Audit of the County Public Service (National Cohesion and Integration Commission, 2016)).*

CEC & CPSB share is the sum of CEC share and CPSB share. *(Source: Own computation.)*

Unitary government (county) is an indicator equal to one for ethnic groups in counties in which they are the largest group, have a co-ethnic initial governor, and have an above-median joint share of the CEC & CPSB for co-ethnic groups of governors. *(Source: Own computation.)*

A.3.2. Variables used in the additional results (Online Appendix B)

Voting intention is an indicator variable that is equal to one unless the respondent answers "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, Q97 in round 4, and Q96 in round 9).*

Party preferences is an indicator variable that is equal to one unless the respondent answers "would not vote", "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. *(Source: Q99 in Afrobarometer rounds 3 and 5–8, Q97 in round 4, and Q96 in round 9).*

Ethnic voting (party-based majority) is an indicator variable that is equal to one if respondent of i from group e would vote for the party that receives the majority of votes of other members of groups e during survey round t. The vote shares are constructed

from the voting intention question in the Afrobarometer. *(Source: Q99 in Afrobarometer rounds 3 and 5–8, Q97 in round 4, and Q96 in round 9).*

Ethnic voting (coalition-based majority) is an indicator variable that is equal to one if respondent of i from group e would vote for the coalition that receives the majority of votes of other members of groups e during survey round t. The vote shares are constructed from the voting intention question in the Afrobarometer matched to the known coalitions at the time of the survey (see Table A.3). *(Source: Q99 in Afrobarometer rounds 3 and 5–8, Q97 in round 4, and Q96 in round 9).*

Ethnic voting (party vote share) is the share of co-ethnics that vote for the same party as respondent i. The vote shares are constructed from the voting intention question in the Afrobarometer. *(Source: Q99 in Afrobarometer rounds 3 and 5–8, Q97 in round 4, and Q96 in round 9).*

Ethnic voting (coalition vote share coalition) is the share of co-ethnics that vote for the same coalition as respondent i. The vote shares are constructed from the voting intention question in the Afrobarometer matched to the known coalitions at the time of the survey (see Table A.3). *(Source: Q99 in Afrobarometer rounds 3 and 5–8, Q97 in round 4, and Q96 in round 9).*

Ethnic voting (co-ethnic candidate party) is an indicator variable that is equal to one if respondent i would vote for the party that runs their co-ethnic candidates if presidential elections were held tomorrow. The co-ethnic parties are only defined for the big 4 (Kamba, Kalenjin, Kikuyu, and Luo) based on the ethnic identity of the presidential and vice-presidential candidates. *(Source: Q99 in Afrobarometer rounds 3 and 5–8, Q97 in round 4, and Q96 in round 9).*

Ethnic voting (co-ethnic candidate coalition) is an indicator variable that is equal to one if respondent i would vote for the coalition that runs their co-ethnic candidates if presidential elections were held tomorrow. The vote shares are constructed from the voting intention question in the Afrobarometer matched to the known coalitions at the time of the survey (see Table A.3). The co-ethnic coalitions are only defined for the big 4 (Kamba, Kalenjin, Kikuyu, and Luo) based on the ethnic identity of the presidential and vice-presidential candidates. *(Source: Q99 in Afrobarometer rounds 3 and 5–8, Q97 in round 4, and Q96 in round 9).*

Ethnic match (respondent-interviewer) is an indicator variable equal to one if the home language of the respondent and the interviewer match and zero otherwise. *(Source home language interviewer, home language as stated above Q114 in Afrobarometer round 3, Q117 in round 4, Q116 in round 5, 6, 7, 8, and 9).*

Alignment county-national is an indicator variable equal to one if a county has a governor belonging to the same party as either the president or the vice president currently

in power. *(Source: Independent Electoral and borders Commission, 2013 and 2017).*

National identification (continuous) is a continuous variable measuring to which degree respondents identify more with the nation compared to their ethnic group. We normalize the ordinal variable to range from 0 to 1.*(Source: Afrobarometer questions Q82 in round 3, Q83 in round 4, Q85b in round 5, Q88b in round 6, Q85b in round 7, Q82b in round 8, and Q84c in round 9).*

National identification (indicator) is an indicator variable equal to one if respondent i identifies strictly more with Kenya than their ethnic group. *(Source: Afrobarometer questions Q82 in Afrobarometer round 3, Q83 in round 4, Q85b in round 5, Q88b in round 6, Q85b in round 7, Q82b in round 8, and Q84c in round 9).*

Ethnic discrimination (continuous) is a continuous variable capturing if respondents feel ethnically discriminated by the government. We normalize the ordinal variable to range from 0 to 1. *(Source: Afrobarometer questions Q81 in round 3, Q82 in round 4, Q85a in round 5, Q88a in round 6, Q85a in round 7, Q82a in round 8, and Q84b in round 9).*

Ethnic discrimination (indicator) is an indicator variable that is equal to one if respondents feel often or always ethnically discriminated by the government. *(Source: Afrobarometer questions Q81 in round 3, Q82 in round 4, Q85a in round 5, Q88a in round 6, Q85a in round 7, Q82a in round 8, and Q84b in round 9).*

A.4. Summary statistics

TABLE A.1
Summary statistics

Variable	Mean	SD	Min	Max	N
Panel A: Variables used in main analysis - respondent level					
Ethnic voting: party-based plurality	0.71	0.46	0.00	1.00	7,262
Ethnic voting: coalition-based plurality	0.75	0.43	0.00	1.00	7,262
ΔRF_c	-0.20	0.24	-0.61	0.28	7,262
ΔEF_e	0.45	0.16	0.02	0.79	7,262
Age	36.00	13.79	18.00	96.00	7,249
Respondent is female	0.47	0.50	0.00	1.00	7,262
Urban cluster	0.37	0.48	0.00	1.00	7,262
Respondent owns a radio	0.87	0.34	0.00	1.00	7,262
Respondent owns a TV	0.51	0.50	0.00	1.00	7,262
Respondent owns a vehicle	0.24	0.43	0.00	1.00	7,262
Δ RF - districts to county	0.02	0.13	-0.35	0.46	6,923
Δ EF - districts to county	-0.14	0.08	-0.42	0.01	6,923
Δ RF - local authorities to county	0.01	0.13	-0.44	0.51	6,922
Δ EF - local authorities to county	-0.11	0.07	-0.26	0.02	6,922
Δ RF - electoral constituencies	-0.00	0.08	-0.46	0.49	6,788
Δ EF - electoral constituencies	0.01	0.03	0.00	0.35	6,788
Δ Regional population	-0.72	0.28	-0.98	0.00	7,262
Δ Capital proximity	-0.46	0.34	-0.94	0.00	7,262
Support referendum	0.58	0.49	0.00	1.00	7,262
Largest group in county	0.72	0.45	0.00	1.00	7,262
Unitary government (county)	0.38	0.48	0.00	1.00	7,262
Panel B: Variables used in main analysis - county-by-ethnicity level					
Largest group (county)	0.03	0.17	0.00	1.00	1,666
Coethnic governors (initial)	0.03	0.17	0.00	1.00	1,666
County executive board (CEC) share	0.03	0.14	0.00	1.00	1,666
County public service board (CPSB) share	0.03	0.14	0.00	1.00	1,666
CEC & CPSB share	0.03	0.14	0.00	1.00	1,666
Panel C: Variables used in the online appendix - respondent level					
Voting intention	0.92	0.27	0.00	1.00	10,271
Party preferences	0.97	0.17	0.00	1.00	10,271
Ethnic voting: party-based majority	0.77	0.42	0.00	1.00	5,806
Ethnic voting: coalition-based majority	0.78	0.42	0.00	1.00	6,584
Ethnic voting: vote share party	0.59	0.30	0.00	1.00	7,262
Ethnic voting: vote share coalition	0.64	0.28	0.00	1.00	7,232
Ethnic voting: coethnic candidate party	0.71	0.45	0.00	1.00	4,290
Ethnic voting: coethnic candidate coalition	0.78	0.42	0.00	1.00	4,290
Big4	0.59	0.49	0.00	1.00	7,262
Ethnic match (respondent-interviewer)	0.81	0.39	0.00	1.00	7,262
Alignment county-national	0.53	0.50	0.00	1.00	7,262
National identification (continuous)	0.73	0.22	0.20	1.00	7,234
National identification (indicator)	0.44	0.50	0.00	1.00	7,234

Continued on next page

Table A.1 – *Continued from previous page*

Variable	Mean	SD	Min	Max	N
Ethnic discrimination (continuous)	0.48	0.24	0.25	1.00	7,069
Ethnic discrimination (indicator)	0.23	0.42	0.00	1.00	7,069

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

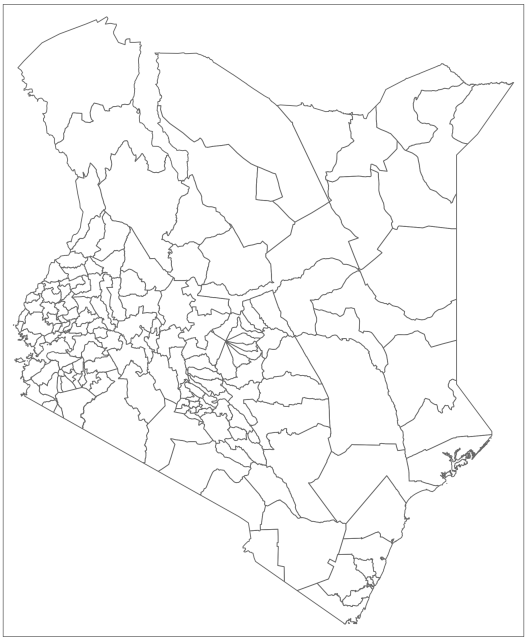
A.5. Additional border changes in Kenya

We collect data on the additional border changes and identify the appropriate counterfactual. In two cases, this is straightforward. The Independent Electoral and Boundaries Commission (IEBC) publishes constituency borders for Kenya for each election. The pre-and post-reform constituency borders are those of the 2007 and 2013 elections. In the case of the local authorities, we take the 175 city, municipal, county, and town council borders that were in effect from 1963 until 2010 as the pre-reform baseline (Mboga, 2009), and the borders of the 47 counties as the post-reform geographies (as they completely replaced the lower and less-well funded layer). We could not identify geometries for all 257 districts that existed (even if only on paper) by early September 2009. This is because the Kibaki government was still actively creating new districts in March 2009 (when it finalized the conversion of all 210 constituencies into districts and planned to set up 70 additional district headquarters by the end of the year).[3] The High Court decision interrupted this process so that many of those districts were never established or only existed for a few months. Instead, we use the 158 districts that were used as a basis for the 2009 census. The post-reform borders are those of the 47 counties. Constituencies were split while local authorities and districts were merged into counties as part of the reform process.

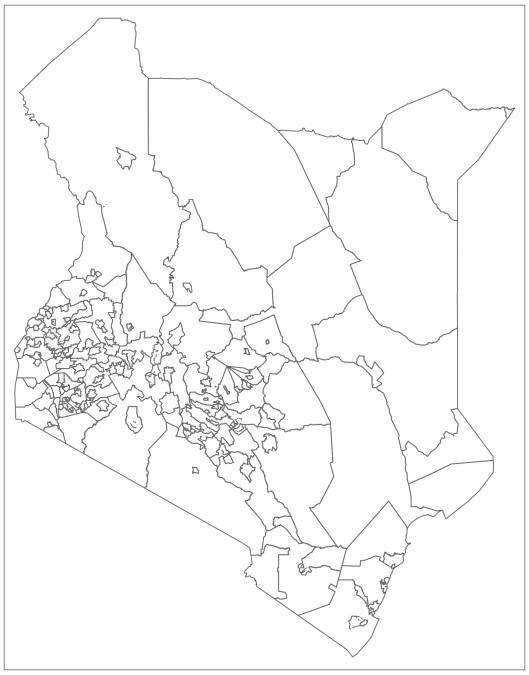
[3]Kenya; All Constituencies Now Turned Into Districts. Africa News, July 13, 2009 Monday. advance.lexis.com/api/document?collection=news&id=urn:contentItem:7W4Y-7370-Y9KG-Y1KK-00000-00&context=1516831.

FIGURE A.2
Other political borders affected by the reform

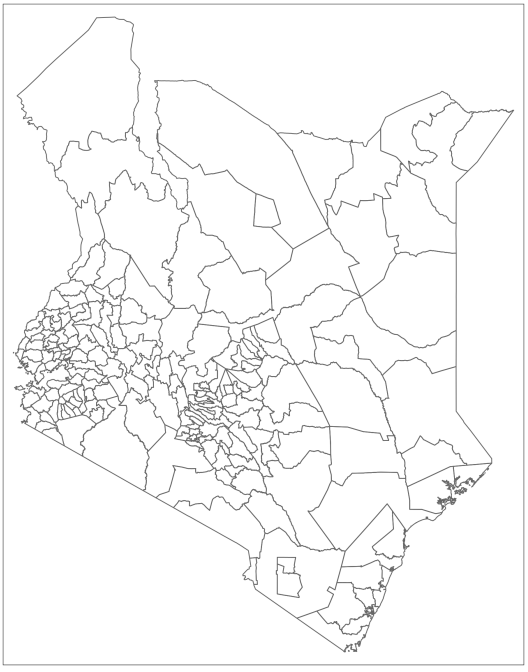
(A) Districts



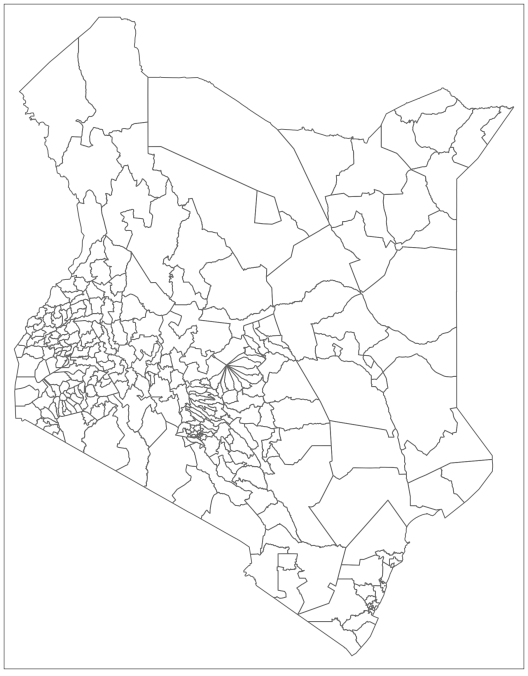
(B) Local Authorities



(C) Constituencies (pre-reform)



(D) Constituencies (post-reform)

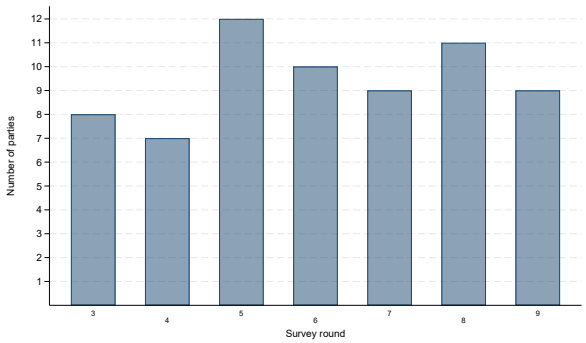


Notes: Panel A depicts the districts of Kenya as of 2008. They where abolished with the constitutional reform. Panel B depicts the local authorities prior to the reform. Panel C depicts the pre-reform electoral constituencies, and panel D post-reform ones.

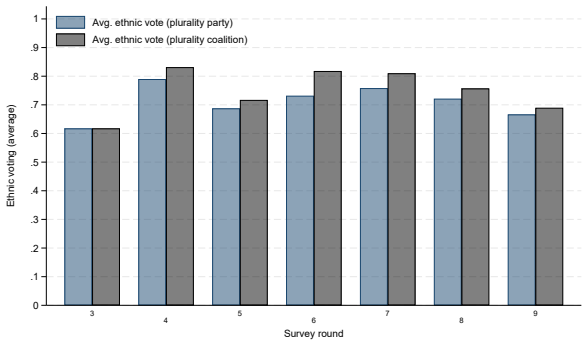
A.6. Further descriptive statistics

FIGURE A.3
Number of parties and average ethnic voting

(A) No. of parties



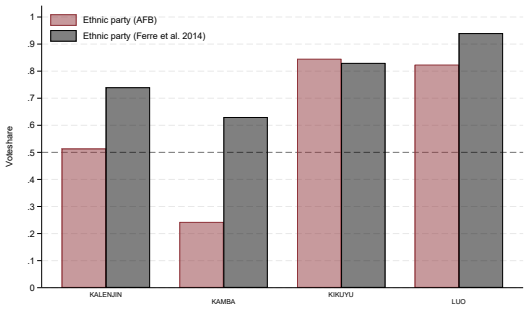
(B) Avg. ethnic voting



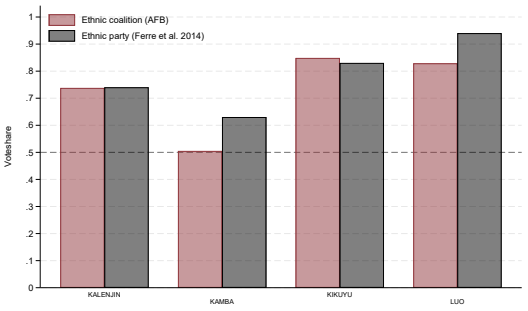
Notes: Panel A of the figure plots the number of parties stated as voting choices by respondents in the Afrobarometer survey during each survey round. Panel B of the figure plots average ethnic voting (plurality party in blue, plurality coalition in black) over the survey rounds.

FIGURE A.4
Similarity of ethnic party voting in Afrobarometer and exit polls

(A) Parties

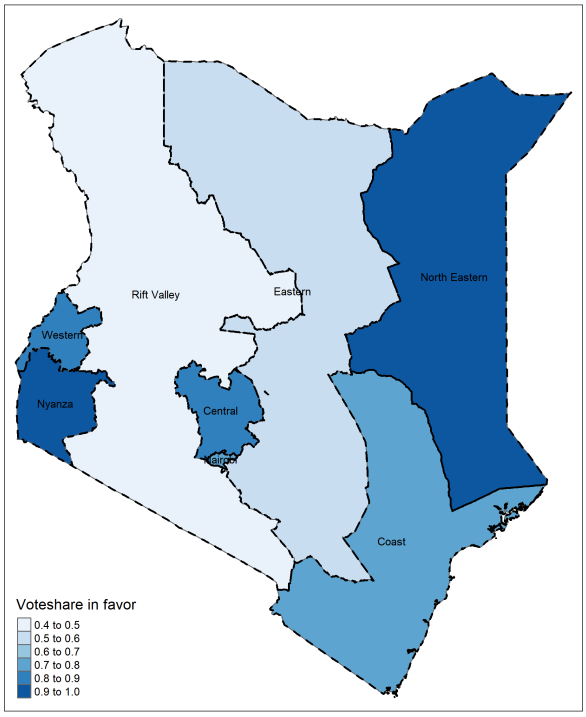


(B) Coalitions



Notes: Panel A of the figure plots the share of respondents from the big four ethnic groups who intend to vote for the party with a co-ethnic presidential or vice-presidential candidate according to the Afrobarometer survey data (in maroon) and the share of voters from these groups who voted for the presidential ticket with co-ethnic presidential or vice-presidential candidate according to the exit polls by Ferree et al. (2014) (in black). Panel B replicates panel A but aggregates the political parties at the level of coalitions, as coalitions correspond more closely to the presidential tickets used in the exit polls. The Afrobarometer voteshare is based on wave 6 (2014), which is closest to the exit polls in Ferree et al. (2014) conducted in 2013.

FIGURE A.5
2010 Referendum support for the constitutional reform across provinces



Notes: The figure plots the voteshare in favor of the constitutional reform during the 2010 referendum across provinces.

TABLE A.2
Most popular parties by group and survey round

Ethnic group	Survey round	Re-spondents	Most popular party	Vote share 1st party	Second most popular party	Vote share 2nd party
EMBU / MERU	3	30	NARC-K	.85	KANU	.04
EMBU / MERU	4	37	PNU	.44	ODM	.26
EMBU / MERU	5	60	PNU	.56	ODM	.26
EMBU / MERU	6	111	TNA	.90	ODM	.03
EMBU / MERU	7	90	JAP	.90	TNA	.05
EMBU / MERU	8	145	JAP	.84	ODM	.11
EMBU / MERU	9	151	UDA	.69	ODM	.16
KALENJIN	3	119	KANU	.51	NARC-K	.27
KALENJIN	4	41	ODM	.97		
KALENJIN	5	105	UDM	.43	ODM	.28
KALENJIN	6	183	URP	.58	TNA	.25
KALENJIN	7	167	JAP	.81	URP	.09
KALENJIN	8	355	JAP	.88	ODM	.06
KALENJIN	9	294	UDA	.84	JAP	.09
KAMBA	3	109	NARC-K	.65	LDP	.21
KAMBA	4	66	ODM-K	.58	PNU	.20
KAMBA	5	150	ODM-K	.42	ODM	.29
KAMBA	6	202	ODM	.35	WDM-K	.33
KAMBA	7	142	JAP	.44	ODM	.32
KAMBA	8	239	JAP	.43	ODM	.26
KAMBA	9	254	UDA	.39	WDM-K	.27
KIKUYU	3	153	NARC-K	.7	KANU	.17
KIKUYU	4	141	PNU	.64	ODM	.13
KIKUYU	5	249	PNU	.74	KANU	.08
KIKUYU	6	343	TNA	.96	ODM	.02
KIKUYU	7	229	JAP	.92	TNA	.05
KIKUYU	8	410	JAP	.93	ODM	.04
KIKUYU	9	444	UDA	.70	JAP	.15
KISII	3	88	NARC-K	.48	KANU	.18
KISII	4	38	ODM	.85	PNU	.11
KISII	5	68	ODM	.66	PNU	.26
KISII	6	121	ODM	.58	TNA	.35
KISII	7	93	JAP	.55	ODM	.41
KISII	8	160	ODM	.53	JAP	.44
KISII	9	142	ODM	.59	UDA	.28
LUHYA	3	111	NARC-K	.49	LDP	.22
LUHYA	4	62	ODM	.91	KADDU-ASIL	.02
LUHYA	5	192	ODM	.78	PNU	.09
LUHYA	6	256	ODM	.65	TNA	.22
LUHYA	7	198	ODM	.53	JAP	.39
LUHYA	8	349	ODM	.44	JAP	.38
LUHYA	9	387	ODM	.55	UDA	.25
LUO	3	118	LDP	.81	NARC-K	.14
LUO	4	97	ODM	1		
LUO	5	207	ODM	.96	NARC-K	.02
LUO	6	210	ODM	.92	TNA	.06
LUO	7	170	ODM	.92	JAP	.05
LUO	8	283	ODM	.88	JAP	.10
LUO	9	249	ODM	.92	UDA	.05
MAASAI / SAMBURU	3	15	NARC-K	.42	KANU	.33

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Table A.2 – *Continued from previous page*

Ethnic group	Wave	Respondents	Most popular party	Vote share 1st party	Second most popular party	Vote share 2nd party
MAASAI / SAMBURU	4	9	ODM	.50	PNU	.17
MAASAI / SAMBURU	5	28	ODM	.81		
MAASAI / SAMBURU	6	26	TNA	.58	ODM	.21
MAASAI / SAMBURU	7	43	JAP	.59	ODM	.18
MAASAI / SAMBURU	8	72	JAP	.54	ODM	.44
MAASAI / SAMBURU	9	50	ODM	.47	UDA	.38
MIJIKENDA	3	72	NARC-K	.5	KANU	.20
MIJIKENDA	4	17	ODM	.64	ODM-K	.09
MIJIKENDA	5	78	ODM	.5	PNU	.27
MIJIKENDA	6	88	ODM	.75	TNA	.16
MIJIKENDA	7	23	ODM	.53	JAP	.27
MIJIKENDA	8	107	ODM	.59	JAP	.40
MIJIKENDA	9	136	ODM	.61	UDA	.21
SOMALI	3	12	KANU	.44	NARC-K	.22
SOMALI	4	51	ODM	.82	PNU	.12
SOMALI	5	90	ODM	.50	PNU	.28
SOMALI	6	100	TNA	.56	ODM	.25
SOMALI	7	8	JAP	.75		
SOMALI	8	82	JAP	.71	ODM	.19
SOMALI	9	91	UDA	.39	ODM	.31

Notes: The table reports the names and vote share of each ethnic group's most popular party and second most popular party, as well as the vote fractionalization across parties for each of the 10 largest ethnic groups in Afrobarometer survey round.

TABLE A.3
Match of parties to coalitions for each Afrobarometer survey round

Survey round	Party	Coalition	Coalition past election	Coalition next election	Respondents
3	DP	NARC	NARC	PNU	12
3	FORD-K	NARC	NARC	PNU	19
3	KANU	KANU	KANU	PNU	135
3	LDP	ODM	NARC	ODM	152
3	NARC-K	NARC-K	NARC-K	PNU	327
3	NPK	NARC	NARC	.	4
3	Shirikisho				4
3	SDP	SDP	SDP	SDP	1
4	FORD-K	PNU	PNU	CORD	1
4	KADDU-ASIL	KADDU-ASIL	KADDU-ASIL	.	2
4	KANU	PNU	PNU	Amani	8
4	NARC-K	PNU	PNU	NARC-K	14
4	ODM	ODM	ODM	CORD	270
4	ODM-K				42
4	PNU	PNU	PNU	Jubilee (JAP)	107
5	DP	DP	PNU	.	2
5	FORD-K	FORD-K	PNU	CORD	2
5	G7	.	.	.	3
5	KADDU-ASIL	KADDU-ASIL	KADDU-ASIL	.	1
5	KANU	KANU	PNU	Amani	29
5	NARC-K	NARC-K	PNU	NARC-K	37
5	NFK	NFK	NFK	Amani	3
5	ODM	ODM	ODM	CORD	478
5	ODM-K				72
5	PNU	PNU	PNU	Jubilee (JAP)	245
5	SAFINA	.	.	SAFINA	1
5	UDM	ODM	ODM	CORD	41
6	FORD-K	CORD	CORD	NASA	9
6	KSC	CORD	CORD	.	3
6	NARC-K	NARC-K	NARC-K	NARC-K	10
6	ODM	CORD	CORD	NASA	504
6	RBK	RBK	RBK	.	2
6	SAFINA	SAFINA	SAFINA	.	2
6	TNA	Jubilee (JAP)	Jubilee (JAP)	Jubilee (JAP)	607
6	UDF	Amani	Amani	Jubilee (JAP)	13
6	URP	Jubilee (JAP)	Jubilee (JAP)	Jubilee (JAP)	125
6	WDM-K	CORD	CORD	NASA	53
7	JAP	Jubilee (JAP)	Jubilee (JAP)	Jubilee (JAP)	529
7	NARC-K	NARC-K	NARC-K	.	3
7	ODM	CORD	CORD	NASA	295
7	RBK	RBK	RBK	.	2
7	SAFINA	SAFINA	SAFINA	.	1
7	TNA	Jubilee (JAP)	Jubilee (JAP)	Jubilee (JAP)	27
7	UDF	Jubilee (JAP)	Amani	Jubilee (JAP)	4
7	URP	Jubilee (JAP)	Jubilee (JAP)	Jubilee (JAP)	13
7	WDM-K	CORD	CORD	NASA	22
8	Amani National Congress	NASA	NASA	KK	28
8	FORD-K	NASA	NASA	KK	15
8	JAP	Jubilee (JAP)	Jubilee (JAP)	Azimio	956
8	KANU	KANU	KANU	Azimio	13
8	KSC	.	.	.	1

Continued on next page

Table A.3 – *Continued from previous page*

Survey round	Party	Coalition	Coalition past election	Coalition next election	Respondents
8	Maendeleo Chap Chap	Jubilee (JAP)	Jubilee (JAP)	KK	9
8	NARC-K	.	.	.	5
8	ODM	NASA	NASA	Azimio	549
8	Thirdway Alliance	Thirdway Alliance	Thirdway Alliance	Thirdway Alliance	14
8	UDF	Jubilee (JAP)	Jubilee (JAP)	Jubilee (JAP)	2
8	WDM-K	NASA	NASA	Azimio	41
9	Amani National Congress	NASA	NASA	KK	27
9	JAP	Jubilee (JAP)	Jubilee (JAP)	Azimio	162
9	KANU	KANU	KANU	Azimio	6
9	KSC	.	.	.	1
9	Maendeleo Chap Chap	Jubilee (JAP)	Jubilee (JAP)	KK	2
9	NARC-K	.	.	.	4
9	ODM	NASA	NASA	Azimio	566
9	UDA	UDA	UDA	KK	695
9	WDM-K	NASA	NASA	Azimio	34

Notes: The table reports the matching of parties to coalitions for each Afrobarometer survey round. "Coalition past election" classifies parties based on their coalition membership in the last election, and "coalition next election" based on their coalition membership in the following election. "Coalition," which is our main measure, corresponds to "coalition next election" if the party has already communicated its coalition membership for the following election, and to "coalition past election" otherwise.

Table A.4
Correlation of treatments with other border changes

Panel A: Regional fractionalization				
			ΔRF_c	
	(main)	(Districts)	(L. authorities)	(Constituencies)
ΔRF_c	1			
ΔRF_c (Districts)	0.154	1		
ΔRF_c (Local authorities)	0.0780	0.660	1	
ΔRF_c (Constituencies)	-0.0242	0.0274	-0.0358	1
Panel B: Ethnic fragmentation				
			ΔEF_e	
	(main)	(Districts)	(L. authorities)	(Constituencies)
ΔEF_e	1			
ΔEF_e (Districts)	0.150	1		
ΔEF_e (Local authorities)	0.0772	0.833	1	
ΔEF_e (Constituencies)	-0.132	-0.450	-0.102	1

Notes: The table reports the correlations between our two main empirical measures ΔRF and ΔEF constructed from the border changes from provinces to counties, and our alternative boundary changes discussed in Section 5.3. Specifically, the ΔRF and ΔEF constructed from the 2008 districts to counties, the local authorities to counties, and the electoral constituencies to counties.

TABLE A.5
Correlation of treatment with devolution and reform support

	ΔRF_c	ΔEF_c	Δ Regional population	Δ Capital proximity	Support referendum
ΔRF_c	1				
ΔEF_e	-0.233	1			
Δ Regional population	0.333	-0.233	1		
Δ Capital proximity	0.297	-0.184	0.576	1	
Support referendum	-0.125	0.0965	-0.487	-0.382	1

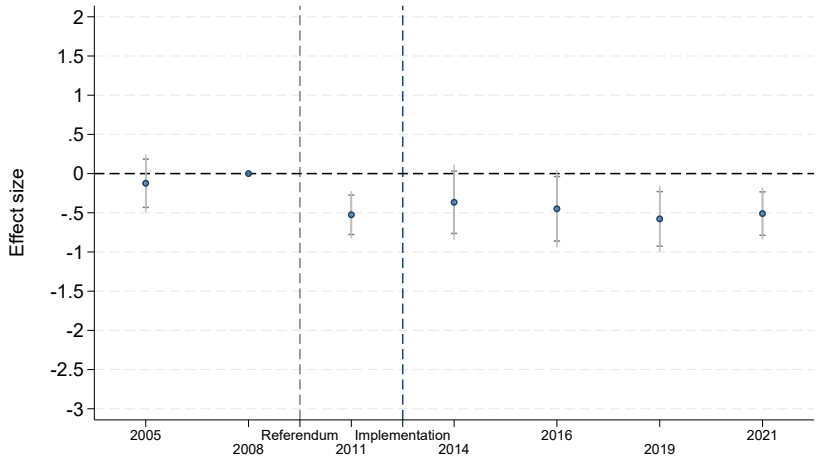
Notes: The table reports the correlations between our two main empirical measures ΔRF and ΔEF and several proxies for the devolution as well as our measure for province-level reform support.

B. Additional results

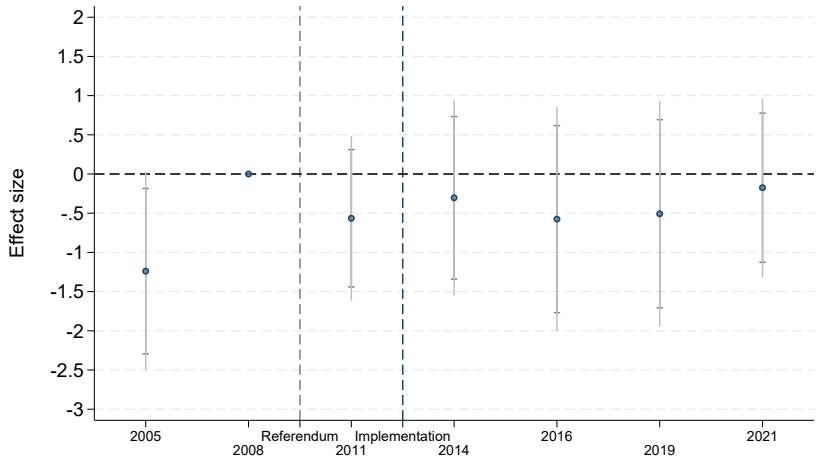
B.1. Figures

FIGURE B-1
Effect symmetry

(A) Decreasing regional fractionalization



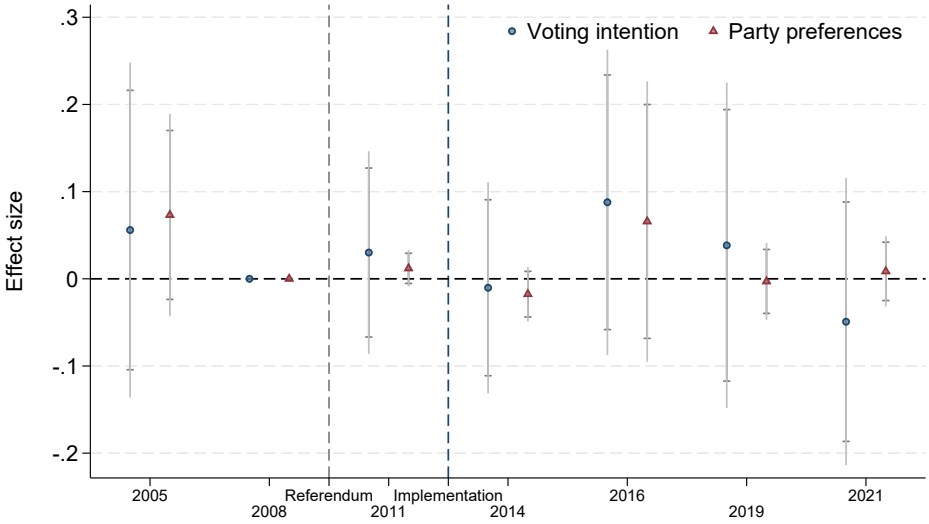
(B) Increasing regional fractionalization



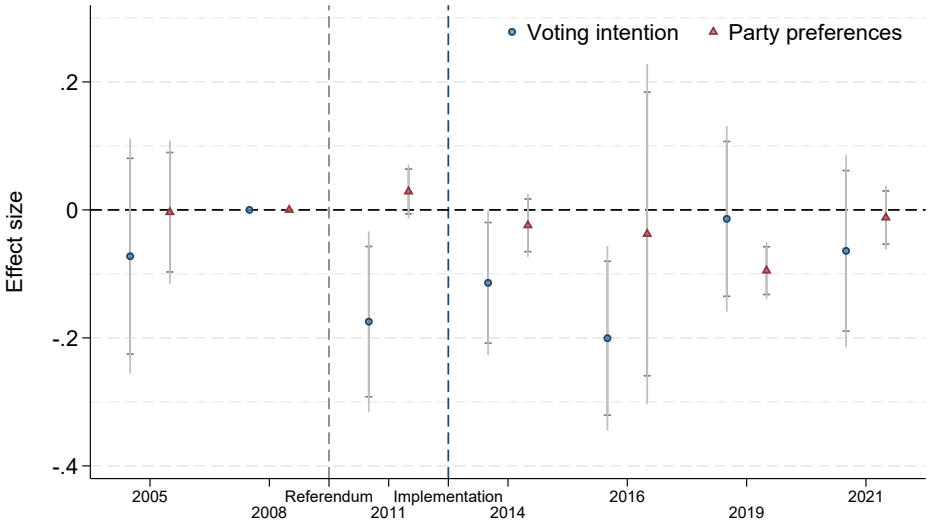
Notes: The figure shows event study coefficients of the effect of reform-induced changes in regional fractionalization on ethnic voting split by whether regional fractionalization increases or decreases. Panel A shows estimates for reductions in regional fractionalization, and panel B shows estimates for increases in regional fractionalization. Note that the negative ΔRF_c values in panel A are multiplied by -1 to report the effect of reductions in regional fractionalization. All specifications include changes in ethnic fragmentation (ΔEF_e), county-by-ethnicity and time-fixed effects as well as the following individual level control variables: age and indicator variables for residence in an urban cluster, being female, owning a radio, TV, and motorized vehicle. Note that ethnic fragmentation increases for all groups, so we do not report the effect of ΔEF_e in this figure. 95% confidence intervals based on two-way clustered standard errors at the province-by-ethnicity and county level are plotted as gray error bars.

FIGURE B-2
Intention to vote and willingness to reveal party preferences

(A) Effects of changes in regional fractionalization



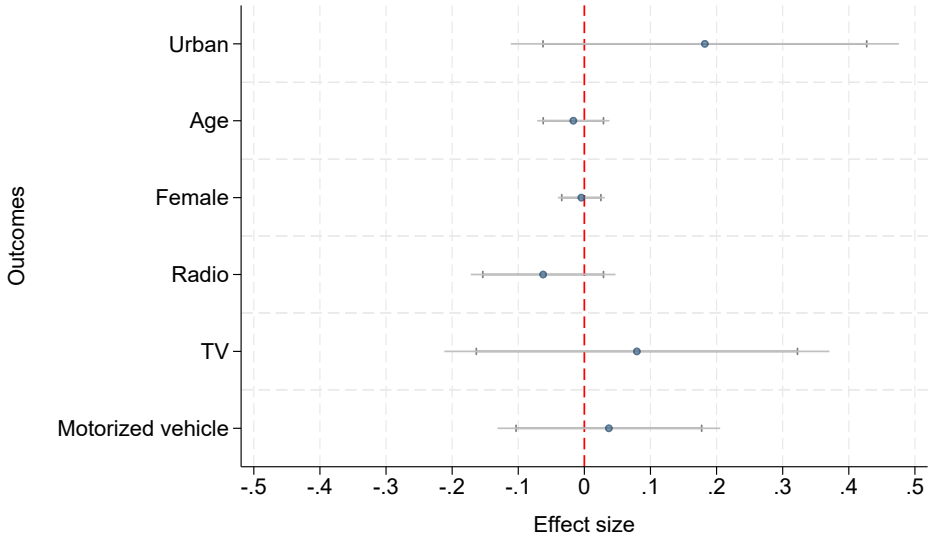
(B) Effects of changes in ethnic fragmentation



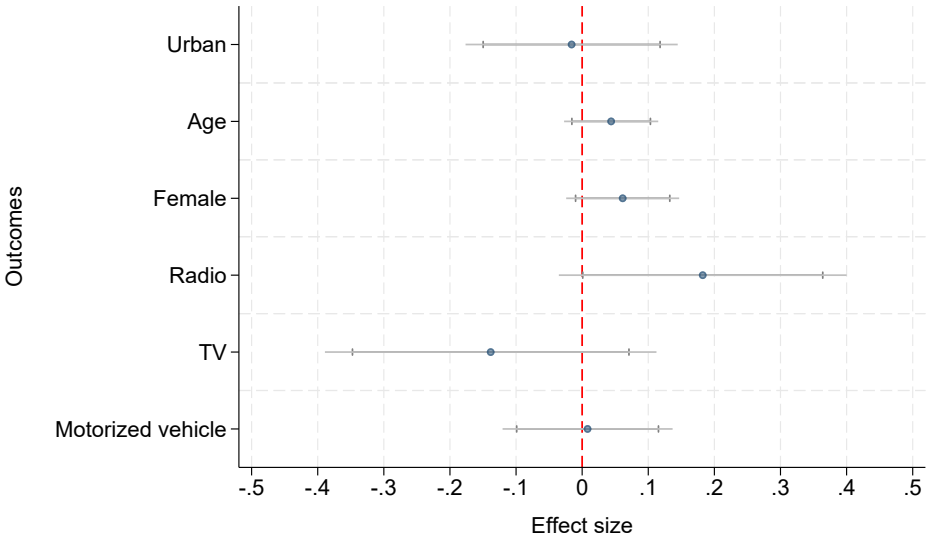
Notes: The figure shows event study coefficients of reform-induced changes in regional fractionalization and ethnic fragmentation on whether a respondent indicates an intention to vote (circles) and whether they are willing to reveal the party's candidate they intend to vote for (triangles). The event study specifications include county-by-ethnicity and time-fixed effects as well as the following individual-level control variables: age and indicator variables for residence in an urban cluster, being female, owning a radio, TV, and motorized vehicle. 95% confidence intervals based on standard errors clustered at the province-by-ethnicity and county level are plotted as gray error bars.

FIGURE B-3
Balancing results

(A) Changes in regional fractionalization (ΔRF_c)



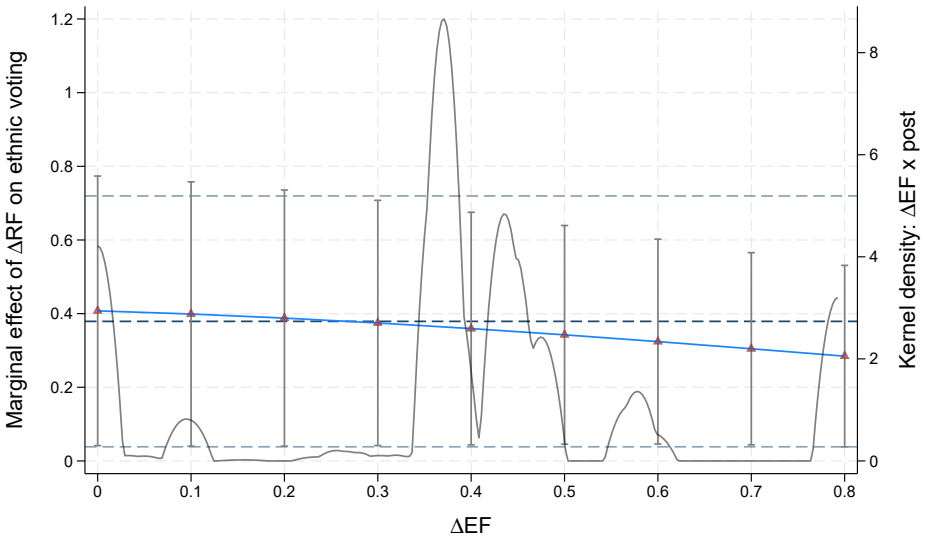
(B) Changes in ethnic fragmentation (ΔEF_e)



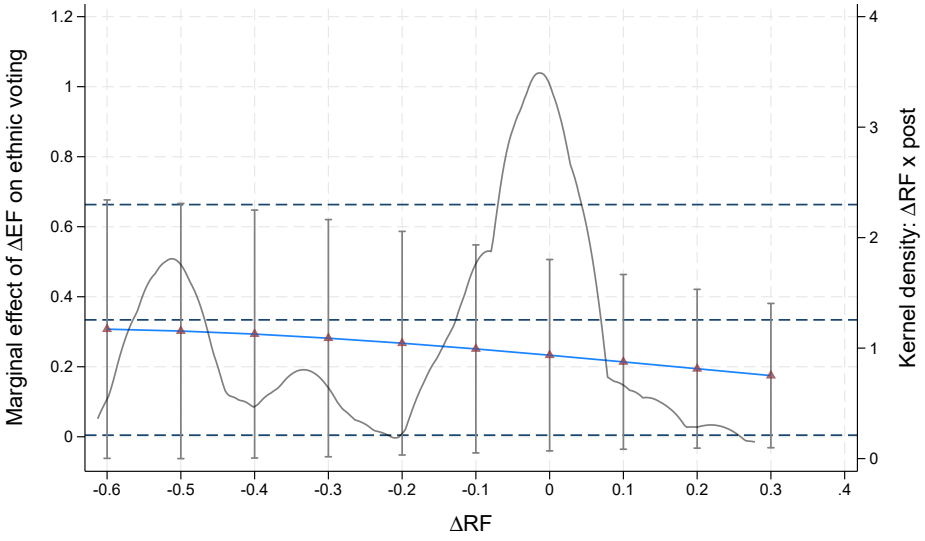
Notes: The figure summarizes the balancing tests on individual characteristics for our treatments. Panels A and B report the point estimates and 95% confidence intervals of a change in regional fractionalization and ethnic fragmentation over different individual controls. The 95% confidence intervals based on two-way clustered standard errors at the county and province-by-ethnicity level are plotted as gray error bars.

FIGURE B-4
Marginal effects: Δ RF & Δ EF

(A) Effect ΔRF_c



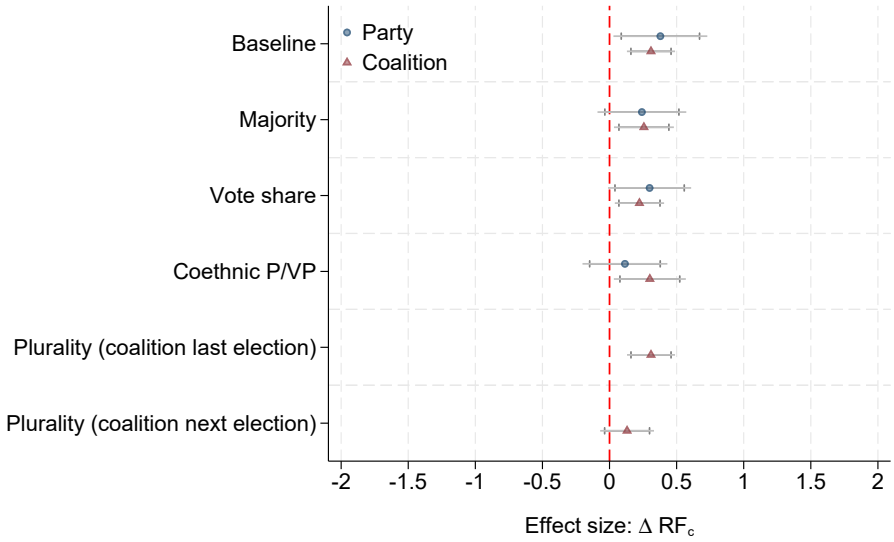
(B) Effect ΔEF_e



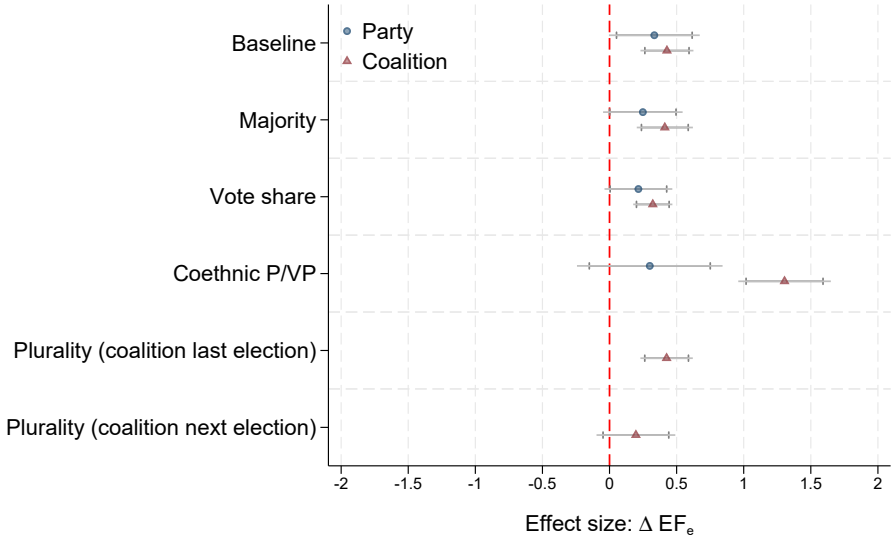
Notes: The figure plots the marginal effects on Δ RF $\times D_t$ (panel A) and Δ EF $\times D_t$ (panel B), over the empirical distribution of the respective other measure on party-based ethnic voting. The plots are based on the logit specification depicted in column (2) of Table B-1.

Figure B-5
Robustness tests with alternative voting outcomes

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



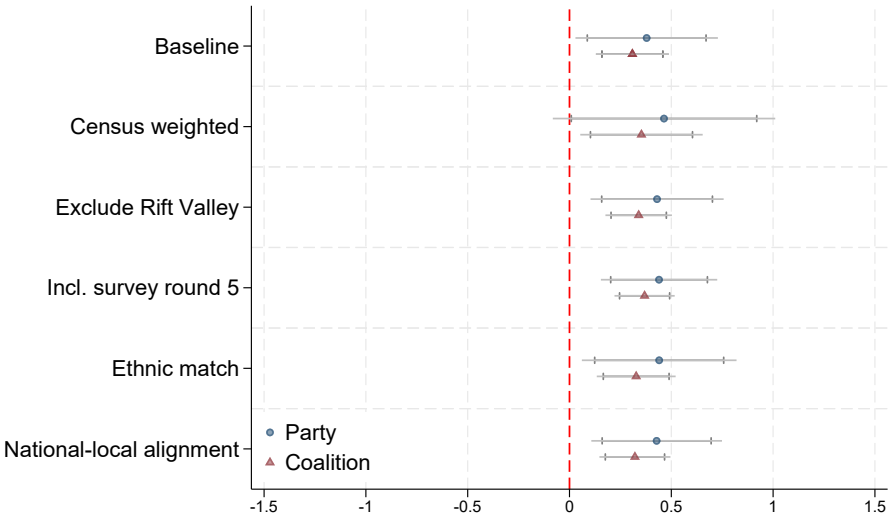
(B) Effect of changes in ethnic fragmentation on ethnic voting



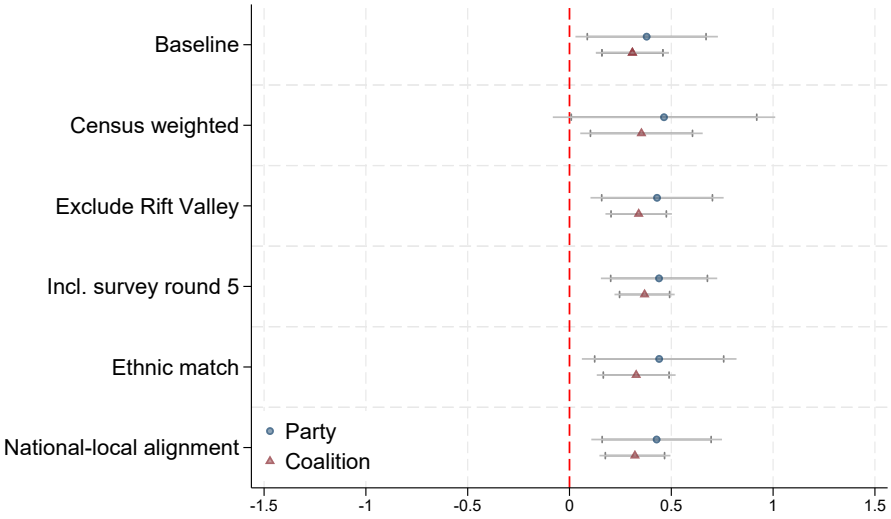
Notes: The figure checks the robustness of our main results (see Table I, columns 2 and 5) to alternative measures of ethnic voting. Panel A shows estimates for regional fractionalization, and panel B shows estimates for ethnic fragmentation. Blue circles indicate party-based measures of ethnic voting, and red triangles indicate coalition-based measures. Baseline indicates the use of our plurality indicator of ethnic voting. Majority indicates the use of a majority indicator of ethnic voting, which is equal to one only for parties/coalitions that receive 50% of more of the vote share of an ethnic group in a survey round. Group share indicates the use of the vote share of the plurality party. Co-ethnic P/VP indicates the use of an indicator of voting for a party headed by a co-ethnic presidential or vice-presidential candidate (only defined for the Kalenjin, Kamba, Kikuyu, and Luo). Plurality (coalition past election) and plurality (coalition next election) indicate use of a coalition-based plurality indicator based on coalitions in the past or the next election (rather than the coalition known at the survey date). 95% confidence intervals based on two-way clustered standard errors at the province-by-ethnicity and county level are plotted as gray error bars.

FIGURE B-6
Robustness tests with perturbed samples

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

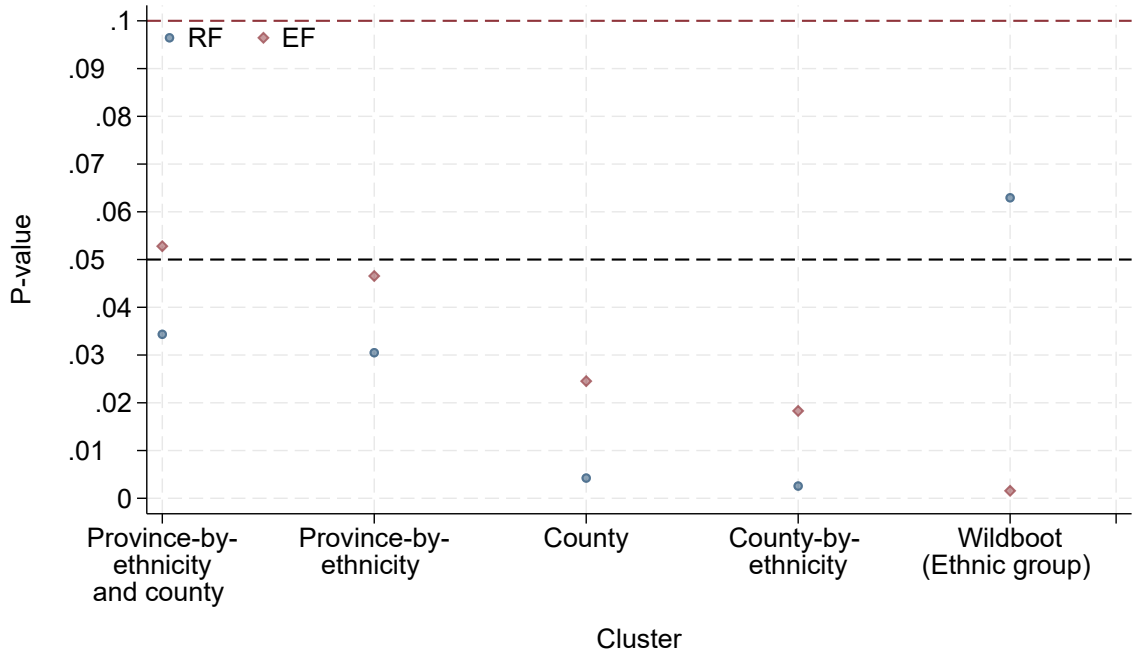


(B) Effect of changes in ethnic fragmentation on ethnic voting



Notes: The figure checks the robustness of our main results (see Table I, columns 2 and 5) to samples. Panel A shows estimates for regional fractionalization, and panel B shows estimates for ethnic fragmentation. Census weighted weights each Afrobarometer respondent in proportion to the census population (e.g., if five members of a group are sampled in a county where 10,000 people from their group live, each receives a weight of 2000). Exclude Rift Valley indicates that we exclude all counties of the former Rift Valley province. Incl. Survey round 5 indicates that we add survey round 5 as the first post-treatment period to the regression. Ethnic match indicates that we exclude all respondents whose language spoken at home does not match the language spoken at home by the Afrobarometer interviewer. National-local alignment indicates that we control for the alignment of governors in 2013 with the current co-ethnic presidential or vice-presidential candidate for an ethnic group within a county. 95% confidence intervals based on two-way clustered standard errors at the province-by-ethnicity and county level are plotted as gray error bars.

FIGURE B-7
Alternative clustering of the standard errors



Notes: The figure reports estimated p-values of regional fractionalization (blue dots) and ethnic fragmentation (red diamonds) of our baseline specification (column 2 of Table I) for alternative forms of standard error clustering or their calculation.

B.2. Tables

TABLE B-1
Main results: Logit and triple-interaction

	Dependent variables: Ethnic voting (party-based plurality)					
	(1)	(2)	(3)	(4)	(5)	(6)
$\Delta RF_c \times D_t$	2.062**	2.062**	5.064***	5.104***	0.373**	0.370**
	(0.925)	(0.939)	(1.935)	(1.937)	(0.163)	(0.165)
$\Delta EF_e \times D_t$	1.584*	1.528	-0.202	-0.284	0.245	0.232
	(0.931)	(0.939)	(1.242)	(1.219)	(0.150)	(0.148)
$\Delta RF_c \times \Delta EF_e \times D_t$			-6.617*	-6.710**	-1.065	-1.087
			(3.388)	(3.334)	(0.674)	(0.657)
Est-M.	Logit	Logit	Logit	Logit	LPM	LPM
County-by-ethnicity FE	✓	✓	✓	✓	✓	✓
Time-FE	✓	✓	✓	✓	✓	✓
Controls	–	✓	–	✓	–	✓
Observations	6143	6134	6143	6134	6379	6370

Notes: The table reports the regression results of regressing our party-based plurality indicator of ethnic voting on the post-treatment indicator times the change in regional fractionalization ($\Delta RF_c \times D_t$), and the change ethnic fragmentation ($\Delta EF_e \times D_t$). All specifications include county-by-ethnicity and time-fixed effects and control for the age of a respondent, indicators if the respondent lives in an urban survey cluster, is female, owns a TV, radio, or motorized vehicle. Standard errors are two-way clustered at the province-by-ethnicity and county levels. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

TABLE B-2
Main results: Single component effects

	Dependent variables: Ethnic voting					
	Party-based plurality			*Coalition-based plurality*		
	(1)	(2)	(3)	(4)	(5)	(6)
$\Delta RF_c \times D_t$	0.379**	0.205*		0.309***	0.219**	
	(0.174)	(0.106)		(0.089)	(0.084)	
$\Delta EF_e \times D_t$	0.334*		0.185	0.428***		0.394*
	(0.168)		(0.269)	(0.098)		(0.230)
County-by-ethnicity FE	✓	✓	✓	✓	✓	✓
Time FE	✓	–	–	✓	–	–
Ethnicity-by-time FE	–	✓	–	–	✓	–
County-by-time FE	–	–	✓	–	–	✓
Controls	✓	✓	✓	✓	✓	✓
Observations	6370	6370	6370	6370	6370	6370

Notes: The table reports the regression results of regressing our plurality indicator of ethnic voting (party-based plurality in columns 1–3 and coalition-based plurality in columns 4–6) on the post-treatment indicator times change in regional fractionalization ($\Delta RF_c \times D_t$) and change ethnic fragmentation ($\Delta EF_e \times D_t$). All specifications include county-by-ethnicity and time-fixed effects and control for the age of a respondent, indicators if the respondent lives in an urban survey cluster, is female, owns a TV, radio, or motorized vehicle. In columns 2 and 5 we include ethnicity-by-time fixed effects to isolate the partial impact of a change in regional fractionalization. In columns 3 and 6 we include county-by-time fixed effects to isolate the partial impact of a change in ethnic fragmentation. Standard errors are two-way clustered at the province-by-ethnicity and county levels. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

TABLE B-3
Controlling for other constitutional changes: Coalition-based results

	Dependent variables: Ethnic voting (coalition-based plurality)					
	(1)	(2)	(3)	(4)	(5)	(6)
$\Delta RF_c \times D_t$	0.312***	0.267***	0.289***	0.303***	0.282***	0.321***
	(0.092)	(0.087)	(0.087)	(0.109)	(0.103)	(0.080)
$\Delta EF_e \times D_t$	0.481***	0.397***	0.410***	0.431***	0.444***	0.428***
	(0.094)	(0.079)	(0.084)	(0.100)	(0.105)	(0.075)
ΔRF_c (Constituencies) $\times D_t$	0.041					
	(0.092)					
ΔEF_e (Constituencies) $\times D_t$	0.552**					
	(0.269)					
ΔRF_c (Local authorities) $\times D_t$		-0.074				
		(0.048)				
ΔEF_e (Local authorities) $\times D_t$		0.372				
		(0.254)				
ΔRF_c (Districts) $\times D_t$			-0.021			
			(0.041)			
ΔEF_e (Districts) $\times D_t$			0.195			
			(0.240)			
Δ Regional population $\times D_t$				0.013		
				(0.054)		
Δ Capital proximity $\times D_t$					0.060	
					(0.049)	
Support referendum $\times D_t$						0.054*
						(0.029)
County-by-ethnicity FE	✓	✓	✓	✓	✓	✓
Time FE	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓
Observations	5938	6042	6043	6370	6370	6370

Notes: The table reports the regression results of regressing the coalition-based plurality indicator of ethnic voting on the post-treatment indicator times change in regional fractionalization ($\Delta RF_c \times D_t$) and change ethnic fragmentation ($\Delta EF_e \times D_t$), controlling for alternative border changes (columns 1 to 3). Specifically, changes between electoral constituencies, local authorities to counties, and districts to counties. Columns 4 and 5 add controls for proxies of the degree of decentralization. The change in regional population, the average distance of respondents to the county capital compared to the province capital. Column 6 controls for the province-level support of the constitutional referendum. All specifications include county-by-ethnicity and time-fixed effects and control for the age of a respondent, indicators if the respondent lives in an urban survey cluster, is female, owns a TV, radio, or motorized vehicle. Standard errors are two-way clustered at the province-ethnicity and county levels. $p < 0.1$, $p < 0.05$, $p < 0.01$.

TABLE B-4
Self-identification: Nation vs. ethnic group

	Dependent variable: National self-identification					
	Continuous			*Indicator*		
	(1)	(2)	(3)	(4)	(5)	(6)
$\Delta RF_c \times D_t$	-0.013	-0.013	-0.029	-0.039	-0.040	-0.065
	(0.029)	(0.030)	(0.033)	(0.071)	(0.075)	(0.073)
$\Delta EF_e \times D_t$	-0.040	-0.046	-0.044	-0.086	-0.091	-0.077
	(0.032)	(0.036)	(0.037)	(0.067)	(0.074)	(0.077)
County-by-ethnicity FE	✓	✓	✓	✓	✓	✓
Time FE	✓	✓	✓	✓	✓	✓
Controls	–	✓	✓	–	✓	✓
Controls $\times$ D_t	–	–	✓	–	–	✓
Observations	6283	6274	6274	6283	6274	6274

Notes: The table reports the results of regressing two proxies for self-identification (continuous and an indicator for more national) on the same explanatory variables as in Table I. All specifications include county-by-ethnicity and time-fixed effects and control for the respondent's age, indicators if the respondent lives in an urban survey cluster, is female, owns a TV, radio, or motorized vehicle. Standard errors are two-way clustered at the province-ethnicity and county levels. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

TABLE B-5
Ethnic discrimination

	Dependent variable: Ethnic discrimination			
	Continuous		*Indicator*	
	(1)	(2)	(3)	(4)
Largest group	0.003		-0.003	
	(0.007)		(0.010)	
Unitary government		0.014		0.006
		(0.020)		(0.029)
County FE	✓	✓	✓	✓
Ethnicity-by-time FE	✓	✓	✓	✓
Controls	✓	✓	✓	✓
Observations	5240	5240	5240	5240

Notes: The table reports the results of regressing two proxies for ethnic discrimination (continuous and an indicator for feeling often or regularly discriminated by the government based on one's ethnicity) on the measures of regional control used in Table IV in the post-treatment period (i.e., from Afrobarometer survey round 6 onwards). These measures are an indicator for the largest group in the county (columns 1 and 3) and an indicator for unitary local government control, which is equal to one if an ethnic group is the largest group in the county, has a coethnic governor, and has a share across the CEC and the CPSB of at least 94 percent (which is the median share for groups with a coethnic governor) in columns 2 and 4. All specifications include county and ethnicity-by-time-fixed effects and control for the respondent's age, indicators if the respondent lives in an urban survey cluster, is female, owns a TV, radio, or motorized vehicle. Standard errors are two-way clustered at the province-ethnicity and county levels. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

TABLE B-6
Effects of optimal reform on ethnic voting

Ethnic group	Predicted change in ethnic voting due to			Population share
	ΔEF	$\Delta\ RF$	$\Delta\ EF + \Delta RF$	
Kikuyu	0.000	-0.004	-0.004	0.208
Luhya	0.000	-0.006	-0.006	0.148
Luo	0.004	-0.105	-0.101	0.124
Kamba	0.009	-0.170	-0.162	0.114
Kalenjin	0.000	-0.007	-0.007	0.113
Embu / Meru	0.012	-0.173	-0.162	0.062
Kisii	0.009	-0.172	-0.164	0.062
Mijikenda	0.009	-0.068	-0.059	0.046
Maasai / Samburu	0.000	-0.006	-0.006	0.023
Turkana	0.119	-0.142	-0.023	0.013
Change in ethnic voting for big 4: -0.58				
Change in ethnic voting for Kenya: -0.056				

Notes: The table reports the aggregate voting change per group (for the largest ten groups) by multiplying the difference-in-difference coefficients with the group-county-specific populations. It also reports the population-weighted predicted ethnic voting change for the big four groups and the country below.

C. Theoretical framework

This section presents a simple theoretical framework illustrating the mechanism by which devolution and regional government control reduce ethnic voting.

Setting: There is a country with ethnic groups $e = 1, ..., N_e$ and political regions $r = 1, ..., N_r$. The share of the total population identifying with group e and living in region r is $s_{e,r} \geq 0$. Hence, the population share of region r is $s_r = \sum_{e=1}^{N_e} s_{e,r}$ and the population share of group e is $s_e = \sum_{r=1}^{N_r} s_{e,r}$. We denote the largest group in region r by e_r.

We assume that each region r has a governor identifying with its largest group e_r and focus on the national presidential election. There are different presidential candidates (or parties) p differing in their ethnicity e_p and their ability $\alpha_p \in [0, 1]$ in collecting tax revenues. Alternatively, we can think of α_p as their honesty, which affects the tax revenues that are not "eaten" by the president and their clan.

A central government headed by president p raises tax revenues $T_p = a_p \tau Y$, where τ and Y are the exogenous tax rate and the exogenous aggregate income. The share $d \in (0, 1)$ (where d may stand for devolution) of the tax revenues T_p are distributed to the political regions in proportion to their population sizes s_r, while $(1 - d)T_p$ remain at the central government. The president provides the national public goods $G_p = (1-d)T_p$, which generates utility G_p for co-ethnic individuals, i.e., individuals identifying with group e_p, and ψG for all other individuals, where $\Psi \in (0, 1)$. The governor of region r provides the regional public good $g_r = s_r dT$, which generates utility g_r for co-ethnic individuals, i.e., individuals identifying with group e_r, and ψg_r for all other individuals in region r, where $\psi \in (0, 1)$.[4]

Vote choices: We assume that individuals vote for the presidential candidate who, if elected, would maximize their aggregate utility from national and regional public goods. All voters would find it ideal to have a co-ethnic president with high ability a_p. Hence, each voter would prefer a co-ethnic presidential candidate over an equally or less skilled candidate from another group. We focus on how much lower the ability of a co-ethnic presidential candidate would need to be for the voter to prefer a non-co-ethnic presidential candidate. Let us denote the ability of the co-ethnic presidential candidate by $\underline{\alpha}$ and the ability of the non-co-ethnic presidential candidate by $\overline{\alpha}$.

Let us first look at voters in region r who identify with the largest group $e = e_r$ in this region. These voters get utility $[(1 - d) + s_r d]\underline{\alpha}\tau Y$ when voting for the co-ethnic presidential candidate, and utility $[\Psi(1-d) + s_r d]\overline{\alpha}\tau Y$ when voting for the non-co-ethnic presidential candidate. (In both cases, the first product is their utility from national

[4] For our results, it is important that g_r is increasing in s_r and d (and that G_p is decreasing in d), but it is not important that these effects are linear.

public goods and the second product their utility from regional public goods.) Hence, they prefer the co-ethnic presidential candidate if and only if

$$\frac{\overline{\alpha}}{\underline{\alpha}} < \hat{\alpha}(e = e_r) \equiv \frac{(1-d) + s_r d}{\Psi(1-d) + s_r d}.$$

Similarly, voters in region r who identify a minority group $e \neq e_r$ prefer the co-ethnic presidential candidate if and only if

$$\frac{\overline{\alpha}}{\underline{\alpha}} < \hat{\alpha}(e \neq e_r) \equiv \frac{(1-d) + \psi s_r d}{\Psi(1-d) + \psi s_r d}.$$

We now present and discuss the main insights offered by this simple theoretical framework.

Result 1: Devolution reduces ethnic voting.

Proof: The thresholds $\hat{\alpha}(e = e_r)$ and $\hat{\alpha}(e \neq e_r)$ are both decreasing in d because $\Psi < 1$. Hence, larger d induces voters to prefer the non-co-ethnic presidential candidate already for lower relative skills $\overline{\alpha}/\underline{\alpha}$.

Intuition: Devolution implies that more public resources are spent at the regional level. This reduces the benefits of having a co-ethnic president allocating the national public goods but does not change the importance of having an able president who can generate high revenues. Hence, devolution makes the co-ethnicity of the presidential candidate relatively less important.

Result 2: Identification with the regional majority reduces ethnic voting.

Proof: It holds that $\hat{\alpha}(e = e_r) > \hat{\alpha}(e \neq e_r)$ because $\psi < 1$. Hence, voters prefer the non-co-ethnic presidential candidate already for lower relative skills $\overline{\alpha}/\underline{\alpha}$ if $e = e_r$.

Intuition: Regional public goods are relatively more important for voters identifying with the ethnic group that is the largest in the region and provides the governor. This increases the benefits of having an able president who can generate high revenues. Hence, the co-ethnicity of the presidential candidate becomes relatively less important.

Result 3: Larger regions reduce ethnic voting.

Proof: The thresholds $\hat{\alpha}(e = e_r)$ and $\hat{\alpha}(e \neq e_r)$ are both decreasing in s_r because $\Psi < 1$. Hence, larger s_1 induces voters to prefer the non-co-ethnic presidential candidate already for lower relative skills $\overline{\alpha}/\underline{\alpha}$.

Intuition: Economies of scale make regional public goods relatively more important for voters in larger regions. This increases the benefits of having an able president who can generate high revenues. Hence, the co-ethnicity of the presidential candidate becomes relatively less important.

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