

Sanghamitra Bandyopadhyay and [Elliott Green](#)
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Precolonial Political Centralization and Contemporary Development in Uganda

SANGHAMITRA BANDYOPADHYAY

Queen Mary, University of London

ELLIOTT GREEN

London School of Economics

I. Introduction

It is now widely recognized that political institutions have had a major influence on the nature and scope of economic development in broad historical terms (Nunn 2009). Across the developing world there has been a large amount of attention given to the influence of colonial institutions in recent years, with a smaller but growing field of study demonstrating the impact of the precolonial period on postcolonial developments (Hjort 2010; Green 2012; Jha 2013). In one recent example of this trend, several scholars have suggested that precolonial political centralization has had an impact on contemporary levels of development within Africa (Gennaioli and Rainer 2007; Michalopoulos and Papaioannou 2013; Fenske 2014; Alsan 2015; Michalopoulos and Papaioannou 2015). Measuring precolonial centralization by using data from Murdock (1967), they show a robust positive correlation between the percentage of each country's population that is from a centralized ethnic group and outcomes such as light density at night, paved roads, immunization, literacy, and infant mortality rates.

Much of this work, however, has been based on outdated ethnographic data that fail to capture postcolonial patterns of migration and urbanization that may have affected contemporary developmental outcomes. Moreover, there remain questions as to the actual mechanism through which precolonial centralization has affected contemporary developmental outcomes. Thus, for instance, if centralization appears to have a positive effect on the provision of locally

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large variance in centralization across different parts of the country.¹ Second, because of decentralization policies that began after the current government took office in 1986, local governments have played a large role in local public goods provision, thereby allowing us to test the mechanism that centralization has affected development outcomes through local government institutions. Third, because of the availability of development data at the district and subcounty level, we are able to use large sample sizes, with 56–76 observations at the district level and 958 at the subcounty level. Fourth, because of the fact that Uganda is one of 20 countries in Africa to have been surveyed by the Afrobarometer, we can also employ survey data that contain information on assets, public goods, ethnicity, and a variety of control variables. Fifth, unlike most African censuses that fail to record any data on ethnicity, the most recent Ugandan census from 2002 contains data on ethnicity disaggregated down to the level of the subcounty, thereby allowing us to construct a detailed picture of precolonial centralization.² Finally, the use of a single country case study allows us to identify an instrument for precolonial centralization that can thereby help to clarify the direction of causality.

Our results are striking in two ways. First, using a variety of dependent variables, we confirm the hypothesis that precolonial centralization is highly correlated with modern-day development outcomes at the district, subcounty, and individual levels. These results are robust to the use of various control variables and clustered standard errors; we also use distance from the ancient capital of Mubende as an instrument for precolonial political centralization and find that most of our results become even stronger. However, our second finding is that a number of dependent variables are not correlated with precolonial centralization, specifically those that measure public goods provision like immunization and schooling as well as access to hospitals, clean water, and other public services. Moreover, using Afrobarometer results we find that there is no relationship between local levels of precolonial centralization and the quality of public services. These findings are thus consistent with a correlation between precolonial centralization and the accumulation of private goods rather than public goods, thereby suggesting the persistence of poverty and wealth from the precolonial period to the present.

The article is organized as follows. First, we give an overview of the literature in Section II before describing our data in Section III, including how we

¹ Indeed, for this reason Gennaioli and Rainer (2007, 188–91) use it as their primary qualitative example for the impact of precolonial centralization on postcolonial outcomes.

² Morning (2008) finds that only 44% of African countries ask questions about ethnicity on their censuses, tied with Europe for the lowest proportion among all regions in the world. Some countries like Tanzania have not asked questions about ethnicity on their censuses since the 1960s.

ascribed different levels of precolonial complexity to each of Uganda's 56 ethnic groups. In Section IV we present our empirical analysis, using data at the district, subcounty, and individual levels, as well as the use of an instrumental variable in Section V. In Section VI we show how our results differ according to private versus public goods. In Section VII we conclude.

II. Related Literature

There is a growing emphasis within development economics on the role of history in determining contemporary development outcomes. Much of this recent work owes to the seminal influence of Acemoglu, Johnson, and Robinson (2001), who argue that the quality of colonial institutions is an important determinant of economic development across the postcolonial world. While much of this work has examined the legacies of colonialism, a small but growing literature has discussed the role of the precolonial period in determining modern-day outcomes. For instance, Green (2012) shows that low precolonial population densities in Africa led colonizers to construct large states with artificial straight-line borders that have persisted to the present day, while Huillery (2011) claims that the congruence between precolonial and postcolonial wealth patterns in French West Africa is due to European tendencies to settle in rich yet peaceful areas. In southern Africa, Hjort (2010) argues that Botswana's postcolonial success derives from precolonial cultural characteristics that favored good interethnic relations, democratic institutions, and individual property rights. Finally, in India Jha (2013) exhibits a positive correlation between precolonial trade patterns and contemporary peaceful Muslim-Hindu relations.

In one recent article, Gennaioli and Rainer (2007) argue that precolonial centralization is a determinant of postcolonial African development. They measure precolonial centralization by using data from Murdock (1967), which lists information about ethnic groups from around the world along a variety of dimensions. One of these dimensions is political centralization, which ranges from 0 for acephalous or stateless societies such as the Kikuyu (Kenya) and Nuer (Sudan) to 4 for highly centralized groups like the Javanese and Vietnamese. More centralized ethnic groups thus have more integrated and hierarchical governments, while less centralized groups have more fragmented political leadership. Using these data as well as demographic data from the 1960s, Gennaioli and Rainer (2007) calculate the percentage of each African country's population that is a member of an ethnic group with a precolonial centralization score of 2 or higher. They then regress contemporary measures of paved roads, immunization, literacy, and infant mortality rates on their political centralization variable and find robust statistically significant relationships between centralization and all five public goods. They claim that the mecha-

nism linking precolonial centralization to modern-day development outcomes is the legitimacy of local government institutions, such that more centralized groups have been able to introduce modern technologies and coordinate government activities better than noncentralized groups.

Gennaioli and Rainer's (2007) argument is intriguing but cannot be considered definitive, in part because of the low number of observations in their sample as well as an inability to rule out potential reverse causality. More recently, Michalopoulos and Papaioannou (2013) have used satellite images to examine the impact of precolonial centralization on regional nighttime light density. In their analysis the basic unit of observation for precolonial centralization is the ethnic group, while their observational unit for light density is the ethnic group homeland. As with Gennaioli and Rainer (2007), they show a robust positive impact of precolonial centralization on contemporary outcomes, both at the ethnic group level and at the sub-ethnic-group level of the pixel from their luminosity data.

Despite their use of much more fine-grained data than Gennaioli and Rainer (2007), Michalopoulos and Papaioannou (2013) nonetheless suffer from two notable concerns. First, by using the level of precolonial centralization for the entire ethnic homeland, Michalopoulos and Papaioannou (2013) assume that the level of political centralization was a constant across each ethnic homeland, an implausible assumption given the rich literature on how even the most centralized precolonial African states saw their power trail off as one got closer to their borders (see Herbst [2000] for a general overview). For instance, the core of nineteenth-century Burundi was controlled by the *mwami* (king), while outlying regions were instead ruled over by various princes and chiefs (Lemarchand 1994, 37); in Rwanda as well the state controlled the core, but the peripheral populations near its borders lived more autonomously and "were perceived pejoratively as not very 'Rwandan'" (Chrétien 2003, 161). Indeed, the historical literature suggests a strong link between declining political influence as one traveled outward from the state core and a declining tendency to identify ethnically with the state's core ethnic group (Chrétien 2003; Green 2008). Second, it is not exactly clear whether luminosity is an indicator of the accumulation of private wealth or the provision of public goods, with previous studies showing clear correlations with the former but not investigating any links with the latter (Henderson, Storeygard, and Weil 2008; Chen and Nordhaus 2011).³

³ Michalopoulos and Papaioannou (2013) do show a series of positive correlations between luminosity and access to public goods across four African countries, but here again the direction of causality is difficult to interpret.

III. Empirical Overview

Here we examine the role of precolonial centralization at the subnational level in Uganda. As noted above, Uganda exhibits large internal variation in the distribution of political centralization, with the traditional centralized kingdoms of Ankole, Buganda, Bunyoro, Busoga, and Toro in the south and west and the noncentralized areas of the Acholi, Itesot, Karamojong, and Langi in the north and east. Upon colonizing Uganda in the late nineteenth and early twentieth centuries, the British maintained local ethnic identities through their policy of indirect rule; while the British did use Baganda intermediaries to help conquer other parts of the country, they were quickly replaced such that by the 1910s almost all areas of the country were ruled over by local chiefs (Roberts 1962). However, the role of these chiefs was altered significantly under colonial rule, inasmuch as they became less accountable to their subjects and more accountable to the British, thereby turning them into “decentralized despots” (Mamdani 1996). This shift in accountability was most obvious in non-centralized areas, where the British introduced chiefdoms as a means to govern local areas, but it was also true in centralized areas where ethnic kings supposedly had power over local government but were still overseen by the British administration. Indeed, to take one example, chiefs in Buganda had become so unpopular because of their dictatorial tendencies that riots erupted against their rule in 1945 and 1949, leading the British government to force through the election of chiefs in Buganda before the country gained independence in 1962. The differences in local government between centralized and noncentralized areas were abolished in the 1967 constitution, which also abolished all kingdoms in southern Uganda. These kingdoms were eventually restored in the 1990s, but only as cultural organizations with no official role for chiefs, such that local government structures continue to remain the same across the whole country.⁴ In other words, the legal/institutional differences between the kingdom and nonkingdom areas were present in the past but have not existed for almost 50 years.

With few exceptions, neither the colonial nor postcolonial governments encouraged ethnic change or assimilation such that we can be reasonably confident about the continuity of ethnic identity from the precolonial era to the present.⁵ We cannot, however, be so confident that areas that were within the

⁴ Chiefs in the kingdom areas do exist but receive no state salaries and have no power over land or any other local resources, which are instead in the hands of local government officials.

⁵ Under President Idi Amin in the 1970s there was some evidence of people switching ethnic identities to access state power, but this process came to an end when his regime fell in 1979 (Kasfir 1979). More importantly, during the colonial period the Buganda region saw some Banyoro and Banyarwanda migrants assimilate into Buganda society in order to access land in the region (Green

ethnic homelands of centralized groups in the precolonial era would be home only to members of centralized groups today. As elsewhere in colonial Africa, the British colonial administration set up cotton, coffee, and sugar industries in central and southern Uganda in the early twentieth century to which they recruited migrant labor from northern and eastern Uganda as well as from Rwanda, Burundi, and the Congo through the introduction of the poll tax and other measures (Mamdani 1976, 52, 149–51). Many of these migration patterns continued after independence, not only for economic reasons but also because of political instability and civil war in northern and eastern Uganda and surrounding neighboring states. While some of these migrants were only temporary, many others settled permanently such that members of non-centralized groups account today for significant percentages of the population within the ethnic homelands of centralized groups. For instance, Masindi district is located in the kingdom of Bunyoro and its capital, Masindi town, was briefly capital of the kingdom between 1912 and 1924. However, because of decades of migration only 39.9% of the population of Masindi district in Bunyoro region identified as members of centralized groups on the 2002 census, while those from noncentralized groups included Alur (20.4% of the population), Acholi (9.2%), and Lugbara (6.9%). Similarly low percentages of centralized groups inhabit Bugiri district in Busoga kingdom (34.3%) and Kamwenge district in Toro kingdom (52.3%), among others. In other words, coding each area as centralized according to its precolonial status would fail to account for colonial and postcolonial demographic changes and thus yield imprecise estimates.⁶

As such, we use local districts and subcounties as our units of observations and use 2002 census data to measure the percentage of the population within each unit that is from a centralized ethnic group. We use the same methodology for computing precolonial centralization in Uganda as Gennaioli and Rainer (2007) and Michalopoulos and Papaioannou (2013), albeit at the dis-

2008). As a result, we reran all of our estimations excluding the Buganda region, with no changes in our results (available from authors).

⁶ This issue, which arises in Michalopoulos and Papaioannou (2013), would not be a problem if the mechanism by which precolonial centralization influences contemporary development is transferred across time via territory regardless of who now lives in the relevant geographical unit. However, if instead it is transferred intergenerationally within members of centralized ethnic groups, then Michalopoulos and Papaioannou's (2013) analysis cannot distinguish between areas that were inhabited by centralized groups in the precolonial period but today have different demographic profiles due to migration. In any case, we reran our results from tables 1, 4, and 5 below using an ordinal measure of centralization along the lines used by Michalopoulos and Papaioannou (2013), with a noticeable loss of precision but otherwise very similar results (available from authors on request).

tract and subcounty level; as elsewhere in Africa, we observe several stateless societies at level 0 in our Ugandan sample but no highly complex groups at level 4. The district is the highest level of local government; in recent years the national government has repeatedly created new districts, such that in our analysis below the number of districts varies between 56 and 80 depending on the date the data were collected.⁷ The subcounty is the third-highest level of local government (out of five different levels); in contrast to the ever-increasing number of districts, there has been no increase in the number of subcounties in recent years. Since decentralization reforms in the early 1990s, district governments have taken responsibility for the provision of health and education services, with secondary assistance from subcounty governments (Akin, Hutchinson, and Strumpf 2005).

For Uganda's major ethnic groups such as the Acholi, Baganda, Basoga, Iteso, and Langi—members of which account for over 82% of the current population of Uganda—we can use the Murdock (1967) data directly. However, the smaller ethnic groups (34 out of the 56 groups listed in the 2002 census) were not coded by Murdock (1967), and thus we have to infer the level of precolonial complexity by using the attributes of a related group. To do so we used the Ethnologue database to find ethnic groups who speak languages closely related to those listed in the Ugandan census data, as listed in appendix A. To calculate the percentage of residents in each local government unit from a centralized ethnic group, we used the most recent Ugandan census from 2002, which lists ethnic identity down to the level of the subcounty (Government of Uganda 2002). As noted above, the detailed nature of this data is unusual for African censuses, and it is also unusual for Ugandan censuses, which have never before listed ethnic data at the subcounty level. We also consider the use of census data to be superior to ethnic data used by the other scholarship on African precolonial political centralization discussed above, both because the Murdock data are from the 1960s and because census data allow individuals to choose their own identity rather than have it assigned by researchers. Figure 2 displays a map of Uganda with 80 districts shaded five different ways according to the percentage of residents from centralized ethnic groups; the Bantu-dominated central and southwest region is almost entirely dark, while the northern and eastern non-Bantu areas are largely white.

In doing so, our measure of precolonial centralization is a more accurate metric of the transmission of institutions via centralized groups. Not only does the measure capture the percentage of a given region's population that was centralized in the precolonial era, but it also takes into account demographic changes

⁷ For more on district creation in Uganda, see Green (2010).

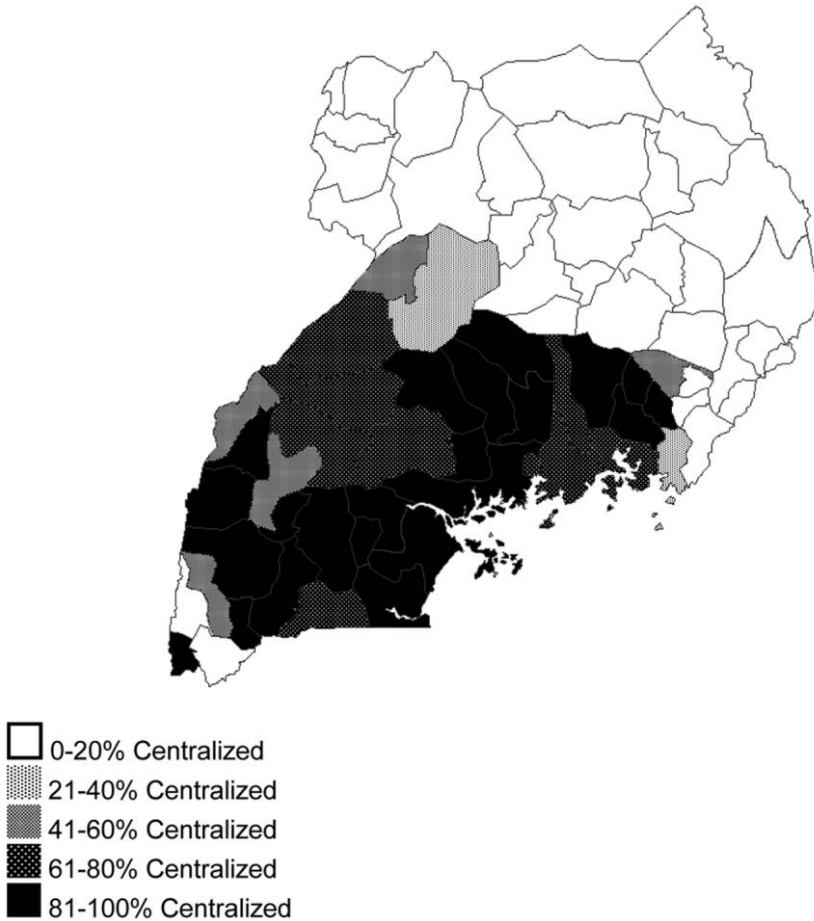


Figure 2. District-level map of Uganda

across the colonial and postcolonial periods that have caused changes in the proportion of centralized groups in the same region over time.

IV. Empirical Analysis

To examine the centralization hypothesis, we estimate a basic model using ordinary least squares (OLS), for the relationship between indicators of pre-colonial centralization and development

$$D_i = \alpha + \beta \text{Centralization}_i + \mathbf{X}_i \gamma + \varepsilon_i, \quad (1)$$

where D_i is a development indicator for regional unit i ; Centralization_i is an indicator of precolonial centralization for regional unit i , as measured by the

percentage of residents in each unit from ethnic groups coded with a pre-colonial centralization score of 2 or higher; \mathbf{X}_i is a vector of controls for regional unit i ; and ε_i is an error term assumed to be normally distributed, $N(0, \sigma_\varepsilon^2)$. We also use a series of controls to account for geographical determinants of contemporary development outcomes. We control for elevation (in feet, logged), average annual rainfall, malaria suitability, and ecological diversity, and we use dummies to control for whether the district has an international border or access to large rivers or lakes. Moreover, we control for two types of poor soil content, in both cases via dummy variables. First we control for lithosols, or orthents, which are shallow soils and are thus unsuitable for arable farming, as well as vertisols, which are noted for their high clay content that can only be farmed under a very narrow range of rainfall conditions. Finally, we control for ethnolinguistic fractionalization (ELF) as computed from the 2002 census. More details about all of the variables can be found in appendix B.

In table 1 we present our first set of results: we list the dependent variables in the first column, followed by results without controls and then with controls alongside the number of observations. We first list district-level results. Our first set of data comes from the 2005 United Nations Development Program (UNDP) Ugandan Human Development Report, which calculated a Human Development Index (HDI) for each of Uganda's then 56 districts. The second set of data comes from the 2007 Ugandan Human Development Report, which calculated not only an updated list of HDIs per district—which came to 76 at the time of their analysis—but also their component indexes for gross domestic product (GDP), literacy, gross primary school enrollment, and life expectancy.⁸ In the latter two cases the data are not strictly the same as those used by Gennaioli and Rainer (2007) but nonetheless function as a good proxy for measuring the quality of education and health in each district, respectively.⁹ Our results are all positive and statistically significant for the 2005 and 2007 HDIs as well as the literacy and GDP indexes but not for the gross enrollment or life expectancy indexes, which both produce negligible coefficients and very low R^2 s, a discrepancy we return to below.

⁸ The 2005 and 2007 UN HDIs are based on national household survey from 2003 and 2005, respectively. Both surveys covered all districts of Uganda, with the exception in the former case of Pader as well as some parts of Gulu and Kitgum districts because of the civil war in northern Uganda.

⁹ Incidentally, Gennaioli and Rainer (2007, 193) note that their results are nearly identical if they substitute life expectancy for infant mortality. We were unfortunately unable to match Gennaioli and Rainer's (2007) analysis for road coverage, as data only exist for 20 districts (Government of Uganda 2010, 169); we present our results for immunization below.

TABLE 1
PRECOLONIAL CENTRALIZATION AND DEVELOPMENT IN UGANDA: OLS ESTIMATES

Dependent Variable	Precolonial Centralization (without Controls)	R^2	Precolonial Centralization (with Controls)	R^2	Number of Local Government Units
District-level data: ^a					
HDI (2005)	.101*** (.022)	.311	.071*** (.019)	.498	55
HDI (2007)	.086*** (.021)	.186	.079*** (.023)	.435	76
Literacy index (2007)	.202*** (.042)	.251	.200*** (.056)	.483	76
GDP index (2007)	.108*** (.016)	.396	.081*** (.020)	.534	76
Gross enrollment index (2007)	.009 (.089)	.000	.023 (.108)	.318	76
Life expectancy index (2007)	.010 (.031)	.002	.020 (.036)	.318	76
Sub-county-level data (from 2002): ^b					
Poverty headcount	-26.092*** (4.197)	.317	-16.218*** (3.625)	.446	958
Poverty gap	-12.630*** (2.219)	.297	-8.021*** (1.852)	.419	956

Sources. UNDP (2005, 2007) and Emwanu et al. (2007).

Note. Robust standard errors in parentheses.

^a Controls include log of elevation, ethnolinguistic fractionalization, rainfall, ecological diversity, malaria, and dummies for poor soils (lithosol and vertisol), access to rivers and lakes, and international borders.

^b We cluster standard errors at the district while our controls include ethnolinguistic fractionalization, ecological diversity, malaria, and dummies for poor soils (lithosol and vertisol), access to rivers and lakes, and international borders.

*** $p \leq .01$.

Table 1 also reports results with sub-county-level data, here compiled by the Ugandan Bureau of Statistics. For this data set, we have obtained the poverty headcount measure and a poverty gap measure that calculates the average gap in expenditure necessary for the poor in each region to reach the poverty line, as poverty development indicators. The data on poverty headcount and poverty gaps are estimated using data on household consumption, which themselves were modeled using various household characteristics.¹⁰ Here we cluster errors at the district level to account for district-level effects.

In both cases precolonial centralization is statistically significant and has the expected positive sign. Moreover, in many regressions without controls, pre-

¹⁰ The household characteristics that were most commonly associated with expenditure patterns included household size, education, marriage, housing materials, type of toilet, and access to energy and water (Emwanu et al. 2007, 71). There is no indication that ethnic identity was used as a regressor in these models, which would have introduced an element of tautology to our results.

colonial centralization explains a great deal of variation in the dependent variable; in the case of the poverty headcount, for instance, it alone explains almost one-third of the variation across 958 subcounties.

We plot the relationship between centralization and the six dependent variables from table 1 in figure 3; as can be seen, there are no serious outliers driving our results. To confirm the lack of outliers, we also computed the Dfbetas from each regression, removed all values where $Dfbeta > 2/\sqrt{n}$ —where n = number of observations (Belsley, Kuh, and Welsch 1980, 28)—and reran our regressions, with no differences in our findings (we performed these tests for all regressions reported in tables 4–6 as well, with no changes in our results, which are available from authors on request). We also checked for and eliminated observations with a high Cook's Distance; our results again remained the same.

For additional robustness, we also test an alternative measure of centralization, where only groups that score 3 are coded as centralized and all others are recorded as decentralized, a change that especially makes a difference in eastern Uganda. (We cannot, however, perform the exercise using a score of 1 as the threshold, since it only yields six districts with less than half of their residents from centralized ethnic groups.) The results, which are available from the authors, are even stronger than those in table 1.

We also reran our results excluding all districts and subcounties with less than 20% of their residents from centralized groups, for two reasons. First, as seen in figure 2 there is a strong divide between northern and eastern Uganda, with almost no residents from centralized groups, and the rest of the country. Thus, it is of interest to see whether the northern and eastern districts are driving our results and whether our results would still hold in the southern and western kingdom areas of Uganda. Second, our dependent variables were measured during the height of the war involving the Lord's Resistance Army, which only affected northern Uganda, and thus the war could be driving our results as well. However, we found no changes in our results upon excluding the relevant districts and subcounties. We also excluded all districts with more than 80% of their residents from centralized groups, again with no changes in our results. Finally, as Buganda has long been the richest kingdom and was the only kingdom granted federal status upon independence in 1962, we excluded Buganda from our results, with no changes. (All of these additional results are available from the authors.)

As a further robustness test, we reestimated the above models by clustering the standard errors in two different ways. First, we cluster the standard errors at the primary ethnic group level to account for the fact that precolonial centralization varies with the ethnic group. Second, to account for spatial

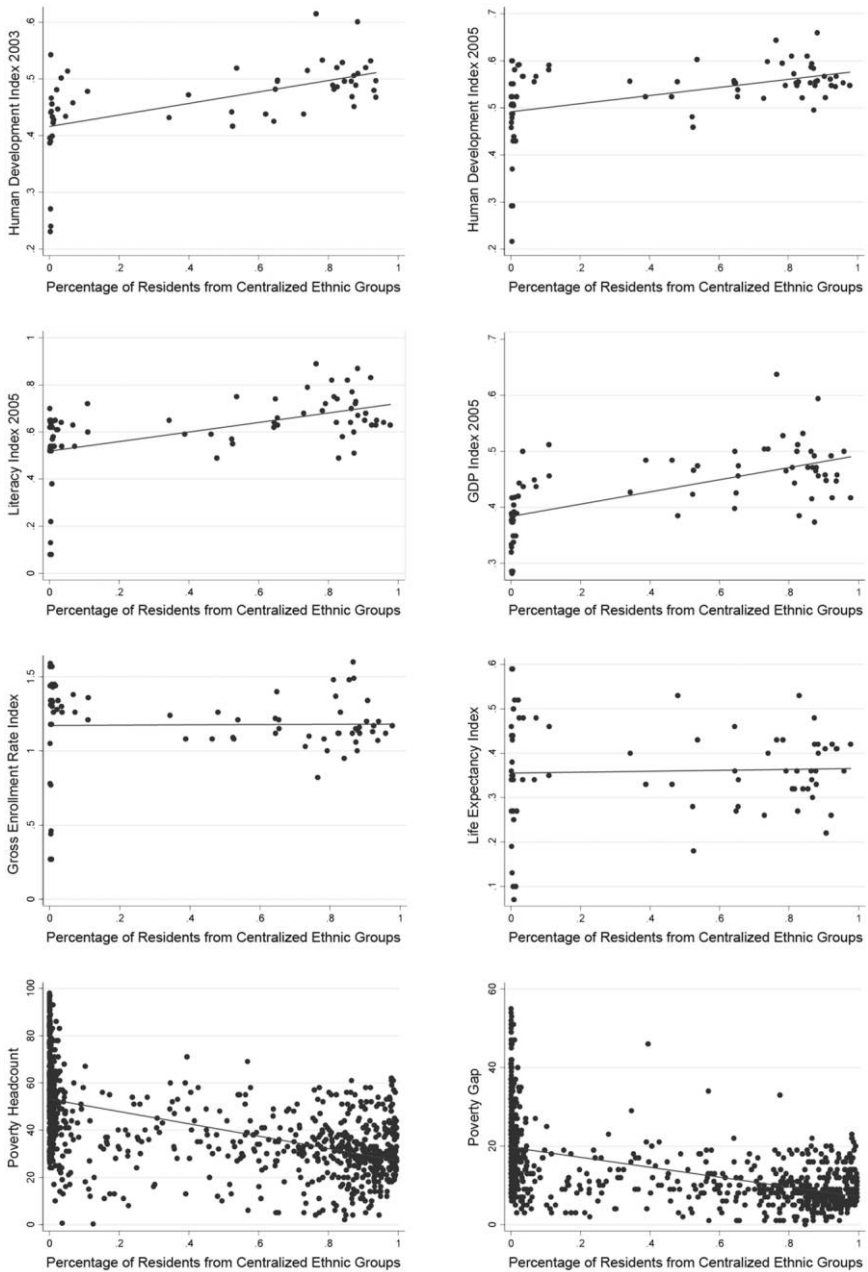


Figure 3. Political centralization and development outcomes (from table 1)

correlation, we estimate Conley standard errors.¹¹ The results for these estimations are in appendix C, table C1, available in the online version of *Economic Development and Cultural Change*. Our findings remain unchanged.

A. Survey-Based Empirical Estimates

We next turn to results from the Afrobarometer Round 4 survey in Uganda, which in 2008 asked over 2,400 respondents a variety of questions relevant to our analysis here. The Afrobarometer is a cross-country survey that first started in 1999 and completed four rounds across 19 countries in Africa by 2008; it measures public attitudes to a variety of social, economic, and political phenomena. It is particularly useful to us for several reasons. First, it allows us to work with individual-level survey data, thus providing us with an accurate representation of the reach of public policies as well as allowing respondents to freely identify their ethnic groups. Second, it has a very large number of respondents who are well represented across Uganda. Third, it yields a more representative choice of variables with which we can work than the local government data. More specifically, while our previous dependent variables focused on literacy, health, human development, and income and poverty, the Afrobarometer survey gives us responses on ownership of assets and access to vital necessities, all or some of which are often discussed in the literature as being much more directly related to public expenditures than macrolevel variables such as HDI indexes, literacy indexes, and income and poverty levels. For our principal explanatory variable, precolonial centralization, we use the individuals' response on his or her ethnic identity to create a dummy variable that captures whether the respondent's ethnic group was centralized. The data set also provides us with a variety of socioeconomic variables that we use as controls, such as age, age², a dummy for gender and household head, and subcounty ELF. For our dependent variable, we use responses to questions on access to vital necessities in the past year, namely, food, water, medical care, cooking fuel, and cash income. Responses to the questions range from never (coded as 0) to always (coded 4).

The relationship we estimate is given by equation (2), and we use an ordered logit to estimate it.

$$C_i = \delta + \theta \text{CentralizationDummy}_i + \mathbf{X}_i \lambda + \varepsilon_i, \quad (2)$$

¹¹ For the estimation of the Conley standard errors presented in the tables, we chose the distance at which spatial correlation is assumed to vanish to be 300 kilometers, which is the maximum width of Uganda's east-to-west borders (to account for the fact that levels of precolonial centralization vary little along longitudinal lines). We have also set the value to be lesser values (50, 100, 200) with no changes in the estimated Conley standard errors.

where C_i corresponds to a response to the question “Gone without ___ in past year” (0–4, with 0 = never and 4 = always) for individual i . We perform estimations with responses to all five questions (q5a–q5e) asked on food, water, medical care, cooking fuel, and cash income. Whether the respondent’s ethnic group was centralized is captured by $\text{CentralizationDummy}_i$, \mathbf{X}_i is a vector of controls for individual i , and ε_i is an error term assumed to follow the logistic distribution. Table 2 presents ordered logit estimates of equation (2).

In table 2 we present estimates of logit regressions of a similar relationship of precolonial centralization with the ownership of assets such as a radio, television, and a car or motorcycle. We estimate the following relationship:

$$A_i = \mu + \rho \text{CentralizationDummy}_i + \mathbf{X}_i\psi + \nu_i, \quad (3)$$

where A_i corresponds to a response to the question “Personally own a ___” (0 = no and 1 = yes) for individual i , \mathbf{X}_i is a vector of controls (the same

TABLE 2
PRECOLONIAL CENTRALIZATION AND DEVELOPMENT IN UGANDA, AFROBAROMETER SURVEY DATA

Dependent Variable	Precolonial Centralization Dummy	Controls	Observations	Subcounty Clusters	Pseudo-R ²
Ordered logit regressions:					
Gone without ___ in the past year (0–4, with 0 = never and 4 = always):					
Food	–1.271*** (.134)	Yes	2,410	168	.062
Clean water	–.757*** (.126)	Yes	2,415	168	.020
Medical care	–.565*** (.135)	Yes	2,413	168	.015
Cooking fuel	–.770*** (.126)	Yes	2,412	168	.015
Cash income	–.388*** (.121)	Yes	2,410	168	.023
Logit regressions:					
Personally own a ___ (0 = no, 1 = yes):					
Radio	.341*** (.132)	Yes	2,416	168	.048
Television	.602** (.241)	Yes	2,416	168	.076
Car or motorcycle	.374* (.195)	Yes	2,416	168	.053

Note. Robust standard errors clustered at the subcounty level in parentheses. Controls include age, age², gender, head of household dummy, and subcounty ethnolinguistic fractionalization.

* $p \leq .1$.

** $p \leq .05$.

*** $p \leq .01$.

controls used as for estimating model 2) for individual i , and ν_i is an error term assumed to follow the logistic distribution.

In all cases, we cluster the standard errors at the subcounty level, with our results robust to clustering at alternative levels of local government as well. Our results are unequivocal: all of the coefficients of the centralization variable have the correct sign and are statistically significant at the 5% level or better, with the sole exception of car or motorcycle ownership, which is significant at the 10% level.

We also use two additional sets of survey results. First, we use a survey conducted by a joint team from Uganda and the World Bank in 2010, the Uganda Migration Household Survey. While the subject of the survey was international migration and remittances, surveyors nonetheless asked about ethnicity as well as asked a wide range of questions about asset ownership that allow us to use the survey results here. We estimate model 3 using a logistic regression, where A_i corresponds to a response to the question “Has/Owns ____” (0 = no and 1 = yes) for individual i . Here we control for age, age², gender, the number of people in the household, and urbanization; since the subcounties are not listed in the data set, we control for district-level ELF and cluster the standard errors at the enumeration level. (As before, the results are robust to clustering at the district level as well.) For brevity, we present the results in table C3; as can be seen, for the 17 questions the precolonial centralization variable has the expected sign in 15 regressions and is statistically significant at the 5% level or better in 12 regressions.

Second, we use the 1988 Ugandan Demographic and Health Survey (DHS). Rather than using the most recent DHS data from Uganda, we deliberately focused on the first DHS survey, which was conducted across most of Uganda in 1988–89 among women age 15–49. The timing of the DHS survey is interesting for our purposes, as it was conducted just after Uganda emerged from a 20-year period of rule by members of noncentralized ethnic groups. If, as has been suggested elsewhere (Frank and Rainer 2012), African rulers favor their own ethnic groups, we should expect to see centralized groups to have suffered significantly under the rule of Obote and Amin relative to non-centralized groups. Nonetheless, as reported in table C4, we find a robust relationship between centralization and measures of educational achievement, literacy, and asset ownership when controlling for age, age², urbanization, and marital status.

V. Instrumental Variable Regressions

It is possible that the relationship between precolonial economic development and contemporary economic development is a consequence of reverse causality, whereby precolonial development led both to the emergence of pre-

colonial states and to the persistence of economic development outcomes to the present day.¹² One way to deal with this problem is to use an instrumental variable analysis; of course, finding an instrument for precolonial centralization at the country level is extremely difficult given the complex precolonial history of Africa. However, the use of the Ugandan case study here simplifies the search for such an instrument given the large literature on precolonial state formation in Uganda.

Here we employ the log of distance from Mubende town as an instrument for precolonial political complexity.¹³ Mubende town, in what is now Mubende district, was the legendary capital of the medieval Bacwezi empire established by King Ndahura, who supposedly “conquered lands in various directions” from his capital (Chrétien 2003, 97). While much of the history of the Bacwezi is shrouded in uncertainty, recent archeological evidence suggests a significant human presence at Mubende between 1275 and 1400 (Robertshaw and Taylor 2000, 16).¹⁴ Moreover, historians are much more certain about the precolonial history of the kingdom of Bunyoro, whose capital was established at Mubende at one point and which spawned the other neighboring kingdoms of southern and western Uganda over subsequent centuries (Oliver 1955, 115; Chrétien 2003, 103). We plot the relationship between the log of distance and precolonial centralization for 79 districts in figure 4; because we are forced to drop Mubende district, the number of observations decreases by one in relation to table 1. As is clear, the relationship is not driven by any outliers, and distance from Mubende explains a majority of the variation in precolonial centralization.

Mubende, of course, is in Buganda and thus not particularly far from Kampala, which is the political and economic hub of the country. It is thus possible that any relationship between distance from Mubende and political centralization could be a result of migrants who move toward Kampala for economic reasons and eventually assimilate into more centralized groups indigenous to the area. To allow for this possibility, we add a control for log of distance from Kampala.

¹² In a recent paper, Fenske (2014) demonstrates that the development of centralized states in Africa was a consequence of the potential for trade, as proxied by a measure of ecological diversity. However, note that Osafo-Kwaako and Robinson (2013) find no relationship between trade and centralization in precolonial Africa when using data on trade from Murdock (1967).

¹³ We measure geodesic or great circle distance through the Haversine formula.

¹⁴ Robertshaw and Taylor (2000) also discuss evidence of an earlier settlement at Ntusi, some 65 kilometers southwest of Mubende in what is now the neighboring district of Sembabule; while there is no legend attaching Ntusi to the growth of the region’s subsequent kingdoms, the evidence nonetheless does suggest the existence of a centralized chiefdom some 200 years earlier than at Mubende. If we use an instrument measuring distance from Ntusi rather than from Mubende, we obtain essentially the same results as reported here (results available from authors).

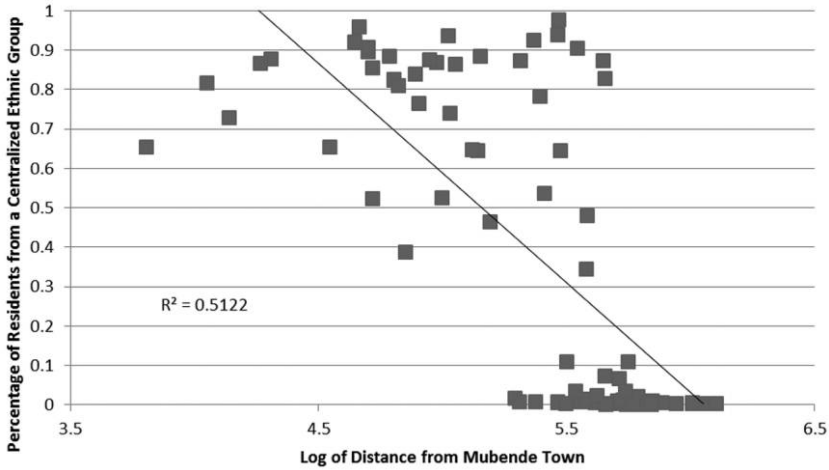


Figure 4. Log of distance from Mubende and precolonial centralization

In table 3 we regress precolonial centralization on distance from Mubende for the two data sets of districts and the subcounties alongside distance from Kampala and other geographical controls, namely, elevation, malaria, ecological diversity, access to rivers and lakes, rainfall, and poor soil as measured by lithosol and vertisol dummy variables. Distance from Mubende is negative and statistically significant, with p -values lower than 0.001 for all three regressions; vertisols and lithosols are also strongly and weakly significant, respectively, both in the expected direction.¹⁵ It is notable that distance from Kampala is not statistically significant in either of the two district-level regressions. Finally, the F -statistic in all three regressions is high, suggesting that distance from Mubende is a strong instrument.¹⁶

As with any instrumental variable, the question arises as to whether distance from Mubende has influenced contemporary developmental outcomes via channels other than precolonial centralization. For instance, it is plausible that the areas near Mubende where centralized polities were established in the precolonial period had better climatic conditions for agriculture and thus had higher levels of development that have persisted to the present day. However, the controls for soil, rainfall, and elevation in table 3 fail to remove the statistical

¹⁵ We do not include vertisol and lithosol as instruments since bivariate regressions show that they explain much smaller percentages of the variation in complexity than does distance from Mubende; nonetheless, our results are robust to the use of both soil types as additional instruments (results available from authors).

¹⁶ We reproduce our analysis in table 3 using clustered standard errors at the primary ethnic group level and Conley standard errors in table C2, with no changes in our results.

TABLE 3
DETERMINANTS OF PRECOLONIAL CENTRALIZATION IN UGANDA: OLS ESTIMATES

	(1)	(2)	(3)
Mubende distance (log)	-.336*** (.069)	-.364*** (.065)	-.397*** (.066)
Kampala distance (log)	-.061* (.036)	-.078 (.046)	-.099*** (.035)
Lithosol	-.093 (.074)	-.072 (.060)	-.119** (.049)
Vertisol	-.218* (.082)	-.159** (.069)	-.130** (.055)
Malaria	-.193 (.229)	-.263 (.171)	-.468** (.224)
Ecological diversity	.188 (.244)	.336 (.211)	.060 (.239)
Access to rivers/lakes	.098 (.073)	.081 (.069)	.047 (.083)
Elevation (log)	.298 (.229)	.130 (.173)	
Rainfall	-.065* (.033)	-.053** (.027)	
N	54	75	957
R ²	.660	.612	.498
F-statistic	22.88	30.33	29.98
Prob > F	.000	.000	.000

Note. Robust standard errors in parentheses (clustered at the district level in col. 3).

* $p \leq .1$.

** $p \leq .05$.

*** $p \leq .01$.

significance of the variable measuring distance from Mubende. Moreover, historical evidence suggests that the center of power for Bunyoro had shifted northward from Mubende far before independence. From the late eighteenth to the mid-nineteenth centuries, its capitals were located in what is now Kibaale district (Nyakatura 1973, 88, 92, 98), while its late nineteenth-century capitals were in what are now Hoima and Masindi districts (Doyle 2006, 39). The colonial period saw the establishment of the capitals of Bunyoro in the towns of Hoima (1900–1912 and 1924–present) and, as noted above, Masindi (1912–24), while the new railway system that was constructed from Kasese in western Uganda all the way to Nairobi and the Indian Ocean coast bypassed Mubende (as can be seen in fig. 1). The result is that Mubende today remains a relative backwater town in one of the poorer parts of Buganda kingdom, suggesting that proximity to Mubende does not have any direct effect on contemporary developmental outcomes.

Viewing the results in table 3 as the first stage of our instrumental variable analysis, we now estimate equation (1) as the second-stage regression and present our second-stage results in table 4. As before, all but the enrollment and life

TABLE 4
INSTRUMENTAL VARIABLE RESULTS

Dependent Variable	Precolonial Centralization (without Controls)	Precolonial Centralization (with Controls)	Number of Local Government Units
District-level data: ^a			
HDI (2005)	.135*** (.035)	.228*** (.080)	54
HDI (2007)	.109*** (.035)	.176*** (.052)	75
Literacy index (2007)	.331*** (.062)	.577*** (.110)	75
GDP index (2007)	.149*** (.021)	.186*** (.040)	75
Gross enrollment index (2007)	.183 (.140)	.554* (.257)	75
Life expectancy index (2007)	-.102** (.041)	-.222*** (.083)	75
Sub-county-level data (from 2002): ^b			
Poverty headcount	-35.073*** (6.208)	-22.863*** (6.931)	957
Poverty gap	-18.073*** (3.601)	-13.181*** (3.728)	955

Sources. UNDP (2005, 2007) and Emwanu et al. (2007).

Note. Two-stage least squares estimates with log of distance from Mubende as an instrument for pre-colonial centralization. Robust standard errors in parentheses.

^a Controls include log of elevation, ethnolinguistic fractionalization, rainfall, ecological diversity, malaria, and dummies for poor soils (lithosol and vertisol), access to rivers and lakes, and international borders.

^b We cluster standard errors at the district while our controls include ethnolinguistic fractionalization, ecological diversity, malaria, and dummies for poor soils (lithosol and vertisol), access to rivers and lakes, and international borders.

* $p \leq .1$.

** $p \leq .05$.

*** $p \leq .01$.

expectancy variables are both statistically significant and in the expected direction. The enrollment variable is not significant without controls and only weakly significant with controls; life expectancy, however, is negative and significant, indicating that areas with people from more centralized ethnic groups have lower average levels of life expectancy. The coefficient for centralization is higher for the results at the district level but is almost the same for the sub-county data set.

VI. Testing Mechanisms and Interpretation

There are three competing hypotheses for the relationship between pre-colonial centralization and contemporary development. First, areas that were al-

ready developed in the precolonial period have remained more developed to the present day, a mechanism that we call here the “persistence” hypothesis. Second, it could be that centralized ethnic groups have more legitimate local chiefs and that these chiefs thereby have both better incentives and a better ability to implement modernization programs. Third, the relationship could be driven by national-level mechanisms, whereby centralized ethnic groups improve national-level development patterns. Since we are attempting to explain within-country differences, we can obviously eliminate the third hypothesis, which leaves us with the first two hypotheses.

Both Gennaioli and Rainer (2007) and Michalopoulos and Papaioannou (2013) propose that the second mechanism, which the former call the “local accountability” hypothesis, is correct. To do so, Gennaioli and Rainer (2007) split each country’s population along a 2×2 matrix of two binary variables, namely, centralization and class stratification, with the latter variable also taken from Murdock (1967). They then designate various types of public goods as characterized by high levels of geographic spillover (education and infant mortality), such that local chiefs are forced to cooperate, and low levels of spillover (paved roads and immunization), which instead have little influence outside the community in question. As such Gennaioli and Rainer (2007) predict that for low-spillover goods the benefits of precolonial centralization will be higher for more stratified groups, since such groups would have particularly poor public goods provision due to class divisions. In the converse, however, for high-spillover goods the effect of precolonial centralization should be uniform across stratified and egalitarian groups. The authors’ cross-national results appear to confirm these hypotheses.

Data limitations prevent us from undertaking the same exercise here, as data on stratification are missing for various major ethnic groups, while inferring data from related groups is more difficult with stratification as it does not correspond to linguistic differences in the same way as centralization. Gennaioli and Rainer (2007) also test for a variety of other measurements of precolonial advancement for which there are no subnational data available for Uganda or there is little to no variation at the subnational level, such as being landlocked or nomadic.

However, we have a variety of other data that allow us to test for mechanisms here, both at the district and the individual levels. If the persistence mechanism is correct, then its effects should be obvious at the individual level and not just the local government level; moreover, if true, it implies that areas dominated by individuals from centralized ethnic groups should have higher access to private goods than other areas but that centralized areas should not necessarily have better public goods. If instead it is the local accountability

hypothesis that is correct, we should see a set of correlations between centralization and public goods outcomes. Inasmuch as the local accountability hypothesis relies on the higher levels of legitimacy for local governments in more centralized areas, we should also observe higher levels of local government performance in more centralized areas.

We can reexamine our results from tables 1 and 4 in this regard, whereby the positive relationship between centralization and district-level HDI was driven by GDP and literacy but not by school enrollment or life expectancy. GDP can be interpreted as a measure of private goods, since government expenditure has remained around 16% of GDP since the 1990s (Fan and Zhang 2008). School enrollment and life expectancy are more obvious measures of public goods, since they are heavily influenced by government spending on education and health, respectively.¹⁷ While literacy at first appears to be a measure of public good provision, it has higher levels of correlation with GDP ($r = 0.73$) than with primary school enrollment ($r = 0.60$) or life expectancy ($r = -0.11$).¹⁸ Indeed, evidence from Uganda suggests that despite the abolition of school fees, households still have to cover indirect private costs such as meals, uniforms, and transportation (Nishimura, Yamano, and Sasaoka 2008), which means that those who achieve literacy are not necessarily just those who attend school but those who also have additional levels of private wealth. These results thus seem to provide evidence for the persistence thesis over the local accountability thesis.

As for table 2, all of our results provide additional evidence of the link between centralization and private goods. The negative relationship between centralization and going without medical care might indicate that centralized areas have better access to public health care. However, most health care in Uganda is provided privately through either traditional healers or private practitioners (Birungi et al. 2001; Nuwaha 2002; Xu et al. 2006), which suggests that here again centralization is correlated with private rather than public goods.

We also test these two hypotheses with a variety of data on public goods provision at the district level in table 5. We first use the most recent government data on access to safe drinking water (in 2008) and the percentage of

¹⁷ For an overview of recent evidence supporting life expectancy as a measure of public goods, see Deaton (2013).

¹⁸ High levels of correlation between literacy and GDP at the national level have led to a series of criticisms of the HDI going back to its inception (cf. McGillivray 1991 and, more recently, Høyland, Moene, and Willumsen 2011). Because of this problem as well as additional concerns about the measurement of literacy, the UNDP replaced literacy and gross enrollment rates as measures of education with mean and expected years of schooling in 2010.

TABLE 5
PRECOLONIAL CENTRALIZATION AND PUBLIC GOODS IN UGANDA: OLS ESTIMATES

Dependent Variable	Precolonial Centralization	Controls	R ²	Number of Districts
Access to safe drinking water	-.029 (.075)	Yes	.180	76
Percentage of district health posts filled	-.089 (.066)	Yes	.148	80
Health centers per 10,000 inhabitants	-.063 (.268)	Yes	.141	80
BCG immunization	-3.327 (6.679)	Yes	.275	80
Measles immunization	-19.325*** (7.245)	Yes	.250	80
Oral polio vaccine	-17.313*** (6.574)	Yes	.276	80
DPT immunization	-16.368** (7.471)	Yes	.189	80
Gross intake rate	-17.389 (19.849)	Yes	.174	80
Net intake rate	3.941 (6.906)	Yes	.095	80
Gross enrollment rate	-12.296 (13.180)	Yes	.213	80
Net enrollment rate	-6.642 (9.188)	Yes	.168	80

Sources. UNDP (2007) and Government of Uganda (2008, 2009, 2010).

Note. Robust standard errors in parentheses. Controls include log of elevation, ethnolinguistic fractionalization, rainfall, ecological diversity, malaria, and dummies for poor soils (lithosol and vertisol), access to rivers and lakes, and international borders. Data for the dependent variable are from Government of Uganda (2008) for the first row, Government of Uganda (2009) for the second row, and Government of Uganda (2010) for the rest of the table. Dependent variables for the last eight rows are all based on the average measurement between 2007 and 2009.

** $p \leq .05$.

*** $p \leq .01$.

district health posts that were actually filled (in 2009).¹⁹ Moreover, we use a number of different measures from the most recent Ugandan Statistical Yearbook before the most recent expansion in the number of districts (Government of Uganda 2010). We first measure the total number of health centers per 10,000 inhabitants as well as the average level of coverage between 2007 and 2009 for all four different types of immunization assessed by the Statistical Yearbook: BCG (against tuberculosis), DPT (against diphtheria, pertussis, and

¹⁹ Note the difference in the variables measuring how often per year a household went without clean water from table 2 and access to clean water in table 5. In Uganda water, like electricity, is provided by the state with the goal of achieving universal access to all citizens, with the caveat that it is charged at various tariffs. Thus, poor households might have access to water supplies but might not be able to purchase clean water year-round.

tetanus), measles, and oral polio vaccines. Finally, we use data on all four indicators for primary education assessed by the Statistical Yearbook, namely, gross intake rate, net intake rate, gross enrollment rate, and net enrollment rate. (See app. B for more details on the differences between these variables.) As with immunization, in all four cases we take the average level between 2007 and 2009.

The model estimated is given by

$$G_i = \zeta + \phi \text{CentralizationDummy}_i + \mathbf{H}_i \mathbf{v} + \omega_i, \quad (4)$$

where G_i is the development outcome variable (either an education or life expectancy or health outcome), \mathbf{H}_i is a vector of controls for regional unit i , and ω_i is an error term assumed to be normally distributed, $N(0, \sigma_\omega^2)$. Equation (4) is estimated using OLS.

Our results, as reported in table 5, show a striking lack of correlation between precolonial centralization and these 11 variables measuring education and health outcomes. Indeed, with all four immunization variables we observe a negative relationship between centralization and public goods provision, although this result is not robust to dropping soil types as control variables.

Of course, the lack of any relationship between centralization and these education and health outcomes could be the result of central government decisions rather than local government policies. However, as noted above, education and health spending in Uganda have been decentralized since the early 1990s, with district and subcounty governments receiving 35% and 42% of all locally generated revenue, respectively (Francis and James 2003, 328). Indeed, in one noted study, scholars found that not only was actual local government spending on nonwage education expenditures a fraction of its budget, but it varied significantly across regions, suggesting a strong degree of local autonomy over education spending (Reinikka and Svensson 2004). The possibility still remains that the national government has somehow influenced public goods provision so that the Banyankole kin of President Museveni have better services, which conforms to previous work on ethnic favoritism in Africa (Franck and Rainer 2012). However, when we either exclude all Banyankole or the Ankole region from our analysis our results do not change (results available from authors).²⁰

If, according to the local accountability hypothesis, there should be a positive correlation between centralization and local government accountability

²⁰ It could well be that previous governments led by members of centralized ethnic groups have influenced contemporary public goods provision. However, from independence up to 1986 Uganda was led almost entirely by members of noncentralized groups, with the sole exception of the interim presidency of Yusuf Lule from 1979 to 1980.

and performance, then we should also be able to observe this relationship using Afrobarometer data. The Afrobarometer records information on citizens' trust in local government, local government corruption, the degree to which citizens feel that local government councilors listen to them, and the performance of local governments in handling the following items: maintaining roads, maintaining market places, maintaining food standards at restaurants and food stalls, keeping the council clean, collecting license fees and property taxes, making their work known to citizens, providing information about their budgets, allowing citizens to participate in decision making, consulting others, handling complaints, and using government revenues well. We estimate model 4 using ordered logit regressions, with Afrobarometer variables on service provision as our dependent variables.

If numerous individuals from centralized ethnic groups recently migrated from their homelands to more poorly governed areas, then our analysis would fail to pick up any relationship between centralization and public goods provision. Thus we change our independent variable of interest here from a centralization dummy based on each individual's ethnic identity to one that measures the percentage of people in each subcounty from centralized ethnic groups, as in tables 1 and 4.²¹ In all cases we use the same set of control variables as in table 2 and cluster errors at the subcounty level. The results, which can be found in table 6, demonstrate a notable lack of correlation between subcounty pre-colonial centralization and perceptions of local government performance, which in most cases results in a negative (albeit nonsignificant) relationship that is also quantitatively small.

As an additional robustness check, we return to our subcounty data on poverty from table 1. If the operating mechanism is the quality of local institutions, specifically ethnic institutions that originate in the precolonial era, then the relationship between centralization and development should be evident across areas with different ethnic institutions but not within areas sharing the same institutions. However, if instead the operating mechanism is the persistence of wealth within ethnic groups, then the relationship between centralization and development should be evident within the same region, as long as there is enough variation in the percentage of people from centralized ethnic groups.

To examine which mechanism is operating in our Ugandan case study, we reestimate our regressions from table 1 using a series of subsamples, as

²¹ As an additional measure, we eliminated from our analysis all members of nonindigenous ethnic groups in each district, as measured in the 2002 census, with no changes in our results (available on request).

TABLE 6
PRECOLONIAL CENTRALIZATION AND DEVELOPMENT IN UGANDA: ORDERED LOGIT ESTIMATES

Dependent Variable	Precolonial Centralization Percentage	Controls	Observations	Subcounty Clusters	Pseudo-R ²
Trust in LG (0–3; 0 = none, 3 = a lot)	.014 (.183)	Yes	2,356	168	.005
Degree of LG corruption (0–3; 0 = none, 3 = a lot)	.182 (.169)	Yes	2,241	168	.002
LG councilors listen to people like me (0–3; 0 = none, 3 = a lot)	–.125 (.194)	Yes	2,368	168	.005
How does the LG handle the following item (1–4; 1 = very badly, 4 = very well):					
Maintains local roads	.054 (.221)	Yes	2,403	168	.002
Maintains marketplaces	–.184 (.196)	Yes	2,343	168	.002
Maintains food health standards	–.272 (.179)	Yes	2,318	168	.004
Keeps council clean	–.155 (.167)	Yes	2,348	168	.002
Collects license fees	.194 (.195)	Yes	1,803	168	.004
Collects property tax	.099 (.180)	Yes	1,623	168	.002
Makes work known to ordinary people	–.317* (.189)	Yes	2,219	168	.006
Provides information about budgets	–.452** (.182)	Yes	2,200	168	.008
Allows citizens to participate in decisions	–.123 (.190)	Yes	2,245	168	.004
Consults others	–.339* (.197)	Yes	2,101	168	.006
Handles complaints	–.319 (.203)	Yes	2,130	168	.002
Uses government revenues well	–.154 (.207)	Yes	2,095	168	.004

Source. Afrobarometer Survey Data

Note. Robust standard errors clustered at the subcounty level in parentheses. Controls include age, age², gender, head of household dummy, and subcounty ethnolinguistic fractionalization. LG = local government.

* $p \leq .1$.

** $p \leq .05$.

presented in table 7. First, we take a subsample of just the areas that were historically governed by kingdom governments (i.e., the districts formerly under the rule of Ankole, Buganda, Bunyoro, Busoga, and Toro). As seen in column 1, the coefficient of precolonial centralization diminishes in size for both dependent variables (poverty headcount and poverty gap) but remains statistically significant in this subsample. Second, we examine this relationship within individual kingdoms in four of the five kingdoms that exhibit variation at the subcounty level in the percentage of residents from centralized groups. (The fifth, Buganda, has no subcounties with less than 40% of their residents from centralized groups, in contrast to the other four kingdoms, all of which have at least one subcounty with less than 5% of its residents from centralized groups.) The results are again consistent with those obtained using the larger sample for both poverty headcount and poverty gap, with similarly sized coefficients of precolonial centralization and high levels of statistical significance. The only exception here is the kingdom of Busoga, where the coefficients of precolonial centralization have the correct sign but are not statistically significant; one possible explanation for this result is that Busoga is alone among the kingdoms in receiving a centralization mark of 2 rather than 3 in Murdock

TABLE 7
PRECOLONIAL CENTRALIZATION AND DEVELOPMENT IN UGANDA, SUBCOUNTY SUBSAMPLES: OLS ESTIMATES

	Kingdoms Only (1)	Ankole Only (2)	Bunyoro Only (3)	Busoga Only (4)	Toro Only (5)
Dependent variable = poverty headcount:					
Precolonial Centralization	-19.706*** (3.621)	-20.302*** (2.014)	-19.775** (5.311)	-31.474 (18.748)	-17.819** (6.290)
Controls	Yes	Yes	Yes	Yes	Yes
Observations	488	90	46	82	68
Districts	31	7	4	7	5
R ²	.195	.224	.582	.127	.432
Dependent variable = poverty gap:					
Precolonial Centralization	-7.756*** (1.505)	-6.238*** (1.572)	-7.847* (2.702)	-11.156 (7.436)	-6.070* (2.787)
Controls	Yes	Yes	Yes	Yes	Yes
Observations	488	90	46	82	68
Districts	31	7	4	7	5
R ²	.244	.119	.755	.105	.295

Sources. UNDP (2005, 2007) and Emwanu et al. (2007).

Note. Robust standard errors clustered at the district level in parentheses. Controls include ethnolinguistic fractionalization, ecological diversity, malaria, and dummies for poor soils (lithosol and vertisol), access to rivers and lakes, and international borders.

* $p \leq .1$.

** $p \leq .05$.

*** $p \leq .01$.

(1967), in large part because it was not a kingdom in the precolonial era.²² For robustness, we also estimate equations (2) and (3) using DHS data for kingdom areas only, with the same results as above, as listed in table C5.

Finally, our results here could be the result of a clash between traditional authorities from centralized ethnic groups and contemporary local government officials. More specifically, it could be that local accountability explained a divergence in public goods provisions across Uganda in previous decades when traditional authorities held control over local government administration but that this link was broken when Milton Obote abolished the political role of Uganda's kingdoms in the 1960s. Indeed, after the kingdoms were restored under President Museveni's government in 1993, they have clashed with the central government on such issues as land ownership. However, there is little evidence that the kingdoms have attempted to stymie the provision of local public goods; if anything, the *kabaka* (king) of Buganda and other kingdom leaders have explicitly encouraged their subjects to attend school and get immunized (Nasamula 2012).

To sum up this section, the set of results presented in table 5 show a striking lack of correlation between precolonial centralization and education and health public goods, while in table 6 the results showed a lack of correlation between precolonial centralization and local government accountability and performance. These results contrast strongly with the results presented in tables 1, 2, and 4, which clearly showed a strong relationship between precolonial centralization and measurements such as GDP, poverty, and asset ownership. This dual set of results is highly supportive of the persistence hypothesis, in that precolonial centralization is correlated with contemporary access to private goods rather than public goods.

VII. Conclusion

In this article we tested the hypothesis that precolonial political centralization is a determinant of postcolonial African development by using the case of Uganda. Employing a wide variety of evidence from UNDP, Afrobarometer, DHS, and Ugandan government sources, we showed that precolonial centralization is significantly correlated with contemporary local measurements of GDP, poverty, and asset ownership, a result that is robust to the use of various control variables and distance from the ancient capital of Mubende as an instrumental variable. However, we also showed that precolonial centralization is

²² Although Busoga does have a history of chiefdoms, it only received its first king (*kyabazinga*) in 1939. After independence, however, it enjoyed the same semifederal status as Ankole, Bunyoro, and Toro and like the other kingdoms was restored on a nonpolitical basis in the 1990s.

correlated neither with public goods provision in the case of health and education nor with local government accountability or efficacy.

Our results therefore suggest a correlation between precolonial centralization and private rather than public goods, leading us to propose that levels of wealth have persisted in Uganda from the precolonial period to the present day. Indeed, the qualitative historical record supports this conclusion in four ways. In the first case, we can document a positive effect of precolonial states on local welfare. Centralized states were able to introduce new technologies, coordinate labor supplies, and build roads, whereas noncentralized areas could not, in part because political instability contributed to short time horizons (Osafo-Kwaako and Robinson 2013). Indeed, states like Buganda and Bunyoro not only were centers of wealth but had the ability to use this wealth to feed the poor in times of famine (Doyle 2006, 31). Precolonial Uganda is no unique in this regard: as noted by McCaskie (2003, 31), precolonial states like the Asante in West Africa “cannot be remotely classified as an economy of generalized want and hunger.” Moreover, such states could hold a monopoly of violence within their territories, thereby preserving wealth and assets in contrast to less centralized areas such as Teso that suffered from high levels of warfare (Lawrance 1957, 3). Indeed, recent evidence from Depetris-Chauvin (2015) suggests that long-term exposure to statehood in Africa is negatively correlated with conflict.

Second, there is recent evidence that precolonial centralization is actually negatively correlated with contemporary levels of democracy outside Europe, whereby the spread of colonial institutions was hindered by strong precolonial states (Hariri 2012). In other words, precolonial centralization appears to be correlated with lower rather than higher levels of political accountability today, at least at the country level. It does not require a large leap of the imagination to suppose that the same mechanisms would have worked at the subnational level within Uganda and other African countries that exhibited large variation in levels of precolonial political centralization, such that precolonial centralization would not have a positive effect on contemporary institutions at the local level. Moreover, as noted in Section III above, in Uganda as elsewhere in Africa the colonial period saw the introduction of chieftaincies to non-centralized areas, whose persistence to the present day has meant that institutional differences across centralized and noncentralized areas have long been minimal.²³

²³ Thus, the roles that many ethnic chiefs play today in the provision of public services may indeed be important (Michalopoulos and Papaioannou 2013), but it remains an open question as to whether chiefs in centralized areas are more or less accountable than those in noncentralized areas. For instance, Baldwin (2013) suggests that patterns of precolonial centralization have no effect on the relationship between chiefs and subjects in contemporary Zambia.

Third, people in centralized precolonial states were generally better off than stateless people because of the effects of states predating on stateless people, particularly through slave-raiding. The effects of the intercontinental slave trade on African underdevelopment have already been explored by Nunn (2008), who finds a robust relationship between the number of slaves exported and contemporary GDP per capita; Nunn and Wantchekon (2011) suggest that the relevant mechanism here was the way in which slavery led to greater levels of mistrust within Africa. Indeed, in precolonial sub-Saharan Africa, land was abundant while labor was scarce, which meant that poverty at the time was more defined by a lack of access to labor than to land (Ilfé 1987). Slave-raiding was therefore the ideal way to alleviate labor shortages, especially by raiding neighboring groups (Lovejoy 2000). In precolonial Uganda, the Bunyoro state would often raid for slaves among the Alur of northwest Uganda (Doyle 2006, 37), while neighboring Acholi, Lugbara, and Madi people were similarly targeted by Arabic slave traders from what is now Sudan (Leopold 2006, 181–85).²⁴ The effect of such raids was to negatively affect not only those who became slaves but also those left behind where labor was even more scarce than it had been before, thereby only exacerbating precolonial inequalities between centralized and stateless peoples.²⁵ The nature of the impact of precolonial slavery within Africa on postcolonial development—as opposed to the effects of the intercontinental slave trade—remains, however, a topic for further discussion.

Fourth and finally, recent evidence from economic history suggests that states have not done as well as previously thought in eliminating inequalities of wealth through redistribution (Clark 2014). Attempts at interregional redistribution in Uganda, as elsewhere in Africa, have been notably absent, with equalization grants given to poorer districts comprising only 0.5% of all central government funding to districts (Bitarabeho 2008). Colonial policies of indirect rule and a lack of redistribution policies under previous governments—with the exception of elite accumulation at high levels of government—have thus meant that wealth in Uganda and Africa more widely has not been re-

²⁴ Michalopoulos and Papaioannou (2013) attempt to control for this possibility by introducing a dummy variable measuring the existence/nonexistence of slavery within each ethnic group; they find no statistical relationship between this slavery variable and light intensity. However, the existence of slavery was not necessarily correlated with slave raiding; the Alur and Lugbara, to take two examples, are both recorded by Murdock (1967) as using slaves yet suffered from slave-raiding much more than they gained.

²⁵ For evidence outside Africa, see Scott (2009), who suggests that stateless peoples in southeast Asia deliberately refused to adopt writing in order to frustrate state attempts at capturing and classifying them; being preliterate (or postliterate as Scott [2009] calls them) would have also inhibited economic development in obvious ways.

distributed from richer areas to poorer ones over the past century (Van de Walle 2009). It is thus not surprising to find evidence of the relative persistence of wealth in centralized areas from the precolonial period to the present.

As regards the literature on the contemporary legacies of precolonial centralization, our results support the finding that centralization is correlated with contemporary development but do not support the idea that the mechanism is through the quality of local government in centralized areas. In suggesting the persistence of poverty from the precolonial period to the present, we thereby argue against the noted Reversal of Fortune thesis proposed by Acemoglu, Johnson, and Robinson (2002), whereby colonialism made poorer areas rich and turned richer areas poor. Our results instead match with those of Bandyopadhyay and Green (2012), who argue that this reversal did not take place within Africa, alongside those of Hjort (2010) and others who suggest that precolonial social formations have persistent effects on contemporary development.

Moreover, our results add to a growing literature on the specific impact of precolonial political centralization on subsequent economic and political development. For instance, Gerring et al. (2011) show that precolonial centralization is positively and robustly correlated with indirect colonial rule, which suggests that much of the impact of colonialism on contemporary development may in fact be attributable to the influence of precolonial development instead. Similarly, Bockstette, Chanda, and Putterman (2002) suggest that a history of a state over the past 2,000 years is highly correlated at the cross-national level with contemporary measures of political stability and economic development.

We hope this analysis has contributed toward the growing literature on the role of history in contemporary African development. Further work on this subject could investigate the same relationships in another context, whether in another African country or somewhere else with similarly large variation in levels of precolonial centralization.

Appendix A

TABLE A1
ETHNIC GROUPS AND PRECOLONIAL CENTRALIZATION

Ethnic Group	Centralization	Similar Ethnic Group	Ethnic Group	Centralization	Similar Ethnic Group
Acholi	1		Batoro	3	
Alur	1		Batuku	3	Batoro
Aringa	1	Acholi/Iteso/Kakwa	Batwa	0	Mbuti (in the DRC)
Baamba	0		Chope	1	Acholi/Iteso/Kakwa
		Tiriki (Luhya;	Dodoch	1	Jie
Babukusu	1	in Kenya)	Ethur	1	Jie
Babwisi	0	Baamba	Ik (Teuso)	1	Acholi/Iteso/Kakwa
Bafumbira	3	Banyarwanda	Iteso	1	
Baganda	3		Jie	1	
Bagisu	1		Jopadhola	1	Acholi/Iteso/Kakwa
Bagungu	3	Banyoro/Batoro	Kumam	1	Acholi/Iteso/Kakwa
		Tiriki (Luhya;	Jonam	1	Acholi/Iteso/Kakwa
Bagwe	1	in Kenya)	Kakwa	1	
Bagwere	2	Basoga	Karimojong	1	Jie
Bahehe	2		Kebu(okebu)	1	Acholi/Iteso/Kakwa
Bahororo	3	Banyankole	Kuku	1	
Bakenyi	2	Basoga	Kumam	1	Acholi/Iteso/Kakwa
Bakhonzo	0		Langi	1	
Bakiga	0		Lendu	1	Acholi/Iteso/Kakwa
Banyankole	3		Lugbara	1	
Banyara	3	Baganda/Banyoro	Madi	1	
Banyarwanda	3		Mening	1	Iteso
		Tiriki (Luhya;	Mvuba	1	Acholi/Iteso/Kakwa
Banyole	1	in Kenya)	Napore	1	Acholi/Iteso/Kakwa
Banyoro	3				Dinka (in Sudan)/
Baruli	3	Baganda/Banyoro	Nubi	1	Kakwa/Lugbara
		Tiriki (Luhya;	Nyangia	1	Acholi/Iteso/Kakwa
Basamia	1	in Kenya)	Pokot	1	Acholi/Iteso/Kakwa
Basoga	2		Sabiny/Sebei	1	
Basongora	0	Baamba	So/Tepeth/		
Batagwenda	3	Banyankole/Batoro	Topotha	1	

Appendix B

TABLE B1
DATA SOURCES

	Description	Source
Dependent variable:		
Access to safe drinking water	Access to safe drinking water in 2008	Government of Uganda (2008)
BCG immunization	Average coverage of BCG (tuberculosis) immunization between 2007 and 2009	Government of Uganda (2010)
DPT immunization	Average coverage of DPT (diphtheria, pertussis, and tetanus) immunization between 2007 and 2009	Government of Uganda (2010)
GDPIndex	GDP per capita index for 2005	UNDP (2007)
HDI2003	Human development index for 2003	UNDP (2005)
HDI2005	Human development index for 2005	UNDP (2007)
Gross enrollment index	Index of the ratio of all pupils enrolled in primary school to the total population of 6–12-year-olds in the district for 2005	UNDP (2007)
Gross enrollment ratio	Average ratio of all pupils enrolled in primary school to the total population of 6–12-year-olds in the district between 2007 and 2009	Government of Uganda (2010)
Gross intake ratio	Average ratio of all pupils enrolled in primary grade 1 to the total population of 6-year-olds per district between 2007 and 2009	Government of Uganda (2010)
Health centers per 10,000 inhabitants	Total number of health centers per 10,000 inhabitants	Government of Uganda (2010)
Inequality	Gini index of inequality, ranging from 0 (perfect equality) to 1 (perfect inequality)	Emwanu et al. (2007)
Life expectancy index	Average life expectancy index for 2005	UNDP (2007)
Literacy index	Adult literacy index for 2005	UNDP (2007)
Measles immunization	Average coverage of measles immunization between 2007 and 2009	Government of Uganda (2010)
Net enrollment ratio	Average ratio of pupils enrolled in primary school age 6–12 to the total population of 6–12-year-olds in the district between 2007 and 2009	Government of Uganda (2010)
Net intake ratio	Average ratio of pupils age 6 enrolled in primary grade 1 to the total population of 6-year-olds per district between 2007 and 2009	Government of Uganda (2010)
Oral polio vaccine	Average coverage of oral polio vaccine between 2007 and 2009	Government of Uganda (2010)
Percentage of district health posts filled	Percentage of district health posts filled (actual number divided by the norm) in 2009	Government of Uganda (2009)
Poverty gap	Average gap in expenditure necessary for the poor to reach the poverty line	Emwanu et al. (2007)
Poverty headcount	Percentage of residents under the poverty line	Emwanu et al. (2007)

TABLE B1 (Continued)

	Description	Source
Independent variable:		
Border	Dummy variable that takes the value 1 in districts/subcounties that have an international border and 0 otherwise	Computed by authors
Ecological diversity	Level of ecological or vegetative diversity in a given area	Fenske (2014)
Ethnolinguistic fractionalization (ELF)	Probability that two people chosen at random will be from different ethnic groups, as computed using the Herfindahl index	Government of Uganda (2002)
Precolonial centralization dummy	Dummy variable taking the value 1 if the survey respondent is a member of an ethnic group classified as having a degree of precolonial political centralization at a level 2 or higher (with a total of range of 0–4)	Murdock (1967)
Precolonial centralization percentage	Percentage of people in each local government unit who are members of an ethnic group classified as having a degree of precolonial political complexity at a level 2 or higher (with a total of range of 0–4)	Murdock (1967), Government of Uganda (2002)
Elevation	Elevation in feet (logged) for each district capital	Google Earth
Malaria	Malaria ecology index	Kiszewski et al. (2004)
Rainfall	Annual rainfall, with measurements ranging across seven discrete values, from less than 800 mm per annum (0) to more than 1,800 mm (6)	Basaliwa (1995)
Rivers/lakes	Dummy variable that takes the value 1 in districts/subcounties that contain a major river or lake	Computed by authors
Soil type:		
Lithosol	Dummy variable that takes the value 1 when a significant portion of the district's soil is lithosol and 0 otherwise	Government of Uganda (1967)
Vitrosol	Dummy variable that takes the value 1 when a significant portion of the district's soil is vitrosol and 0 otherwise	Government of Uganda (1967)

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