

The Origins of Inequality in Sub-Saharan Africa

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1. Introduction

Economic inequality can be conceived of on a number of scales, from the international (Deaton 2013, Milanovic 2016) to the regional (Milanovic 2005, Ezcurra and Rodríguez-Pose 2013) and individual levels (Piketty 2014).¹ Recent research has demonstrated that an important source of within country inequality is inequality *between* ethnic groups (Alesina, Michalopoulos et al. 2016). For example, incomes in the United States vary substantially by racial and ethnic origins; according to 2015 census data, the median income of Asian Americans is almost double that of African Americans (Proctor, Semega et al. 2016). This kind of ethnic group stratification has long been held to be a major cause of ethnic voting and even ethnic conflict (Horowitz 1985). However, it is also the case that inequality *within* groups varies significantly (Huber and Suryanarayan 2015, Kochhar and Cilluffo 2018), and that this variation may condition the effect of between group inequality on political behavior (Houle 2015, Houle, Kenny et al. 2018). Nowhere is this issue more salient than in Sub-Saharan Africa, where ethnic groups display large differences in their levels of both between and within group inequality (Houle and Bodea 2017).

Although between group inequality has been shown to be largely determined by disparities across groups in access to resources such as rivers, high quality soils, and minerals (Alesina, Michalopoulos et al. 2016), in this paper we show that these kinds of disparities only partially explain levels of within group inequality. Additionally, we argue that the political institutions that govern how access to public goods are distributed among group members and

¹ For overviews of this literature, see (Neckerman and Torche 2007, Galbraith 2016)

how public officials are held to account are likely to be important determinants of inequality within groups. Superior public goods provision and greater accountability of political leaders should be associated with reduced inequality. An ethnic group's political institutions are of course partly endogenous to the geographic conditions prevailing in and around a group's homeland; but geography is not destiny. Rather, groups can and do develop different institutional solutions to similar geographic and political ecologies (Fenske 2013). For example, some groups in control of territories with rich mineral deposits concentrate the gains among a small elite, while others distribute those gains widely by financing and effectively providing public goods and mitigating corruption.

We argue that contemporary within group inequality in Africa is partly determined by a group's historical *stateness*. While the origin of the state has typically been positively associated with the emergence and persistence of socioeconomic inequality (Boix 2015, Scott 2017), we argue that groups with historically more state-like institutions should tend to have *lower* current levels of inequality. This apparent paradox prevails because contemporary public goods provision and political elite accountability are higher among groups with historically more complex political organizations. Ethnic groups that were governed by hierarchical chiefdoms or kingdoms prior to Western colonial rule have inherited a legacy of powerful traditional leaders and chiefs (Herbst 2000). First, because of their close relationships with community members, traditional elites have both the capacity and incentive to deliver local public goods (Baldwin 2018). Second, in spite of their undemocratic credentials, traditional leaders whose institutional origins go back before colonial rule are more accountable than weak, centrally appointed bureaucrats or even chiefs of more recently created lineages (Boone 2003: 92-137, Nathan

2019), thus mitigating—though not eliminating—corruption. Both of these processes in turn should lead to lower inequality.

We test the effect of pre-colonial state centralization on inequality using survey data from the Afrobarometer and the Demographic and Health Surveys (DHS). These surveys provide information on the ethnicity of the respondents as well as information that can be used to estimate the wealth of each respondent. This enables us to develop a novel measure of group inequality. We capture pre-colonial centralization using Murdock’s Ethnographic Atlas (1967). We find strong evidence in favor of our main hypothesis: ethnic groups with more centralized pre-colonial institutions are more equal today. We also test some of the implications of the two mechanisms we propose using respondent-level data from the Afrobarometer, and find support for both mechanisms.

Our findings provide further evidence of the long socioeconomic shadow cast by historical institutions (e.g., Acemoglu, Johnson, et al. 2001, Iyer 2010, Lee, A. and K. Schultz, 2012). In spite of the substantial social, economic, and political dislocations of colonial rule and the further administrative reforms wrought by new indigenous governments in the decades since independence, pre-colonial political institutions continue to have an effect on current economic outcomes that is independent of geography (Boone 2003, Gennaioli and Rainer, 2007, Fenske 2013, Michalopoulos and Papaioannou 2015a, Michalopoulos and Papaioannou 2015b). Our findings also expand on recent research on the effects that traditional leaders or chiefs play in developmental outcomes in present day Africa through their role in delivering public goods (Acemoglu, Reed et al. 2014, Baldwin and Raffler 2017, Baldwin 2018, Wilfahrt 2018, Nathan 2019). We show that chiefs are more likely to play a positive role in the provision of public goods in ethnic groups with a legacy of greater political complexity. Although this outcome may

be partially due to a bottom up electoral mechanism, we argue that traditional chiefs may also have greater upward accountability, with positive implications for public goods provision and corruption even in non-democratic settings.

2. Argument

Although socioeconomic inequality was instrumental to the rise of the state, we theorize that a historical legacy of pre-colonial *stateness* should today be associated with *lower* levels of economic inequality within groups today. The substantial role of the modern state in public goods provision has disrupted the historical relationship between stateness and inequality (Lindert 2004, Scheve and Stasavage 2016). States that effectively provide public goods such as education and healthcare and that can effectively enforce the rule of law have lower inequality today. We argue that pre-colonial African stateness is associated with superior public goods provision and greater accountability, both of which should lower inequality.

The emergence of political complexity—culminating in the centralized state—was conditional, first, on increases in population (Turchin, Whitehouse et al. 2018), and second, on the development of socioeconomic stratification (Flannery and Marcus 2012, Boix 2015). Early states, from the Fertile Crescent to China to India, were characterized by high levels of inequality as the political elite appropriated economic surpluses (Mayshar 2018, Morris 2010, Scott 2017). Indeed, with the partial exception of Classical Greece (Ober 2015), prior to the development of the welfare state, stateness and inequality have gone hand-in-hand.

Sub-Saharan Africa has been no exception to this general rule. The production of agricultural surpluses, population pressures, and inequality have been necessary, though not sufficient, conditions for the development of political complexity (Connah 2016, Ehret 2016; for

an alternative perspective see Dueppen 2014). In general, in fact, state development in Africa generally came late, as there remained extensive “open” territories into which expanding populations could move (Herbst 2000). Incumbent hunting-gathering groups could either be displaced or incorporated into gradually expanding agricultural societies as sources of wild produce and resources. The circumscription of populations that drove social complexity in Nilotic Africa and the Fertile Crescent was largely absent south of the Sahara (Carneiro 1970). However, while most ethnic groups in Sub-Saharan Africa had very simple political structures on the eve of Western colonization, there were some substantial kingdoms with high rates of urbanization and centralization. These states—including the Kingdom of the Kongo and the Ashanti Kingdom—arose where geography tended to limit expansion and where agriculture was amenable to the production of surpluses.

Within present-day Sub-Saharan African states, we posit that those groups with a legacy of pre-colonial stateness are better able to deliver on public goods and are likely to have lower levels of misappropriation of state resources. As a consequence they should have lower inequality. Even relatively weak states in Sub-Saharan Africa are expected to deliver public goods such as education and healthcare. States also must provide justice and deliver on a range of other bureaucratic responsibilities. The better these goods and services are provided, the lower should be socioeconomic inequality. In the African context, however, because national states have low levels of capacity, the actual delivery of public goods depends very much on the quality of the local institutions and intermediaries who provide them, namely headmen, chiefs, and other tribal leaders (Baldwin and Raffler 2017, Baldwin 2018, Wilfahrt 2018, Kramon 2019, de Kadt and Larreguy 2018). Moreover, chiefs or traditional leaders whose lineage extends back in time before the colonial period—rather than to the colonial period itself—should be less

subject to capture and have even greater formal and informal authority to positively impact the distribution of public goods (Nathan 2019). Thus, historical stateness should affect the quality of local government through the prominent contemporary role played by traditional leaders.

We are not the first to posit such a connection between historical stateness and present-day governance in the African context. First, Nathan (2019) argues that chiefs in Ghana whose lineage extends prior to colonial rule are more accountable to their co-ethnic clienteles than chiefs or leaders whose positions the British created during colonial rule. Our focus on accountability echoes that of Nathan (2019) but we argue that this mechanism does not rely on electoral incentives. Rather we expect it to operate also in non-democracies. Second, Wilfahrt (2018) argues that ethnic groups with stronger collective identities should have better public goods provision. She writes that “Areas home to precolonial kingdoms were endowed with collective identities stretching across villages, but in historically acephalous areas—those lacking hierarchical precolonial political institutions—such cross-village ties are absent” (Wilfahrt 2018: 240). In turn, public goods distribution should be superior among more state-like groups as they can better solve coordination and collective action problems. Wilfahrt’s (2018) causal mechanism, however, relies on the assumption of the ethnic congruence of local government units. We posit two additional mechanisms through which historical stateness should affect contemporary public goods provision and quality of government that do not depend on this condition.

First, we expect local leaders from historically more hierarchical states to have greater *capacity* to provide public goods. Previous research has found evidence that historical stateness is associated with generally superior bureaucratic and administrative capacity, even controlling for varied geographic inheritances (Fenske 2013, Archibong 2015). There is also direct cross-

national evidence that historical stateness is associated with higher levels of contemporary public goods provision (Gennaioli and Rainer 2006, Gennaioli and Rainer 2007, Archibong 2015), which should in turn lower inequality.

We follow recent research on public goods provision in Africa in locating the causal mechanism behind these results in the role played by chiefs or traditional leaders (Baldwin and Raffler 2017, Baldwin 2018, Wilfahrt 2018, Henn 2018). Prior to the onset of colonial rule, local chiefs played the key role in the provision of public goods, not least through the coordination of local labour and the performance of judicial functions. Owing to the predominance of indirect over direct rule in Sub-Saharan Africa, chiefs' administrative roles were altered but not significantly diminished (Chanock 1985, Geshiere 1993, Boone 2003). Even with the benefit of imperial backing, chiefs were still substantially accountable to their co-ethnics (Baldwin 2018: 29-32). Where indigenous chieftains were weak or absent, colonial governments were less able to tax and spend, leaving behind a post-independence legacy of low institutional capacity (Bolt and Gardner 2016). Moreover, in spite of the antipathy of many African nationalist leaders after independence, the role of traditional leaders in governance in contemporary Africa remains substantial (Koter 2016, Baldwin 2018). Boone (2003: 58), for example, notes that even in the case of Senegal, the elimination of the formal administrative role of cantonal chiefs "did not put an end...to their power as rural political leaders."

Chiefs, in part because of their deep embeddedness in local communities, are better able to organize the delivery of local public goods, such as school or health center construction, especially where this requires the contribution of voluntary labor from residents (Baldwin 2018: 10-11). Traditional leaders, in other words, have access to an informal organizational resource, which facilitates the delivery of local public goods. Contemporary localities without traditional

leaders do not have the capacity to coordinate the implementation of nationally funded development projects. Additionally, evidence indicates that traditional chiefs play a significant role in disputes over resources, especially land (Goldstein and Udry, 2008, Baldwin 2013). There is also evidence that historical stateness is associated with more effective enforcement of property rights (Boone 2003). Equal access to the law, even if in traditional courts, should be associated with lower inequality (Bennett and Nikolaev 2016). We thus expect inequality lower among groups with historically higher levels of stateness.

Second, we expect local leaders from historically more hierarchical states to be more accountable and hence to be less corrupt than appointed bureaucrats. Previous research has demonstrated that traditional chiefs may have a paradoxically positive role in the provision of responsive government in *democratic* Africa (Baldwin 2016, Baldwin and Raffler 2017, Carlson and Seim 2018, Nathan 2019). The legitimacy of traditional leaders depends in part on the perception that they share the wealth rather than overtly monopolize it themselves (Acemoglu, Reed et al. 2014). Moreover, local chiefs have a significant influence on the political behaviour of their constituents in national elections (Koter 2013, de Kadt and Larreguy 2018). For national political elites seeking to gain favour with their constituencies, delivering on local public goods through traditional leaders is good electoral politics.

However, we suggest that traditional leaders are likely to be more accountable—and hence to deliver higher quality government—also in authoritarian systems when they can be effectively monitored from *above*. Even in authoritarian systems, national leaders have an incentive to limit the rents obtained by local elites (North, Wallis et al. 2012). Hence misgovernance should be lower where local leaders are more accountable to superiors, mitigating the principal agent problem. Historically more centralized groups had a higher degree

of accountability of traditional local leaders to their superior chiefs or kings (Herbst 2000, Boone 2003, Gennaioli and Rainer 2006). Colonial rule likely made traditional chiefs less accountable to citizens (Mamdani 1996, Palagashvili 2018), but local leaders remained dependent on patronage from above (Crowder and Ikime 1970). In the post-independence period, centralization dependent in part on the degree to which brokers' access to rents depended on centrally allocated privileges rather than autochthonous control over the local economy (Boone 2003: 90). More generally, while traditional leaders' brokerage position in national patronage networks does provide some opportunity for graft, their ability to engage in graft is mitigated in more centralized patronage networks (Kenny 2017). Where central control over local leaders is higher, the latter can be sanctioned or even removed if they are seen by superiors to be engaging in the excessive extraction of rent. In contexts such as Sub-Saharan Africa, where corruption is such a common source of wealth, this greater top-down accountability should lower inequality (Gyimah-Brempong 2002, Dincer and Gunalp 2012).

3. Data

Our sample consists of all ethnicities reported by at least twenty respondents in the Afrobarometer and Demographic and Health Survey (DHS) rounds. Due to availability of questions needed to construct our dependent variable, rounds one and two of Afrobarometer are excluded. For the DHS, we include all survey rounds for all years from sub-Saharan Africa. We pool these surveys and rounds together, leaving us with ethnicities from 32 countries over the time period of 1986—2017.

We take the ethnicities reported in the surveys and match them to Murdock's Ethnographic Atlas. Matching was done by consulting Nunn and Wantchekon (2011) and Olson

(1996). Olson was further used to track alternative spellings and splintering of groups post-colonialism. Overall, we were able to match 280 ethnicities in 32 countries for 1,644 total observations (Table A1 in the appendix displays all country-years observed).

Our unit of analysis is survey-country-ethnicity. In this way, the same ethnicity in two separate countries constitutes two separate observations. This is both preferable and necessary as many control variables in our analysis relate to the modern government and context of the group.

3.1. Dependent Variable

Unfortunately, the Afrobarometer and the DHS do not have questions that directly capture the income of the respondents. Regardless, most African countries are relatively poor, and a large fraction of their citizens do not have access to monetized income (Baldwin and Huber 2010; Bratton 2008). Using cash income would thus be inappropriate to capture inequality in these countries.

The Afrobarometer and the DHS, however, have questions about the ownership of a number of assets. Previous authors have employed these questions to construct measures of the wealth of the respondents as well as inequality within and between ethnic groups (e.g., Baldwin and Huber 2010; Dionne et al. 2014; Houle 2015). We follow the same approach. The DHS asks respondents whether they have the following goods: a refrigerator, a television, a radio, access to electricity, a bicycle, and a car. For each respondent, we create a variable ranging from 0 to 6, where 0 indicates that the individual does not possess any of these goods, and 6 that the person possesses them all. Similarly, the Afrobarometer asks respondents whether they own a radio, a television, and a motor vehicle. Using these questions, we construct an indicator ranging from 0 to 3.

We use information on the ethnicity of the respondents to construct a measure of inequality for each ethnic group of each country. The inequality level of an ethnic group is calculated as the Gini coefficient among its members. For all countries, we calculate a Gini coefficient for each group separately. The Gini coefficient is computed using the command ‘ineqdec0’ in Stata.

3.2 *Independent Variables*

Our main independent variable of interest comes from Murdock’s Ethnographic Atlas (1967) (from hereon “the Atlas”) and measures precolonial tribal jurisdictional hierarchy beyond the local level. Based on Murdock’s original map of 1959, the version of the Atlas georeferenced by Nunn (2008) yields 843 unique ethnic homelands in sub-Saharan Africa. The Atlas has been used frequently in recent research on the effects of pre-colonial institutional and socioeconomic factors on contemporary development (Fenske 2013, Michalopoulos and Papaioannou 2015a, Michalopoulos and Papaioannou 2015b, Nunn 2008, Nunn, Puga et al. 2012, Nunn and Wantchekon 2011).

“Jurisdictional hierarchy” is an ordinal variable and ranges from 0—4, where zero indicates “stateless societies,” one and two indicate “petty and larger paramount chiefdoms or their equivalent,” and three and four indicate “large states.” Recent cross-validation has shown this measure to be accurate in terms measuring political centralization of precolonial ethnicities (Michalopoulos and Papaioannou 2011). Overall, approximately 16% of observations fall in the “stateless” category, 43% are coded as 1, 26% a 2, and 15% a 3. No observed ethnicities were coded at the highest level of jurisdictional hierarchy.

We include several controls both at the group- and country-level in our analysis. First, in terms of economic variables, we first include an index measuring reliance on hunting, gathering, and fishing as a proxy for precolonial inequality (“Mode of Production”). Work by Smith, Borgerhoff Mulder et al. (2010) and Boix (2015) has shown more reliance on these as opposed to pastoralism as a strong indicator of inequality. We further account for contemporary per capita GDP of the country (logged).

Next, we include several geographical variables to account for differences in resources and factor endowments. First, a measure of terrain ruggedness from Nunn and Puga (2012). The terrain ruggedness index measures variation in elevations throughout the area. More variation indicates higher difficulty in terms of land cultivation, hurting prospects of economic development. Similarly, we include measures of distance from the coast (Fenske 2014) and the proportion of soil that is suitable for agriculture in an ethnic homeland (Nunn and Puga 2012) to account for differing types of variation in factor endowments.

In countries with multiple ethnic groups, ethnicity likely play a more salient role in politics, which may incite groups to adopt policies targeted at their own group, thus reducing their within-group inequality. Yet at the same time, ethnic diversity may also be correlated with centralization. For example, it is possible areas that were more diverse had more difficulty in terms of building up centralized institutions. Thus, we finally include a measure of ethno-linguistic fractionalization of the country.

In addition, we add further controls in additional models to ensure robustness. First, in addition to the measure of overall soil fertility, we utilize pixel-level soil quality measures from Michalopoulos and Papaioannou (2013). They report soil quality for pixel areas 0.125 degrees by

0.125 degrees, matched to the ethnicity occupying the area. We utilize variations in these sub-ethnic pixels to calculate Gini coefficients capturing disparity of soil quality for each ethnicity.

It has been shown that protestant missions specifically have aided in the development of the region. They are specifically associated with a heightened level of book printing (Eisenstein 1979, 403–23), an advocacy of mass literacy (Woodberry 2012), and an increase in education and development leading to a stronger middle class (Lankina and Getachew 2012), thereby reducing within-group inequality. The locations of protestant missions, of course, may well be endogenous to pre-colonial institutions. Thus, we utilize spatial data (Nunn 2014) to map protestant missions to Murdock’s ethnic boundaries, and include a control for the number of missions within each ethnic area.

Additionally, as a proxy for contemporary development, we include a measure of average luminosity for the ethnic group, taken from satellite imagery in 2007-2008. The measures are calculated for a roughly square-kilometer area, and aggregated to the ethnicity-level (Michalopoulos and Papaioannou 2013). We finally add a measure of overall ethnic group size, constructed using data from the Joshua Project. Our results remain robust across all model specifications.

4. Empirical Analysis

4.1 Main Analysis

Table 1 tests the effect of pre-colonial centralization on contemporary inequality using OLS. Model 1 runs the analysis without country fixed effects. As expected, ethnic groups that had more centralized political institutions prior to colonization are more equal today. It is possible that country-specific factors that are not included in the estimation influence group

inequality. In order to account for this possibility, model 2 includes country fixed effects. This model does not control for ethnic fractionalization because it is time-invariant. Once again, we find that centralized groups have lower levels of inequality, and the effect is statistically significant at the 1 percent level.

Figure 1 shows predicted Gini coefficients at different *Pre-Colonial Centralization* levels based on model 2. As explained above, *Pre-Colonial Centralization* has four values: 1, 2, 3 and 4. A value of 1 ('No Levels') indicate "stateless societies," 2 ('One Levels') "petty and larger paramount chiefdoms or their equivalent," and 3 ('Two Levels') and 4 ('Three Levels') "large states." As shown in the figure, increasing *Pre-Colonial Centralization* has a strong negative effect on the Gini coefficient. The effect of increasing *Pre-Colonial Centralization* by one unit is not statistically significant, but increasing it by two units always have a statistically significant effect (at the 5 percent level). For example, increasing *Pre-Colonial Centralization* from 1 to 3 decreases the Gini coefficient from 43.29 (95 percent confidence interval: 42.07- 44.51) to 41.17 (95 percent confidence interval: 40.58-41.77).

Table 1: Effect of Pre-Colonial Centralization on Group Inequality

	(1)	(2)	(3)
Pre-Colonial Centralization	-0.0108*** (0.00372)	-0.0106*** (0.00352)	-0.0135*** (0.00415)
Mode of Production	0.00304 (0.00287)	0.00427 (0.00301)	0.00738** (0.00326)
Ruggedness	-6.92e-08 (6.37e-08)	-1.12e-08 (6.86e-08)	2.31e-08 (8.66e-08)
Distance from the Coast	0.00296** (0.00125)	0.00822*** (0.00150)	0.00716*** (0.00180)
Soil Quality	-0.00101*** (0.000206)	-0.00231*** (0.000465)	-0.00147*** (0.000504)
GDP pc (logged)	-0.0441*** (0.00532)	-0.130*** (0.0210)	-0.145*** (0.0211)

Ethnic Fractionization	-0.119*** (0.0277)		
Mean Luminosity			-0.00475*** (0.00116)
Soil Quality Gini			0.193*** (0.0313)
Group Size			-0.113*** (0.0341)
Protestant Mission Density			-0.000813 (0.000659)
Country FEs	N	Y	Y
Observations	1,182	1,182	970
R-squared	0.155	0.381	0.389

Notes: All models are estimated with OLS. Robust standard errors in parentheses.
 *** p<0.01, ** p<0.05, * p<0.1.

Model 3 adds additional control variables. In order to account for the wealth of the group, we control for the average level of luminosity of the ethnic homeland. We also control for the density of protestant missions within the ethnic homeland as well as the size of the group. Finally, we add a variable to account for the variation in soil quality within the ethnic homeland (*Soil Quality Gini*). These control variables are not included in the other models because of missing values. As before, we find that pre-colonial centralization reduces inequality and the effect is again highly significant.

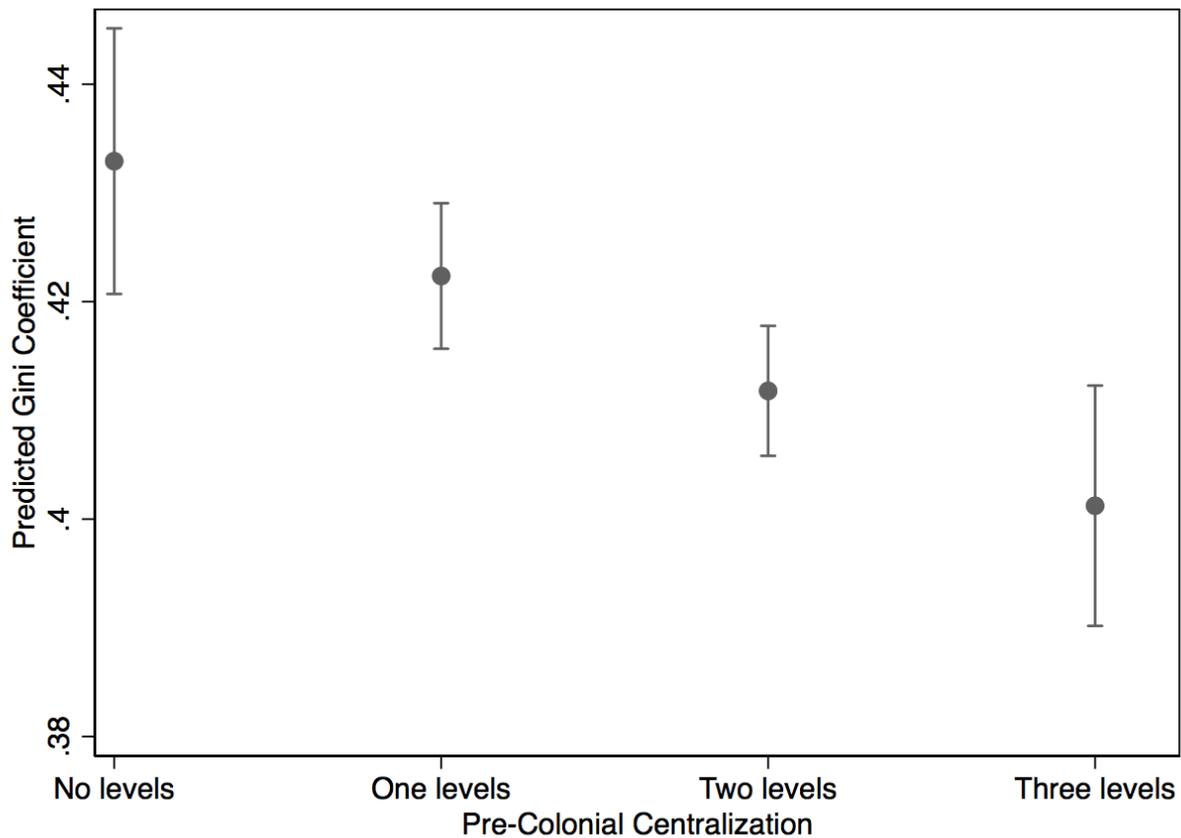


Figure 1: Effect of Pre-Colonial Centralization on Predicted Inequality Level

One very interesting finding is that *Soil Quality Gini* has a strong positive effect on group inequality. In other words, inequality in land quality among members of the same ethnic group increases inequality among members of the group. This finding parallels the result of Alesina et al. (2016), according to which inequality in factor endowments *between* the ethnic homelands of *different* ethnic groups is among the main determinants of inequality *between* ethnic groups. To our knowledge, this is the first paper to show that the same applies to within group inequality: differences in factor endowment within ethnic homeland increases group inequality. However, it is notable that even controlling for these uneven geographical inheritances, political institutional legacies continue to have a significant effect on contemporary levels of within group inequality.

4.2 *Testing the Mechanisms*

This section tests some of the implications of the two mechanisms we presented above. All tests rely on the Afrobarometer, since the questions we used are not asked in the DHS. While in the main analysis the unit-of-analysis was the ethnic group-survey year, in the analyses presented in this section, the unit-of-analysis is the respondent-year. In order to account for systematic differences across countries, all models presented in this section employ multilevel models. In models 1 and 2, the dependent variable is binary. Therefore, we use multilevel probit models. In models 3-7, the dependent variable is continuous and thus, we use mixed-effects models.

According to the first mechanism, ethnic group with centralized pre-colonial institutions will be more likely to have the capacity to distribute public goods among the group's members. Public goods, in turn, reduce group inequality. This mechanism has several implications. First, it suggests that members of groups that had strong institutions prior to colonization should be more likely to believe that traditional elites should be responsible for delivering public goods. Models 1 and 2 employ questions from the fourth round of the Afrobarometer to test whether this is the case. In model 1 we use a question that asks respondent to identify which group should, according to them, manage schools: the central government, the local government, traditional leaders, members of the community or none of them. We code a dummy variable, *Traditional Leaders Education*, that takes the value one if the respondent answers 'traditional leaders' and zero otherwise. The dependent variable in model 2, *Traditional Leaders Health*, is constructed in a similar manner, but instead of looking at whether respondents believe traditional leaders should manage education, it captures whether they believe traditional leaders should manage health clinics. As shown in the table, we find strong evidence that members of groups with centralized

pre-colonial institutions are more likely to believe that traditional leaders should be responsible for managing schools and health clinics.

Table 2: Tests of the Mechanisms

	Trad. Leaders Educ.	Trad. Leaders Health	Interviewer Public Goods	Quality Schools	Quality Health	Trad. Leaders Corruption	Quality Local Government
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Pre-Colonial Cent.	0.0746*** (0.0286)	0.0616** (0.0304)	0.00517*** (0.00103)	0.0111*** (0.00228)	0.0156*** (0.00197)	-0.00434** (0.00192)	0.00270** (0.00123)
Education	-0.0234* (0.0129)	-0.0232* (0.0140)	0.0209*** (0.000447)	-0.00466*** (0.000994)	-0.00132 (0.000865)	0.00922*** (0.000836)	-0.000564 (0.000537)
Gender	0.0143 (0.0434)	0.0271 (0.0467)	0.0126*** (0.00158)	0.0167*** (0.00344)	0.0113*** (0.00301)	-0.000238 (0.00298)	0.0108*** (0.00190)
Age	0.000658 (0.00157)	0.000190 (0.00171)	0.000217*** (5.65e-05)	0.000388*** (0.000126)	0.000340*** (0.000108)	-4.95e-05 (0.000108)	-4.89e-05 (6.83e-05)
Urban	-0.190*** (0.0518)	-0.203*** (0.0559)	0.293*** (0.00175)	-0.000647 (0.00384)	-0.0213*** (0.00334)	0.0331*** (0.00331)	0.0251*** (0.00211)
# Countries	19	19	26	25	25	26	26
Observations	15,709	15,677	79,957	27,098	32,665	35,874	78,209
Log Likelihood	-1919.421	-1615.911	8184.673	-3541.861	-2944.953	-4733.878	-5531.079

Notes: Models 1-2 are estimated using multilevel probit models and models 3-7 multilevel mixed-effects models. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

A second implication of the first mechanism is that members of groups with centralized pre-colonial institutions should have access to more public goods and the public goods they receive should be of better quality. Model 3 looks at whether members of these groups receive more public goods. The dependent variable, *Interviewer Public Goods*, is constructed from a series of questions asked in rounds 3-6 of the Afrobarometer. These questions are answered by the *interviewers* of the Afrobarometer, not the interviewees. They ask whether the neighborhood inhabited by the respondents have the following: an electricity grid, a pipe water system, a sewage system, a post-office, a school, a police station, a health clinic, and paved roads. Each of

these questions are recoded such that they take the value one if the respondent's neighborhood has these goods and zero otherwise. We then compute *Interviewer Public Goods* as the average of all questions. It thus ranges from 0 to 1, where 1 means that the respondent's neighborhood has all the listed public goods. As shown in model 3 of Table 2, we do find that members of groups that were centralized prior to colonization have access to more public goods, and the effect is highly statistically significant.

Models 4 and 5 address the issue of the quality of public goods. Both models use rounds 3 and 5 of the Afrobarometer. The dependent variable in model 4, *Quality Schools*, captures diverse aspects related to the quality of schooling in the area inhabited by the respondents. The questions capture: whether schooling is affordable, whether schools lack textbooks and other supplies, the quality of the teachers, whether teachers often miss classes, whether classes are overcrowded, and the quality of school facilities. Again, we recoded all questions such that they range from 0 to 1, where 1 indicates that schools are of the highest quality.

The dependent variable used in model 5, *Quality Health*, is similar but captures the quality of health services rather than of education services. As shown in models 4 and 5 of Table 2, we find that members of groups with high *Pre-Colonial Centralization* values are more likely to have access to high quality education and health services. Thus, we find strong evidence in favor of the first mechanism: members of groups that had centralized institutions before colonization are more likely to believe that traditional leaders should be responsible for providing public goods, they are likely to have access to more public goods, and the public goods they receive are of higher quality.

According to the second mechanism, traditional leaders of ethnic groups with strong pre-colonial institutions are subject to more accountability. This increases the incentives of

traditional leaders to make decisions that benefit the group as a whole. They also should be less likely to indulge in corruption and be more likely to provide good governance. This, in turn, should decrease inequality. The literature as long demonstrated that corruption and the lack of accountability tends to increase inequality at the country-level (Gupta et al. 1998). This effect should be even stronger within Africa where economic wealth is often accumulated through political power, as opposed than through the private sector, for example. Note that although this mechanism is related to the first mechanism, it is theoretically distinct. One potential implication of this mechanism, for instance, is also that groups with high *Pre-Colonial Centralization* levels should be more likely to receive public goods, since traditional leaders have more incentives to target all members of the group. However, the rationale driving this effect is different. According to the first mechanism, pre-colonial centralization increases the *capacity* of the group to provide public goods. According to the second mechanism, it also creates *motivations* for group leaders to do so.

Model 6 of Table 2 tests the most direct implication of the second mechanism, i.e. that traditional leaders of groups with centralized pre-colonial institutions are perceived as being less corrupt. The dependent variable, *Traditional Leader Corruption*, is constructed from a question in rounds 4 and 6 of the Afrobarometer. It asks whether the respondents believe that traditional leaders are corrupted. We recoded the variable such that it lies between 0 and 1, where 1 indicates that the respondent believes that traditional leaders are highly corrupted. As expected, members of groups with centralized pre-colonial institutions are less likely to view their traditional leaders as being corrupted and the relationship is significant at the one percent level.

One limitation with model 6 is that it covers only two rounds of the Afrobarometer. Model 7 presents another test that uses a large number of questions rounds 3-6 of the

Afrobarometer to capture the quality of local governments. In sub-Saharan Africa, there is often a strong relationship between traditional leaders and local governments (Wilfahrt 2018).

Traditional leaders, for example, often sit on local government councils. We should thus expect *Pre-Colonial Centralization* to increase the quality of local governments.

The variable *Quality Local Government* is constructed from questions that ask whether local governments do a good job at: maintaining roads, keeping the community clean, collecting local taxes, making spending decisions, maintaining local markets, handling health standards in restaurants, collecting license fees, collecting rates on private houses, and handling the use of land. As shown in model 7 of Table 2, we find that *Pre-Colonial Centralization* increases the quality of local governments.

On balance, we thus find evidence in favor of both mechanisms. Again, although the two mechanisms are clearly *theoretically* distinct, they do have a number of common *implications*. Therefore, it is somewhat difficult based on the data to clearly distinguish between the two mechanisms. In any event, the general argument developed in the theoretical section is strongly supported by the empirical evidence.

5. Conclusion

This paper has shown that pre-colonial institutions have had a strong effect on the development of group inequality in sub-Saharan Africa. In particular, groups that had highly organized and centralized political institutions prior to colonization became more equal after colonization than those that lacked such institutions. We proposed two mechanisms that could explain the relationship. First, ethnic groups with centralized pre-colonial institutions can more easily distribute public goods among their members. Public good provision, in turn, reduces

group inequality. Second, highly organized ethnic groups have more within-group accountability. Village chiefs, for example, are more likely to be accountable to higher level group authorities. This structure of accountability, in turn, forces local leaders to make decisions that benefit group members as a whole instead of a small group of local elites. Accountability also reduces opportunities for corruption. Therefore, in groups with centralized pre-colonial institutions, inequality between local elites and the rest of group members should be lower.

We tested the aggregate effect of pre-colonial centralization as well as the two mechanisms using data from the Afrobarometer and the DHS. Our main analyses show that pre-colonial centralization has a strong negative effect on contemporary inequality. We also find strong evidence in favor of key implications of our mechanisms: members of groups with strong pre-colonial institutions are more likely to believe traditional leaders should be responsible to provide public goods, that they receive more and better public goods, that they are less likely to believe that traditional leaders are corrupted and that they believe that local governments are of better quality.

These findings have important implications for the literature. They suggest that pre-colonial institutions continue to have important political and economic effects in sub-Saharan Africa, notably through their effect on group inequality. The previous literature has shown that ethnic groups with within group equality, when combined with between group inequality, increases ethnic voting (Houle et al. 2019), destabilizes democracies (Houle 2015), fosters coups (Houle and Bodea 2017), but reduces the likelihood of a civil war (Huber and Mayoral 2019). Our results thus imply that pre-colonial institutions may have an indirect effect – operating through group inequality – on these different factors.

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Appendix 1

Table A1: Country-Years Observed

Country	Years
Benin	1996 2001 2006 2008* 2010* 2011 2015* 2017*
Botswana	2008* 2010* 2015* 2017*
Burkina Faso	1993 1999 2003 2010 2010* 2014 2015* 2017*
Central African Republic	1994
Cameroon	1998 2004 2015* 2017*
Chad	1997 2004 2014
Congo	2005 2009 2011
Cote d'Ivoire	1998 2005 2012 2015* 2017*
DR Congo	2007 2013
Ethiopia	2000 2005 2011 2016
Gabon	2000 2012 2017*
Gambia	2013
Ghana	1988 1993 1998 2003 2008 2008* 2010* 2013 2015* 2016 2017*
Guinea	1999 2005 2012 2015* 2017*
Kenya	1989 1993 1998 2003 2008 2008* 2010* 2014 2015 2015* 2017*
Lesotho	2008* 2010* 2015* 2017*
Liberia	2009 2010* 2011 2013 2015* 2017*
Madagascar	2008* 2010* 2015* 2017*
Malawi	2000 2004 2008* 2010 2010* 2012 2014 2015 2015* 2017*
Mali	1987 1996 2001 2006 2008* 2010* 2012 2015* 2017*
Mozambique	2008* 2010* 2011 2015* 2017*
Namibia	1992 2000 2008* 2010* 2015* 2017*
Niger	1992 1998 2006 2015* 2017*
Nigeria	2008 2008* 2010 2010* 2013 2015 2015* 2017*
Senegal	1986 1992 1997 2005 2006 2008 2008* 2010 2010* 2012 2014 2015 2015* 2016 2017*
Sierra Leone	2008 2013 2015* 2016 2017*
South Africa	2008* 2010* 2015* 2017*
Tanzania	2008* 2010* 2015* 2017*
Togo	2015* 2017*
Uganda	1995 2008* 2009 2010* 2011 2014 2015* 2017*
Zambia	1992 1996 2002 2007 2008* 2010* 2013 2015* 2017*
Zimbabwe	2010* 2015* 2017*

*Indicates Afrobarometer, else data from DHS