The impact of precolonial ethnic institutions and colonial rules in Africa: Evidence from the Afrobarometer data on 20 African countries

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Sangeun Lee

Thesis

ABSTRACT

  With the ongoing importance on the role of traditional chiefs, the paper investigates the impact of precolonial centralization of ethnic groups on the public goods provision and trust level toward chiefs today. With the question whether the succession of the traditional institutions is affected by the type colonial rule either by Britain or France, I match Afrobarometer data with Murdock's Ethnographic Atlas and other data sets. The paper documents three main findings. First, I find a strong positive association between precolonial ethnic political centralization and trust toward local chiefs today among Anglophone countries, but a negative association among Francophone countries. Second, there is a strong positive association for both countries colonized by Britain or France in terms of infrastructure. Third, I find a strong positive association between precolonial centralization and wellbeing among Anglophone countries, but no impact in Francophone countries. The similar pattern of positive and robust association on the infrastructure implies that precolonial centralization was conducive to African public goods provision with different colonial rule having a limited impact. On the other hand, the opposite pattern of association on the trust toward local chiefs implies that different colonial rule has affected social capital of contemporary traditional institutions differently. Under the assumption that local accountability mechanism holds, positive association among Anglophone countries implies that the precolonial institutions have been more likely to survive under British indirect rule compared to French direct rule. The findings suggest that contemporary African development, particularly access to public goods provision or local chieftaincy system are linked to the preexisting ethnic institutions as well as the legacies of colonialism.

I. Introduction

Traditional chiefs are still very popular in many of the African societies in development arena. With the recognition on the importance of traditional chiefs, the institution of traditional leadership was formally recognized by the national constitution in some countries such as Zimbabwe or Ghana. On the other hand, in many other African societies, chiefs continue to hold its symbolic, cultural, and political role and have become informal administrators as an essential part of local governance.

In most African societies, traditional chiefs are development intermediaries, positioned between the local community and the state. With the long-time horizon of political and social power, traditional chiefs represent communities' interests and demands to the state today, coordinating local collective action, resolving conflicts, and helping citizens access to the public goods (Honig et al., 2019). Recently, chiefs played a vital role in fighting against the COVID-19 with close interaction with the local community (Sanny & Asiamah, 2020). Although there is a debate over chief's undemocratic character, scholars consider its undemocratic character can rather give them a capacity to organize and respond to the citizens' demand, which ultimately facilitates democratic responsiveness (Baldwin, 2016).

Dating back to precolonial times when the authority of local chiefs originates from, the traditional institutions differed in terms of the level of hierarchy. In hierarchical institutions, chiefs were believed to be more influential, accountable, and loyal, which ultimately leverage the development outcomes (Honig et al., 2019). Considering that French and British adopted two different colonial rule in African countries in the colonial periods, this paper argues that hierarchical institutions have brought differential development outcome by the level of hierarchy and the type of colonial experience.

Motivated by the previous study which empirically found the French direct colonization were more likely to lead to the termination of the lines of succession compared to British rule (Muller, 2020), the paper argues that the association between pre-colonial centralization and public goods provision, will differ by colonial rule. By investigating the long-term effects of precolonial ethnic institutions on development by two different colonial rules, this paper helps us better understand on the institutional

persistence of traditional authorities, which facilitates a better understanding of contemporary chieftaincy.

In addition to the first research question, my second question is related to the trust toward local chiefs. Traditional chiefs get consistently higher trust compared to elected government officials. And Afrobarometer survey of 28 African countries in 2019/2021 found that 62% of people trusted their local chiefs (Logan & Amakoh, 2022). From the viewpoint of economics of trust, trust matters as arranging for alternative sanctions and guarantees is very costly to arrange for alternative in the absence of trust. Trust makes the society efficient, saving unnecessary troubles and bringing mutually beneficial cooperation (Ho, 2021).

In the cycle of trust model developed by Ho (2021), trustee demonstrates his trustworthiness by reciprocating that act of trust, and the trustee's actions update the reputation he has with the trustor, which sets the stage for the next interaction. In this paper, I presume that the accountability mechanism (Boone, 2003; Gennaioli & Rainer, 2007; Honig, 2019) holds, which proposes highly centralized societies in precolonial periods perform better as local chiefs have high level of accountability toward the people in hierarchical institutions. Under the presumption, I argue that the level of trust toward local chiefs who are from highly centralized societies in the precolonial periods is also higher. In other words, I expect there is a positive association between the local accountability (the level of centralization of traditional societies) and the trust toward local chiefs and I try to investigate whether the trust system works differently either under British colonial rule or French rule.

In sum, the study hypothesizes that the association between precolonial political centralization and i) the public goods provision (including infrastructure and wellbeing) as well as ii) the trust toward local chiefs will be different by colonial rule. In other words, I assume the impact of precolonial political centralization is different whether the individual belongs to Anglophone countries or Francophone countries.

The study is mainly composed of seven parts. In the second part, the literature review, I introduce a few historical studies that explain the role of ethnic institutions in Africa: the British indirect colonial rule and French direct rule. Additionally, I introduce my own approach which bring the local chieftaincy in to the whole picture with the understanding of colonial legacy.

In the following data part, I show the summary statistics of data and the structure of dataset that is utilized in the analysis. Afrobarometer survey data provides the information on the outcome variables including trust level toward local chiefs, access to basic infrastructure (water, electricity and sewage system), and wellbeing (whether one can access to school, health clinic and police station in the walking distance). Moreover, for the explanatory variable, the "jurisdictional hierarchy beyond the local community level" data in Murdock's Ethnographic Atlas (1967) in the replication data by Michalopoulos and Papaioannou (2013) is used in the analysis. The jurisdictional hierarchy index is a proxy variable of precolonial political centralization of the ethnic institutions in the paper.

In part 4, I explain the empirical strategy and the main equation in the analysis. For the analysis, I exploit the OLS with fixed effect methodology. To control the country varying specific characteristics, country fixed effect is included. Furthermore, since the dataset is pooled cross-sectional data which includes the year of 2008, 2016 and 2019, time fixed effect is also used in the analysis. To address the potential misinterpretation problem, an alternative empirical method using OLS with interaction term is also exploited.

The results document that there is a strong positive association between precolonial ethnic political centralization and trust toward local chiefs today among Anglophone countries, but a negative association among Francophone countries. Second, there is a strong positive association either countries colonized by Britain or France in terms of infrastructure. Third, I find a strong positive association between precolonial centralization and wellbeing among Anglophone countries, but no impact in Francophone countries. The similar pattern of positive and robust association on the infrastructure implies that precolonial centralization was conducive to African public goods provision with different colonial rule having a limited impact. On the other hand, the opposite pattern of association on the trust toward local chiefs implies that different colonial rule has affected social capital of contemporary traditional institutions differently.

To check the robustness, I excluded the capital cities from the sample to deal with the concerns that the features of capital city drive the result. Moreover, I exploited within country analysis for Cameroon case. As Cameroon was divided into two part in the colonial periods, some part colonized by French

and the other by British. But there is a limitation to interpret the result as significant as the sample data is imbalanced and insufficient.

Lastly in the conclusion part, I discuss the summary of main findings and limitations of the paper and suggest the evaluation and policy implications of the results.

II.   Literature Review and Contribution

A. Different strands on institutional origins of Africa

A growing number of empirical studies have focused on historical and institutional origins of Africa's economic, political, and social development (Michalopoulos & Papaioannou, 2020). Among all, we need to note the two different strands on the institutional origins. On the one hand, researchers have stressed the impact of extractive colonial rule on the quality of government among European colonies in the long run (La Porta et al. 1999; Acemoglu et al. 2001). To be specific, they found that the mortality rate in the African countries affected the European's decision on the settlement, whether they settle and set up institutions to protect property rights or establish extractive institutions where they do not settle down. Furthermore, some scholars have stressed the different colonial strategy by colonial power: Britain and France, and its long-term effect on the contemporary Africa (Ali et al., 2020). Ali and al. (2020) emphasized that Britain and France adopted different colonial rule, where Britain strengthened ethnic institutions by adopting indirect colonial rule while France adopted direct rule, which ultimately weakened the ethnic institutions in the colonial periods.

Meanwhile, other literature and many anecdotal accounts have emphasized the importance of the role of precolonial ethnic institutions both in the pre-colonial, colonial, and post-independent periods. In the precolonial periods, the ethnic institutions with stronger centralization equipped with higher accountability of local chiefs, as the hierarchy system impose them a check and balance system to prevent them from abusing power. Moreover, during the colonial periods and after the independence, ethnic institutions were still important as centralized societies were more efficient in negotiating with the colonial or postcolonial governments, as well as obtaining concessional loans (Bates, 1983; Boone, 2003; Herbst; 2000).

The former strands of colonial studies put more emphasis on the impact of colonialism on the African development through its impact on the political or economic institutions. In the meanwhile, the latter strands of precolonial ethnic institutional studies stress the role of the preexisting ethnic institutions on the African development, throughout the history.

B. Ethnic institutions in Africa

Before proceeding further, it is necessary to understand the ethnic institutions in African states. Ethnic identities and traditions were invented and prolonged along with polities, religions and economies throughout African history even long before the European colonial powers arrived at the continent. In the meantime, the modern ethnicities are influenced by colonial period although it is very clear that they are derived from the precolonial societies (Berman, 1998). From the constructivist approach by Berman (1998), ethnicity is not a fixed condition or essence, but a historical process that can be understood and studied in the contexts.

Given that ethnic institutions have viable and changeable characteristics as process, I need to clearly state what ethnic institutions mean in the study. Ethnic institutions in this paper, mainly refer to the institutions based on the ethnic groups which were deeply involved in political, socio-economic, and religious matters. They derive legitimacy and authority from customs, traditions, and spirituality.

Throughout history, it is well known that Africa had relatively lower level of political centralization compared to Europe and Asia. Lower level of political centralization is pointed out as one of the causes of underdevelopment of Africa. Arica had fewer kingdoms, empires, and state-like entities at the time of colonization (Michalopoulos & Papaioannou, 2020).

Even though the precolonial societies in general had relatively lower level of political centralization, the degree of centralization varied across ethnic groups within the continent. Prior to colonial periods, some ethnic societies such as Igbo in Nigeria and Masai in Kenya lacked political centralization beyond the local village level. On the contrary, some ethnic societies such as Yoruba in Nigeria and Luba in Central Africa formed states with higher political centralization beyond the local level (Afigbo, 1967; Diamond, 1997; Tignor, 1971).

Several historians stress the importance of ethnic institutions in African society, not only in precolonial periods but also colonial period and after the independence. Herbst (2000) and Boone (2003) emphasized the role of ethnic institutions in the local development through the 'local accountability' mechanism. The rationale behind the local accountability mechanism is that higher political centralization renders the local chiefs more accountable about the local population when there is superior centralized power such as kings beyond the local level. In the societies with high level of political centralization, the power of local chiefs can be restrained by the 'check and balance', which can also reduce the local tyranny.

Based upon the historical accounts and anecdotal evidence on the importance of ethnic institutions in development across Africa, several researches empirically found that there is positive association between precolonial ethnic institutions and contemporary development. Gennaioli and Rainer (2007) documented that there is a strong positive association between the provision of public goods, such as education, health and infrastructure in African countries and the centralization of their ethnic groups' precolonial institutions via the local accountability mechanism. Furthermore, Michalopoulos and Papaioannou (2013) also found that there is a strong positive association between precolonial ethnic political centralization and contemporary regional development, which is proxied by the light density. This empirical evidence supports the historical accounts on the importance of precolonial ethnic institutions in the development of contemporary Africa.

At the onset of colonization and even after the independence, the ethnic institutions have still played a significant role across countries in Africa. Centralized ethnic groups were more efficient in utilizing their bargaining power, which enabled the colonial and postcolonial governments to foster policy coordination and implementation. This could lead to a faster adoption of European policies and technologies (Schapera, 1970). Colonial and post-independence states have engaged with traditional leaders to collect taxes, organize labor, maintain social stability and later to broker votes (Honig, 2019). Ethnic leaders in the contemporary era, still enjoy considerable support and popularity across local communities as they have significant influence in governing the local communities, such as by allocating land rights, or managing public goods and services collaborating with the central or local governments (Baldwin, 2016).

In brief, the precolonial ethnic institutions with stronger centralization have been conducive to local development in Africa. In precolonial periods, they were important as they elevated the local accountability of chiefs and reducing the tyranny. Moreover, they had facilitated the local development through elevating the bargaining power of the community both with the colonial and postcolonial governments. They remain their importance as a form of local chieftaincy still today, when they deliver development projects and manage public goods and services in local peripheries.

C. Different colonial rules in Africa

In the previous research on the robust long-term impact of precolonial ethnic institutions on the development of Africa (Michalopoulos and Papaioannou 2013; Gennaioli and Rainer 2007), the impact of colonization on the ethnic institutions is often considered insubstantial in both timing and location (Herbst, 2000). Their findings support the institutional persistence, which views that the ethnic institutions in the contemporary era reflects that of precolonial periods. However, some other scholars contend that the extent of institutional persistence at present differs that from the precolonial past (Young, 1994; Englebert, 2002). The main reason for this variation, in this view, comes from the two different colonial strategies either French direct rule or British indirect rule in the colonial periods.

Therefore, to clearly examine and distinguish the impact of precolonial centralization and colonization by two different colonial rules in Africa, it is necessary to consider the impact of colonization. In attempt to control African population, European colonial powers had to consider to utilize the existing ethnic institutions as political structure that they encountered. However, there were fundamental difference in the way of colonization between the two main colonial rules of Britain and France.

In the comparative study of the colonial legacy, there have been ample research which compares the different type of colonial rules. British generally adopted indirect rule, so-called hands-off approach, which allowed continuation of local institutions including customary law or modification of British institutions to local environment (Grier, 1999). They co-opted preexisting institutions where they existed and focused on institutionalizing the local chiefs' roles (Crowder, 1968; Mamdani, 2018). On the other hand, France adopted direct rule as they intended to include their colonies in the French society and implemented French institutions (Grier, 1999). They were comparatively hostile toward the local

chiefs, and the chiefs were often replaced with French native institutions. Chiefs were stripped of their power and their role was constrained to collecting taxes or recruiting labor (Crowder, 1964). Therefore, through the colonial periods, the persistence of ethnic institutions varied such that ethnic institutions were somewhat destroyed under French direct rule whereas they traditional institutions were rather strengthened under British indirect rule.

One thing that we need to note is about the colonial chiefs in the chiefless societies in countries under indirect colonial rule. In countries where there were strong politically centralized groups, colonial power ruled the communities utilizing the local political structure via local chiefs (Mamdani, 2018; Tignor, 1971). This means that precolonial institutions could be best used as tools for indirect rule in centralized states. However, in places where there was no political centralization in societies, colonizers had to make up for the absence of precolonial institutions and they often established new institutions by appointing warrant chiefs who can collaborate with the colonial governments.

In terms of differential impact of colonial rule on the continuity of precolonial ethnic institutions, Muller (2020) found that the succession of the precolonial lines of polities varies by the British and French colonial rule. It is found that 70 percent of the ruling lines of succession of centralized precolonial states under British rule persisted until independence, while only 30 percent did so under French rule. In addition, empirical research by Neupert and Muller (2021) found that there is a robust association between past and present levels of centralization which is almost exclusively driven by the former British colonies with more reliance on precolonial institutions than other colonies, particularly French ones.

Summing up, the anecdotal and empirical evidence suggests that there were different colonial strategies in the Africa. Britain adopted indirect rule in centralized societies and direct rule in stateless societies while France exploited direct rule across all of its colonies. Given the two different approach, we need to note that the precolonial ethnic institutional persistence differs by the colonial rule where the succession of lines were more likely to survive under the British rule compared to the French direct rule. The empirical evidence implies that the impact of precolonial ethnic institutions on the public goods provision can also differ by two different colonial rules.

D. My approach: Bringing local chiefs and the colonial legacy into the picture

In line with the previous studies, this paper mainly links the different paths of African development studies which stress the role of precolonial ethnic institutions and colonization. The study contributes to the literature on the importance of the role of precolonial ethnic institutions (Herbst, 2000; Boone, 2003; Schapera, 1970; Tosh, 1978, Bockckstette et al., 2002; Logan, 2011; Acemoglu et al., 2012; Baldwin, 2016). Particularly, this study is closely related to the literature by Gennaioli and Rainer (2007) and Michalopoulos and Papaioannou (2013) which presented the empirical evidence of the positive correlation between precolonial political centralization and public goods provision at country level or regional economic development at ethnicity level. I advance the literature by investigating the association between the precolonial political centralization and contemporary trust toward local chiefs, as well as access to public goods provision (such as basic infrastructure including electricity, piped water, and sewage system or facilities for wellbeing including school, health and police station) at individual level.

Furthermore, the study relates to the literature on the differential impact of colonial rules by Britain or France (Ali et al., 2020; Lee & Schultz, 2012; Fenwick, 2009). In particular, I was motivated by Muller (2020) as well as Neupert and Muller (2021) which document that the succession of the lines of precolonial polities differ by the different colonial power, in which the persistence of precolonial centralization is mainly driven by the societies under the British rule. I fill the gap of previous studies (Gennaioli & Rainer, 2007; Michalopoulos & Papaioannou, 2013) by comparing the impact of precolonial political centralization in countries which were colonized by Britain in the one hand, and the countries colonized by France on the other hand. Empirical evidence of my study of the differential impact of precolonial centralization on the contemporary Africa (such as the impact on trust level toward local chiefs, infrastructure and wellbeing) supports the preexisting literature and has some implications that the different persistence of ethnic institutions which varied by the different colonial rules might have caused different impact on the public goods provision through the colonialism.

In the next section, I discuss the data for the trust level toward local chiefs, the infrastructure and wellbeing which are the outcome variables and the level of precolonial centralization which is the explanatory variable in the analysis. Furthermore, I present the descriptive statistics of the variables in

the following part.

III. Data and Descriptive Statistics

A. Afrobarometer Data

The individual data are from the Afrobarometer survey round 4, 6 and 7. These nationally representative survey data are basically cross-sectional data based on the interview of citizens of voting age in African countries. Samples are randomly selected and usually include 1,200 or 2,400 individuals in a given country. The data provides the information not only on basic socioeconomic characteristics of the respondents, but also on the citizen's attitudes on the issues of democracy, governance, and economy.

Figure 1. Historical Boundaries of Ethnicities and Colonialism in African Countries
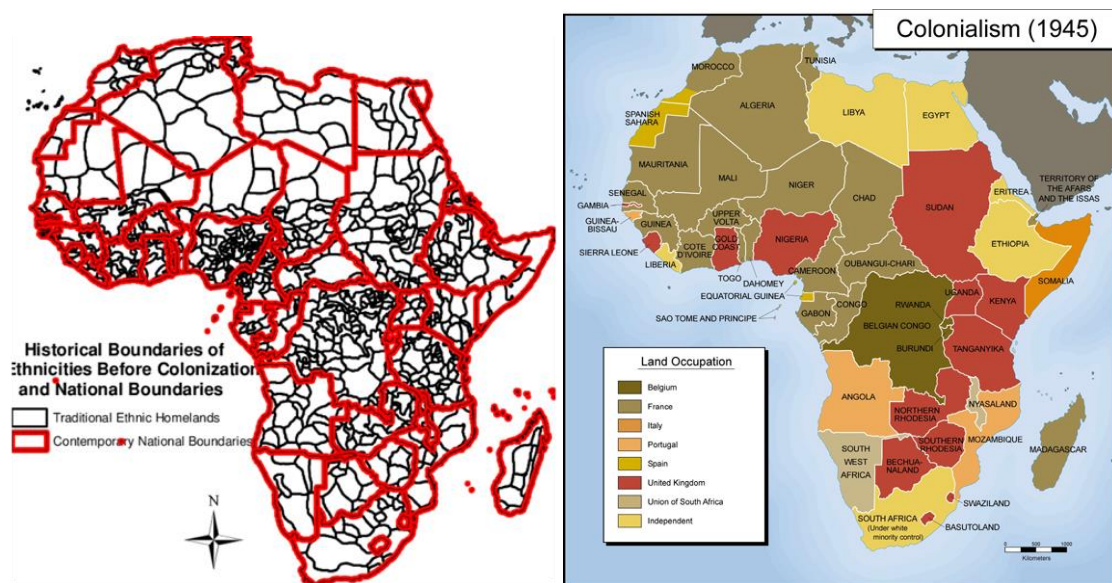
Source: Michalopoulos & Papaioannou (2013), Exploring Africa (2022)

The sample covers 20 African countries, of which 9 are francophone countries and 11 are anglophone countries. The francophone countries in the sample are Benin, Burkina Faso, Cote d'Ivoire, Guinea, Madagascar, Mali, Niger, Senegal, and Togo. For all three survey waves, the first five countries are included but the last 4 countries including Guinea, Cote d'Ivoire, Niger and Togo are only included for the survey round 6 and 7. The anglophone countries in the sample across all the survey rounds are

Botswana, Ghana, Kenya, Malawi, Namibia, Nigeria, Uganda, Zambia. Survey data for Tanzania is included for survey round 4 and 7, and Sierra Leone and Zambia are included in the survey round 6 and 7.

Table 1. Country list in the analysis

Country/ Year	2008(round 4)	2016(round 6)	2019(round 7)	Total
Panel A. Anglophone Countries				
Botswana	1051	800	681	2532
Ghana	957	2003	1656	4616
Kenya	1063	2070	1339	4472
Malawi	990	1059	904	2953
Namibia	345	225	258	828
Nigeria	2081	1993	1312	5386
Tanzania	618	0	1253	1871
Uganda	2180	2004	1013	5197
Zambia	1136	1136	1106	3378
Zimbabwe	0	616	303	919
Sierra Leone	0	412	378	790
Panel B. Francophone Countries				
Benin	1156	1008	973	3137
Burkina Faso	756	748	683	2187
Madagascar	1059	933	859	2851
Mali	1017	711	673	2401
Senegal	885	788	836	2509
Guinea	0	409	387	796
Cote d'Ivoire	0	437	446	883
Niger	0	867	807	1674
Togo	0	93	92	185
Observations	15,294	18,312	15,959	49565
Number of countries	14	19	20	20

I use survey wave 4, 6, and 7 of which the survey waves were conducted in 2008, 2016, and 2019 respectively as these rounds provide the information on outcome variables including trust toward local chiefs, as well as infrastructure and wellbeing. After I merge the three survey rounds, I have a potential sample of 82,412 respondents: 54,637 from anglophone countries and 27,775. Within the sample, only 32,851 from anglophone countries and 16,521 from francophone countries could be matched with the Murdock's precolonial centralization data. Among non-matched respondents, some of them respond 'other' as their ethnicity or list their ethnicity as a 'country' not a specific ethnic group. After matching

the Afrobarometer data with the Murdock's precolonial centralization data, the full sample leaves me with 49,372 observations.

The first main outcome variable from survey data, measures the trust level toward local chiefs. The survey question is: How much do you trust traditional leaders, or haven't you heard enough about them to say? The respondents can choose between four options: not at all, just a little, somewhat, or a lot. Since the answers to the question are categorical and ordered variable, I converted the variable into binary variable, which takes 1 if the answer is "a lot" and 0 otherwise.

The second main outcome variable is on the basic infrastructure including electricity, piped water system, and sewage system. The survey question reads: Are the following services present in the primary sampling unit/enumeration area: Electricity grid/ Piped water system/ Sewage system(respectively) that most houses could access? The question is filled in conjunction with field supervisor. The answer to the question is binary, either "yes" or "no". Since the three components are necessary and basic infrastructure, I created a mixed variable *Infrastructure* which combines these three variables. *Infrastructure* variable takes 1 if the respondents have access to all the three components: electricity, piped water, and sewage system, and 0 otherwise.

The third outcome variable is on the wellbeing which measures whether the facilities to achieve wellbeing are present in the area where respondents live, and the question is also filled with field supervisor. The question is: Are the following facilities present in the primary sampling unit/ enumeration area, or within easy walking distance: School/ Health clinic/ Police station(respectively)? The answer is also binary, either "yes" or "no" and I created another mixed variable *Wellbeing*, which takes value 1 when all the three facilities are present in the walking distance, and 0 otherwise.

B. Ethnicity-level data on Precolonial Centralization

The data on the precolonial centralization at ethnic group level rely on the replication data of Murdock's Ethnographic Atlas (1967). The replication data (Nunn, 2011; Michalopoulos & Papaioannou, 2013) provides the data on Murdock's (1967) "Jurisdictional Hierarchy Beyond the Local Community Level" index, which can be a proxy of precolonial political centralization of ethnic institutions (Gennaioli & Rainer, 2006).

The jurisdictional hierarchy index describes the number of political jurisdictions above the local community level for each ethnic group. The variable is an ordered variable which ranges from 0 to 4, of which the score 0 indicates stateless societies, score 1 indicates petty chiefdom, score 2 indicates paramount chiefdom, and score 3 and 4 indicate part of large states. To address the measurement error of historical data, I created a dummy variable of jurisdictional hierarchy index following Gennaioli and Rainer (2006, 2007) and Michalopoulos and Papaioannou (2013) that takes the value of zero when the ethnic groups belong to stateless societies or petty chiefdom, and 1 if the group is part of large chiefdom or large state.

Table2. Descriptive Statistics

	Full sample	Anglophone countries	Francophone countries
Precolonial political centralization	0.654 (0.476)	0.612 (0.487)	0.738 (0.440)
Trust toward local chief	0.437 (0.496)	0.377 (0.485)	0.555 (0.497)
Infrastructure	0.197 (0.398)	0.221 (0.415)	0.151 (0.358)
Wellbeing	0.307 (0.461)	0.328 (0.469)	0.265 (0.441)
Living in Rural	0.627 (0.484)	0.607 (0.488)	0.667 (0.471)
Female	0.501 (0.500)	0.501 (0.500)	0.501 (0.500)
Age	36.72 (14.46)	35.89 (14.28)	38.37 (14.66)
Living condition	2.656 (1.214)	2.653 (1.247)	2.664 (1.146)
Level of education	3.107 (2.152)	3.608 (1.989)	2.114 (2.120)
Ethnic share within district	0.629 (0.328)	0.614 (0.336)	0.660 (0.309)
N	49565	32942	16623

Note: Standard deviations in parentheses

IV. Empirical Strategy

To examine whether there is a differential pattern between anglophone and francophone countries on the impact of precolonial centralization on the trust, infrastructure, or wellbeing, I have several options for the identification strategy. In this paper, I exploit i) subsample analysis using OLS with fixed effect and the alternative empirical strategy using ii) OLS with interaction term.

A. OLS with fixed effect

First, I conduct an empirical analysis by dividing the sample into subsamples by colonial rule: one is anglophone countries and the other is francophone countries. Subsample analysis has advantage in regard that I can include country fixed effect in the equation. Following the Michalopoulos and Papaioannou (2013), I exploit the fixed effect model, by including an interaction of time and country fixed effect to capture and control the time invariant within-country variations as well as other time varying country level effects since the sample in the research covers survey rounds across three time periods.

To examine the association between precolonial centralization and trust level toward local chiefs today, my baseline equation using OLS with fixed effect is:

$$y_{i,e,c,t} = \alpha_0 + \beta CENT_e + \alpha_c + \alpha_t + X'_i\Gamma + \varepsilon_{i,e,c,t},$$

where i indexes individuals, e ethnic groups, and c countries. The outcome variable $y_{i,e,c,t}$ is the binary trust level toward local chiefs today, the access to basic infrastructure (piped water, electricity, and sewage system) and wellbeing (school, health clinic, and police station in the walking distance) which vary across individuals. $CENT_e$ denotes the precolonial political centralization of ethnic groups which individuals belong to, as proxied by the jurisdictional hierarchy beyond the local level (usually village). α_c denotes the country fixed effect which denotes the time variant country characteristics such as country specific policies. Time(year) fixed effect α_t is also included to account for time varying characteristics. The vector $X'_i\Gamma$ denotes a set of individual-level covariates, including individual's age, gender, level of education, the ethnic share of the respondent to the population within the district, and an indicator variable that takes value 1 if the respondent lives in the urban area or 0 otherwise.

B. Alternative Methodology: OLS with interaction term

Even though there is a merit of subsample analysis that it allows me to include the country fixed effect, the result should be carefully interpreted as the significance of the coefficient depend on other covariates as well. For example, if there is high multicollinearity in one group, the result will show us statistical insignificance even if the effect is as strong as in the other group. To address the potential misinterpretation, I also examined an alternative methodology using OLS with interaction term.

The equation with interaction term is as below:

$$y_{i,e,c,t} = \alpha_0 + \beta CENT_e * Anglo_c + \beta CENT_e + Anglo_c + \alpha_c + \alpha_t + X'_i \Gamma + \varepsilon_{i,e,c,t},$$

V.   Main Result

A. Result of the Subsample Analysis using OLS with Fixed effect

In Table 3, I document the association between the main outcome variables and the precolonial political centralization of ethnic groups which is hypothesized in the section IV. The table reports the Ordinary Least Squares estimates for each of the subsamples and the full sample. As reported in the table, for all the regression analyses, individual characteristics are controlled which include gender, age, level of education, urbanity, and ethnic share within the district. To prevent the country level factors from driving the result, country fixed effect is used in the analyses. Furthermore, year fixed effect is included to control time varying individual characteristics as the data for all three outcome variables are collected across three time periods.

In Panel A - C in the table 3, the three different dependent variables are binary dependent variables after the transformation. Since the outcome variable is an indicator variable, the model follows the linear probability model and the error term is heteroskedastic because the variance depends on the value of the independent variables, not constant. To correct the heteroskedasticity problem in linear probability model, heteroskedastic robust standard error is used in the analyses.

In the panel A, I regress binary trust level toward local chiefs on precolonial political centralization. Column (2) in the panel A shows that in anglophone countries, the individuals from more centralized ethnic groups in the precolonial periods are 3.2 percent more likely to trust their traditional chiefs

today than those from less centralized ethnic groups in the precolonial periods. However, the reverse pattern is observed in francophone countries.

Table3. Subsample Analyses

: Precolonial political centralization and Trust, Infrastructure and Wellbeing

	(1) Full sample	(2) Anglophone	(3) Francophone
Panel A. Trust toward local chiefs			
Precolonial	0.00591	0.0328***	-0.0798***
Centralization	(0.00546)	(0.00613)	(0.0119)
Mean of dep.var.	0.437	0.377	0.555
N	45476	30129	15347
adj. R^2	0.136	0.101	0.132
Panel B. Infrastructure (Piped water, electricity and sewage system)			
Precolonial	0.0266***	0.0274***	0.0201***
Centralization	(0.00345)	(0.00403)	(0.00662)
Mean of dep.var.	0.197	0.221	0.151
N	49218	32701	16517
adj. R^2	0.308	0.325	0.257
Panel C. Wellbeing (School, Health clinic and Police station)			
Precolonial	0.0108**	0.0173***	-0.0109
Centralization	(0.00474)	(0.00547)	(0.00946)
Mean of dep.var.	0.307	0.328	0.265
N	49218	32701	16517
adj. R^2	0.166	0.156	0.182
Individual Controls	Y	Y	Y
Country Fixed Effect	Y	Y	Y
Year Fixed Effect	Y	Y	Y

Note. Standard errors are reported in the parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

In column (3), the individuals from more centralized ethnic groups are nearly 7.9 percent less likely to trust their chiefs than those from less centralized ethnic groups. Both of the coefficients on the political centralization are statistically significant at 1 percent level of significance. Considering that there is an opposite direction of the association between precolonial political centralization and trust

level for the two subsamples, no statistically significant correlation is observed for the full sample. Muller found that indigenous or native administrations increases in the level of precolonial centralization among British colonies while French colonies exhibit no significant or even opposite associations. The finding of this paper supports the idea that precolonial centralization was a strong determinant of indirect rule in the British.

Panel B reports the regression result with the infrastructure as a dependent variable. Columns (1)-(3) show that there is a positive correlation between precolonial political centralization and the access to infrastructure for both two subsamples as well as full sample. The results are all statistically significant at 1 percent level. Although the absolute value of the coefficient in column (2) is larger than that in column (3), we interpret the result as the proportion of having access to infrastructure rise by 12 percent among respondents from centralized societies in Anglophone countries while it rises by 13 percent among Francophone countries.

Turing to Panel C, the positive and significant association remains the same for anglophone countries in column (2) while the significance disappears in the column (3). In anglophone countries, individuals from more centralized ethnic groups are 1.7 percent more likely to have wellbeing in regard that they have access to school, health clinic and police station within the walking distance in comparison to those from less centralized ethnic groups. There is no statistically significance between the variables in the column (3) for francophone countries. Thus, we may infer that the positive and significant association in the column (1) for the full sample is largely driven by the strong positive association in anglophone countries.

B. Alternative Strategy: OLS with interaction term without Fixed effect.

We now turn to the alternative empirical strategy using OLS with an interaction term. In the alternative model, the precolonial centralization is interacted with the anglophone indicator variable. Although the main empirical model using subsample analysis has advantages in regard that country fixed effect can be used in the analysis, subsample analysis does not clear the possibility of misinterpreting the result if there is a multicollinearity when dividing the subsamples. Therefore, our alternative model with an interaction term may provide a measure to check the robustness of the result.

Table 4. Alternative Model with interaction term

: Precolonial political centralization and Trust, Infrastructure and Wellbeing

Dependent/ Explanatory	(1) Trust toward local chiefs	(2) Infrastructure	(3) Wellbeing
Anglophone	-0.137***	-0.00225	-0.00573
	(0.00909)	(0.00517)	(0.00740)
Precolonial centralization	-0.00521	0.0296***	0.0331***
	(0.00892)	(0.00498)	(0.00634)
Anglophone× Centralization	0.0431***	0.0331***	0.0243***
	(0.0105)	(0.00634)	(0.00867)
Individual Controls	Y	Y	Y
Year fixed effect	Y	Y	Y
Mean of dep. var.			
N	45476	49218	49218
adj. R^2	0.079	0.267	0.134

Note. Standard errors in parentheses *** Significant at 1%, ** significant at 5%, * significant at 10%.

Table 4 shows the estimation result of the alternative model using OLS with an interaction term. Since there is an anglophone indicator variable now, country fixed effect is dropped in the analysis and only the individual characteristics and year fixed effect are included in the analysis. The differential effect of precolonial centralization between anglophone and francophone countries is reported in the estimation result for the interaction term, which is Anglophone × Centralization. The interaction term allows for the heterogeneity in the effect of precolonial centralization on our outcome variables with regards to the predictor *Anglophone.* In other words, I presume that the effect of precolonial centralization on outcome variables may differ as a function of individuals belonging whether anglophone countries or francophone countries.

Column (1) reports estimates of the mean difference between anglophone countries and francophone countries in each dependent variable when precolonial centralization equals zero. With the estimated result for the trust dependent variable, we can infer that there is a significant mean difference in trust level toward chiefs between anglophone and francophone. This is a consistent result with the previous

paper by Ali et al. (2020) which documented the negative correlation between British indirect colonial rule and the trust level toward local chiefs today.

In column (2), the result shows the effect of precolonial centralization on the outcome variables when anglophone is zero, in other words, the effect of precolonial centralization for francophone countries. Surprisingly, the significantly negative correlation between precolonial centralization and trust toward local chiefs among francophone countries in the subsample analysis, disappear here. On the other hand, we still see there is a positive and significant relationship between precolonial centralization and infrastructure and wellbeing. The different estimated result may partly be explained by the fact that we could not include country fixed effect in the alternative model, or the multicollinearity bias can be reinforced by subsampling.

Column (3) reports the coefficients for the interaction term, which test whether the relationship between precolonial centralization and outcome variables differ between anglophone and francophone countries. The estimated result shows that there is a positive and statistically significant association in the interaction term for all three dependent variables, which means that the effect of precolonial centralization is greater among anglophone countries with statistical significance. The estimates in the column (3) imply that individuals belonging to anglophone countries increases the effect of precolonial centralization on trust level toward local chiefs by the probability of 0.04, on infrastructure by 0.033 and wellbeing by 0.024 compared to francophone countries. In other words, precolonial centralization would increase the probability by 0.04, 0.033 and 0.024 to trust local chiefs, to have access to infrastructure or wellbeing of individuals in anglophone compared to francophone countries.

VI.   Robustness check

There still are some concerns that some specific features of capital city may drive the results of the analysis. This is mainly because that capital cities are expected to have greater access to infrastructure and wellbeing compared to noncapital areas as contemporary national institutions, especially the central government, are usually located in the capital cities while there is a limited influence in the non-capital cities (Herbst, 2000). To deal with the concerns that features of capital city are driving the results, now the capital cities are excluded from the sample.

Table 5. Subsample Analyses excluding capital city

Excluding capital city	(1) Full sample	(2) Anglophone	(3) Francophone
Panel A. Trust toward local chiefs			
Precolonial Centralization	0.00987*	0.0350***	-0.0719***
	(0.00565)	(0.00635)	(0.0123)
Mean of dep.var.	0.443	0.393	0.538
N	41712	28203	13509
adj. R^2	0.134	0.100	0.123
Panel B. Infrastructure (Piped water, electricity and sewage system)			
Precolonial Centralization	0.0241***	0.0236***	0.0251***
	(0.00340)	(0.00401)	(0.00601)
Mean of dep.var.	0.189	0.208	0.152
N	44823	30483	14340
adj. R^2	0.314	0.340	0.194
Panel C. Wellbeing (School, Health clinic and Police station)			
Precolonial Centralization	0.0177***	0.0235***	-0.00583
	(0.00484)	(0.00559)	(0.00965)
Mean of dep.var.	0.295	0.313	0.258
N	44823	30483	14340
adj. R^2	0.182	0.170	0.195
Individual Controls	Y	Y	Y
Country Fixed Effect	Y	Y	Y
Year Fixed Effect	Y	Y	Y

Note. Standard errors in parentheses *** Significant at 1%, ** significant at 5%, * significant at 10%.

The result excluding the capital for trust and wellbeing is consistent with our main regression result. Table 5 shows that precolonial centralization and the trust level has a positive association among Anglophone countries while there is a negative association among Francophone countries. Also, there is a positive association between the precolonial centralization and the wellbeing among Anglophone countries whereas there is no significant association among Francophone countries. For infrastructure, the association is both positive for Anglophone and Francophone countries although the magnitude of the positive sign is somewhat different from the main result in table 3. Even after excluding the capital

cities from the sample, the results are consistent so that we can conclude that city specific effect does not drive the result.

One of the short-coming of the studies on the colonial legacy at country level is that there can be some unobserved heterogenous factors in the post-independence political histories of countries (Lee & Schultz, 2012). Country fixed effect can somewhat fix the time varying country specific characteristics, but it does not specifically fully account for the heterogenous political histories in the post-colonial era. The heterogeneity can cause a bias and blur the pure colonizer effect. To assuage the potential bias that might occur due to the heterogeneous political histories in the post-colonial periods, I narrowed down the country to Cameroon case and conducted a within country analysis.

Historically, Cameroon was originally colonized by Germany but it was divided into two portions ruled by French and British during World War I. North-west part of Cameroon was colonized by the Britain and the larger portion of Cameroon in the East and Southern part were colonized by the French. Therefore, within country analysis for Cameroon case can help me to clearly identify the effect of colonial legacy as the country share similar post-independence histories after the independence and reunification in 1960. For the analysis, the respondents who reside in the north west, and south west area are coded as 1, which means they belong to Anglophone region in the colonial periods and the rest areas are coded as 0, meaning that they belong to Francophone region in the colonial periods. Since the survey round 6 and 7 are the only rounds which include Cameroon as a sample country, data in these two survey rounds are used for the analysis.

The table 6 reports the result of within country analysis for Cameroon case. In column 2 in panel A, we can see that there is a positive association between the precolonial centralization and trust toward local chiefs among Anglophone countries, which can be interpreted that even within Cameroon individuals from centralized ethnic groups in Anglophone areas are 21.5 percent more likely to trust their local chiefs today. For the rest of the estimates, we cannot see any of the statistical significance.

Although there is a possibility to interpret the result as the main hypothetical argument that the preexisting ethnic institutions have been more likely to survive through British indirect rule compared to French direct rule, there is a limitation that the observations in the sample are insufficient. As only a small portion of Cameroon, such as north-west and south-west part of Cameroon were colonized by

Britain and the rest larger portion of Cameroon were colonized by French, the number of respondents in the sample are imbalanced when I divide it into Anglophone and Francophone areas. Due to the imbalance and insufficiency of the sample data, therefore, it would be hard for us to interpret the result as statistically significant.

Table 6. Within country analysis: Cameroon case

Cameroon	(1) Full sample	(2) Anglophone	(3) Francophone
Panel A. Trust toward local chiefs			
Precolonial centralization	-0.0176	0.215*	-0.0401
	(0.0310)	(0.110)	(0.0320)
N	1816	63	1753
adj. R^2	0.341	0.120	0.349
Panel B. Infrastructure (Piped water, electricity and sewage system)			
	0.0229	0.0259	0.0306
	(0.0280)	(0.0753)	(0.0296)
N	1825	65	1760
adj. R^2	0.529	0.675	0.529
Panel C. Wellbeing (School, Health clinic and Police station)			
	-0.0272	0.0235	-0.0135
	(0.0281)	(0.129)	(0.0282)
N	1856	65	1791
adj. R^2	0.396	0.065	0.414
Individual Controls	Y	Y	Y
Region Fixed Effect	Y	Y	Y
Year Fixed Effect	Y	Y	Y

Note. Standard errors in parentheses *** Significant at 1%, ** significant at 5%, * significant at 10%.

VII.   Conclusion

In this paper, I document a positive association between the modern public goods provision such as basic infrastructure including water, electricity, and the sewage system in 20 African countries and the precolonial centralization of each ethnic group. I combine the Afrobarometer microlevel data on the

trust, infrastructure and wellbeing and Murdock's Ethnographic Atlas data on the jurisdictional hierarchy level beyond the local village level.

Following the previous systemic empirical evidence on the variation in the application of indirect rule between French and British, I hypothesize that British indirect colonial rule had been relatively more favorable to maintain the local ethnic political institutions compared to French direct rule. To examine whether there is a differential impact of precolonial centralization, I exploit a subsample analysis.

For the infrastructure I find the strong positive association for both subsamples, which means that precolonial ethnic political centralization has been conducive to the contemporary basic infrastructure. On the other hand, I find a differential impact in wellbeing where centralization has a strong positive impact among Anglophone countries whereas no significant impact among Francophone countries. Summing up, we can infer that there is mixed impact of centralization on the public goods provision by different colonial rule.

However, I can clearly find that there is a marked difference in the estimate on the trust level toward local chief by different colonial rules. The social capital, which is measured by trust toward local chiefs today, can mirror the persistence of traditional institutions of the precolonial predecessors. Therefore, I can infer that the positive and robust association between centralization and today's trust toward local chief among Anglophone countries stands for the persistence of traditional institutions. Following the previous studies which find that French colonization more likely led to the demise of the lines of the continuation of precolonial polities compared to Britain, the British indirect rule might have been more favorable to the survival of traditional institutions compared to French direct rule.

This implies that the British indirect rule was more favorable for the ethnic leaders to consistently enjoy local support while it was not the case under French direct rule. Even though there still is an ongoing importance of ethnic specific institutions across Sub Saharan Africa, including countries colonized by France, the trust system toward the local chief might have experienced change. Therefore, the government needs to coordinate with the local chieftaincy when delivering development projects differently. For example, the strong positive association between precolonial centralization and the trust toward local chiefs today among Anglophone countries, implies that the trust system of preexisting ethnic institutions has consistently play a critical role in local communities and enjoy considerable

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support from people in line with the historical lines. Moreover, this paper provides empirical evidence in emphasizing the importance of ethnic institutions and the impact of colonial rule in shaping contemporary public goods provision.

My research also bears some limitations and call for future research. First, I provide evidence on the correlation between precolonial centralization and outcomes today in Africa, but it is difficult to identify the causal relationship between them. Second, although I find that the individuals from more centralized ethnic groups are more likely to trust their local chiefs today under British indirect rule, the empirical result does not necessarily mean that local chiefs were more accountable. Trust index toward local chief cannot fully translated to local accountability of chiefs, therefore we can only conclude that individuals 'trust' their local chiefs more among Anglophone countries, but we cannot conclude that local chiefs perform better or are more accountable. Therefore, the finding is not empirically fully accounting the channel through which individuals in Anglophone countries have better access to public goods provision although the impact is limited.

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