

# Ethnic Diversity, Segregation, and Ethnocentric Trust in Africa

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## Abstract

Ethnic diversity is generally associated with less social capital and lower levels of trust. However, most empirical evidence for this relationship is focused on generalized trust, rather than more theoretically appropriate measures of group-based trust. This paper instead evaluates the relationship between ethnic diversity – at both national and local levels – and the degree to which coethnics are trusted more than non-coethnics, a value I call the “coethnic trust premium.” Using public opinion data from sixteen African countries, I find that ethnically diverse states have, on average, larger coethnic trust premiums. However, when evaluating this same relationship within countries, I find the seemingly contradictory pattern that local-level ethnic diversity is associated with greater interethnic trust. I then show, consistent with this finding, that diversity is only detrimental to intergroup trust in the presence of ethnic group segregation. I propose that this is because the elite-led politicization of ethnicity is less successful in ethnically diverse localities, where intergroup contact results in less prejudice and greater intergroup trust.

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A growing literature has focused on how diverse contexts – neighborhoods, cities, states, and countries – influence social capital. This literature is motivated by the desire to understand the origins of global differences in social capital, as well as to predict the long-term consequences of increased diversity through increased globalization and rates of immigration. Understanding how diversity impacts social capital – and interpersonal trust, in particular – is important, as low levels of social capital has been associated with poorer economic performance (Knack and Keefer, 1997; Zak and Knack, 2001), more prevalent corruption (Uslaner, 2008), and a reduced capacity for collective action (Levi, 1998).

While the empirical literature within political science and economics has tended to document a negative association between ethnic diversity and social trust (Knack and Keefer, 1997; Alesina and La Ferrara, 2002; Bahry et al., 2005), two different theoretical traditions within psychology and sociology make competing claims about what relationship we should expect to observe. Contact theory, most strongly associated with Gordon Allport, makes the optimistic prediction that diversity leads to interethnic tolerance and trust (Allport, 1954; Pettigrew, 1998). In contrast, conflict theory claims that intergroup contact will lead to an increase in conflict, as groups compete, or perceived themselves to be competing, over finite material resources (Blumer, 1958; Blalock, 1967; Bobo and Tuan, 2006).

While most existing evidence is more consistent with conflict theory than contact theory, there has been a general mismatch between the construct of ethnocentric trust and the way in which it is typically measured. In particular, most studies of diversity and trust utilize the so-called “generalized trust” question, assuming – implicitly, if not explicitly – that the answer tells us something about trust across ethnic lines. In an attempt to remedy this inconsistency, I use more appropriate measures of ingroup and outgroup trust to explore the relationship between diversity and ethnocentric trust. I do so using public opinion data from sixteen African states, thus addressing a general theoretical question within a context where intergroup relations are central to the study of politics.

I find that, consistent with conflict theory, ethnically diverse states have, on average, lower levels of interethnic trust. However, when evaluating this same relationship *within* countries, I find the seemingly contradictory pattern that local-level ethnic diversity and ethnic group integration is associated with *greater* interethnic trust. When both measures of diversity are included in the same multi-level model, their interaction suggests

that the impact of national-level ethnic diversity on ethnocentric trust is moderated by district-level diversity: in particular, the level of diversity at the national level increases the size of the coethnic trust premium, but this impact is decreasing with local level diversity. This pattern implies that the adverse effects of national diversity on group-based trust are primarily driven by individuals living in relatively homogeneous districts. As a result, we would expect that a country's diversity is only detrimental to trust when groups are segregated from one another into ethnically homogenous regions. Consistent with this expectation, cross-national correlations show that the negative effects of diversity on trust are strongest when the level of ethnic groups segregation is high. Taken together, these results suggest that diversity *per se* does not undermine interethnic trust, but diversity in combination with segregation is associated with greater coethnic trust premiums.

I suggest that this pattern may be driven by the interaction between national-level politics, on the one hand, and local-level realities, on the other. In particular, the nature of national-level political competition in Africa often incentivizes political elites to "play the ethnic card," resulting in ethnic-based prejudices and low interethnic trust. Because ethnic diversity increases the number of groups potentially vying for political and economic resources, such competition, and the accompanying ethnic-based appeals, increases with diversity – a pattern consistent with conflict theory. However, citizens' susceptibility to the politicization of ethnic differences will depend on their own experiences with interethnic interactions. Among individuals living in locally diverse contexts, where interethnic contact is an everyday occurrence, such contact leads to less ethnic discrimination in general, and to greater interethnic trust, in particular. In other words, the central expectation of contact theory helps explain the local-level relationship between diversity and interethnic trust.

These findings have important implications for understanding interethnic relations, as well as the policies we design to deal with ethnic conflict. First, the results demonstrate that the observed relationship between diversity and trust depends crucially on the level of analysis: while this fact has influenced the study of race relations in the United States (Oliver and Wong, 2003), it is not yet fully appreciated in the study of intergroup relations in Africa. In particular, these results suggest that the study of micro-level relations between members of different ethnic groups is unlikely to tell us very much about how macro-level ethnic diversity influences political and economic outcomes. Second, policy makers must consider the potential for policies to have differential effects

at different levels of aggregation. For example, while proponents of conflict theory advocate for the separation of ethnic groups, both spatially and politically, as a means to reduce conflict (Lijphart, 1977), contact theory is regularly used to justify policies that promote ethnic and racial integration locally (Forbes, 2004). This study suggests, at a minimum, that appropriate policy solutions to ethnic conflict must appreciate the potentially countervailing effects of diversity at different levels of interaction.

## Ethnic Diversity and Ethnocentric Trust

Several theories have been put forth to understand the ways in which exposure to ethnic and racial diversity shapes intergroup attitudes and behavior, including intergroup trust. First, *conflict theory* anticipates that individuals in diverse settings will compete for scarce resources along group lines, thereby increasing the salience and relevance of existing ethnic differences (Blumer, 1958; Bobo, 1983; Quillian, 1996; Bobo and Hutchings, 1996; Glaser, 2003). While not always drawing explicitly on conflict theory, scholars of African politics often explain ethnic antagonisms and distrust as the product of competition over resources within the ethnically diverse national context, either through the rational pursuit of material goods (Melson and Wolpe, 1970; Bates, 1983) or the social psychological response to group inequalities that result from such competition (Horowitz, 1985).

In contrast, many psychologists have argued that exposure to diverse contexts should instead *reduce* the degree to which trust is ethnocentric. This expectation is predicated upon the assumption that negative beliefs about members of other groups are driven not by real or perceived competition, but by ignorance and lack of exposure to individuals from other groups. As a result, contact with non-coethnics is expected to ameliorate interethnic prejudice (Allport, 1954). According to Forbes (2004), the central tenant of *contact theory* is that “more contact between individuals belonging to antagonistic social groups (defined by culture, language, beliefs, skin color, nationality, etc.) tends to undermine the negative stereotypes they have of each other and to reduce theory mutual antipathies, thus improving intergroup relations by making people more willing to deal with each other as equals” (p.70). The mechanisms proposed to lead from intergroup contact to improved relations are learning, changing behavior, affective ties, and in-group reappraisal (Pettigrew, 1998). While this theory has influenced both the scholarship and policy on racial integration in the United States, it has been applied less

often to intergroup relations in developing countries in general, or in African contexts in particular, where ethnic diversity is perceived to be especially problematic (Forbes, 2004; Kasara, 2013).

A third possibility, proposed by Putnam (2007), is that exposure to diverse settings leads to less trust in general, by reducing trust not only in out-group members, but also in in-group members. Putnam calls this *constrict theory* and famously suggests that people who live in diverse areas “hunker down” (2007, p. 149). According to this theory, intergroup contact reduces social capital overall, but not necessarily through worsening intergroup relations or increased prejudices.

Most empirical studies of the relationship between ethnic diversity and aggregate levels of trust find a robust negative relationship (Alesina and La Ferrara, 2002; Delhey and Newton, 2005; Bjørnskov, 2007; Stolle et al., 2008; Putnam, 2007; Hooghe et al., 2009; Dincer, 2011), a pattern which is clearly inconsistent with the expectations of contact theory. However most of this work has focused on the correlation between measures of ethnic or racial diversity and average levels of *generalized trust*. The standard measure of generalized trust asks respondents whether they feel “most people can be trusted” or that “you can’t be too careful.” The use of this question has been heavily criticized for its lack of specificity on who “most people” refers to, or the context(s) in which this trust should apply, making the comparability of answers across individuals and societies potentially problematic (Nannestad, 2008). But more importantly for understanding diversity’s impact on trust, it’s a poor measure of the theoretically relevant construct – the degree to which trust is ethnically determined. Conflict theory expects that diversity will increase the size of the *coethnic trust premium* – the degree to which coethnics are trusted more than non-coethnics – by making individuals less trusting of non-coethnics. Constrict theory expects that diversity will drive down trust in both coethnics and non-coethnics, and would not expect the size of the coethnic trust premium to vary with diversity. However, both of these theories are consistent with the negative relationship between diversity and *generalized* trust.

To distinguish these two theories, an ideal measure of trust would capture trust in coethnics separately from trust in non-coethnics. Fortunately, the third-round Afrobarometer public opinion survey includes separate questions on trust in coethnics and trust in non-coethnics, and was administered in sixteen African countries between 2005-2006: Benin, Botswana, Ghana, Kenya, Lesotho, Madagascar, Malawi, Mali, Mozambique,

Namibia, Nigeria, Senegal, South Africa, Tanzania, Uganda, and Zambia (Afrobarometer, 2006).<sup>1</sup> Respondents were asked to rate their level of trust in different groups of people – not at all, just a little, somewhat, or a lot – including “people from your ethnic group” and “[Ghanaians/Kenyans/Malawians] from other ethnic groups.” Across the sixteen countries in this sample, the average trust in coethnics is 1.69 ( $sd = 0.99$ ), which corresponds to a little over halfway between “just a little” and “somewhat.” Senegal has the highest level of ethnic group trust, on average, at 2.33, while Nigeria has the lowest at 1.31. The average trust in non-coethnics is lower, at 1.38 ( $sd = 0.99$ ), corresponding to a little more than “just a little.” Senegal also has the highest level of trust in non-coethnics at 2.12 and Nigeria has the lowest at 1.04. These brief summary statistics suggest that cross-country differences in *trust in general* – with Senegal having high levels of trust and Nigeria having low levels of trust – may be masking interesting variation in the difference in trust in coethnics versus non-coethnics.

Thus, perhaps more importantly than providing independent measures of coethnic trust and non-coethnic trust, these questions allow me to measure the degree to which individuals trust coethnics more than non-coethnics – the coethnic trust premium – by subtracting trust in non-coethnics from trust in coethnics. Given the four-point trust scale for each trust question, the coethnic trust premium can range from -3 (where non-coethnics are trusted “a lot” and coethnics are trusted “not at all”) to 3 (where coethnics are trusted “a lot” and non-coethnics are trusted “not at all.”) The average coethnic trust premium across all sixteen country samples is 0.31 ( $sd = 0.79$ ), with Mali having the highest premium (0.50) and Botswana the lowest (0.12). Another way to think about ethnocentric trust is to simply indicate whether or not a respondent trusts his or her coethnics *more than* non-coethnics, ignoring the magnitude of that difference. In this case, 27% of the sample exhibit ethnocentric trust, ranging from 37% in Uganda to 13% in Botswana.<sup>2</sup> I use these measures of ethnic-based trust to evaluate the impact of ethnic diversity on ethnocentric trust.

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<sup>1</sup>Data for the third round was also collected in Zimbabwe, but the series of trust questions were not asked there.

<sup>2</sup>Note that, given the four-point ranking of trust, these measures of ethnocentric trust are subject to both floor and ceiling effects.

## Diverse States

To evaluate the degree to which these measures of ethnocentric trust are related to a country's level of ethnic diversity, I use the standard indicator of ethnic diversity – the degree of ethnic fractionalization – measured by:

$$F_c = 1 - \sum_{m=1}^M P_{cm}^2 \quad (1)$$

where  $F_c$  is the level of ethnic fractionalization in country  $c$ ,  $m$  indexes ethnic groups, and  $P_{cm}$  is the proportion of the population in country  $c$  belonging to ethnic group  $m$ . Theoretically, ethnic fractionalization ranges from zero, where all individuals are members of the same ethnic group, to one, where each individual belongs to his or her own ethnic groups. Measured in this way, diversity is conceptualized as the likelihood that two randomly selected individuals within a given country are from different ethnic groups.

To measure the level of ethnic diversity in each of the sixteen countries in the Afrobarometer sample, I measure  $P_{cm}$  as the proportion of the respondent sample in country  $c$  that belong to ethnic group  $m$ . I use the diversity within the Afrobarometer sample as a measure of a county's level of diversity, rather than using existing measures of ethnic diversity based on other data. Because Afrobarometer selects nationally representative samples, this measure of ethnic fractionalization is very closely related to the most commonly used measure of ethnic fractionalization, based on the information published by Soviet ethnographers in the *Atlas Narodov Mira*. The correlation between these two measures is 0.53 ( $p=0.03$ ), but as you can see in Figure 1, Madagascar is an outlier, with a much higher measure of fractionalization for Afrobarometer data than for *Atlas Narodov Mira* data. This difference is likely driven by a different list of groups within Madagascar, exemplifying my reasoning for using Afrobarometer data to construct the measure of ethnic fractionalization: the correlation between the two measures excluding Madagascar is much higher ( $r = 0.89, p < 0.01$ ).

[Figure 1 about here.]

Using this measure of ethnic fractionalization, Figure 2 shows a positive bivariate relationship between the degree of ethnic diversity in a country and the proportion of respondents within that country who trust their coethnics more than their non-coethnics.

[Figure 2 about here.]

Table 1 shows that this bivariate relationship is statistically significant (Model 1), and robust to controlling for income, civil war experience, and British colonization (Model 2).<sup>3</sup> Similarly, Models 3 and 4 estimate a positive and statistically significant relationship between a country's ethnic diversity and the average size of the coethnic trust premium. This relationship is driven by a separation in the average coethnic trust and the average non-coethnic trust at higher levels of diversity (see Figure 3), as there is no statistically significant relationship between ethnic diversity and average levels of coethnic trust ( $r = 0.20, p = 0.47$ ) or non-coethnic trust ( $r = 0.03, p = 0.92$ ).

[Table 1 about here.]

[Figure 3 about here.]

The positive correlation between ethnic diversity and ethnocentric trust within Africa is more consistent with the expectations of conflict theory than either of its alternatives. The fact that diversity is related to more, rather than less, ethnocentric trust is at odds with the sanguine expectations of contact theory, and unlike with cities in the US (Putnam, 2007), diversity in African states is not related to less trust across the board. Thus, the results presented above fit well with the standard logic that ethnic diversity increases the salience of ethnic differences through competition over limited resources, both political and economic. Given such ethnic competition, these findings on group-based trust suggest that generalized trust is lower in multi-ethnic countries because citizens have, on average, more non-coethnic compatriots *and* because the difference between the levels of trust in coethnics and non-coethnics is larger.

## Diverse Districts

If the mechanism relating national-level diversity to a larger coethnic trust premium is through competitive interactions, as argued above, then we should also expect within-country variation in ethnic diversity to be similarly conducive to ethnocentric trust.

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<sup>3</sup>Income is measured as the natural log of GDP per capita in 2005 (Heston et al., 2012), civil war is a dichotomous indicator of having experienced a conflict in which at least twenty-five people were killed between independence and 2001 (Gleditsch et al., 2002), and British colony is an indicator of being colonized by the British and comes from Fearon and Laitin (2003). Income is negatively correlated with ethnocentric trust, while past experience with civil conflict and British colonialism are positively correlated with trusting coethnics more than non-coethnics.



While African states are among the most ethnically diverse in the world, in most cases ethnic homogeneity at the local level coexists with extreme heterogeneity at the state-level: many African states comprise multiple, ethnically-distinct regions with local-level diversity existing mostly at ethnic borders or in urban centers. Thus, we might expect that the negative relationship between diversity and intergroup trust at the local level would have to be even stronger than the cross-national results reported above, in order for the relatively few diverse locales to be able to explain the relationship between diversity and trust at the national level.

To evaluate the relationship between diversity and trust within countries, I first calculate an ethnic fractionalization index at the district level:

$$F_j = 1 - \sum_{m=1}^M p_{jm}^2 \quad (2)$$

where  $F_j$  is the level of ethnic fractionalization in district  $j$ ,  $m$  indexes ethnic groups, and  $p_{jm}$  is the proportion of the sample in district  $j$  belonging to ethnic group  $m$ . Again, this index represents the likelihood that two randomly selected individuals within a given district are from different ethnic groups.<sup>4</sup>

Figure 4 plots the relationship between national-level ethnic fractionalization and the average local-level ethnic fractionalization across all districts. There is no relationship between the two measures ( $r = -0.01, p = 0.96$ ), meaning that more diverse countries are not necessarily made up of more diverse districts. With the exception of Lesotho, where both national ethnic fractionalization and the average district's ethnic fractionalization are 0.4, all sixteen states in the sample are more diverse at the macro-level than they are locally. However, there exists considerable variation in local diversity among the diverse states in the sample. For example, while both Nigeria and Zambia have national ethnic fractionalization levels of  $F_c = 0.85$ , Zambia ( $\bar{F}_j = 0.57$ ) is, on average, much more locally diverse than Nigeria ( $\bar{F}_j = 0.27$ ).

[Figure 4 about here.]

How does the within-country variation in local-level ethnic diversity relate to the degree

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<sup>4</sup>Unlike with the country-level measure of ethnic fractionalization, Afrobarometer samples at the district level are not representative. Furthermore, the sample size per district can be as low as only eight respondents. In the next iteration of this paper, I plan to use census data and/or DHS data to construct more accurate measures of local level diversity.

to which non-coethnics are trusted *vis-a-vis* coethnics? To evaluate this relationship, I estimate a fixed-effects regression model relating an individual's coethnic trust premium to the diversity of his or her district. The country fixed-effects control for state-level influences on an individual's attitudes about trust; as a result, the estimated effect is identified by variation in diversity across districts within the same country. Because local diversity is a district-level property, the individual-level standard errors are clustered by district, thereby accounting for interdependence among individuals living within the same district. Table 2 presents the results of estimating this regression.

In contrast to the positive relationship between diversity and ethnocentric trust across states, diversity is *negatively* related to ethnic trust discrimination within states. This negative relationship holds for a dichotomous indicator of trusting one's coethnics more than non-coethnics (Model 1), as well as for a continuous measure of the difference in trust expressed for coethnics and non-coethnics (Models 3). The estimates suggest that moving from a completely homogeneous district to a maximally diverse district is associated with a nine percentage point reduction in the percent of people trusting coethnics more than non-coethnics, and almost a fifty-percent reduction in the average size of the coethnic trust premium (which is equal to trust in coethnics minus trust in non-coethnics). The magnitude of these estimates is reduced slightly with the inclusion of individual-level correlates of ethnocentric trust,<sup>5</sup> but both remain substantively and statistically significant.

[Table 2 about here.]

By analyzing the relationship between local diversity and trust in coethnics separately from the relationship between local diversity and trust in non-coethnics, we can evaluate their relative contributions to the reduction of ethnocentric trust amid diversity. Table 3 shows that local diversity is negatively correlated with trust in coethnics; however, once individual-level controls are included, this apparent relationship vanishes. In contrast, trust in non-coethnics is positively correlated with local diversity, and is statistically significant once individual-level covariates are included.<sup>6</sup> These relationships suggest

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<sup>5</sup>On average, the young, the old, the educated, and those living in urban areas are less likely to trust coethnics more than non-coethnics, and have, on average, lower coethnic trust premiums.

<sup>6</sup>Kasara (2013) also reports a positive relationship between local-level ethnic diversity and trust in non-coethnics within Kenya, using a different source of data on micro-level ethnic diversity. However, because similar analyses were not carried out for trust in coethnics, her results cannot distinguish between a situation in which local diversity increases trust in non-coethnics from (an admittedly less likely) context in which diversity increases trust in everyone, coethnic and non-coethnic alike.

that, at the local level, diversity reduces the size of the coethnic trust premium by increasing trust in non-coethnics.

[Table 3 about here.]

## Diversity at Two Levels

Results at the national and local levels thus appear to contradict each other. While diverse states tend to have higher levels of ethnocentric trust, consistent with conflict theory, diverse areas *within*-states show the lowest levels of ethnic trust discrimination, as predicted by contact theory. While there is a seeming contradiction in these findings, several other scholars have noted similarly striking differences in the relationship between diversity and intergroup relations at different levels of analysis (Forbes, 1997; Williams, 1964; Oliver and Wong, 2003), with lower-level analyses tending to show positive correlations and more aggregated analyses revealing negative associations.<sup>7</sup>

In order to better understand how ethnic diversity at these two different levels interacts, I estimate a multi-level model that includes measures of ethnic fractionalization at both levels, as well as individual and country-level control variables. The multi-level model accounts for the hierarchical nature of the data – with districts nested within countries – and allows me to estimate the cross-level interaction of interest. The results of estimating this multi-level linear model are presented in Model 1 of Table 4. Here again, we see that national ethnic diversity increases an individual’s coethnic trust premium, while district-level ethnic diversity reduces that coethnic trust premium.

In Model 2, diversity at these two levels is interacted. When the interaction term is included, the coefficient on district-level ethnic fractionalization becomes positive and indistinguishable from zero: however, this is not meaningful, since the coefficient represents the estimated effect of district-level diversity when national diversity is zero – a logically impossible set of circumstances. The interaction term itself is also statistically indistinguishable from zero, suggesting that the marginal effect of national diversity on interethnic trust does not vary systematically across districts with different levels of diversity. However, the statistical significance of a multiplicative term is often not im-

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<sup>7</sup>Forbes (2004) refers to this apparent contradiction as the “two correlations” problem. Using a simple example with fictional data, he demonstrates that the correlations between two variables, such as diversity and prejudice, using the exact same individual-level data, can be radically different in sign and magnitude at different levels of aggregation.

portant (Brambor et al., 2006). When we view the interaction graphically, in Figure 5, we can see that national-level ethnic diversity only has a statistically significant positive impact on ethnocentric trust in relatively homogeneous districts ( $F_j < 0.06$ ). In other words, a country's ethnic diversity is only related to greater ethnic trust discrimination in districts with relatively low levels of diversity.

[Table 4 about here.]

[Figure 5 about here.]

Taken together, the results thus far suggest that the positive relationship between ethnic diversity and ethnocentric trust at the national level is driven by those individuals living in the homogeneous districts of diverse states. If this is the case, then the spatial segregation of ethnic groups within diverse states should be an important mediator in the link between ethnic diversity and ethnocentric trust in Africa. It is to this question that I turn in the next section.

## **Ethnic Segregation and Ethnocentric Trust**

The results of the previous section suggested that state-level ethnic diversity may be especially pernicious for ethnocentric trust in the presence of ethnic segregation (i.e., in homogeneous local contexts). While this paper is among very few that consider ethnic segregation in Africa – along with Horn (2005), Agyei-Mensah and Owusu (2010), Owusu and Agyei-Mensah (2011), and Kasara (2013) – it builds on a vast sociological literature exploring the impacts of ethnic and racial segregation in US cities. This literature has focused primarily on whether and how the residential segregation of African Americans from their white counterparts in the United States contributes to long-term racial inequalities in education (Cutler and Glaeser, 1997), health (Yankauer, 1950; Williams and Collins, 2001; Kramer and Hogue, 2009), and employment (Kain, 1968; Jencks and Mayer, 1990; Cutler and Glaeser, 1997).

Before evaluating the relationship between ethnic group segregation in African states and the degree to which citizens within those states base their trust primarily on shared ethnicity, it is useful to review existing evidence linking segregation to trust. In a study based on cities in the United States and the United Kingdom, Uslaner (2011) starts with the observation that, across those cities, segregation and diversity are only weakly correlated. He goes on to show that while diversity is generally detrimental to trust, in the

absence of ethnic or racial segregation *and* the presence of diverse social networks, trust can thrive amid diversity. Alesina and Zhuravskaya (2011) link ethnic group segregation at the country-level with the quality of governance in a worldwide sample, finding that segregation has a negative impact on political accountability, stability, government effectiveness, regulatory quality, rule of law, and the restraint of corruption. One of the mechanisms they put forward to account for the relationship between segregation and government quality is trust. They do, in fact, find that segregation is related to lower levels of trust, and trust, in turn, is predictive of governance quality.

While both of these studies put forward theories that operate through segregation's impact on intergroup trust, neither measures this construct directly, instead relying on the standard measure of generalized trust. Uslaner (2011) seems, implicitly, to take in-group trust for granted, assuming that generalized trust captures trust in out-group members only. Alesina and Zhuravskaya (2011) are more explicit about this shortcoming, noting that because "there are no data separately on between-group and within-group trust" they assume that "measures of generalized trust place more weight on trusting people beyond the borders of local communities," although no argumentation is made to support this assumption (p. 1876). The present study adds to this small literature on ethnic segregation and trust by evaluating the relationship between segregation and interethnic trust directly, as well as the degree to which diversity's impact on trust is moderated by group segregation.

### **Measuring Segregation**

In the interest of understanding the social and political consequences of racial segregation in the American context, a vibrant literature emerged that was concerned with conceptualization and measurement of residential segregation, in general. In a seminal piece within this literature, Massey and Denton (1988) define segregation as the "degree to which groups live separately from one another" (p.282), and outline five distinct dimensions of group segregation: evenness, exposure, concentration, centralization, and clustering.

First, evenness refers to the distribution of groups across spacial units, and measures the degree to which members of particular groups are over-represented or under-represented in each of those units. Second, exposure – or its inverse, isolation – is concerned with the degree to which members of one group come into contact with members of other

groups by virtue of living in the same area as non-group members. Third, concentration deals with the relative amount of physical space occupied by different groups, with the intuition that a group concentrated within a small space is more segregated than a group occupying a larger area, even if the two groups are equally evenly spread and isolated. Fourth, centralization captures the geographic distribution of groups *vis-à-vis* the center, and is considered an important component of segregation in US cities, with their urban cores (“inner cities”) surrounded by suburban communities. Fifth, clustering accounts for the extent to which spatial units associated with a given group are clustered in space. Massey and Denton (1988) evaluate existing measures of each of these five components of segregation, and advocate for a single best measure of each element.

Applying segregation measures, which were developed in relation to members of only two groups (black and white Americans) distributed across neighborhoods, to the context of ethnic group segregation in African states, requires some adaptation of the framework. First, while it is clear how the differential concentration of groups over land (concentration), or their relative proximity to the capital (centralization), could influence group-based *inequalities*, it is not obvious how these dimensions of segregation would influence the degree to which trust is ethnically determined. Thus, the remaining three components of segregation (evenness, isolation, and clustering) are most relevant to the question at hand. While future research will consider all three of these dimensions of segregation, as a first cut I will utilize the oldest and most common measure of segregation (Massey and Denton, 1988) – the dissimilarity index (James and Taueber, 1985) – which only captures the evenness with which group members are distributed across space.

The second challenge in applying traditional segregation measures to African states is that measures put forward by Massey and Denton (1988) capture segregation for individual groups only, rather than as a property of a geographic unit inhabited by more than two groups. In the case of two groups (e.g., black and white Americans), a measure of segregation for either one of those two groups individually is indicative of the degree of segregation within the larger area under study (e.g., a city). However, when there are more than two groups, as is typical in most African states, a single multi-group measure of segregation is desired, which takes into account the degree to which each constituent ethnic group is segregated from all others. Fortunately, Reardon and Firebaugh (2002) build on Massey and Denton by deriving measures of multi-group

segregation from group-level measures of each of the five different dimensions. Thus, I utilize their multi-group dissimilarity index.

### Segregated States

At the state-level, ethnic group segregation, like ethnic group fractionalization, is measured using data on the ethnicity of respondents in the third round of the Afrobarometer survey. I operationalize ethnic segregation at the country level using a measure of ethnic group segregation that captures the evenness with which members of different ethnic groups are distributed across space. In particular, the *generalized dissimilarity index* ( $D$ ) captures the disproportionality in group proportions across districts, by taking the mean relative deviation from proportionality across all ethnic groups within a country. The index is defined as:

$$D_c = \sum_{m=1}^M \sum_{j=1}^J \frac{t_{cj}}{2T_c F_c} |p_{cjm} - P_{cm}| \quad (3)$$

where  $D_c$  is the dissimilarity index for country  $c$ ,  $m$  indexes ethnic groups, and  $j$  indexes districts;  $t_{cj}$  and  $T_c$  are the total populations of district  $j$  and country  $c$ , respectively;  $F_c$  is the country's ethnic fractionalization (computed using Equation 1); and  $p_{cjm}$  is the proportion of district  $j$  composed of members of group  $m$  and  $P_{cm}$  is that proportion for the whole country. The index varies from zero to one, and can be interpreted as the percentage of citizens who would have to move in order to equalize national and district proportions for all groups, divided by the percent who would have to move to get from a state of complete segregation to one of complete proportionality. Thus, larger numbers designate greater segregation. Based on this measure of segregation, the least segregated country in the sample is Lesotho ( $D_{LOS} = 0.12$ ) while the most segregated country is Nigeria ( $D_{NGA} = 0.99$ ). Across all sixteen country, the average level of segregation is 0.71 ( $s_D = 0.19$ ).

Given the negative relationship between local-level ethnic diversity and the degree to which individuals trust their coethnics more than non-coethnics *within* countries, the expectation is that greater ethnic segregation at the national level should be positively related to ethnocentric trust. As shown in Figure 6, as well as Model 1 of Table 5, ethnic segregation is positively related to the proportion trusting coethnics more than non-coethnics, but only weakly so ( $p = 0.102$ ). Once I control for ethnic fractionalization –

which is highly correlated with segregation, as we saw above – segregation is no longer related ethnocentric trust at the national level (Table 5, Model 2).

[Figure 6 about here.]

[Table 5 about here.]

However, we would not necessarily expect ethnic group segregation to have an impact on ethnocentric trust across all levels of ethnic diversity. Instead, given the results in the previous section, we would expect that ethnic group segregation is only the means through which national-level ethnic diversity influences intergroup trust. Thus, we'd expect a positive interaction between ethnic diversity and ethnic segregation. Model 3 of Table 5 shows the results of including this interaction, which is indeed positive and almost reaches standard levels of statistical significance ( $p = 0.107$ ), despite a small sample size. Figure 7 presents this interaction graphically as the change in the marginal effect of diversity on ethnocentric trust as function of ethnic segregation. The graph is consistent with the expectation that national-level ethnic diversity only increases the degree to which citizens trust coethnics more than non-coethnics when ethnic groups are highly segregated ( $D_c > 0.04$ ).

[Figure 7 about here.]

In sum, the previous section showed that individuals are more likely to trust coethnics more than non-coethnics when they live in homogeneous areas of diverse states. Consistent with that finding, this section has shown that countries with more citizens living in homogeneous surroundings (i.e, those that are ethnically segregated) have more individuals expressing ethnocentric trust, and that diversity undermines interethnic trust most when ethnic group segregation is high.

## National Politics vs. Local Realities

This set of results indicates that while ethnic diversity at the national level is associated with more ethnocentric trust, the relationship is driven by those individuals living in ethnically homogeneous contexts of highly segregated states. Given what we know about the way in which African politics work, what could explain these findings? I propose that, at the national-level, electoral and political competition among elites creates incentives for them to politicize ethnic differences, provoking distrust across ethnic



lines, and that these incentives increase with national-level diversity. Many scholars have argued that, in diverse societies, political elites have incentives to mobilize politics along ethnic lines (Gagnon, 1994; Weingast, 1994; de Figueiredo Jr and Weingast, 1997; Tiškov, 1997; Glaeser, 2005). In African states, such incentives can emerge from the benefits of mobilizing large ethnic groups in democratic elections (Posner, 2004, 2005), as well as the competition for economic resources controlled by the state (Bates, 1983; Herbst, 2000). Thus, at the elite-level, the conflict theory hypothesis that diversity will lead to ethnic antagonisms through competition over material goods (political or economic), appears both well-founded and empirically supported in the African context.

However, elites' success in fomenting such ethnic antagonisms will be most effective among individuals living within ethnic enclaves, and less successful among individuals who have long-standing interactions across ethnic lines that contrast with the political rhetoric of interethnic enmity. Individuals living in diverse areas will be more immune to elite-led ethnic mobilization than individuals living in homogeneous areas via one (or more) of the four channels proposed by Pettigrew (1998). First, individuals who regularly interact with people from different ethnic groups in a mutually beneficial way will learn that the negative views of other ethnic groups espoused by their coethnic elite are unfounded (Glaeser, 2005). Second, the necessity of sustained and repeated interactions – in market exchange, for example – may influence behavioral patterns, which in the long term lead to changes in attitudes (Aronson and Patnoe, 1997; Zajonc, 1968). Third, exposure increases the chance of forming interethnic friendships, and such affective ties to an individual member of another group can facilitate improved attitudes toward the group as a whole (Pettigrew, 1997). Fourth, individuals who are members of groups that are integrated with and exposed to other tribes may gain greater insight on their own group *vis-a-vis* exposure to other groups. According to Pettigrew (1998), intergroup contact shows individuals that “ingroup norms and customs turn out not to be the only ways to manage the social world” (p.72), which leads to a reduction in provincialism. For any, or all, of these reasons, at the local level, the key insight of contact theory appears to be valid: contact with members of other ethnic groups will tend to counteract intergroup prejudice and distrust.

These initial thoughts on why the relationship between diversity and interethnic trust is so drastically different at the national and local levels suggests some observable implications. If the relationship between ethnic diversity and ethnocentric trust at the national level is indeed driven by elite-level politicization of ethnicity, then variation in

the opportunities for and values of mobilizing along different cleavages should be related to the patterns observed in the data. For example, we should expect variation in the degree to which consequential political competition operates at the national versus local levels – given variation in the degree of political decentralization across African states (Ndegwa, 2002) – to be important for understanding cross-national variation in the link between diversity, segregation, and ethnocentric trust. In addition, given the importance of group size for the value of political mobilization along ethnic lines (Posner, 2004), we should also expect that the impacts of diversity and segregation would be strongest among members of groups large enough to be politically valuable in electoral politics. These, and other observable implications, will be pursued in future research.

### **Alternative Explanations**

The macro-conflict/micro-contact hypothesis outlined above assumes that interethnic contact at the local level has a causal impact on individual attitudes about trust. However, the within-country results could be driven by at least two alternative explanations.

First, perhaps individuals who are more trusting of non-coethnics choose to live in more diverse locales, or those who are leery of non-coethnics select into areas which are homogeneous. If this were the case, then we would expect a negative association between local ethnic diversity and ethnocentric trust, but with causation running from attitudes to residential choice. This is a well-known problem for contact theory (Forbes, 2004): Pettigrew (1998) suggests that this problem is most overcome by focusing on intergroup contact where individual choice over intergroup contact limited. I would argue that, in sub-Saharan Africa, most individuals live within or nearby to the village in which they were born, as access to land for subsistence farming is obtained through inheritance, and is controlled by local indigenous authorities. Thus, in rural settings, it is difficult for individuals to sort internally based on preferences for or against contact with members of other ethnic groups. Thus, this reverse causation alternative is most likely to be a problem within urban areas, into which most urbanites have self-selected. To determine whether the within-country results relating local ethnic diversity to ethnocentric trust are driven by self-selection into urban areas, I re-estimate the results originally presented in Table 2 for rural individuals only.<sup>8</sup> Among these rural individ-

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<sup>8</sup>Each respondent in the Afrobarometer survey sample is coded by the enumerator as living in either

uals, I assume that variation in ethnic diversity at the local level is driven by living in villages near to ethnic boundaries, rather than relocation to rural areas with high levels of diversity. As the results in Table A.1 of Appendix A show, the results are largely unchanged. The fact that local level diversity reduces ethnocentric trust even among rural Africans improves our confidence that the sequence of causation runs from interethnic contact to less ethnocentric trust.

A second alternative explanation of the relationship between internal ethnic segregation and increased ethnocentric trust relates to the process of data collection itself. By treating the interaction between Afrobarometer enumerators and respondents as a *social interaction*, Adida et al. (2013) document the impact of being interviewed by a non-coethnic enumerator can have on the types of answers people give to Afrobarometer questions. In particular, they find that being interviewed by a non-coethnic is negatively related to the degree to which that respondent claims to trust his or her coethnics more than non-coethnics, a result that is strongly driven by greater expressed trust in non-coethnics when being interviewed by a non-coethnic. If individuals living in ethnically diverse locales are more likely to be interviewed by a non-coethnic Afrobarometer enumerator, which seems likely, then this social desirability bias may be driving the relationship between local diversity and ethnocentric trust. To make sure that the main findings of this paper are robust to considering enumerator ethnicity, Table A.2 of Appendix A reports across district regression coefficients only for respondents interviewed by a coethnic interviewer.<sup>9</sup> Despite a very large reduction in sample size – due to the restriction of the sample to coethnic interviews and the lack of data on enumerator ethnicity for some countries – the results are remarkably robust.

Taken together, these robustness tests strengthen our confidence that the observed relationship between local-level ethnic diversity and reduced ethnic trust discrimination is driven by the positive impacts of intergroup contact on interpersonal trust decisions.

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a rural or an urban setting. Across all sixteen countries, 37% of respondents reside in urban locations, although this number ranges from a low of 14% in Malawi to a high of 54% in South Africa.

<sup>9</sup>Adida et al. (2013) introduce a new dataset on Afrobarometer enumerator ethnicity, which is used here to code for the ethnic match between enumerator and respondent.

## Future Research

The findings presented here represent a first step towards understanding how ethnic diversity and intergroup interaction shape trust within and across group boundaries. The patterns identified are all correlational, and, thus, limit my ability to establish any causal relationship between diversity and trust. However, the patterns are suggestive of a very interesting dynamic, and thus warrant additional research. I outline here my plans for future research.

First, the use of Afrobarometer respondents' ethnicities to calculate measures of ethnic diversity and segregation was a choice of convenience. However, moving forward, I will procure more reliable data on the distribution of ethnic groups across territory within African states. In particular, I will make use of census data at the lowest level possible,<sup>10</sup> and supplement this with data from the Demographic and Health Surveys, which have much larger sample sizes than Afrobarometer. Given differences across data sources on the relevant list of ethnic groups within a country, Afrobarometer groups will need to be matched to groups listed in other sources in order to connect levels of ethnocentric trust to group-level properties. In the one case where I have census data on ethnicity, Malawi, I find a fairly strong correlation between district diversity according to the census and district diversity according to Afrobarometer ( $r = 0.58$ ,  $p < 0.01$ ); this correlation increases dramatically ( $r = 0.73$ ,  $p < 0.001$ ) once Chitipa District, the most diverse district in the sample, is excluded (see Figure 8). In addition, the negative relationship between district diversity and the size of the coethnic trust premium within Malawi is robust to the use of this alternative census-based measure of district diversity.

[Figure 8 about here.]

Second, I plan to include more appropriate measures of ethnic segregation by incorporating spatial information about the units over which segregation is calculated. This additional geographic information will allow me to account for more than just the evenness with which groups are spread across districts, adding in information about the degree to which ethnic groups tend to be clustered in bordering districts. This addi-

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<sup>10</sup>I am in the process of collecting this data for Benin, Ghana, Kenya, South Africa, Tanzania and Uganda. Where I am unable to gain access to the full census data, I will use samples from censuses provided by the Integrated Public Use Microdata Series, International (IPUMS-I) (Minnesota Population Center, 2011).

tional measure of segregation is possible using geographic information systems (GIS) mapping software, but requires matching ethnic demographics to geo-coded shape files.

Third, while this project takes advantage of variation in ethnic group segregation across countries, it currently fails to account for the *causes* of different patterns of group segregation. A better understanding of the origins of variation in segregation, both across countries and across different ethnic groups within countries, may assist in dealing with endogeneity problems by revealing an appropriate instrument for ethnic group segregation. At the very least, it will be important to understand how the “treatment” of interest – ethnic group segregation – is “assigned” to countries and groups. At the country-level, geographic characteristics, variation in land quality, and colonial administration are likely to be important determinants of ethnic group segregation, while at the ethnic group level, the mode of subsistence (e.g., pastoralism, foraging, sedentary agriculture), pre-colonial political organization, and dominant religion may be related to the degree to which groups are spatially isolated from members of other groups.

## **Conclusion**

The last decade has seen an explosion of scholarship on the ways in which interethnic contact, and ethnic and racial diversity more broadly, influence social capital, especially trust. However, while much of this work deals theoretically with trust discrimination along group lines, most empirical studies rely on a poorly understood measure of generalized trust.

This paper contributes to our understanding of the relationship between cultural heterogeneity and trust by evaluating the impact of diverse contexts – both nationally and locally – on trust both within and across ethnic groups. The study focuses on ethnic diversity in Africa, where extreme levels of diversity at the state level belie local level ethnic homogeneity, making the importance of exploring the relationship between diversity and trust at different levels of analysis all the more important. Using public opinion data on trust in coethnics and non-coethnics from sixteen African countries, I find that ethnic diversity is positively related to ethnocentric trust across countries, but negatively related to ethnocentric trust within countries. In other words, individuals are more likely to trust their coethnics more than non-coethnics in diverse countries,

but this pattern is driven by individuals living within homogeneous districts of diverse states.

These patterns suggest that national-level ethnic diversity is most problematic when members of different ethnic groups are geographically segregated. When a measure of ethnic group segregation is interacted with national ethnic diversity, I indeed find that ethnic diversity at the national-level leads to ethnic trust discrimination only when there are high levels of ethnic groups segregation. Thus, existing work that focuses on state-level ethnic diversity alone, without considering how members of different ethnic groups are distributed across that state, has missed an important component of the link between diversity and trust.

A major implication of the fact that ethnic diversity has differential impacts at different levels of aggregation is that we must exercise caution in connecting findings at different levels of analysis. This is especially true in comparative politics, where the increased prominence of rational choice theory and experimental methodologies has led to a greater focus on political phenomena at the micro-level. Such micro-level studies are often motivated by the desire to understand the mechanisms that give rise to macro-level patterns. However, such an approach is inappropriate in contexts where the level of analysis changes the relationship of interest. In short, the results of this paper strongly suggest that we cannot necessarily use patterns observed in ethnically diverse laboratories, neighborhoods, communities, or cities as evidence for the mechanisms relating state-level diversity to political and economic outcomes.

However, this raises the question of where we can appropriately link micro-level mechanisms to macro-level patterns. In particular, the finding that diversity at lower-levels of analysis does not undermine intergroup trust in Africa, and in fact improves it, is at odds with other research that does find a negative relationship between diversity and a whole host of political and economic outcomes. For example, failures of cooperation and low levels of trust in diverse localities have been documented across U.S. cities (Alesina and La Ferrara, 2005), Canadian and American neighborhoods (Stolle et al., 2008), and Ugandan slums (Habyarimana et al., 2009). Two possibilities for this discrepancy are immediately apparent.

First, the diversity in Western cities and African capitals is often driven by immigration, from other countries in the former case, and from rural regions in the latter. It is plausible then that the kinds of positive intergroup relations that I suggest result from

interethnic contact in rural Africa only develop over longer periods of time. Much of the variation in local-level diversity across African districts, for example, is driven by proximity to historical borders between different ethnic communities, rather than through internal migration or international immigration. This suggests that future research, including my own, should consider the different sources of ethnic diversity when considering its impacts.

Second, the mechanism that I propose to account for diversity's relationship to conflict at the national level, but cooperation at the local level is political – I suggest that the success of national elite-level political mobilization along ethnic varies systematically across localities with different levels of ethnic diversity. However, this explanation, if accurate, should only hold where political competition and conflict is national. In contexts where meaningful competition over political power and economic benefits is more local, which is, perhaps, the case in the studies cited above, then the politicalization of ethnicity should also be more localized.

These questions motivate additional research in several directions. First, the results reported in this paper should be confirmed using more fine-grained measures of the distribution of ethnic groups across African states. Second, there is clearly much work to be done in understanding why and how diversity impacts ethnocentric trust differently at different levels of analysis. Finally, future research must aim to understand the causes of ethnic group segregation, as well as to better understand its consequences for intergroup relations in Africa.

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**Table 1:** The relationship between ethnic diversity and ethnocentric trust across African states.

	Proportion Trusting Coethnics > Non-Coethnics		Average Coethnic Trust Premium	
	(1)	(2)	(3)	(4)
Country Ethnic Fractionalization	0.317** (0.133)	0.270*** (0.075)	0.422** (0.184)	0.317*** (0.097)
Ln of GDP/Capita, 2005		-0.019** (0.007)		-0.048** (0.017)
Civil War		0.048** (0.019)		0.053 (0.039)
British Colony		0.030 (0.024)		0.049 (0.040)
Constant	0.015 (0.107)	0.128 (0.075)	-0.025 (0.147)	0.306* (0.165)
Observations	16	16	16	16
$R^2$	0.405	0.617	0.263	0.503

OLS regressions with countries as the unit of analysis.

Robust standard errors in parentheses.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

**Table 2:** The relationship between ethnic diversity and ethnocentric trust across districts within African states.

	Indicator of Trusting Coethnics > Non-Coethnics		Size of Coethnic Trust Premium	
	(1)	(2)	(3)	(4)
District Ethnic Fractionalization	-0.093*** (0.018)	-0.070*** (0.018)	-0.168*** (0.031)	-0.126*** (0.030)
Male		0.002 (0.006)		-0.005 (0.011)
Age		-0.003*** (0.001)		-0.007*** (0.002)
Age <sup>2</sup>		0.000** (0.000)		0.000** (0.000)
Education		-0.015*** (0.002)		-0.029*** (0.004)
Urban		-0.023*** (0.008)		-0.042*** (0.014)
Constant	0.302*** (0.008)	0.429*** (0.023)	0.371*** (0.015)	0.623*** (0.044)
Country FEs	Yes	Yes	Yes	Yes
Observations	22,024	21,688	22,024	21,688
Adjusted $R^2$	0.024	0.029	0.018	0.024

OLS regressions with individuals as the unit of analysis.

Robust standard errors, clustered by district, in parentheses.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

**Table 3:** The relationship between ethnic diversity and an individual's trust in coethnics and non-coethnics across districts within African states.

	Trust in Coethnics		Trust in Non-Coethnics	
	(1)	(2)	(3)	(4)
District Ethnic Fractionalization	-0.141** (0.061)	0.015 (0.051)	0.031 (0.054)	0.143*** (0.049)
Male		0.052*** (0.011)		0.059*** (0.012)
Age		0.010*** (0.002)		0.016*** (0.002)
Age <sup>2</sup>		-0.000*** (0.000)		-0.000*** (0.000)
Education		-0.055*** (0.005)		-0.026*** (0.005)
Urban		-0.150*** (0.024)		-0.108*** (0.023)
Constant	1.742*** (0.023)	1.657*** (0.048)	1.367*** (0.023)	1.023*** (0.051)
Country FEs	Yes	Yes	Yes	Yes
Observations	22,274	21,928	22,078	21,741
Adjusted $R^2$	0.101	0.121	0.082	0.097

OLS regressions with individuals as the unit of analysis.

Robust standard errors, clustered by district, in parentheses.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

**Table 4:** A multi-level linear model of the impact of ethnic diversity, at both the district and national level, on the size of the coethnic trust premium.

	Size of Coethnic Trust Premium	
	(1)	(2)
Country Ethnic Fractionalization	0.367*** (0.131)	0.511*** (0.183)
District Ethnic Fractionalization	-0.068** (0.031)	0.257 (0.287)
Country EF × District EF		-0.396 (0.348)
Male	-0.008 (0.011)	-0.008 (0.011)
Age	-0.007*** (0.002)	-0.007*** (0.002)
Age <sup>2</sup>	0.000*** (0.000)	0.000*** (0.000)
Education	-0.026*** (0.003)	-0.026*** (0.003)
Urban	-0.045*** (0.014)	-0.044*** (0.014)
Ln of GDP/Capita, 2005	-0.031* (0.017)	-0.032* (0.017)
Civil War	0.062* (0.033)	0.062* (0.033)
British Colony	0.061* (0.032)	0.061* (0.032)
Constant	0.430** (0.174)	0.321 (0.200)
Country-Level Random Intercept ( $\sigma^2$ )	0.053 (0.012)	0.053 (0.012)
District-Level Random Intercept ( $\sigma^2$ )	0.165 (0.009)	0.164 (0.009)
Country-Level Observations	16	16
District-Level Observations	1305	1305
Individual-Level Observations	21,688	21,688

Multi-level linear models with individuals as the unit of analysis.

Country and district-level random intercepts.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$



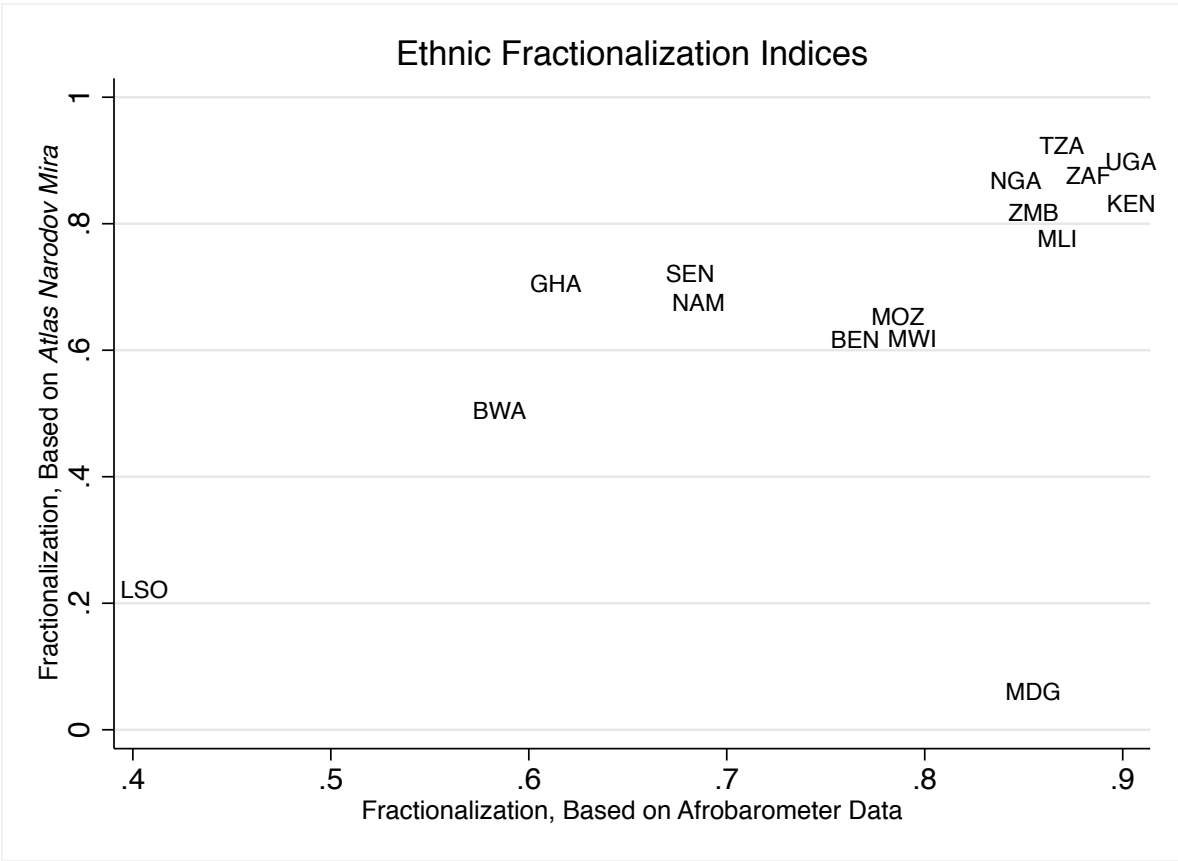
**Table 5:** The relationship between ethnic segregation, diversity, and ethnocentric trust across African states.

	Proportion Trusting Coethnics > Non-Coethnics		
	(1)	(2)	(3)
Ethnic Segregation	0.137 (0.078)	-0.156 (0.118)	-0.527* (0.259)
Ethnic Fractionalization		0.494** (0.171)	0.022 (0.256)
Segregation $\times$ Fractionalization			0.675 (0.387)
Constant	0.160** (0.060)	-0.010 (0.091)	0.233* (0.110)
Observations	16	16	16
Adjusted $R^2$	0.099	0.437	0.496

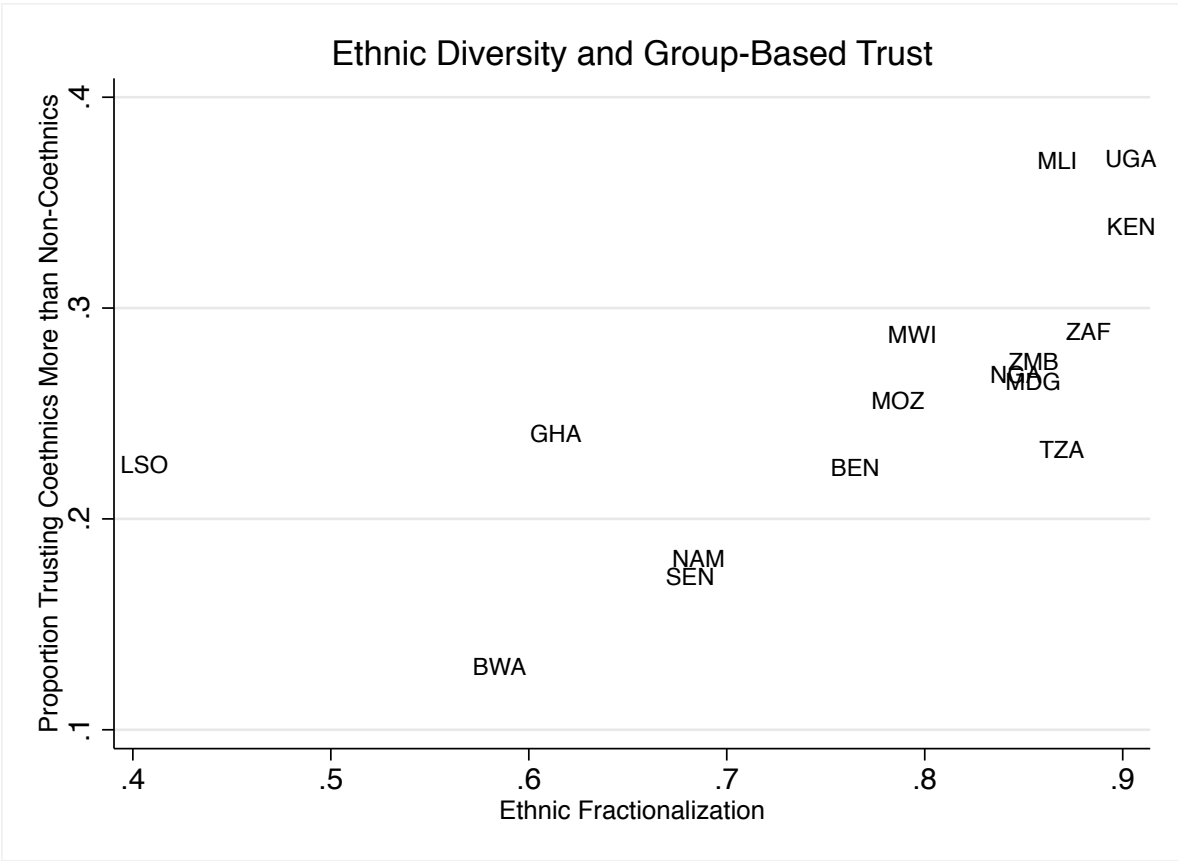
OLS regressions with countries as the unit of analysis.

Robust standard errors in parentheses.

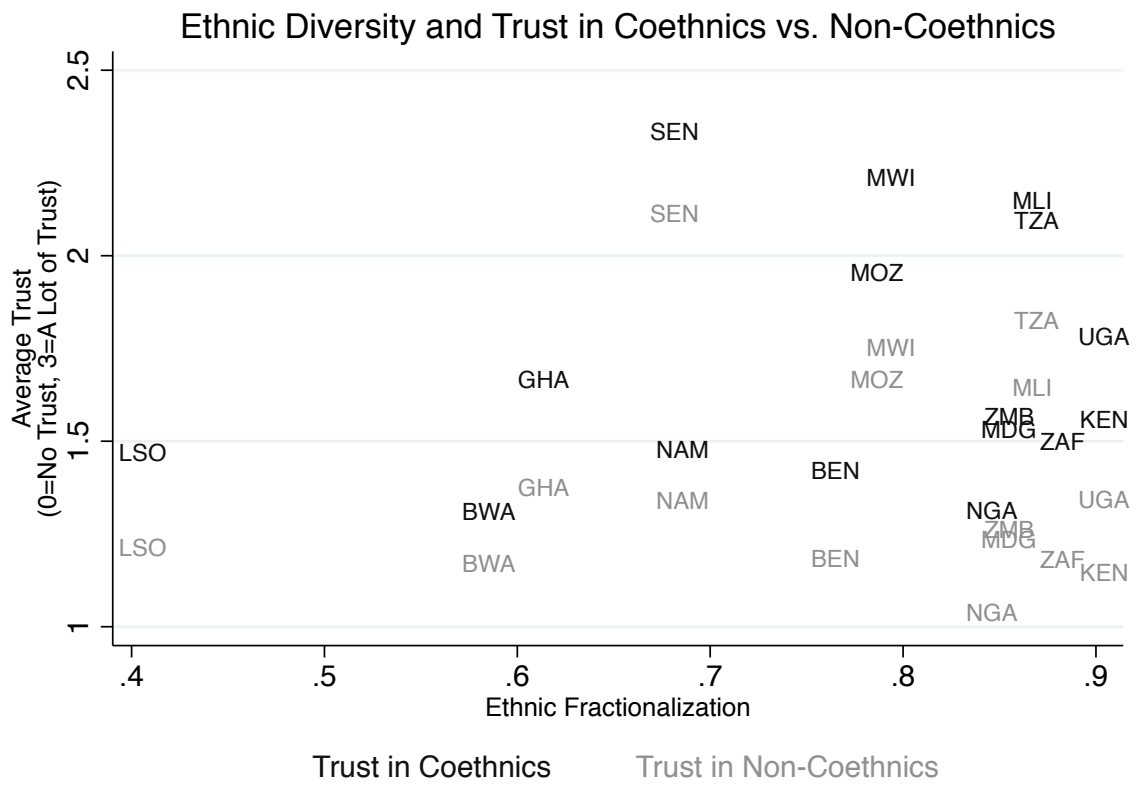
\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$



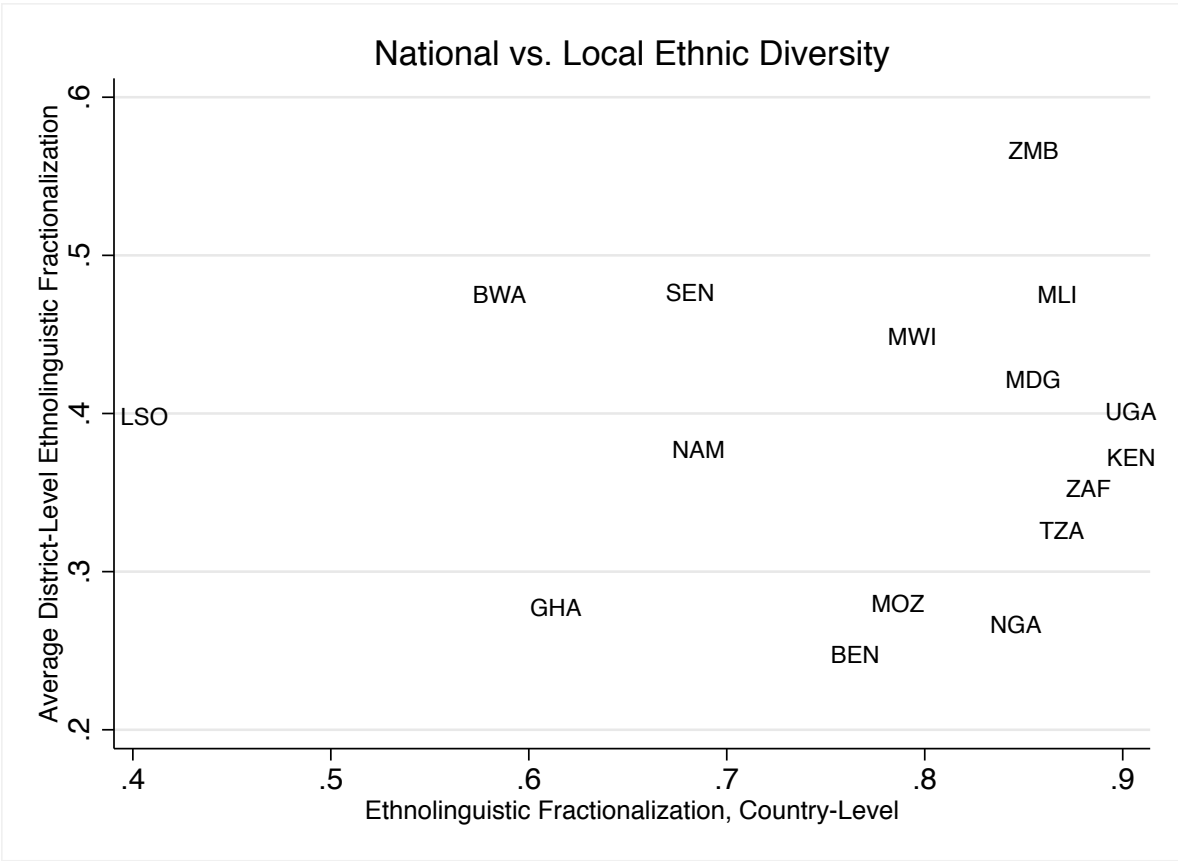
**Figure 1:** The relationship between two different measures of ethnic fractionalization across African states.



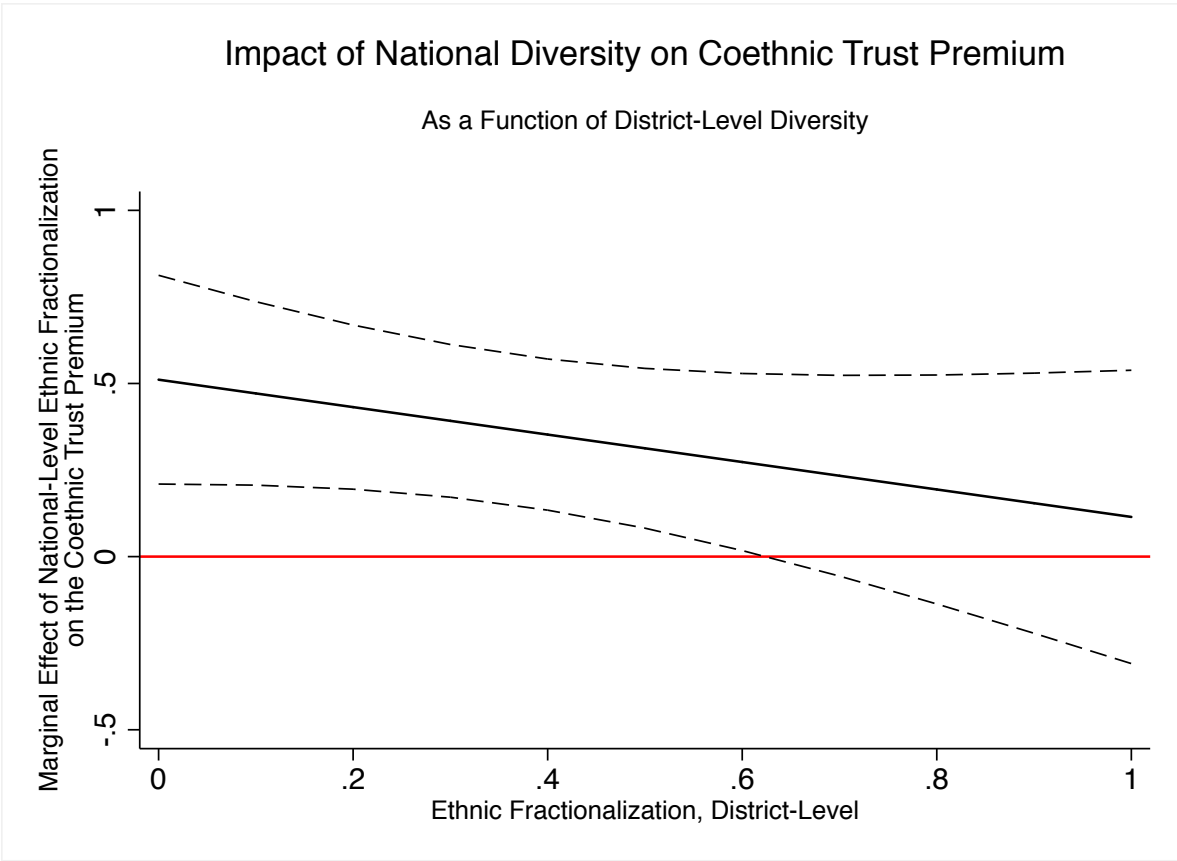
**Figure 2:** The relationship between ethnic fractionalization and the proportion of respondents who trust their coethnics more than their non-coethnics.



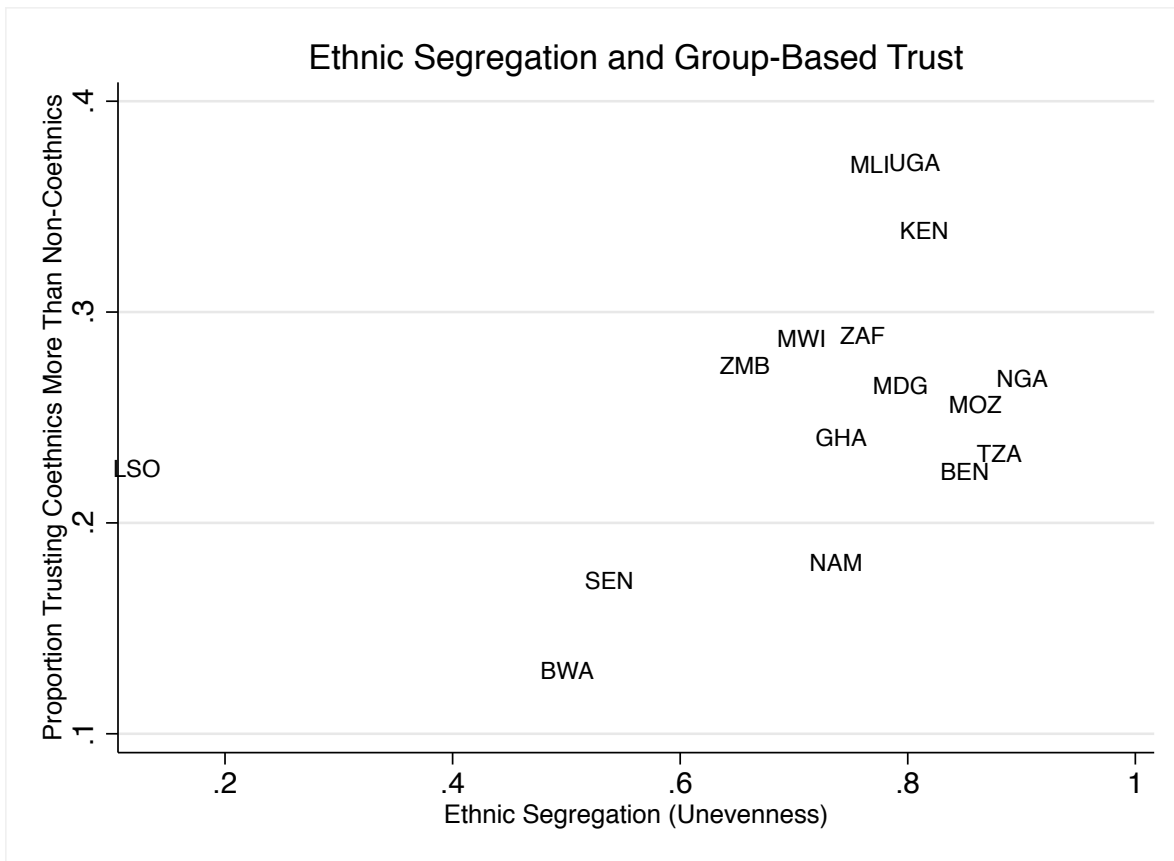
**Figure 3:** The relationship between ethnic fractionalization and the average level of trust in coethnics and non-coethnics.



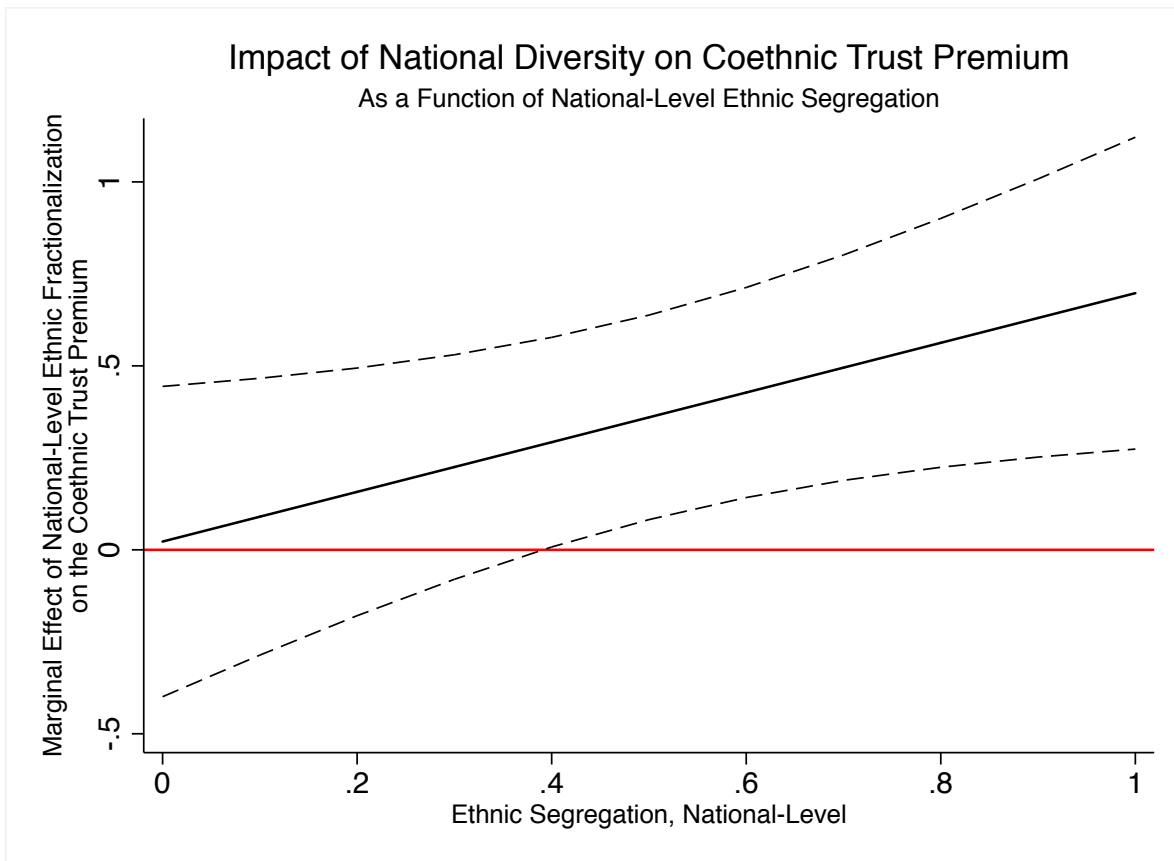
**Figure 4:** National vs. Local Ethnic Diversity



**Figure 5:** The marginal effect of national-level ethnic fractionalization on the size of the coethnic trust premium across different degrees of district-level ethnic fractionalization.

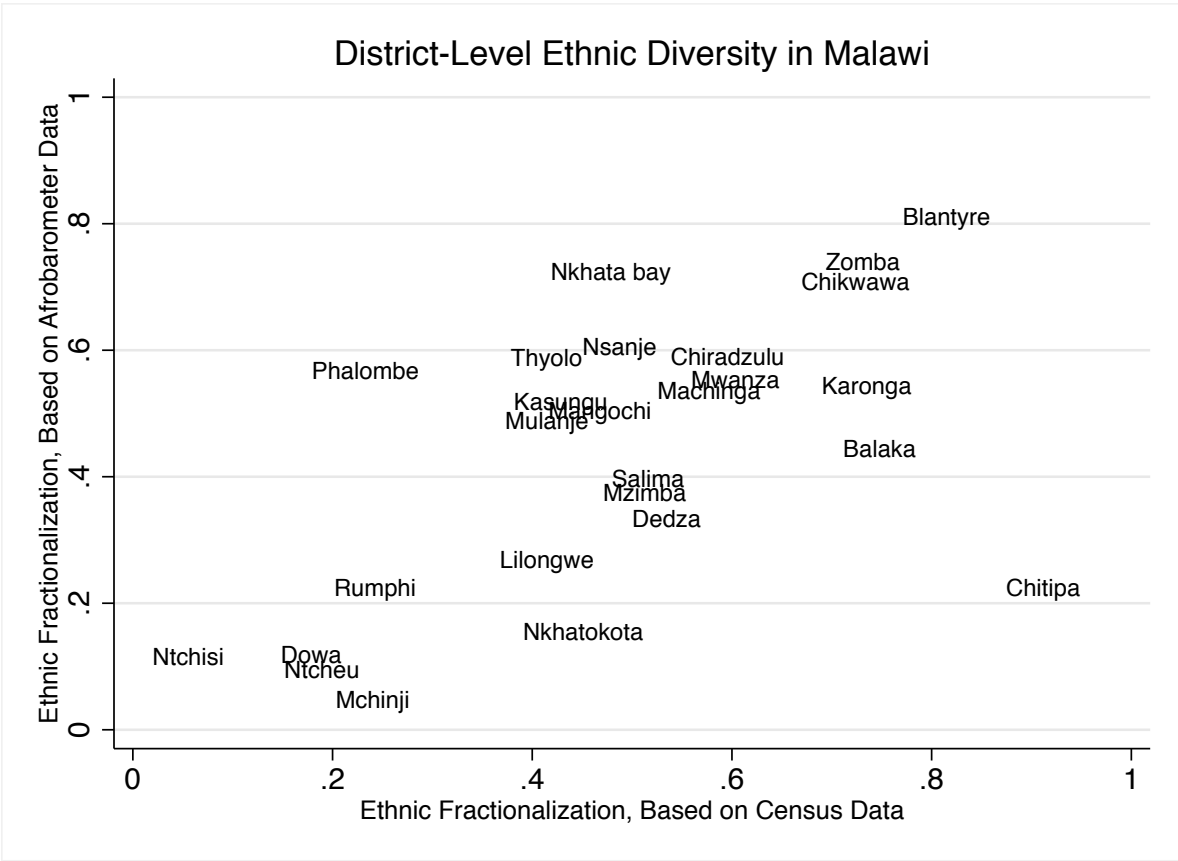


**Figure 6:** The relationship between ethnic group segregation (unevenness) and ethno-centric trust across African countries.



**Figure 7:** The marginal effect of national-level diversity on the proportion trusting coethnics more than non-coethnics as a function of ethnic group segregation.





**Figure 8:** The relationship between two different measures of ethnic group diversity across districts within Malawi.

Appendices to:

Robinson, Amanda Lea. 2013. “Ethnic Diversity, Segregation, and Ethnocentric Trust in Africa.” Working Paper, Stanford University.

## Appendix A

**Table A.1:** Rural Respondents Only: The relationship between ethnic diversity and ethnocentric trust across districts within African states.

	Indicator of Trusting Coethnics > Non-Coethnics		Size of Coethnic Trust Premium	
	(1)	(2)	(3)	(4)
District Ethnic Fractionalization	−0.068*** (0.022)	−0.069*** (0.022)	−0.138*** (0.038)	−0.142*** (0.038)
Male		0.001 (0.007)		−0.012 (0.014)
Age		−0.003*** (0.001)		−0.007*** (0.003)
Age <sup>2</sup>		0.000* (0.000)		0.000** (0.000)
Education		−0.012*** (0.003)		−0.027*** (0.005)
Constant	0.309*** (0.010)	0.429*** (0.030)	0.391*** (0.017)	0.644*** (0.058)
Country FEs	Yes	Yes	Yes	Yes
Observations	13,938	13,670	13,938	13,670
Adjusted $R^2$	0.024	0.027	0.018	0.022

OLS regressions with *rural* individuals as the unit of analysis.

Robust standard errors, clustered by district, in parentheses.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

**Table A.2:** Coethnic Interviewers Only: The relationship between ethnic diversity and ethnocentric trust across districts within African states.

	Indicator of Trusting Coethnics > Non-Coethnics		Size of Coethnic Trust Premium	
	(1)	(2)	(3)	(4)
District Ethnic Fractionalization	-0.095*** (0.028)	-0.083*** (0.029)	-0.145*** (0.053)	-0.115** (0.054)
Male		0.023** (0.011)		0.036* (0.021)
Age		-0.001 (0.002)		-0.000 (0.004)
Age <sup>2</sup>		-0.000 (0.000)		-0.000 (0.000)
Education		-0.013*** (0.004)		-0.030*** (0.007)
Urban		-0.003 (0.016)		-0.008 (0.028)
Constant	0.314*** (0.011)	0.369*** (0.045)	0.386*** (0.021)	0.485*** (0.086)
Country FEs	Yes	Yes	Yes	Yes
Observations	6,281	6,186	6,281	6,186
Adjusted $R^2$	0.043	0.046	0.034	0.037

OLS regressions with individuals as the unit of analysis.

Only respondents interviewed by coethnics are included.

Robust standard errors, clustered by district, in parentheses.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$