

Explaining African Ethnic Diversity

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Abstract:

The costs and consequences of ethnic diversity in Africa have been widely noted. However, the sources of this diversity remain unexplained. Here we show that ethnic diversity in Africa has three sources, namely temperature, the colonial creation of large states and the late onset of urbanization. We examine alternative explanations of ethnic diversity and find no robust evidence of other geographical factors, artificial borders, indirect rule, post-colonial economic growth or political instability on ethnic fractionalization. We also find strong evidence of an effect of urbanization on changes in ethnic identity over time. Inasmuch as the effect of temperature on ethnic diversity is outweighed by state size and urbanization we suggest that Africa's ethnic diversity is not primordial and likely to continue to diminish over time.

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1. Introduction

In recent years Africa's ethnic diversity has become almost synonymous for the continent's economic and political problems. Scholars have argued that ethnic diversity has been responsible for Africa's low economic growth (Easterly & Levine, 1997; Posner, 2004a), political instability and conflict (Buhaug, 2006; Easterly, 2001), high inequality (Barr & Oduro, 2002; Milanovic, 2003) and low provision of public goods (Kimenyi, 2006; Miguel & Gugerty, 2005). At the same time two new datasets on ethnic diversity have appeared, both of which confirm that Africa is notably more ethnically diverse than any other part of the world (Alesina, Devleeshauwer, Easterly, Kurlat, & Wacziarg, 2003; Fearon, 2003).

What remains unexplained, however, are the origins of Africa's ethnic diversity. Previous attempts at explaining ethnic diversity on a global level have still found an African dummy variable to be significant even after introducing a variety of explanatory variables (Ahlerup & Olsson, 2009; Michalopoulos, 2008), and heretofore no one has attempted to examine the specific causes of Africa's ethnic diversity. What makes the continent particularly interesting in this regard is not only its unusually high level of ethnic diversity but also its large standard deviation in the number of ethnic groups per country, which is more than 35% higher than any other region (Fearon, 2003, p. 204).² Indeed, in a continent with such high levels of diversity it is striking to find largely homogenous countries like Burundi and Rwanda.

In this paper we thus probe the origins of Africa's ethnic diversity. We show that Africa's high ethnic diversity is a result of its high average temperatures, large states and late urbanization. Moreover, we show that other variables previously hypothesized as being correlated with ethnic diversity such as latitude, rainfall, artificial borders, indirect rule, economic growth and political instability fail to correlate with ethnic diversity. The paper thus suggests that African ethnic diversity has pre-colonial, colonial and post-colonial roots and is thus continuing to change over time.

The paper is organized as follows. First, we examine a variety of theories for the origins of African ethnic diversity. Second, we test these theories in a series of multivariate regressions, finding that the only three variables that are consistently significant are temperature, state size and urbanization. Third, we perform additional tests on change in ethnic identity over time, confirming the role of urbanization in the late 20th century. Finally we conclude with wider thoughts on African ethnic diversity.

2. Theorizing African Ethnic Diversity

The vast majority of political economy work on Africa takes ethnicity as fixed and thus uses it as an independent variable rather than a dependent variable.³ This phenomenon has continued to occur despite the fact that anthropologists began to move away from a “primordial” understanding of ethnicity towards a more “constructivist” point of view in the late 1960s (Barth, 1969; Cohen, 1969). Indeed, of late political scientists and sociologists have continued to emphasize the dynamism of ethnicity (Brubaker, 2004; Chandra, 2006), although it is too early to say whether these scholars have made a major impact on the field.

One strong conclusion that has come out of the constructivist literature is that modern processes of economic and political development have profoundly shaped ethnic identities. Industrialization, for instance, has had a strong impact on the formation of cross-ethnic national identities (Gellner, 2006 [1983]), while warfare has similarly encouraged the growth of homogenous national identities (Tilly, 1975; Weber, 1976). In particular, scholars have argued that modern African state has strongly influenced ethnic divisions via elections, electoral systems and constituency boundaries (Eifert, Miguel, & Posner, 2009; Posner, 2004b, 2005). Moreover, the colonial state has been acknowledged to have had a major impact on shaping modern ethnic identities in Africa (Laitin, 1994; Posner, 2003).

Thus we should consider the possibility that pre-colonial African ethnic diversity might have different causes from contemporary African ethnic diversity. In a perfect world we would have a good

dataset on pre-colonial African ethnicity, collected sometime in the early to mid-19th century before Europeans colonized the continent. However, the earliest dataset we have on African ethnic diversity is from Soviet scientists in the 1960s (Taylor & Hudson, 1972), which has been widely criticized for not being very reliable (Laitin & Posner, 2001). More recent datasets are of much higher quality (Alesina et al., 2003; Fearon, 2003),⁴ but their contemporary measures of ethnicity means that any attempt to read them back into history is inherently problematic.

One possible solution to this problem is to construct a new dataset on 19th century ethnicity with the use of African historical documents. However, such an exercise would be inherently problematic, inasmuch as indigenous pre-colonial accounts of African societies are extremely rare, and European explorers had a very poor understanding of African ethnic diversity up through World War I and even beyond. Indeed, it is notable in this regard that (Posner, 2004a)'s attempts to compute historic measures of ethnic fractionalization in Africa only back to the 1960s. A second and more viable alternative is to regress ethnic diversity onto a number of historical variables which we explain below.⁵

2.1. Explanations for Pre-Colonial African Ethnic Diversity

Here we examine three types of explanations for African ethnic diversity, namely those that attribute it to the pre-colonial, colonial and post-colonial periods.

2.1.1. Pre-Colonial Origins

There are several already existing hypotheses about the origins of Africa's pre-colonial ethnic diversity. Several of these are geographic in nature: for instance, many scholars have suggested that latitude and/or temperature has an inverse relationship with ethnic diversity, in that warm tropical environments are ideal for growing food and thereby create few incentives for inhabitants to migrate elsewhere or trade extensively with other human populations; this isolation thus spurs the creation of

new ethnic groups in very much the same way as Darwin had proposed for finch species in the Galapagos islands (Ahlerup & Olsson, 2009; Cashdan, 2001; Collard & Foley, 2002; Nichols, 1992; Sutherland, 2003). Another variable which appears significantly correlated with ethnic or linguistic diversity is rainfall (Collard & Foley, 2002; Moore et al., 2002; Nettle, 1996; Nichols, 1992), which may be linked to the need to establish large social networks and ethnic groups in areas of low rainfall and thus high ecological risk. Finally, other researchers have found a significant positive correlation between elevation and ethnic diversity (Nichols, 1992; Sutherland, 2003), which presumably works along the same mechanisms of encouraging isolation among human populations.

An alternative hypothesis for the pre-colonial era is the slave trade: as argued by (Nunn, 2008), the slave trade may have weakened ties between Africans and thereby inhibited the development of broader ethnic identities. Empirically there is a good deal of evidence supporting a relationship between slavery and ethnic diversity: (Nunn, 2008, p. 164), for instance, shows a significant and strong correlation between slave exports per area and contemporary ethnic fractionalization. The names of many African ethnic groups also suggest a link, such as the Dioula of West Africa, whose name comes from the Manding word *gyo-la*, or “the land of the slaves captured through warfare,” while the name of their neighbors the Gio possibly comes from the Bassa phrase *gii-o*, or “slave people” (Holsoe & Lauer, 1976, pp. 141-142). Moreover, this evidence is not limited to West Africa: data from 1856 on freed slaves in what is now north-west Mozambique lists at least 21 different ethnic backgrounds (Isaacman, 1972), while the current Bantu ethnic minority in southern Somalia originated as slaves from southern Africa who were shipped along the East African coast in the 19th century by Zanzibari traders (Webersik, 2004, pp. 525-526).

2.1.2. Colonial Origins

Scholars have long argued that the colonial period had a profound effect on ethnicity in Africa, for a variety of reasons. In particular the literature suggests that colonialists directly promoted ethnic

diversity through “divide and rule” tactics (Berman, 1998; Blanton, Mason, & Athow, 2001) and indirectly by providing “tribal” chiefs and missionaries with the incentives to promote ethnic differences (Laitin, 1994). In particular scholarship on the colonial period has repeatedly emphasized the way colonies were governed according to cost-saving methods. Indeed, at the time of its colonization Africa was actually relatively peripheral to European economic interests in the Americas, Russia and India (Young, 1994, pp. 84-85), and the principle of colonial self-sufficiency meant that colonies had to pay for themselves, no matter how oddly shaped or small they were.

The consequences of this policy on African ethnic diversity were threefold. First, European efforts at creating economies of scale and minimizing bureaucratic costs led to the creation of large states. For instance, the average British district commissioner was responsible for an area the size of Wales (Herbst, 2000, p. 78), while French colonial administrators created unusually large colonies in the more under-populated areas of Central and West Africa. The result, as noted in Table 1, was that former colonies in Africa are considerably larger than former colonies in Asia or Latin America and the Caribbean, whether or not island states are included. When we recall that ethnic groups in Africa are different from caste groups in India or racial groups in the US in the way they tend to be regionally concentrated, it is thus no surprise to find that smaller African states like Burundi, Djibouti and Lesotho have lower levels of ethnic diversity than Chad, the DRC or Tanzania.⁶

[Insert Table 1 here]

A second consequence of colonial cost-saving was the drawing of arbitrary colonial borders. More specifically, due to the costs involved in drawing accurate borders that reflected local political economies Europeans inadvertently “split up ethnic groups and exacerbated preexisting high levels of ethnic and linguistic diversity” when dividing up the continent (Easterly & Levine, 1997, p. 1213). In particular (Englebert, Tarango, & Carter, 2002, p. 1096) have noted that some 44% of colonial borders were straight lines, leading to as many as 177 ethnic groups split across two and sometimes three

colonial borders; when added together these partitioned ethnic groups represented 43% of the average African state's population. Indeed, the supposed arbitrariness of these borders has led some social scientists like (Miguel, 2004; Posner, 2004b) to use them as "natural" experiments inasmuch as they were supposedly drawn exogenous to pre-existing local political conditions.

Finally, colonial cost-saving led to the creation of supposedly homogenous rural "tribal" areas with their own "tribal" chiefs as "decentralized despots" (Mamdani, 1996). Labeled as "indirect rule," this policy led in areas to the creation of new ethnic identities as colonialists split up Africans into separate tribal areas with their own tribal chiefdoms, thereby encouraging separation and ethnic difference. Moreover, the way in which colonial rule restricted migration between tribal areas and restricted property rights to "natives" from each area only helped to encourage isolation and further fractionalization. Examples of such practices abound: for instance, the secession of Toro kingdom from Bunyoro kingdom in western Uganda just before the establishment of colonial rule led the British to institutionalize a separate Batoro identity despite the fact that the Batoro were previously ethnically indistinguishable from the Banyoro (Buchanan, 1978).

2.1.3. Post-Colonial Origins

As regards the post-colonial period, scholars have proposed that both political and economic development can alter ethnic diversity. For instance, (Alesina & Spolaore, 2003) have suggested that ethnic heterogeneity leads to poorer public goods provision due to diverse preferences, and that as a result citizens from ethnically heterogeneous states have the incentive to secede and create new, more ethnically homogenous states. They claim that these incentives would be enhanced as countries democratize and thus give their citizens greater latitude to choose their own future. Yet there is very little evidence supporting this theory in post-colonial Africa, where there has had a remarkable lack of secessionist movements even after democratization swept the continent in the 1990s (Englebert, 2009).

There is more evidence behind two other processes in the post-colonial period, namely nation-building and urbanization. As regards the former, modernization theorists like (Gellner, 2006 [1983]) have argued that political and economic development would produce more homogenous societies, both because ethnic divisions of labor would lead to secession and the creation of more homogenous states and because industrialization required states to create largely homogenous workforces which could easily communicate with each other. Indeed, most African governments in the 1960s and 1970s attempted to create common national identities that transcended ethnicity, following Mozambiquean President Samora Machel's dictum that, "for the nation to live, the tribe must die" (Mamdani, 1996, p. 135). Thus Botswana's success in promoting both economic growth and political stability has led some authors like (Acemoglu, Johnson, & Robinson, 2003, p. 106) to suggest that its unusually high ethnic homogeneity is "more an outcome of Botswana's political institutions than an independent cause."

A second theorized explanation for ethnic change is urbanization. Modernization theorists from Talcott Parsons and Max Weber to (Gellner, 2006 [1983]) invoke urbanization as the key variable in the transition from old multi-ethnic agrarian societies to modern nation-states, while historians like (Weber, 1976) have shown how urbanization spread nationalist ideology and homogenization in France and other western countries in the 19th and 20th centuries. In particular urbanization was seen as both the mechanism by which people from different but related ethnic groups came in contact with each other, realized their commonalities and formed a new ethnic identity, and the way by which the state could enforce nationalist ideology through education and propaganda. Rural citizens, on the other hand, remained isolated from each other physically and socially, and the nation-state often had difficulties reaching out to its rural periphery. Indeed, the best African example of this phenomenon was the way in which large-scale post-colonial urbanization in Botswana allowed for the creation of neutral ethnic spaces which "provided an enabling context for minorities to join and partially 'assimilate' to national life" (Solway, 2004, p. 132).

In Africa the relative lack of urbanization could be one reason behind the continent's high ethnic diversity. Indeed, colonial rulers deliberately suppressed urbanization until the mid-twentieth century,

partially due to the need to utilize labor in rural areas but also because they were worried about the existence of an urban “detribalized” proletariat as a fertile recruiting tool for nationalist anti-colonial movements (Mamdani, 1996, p. 102). Moreover, other phenomena such as low levels of industrialization and fragmented markets and population distributions contributed to low levels of urbanization (Hance, 1970, p. 219). Table 2 thus demonstrates that Africa remains the continent with the lowest level of urbanization, and is projected to become a majority urban region only after 2030.

[Insert Table 2 here]

Yet, despite colonial efforts to suppress urbanization, the dual effects of colonial pacification and economic development programs in the late colonial period encouraged urbanization indirectly via high population growth, local land scarcities and out-migration from tribal areas. While some of these migrants moved to rural areas, many of them moved to cities, where they formed new ethnic identities. In particular the examples of the Ibo of Nigeria, the Jola of Senegal, Duala of Cameroon and Bangala of the DRC can be seen as classic examples of previously different ethnic groups amalgamating into larger ethnic identities as urban migrants found commonalities among each other and transferred these new identities back to their rural brethren as well (Eckert, 1999; Nugent, 2008; Young, 1976). In other words, the growth in urban populations had a significant spillover effect into rural areas as migrants maintained ties with their home communities, suggesting that urban population growth is the key variable of interest rather than growth in the proportion of people living in cities.

3. Empirical Analysis and Results

3.1. Variable Codings

Our goal is thus to regress ethnic diversity on these various hypotheses. As we are examining the origins of ethnic diversity across the pre-colonial, colonial and post-colonial periods we deliberately exclude such countries as Cape Verde, Mauritius and the Seychelles from our database as they were not settled prior to colonization. Our dependent variable here is a recent dataset on worldwide ethnic diversity by (Fearon, 2003). What makes this dataset different from previous codings of ethnic diversity is its focus on ethnic rather than ethnolinguistic diversity, whereby groups in Rwanda and Somalia who speak the same language but are ethnically distinct are coded as such. Thus we deliberately do not employ other datasets that explicitly use language as a proxy for ethnicity such as (Roeder, 2001; Taylor & Hudson, 1972). The sole other dataset that we employ is (Alesina et al., 2003)'s data on ethnic diversity, albeit only as a robustness check as some of its codings are suspect: for instance, countries such as Tanzania and Togo do not have their ethnic identity labels listed in the dataset, a problem which does not occur with (Fearon, 2003)'s data.⁷

To summarize our hypotheses, we have listed ten attributes here which are hypothesized to have effects on ethnic diversity in Africa: for the pre-colonial period we have elevation, latitude, rainfall, temperature and slave exports; for the colonial period we listed state size, arbitrary borders and indirect rule; and for the post-colonial period we have nation-building and urbanization. Several variables present no problems in measurement, with uncontroversial data available for elevation, latitude, rainfall, temperature and state size. We measure urbanization as the annual rate of growth of the urban population between 1960 and 2000 rather than the annual growth in the proportion of people living in cities in order to account for the aforementioned links between urban migrants and their rural brethren; however, we also use the latter measure in our robustness checks.⁸

Other data, however, present certain problems. (Nunn, 2008), for instance, uses current ethnic group identities to code historical slave exports, which he then claims led to the creation of modern ethnic groups, a problem which has been already criticized elsewhere (Austin, 2008). The other problem with this data is that it measures slaves per area that were exported from Africa, thereby

excluding the majority of African slaves who never left the continent (Lovejoy, 2000). However, we use his data here as it is so far the only such cross-national data on slave exports.

Measuring indirect rule is also problematic since the sole available measure is one created by (Lange, 2004) for British colonies, leaving us with only 14 observations. One strategy is to examine pairwise correlations with indirect rule and *Alesina* and *Fearon*, which in both cases are negative (but not significant),⁹ suggesting that, if anything, indirect rule promoted ethnic homogenization rather than fractionalization. Another alternative is to use colonial identity as a proxy for indirect rule, inasmuch as there is some evidence that the British were more forthright in using indirect rule than the French in their African colonies (Blanton et al., 2001; Grier, 1999). We thus introduce colonial dummies for all colonial powers which initially colonized two or more countries in Africa, namely France, Germany, Italy, Portugal and the UK;¹⁰ we also introduce a second set of variables for the post-World War I period when Belgium, the UK and France divided up former German colonies among themselves.

We test for the effects of arbitrary borders in four ways. First, straight borders, as either drawn upon longitude or latitude lines or between two fixed points, obviously indicate a lack of attention to local African societies. With data from (Englebert et al., 2002) we construct two proxies for arbitrary borders by introducing a dummy variable which takes a value of one when any of a country's borders is at least partially straight, and another variable which measures the percentage of the number of a country's borders which are at least partially straight. A third proxy is number of years since 1880 that a given country's borders have been fixed. More specifically, while the borders of the Gambia and Namibia were fixed in 1889 and 1890, respectively, referenda in areas such as British Togoland (1956) and the British Cameroons (1961) gave Africans the opportunity to alter borders to better reflect local ethnic identities. Fourth and finally, we utilize a new "fractal" measure of artificial borders by (Alesina, Easterly, & Matuszeski, 2010) which captures the degree to which a country's borders are one or two dimensional.

Finally, for the post-colonial period we can proxy for the role of nation-building in three ways. Inasmuch as the goal of successful nation-building was to create economic growth and political

stability, we measure the former with economic growth per capita between 1960 and 2000, and the latter using (McGowan, 2003)'s data on coups and coup plots as a proxy alongside data on the number of years of civil wars per country since independence.

3.2. Results

We begin our analysis by testing various pre-colonial variables against each other. As reported in Table 3, we find that Temperature and Slave Exports are the only pre-colonial variables to be always significant at the 5% level, with no evidence that elevation, latitude or rainfall have a significant effect on ethnic diversity. (We remove temperature from regression 4 as it correlates highly with elevation; in this and all other regressions we avoid including variables that correlate at 0.5 or greater.) We also add additional geographical control variables such as mean distance to the coast and sea-navigable rivers and the percentage of each country's land that is potentially arable; in none of these specifications do temperature or slave exports lose their significance or alter their coefficient greatly.

[Insert Table 3 here]

As regards colonial variables, Table 4 demonstrates that state size always has a positive and significant relationship with ethnic diversity, while all other variables are not significant. Surprisingly, none of the colonial dummies hold any significance, either measured by initial colonization or colonial rule after World War I (designated for France and the UK by French2 and British2, respectively). Similarly, none of the three proxies for artificial borders hold any significance, and religious fractionalization does not appear to correlate with ethnic fractionalization.

[Insert Table 4 here]

Table 5 reports the effect of various post-colonial variables on ethnic diversity. We first test for urbanization and other nation-building variables in column 1, with GDP/capita growth in column 2 due to the lower number of observations for which such data exists. Urbanization is always negatively and significantly correlated with ethnic diversity, and the other explanatory variables fail to reach the 5% level of significance. To see if urbanization is proxying for another variable we add additional control variables in regressions 3-7 which have been shown to be correlated with urbanization, namely population growth, fertility change, mortality change, democratization and net migration (Beall & Fox, 2009; Dyson, 2001). In all cases we use data from 1960 to 2000 except for democratization, where we instead measure the shift in Polity IV scores from 1975 to 2000 so that we can account for the change from one-party rule in the 1970s to multi-party rule by the turn of the century.¹¹ In none of these cases are the control variables consistently significant at the 5% level. Finally, in regressions 8-9 we test measures of urbanization over different time periods; when measured from 1950 to 1975 or 1975 to 2000 urbanization is always negative and significant, and the differences in coefficient size and level of significance between regressions 8 and 9 suggests that this relationship is strengthening over time.

[Insert Table 5 here]

4. Robustness Checks and Additional Empirical Results

Tables 3-5 thus yield four variables which seem to correlate with ethnic diversity: temperature, slave exports, state size and urbanization. In Table 6 we therefore check for robustness, first by regressing ethnic diversity on each independent variable in bivariate regressions and then by using smaller sample sizes to see if the results are being driven by any outliers. Regressions 1-4 confirm that the four variables have independent effects on ethnic diversity; in regression 5 we confirm that the measuring urbanization as average annual growth in the proportion of people living in cities between 1960 and 2000 has the same strong negative effect on ethnic diversity as our previous measure, except

with a higher level of significance and an stronger R^2 . When we compile the four main variables together in regression 6 the significance level of slave exports, however, drops below 5%. In regressions 7-8 we eliminate small states (with populations less than 1.5 million)¹² and large states (greater than 50 million),¹³ and in regression 9 we exclude all major oil producers (defined as those with one billion or more barrels in proven oil reserves) to see if the much-discussed relationship between oil wealth and ethnicity has an impact on our results.¹⁴ In columns 10 and 11 we exclude Muslim and Catholic majority states to control for theories that suggest that different religions can have significantly different impacts on nation-building and ethnic conflict (Hastings, 1997).¹⁵ Finally, in column 12 we use data on ethnic fractionalization from (Alesina et al., 2003) as the dependent variable. The specifications in columns 7-12 hold very similar results, with temperature, state size and urbanization remaining significant at all times. However, slave exports are never significant at the 5% level and lose significance altogether in three specifications, thereby suggesting that the relationship between slave exports and ethnic diversity is not robust.

[Insert Table 6 here]

These results thus provide strong evidence that temperature, state size and urbanization are robustly correlated with ethnic diversity in Africa. Yet we still have not established causality with these three variables and ethnic diversity. One way to establish causality is to use instrumental variables; however, with such a small sample estimation bias is a serious problem, and the lack of appropriate instruments other than lagged variables is especially unhelpful here (Angrist & Krueger, 2001).

Qualitative evidence, however, does not suggest a major problem with reverse causality or omitted variables. First, temperature does not pose a problem here as there is little evidence even today of African agency in temperature change, let alone an influence of African ethnic diversity on temperature. Second, in the case of state size one could hypothesize that high levels of ethnic diversity could have led to the creation of large states in Africa. However, there is abundant evidence that

African borders were fixed prior to European knowledge about the content of their colonies, with almost all initial colonial censuses not taking place until after World War I and the collection of systematic demographic data only beginning after World War II. For instance, when the Portuguese-run Mozambique Company took control over central Mozambique in the 1890s, it described its new territory as “an unknown country full of savages” (Allina-Pisano, 2003, p. 64). Similarly, the British colonialist Lord Hailey claimed in 1938 that “every government in Africa has been faced by the initial difficulty of administering an extensive area with a small European staff, frequently ignorant of the local native custom and language” (Herbst, 2000, p. 81).

Third and finally, the urbanization variable is also potentially endogenous in that causality could run from ethnic homogeneity to urbanization rather than vice-versa. Specifically, it is possible that more homogenous countries like Botswana were less likely to suffer from the problems of public goods provisions associated with highly diverse countries and that their population would therefore be more likely to urbanize to take advantage of good public services. However, as with the other variables there is no extant qualitative evidence suggesting that changes in ethnic diversity have led to urbanization; instead, urbanization is normally seen as the result of such factors as mortality decline and population growth (Dyson, 2001).

One additional way to solve this problem is to use earlier measures of ethnic diversity from census data to track changes over time. However, this exercise is not feasible here as most African countries no longer ask questions about ethnicity on their censuses, in large part because of the controversies surrounding ethnic headcounts (Morning, 2008). There is, however, one extant source of changes in ethnic fractionalization over time, namely (Roeder, 2001)’s data on ethnic diversity in 1961 and 1985. While the codings for this dataset are based on ethnolinguistic rather than ethnic diversity, it is however the only such data source allowing us to check whether urbanization has an effect on changes in ethnic diversity over time. Thus in Table 7 we regress changes in (Roeder, 2001) on urbanization rates from 1950 to 1975 to allow for a 10-year lag.¹⁶ In regressions 2-3 we control for urbanization in 1950, the 1961 ethnic diversity scores from (Roeder, 2001) and temperature and state

size, none of which alter the significance or coefficient size for urbanization. Data on economic growth rates for most African countries does not exist prior to 1960, so in regressions 4-5 we compute average growth rates between 1960 and 1975 and 1960 and 1985, respectively, while also controlling for GDP/capita in 1960. In regressions 6-9 we control for migration, changes in Polity IV scores and change in total fertility rates. In none of these specifications does urbanization ever lose significance.

[Insert Table 7 here]

We can also estimate the effects of urbanization on ethnic diversity over time. More specifically, if we use the median coefficient of -0.957 from the eleven regressions in Table 7, the African annual urbanization growth rate of 5.2% between 1950 and 1975 should have lowered ethnic diversity by 0.05 between 1961 and 1985. In other words, if the urban population growth rate were to continue to proceed at the 3.1% rate suggested by current UN projections to 2050, the results suggest that urbanization alone would cause the ethnic diversity of the mean African country to drop by 0.06 in the first half of the 21st century. While this amount may seem small – at this rate it would take Africa some two hundred years to drop from its current mean ethnic diversity of 0.71 to the current global mean of 0.48, and even longer if urbanization rates continue to drop as predicted – this result nonetheless adds further evidence that ethnic diversity is indeed a dynamic process.

5. Interpretation

Our results thus suggest that temperature, state size and urbanization play a strong causal role in African ethnic diversity, and that other hypothesized causes have little to no significant effect. Indeed, while at first the negative results for the other hypothesized variables are counterintuitive, a closer look at the evidence suggests otherwise. As regards the pre-colonial variables, previous scholars have found contradictory evidence: (Cashdan, 2001; Sutherland, 2003), for instance, find no relationship between

diversity and rainfall, while (Nettle, 1996) finds elevation insignificant. Moreover, many of studies mentioned above only examine bivariate correlations and therefore fail to check if any variables lose significance and/or coefficient size in multivariate regressions. Finally, only one of these studies concentrates specifically on Africa, and finds that a majority of ethno-linguistic diversity remains unexplained in their analysis (Moore et al., 2002).

As for the colonial period, there is a good amount of equivocal evidence about the impact of both arbitrary borders and indirect rule on ethnic diversity. For instance, Europeans often tried to avoid splitting indigenous states between colonies when they could: the Angola/Zambia, Benin/Nigeria, Ghana/Burkina Faso, Niger/Nigeria, and Rwanda/Tanganyika borders, among others, were all drawn to ensure that pre-colonial African states were not partitioned. Indeed, the British government pushed for the Ndian river to be demarcated as the border between Nigeria and Kamerun in 1887 as it marked “a distinct ethnographic frontier” between Bantu and non-Bantu peoples (Partridge & Gillard, 1995, p. 251). After the partition of the German colonial empire in 1919 the then British Colonial Secretary was similarly concerned about the initial French/British border in the Cameroons as it “cut across tribal and administrative divisions,” and was pleased at the addition of the British Cameroons and Togoland to the Empire as it brought “completely within our borders native Tribes which have hitherto been partly within British territory and partly outside it” (Louis, 1966, pp. 885-886). Finally, there is evidence as well of European powers allowing for the transfer of populations caught on the wrong side of the borders between Gambia and Senegal, the Belgian Congo and Uganda, and Kenya and Italian Somaliland in the early colonial period (Griffiths, 1986; Trouval, 1966).

There is also evidence that European “tribal” policies did not always increase pre-existing ethnic diversity. In many places such as central Uganda colonial policies had little effect on ethnic identities due to the strength of pre-colonial attachments (Green, 2008). In other areas ethnic groups that were too small to be formed into individual chiefdoms or kingdoms were consolidated into larger groupings and given chiefs with “invented traditions” (Ranger, 1983); in this way the Abaluhya of Kenya and Ndebele of Zimbabwe, among many others, were grouped together in a single district and eventually

became single ethnic groups (Mamdani, 1996, pp. 81-82; Ndegwa, 1997). It was not only the colonial state which promoted ethnic homogeneity through cost-saving: missionaries often “reduced Africa’s innumerable dialects to fewer written languages” and thereby promoted ethnic homogeneity in large part due to budgetary constraints (Hastings, 1997; Iliffe, 2007, p. 239; Posner, 2003).

Finally, in the post-colonial period most African states have done very little to promote nation-building and ethnic homogenization, focusing instead on superficial policies alongside the promotion of deep ethnic divisions that contributed to political instability and civil wars. While rare cases of political stability such as Tanzania have often seen a decreased salience of ethnic diversity, there is little concomitant evidence of ethnic homogenization (Miguel, 2004), while a closer reading of post-colonial Botswana suggests that politicians there have actually done little to integrate ethnic minorities into a common national identity (Poteete, 2009). Indeed, the most stringent example of nation-building in 20th-century Africa took place in Ethiopia, where efforts at promoting Amharic failed to contribute to ethnic homogenization but rather led to ethnic revolts against Emperor Hailie Selassie, the secession of Eritrea and the implementation of a system of ethnic federalism after 1993.

6. Conclusions

In this paper we have shown that Africa’s unusually high ethnic diversity has three sources, namely high temperatures, large states and low levels of urbanization. We demonstrated that these three variables are robust to various specifications and subsamples, and that urbanization is also robustly correlated with changes in ethnic diversity between 1961 and 1985. We also demonstrated that a number of other variables hypothesized to have an affect on ethnic diversity such as latitude, rainfall, arbitrary borders, indirect rule, economic growth and political instability are not robustly correlated with ethnicity.

As such this paper has two broad contributions to the literature on Africa and ethnic diversity. First, it suggests that African ethnic diversity is not primordial or fixed and thus cannot continue to be

used as an exogenous variable in analyses of African political economy. In particular we have seen how the effect of temperature on ethnic diversity is overwhelmed by the combined impact of large states and urbanization, thereby suggesting that African ethnic diversity is a historic and dynamic phenomenon. Thus further research in this area must continue to interrogate the primordialist assumptions that still plague the study of African ethnicity.¹⁷

Secondly, this paper suggests that Africa's ethnic diversity does not have mysterious origins. Africa's large standard deviation in ethnic diversity is thus the result of its extremes in temperature, its uneven colonial partition and its large differences in urbanization rates. We confirm the global role of temperature in promoting ethnic diversity found by (Collard & Foley, 2002) and suggest that the post-colonial norms which have prevented Africa's large states from breaking up are in part responsible for the continent's high levels of ethnic diversity. Indeed, the unusual lack of secessionist movements in post-colonial Africa should thus not only be seen as partially responsible for the continent's lack of state formation and consolidation but also for its ethnic diversity (Englebert, 2009; Herbst, 2000). Finally, the ethnic diversity that pervaded rural society in other regions in the pre-modern era has persisted in Africa in part because of the continent's late start on urbanization.

Further research on this topic could focus on a number of important items. First, inasmuch as pre-colonial slave exports has a significant relationship with modern ethnic diversity across several specifications, better quantitative measures of pre-colonial slavery which do not use ethnicity for identification purposes and which account for the internal slave trade might prove to be more robustly associated with ethnic diversity. Secondly, more substantial time-series data on ethnic change over time would improve our understanding of how political and economic phenomena affect ethnicity in Africa. Finally, similar analyses for other parts of the world would add to our knowledge on this subject.

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Table 1a: Median Former Colony Size by Region (excluding island states)

Name	Size (in km²)	Number
Asia	185,180	20
Latin America and Caribbean	235,685	20
Sub-Saharan Africa	322,460	42

Table 1b: Median Former Colony Size by Region (including island states)

Name	Size (in km²)	Number
Latin America and Caribbean	108,890	33
Asia	181,035	25
Sub-Saharan Africa	270,873	48

Table 2: Percent Urban by Area
(Source: (United Nations, 2008))

Region	1950	1975	2000	2030 (projected)
Sub-Saharan Africa	11.1	21.7	32.8	48.2
Asia	16.8	24.0	37.1	54.1
Latin America and Caribbean	42.0	61.2	75.4	84.3
Europe	50.5	65.6	71.7	78.3
Oceania	62.0	71.5	70.5	73.8
North America	63.9	73.8	79.1	86.7

Table 3: Pre-Colonial Sources of African Ethnic Diversity
(Dependent Variable: (Fearon, 2003))

	(1)	(2)	(3)	(4)	(5)
Temperature	.410* (.176)		.395* (.183)	.496* (.187)	.366* (.165)
Slave Exports	.018* (.009)	.025** (.009)	.019* (.009)	.018* (.009)	.019* (.009)
Latitude	-.044 (.029)	-.066* (.029)	-.047 (.031)	-.024 (.032)	-.052* (.025)
Rainfall	.029 (.041)	-.005 (.040)	.025 (.043)	.059 (.047)	
Elevation		-.030 (.033)			
Coast			-.010 (.030)		
Rivers				.041 (.031)	
Arable					.047 (.103)
Constant	-.763 (.716)	.968 (.371)	-.624 (.828)	-1.558 (.932)	-.442 (.524)
N	42	42	42	42	42
R ²	0.41	0.34	0.41	0.44	0.41

[†] $p \leq 0.1$, * $p \leq 0.05$, ** $p \leq 0.01$; *** $p \leq 0.001$; standard errors in parentheses.

Table 4: Colonial Sources of African Ethnic Diversity
(Dependent Variable: (Fearon, 2003))

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Km ²	.053* (.021)	.051* (.020)	.068* (.029)	.053* (.023)	.050* (.021)	.049* (.022)	.047* (.021)
German	-.050 (.121)		-.034 (.126)	-.051 (.131)	-.073 (.124)	-.068 (.124)	-.066 (.122)
Italian	.016 (.144)	.032 (.138)	.039 (.171)	.014 (.164)	-.009 (.147)	.017 (.145)	.073 (.154)
Portuguese	.036 (.142)	.084 (.136)	.088 (.169)	.037 (.144)	.011 (.145)	.005 (.149)	.021 (.142)
British1	-.054 (.101)		-.063 (.104)	-.054 (.103)	-.076 (.104)	-.070 (.104)	-.067 (.102)
French1	-.006 (.104)		-.005 (.108)	-.006 (.106)	-.018 (.105)	-.018 (.106)	.009 (.105)
Belgian		-.170 (.137)					
British2		.009 (.091)					
French2		.065 (.094)					
Fractal			.296 (3.380)				
Border Years				.001 (.051)			
St. Line Percent.					.095 (.103)		
St. Line Dummy						.049 (.066)	
Religious Fract.							.155 (.147)
Constant	.071 (.289)	.059 (.262)	-.131 (.457)	.070 (.299)	.097 (.291)	.102 (.294)	.063 (.289)
N	42	42	39	42	42	42	42
R ²	0.20	0.27	0.25	0.20	0.22	0.21	0.23

[†] $p \leq 0.1$, * $p \leq 0.05$, ** $p \leq 0.01$; *** $p \leq 0.001$; standard errors in parentheses.

Table 5: Post-Colonial Sources of African Ethnic Diversity
(Dependent Variable: (Fearon, 2003))

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Urbanization 1960-2000	-6.515** (2.172)	-6.288* (2.752)	-6.426** (2.119)	-5.493** (2.032)	-5.536** (1.961)	-6.725* (2.517)	-7.395*** (2.061)		
Year since Independence	.106 (.069)								
Coups	.000 (.013)								
Civil Wars	-.006 (.022)								
GDP/c Growth 1960-2000		-.349 (2.262)							
Population Growth 1960-2000			-1.032 (2.542)						
Fertility Change 1960-2000				11.690* (5.215)	8.914 [†] (5.224)				
Mortality Change 1960-2000					-12.178 [†] (6.171)				
PolityIV 1975-2000						.001 (.005)			
Net Migration 1960-2000							.003 [†] (.001)		
Urbanization 1950-1975								-3.824* (1.609)	
Urbanization 1975-2000									-6.490** (2.210)
Constant	.702* (.268)	1.074*** (.151)	1.096*** (.129)	1.090*** (.112)	.979*** (.122)	1.085*** (.159)	1.128*** (.118)	.953*** (.104)	.853*** (.055)
N	42	34	42	42	42	37	42	42	42
R ²	0.26	0.19	0.20	0.29	0.36	0.19	0.27	0.12	0.18

[†] $p \leq 0.1$, * $p \leq 0.05$, ** $p \leq 0.01$; *** $p \leq 0.001$; standard errors in parentheses.

Table 6: Robustness Checks
(Dependent Variable: (Fearon, 2003))

							Excluding Small States	Excluding Large States	Excluding Oil States	Excluding Muslim States	Excluding Catholic States	Alesina as Dep. Variable
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Temperature	.577*** (.162)					.363* (.146)	.354* (.161)	.366* (.153)	.383* (.158)	.419* (.166)	.339* (.153)	.488** (.146)
Km ²		.057** (.019)				.038* (.015)	.037* (.018)	.039* (.017)	.045* (.018)	.055** (.018)	.034* (.016)	.034* (.015)
Urbanization			-6.553** (2.073)			-4.423* (2.148)	-4.426* (1.775)	-4.365* (1.819)	4.194* (1.879)	-4.735* (1.845)	-4.283* (1.797)	-3.837* (1.708)
Slave Exports				.027** (.008)		.015 [†] (.007)	.013 (.008)	.015 [†] (.008)	.014 [†] (.008)	.015 [†] (.008)	.011 (.008)	.010 (.007)
Urban Proportion					-7.538*** (2.079)							
Constant	-1.118* (.515)	.005 (.242)	1.076*** (.118)	.596*** (.044)	.923*** (.063)	-.741 (.495)	-.681 (.515)	-.757 (.517)	-.894 (.539)	-1.087 (.544)	.598 (.517)	-1.097* (.492)
N	42	42	42	42	42	42	39	39	36	34	38	42
R ²	0.24	0.18	0.20	0.22	0.25	0.53	0.47	0.52	0.54	0.62	0.45	0.52

[†] $p \leq 0.1$, * $p \leq 0.05$, ** $p \leq 0.01$; *** $p \leq 0.001$; standard errors in parentheses

Table 7: Changes in Ethnic Identity, 1961-1985
(Dependent Variable: Change in (Roeder, 2001), 1961-1985)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Urbanization, 1950-1975	-.957*** (.274)	-.982** (.297)	-1.014** (.298)	-.674* (.313)	-.632* (.306)	-.959** (.281)	-.879* (.355)	-.903* (.356)	-1.002*** (.279)
Urbanization, 1950		-.061 (.065)	-.062 (.066)						
Roeder 1961		.042 (.025)	.051 (.029)						
Temperature			-.046 (.034)						
Km ²			.002 (.004)						
GDP/capita, 1960				.003 (.010)	.001 (.009)				
GDP/c Growth, 1960-1975				-.202 (.256)					
GDP/c Growth, 1960-1985					-.493 (.319)				
Net Migration 1950-1975						.005 (.109)			
Polity IV 1960-1975							.002 [†] (.001)		
Polity IV 1960-1985								.002 [†] (.001)	
Fertility Change 1950-1975									1.209 (1.316)
Constant	.047** (.018)	.026 (.028)	.146 (.112)	.016 (.074)	.028 (.072)	.048* (.018)	.051* (.023)	.053* (.023)	.048** (.018)
N	42	42	42	35	35	42	22	21	42
R ²	0.23	0.29	0.33	0.17	0.22	0.23	0.34	0.37	0.25

[†] p ≤ 0.1, * p ≤ 0.05, ** p ≤ 0.01; *** p ≤ 0.001; standard errors in parentheses.

Appendix 1: Data Sources

Dependent Variables

Alesina: ELF as measured by (Alesina et al., 2003).

Fearon: ELF as measured by (Fearon, 2003).

Independent Variables

Geographic Variables

Arable: Percentage of a country's land which is potentially arable. Source: (FAO, 2000).

Coast: Natural log of the mean distance to the nearest coastline. Source: Center of International Development, Harvard University.

Elevation: Natural log of a country's mean latitude. Source: Center of International Development, Harvard University.

Latitude: Natural log of a country's central latitude. Source: Center of International Development, Harvard University.

Rainfall: Natural log of the average mean rainfall per country, 1961-2001. Source: (Mitchell, Carter, Jones, Hulme, & New, 2004).

Rivers: Natural log of the mean distance to the nearest sea-navigable river. Source: Center of International Development, Harvard University.

Temperature: The natural log of the average mean temperature per country, 1961-2001. Source: (Mitchell et al., 2004).

Historical Variables

Area: Natural log of a country's area in square kilometres. Source: Center of International Development, Harvard University.

Border Years: Natural Log of the number of years since 1880 that a given country's borders have been fixed. Source: (Hertslet, 1967).

Colonial Dummies

Belgian: Dummy equals 1 if a state was ever colonized by Belgium (n = 3) and 0 otherwise.

British1: Dummy equals 1 if a state was initially colonized by the UK (n = 15) and 0 otherwise.

British2: Dummy equals 1 if a state was ever colonized by the UK (n = 18) and 0 otherwise.

French1: Dummy equals 1 if a state was initially colonized by France (n = 13) and 0 otherwise.

French2: Dummy equals 1 if a state was ever colonized by France (n = 15) and 0 otherwise.

German: Dummy equals 1 if a state was initially colonized by Germany (n = 6) and 0 otherwise.

Italian: Dummy equals 1 if a state was initially colonized by Italy (n = 2) and 0 otherwise.

Portuguese: Dummy equals 1 if a state was initially colonized by Portugal (n = 4) and 0 otherwise.

Civil Wars: Number of years of post-colonial civil violence. Source: (Englebert et al., 2002).

Colonial Length: Natural log of the length of colonial rule. Source: (Olsson, 2010).

Coups: Natural log of the Total Military Intervention Scores (TMIS), calculated from data on coup plots, failed coups and successful coups. Source: (McGowan, 2003).

Fertility Change: Average annual rate of change in fertility. Source: United Nations Population Division, World Population Prospects.

Fractal: Natural log of a measure computing the degree by which a given country's non-coastal borders are straight lines, with the measure decreasing as the border approaches a straight line. Source: (Alesina et al., 2010).

GDP/capita Growth: GDP/capita growth per country. Source: (Heston, Summers, & Aten, 2009).

GDP/capita in 1960: Natural log of GDP/capita in 1960. Source: (Heston et al., 2009).

Mortality Change: Average annual rate of change per country in crude death rate. Source: United Nations Population Division, World Population Prospects.

Net Migration: Average annual rate of net migration per country. Source: United Nations Population Division, World Population Prospects.

Population Growth: Average annual population growth rate, 1850-2000. Source: (McEvedy & Jones, 1978) and United Nations Population Division, World Population Prospects.

Polity IV: Net change over time in a country's Polity IV rating. Source: Polity IV.

Religious Fractionalization: Religious fractionalization per country. Source: (Alesina et al., 2003).

Slave Exports: Natural log of the total number of slaves exported from a given state between 1400 and 1900, divided by the area of the state. Source: (Nunn, 2008).

Straight Line Dummy: A dummy variable taking the value of one when any of a country's borders are at least partially straight and zero otherwise. Source: (Englebert et al., 2002).

Straight Line Percent: The percentage of a number of a country's borders which are at least partially straight. Source: (Englebert et al., 2002).

Urbanization: Average annual urban population growth rate. Source: (United Nations, 2008).

Urban Proportion: Average annual growth in the proportion of people living in urban areas. Source: (United Nations, 2008).

Years since Independence: Natural log of the number of years since a given state's independence in 2000.¹⁸

¹ I would like to thank Sanghamitra Bandyopadhyay, Tim Dyson, Sean Fox and Eric Kaufmann for comments and suggestions. All errors remain my own.

² The next highest region is Asia.

³ See for instance (Easterly & Levine, 1997; Miguel & Gugerty, 2005), among many others.

⁴ In these datasets the measure of ethnolinguistic fractionalization index (ELF) ranges between 0 (complete homogeneity) and 1 (complete heterogeneity), as computed by adding the squared percentages of each ethnic group larger than 1% of the population and subtracting the total from 1.

⁵ This problem is not fully addressed in two previous attempts at explaining ethnic diversity, namely (Ahlerup & Olsson, 2009; Michalopoulos, 2008), both of which develop formal models of ethnogenesis in the pre-modern world without any attempt to control for the numerous variables that have shaped ethnic diversity in the modern era.

⁶ It is thus also not surprising that (Michalopoulos, 2008) finds no correlation between state size and ethnic diversity on a global scale.

⁷ As a possible result of these miscoding problems, (Alesina et al., 2003) list Tanzania's ethnic diversity score as only 0.735, far below both (Fearon, 2003)'s score of 0.95 and the 1967 Tanzanian census's score of 0.96 (Government of Tanzania, 1969). (The 1967 census was the last to measure ethnicity in Tanzania.)

⁸ For all data sources see Appendix 1.

⁹ Specifically, the Pearson correlation coefficients are -0.42 ($p = 0.14$) for Alesina and -0.12 ($p = 0.68$) for Fearon.

¹⁰ Thus our base category here includes uncolonized states like Ethiopia and Liberia alongside the DRC (colonized by Belgium) and Equatorial Guinea (colonized by Spain).

¹¹ More specifically, many African states had multi-party systems when they became independent in the 1960s and thus measuring the change from independence to 2000 would show little variation.

¹² Specifically, Djibouti, Gabon and Swaziland.

¹³ Ethiopia, the DRC and Sudan.

¹⁴ These are Angola, Cameroon, Chad, Gabon, Nigeria, Republic of Congo and Sudan. The same result holds when we exclude countries with more than 100 million barrels (the above plus DRC, Cote d'Ivoire and Mauritania). For more on the relationship between oil, ethnic fractionalization and underdevelopment see (Hodler, 2006).

¹⁵ Data on religion is from (LaPorta, Lopez-de-Silanes, Shleifer, & Vishny, 1999). States with a Muslim majority include Djibouti, the Gambia, Guinea, Mali, Mauritania, Niger, Senegal and Somalia, while those with a Catholic majority include Angola, the Republic of Congo, Gabon and Rwanda.

¹⁶ We cannot create more than a 10-year lag as the UN data on urbanization only goes back to 1950.

¹⁷ See a similar complaint from (Przeworski, 2006, p. 323), who claims that "'primordialism' is out of fashion and these days everyone is a 'constructivist.' But most 'constructivists' are just 'primordialists one step removed: they invariably assume that identities are made out of something taken as primitives."

¹⁸ We chose the year 2000 as that is approximately the date of the data computed by (Alesina et al., 2003; Fearon, 2003).